Altivar HVAC ATH200

Variable Speed Drives for Asynchronous and Synchronous Motors

Programming Manual

JPS43207.01

12/2025

www.se.com

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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Qualification of Personnel

Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and with this product. In addition, these persons must have received safety training to recognize and avoid hazards involved. These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may be caused by using the product, by changing the settings and by the mechanical, electrical and electronic equipment of the entire system in which the product is used. All persons working on and with the product must be fully familiar with all applicable standards, directives, and accident prevention regulations when performing such work.

Intended Use

This product is intended for industrial use according to this manual.

The product may only be used in compliance with all applicable safety standard and local regulations and directives, the specified requirements and the technical data. The product must be installed outside the hazardous ATEX zone. Prior to using the product, you must perform a risk assessment in view of the planned application. Based on the results, the appropriate safety measures must be implemented. Since the product is used as a component in an entire system, you must ensure the safety of persons by means of the design of this entire system (for example, machine design). Any use other than the use explicitly permitted is prohibited and can result in hazards.

About the document

Document Scope

The purpose of this document is to:

- help you to set up the drive,
- show you how to program the drive,
- show you the different menus, modes, and parameters,
- help you in maintenance and diagnostics.

Validity Note

Original instructions and information given in the present document have been written in English (before optional translation).

This documentation is valid for the Altivar HVAC ATH200 drives.

Product Related Information

Read and understand these instructions before performing any procedure with this device.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Only appropriately trained persons who are familiar with and fully understand the contents of the present manual and all other pertinent product documentation and who have received all necessary training to recognize and avoid hazards involved are authorized to work on and with this device system.
- Installation, adjustment, repair and maintenance must be performed by qualified personnel.
- Verify compliance with all local and national electrical code requirements as well as all other applicable regulations with respect to grounding of all equipment.
- Only use properly rated, electrically insulated tools and measuring equipment.
- Do not touch unshielded components or terminals with voltage present.
- Prior to performing any type of work on the device system, block the motor shaft to prevent rotation.
- Insulate both ends of unused conductors of the motor cable.
- Do not short across the DC bus terminals or the DC bus capacitors or the braking resistor terminals.

Failure to follow these instructions will result in death or serious injury.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Before performing work on the device system:

- Disconnect all power, including external control power that may be present. Take into account that the circuit breaker or main switch does not de-energize all circuits.
- Place a “Do Not Turn On” label on all power switches related to the device system.
- Lock all power switches in the open position.
- Wait 15 minutes to allow the DC bus capacitors to discharge.
- Verify the absence of voltage. (1)

Before applying voltage to the device system:

- Verify that the work has been completed and that the entire installation cannot cause hazards.
- If the mains input terminals and the motor output terminals have been grounded and short-circuited, remove the ground and the short circuits on the mains input terminals and the motor output terminals.
- Verify proper grounding of all equipment.
- Verify that all protective equipment such as covers, doors, grids is installed and/or closed.

Failure to follow these instructions will result in death or serious injury.

(1) Refer to the Verify the Absence of Voltage chapter in the installation manual of the product.

Damaged products or accessories may cause electric shock or unanticipated equipment operation.

⚠⚠DANGER

ELECTRIC SHOCK OR UNANTICIPATED EQUIPMENT OPERATION

Do not use damaged products or accessories.

Failure to follow these instructions will result in death or serious injury.

Contact your local Schneider Electric sales office if you detect any damage whatsoever.

This equipment has been designed to operate outside of any hazardous location. Only install this equipment in zones known to be free of a hazardous atmosphere.

⚠DANGER

POTENTIAL FOR EXPLOSION

Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions will result in death or serious injury.

Your application consists of a whole range of different interrelated mechanical, electrical, and electronic components, the device being just one part of the application. The device by itself is neither intended to nor capable of providing the entire functionality to meet all safety-related requirements that apply to your application. Depending on the application and the corresponding risk assessment to be conducted by you, a whole variety of additional equipment is required such as, but not limited to, external encoders, external brakes, external monitoring devices, guards, etc.

As a designer/manufacturer of machines, you must be familiar with and observe all standards that apply to your machine. You must conduct a risk assessment and determine the appropriate Performance Level (PL) and/or Safety Integrity Level (SIL) and design and build your machine in compliance with all applicable standards. In doing so, you must consider the interrelation of all components of the machine. In addition, you must provide instructions for use that enable the user of your machine to perform any type of work on and with the machine such as operation and maintenance in a safe manner.

The present document assumes that you are fully aware of all normative standards and requirements that apply to your application. Since the device cannot provide all safety-related functionality for your entire application, you must ensure that the required Performance Level and/or Safety Integrity Level is reached by installing all necessary additional equipment.

⚠WARNING

INSUFFICIENT PERFORMANCE LEVEL/SAFETY INTEGRITY LEVEL AND/OR UNINTENDED EQUIPMENT OPERATION

- Conduct a risk assessment according to EN ISO 12100 and all other standards that apply to your application.
- Use redundant components and/or control paths for all critical control functions identified in your risk assessment.
- Implement all monitoring functions required to avoid any type of hazard identified in your risk assessment, for example, slipping or falling loads.
- Verify that the service life of all individual components used in your application is sufficient for the intended service life of your overall application.
- Perform extensive commissioning tests for all potential error situations to verify the effectiveness of the safety-related functions and monitoring functions implemented, for example, but not limited to, speed monitoring by means of encoders, short circuit monitoring for all connected equipment, correct operation of brakes and guards.
- Perform extensive commissioning tests for all potential error situations to verify that the load can be brought to a safe stop under all conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Product may perform unexpected movements because of incorrect wiring, incorrect settings, incorrect data or other errors.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Carefully install the wiring in accordance with the EMC requirements.
- Do not operate the product with unknown or unsuitable settings or data.
- Perform a comprehensive commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop, overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines (1).
- Each implementation of the product must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(1) For USA: Additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems.

Machines, controllers, and related equipment are usually integrated into networks. Unauthorized persons and malware may gain access to the machine as well as to other devices on the network/fieldbus of the machine and connected networks via insufficiently secure access to software and networks.

⚠WARNING

UNAUTHORIZED ACCESS TO THE MACHINE VIA SOFTWARE AND NETWORKS

- In your hazard and risk analysis, consider all hazards that result from access to and operation on the network/fieldbus and develop an appropriate cybersecurity concept.
- Verify that the hardware infrastructure and the software infrastructure into which the machine is integrated as well as all organizational measures and rules covering access to this infrastructure consider the results of the hazard and risk analysis and are implemented according to best practices and standards covering IT security and cybersecurity (such as: ISO/IEC 27000 series, Common Criteria for Information Technology Security Evaluation, ISO/ IEC 15408, IEC 62351, ISA/IEC 62443, NIST Cybersecurity Framework, Information Security Forum - Standard of Good Practice for Information Security, SE recommended Cybersecurity Best Practices*).
- Verify the effectiveness of your IT security and cybersecurity systems using appropriate, proven methods.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(*) : SE Recommended Cybersecurity Best Practices can be downloaded on SE.com.

⚠WARNING

LOSS OF CONTROL

Perform a comprehensive commissioning test to verify that communication monitoring properly detects communication interruptions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The temperature of the products described in this manual may exceed 80°C (176°F) during operation.

⚠WARNING

HOT SURFACES

- Ensure that any contact with hot surfaces is avoided.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity of hot surfaces.
- Verify that the product has sufficiently cooled down before handling it.
- Verify that the heat dissipation is sufficient by performing a test run under maximum load conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

DESTRUCTION DUE TO INCORRECT MAINS VOLTAGE

Before switching on and configuring the product, verify that it is approved for the mains voltage.

Failure to follow these instructions can result in equipment damage.

General Cybersecurity Information

In recent years, the growing number of networked machines and production plants has seen a corresponding increase in the potential for cyber threats, such as unauthorized access, data breaches, and operational disruptions. You must, therefore, consider all possible cybersecurity measures to help protect assets and systems against such threats.

To help keep your Schneider Electric products secure and protected, it is in your best interest to implement the cybersecurity best practices as described in the Cybersecurity Best Practices document.

Schneider Electric provides additional information and assistance:

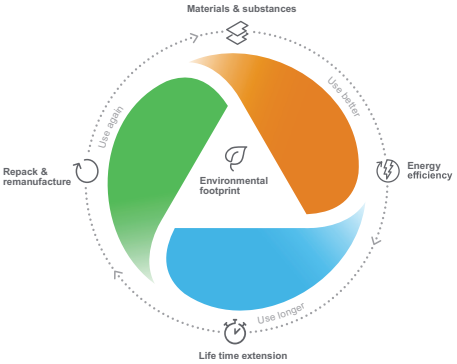
- Subscribe to the Schneider Electric security newsletter.
- Visit the Cybersecurity Support Portal web page to:
  - Find Security Notifications.
  - Report vulnerabilities and incidents.
- Visit the Schneider Electric Cybersecurity and Data Protection Posture web page to:
  - Access the cybersecurity posture.
  - Learn more about cybersecurity in the cybersecurity academy.
  - Explore the cybersecurity services from Schneider Electric.

Environmental Data

The Environmental Data Program is a framework for how we measure, categorize, and compare the environmental attributes and footprint of our products.

Using a rigorous, fact-based methodology, the program provides environmental data from across the product lifecycle.

Five data categories across the product lifecycle



Use Better: How sustainable a product is, including environmental footprint, materials and substances, packaging, and energy efficiency.

Use Longer: How a product's life time can be effectively extended in terms of repairability and updatability.

Use Again: How a product can be reused, from dismantling and remanufacturing to recyclability and manufacturer take back.

With this transparent, verified data, customers and partners are empowered to make conscious environmental choices and accurately evaluate and report on sustainability performance.

All our hardware offers have an associated environmental data available on se.com product pages.

Refer to Environmental Data Program for more information.

Related Documents

Use your tablet or your PC to quickly access detailed and comprehensive information on all our products on www.se.com.

The internet site provides the information you need for products and solutions:

- The whole catalog for detailed characteristics and selection guides,
- The CAD files to help design your installation, available in over 20 different file formats,
- All software and firmware to maintain your installation up to date,
- A large quantity of White Papers, Environment documents, Application solutions, Specifications... to gain a better understanding of our electrical systems and equipment or automation,
- And finally all the User Guides related to your drive, listed below:

Title of Documentation	Reference Number	
Catalog: Altivar Building ATH200	DIA2ED2250901EN (English)	DIA2ED2250901FR (French)
ATH200 Getting Started	JPS43191 (English), JPS43192 (French), JPS43193 (German), JPS43194 (Spanish)	JPS43198 (Italian), JPS43199 (Chinese), JPS43197 (Portuguese), JPS43195 (Turkish)
ATH200 Getting Started Annex (SCCR)	JPS43196 (English)	
ATH200 Installation manual	JPS43203 (English), JPS43204 (French), JPS43202 (German), JPS43201 (Spanish),	JPS43200 (Italian), JPS43208 (Chinese), JPS43205 (Portuguese), JPS43209 (Turkish)
ATH200 Programming manual	JPS43207 (English), JPS43206 (French), JPS43212 (German), JPS43211 (Spanish),	JPS43210 (Italian), JPS43213 (Chinese), JPS43214 (Portuguese), JPS43215 (Turkish)
ATH200 ATEX manual	JPS43218 (English)	
ATH200 Modbus manual	JPS43217 (English)	
ATH200 BACnet manual	JPS43216 (English)	
ATH200 Communication Parameters	JPS43219 (English)	
ATH200 Safety Functions manual	JPS43226 (English), JPS43227 (French), JPS43229 (German),	JPS43233 (Spanish), JPS43231 (Italian), JPS43232 (Chinese)

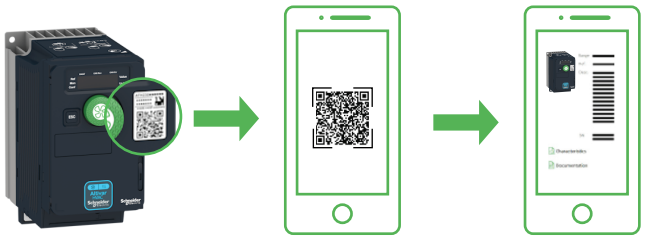
Title of Documentation	Reference Number
ATH200 - ATV Logic manual	JPS43234 (English), JPS43230 (French), JPS43238 (Spanish), JPS43237 (Italian), JPS43236 (German), JPS43235 (Chinese)
SoMove: FDT	SoMove_FDT (English, French, German, Spanish, Italian, Chinese)
ATH200: DTM	ATH200 DTM Library (English, French, Spanish, Italian, German, Chinese)
Recommended Cybersecurity Best Practices	CS-Best-Practices-2019-340 (English)

To find documents online, visit the Schneider Electric download center (www.se.com/ww/en/download/).

Information on Non-Inclusive or Insensitive Terminology

As a responsible, inclusive company, Schneider Electric is constantly updating its communications and products that contain non-inclusive or insensitive terminology. However, despite these efforts, our content may still contain terms that are deemed inappropriate by some customers.

Electronic product data sheet



Terminology used in this document

The technical terms, terminology, and the corresponding descriptions in this manual normally use the terms or definitions in the relevant standards.

Among others, these standards include:

- ISO 13849: The Foundation of Functional Safety in the Machinery
- IEC 60204-1: Safety of machinery - Electrical equipment of machines – Part 1: General requirements.
- IEC 61158 series: Industrial communication networks - Fieldbus specifications
- IEC 61508 Ed.2 series: Functional safety of electrical/electronic/ programmable electronic safety-related.
- IEC 61784 series: Industrial communication networks - Profiles.
- IEC 61800 series: Adjustable speed electrical power drive systems.
- IEC 62443: Security for industrial automation and control systems.

In the area of drive systems this includes, but is not limited to, terms such as **error, error message, failure, fault, fault reset, protection, safe state, safety function, warning, warning message**, and so on.

In addition, the term **zone of operation** is used in conjunction with the description of specific hazards, and is defined as it is for a **hazard zone** or **danger zone** in the EC Machinery Directive (2006/42/EC) and in ISO 12100-1.

General Overview

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Overview

What's in This Chapter

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Factory Configuration

Factory Settings

The ATH200 is factory-set for common operating conditions:

- Display: drive ready **[Ready]** rdY when motor is ready to run and the output frequency when motor is running.
- The LI3 to LI6 logic inputs, AI2 and AI3 analog inputs, LO1 logic output, AO1 analog output, and R2 relay are unassigned.
- Stop mode if error is detected: freewheel.

This table presents the basic parameters of the drive and their factory setting values:

Code	Name	Factory setting values
bFr , page 91	**[Motor Standard]**	50 **[IEC]**
tCC , page 90	**[2/3-Wire Control]**	**[2-Wire Control]** 2C: 2-wire control
Ctt , page 113	**[Motor control type]**	**[U/F VC Quad.]** uF9: U/F VC point voltage/frequency
ACC , page 93	**[Acceleration]**	3.0 s
dEC , page 93	**[Deceleration]**	3.0 s
LSP , page 94	**[Low Speed]**	0.0 Hz
HSP , page 94	**[High Speed]**	50.0 Hz
ItH , page 93	**[Motor Th Current]**	Nominal motor current (value depending on drive rating)
SdC1	**[Auto DC inj Level 1]**	0.7 x nominal drive current, for 0.5 s
SFr	**[Switching frequency]**	4 kHz
Frd , page 136	**[Forward]**	**[DI1]** LI1: Logic input LI1
rrS , page 137	**[Reverse Assign]**	**[DI2]** LI2: Logic input LI2
Fr1 , page 174	**[Ref Freq 1 Config]**	**[AI1]** AI1: Analog input AI1
r1	**[R1 Assignment]**	**[No drive flt]** FL: The contact opens when the drive has detected error or when the drive has been switched off
brA	**[Dec.Ramp Adapt]**	**[Yes]** YES: Function active (automatic adaptation of deceleration ramp)
AtR	**[Auto Fault Reset]**	**[No]** no: Function inactive
Stt	**[Type of stop]**	**[Ramp Stop]** rMP: On ramp
CFG , page 87	**[Macro Config]**	**[Start/Stop]** StS

NOTE: If you want to keep the drive pre-settings to a minimum, select the macro configuration **[Macro Config]** CFG = **[Start/Stp]** StS followed by **[Restore Configuration]** FCS to **[Macro Config]** ini. Refer CFG, page 87 for information.

Verify whether the above values are compatible with the application and modify them if required.

Application Functions

Introduction

The following tables show the combinations of functions and applications to guide your selection.

The applications in these tables relate to the following machines:

- **HVAC:** Air cooled chiller, water cooled chiller, roof top, air handling unit, cooling tower, heat pump, boiler, condenser.

Each application has its own special features, and the combinations listed here are not mandatory or exhaustive.

Application-Specific Functions

Function	Application							
	Air cooled chiller	water cooled chiller	Roof top	Air handling unit	Cooling tower	Heat pump	Boiler	Con-denser
Fire Mode			✓	✓				
Run Permissive	✓	✓	✓	✓	✓	✓	✓	✓
Damper Control			✓	✓				
PID Controller	✓	✓	✓	✓	✓	✓	✓	✓
Additional PID			✓	✓				
Broken Belt Detection			✓	✓				

Basic Functions

Drive Ventilation

The fan starts automatically when the drive thermal state reaches 70% of the maximum thermal state and if the **[Fan mode]** FFM is set to **[Standard]** Std.

Powering Up the Drive for the First Time

Powering Up the Drive with Graphic Display Terminal for the First Time

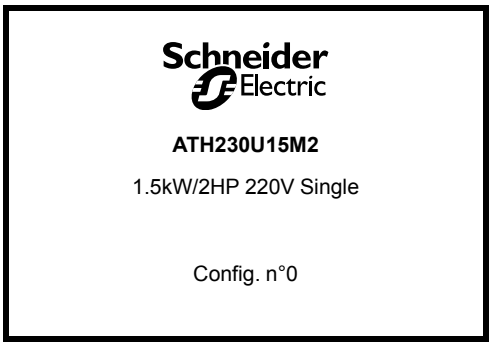
When powering up the graphic display terminal for the first time, you have to select the required language.

The following is displayed after the graphic display terminal has been powered up for the first time.

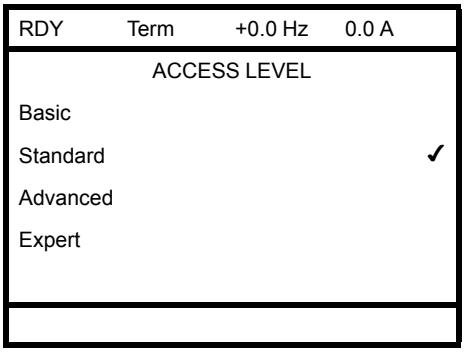
Select the language and press ENT.

ENT

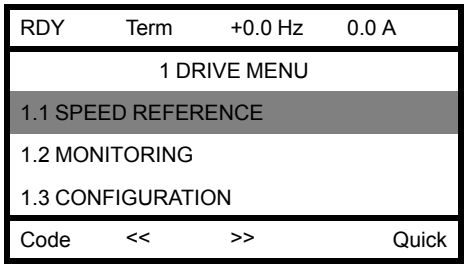
The drive rating details are displayed.



3 s

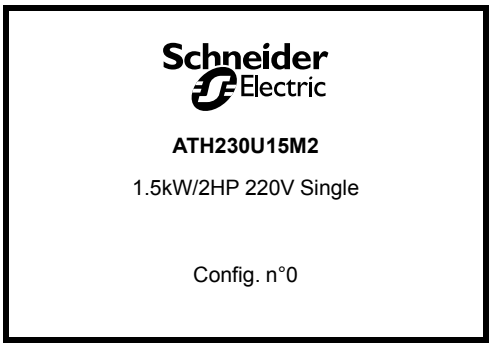


ENT


RDY Term +0.0 Hz 0.0 A
1 DRIVE MENU
1.1 SPEED REFERENCE
1.2 MONITORING
1.3 CONFIGURATION
Code << >> Quick

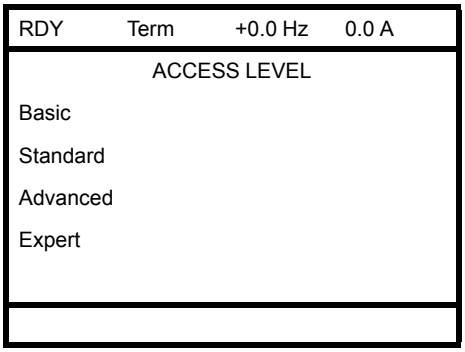
Powering Up the Drive for the First Time

With the integrated display terminal, when powering up the drive for the first time, the user immediately accesses to **[Motor Standard]** bFr , page 91) in the menu (**[Configuration]** ➞ **[Full]** ➞ **[Simply start]**).



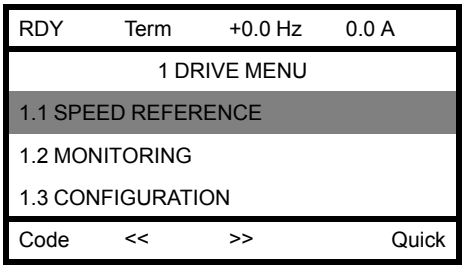
Display after the drive has been powered up for the first time.

3 s



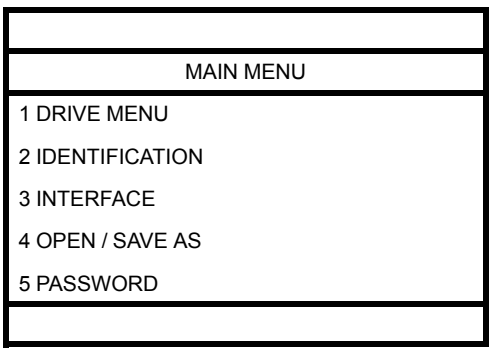
The **[Access Level]** screen follows automatically.

ENT



Automatically switches to the **1 [Drive menu]** menu after 3 seconds.

ESC

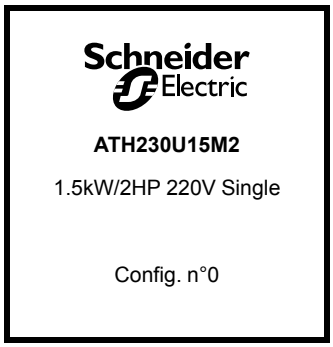


The **MAIN MENU** appears on the graphic display terminal if you press the ESC key.

Subsequent Power-ups

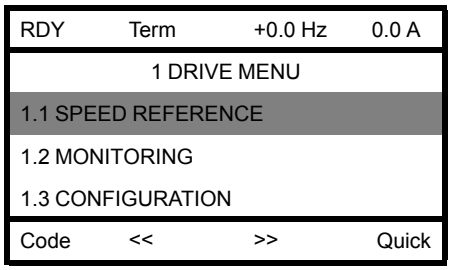
With the integrated display terminal, at subsequent power-ups of the drive for the first time, you can immediately access the drive state (Same list than **[Device State]** H S T , page 65. Example : **[Ready]** r d Y.

The following is displayed after powering up.



3 s

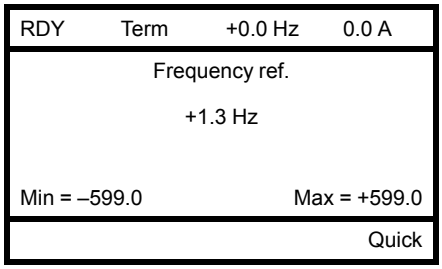
Automatically switches to the **1 [Drive menu]** menu after 3 seconds.



Select the menu and press ENT.

10 s

Automatically switches to the monitoring screen after 10 seconds.

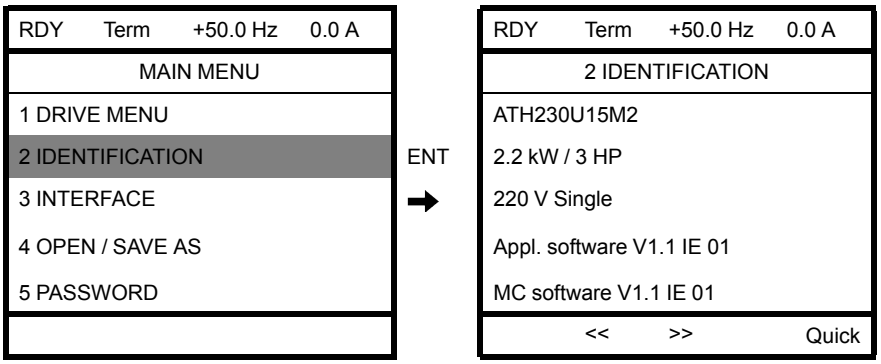


Identification Menu

The **2 [Identification]** $\square\ id$- menu can only be accessed on the graphic display terminal.

This is a read-only menu that cannot be configured. It enables the following information to be displayed:

- Drive reference, power rating and voltage
- Drive software version
- Drive serial number
- Safety function status and checksum
- Function blocks program and catalogue version
- Type of options present, with their software version
- Graphic display terminal type and version



FFFFFFFFF

Product V1.1 IE 01

SAFETY FUNCTIONS

Drive Safety status Standard

Safe param. CRC 8529

FUNCTION BLOCKS

Prg. format version 1

Catalogue version 1

OPTION 1

No option

GRAPHIC TERMINAL

GRAPHIC S

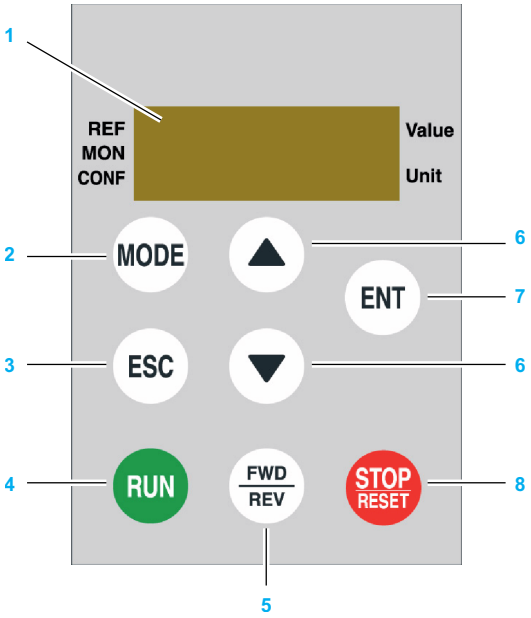
V1.2IE07

00000000000000000

Remote Display Terminal Option

Description

This remote display terminal is a local control unit which can be mounted on the door of the wall-mounted or floor-standing enclosure. It has a cable with connectors, which is connected to the drive serial link. With this remote display terminal, up and down arrows are used for navigation rather than a jog dial.



1. Four digits display
2. **MODE** key(1): used to switch **1.1 [Reference speed]** rEF-, **1.2 [MONITORING]** MOn- and **1.3 [Configuration]** CONF- menus.

   NOTE:

   (1) If the drive is locked by a code (**[PIN code 1]** COd, page 356), pressing the MODE key enables you to switch from the **1.2 [MONITORING]** MOn menu to the **1.1 [Reference speed]** rEF menu and vice versa.
3. **ESC** key: used to quit a menu/parameter or remove the currently displayed value to revert to the previous value retained in the memory
4. **RUN** key: executes the function assuming it has been configured
5. Key for reversing the direction of rotation of the motor
6. Navigation keys
7. **ENT** key: used to save the current value or access the selected menu/parameter
8. **STOP** key: used to stop the motor and perform a reset

To activate the keys on the remote display terminal, you have to configure **[Ref Freq Ch 1]** Fr1, page 174 **=[HMI]** LCC.

Accessory: Graphic Display Terminal VW3A1111

Software Version of the Graphic Display Terminal

⚠⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

- The software version of the Graphic Display Terminal VW3A1111 must be equal to or higher than V2.0 to be used with these drives.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Go to **[Identification]** - menu to verify the software version of the Graphic Display Terminal.

Software Version of the Graphic Display Terminal VW3A1111

On VW3A1111 Graphic Display Terminal, the parameter labels may differ from VW3A1101 Remote Graphic Display Terminal. This document shows the labels of the most recent Remote Graphic Display Terminal, the VW3A1111.

NOTE: The code of the menus and parameters remains identical for VW3A1111 and VW3A1101.

On VW3A1111, the password feature, the interface menu and the configuration transfer/storage are identical to the VW3A1101 Graphic Display Terminal.

The Multipoint Screen feature of the Graphic Display Terminal VW3A1111 can be used with ATH230.

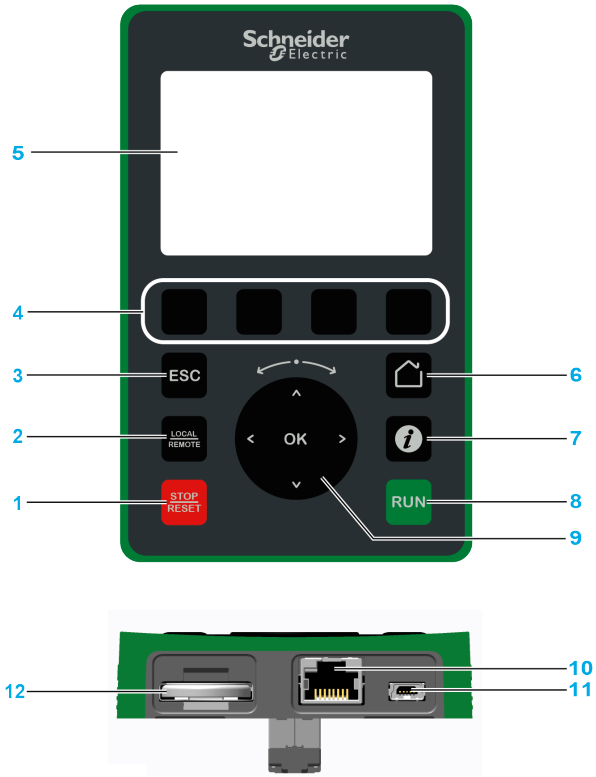
VW3A1111 and VW3A1101 shows different keys, for more information refer to the description of each Graphic Display Terminal.

Description of the Graphic Display Terminal

The Graphic Display Terminal is a local control unit which can be either plugged on the drive using a cable or mounted on the door of the wall-mounted or floor-standing enclosure with an adaptator VW3A1112. It has a cable with connectors, which is connected to the drive front Modbus serial link.

Note

- When BACnet MS/TP is enabled, the keypad is unavailable and SoMove cannot connect.



1 STOP / RESET: Stop command / apply a Fault Reset.

2 LOCAL / REMOTE: used to switch between local and remote control of the drive if one of the function keys displays **[T/K]** F t K , otherwise the key is unused.

NOTE:

To assign a function key (F1…F4) to the function LOCAL/REMOTE, go to **[Command]** C t L - menu

and assign **[F1 key assignment]** F n 1 or … or **[F4 key assignment]** F n 4 to **[T/K]** F t K .

3 ESC: used to quit a menu/parameter or remove the currently displayed value to revert to the previous value retained in the memory.

4 F1 to F4: function keys used to access quick view, and submenus. Simultaneous press of F1 and F4 keys generates a screenshot file in the Graphic Display Terminal internal memory.

5 Graphic display.

6 Home: used to access directly at the home page if the Graphic Display Terminal displays **Quick** on one of its function keys.

7 Information: used to show the code of menus, submenus, and parameters if the Graphic Display Terminal displays **Code** on one of its function keys.

8 RUN: executes the function assuming it has been configured.

9 Touch wheel / OK: used to save the current value or access the selected menu/parameter. The touch wheel is used to scroll fast into the menus. Up/down arrows are used for precise selections, right/left arrows are used to select digits when setting a numerical value of a parameter.

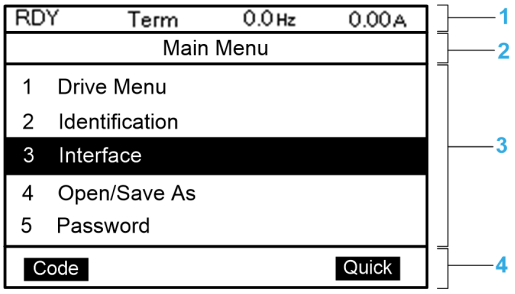
10 RJ45 Modbus serial port: used to connect the Graphic Display Terminal to the drive in remote control.

11 MiniB USB port: used to connect the Graphic Display Terminal to a computer.

12 Battery (10 years service life. Type: CR2032). The battery positive pole points to the front face of the Graphic Display Terminal.

NOTE: Keys 1, 8 and 9 can be used to control the drive if control via the Graphic Display Terminal is activated. To activate the keys on the Graphic Display Terminal, you first need to set (**[Ref Freq Ch 1]** F r 1 to **[HMI]** L C C).

Description of the Graphic Display



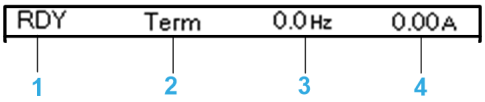
1 Display line: its content can be configured

2 Menu line: indicates the name of the current menu or submenu

3 Menus, submenus, parameters, values, bar charts, and so on, are displayed in drop-down window format on a maximum of five lines. The line or value selected by the navigation button is displayed in reverse video

4 Section displaying tabs (1 to 4 by menu), these tabs can be accessed using F1 to F4 keys

Display line details:



Number	Description
1	Drive status
2	Active control channel • TERM: terminals • HMI: Graphic Display Terminal • MDB: integrated Modbus serial • NET: fieldbus module • TUD: +/- speed • PWS: DTM based commissioning software
3	Customer defined via the menu **[Param. Bar Select]** PbS-.
4	Customer defined via the menu **[Param. Bar Select]** PbS-.

Graphic Display Terminal Connected to a Computer

NOTICE

INOPERATIVE EQUIPMENT

Do not connect equipment to the RJ45 port and to the USB port of the Graphic Display Terminal at the same time.

Failure to follow these instructions can result in equipment damage.

The Graphic Display Terminal is recognized as a USB storage device named SE_VW3A1111 while plugged on a computer.

This allows to access the saved drive configurations (*DRVCONF* folder) and the Graphic Display Terminal screenshots (*PRTSCR* folder).

Screenshots can be stored by a simultaneous press on *F1* and *F4* function keys.

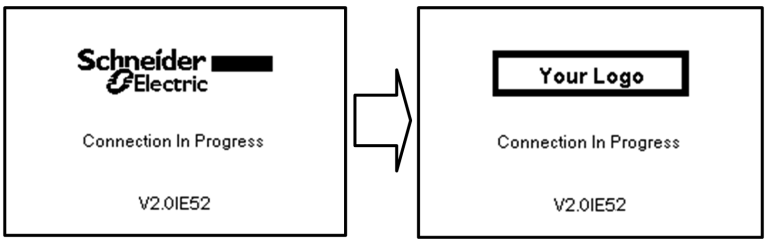
How To Update Language Files on the Graphic Display Terminal?

The Graphic Display Terminal (VW3A1111) language files can be updated:

- Download the latest version of language files here: Languages_Drives_VW3A1111
- Unzip the file and follow the instructions of the ReadMe text file.

How to customize the logo displayed at power on of the Graphic Display Terminal?

From the firmware version V2.0 of the Graphic Display Terminal, the logo displayed at power on by the Graphic Display Terminal can be customized. By default, the Schneider-Electric logo is displayed.



To modify the displayed logo, you must:

- Create your own logo and save it as a *bitmap file* (*.bmp*) with the name *logo_ini*. The logo must be saved in black & white and the dimensions must be 137x32 pixels.
- Connect the Graphic Display Terminal to a computer via an USB cable.
- Copy your logo (*logo_init.bmp*) in the folder *KPCONFIG* of the Graphic Display Terminal.

At next power on of the Graphic Display Terminal connected to the drive, your own logo should be displayed.

If the logo of Schneider-Electric is still displayed, verify the characteristics of your file and the location where it has been copied.

Structure of the Parameter Table

General Legend

Pictogram	Description
★	These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.
( )	Setting of this parameter can be done during operation or when stopped.
2 s	To change the assignment of this parameter, press the ENT key for 2 s.

Menu Presentation

This document shows the **[Short Label]** labels and ***Long Label*** of the most recent Remote Graphic Display Terminal, the VW3A1111.

Below an example of a menu presentation:

[Short Label] CodE

Long Label (is written in italic and accessible with the "i" button on the graphic display terminal VW3A1111, or visible on the DTM interface).

Access path: MEnu codE ➡ Sub-MEnu codE

About this menu
Description of the menu.

Parameter Presentation

Below an example of a parameter presentation:

HMI label	Setting or Display	Factory setting
[Short Label] CodE (pictogram)	XXX...XXX **[unit]** **[additional informations]**	**Factory setting**: **[Short Label]** CodE
[Long label] Reference exclusivity and required optional modules. Example: Fieldbus Module VW3A3607 is required. Description of the parameter. Parameter incompatibilities and / or required configuration. Example: This parameter can be accessed it **[Short Label]** CodE is set to **[Short Label]** CodE. This parameter is not compatible with **[Short Label]** CodE. Impact on other parameters. Example: If this parameter is modified, the parameter **[Short Label]** CodE is set to factory settings.		

Finding a Parameter in this Document

The following assistance with finding explanations on a parameter is provided:

- With the integrated display terminal and the remote display terminal: direct use of the parameter code index Index of Parameter Codes, page 383, to find the page giving details of the displayed parameter.
- Select the required parameter and press F1 (F1) : **[Code]**. The parameter code is displayed instead of its name while the key is held down.

  Example: ACC

RDY	Term	+0.0 Hz	0.0 A
SETTINGS			
Ramp increment			0.1
Acceleration			9.51 s
Deceleration			9.67 s
Low speed			0.0 Hz
High speed			50.0Hz
Code	<<	>>	Quick

Code ➡

RDY	Term	+0.0 Hz	0.0 A
SETTINGS			
Ramp increment			0.1
ACC			9.51 s
Deceleration			9.67 s
Low speed			0.0 Hz
High speed			50.0Hz
Code	<<	>>	Quick

- Use the parameter code index Index of Parameter Codes, page 383, to find the page giving details of the displayed parameter.

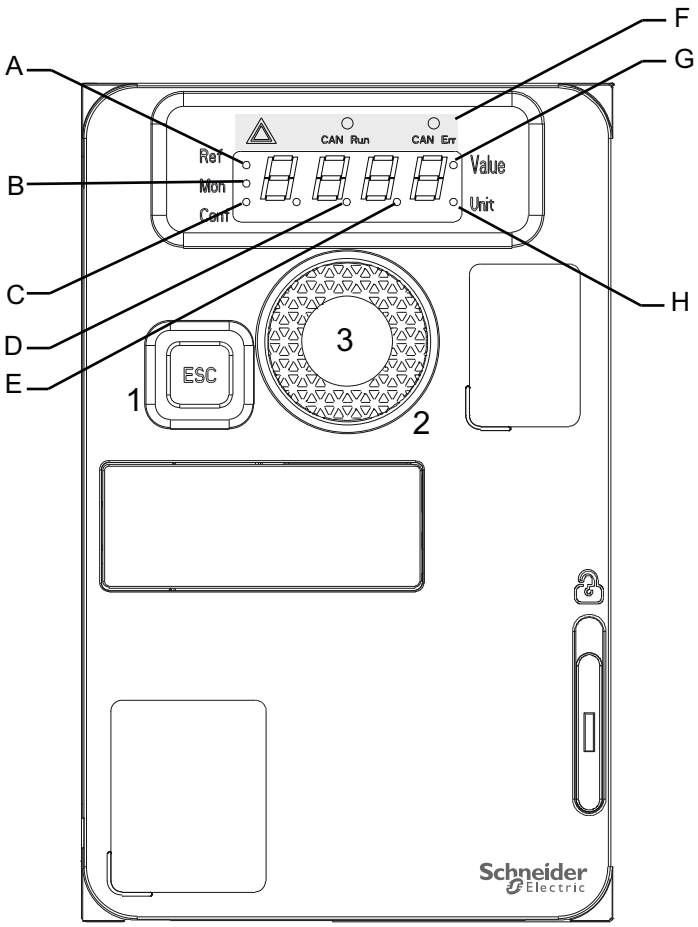
Description of the HMI

Display and Keys Functionalities

1 The **ESC** key is used for menu navigation (backward) and parameters adjustment (cancel)

2 The **Jog dial** is used for menu navigation (up or down) and parameters adjustment (increase/decrease value or element choice). It can be used as Virtual analog input 1 for drive frequency reference value.

3 The **ENT** key (push on the Jog dial) is used for menu navigation (forward) and parameters adjustment (validation).



Item	Description
A	Reference mode selected rEF-
B	Monitoring mode selected Mon-
C	Configuration mode selected CONF
D	Dot used to display parameter value (1/100 unit)
E	Dot used to display parameter value (1/10 unit)
F	From the left to the right: • Indicates that the drive has detected an error
G	Current display is parameter value
H	Current display is parameter unit

Normal display, with no detected error code displayed and no startup:

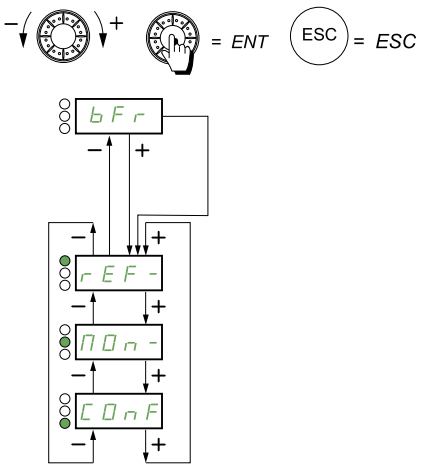
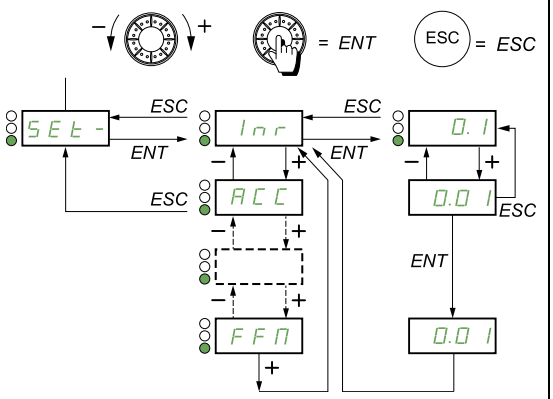
Displays the parameter selected in the **1.2 [MONITORING]** Mon- menu (default: **[Pre-Ramp Ref Freq]** FrH).

- InIt: Initialization sequence (only on remote display terminal)
- tUn: AutoTuning

- dCb: Injection braking
- rdY: Drive ready
- nSt: Freewheel stop control
- CL 1: Current limit
- FSt: Fast stop
- FLU: Fluxing function is activated
- nLP: Control is powered on but the DC bus is not loaded
- CtL: Controlled stop
- obr: Adapted deceleration
- SoC: Stand by output cut
- uSA: Under-voltage alarm
- Sto: Safety function STO

NOTE: In the event of a detected error, the display flashes to notify the user accordingly. If a Graphic Display Terminal is connected, the name of the detected error is displayed.

Structure of the Menus

Powering up		Parameter selection
	This parameter is only visible when the drive is powered up for the first time. The setting can be amended subsequently in the menu **[Motor control]** drC- for **[Motor Standard]** bFr **1.1** **[Reference speed]** rEF- **1.2 [MONITORING]** MOn- **1.3 [Configuration]** CONF	

On the 7-segment display, a dash after menu and submenu codes is used to differentiate them from parameter codes.

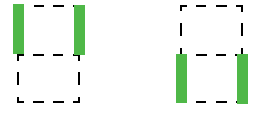
Example: **[Application function]** FUn- menu, **[Acceleration]** ACC parameter

Selection of Multiple Assignments for One Parameter

Example: List of group 1 warning in **[Inputs / Outputs]** I_O- menu

A number of warnings can be chosen by selecting them as follows.

The digit on the right indicates:



The same principle is used for all multiple selections.

Cyber Security

What's in This Chapter

Overview 31
Defense in depth measures expected in the environment 32
Security Policy 34
Potential Risks and Compensating Controls 34
Account Management Guidelines 36

Overview

Cyber Security is a branch of network administration that addresses attacks on or by computer systems and through computer networks that can result in accidental or intentional disruptions.

The objective of Cyber Security is to help provide increased levels of protection for information and physical assets from theft, corruption, misuse, or accidents while maintaining access for their intended users.

No single Cyber Security approach is adequate. Schneider Electric recommends a defense-in-depth approach. Conceived by the **National Security Agency** (NSA), this approach layers the network with security features, appliances, and processes.

The basic components of this approach are:

- Risk assessment
- A security plan built on the results of the risk assessment
- A multi-phase training campaign
- Physical separation of the industrial networks from enterprise networks using a demilitarized zone (DMZ) and the use of firewalls and routing to establish other security zones
- System access control
- Device hardening
- Network monitoring and maintenance

This chapter defines the elements that help you configure a system that is less susceptible to cyber attacks.

For detailed information on the defense-in-depth approach, refer to the TVDA: **How Can I Reduce Vulnerability to Cyber Attacks in the Control Room (STN V2)** on the Schneider Electric website.

To submit a Cyber Security question, report security issues, or get the latest news from Schneider Electric, visit the Schneider Electric website.

Defense in depth measures expected in the environment

Machines, controllers, and related equipment are usually integrated into networks. Unauthorized persons and malware may gain access to the machine as well as to other devices on the network/fieldbus of the machine and connected networks via insufficiently secure access to software and networks.

⚠WARNING

UNAUTHORIZED ACCESS TO THE MACHINE VIA SOFTWARE AND NETWORKS

- In your hazard and risk analysis, consider all hazards that result from access to and operation on the network/fieldbus and develop an appropriate cybersecurity concept.
- Verify that the hardware infrastructure and the software infrastructure into which the machine is integrated as well as all organizational measures and rules covering access to this infrastructure consider the results of the hazard and risk analysis and are implemented according to best practices and standards covering IT security and cybersecurity (such as: ISO/IEC 27000 series, Common Criteria for Information Technology Security Evaluation, ISO/ IEC 15408, IEC 62351, ISA/IEC 62443, NIST Cybersecurity Framework, Information Security Forum - Standard of Good Practice for Information Security, SE recommended Cybersecurity Best Practices*).
- Verify the effectiveness of your IT security and cybersecurity systems using appropriate, proven methods.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(*) : SE Recommended Cybersecurity Best Practices can be downloaded on SE.com.

Additionally, use a layered network approach with multiple security and defense controls in your IT and control system to minimize data protection gaps, reduce single-points of failure and create a strong cybersecurity posture. The more layers of security in your network, the harder it is to breach defenses, take digital assets or cause disruption.

Control System - Cybersecurity policy

- Cybersecurity governance – available and up-to-date guidance on governing the use of information and technology assets in your company that is matching with a dedicated risk analysis about the control system
- The access control policy defined in the cybersecurity governance is strictly applied. In particular, it guarantees the authenticity of privileged operations. For example operations that can alter the critical assets.
- The instructions and procedures should structure the roles and responsibilities in terms of security within the organization; in other words, who is authorized to perform what and when. These should be known by the users.
- Define information security continuous monitoring (ISCM) to maintain the awareness of information security, vulnerabilities and threats to your organization.
- Perform patch management by applying security patches from vendor to ensure stability and completeness.

Physical perimeter security

- Set up the devices in an enclosed area with physical access control to prevent authorized access to the device, with dedicated monitoring

Physical network segmentation

Independence from non-control system networks – the control system provides network services to control system networks, critical or non-critical, without a connection to non-control system networks

- Physically segment control system networks from non-control system network
- Physically segment critical control system networks from non- critical control system networks

Logical isolation of critical networks

The control system provides the capability to logically and physically isolate critical control system networks from non-critical control system networks. For example, using VLANs.

Zone boundary protection – the control system provides the capability to:

- Manage connections through managed interfaces consisting of appropriate boundary protection devices, such as: proxies, gateways, routers, firewalls, and encrypted tunnels
- Use an effective architecture, for example, firewalls protecting application gateways residing in a DMZ
- Control system boundary protections at any designated alternate processing sites should provide the same levels of protection as that of the primary site, for example, data centers

No public internet connectivity – access from the control system to the internet is not recommended

Information disclosure prevention

- Encrypt protocol transmissions over all external connections using an encrypted tunnel, TLS wrapper or a similar solution
- Reduce access to control system information by distributing permissions according to predefined access control with least privilege practices

Control against malware

- Detection, prevention, and recovery controls to help protect against malware are implemented and combined with appropriate user awareness
- Any computer in use on the control system either on premise or temporarily connected, should have an updated anti-virus, anti-malware, anti-ransomware application activated during the use

Resource & control system availability

- Help to ensure continuity of service – ability to break the connections between different network segments or use duplicate devices in response to an incident, redundancy of controllers or network device like switches or similar solution.
- Manage communication loads – the control system provides the capability to manage communication loads to mitigate the effects of information flooding types of DoS (Denial of Service) events
- Manage the retention cycles of data and programs with the retention periods determined as appropriate.

Security Policy

The device does not have the capability to transmit data encrypted using the following protocols: Modbus serial, Modbus TCP, Bacnet IP and Bacnet MS/TP. If other users gained access to your network, transmitted information can be disclosed or subject to tampering.

⚠WARNING

CYBERSECURITY HAZARD

- For transmitting data over an internal network, physically or logically segment the network, the access to the internal network needs to be restricted by using standard controls such as firewalls.
- For transmitting data over an external network, encrypt protocol transmissions over all external connections using an encrypted tunnel, TLS wrapper or a similar solution.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Any computer using SoMove/DTM should have an updated anti-virus, anti-malware, anti-ransomware application activated during the use.

The ATH230 has the capability to export its settings and files manually or automatically. It is recommended to archive any settings and files (device configuration) in a secure area.

Potential Risks and Compensating Controls

Address potential risks using these compensating controls:

Area	Issue	Risk	Compensating controls
User accounts.	Default account settings are often the source of unauthorized access by malicious users.	If you do not change default password or disable the user access control, unauthorized access can occur.	Help to ensure user access control is enabled on all the communication ports and change the default passwords to help reduce unauthorized access to your device.
Secure protocols.	The device does not have the capability to transmit data encrypted using these protocols: • Bacnet MS/TP • Bacnet IP • Modbus TCP • Modbus serial	If a malicious user gained access to your network, they could intercept communication.	For transmitting data over internal network, physically or logically segment your network. For transmitting data over external network, encrypt protocol transmissions over all external connections using an encrypted tunnel, TLS wrapper or a similar solution.

Data Flow Restriction

To secure the access to the drive and limit the data flow, the use of a firewall device is required.

Firewall Product

The Firewall is a security appliance that provides levels of protection against cyber threats for industrial networks, automation systems, SCADA systems, and process control systems.

This Firewall is designed to permit or deny communications between devices connected to the external network connection of the Firewall and the protected devices connected to the internal network connection.

The Firewall can restrict network traffic based on user defined rules that would permit only authorized devices, communication types and services.

The Firewall includes built-in security modules and an off-line configuration tool for creating secure zones within an industrial automation environment.

Backing-up and Restoring the Software Configuration

To protect your data, Schneider Electric recommends backing-up the device configuration and keeping your backup file in a secure place. The backup is available in the device DTM, using **load from device** and **store to device** functions.

Remote Access to the Drive

When remote access is used between a device and the drive, help to ensure your network is secure (VPN,Firewall…).

Machines, controllers, and related equipment are usually integrated into networks. Unauthorized persons and malware may gain access to the machine as well as to other devices on the network/fieldbus of the machine and connected networks via insufficiently secure access to software and networks.

⚠WARNING

UNAUTHORIZED ACCESS TO THE MACHINE VIA SOFTWARE AND NETWORKS

- In your hazard and risk analysis, consider all hazards that result from access to and operation on the network/fieldbus and develop an appropriate cybersecurity concept.
- Verify that the hardware infrastructure and the software infrastructure into which the machine is integrated as well as all organizational measures and rules covering access to this infrastructure consider the results of the hazard and risk analysis and are implemented according to best practices and standards covering IT security and cybersecurity (such as: ISO/IEC 27000 series, Common Criteria for Information Technology Security Evaluation, ISO/ IEC 15408, IEC 62351, ISA/IEC 62443, NIST Cybersecurity Framework, Information Security Forum - Standard of Good Practice for Information Security, SE recommended Cybersecurity Best Practices*).
- Verify the effectiveness of your IT security and cybersecurity systems using appropriate, proven methods.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(*) : SE Recommended Cybersecurity Best Practices can be downloaded on SE.com.

Deactivation of Unused Functions

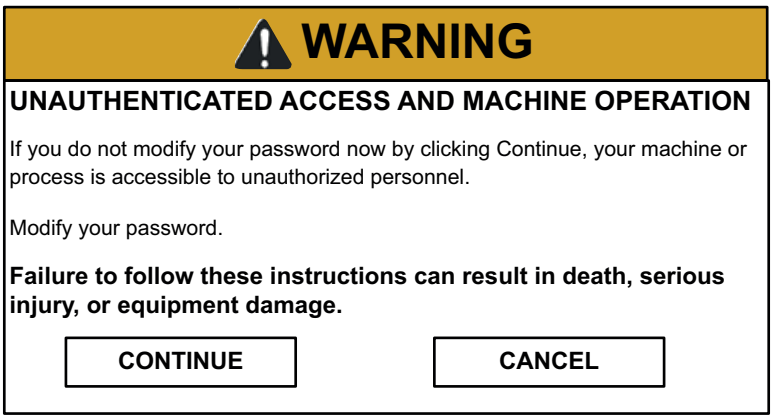
To avoid unauthorized access, it is advisable to deactivate unused functions.

Account Management Guidelines

The ATH200 password must contain:

- A total of eight characters
- At least one upper-case letter
- At least one lower-case letter
- At least one special character (for example, @, #, $)
- No blank character

The figure below displays the first connection a dialog box requiring the modification of the default password. This dialog box continues to be displayed until a password is defined.



Schneider Electric recommends to:

- Modify the password every 90 days
- Use a dedicated password (not related to your personal password)

  NOTE: No responsibility is assumed by Schneider Electric for any consequences if anyone hacks your product password and if you use the same password for personal usage.

Setup

What's in This Chapter

Steps for Setting-Up the Drive 37
Initial Steps 38

Steps for Setting-Up the Drive

①
Refer to the installation manual.

②
Apply input power to the drive, but do not give a run command.

③
Configure:

- The nominal frequency of the motor **[Motor Standard]** bFr , page 91 if this is not 50 Hz.
- The motor parameters in the **[Motor control]** drC- , page 113 menu, only if the factory configuration of the drive is not suitable.
- The application functions in the **[Input/Output]** I/O - , page 135 menu, the **[Command]** CtL - Access, page 174 menu, and the **[Application function]** Fun- , page 188 menu, only if the factory configuration of the drive is not suitable.

④
In the **[Settings]** SEt- menu, adjust the following parameters:

- **[Acceleration]** ACC , page 93 and **[Deceleration]** dEC , page 93.
- **[Low Speed]** LSP , page 94 and **[High Speed]** HSP , page 94.
- **[Motor Th Current]** ItH , page 93.

⑤
Start the drive.

Drive systems may perform unexpected movements because of incorrect wiring, incorrect settings, incorrect data or other errors.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Carefully install the wiring in accordance with the EMC requirements.
- Do not operate the product with unknown or unsuitable settings or data.
- Perform a comprehensive commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Tips

- Before beginning programming, complete the customer setting tables. See parameter code index, page 383.
- Use the **[Restore Configuration]** FCS 1.3.2 **[Factory settings]** FCS-, page 84 parameter to return to the factory settings at any time.
- To locate the description of a function quickly, use the index of functions, page 381.

- Before configuring a function, read carefully the Function compatibility section.

  NOTE: The following operations must be performed for optimum drive performance in terms of accuracy and response time:

  - Enter the values indicated on the motor nameplate in the **[Motor control]** drC- , page 113 menu.
  - Perform auto-tuning with the motor cold and connected using the **[Autotuning]** tUn , page 93 parameter.

Initial Steps

If the drive was not connected to mains for an extended period of time, the capacitors must be restored to their full performance before the motor is started.

NOTICE
REDUCED CAPACITOR PERFORMANCE • Apply mains voltage to the drive for one hour before starting the motor if the drive has not been connected to mains for the specified periods of time.(1) • Verify that no Run command can be applied before the period of one hour has elapsed. • Verify the date of manufacture if the drive is commissioned for the first time and run the specified procedure if the date of manufacture is more than 12 months in the past. **Failure to follow these instructions can result in equipment damage.**

(1) Period of time:

- 12 months at a maximum storage temperature of +50°C (+122°F)
- 24 months at a maximum storage temperature of +45°C (+113°F)
- 36 months at a maximum storage temperature of +40°C (+104°F)

If the specified procedure cannot be performed without a Run command because of internal mains contactor control, perform this procedure with the power stage enabled, but the motor being at a standstill so that there is no appreciable mains current in the capacitors.

Before Powering up the Drive

⚠WARNING
UNANTICIPATED EQUIPMENT OPERATION Before switching on the device, verify that no unintended signals can be applied to the digital inputs that could cause unintended movements. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

Drive Locked in Blocking State

The drive is in a blocking state and displays **[Freewheel Stop]** nSt , If a Run command such as Run forward, Run reverse, DC injection is still active during:

- a product reset to the factory settings,
- a manual **Fault Reset** using **[Fault Reset Assign]** rSF ,

- a manual **Fault Reset** by applying a product switched off and on again,
- a stop command given by a channel that is not the active channel command (such as Stop key of the display terminal in 2/3 wires control).

It is necessary to deactivate all active Run commands prior to authorizing a new Run command.

Mains Contactor

NOTICE

RISK OF DAMAGE TO THE DRIVE

Do not switch on the drive at intervals of less than 60 s.

Failure to follow these instructions can result in equipment damage.

Using a Motor with a Lower Rating or Dispensing with a Motor Altogether

With the factory settings, the motor output phase loss detection is active: **[Output phase loss]** oPL is set to **[Yes]** YES.

For commissioning tests or maintenance phase, deactivate the motor output phase loss detection (**[Output phase loss]** oPL = **[No]** nO) to avoid the usage of a motor with the same rating as the drive.

This can prove particularly useful if very large drives are being tested with a small motor.

Set **[Motor control type]** Ctt , page 113, to **[Standard]** Std in **[Motor control]** drC-.

NOTICE

MOTOR OVERHEATING

Install external thermal monitoring equipment under the following conditions:

- If a motor with a nominal current of less than 20% of the nominal current of the drive is connected.
- If you use the function Motor Switching.

Failure to follow these instructions can result in equipment damage.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

If output phase monitoring is disabled, phase loss and, by implication, accidental disconnection of cables, are not detected.

- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

Programming

What's in This Part

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1.3.4.1 **[Full]** FULL – – **[Simply start]** SIM– 90
1.3.4.2 **[Full]** FULL – – **[Settings]** SET– 95
1.3.4.3 **[Full]** FULL – – **[Motor control]** drC– 112
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2. **[Interface]** ITF- 334
3. **[Open / Save as]** trA- 352
4. **[Password]** COD- 355

Unsuitable settings or unsuitable data or unsuitable wiring may trigger unintended movements, trigger signals, damage parts and disable monitoring functions.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Only start the system if there are no persons or obstructions in the zone of operation.
- Verify that a functioning emergency stop push-button is within reach of all persons involved in the operation.
- Do not operate the product with unknown settings or data.
- Verify that the wiring is appropriate for the settings.
- Never modify a parameter unless you fully understand the parameter and all effects of the modification.
- When commissioning, carefully run tests for all operating states, operating conditions and potential error situations.
- Anticipate movements in unintended directions or oscillation of the motor.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

1.1 [Reference speed] rEF-

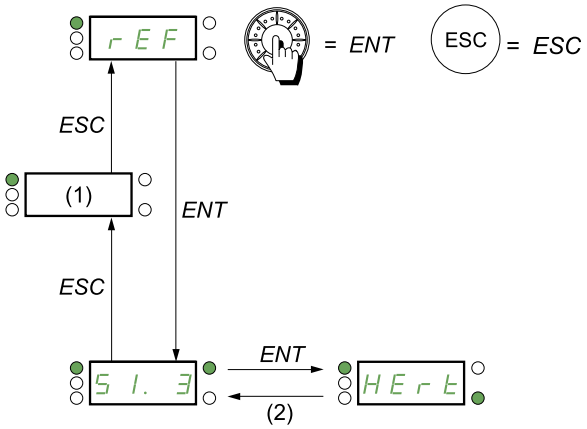
Introduction

Use the reference mode to monitor and, if the reference channel is the analog input 1 (**[Ref Freq Ch 1]** Fr1, page 174 set to **[AI Virtual 1]** AIV1), adjust the actual reference value by modifying the analog input voltage value.

If local control is enabled (**[Ref Freq Ch 1]** Fr1, page 174 set to **[HMI]** LCC), the jog dial or the Up/Down navigation keys on the remote display terminal acts as a potentiometer to change the reference value up and down within the limit preset by other parameters (**[Low Speed]** LSP or **[High Speed]** HSP).

There is no need to press the ENT key to confirm the change of the reference.

Organization Tree



Value – Unit

1. Depending on the active reference channel. Possible values:
   AIV1, LFr, MFr, rP1, FrH, rPC
2. 2 s or ESC

NOTE: Displayed parameter value and unit of the diagram are given as examples.

Access

Parameters described below can be accessed by: dr1 ➡ rEF

About This Menu

Displayed parameters depend on drive settings.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

1.1 [Reference speed] rEF-

Displayed parameters depend on drive settings.

HMI label	Settings	Factory setting
[AIV1 Image input] AIV1 ★ (1)	0 to 100% of HSP-LSP	0%
AIV1 Image input, first virtual AI value. This parameter allows to modify the frequency reference with the embedded jog dial.		
[Ref Frequency] LFr ★ (1)	-599 to +599 Hz	0 Hz
Reference frequency (signed value). This parameter allows to modify the frequency reference with the remote HMI.		
[Multiplying coeff.] MFr ★	0 to 100%	100%
Multiplying coefficient, can be accessed if **[Ref Freq 2 Multiply] [Ref Freq 3 Multiply]** MA2, MA3 has been assigned to the graphic terminal.		
[Internal PID ref] rPI ★ (1)	0 to 32,767	150
Internal PID reference This parameter allows to modify the PID internal reference with the jog dial. Internal PID reference is visible if **[PID feedback Assign]** PIF is not set to **[No]** nO.		
[Pre-Ramp Ref Freq] FrH ★	-599 to +599 Hz	–
Reference frequency before ramp (signed value). Actual frequency reference applied to the motor regardless of which reference channel has been selected. This parameter is in read-only mode. Frequency reference is visible if the command channel is not HMI or virtual AI.		
[PID reference] rPC ★	0 to 65,535	–
PID reference PID: Setpoint value. PID reference is visible if **[PID feedback Assign]** PIF is not set to **[No]** nO.		

(1) It is not necessary to press the ENT key to confirm the modification of the reference.

1.2 [MONITORING] MON-

What's in This Chapter

[MONIT. MOTOR] MMO- 46
[I/O Map] IOM- 46
[MONIT. SAFETY] SAF- 51
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[Communication map] CMM- 54
[MONIT. PI] MPI- 60
[Power-On time] PET- 60
[Warnings] ALR- 61
[Other State] SST- 63
[Diagnostics] DGT- 64
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Introduction

The parameters can be accessed when the drive is running or stopped.

Some functions have numerous parameters. To clarify programming and avoid having to scroll through endless parameters, these functions have been grouped in submenus. Like menus, submenus are identified by a dash after their code.

When the drive is running, the value displayed is one of the monitoring parameters. By default, the value displayed is the input frequency reference **[Pre-Ramp Ref Freq]** FRH parameter , page 45).

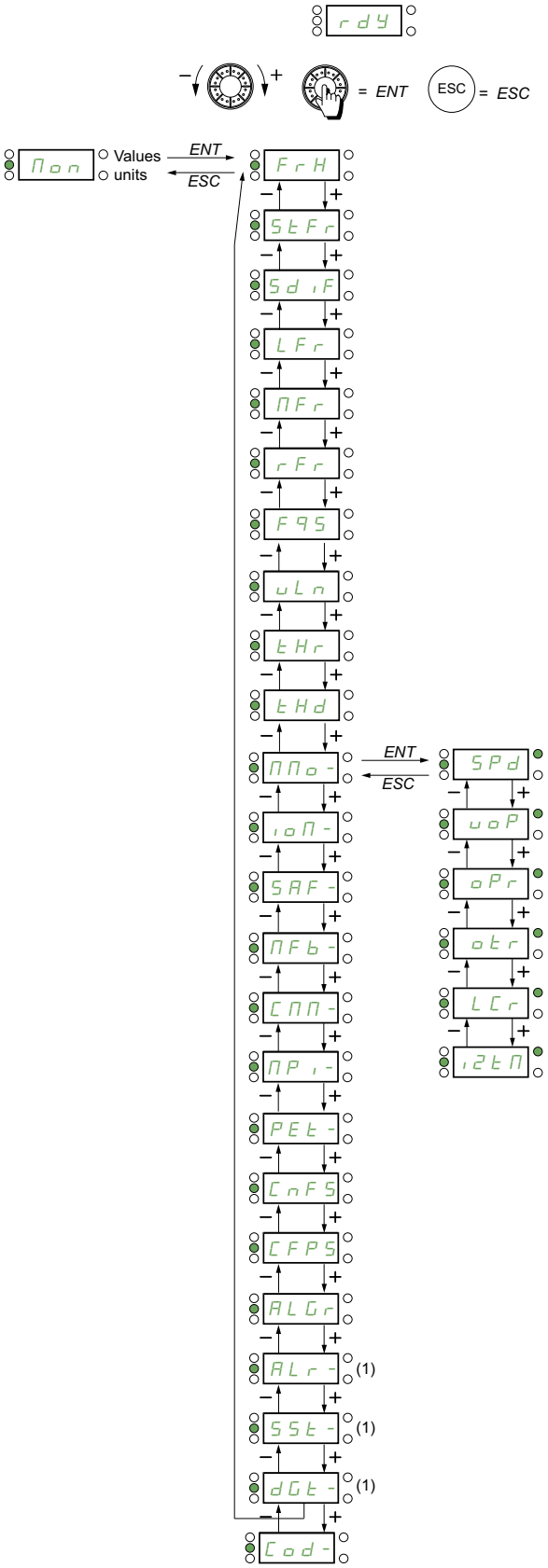
While the value of the new monitoring parameter required is being displayed, press the jog dial key for the second time to display the units or press and hold down the jog dial (OK) again (for 2 seconds) to confirm the change of monitoring parameter and store it. From then on, it is the value of this parameter that is displayed during operation (even after powering down).

Unless the new choice is confirmed by pressing and holding down ENT again, the display reverts to the previous parameter after powering down.

> **NOTE:** After the drive has been turned off or following a loss of supply mains, the parameter displayed is the drive status (example: **[Ready]** RDY). The selected parameter is displayed following a run command.

Organization Tree

Displayed parameters of the diagram are given as examples.



(1) Visible only with graphic display terminal.

Access

Parameters described below can be accessed by: dr ➡ MON

About This Menu

Displayed parameters depend on drive settings.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

(↻) : Setting of this parameter can be done during operation or when stopped.

1.2 [MONITORING] MON-

HMI label	Settings	Factory setting
[AIV1 Image input] AIV1 (↻)	[%]	—
AIV1 Image input, First virtual AI value. This parameter is read-only. It enables you to display the speed reference applied to the motor.		
[Pre-Ramp Ref Freq] FrH	[Hz]	—
Reference frequency before ramp (signed value). This parameter is read-only. It enables you to display the speed reference applied to the motor, regardless of which reference channel has been selected.		
[Stator frequency] StFr	[Hz]	—
Stator frequency, displays the estimated stator frequency in Hz (signed value).		
[Stator Freq Consist] SdiF	[Hz]	—
Stator frequency Consistency, displays the difference between the estimated stator frequency and the internal computed stator frequency in Hz. For more information refer to the ATH230 safety functions manual .		
[Ref Frequency] LFr	[Hz]	—
Reference frequency (signed value). This parameter only appears if the function has been enabled. It is used to change the speed reference from the remote control. ENT does not have to be pressed to enable a change of reference.		
[Multiplying coeff.] MFr ★ (↻)	[%]	—
Multiplying coefficient. It can be accessed if **[Ref Freq 2 Multiply] [Ref Freq 3 Multiply]** MA3 MA2 has been assigned.		
[Measured output fr.] MMF	[Hz]	—
Measured output freq. (signed value). The measured motor speed is displayed if the speed monitoring module has been inserted (VW3A3620).		
[Motor Frequency] rFr	[Hz]	—
Motor frequency (signed value)		
[Measured Freq] F95 ★	[Hz]	—
Pulse input measured frequency		
[Mains Voltage] ULn	[V]	—

HMI label	Settings	Factory setting
Mains voltage. Based on DC bus measurement, motor running or stopped.		
[Motor Therm State] tHr	[%]	—
Motor thermal state. 100% = Nominal thermal state, 118% = "OLF" threshold (motor overload).		
[Drive Therm State] tHd	[%]	—
Drive thermal state. 100% = Nominal thermal state, 118% = "OHF" threshold (drive overload).		

[MONIT. MOTOR] MMO-

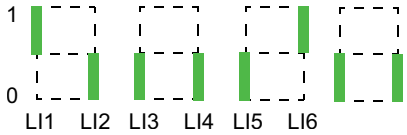
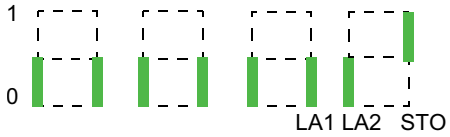
Access
Parameters described below can be accessed by: dr1 ➡ MON

HMI label	Settings	Factory setting
[Motor Speed] SPd	[rpm]	—
Motor speed in rpm (Estimated value)		
[Motor voltage] uoP	[V]	—
Motor voltage (Estimated value)		
[Mot Mech Power in %] oPr	[%]	—
Motor power in %. Output power monitoring (100% = nominal motor power, estimated value based on current measure).		
[Motor torque] otr	[%]	—
Motor torque. Output torque value (100% = nominal motor torque, estimated value based on current measure).		
[Motor Current] LCr	[A]	—
Motor current (Estimated value)		
[I2t overload level] I2tM	[%]	—
Monitoring of I2t overload level. This parameter can be accessed if **[I²t model activation]** I2tA is set to **[Yes]** YES.		

[I/O Map] IOM-

Access
Parameters described below can be accessed by: dr1 ➡ MON ➡ IOM ➡ **[LOGIC INPUT CONF.]**

HMI label	Settings	Factory setting
[Digital Input Map] LIA-		
Logic input functions.		
[DI1 assignment] LI1A	—	—
DI1 assignment Read-only parameters, cannot be configured. It displays all the functions that are assigned to the logic input to check for multiple assignments.		

HMI label	Settings	Factory setting
If no functions have been assigned, **[No]** no is displayed. Use the jog dial to scroll through the functions. The use of graphic display terminal allows to see the delay **[DI1 Delay]** L Id. Possible values are the same than in configuration menu .		
[DI2 assignment] L2A to **[DI6 assignment]** L6A **[DA1 assignment]** LA1A **[DA2 assignment]** LA2A	—	—
All the logic inputs available on the drive are processed as in the example for LI1 above.		
[State of logic inputs LI1 to LI6] LIS1		
It can be used to visualize the state of logic inputs LI1 to LI6 (display segment assignment: high = 1, low = 0).  Example above: LI1 and LI6 are at 1; LI2 to LI5 are at 0.		
[State of Safe Torque Off] LIS2	—	—
It can be used to visualize the state of LA1, LA2 and STO (Safe Torque Off) (display segment assignment: high = 1, low = 0).  Example above: LA1 and LA2 are at 0; STO (Safe Torque Off) is at 1.		

[Analog inputs image] AIA-

Access
Parameters described below can be accessed by: dr1 ➜ Mon ➜ IOM ➜ AIA

Analog input functions.

HMI Label	Settings	Factory setting
[AI1] AI1C	[V]	—
Physical value AI1. AI1 customer image: Value of analog input 1.		
[AI1 assignment] AI1A	—	—

HMI Label	Settings	Factory setting
AI1 assignment		
If no functions have been assigned, **[No]** nO is displayed.		
Following parameters are visible on the graphic display terminal by pressing the ENT key on the parameter.		
[No] nO: Not assigned		
[Ref Freq 1 Config] Fr1: Reference source 1		
[Ref Freq 2 Config] Fr2: Reference source 2		
[Summing Input 2] SA2: Summing reference 2		
[PID feedback Assign] PIF: PI feedback (PI control)		
[Ref Torque Assign] tAA: Torque limitation: Activation by an analog value		
[Subtract Ref Freq 2] dA2: Subtracting reference 2		
[Manual PID reference] PIM: Manual speed reference of the PI(D) regulator (auto-man)		
[Speed ref. assign.] FPI: Speed reference of the PI(D) regulator (predictive reference)		
[Summing Input 3] SA3: Summing reference 3		
[Ref.1B channel] Fr1b: Reference source 1B		
[Subtract Ref Freq 3] dA3: Subtracting reference 3		
[Forced Local Chan] FLoC: Forced local reference source		
[Ref Freq 2 Multiply] MA2: Multiplying reference 2		
[Ref Freq 3 Multiply] MA3: Multiplying reference 3		
[IA01 Assignment] IA01: Functions blocks: Analog Input 01		
....		
[IA10 Assignment] IA10: Functions blocks: Analog Input 10		
[AI1 Min. Value] uIL1	[V]	—
AI1 voltage scaling parameter of 0%		
[AI1 Max Value] uIH1	[V]	—
AI1 voltage scaling parameter of 100%		
[AI1 filter] AI1F	[s]	—
AI1 filter. Interference filtering cut-off time of the low-filter.		
[AI2] AI2C	[V]	—
Physical value AI2. AI2 customer image: Value of analog input 2.		
[AI2 Assignment] AI2A	—	—
AI2 assignment		
If no functions have been assigned, **[No]** nO is displayed.		
Following parameters are visible on the graphic display terminal by pressing the ENT key on the parameter.		
Identical to **[AI1 assignment]** AI1A , page 47.		
[AI2 Min. Value] uIL2	[V]	—
AI2 voltage scaling parameter of 0%		
[AI2 Max value] uIH2	[V]	—
AI2 voltage scaling parameter of 100%		

HMI Label	Settings	Factory setting
[AI2 filter] AI2F	[s]	—
AI2 filter. Interference filtering cutoff time of the low-filter.		
[AI3] AI3C	[V]	—
Physical value AI3. AI3 customer image: Value of analog input 3.		
[AI3 Assignment] AI3A	—	—
AI3 assignment If no functions have been assigned, **[No]** nO is displayed. Following parameters are visible on the graphic display terminal by pressing the ENT key on the parameter. Identical to **[AI1 assignment]** AI1A , page 47.		
[AI3 Min. Value] CrL3	[mA]	—
AI3 current scaling parameter of 0%		
[AI3 Max Value] CrH3	[mA]	—
AI3 current scaling parameter of 100%		
[AI3 filter] AI3F	[s]	—
AI3 filter. Interference filtering cutoff time of the low-filter.		

[Analog outputs image] AoA-

Access
Parameters described below can be accessed by: dr1 → Mon → ioM → AoA

Analog output functions.

Following parameters are visible on the graphic display terminal by pressing the ENT key on the parameter.

HMI label	Settings	Factory setting
[AQ1] Ao1C	—	—
AQ1 physical value. AO1 customer image: Value of analog output 1.		
[AQ1 assignment] Ao1	—	—
AQ1 assignment If no functions have been assigned, **[No]** no is displayed. Identical to **[AQ1 assignment]** Ao1.		
[AQ1 min Output] uoL1 ★	[V]	—
AQ1 minimum output. Voltage scaling parameter of 0%. Can be accessed if **[AQ1 Type]** Ao1t is set to **[Voltage]** 10u.		
[AQ1 max Output] uoH1 ★	[V]	—
AQ1 maximum output. Voltage scaling parameter of 100%. Can be accessed if **[AQ1 Type]** Ao1t is set to **[Voltage]** 10u.		
[AQ1 min output] AoL1 ★	[mA]	—
AQ1 min output value. Current scaling parameter of 0%. Can be accessed if **[AQ1 Type]** Ao1t is set to **[Current]** 0A.		
[AQ1 max output] AoH1 ★	[mA]	—
AQ1 max output value. Current scaling parameter of 100%. Can be accessed if **[AQ1 Type]** Ao1t is set to **[Current]** 0A.		
[Scaling AQ1 Min] ASL1	[%]	—
Scaling AQ1 min		
[Scaling AQ1 Max] ASH1	[%]	—
Scaling AQ1 max		
[AQ1 Filter] Ao1F	[s]	—
AQ1 filter. Cutoff time of the low-filter.		

[Freq. signal image] FS1-

Access
Parameters described below can be accessed by: dr1 ➜ Mon ➜ 1oM ➜ FS1

Frequency signal image.

This menu is visible only on graphic display terminal.

HMI label	Settings	Factory setting
[RP input] PFrC	[Hz]	—
Custom filter pulse input. Following parameters are visible on the graphic display terminal by pressing the ENT key on the parameter.		
[RP assignment] P1A	—	—
Pulse input assignment. If no functions have been assigned, **[No]** no is displayed. Identical to **[AI1 assignment]** A1IA, page 47.		
[RP min value] P1L	[kHz]	—
Minimum pulse input. RP minimum value. Pulse input scaling parameter of 0%.		
[RP max value] PFr	[kHz]	—
RP maximum value. Pulse input scaling parameter of 100%.		
[RP filter] PF1	[ms]	—
RP filter. Interference filtering pulse input cutoff time of the low-filter.		

[MONIT. SAFETY] SAF-

Access
Parameters described below can be accessed by: dr1 ➜ Mon ➜ SAF

For more details on Integrated Safety Functions, please refer to dedicated Safety manual.

HMI label	Settings	Factory setting
[STO fct status] StoS	—	—
Safe torque Off function Status • **[Not active]** idLE: ***Not active***, STO not in progress • **[Active]** Sto: ***Active***, STO in progress • **[Error]** FLt: ***Error***, STO error detected		

HMI label	Settings	Factory setting
[Safety fct ErrorReg] SFFE	—	—

Safety function error register

- Bit0 = 1: Logic inputs debounce time-out (verify value of debounce time LIDT according to the application)
- Bit1 Reserved
- Bit2 = 1: Reserved
- Bit3 = 1: Reserved
- Bit4: Reserved
- Bit5: Reserved
- Bit6 = 1: Motor speed sign has changed
- Bit7 = 1: Reserved
- Bit8: Reserved
- Bit9: Reserved
- Bit10: Reserved
- Bit11: Reserved
- Bit12: Reserved
- Bit13 = 1: Not possible to measure the motor speed (verify the motor wiring connection)
- Bit14 = 1: Motor ground short-circuit detected (verify the motor wiring connection)
- Bit15 = 1: Motor phase to phase short-circuit detected (verify the motor wiring connection)

[Monit. Fun. Blocks] MFb-

Access
Parameters described below can be accessed by: dr1 ➜ Mon ➜ MFb

For more details on function blocks, please refer to dedicated function blocks manual.

HMI label	Settings	Factory setting
[FB Status] FbSt	—	—
FunctionBlock status • **[Not Active]** idLE: ***Not active***, idle state • **[Check prog.]** CHEC: ***Check program*** • **[Stop]** StoP: ***Stop*** • **[Init]** init: ***Init***, initialization state • **[Run]** run: ***Run***, RUN state • **[Error]** Err: ***Error***, Error state		
[FB Error] FbFt	—	—
FunctionBlock error Status of the function blocks execution. • **[No]** no: ***No***, no error detected • **[Internal]** int: ***Internal***, internal error detected • **[Binary file]** bin: ***Binary file***, binary error detected • **[Intern para.]** inP: ***Internal parameters***, internal parameter error detected • **[Para. RW]** PAr: ***Parameter access on read or write***, parameter access error detected • **[Calculation]** CAL: ***Calculation***, calculation error detected • **[AUX TO]** toAu: ***TimeOut AUX task*** • **[Synch TO]** toPP: ***TimeOut in synchronous tasks***, timeOut in PRE/POST task • **[Bad ADLC]** AdL: ***ADLC with bad parameter*** • **[Input Assign]** in: ***Inputs assignment***, input not configured		

[FB Identification] Fb1-

Access
Parameters described below can be accessed by: dr1 ➜ Mon ➜ Fb1

HMI label	Settings	Factory setting
[Program version] bVEr ★	—	—
Program version Can be accessed if **[FB Status]** FbSt is not set to **[Idle]** idLE.		
[Program size] bnS ★	—	—
Program size Program file size. Can be accessed if **[FB Status]** FbSt is not set to **[Idle]** idLE.		
[Prg. format version] bnV	—	—
Program format version Binary format version of the drive. Can be accessed if **[FB Status]** FbSt is not set to **[Idle]** idLE.		

HMI label	Settings	Factory setting
[Catalogue version] CtV	—	—
Catalogue version		

[Communication map] CMM-

Access
Parameters described below can be accessed by: dr1 ➜ Mon ➜ CMM

This menu is visible only on graphic display terminal, except for **[Com. scan input map]** iSA- and **[Com scan output map]** oSA- menus.

HMI label	Settings	Factory setting
[Command Channel] CMdC	—	—
Command channel • **[Terminals]** tEr : ***Terminal block*** • **[HMI]** LCC : ***Local HMI***, graphic display terminal or remote display terminal • **[MODBUS]** Mdb : ***Modbus communication***,integrated Modbus • **[+/- speed]** tUd : ***Increase/Decrease speed*** • **[Com. Module]** nEt : ***Ext. communication module***, communication module (if inserted) • **[PC tool]** PS) : ***PC tool***		
[Cmd Register] CMd	—	—
Command register DRIVECOM command register value. **[Profile]** CHCF , page 175 is not set to **[I/O profile]** io. Possible values in CiA402 profile, separate or not separate mode. • Bit 0: "Switch on"/Contactor command • Bit 1: "Disable voltage"/Authorization to supply AC power • Bit 2: "Quick stop"/Emergency stop • Bit 3: "Enable operation"/Run command • Bit 4 to Bit 6: Reserved (set to 0) • Bit 7: "Fault reset"/detected error acknowledgment active on 0 to 1 rising edge • Bit 8: Halt Stop according to the **[Type of stop]** Stt parameter without leaving the operation enabled state • Bit 9: Reserved (set to 0) • Bit 10: Reserved (set to 0) • Bit 11 to Bit 15: Can be assigned to a command Possible values in the IO profile. On state command **[2-Wire Control]** 2C . Bit 0: Forward (on state) command • = 0: No forward command • = 1: Forward command The assignment of bit 0 cannot be modified. It corresponds to the assignment of the terminals. It can be switched. Bit 0 (**[CD00]** CD00) is only active if the channel of this control word is active. Bit 1 to Bit 15: Can be assigned to commands.		

HMI label	Settings	Factory setting
On edge command **[3-Wire Control]** 3C. Bit 0: Stop (run authorization). • = 0: Stop • = 1: Run is authorized on a forward or reverse command Bit 1: Forward (on 0 to 1 rising edge) command The assignment of bits 0 and 1 cannot be modified. It corresponds to the assignment of the terminals. It can be switched. Bits 0 (**[CD00]** CD00) and 1 (**[CD01]** CD01) are only active if the channel of this control word is active. Bit 2 to Bit 15: Can be assigned to commands		
[Ref Freq Channel] rFCC	—	—
Channel for reference frequency • **[Terminals]** tEr: ***Terminal block*** • **[Local]** Loc: ***Local***, jog dial • **[HMI]** LCC: ***Local HMI***, graphic display terminal or remote display terminal: • **[MODBUS]** Mdb: ***Modbus communication***, integrated Modbus • **[+/- speed]** tUd: ***Increase/Decrease speed*** • **[Com. Module]** nEt: ***Ext. communication module***, communication module (if inserted) • **[PC tool]** PS: ***PC tool***		
[Pre-Ramp Ref Freq] FrH	[Hz]	—
Reference frequency before ramp		

HMI label	Settings	Factory setting
[Status Register] EtA	—	—

Status Register

DRIVECOM status word.

Possible values in CiA402 profile, separate or not separate mode.

- Bit 0: "Ready to switch on", awaiting power section supply mains
- Bit 1: "Switched on", ready
- Bit 2: "Operation enabled", running
- Bit 3: "Operating state fault "
  - = 0: No error detected
  - = 1: Detected error
- Bit 4: "Voltage enabled", power section supply mains present
  - = 0: Power section supply mains absent
  - = 1: Power section supply mains present

  When the drive is powered by the power section only, this bit is always at 1.
- Bit 5: Quick stop/Emergency stop
- Bit 6: "Switched on disabled", power section supply mains locked
- Bit 7: Alarm
  - = 0: No alarm
  - = 1: Alarm
- Bit 8: Reserved (= 0)
- Bit 9: Remote: command or reference via the network
  - = 0: Command or reference via the graphic display terminal or the remote display terminal
  - = 1: Command or reference via the network
- Bit 10: Target reference reached
  - = 0: The reference is not reached
  - = 1: The reference has been reached

  When the drive is in speed mode, this is the speed reference.
- Bit 11: "Internal limit active", reference outside limits
  - = 0: The reference is within the limits
  - = 1: The reference is not within the limits

  When the drive is in speed mode, the limits are defined by the **[Low Speed]** LSP and **[High Speed]** HSP parameters.
- Bit 12 and Bit 13: Reserved (= 0)
- Bit 14: "Stop key", STOP via stop key
  - = 0: STOP key not pressed
  - = 1: Stop triggered by the STOP key on the graphic display terminal or the remote display terminal
- Bit 15: "Direction", direction of rotation
  - = 0: Forward rotation at output
  - = 1: Reverse rotation at output

The combination of bits 0, 1, 2, 4, 5 and 6 defines the state in the DSP 402 state chart (see the Communication manuals).

Possible values in the I/O profile.

NOTE: The value is identical in the CiA402 profile and the I/O profile. In the I/O profile, the description of the values is simplified and does not refer to the CiA402 (Drivecom) state chart.

- Bit 0: Reserved (= 0 or 1)
- Bit 1: Ready

HMI label	Settings	Factory setting
◦ = 0: Not ready ◦ = 1: Ready • Bit 2: Running ◦ = 0: The drive does not start if a reference other than zero is applied. ◦ = 1: Running, if a reference other than zero is applied, the drive can start. • Bit 3: Operating state fault ◦ = 0: No error detected . ◦ = 1: Detected error • Bit 4: Power section supply mains present ◦ = 0: Power section supply mains absent ◦ = 1: Power section supply mains present • Bit 5: Reserved (= 1) • Bit 6: Reserved (= 0 or 1) • Bit 7: Alarm ◦ = 0: No alarm ◦ = 1: Alarm • Bit 8: Reserved (= 0) • Bit 9: Command via a network ◦ = 0: Command via the terminals or the graphic display terminal ◦ = 1: Command via a network • Bit 10: Reference reached ◦ = 0: The reference is not reached ◦ = 1: The reference has been reached • Bit 11: Reference outside limits ◦ = 0: The reference is within the limits ◦ = 1: The reference is not within the limits When the drive is in speed mode, the limits are defined by LSP and HSP parameters. • Bit 12 and Bit 13: Reserved (= 0) • Bit 14: Stop via STOP key ◦ = 0: STOP key not pressed ◦ = 1: Stop triggered by the STOP key on the graphic display terminal or the remote display terminal • Bit 15: Direction of rotation ◦ = 0: Forward rotation at output ◦ = 1: Reverse rotation at output		

[Modbus network diag] Mnd-

Access
Parameters described below can be accessed by: dr1 ➡ Mon ➡ COM ➡ Mnd

Modbus network diagnostic.

HMI label	Settings	Factory setting
[COM LED] Mdb1	—	—
COM LED. View of the Modbus Communication.		

HMI label	Settings	Factory setting
[Mdb Frame Nb] nICt	—	—
Mdb frame number. Modbus number of processed frames.		
[Mdb CRC errors] nIEC	—	—
Mdb CRC errors. Modbus network CRC errors counter.		

[Com. scan input map] iSA-

Access
Parameters described below can be accessed by: dr i ➡ Mon ➡ CNN ➡ iSA

Used for Modbus Network.

HMI label	Settings	Factory setting
[Com Scan In1 val.] nM1	—	—
Com scan input 1 value		
[Com Scan In2 val.] nM2	—	—
Com scan input 2 value		
[Com Scan In3 val.] nM3	—	—
Com scan input 3 value		
[Com Scan In4 val.] nM4	—	—
Com scan input 4 value		
[Com Scan In5 val.] nM5	—	—
Com scan input 5 value		
[Com Scan In6 val.] nM6	—	—
Com scan input 6 value		
[Com Scan In7 val.] nM7	—	—
Com scan input 7 value		
[Com Scan In8 val.] nM8	—	—
Com scan input 8 value		

[Com scan output map] oSA-

Access
Parameters described below can be accessed by: dr i ➡ Mon ➡ CNN ➡ oSA

HMI label	Settings	Factory setting
[Com Scan Out1 val.] nC1	—	—
Com scan output 1 value		
[Com Scan Out2 val.] nC2	—	—
Com scan output 2 value		

HMI label	Settings	Factory setting
[Com Scan Out3 val.] nC3	—	—
Com scan output 3 value		
[Com Scan Out4 val.] nC4	—	—
Com scan output 4 value		
[Com Scan Out5 val.] nC5	—	—
Com scan output 5 value		
[Com Scan Out6 val.] nC6	—	—
Com scan output 6 value		
[Com Scan Out7 val.] nC7	—	—
Com scan output 7 value		
[Com Scan Out8 val.] nC8	—	—
Com scan output 8 value		

[Cmd word image] C I-

Access
Parameters described below can be accessed by: dr I → Mon → CMM → C I

Command word image: Only accessible via graphic display terminal.

HMI label	Settings	Factory setting
[Modbus Cmd] CMd1	—	—
Modbus command register		
[COM. Module cmd.] CMd3	—	—
DrivecomCmdRegCom.. Communication module command word image.		

[Freq. ref. word map] r I-

Access
Parameters described below can be accessed by: dr I → Mon → CMM → r I

Frequency reference image: Only accessible via graphic display terminal.

HMI label	Settings	Factory setting
[Modbus Ref Freq] LFr1	[Hz]	—
Modbus reference frequency		
[Com Module Ref Freq] LFr3	[Hz]	—
Communication module reference frequency		

[MONIT. PI] MPI-

Access
Parameters described below can be accessed by: drI → Mon → MPI

★: PID management. Visible if **[PID feedback Assign]** PIF is not set to **[No]** no.

HMI label	Settings	Factory setting
[Internal PID ref] rPI ★	—	—
Internal PID reference		
[PID Error] rPE ★	—	—
PID error		
[PID feedback] rPF ★	—	—
PID feedback		
[PID reference] rPC ★	—	—
PID reference. PID setpoint value via graphic display terminal.		
[PID Output] rPo	[Hz]	—
PID output. PID output value with limitation.		

[Power-On time] PET-

Access
Parameters described below can be accessed by: drI → Mon → PET

HMI label	Settings	Factory setting
[Consumption] APH	[Wh], [kWh], [MWh]	—
Power consumption. Energy consumption in Wh, kWh or MWh (accumulated consumption). If you read this parameter via fieldbus, the unit of this parameter is given by the parameter **[Unit]** unI. See the Communication Parameters file.		
[Motor Run Time] rtH	[s], [min], [h]	—
Motor run time. Run elapsed time display (resetable) in seconds, minutes or hours (length of time the motor has been switched on). If you read this parameter via fieldbus, the unit of this parameter is given by the parameter **[Unit]** unI. See the Communication Parameters file.		
[Power-on time] PtH	[s], [min], [h]	—
Power-on time. Power elapsed time display in seconds, minutes or hours (length of time the drive has been switched on). If you read this parameter via fieldbus, the unit of this parameter is given by the parameter **[Unit]** unI. See the Communication Parameters file.		
[Counter Reset] rPr	—	—
Counter reset. Reset of run elapsed time. • **[No]** no: ***No***, reset operation not in progress • **[Reset Cons]** APH: ***Reset consumption counters***, clear **[Reset Cons]** APH • **[Reset Run Time]** rtH: ***Reset run time***, clear **[Reset Run Time]** rtH • **[Reset Pw On Time]** PtH:***Reset power ON time***, clear **[Reset Pw On Time]** PtH		
[Config. active] CnFS	—	—

HMI label	Settings	Factory setting
Active configuration • **[In progress]** CNO: ***In progress***, transitory state (configuration changing) • **[Config. No.0]** CNF0: ***Configuration 0 active*** • **[Config. No.1]** CNF1: ***Configuration 1 active*** • **[Config. No.2]** CNF2: ***Configuration 2 active***		
[Used param. set] CFPS ★	—	—
Used parameter set Configuration parameter status (can be accessed if parameter switching has been enabled. • **[None]** NO: ***Not Assigned*** • **[Set No.1]** CFP1: ***Parameter set 1***, Parameter set 1 active • **[Set No.2]** CFP2: ***Parameter set 2***, Parameter set 2 active • **[Set No.3]** CFP3: ***Parameter set 3***, Parameter set 3 active		
[Warning groups] ALGr	—	—
Warning groups Current impacted alarm group numbers Group of alarms could be user defined in **[Inputs / Outputs]** I-O , page 135 . • **[--- Groups Warn]** ---: ***No warning groups active*** • **[1-- Groups Warn]** 1--: ***Warning group 1 active*** • **[-2- Groups Warn]** -2-: ***Warning group 2 active*** • **[12- Groups Warn]** 12-: ***Warning groups 12 active*** • **[--3 Groups Warn]** --3: ***Warning group 3 active*** • **[1-3 Groups Warn]** 1-3: ***Warning groups 1_3 active*** • **[-23 Groups Warn]** -23: ***Warning groups _23 active*** • **[123 Groups Warn]** 123: ***Warning groups 123 active***		
[Cust. output value] SPD1 or **[Cust. output value]** SPD2 or **[Cust. output value]** SPD3	—	—
Output value customer **[Cust. output value]** SPD1, **[Cust. output value]** SPD2 or **[Cust. output value]** SPD3 depending on the **[Scale factor display]** SDS parameter **[Cust. output value]** SPD3in the factory setting		

[Warnings] ALr-

Access
Parameters described below can be accessed by: dr1 ➜ MON ➜ ALr

HMI label	Settings	Factory setting
List of current alarms. If an alarm is present, a appears ✓ on the graphic display terminal. • **[No Warning]** noAL : ***No warning*** • **[PTC Fdbk Handling]** PtCL : ***PTC probe feedback handling*** • **[Ext Error assign]** EtF : ***External error assignment*** • **[UnderV Warn]** uSA: ***Undervoltage warning*** • **[Cur Thd Reached]** CtA: ***Current threshold reached*** • **[Mot Freq High Thd]** FtA: ***Motor frequency high threshold reached*** • **[2nd Freq Thd Reached]** F2A: ***2nd frequency threshold reached*** • **[Ref Freq Warn]** SrA: ***Reference frequency warning*** • **[Motor Therm Thd reached]** tSA: ***Motor thermal threshold reached*** • **[Mot2 Therm Thd reached]** tS2: ***Motor 2 thermal threshold reached*** • **[Mot3 Therm Thd reached]** tS3: ***Motor 3 thermal threshold reached*** • **[Preventive UnderV Active]** uPA: ***Preventive undervoltage active*** • **[High Speed Reached]** FLA: ***High speed reached*** • **[Device Th Warn]** tHA: ***Device thermal state warning*** • **[Warning Grp 1]** AG1: ***Warning group 1*** • **[Warning Grp 2]** AG2: ***Warning group 2*** • **[Warning Grp 3]** AG3: ***Warning group 3*** • **[PID error Warn]** (PEE: ***PID error warning*** • **[PID Fdbk Warn]** PFA: ***PID feedback warning*** • **[AI3 4-20 Warning]** AP3: ***AI3 4-20 loss warning*** • **[Torque Limit Reached]** SSA: ***Torque limit reached*** • **[Dev Th reached]** tAd: ***Device thermal threshold reached*** • **[Therm Junction Warn]** tJA: ***Thermal junction warning*** • **[Proc Undld Warn]** uLA: ***Process underload warning*** • **[Proc Overload Warn]** oLA: ***Process overload warning*** • **[High Torque Warn]** ttHA: ***High torque warning*** • **[Low Torque Warn]** ttLA: ***Low torque warning*** • **[Pulse Warn Thd Reached]** FqLA: ***Pulse warning threshold reached***		

[Other State] SSt-

Access
Parameters described below can be accessed by: dr1 ➔ Mon ➔ SSt

HMI label	Settings	Factory setting
List of secondary states. This menu is visible only on graphic display terminal. • **[In motor fluxing]** FLX: ***In motor fluxing*** • **[PTC Fdbk Handling]** PtCL: ***PTC probe feedback handling*** • **[Fast Stop Assign]** FSt: ***Fast stop assignment*** • **[Cur Thd Reached]** CtA: ***Current threshold reached*** • **[Mot Freq High Thd]** FtA: ***Motor frequency high threshold reached*** • **[2nd Freq Thd Reached]** F2A: ***2nd frequency threshold reached*** • **[Ref Freq Warn]** SrA: ***Reference frequency warning*** • **[Motor Therm Thd reached]** tSA: ***Motor thermal threshold reached*** • **[Ext Error Assign]** EtF: ***External error assignment*** • **[Auto]** Auto: ***Auto*** • **[Remote]** FtL: ***Remote*** • **[Autotuning]** tun: ***Autotuning*** • **[UnderV Warn]** uSA: ***Undervoltage warning*** • **[Conf. 1 act.]** CnF1: ***2 configurations assignt.*** • **[Conf. 2 act.]** CnF2: ***3 configurations assignt.*** • **[High Speed Reached]** FLA: ***High speed reached*** • **[Set 1 active]** CFP1: ***Parameter set 1*** • **[Set 2 active]** CFP2: ***Parameter set 2*** • **[Set 3 active]** CFP3: ***Parameter set 3*** • **[DC charged]** dbL: ***DC bus charged*** • **[High Torque Warn]** ttHA: ***High torque warning*** • **[Low Torque Warn]** ttLA: ***Low torque warning*** • **[Run Forward]** MFrd: ***Run forward*** • **[Run Reverse]** Mrrs: ***Run reverse*** • **[Pulse Warn Thd Reached]** F9LA: ***Pulse warning threshold reached***		

[Diagnostics] dGt-

This menu is visible only on graphic display terminal.

[Error history] PFH-

Shows the 8 last detected errors.

Access
Parameters described below can be accessed by: dr1 ➜ Mon ➜ dGt ➜ PFH

HMI label	Settings	Factory setting
[Last Error 1] dP1	—	—

Last error 1 (1 is last)

- **[No Error]** noF: ***No error detected***
- **[Angle error]** ASF: ***Angle error***, Angle setting detected error
- **[Incorrect Config]** CFF: ***Incorrect configuration*** Invalid configuration at power on
- **[Conf Transfer Error]** CF12: ***Configuration transfer error***
- **[Fdbus Com Interrupt]** CnF: ***Fieldbus communication interruption***
- **[AFE contactor feedback error]** CrF3: ***AFE contactor feedback error***
- **[Channel Switch Error]** CSF: ***Channel switching detected error***
- **[Ctrl Memory Error]** EEF1: ***Control memory error***
- **[Pwr Memory Error]** EEF2: ***Power memory error***
- **[External Error]** EPF1: ***External detected error***
- **[Fieldbus Error]** EPF2: ***External error detected by Fieldbus***
- **[Func Block Error]** FbE: ***Function Block error***
- **[Func Block Stop Error]** FbE5: ***Function Block stop error***
- **[Boards Compat]** HCF: ***Boards compatibility***, hardware configuration detected error
- **[IGBT desaturation]** HdF: ***IGBT desaturation***, hardware detected error
- **[Internal Link Error]** iLF: ***Internal communication interruption with option module***
- **[Internal Error 1]** inF1: ***Internal error 1 (Rating)***
- **[Internal Error 2]** inF2: ***Internal error 2 (Soft)***, unknown or incompatible power board
- **[Internal Error 3]** inF3: ***Internal error 3 (Intern Comm)***, internal serial link communication interruption
- **[Internal Error 4]** inF4: ***Internal error 4 (Manufacturing)***, invalid industrialization zone
- **[Internal Error 6]** inF6: ***Internal error 6 (Option)***, unknown or incompatible option board
- **[Internal Error 9]** inF9: ***Internal error 9 (Measure)***, current measurement circuit detected error
- **[Internal Error 10]** inFA: ***Internal error 10 (Mains)***, input phase loss circuit detected error
- **[Internal Error 11]** inFb: ***Internal error 11 (Temperature)***, thermal sensor detected error (OC or SC)
- **[Internal Error 14]** inFE: ***Internal error 14 (CPU)*** (ram, flash, task ...)
- **[Input Contactor]** LCF: ***input contactor***, line contactor detected error
- **[AI3 4-20mA loss]** LFF3: ***AI3 4-20mA loss***
- **[DC Bus OverV]** obF: ***DC bus overvoltage***
- **[Overcurrent]** oCF: ***Overcurrent***
- **[Device Overheat]** oHF: ***Device overheating***
- **[Process Overload]** oLC: ***Process overload***
- **[Motor Overload]** oLF: ***Motor overload***
- **[Single out ph loss]** oPF1: ***Single output phase loss***

HMI label	Settings	Factory setting
• **[Output Ph Loss]** oPF2: ***Output phase loss*** • **[Supply Mains OverV]** oSF: ***Supply mains overvoltage***, oversupply detected error • **[DI6=PTC Overheat]** otFL: ***DI6=PTC overheat***, motor overheating detected error from PTCL: standard product • **[Input Phase Loss]** PHF: ***Input phase loss*** • **[DI6=PTC Probe Error]** PtFL: ***DI6=PTC probe detected error*** (OC or SC) • **[Safety Func Error]** SAFF: ***Safety function detected error*** • **[Motor short circuit]** SCF1: ***Motor short circuit*** (hard detection) • **[Ground Short Circuit]** SCF3: ***Ground short circuit*** (hard detection) • **[IGBT Short Circuit]** SCF4: ***IGBT short circuit*** (hard detection) • **[Mot Short Circuit]** SCF5: ***Motor short circuit***, Load short-circuit during Igon load sequence (hard detection) • **[Mdb Com Interrupt]** SLF1: ***Modbus communication interruption*** • **[PC Com Interrupt]** SLF2: ***PC communication interruption*** • **[HMI Com Interruption]** SLF3: ***HMI communication interruption*** • **[Motor Overspeed]** SoF: ***Motor overspeed*** • **[Torque Limit Error]** SSF: ***Torque limitation error*** • **[Device Overheat]** tJF: ***Device overheating*** • **[Autotuning Error]** tnF: ***Autotuning detected error*** • **[Proc Underload]** uLF: ***Process underload*** • **[Supply Mains UnderV]** uSF: ***Supply mains undervoltage***		
[Device State] HS1	—	—
HMI status HMI Status of the detected error record 1. • **[Autotuning]** tun: ***Autotuning*** • **[In DC inject.]** dCb: ***DC injection*** • **[Ready]** rdY: ***Ready*** • **[Freewheel]** nSt: ***Freewheel stop*** • **[Running]** run: ***Running***, motor in steady state or run command present and zero reference • **[Accelerating]** ACC: ***Accelerating*** • **[Decelerating]** dEC: ***Decelerating*** • **[Current Limitation]** CL1: ***In current limitation***, current limit (in case of using a synchronous motor, if the motor does not start, follow the procedure) • **[Fast stop]** FSt: ***Fast stop*** • **[Mot. fluxing]** FLu: ***Motor fluxing*** fluxing function is activated • **[No Mains Voltage]** nLP: ***No mains voltage***, control is powered on but the DC bus is not loaded • **[control.stop]** CtL: ***Control stopping*** • **[Dec. adapt.]** obr: ***Dec ramp adaptation*** • **[Output cut]** SoC: ***Output cut*** • **[UnderV Warn]** uSA: ***Undervoltage warning*** • **[TC Mode Active]** tC: ***TC mode active*** • **[In autotest]** St: ***In autotest*** • **[Autotest error]** FA: ***Autotest error*** • **[Autotest OK]** YES: ***Autotest OK*** • **[EEprom test]** EP: ***EEprom test***, self test Eeprom detected error • **[Operating State "Fault"]** FLt: ***Operating state "Fault"***, product has detected a error		

HMI label	Settings	Factory setting
• **[STO active]** Sto: ***STO active***, safety function STO		
[Last Error 1 Status] EP1	—	—
Status of last error 1, DRIVECOM status register of detected error record 1 (same as **[Status Register]** ETA , page 56).		
[ETI state word] iP1	—	—
ETI state word, extended status register of detected error record 1 (see the communication parameters file).		
[Cmd word] CMP1	—	—
Cmd word, command register of detected error record 1 (same as **[Cmd Register]** CMd , page 54).		
[Motor current] LCP1	[A]	—
Motor current, estimated motor current of detected error record 1 (same as **[Motor Current]** LCr , page 46).		
[Output frequency] rFP1	[Hz]	—
Output frequency, estimated motor frequency of detected error record 1 (same as **[Motor Frequency]** rFr , page 45).		
[Run Elapsed time] rtP1	[h]	—
Run Elapsed time. Elapsed run time of detected error record 1 (same as **[Motor Run Time]** rtH , page 60).		
[Mains Voltage] ULP1	[V]	—
Mains voltage. Main voltage of detected error record 1 (same as **[Mains Voltage]** ULn).		
[Motor therm state] tHP1	[%]	—
Motor thermal state. Motor thermal state of detected error record 1 (same as **[Motor Therm State]** tHr).		
[Command Channel] dCC1	—	—
Command channel. Command channel of detected error record 1 (same as **[Command Channel]** CMdC , page 54).		
[Ref Freq Channel] drC1	—	—
Channel for reference frequency. Reference channel of detected error record 1 (same as **[Ref Freq Channel]** rFCC , page 55).		
[Saf1 Reg n-1] Sr11	—	—
Saf1 Reg n-1, SAF1 Register x (1 is last)		
[Saf2 Reg n-1] Sr21	—	—
Saf2 Reg n-1, SAF2 Register x (1 is last)		
[SF00 Reg n-1] SrA1	—	—
SF00 Reg n-1, SF00 Register x (1 is last)		
[SF01 Reg n-1] Srb1	—	—
SF01 Reg n-1, SF01 Register x (1 is last)		
[SF02 Reg n-1] SrC1	—	—
SF02 Reg n-1, SF02 Register x (1 is last)		
[SF03 Reg n-1] Srd1	—	—
SF03 Reg n-1, SF03 Register x (1 is last)		
[SF04 Reg n-1] SrE1	—	—
SF04 Reg n-1, SF04 Register x (1 is last)		

HMI label	Settings	Factory setting
[SF05 Reg n-1] SrF1	—	—
SF05 Reg n-1, SF05 Register x (1 is last)		
[SF06 Reg n-1] SrG1	—	—
SF06 Reg n-1, SF06 Register x (1 is last)		
[SF07 Reg n-1] SrH1	—	—
SF07 Reg n-1, SF07 Register x (1 is last)		
[SF08 Reg n-1] Sr 1 1	—	—
SF08 Reg n-1, SF08 Register x (1 is last)		
[SF09 Reg n-1] SrJ1	—	—
SF09 Reg n-1, SF09 Register x (1 is last)		
[SF10 Reg n-1] SrK1	—	—
SF10 Reg n-1, SF10 Register x (1 is last)		
[SF11 Reg n-1] SrL1	—	—
SF11 Reg n-1, SF11 Register x (1 is last)		
[Last Error 2] dP2	—	—
Last error 2 **[Saf1 Reg n-2]** Sr 12, **[Saf2 Reg n-2]** Sr22, **[SF00 Reg n-2]** SrA2, **[SF01 Reg n-2]** Srb2, and **[SF02 Reg n-2]** SrC2 to **[SF11 Reg n-2]** SrL2 may be visible with this parameter. Identical to **[Last Error 1]** dP1, page 64.		
[Last Error 3] dP3	—	—
Last error 3 **[Saf1 Reg n-3]** Sr 13, **[Saf2 Reg n-3]** Sr23, **[SF00 Reg n-3]** SrA3, **[SF01 Reg n-3]** Srb3, and **[SF02 Reg n-3]** SrC3 to **[SF11 Reg n-3]** SrL3 may be visible with this parameter. Identical to **[Last Error 1]** dP1, page 64.		
[Last Error 4] dP4	—	—
Last error 4 **[Saf1 Reg n-4]** Sr 14, **[Saf2 Reg n-4]** Sr24, **[SF00 Reg n-4]** SrA4, **[SF01 Reg n-4]** Srb4, and **[SF02 Reg n-4]** SrC4 to **[SF11 Reg n-4]** SrL4 may be visible with this parameter. Identical to **[Last Error 1]** dP1, page 64.		
[Last Error 5] dP5	—	—
Last error 5 **[Saf1 Reg n-5]** Sr 15, **[Saf2 Reg n-5]** Sr25, **[SF00 Reg n-5]** SrA5, **[SF01 Reg n-5]** Srb5, and **[SF02 Reg n-5]** SrC5 to **[SF11 Reg n-5]** SrL5 may be visible with this parameter. Identical to **[Last Error 1]** dP1, page 64.		
[Last Error 6] dP6	—	—
Last error 6 **[Saf1 Reg n-6]** Sr 16, **[Saf2 Reg n-6]** Sr26, **[SF00 Reg n-6]** SrA6, **[SF01 Reg n-6]** Srb6, and **[SF02 Reg n-6]** SrC6 to **[SF11 Reg n-6]** SrL6 may be visible with this parameter. Identical to **[Last Error 1]** dP1, page 64.		
[Last Error 7] dP7	—	—

HMI label	Settings	Factory setting
Last error 7 **[Saf1 Reg n-7]** Sr17, **[Saf2 Reg n-7]** Sr27, **[SF00 Reg n-7]** SrA7, **[SF01 Reg n-7]** Srb7, and **[SF02 Reg n-7]** SrC7 to **[SF11 Reg n-7]** SrL7 may be visible with this parameter. Identical to **[Last Error 1]** dP1, page 64.		
[Last Error 8] dP8	—	—
Last error 8 **[Saf1 Reg n-8]** Sr18, **[Saf2 Reg n-8]** Sr28, **[SF00 Reg n-8]** SrA8, **[SF01 Reg n-8]** Srb8, and **[SF02 Reg n-8]** SrC8 to **[SF11 Reg n-8]** SrL8 may be visible with this parameter. Identical to **[Last Error 1]** dP1, page 64.		

[Actual error] PFL-

Access
Parameters described below can be accessed by: dr1 ➔ Mon ➔ PFL

HMI label	Settings	Factory setting

- **[No Error]** noF : ***No error detected***
- **[Angle error]** ASF : ***Angle error***, angle setting detected error
- **[Incorrect Config]** CFF : ***Incorrect configuration***, invalid configuration at power on
- **[Conf Transfer Error]** CF i2 : ***Configuration transfer error***
- **[Fdbus Com Interrupt]** CnF : ***Fieldbus communication interruption***
- **[AFE contactor feedback error]** CrF3 : ***AFE contactor feedback error***
- **[Channel Switch Error]** CSF : ***Channel switching detected error***
- **[Ctrl Memory Error]** EEF 1 : ***Control memory error***
- **[Pwr Memory Error]** EEF2 : ***Power memory error***
- **[External Error]** EPF 1 : ***External detected error***
- **[Fieldbus Error]** EPF2 : ***External error detected by Fieldbus***
- **[Func Block Error]** FbE : ***Function Block error***
- **[Func Block Stop Error]** FbES : ***Function Block stop error***
- **[Boards Compat]** HCF : ***Boards compatibility***, hardware configuration detected error
- **[IGBT desaturation]** HdF : ***IGBT desaturation***, hardware detected error
- **[Internal Link Error]** iLF : ***Internal communication interruption with option module***, option internal link interruption
- **[Internal Error 1]** inF 1 : ***Internal error 1 (Rating)***
- **[Internal Error 2]** inF2 : ***Internal error 2 (Soft)***, unknown or incompatible power board
- **[Internal Error 3]** inF3 : ***Internal error 3 (Intern Comm)***, internal serial link communication interruption
- **[Internal Error 4]** inF4 : ***Internal error 4 (Manufacturing)***, invalid industrialization zone
- **[Internal Error 6]** inF6 : ***Internal error 6 (Option)***, unknown or incompatible option board
- **[Internal Error 9]** inF9 : ***Internal error 9 (Measure)***, current measurement circuit detected error
- **[Internal Error 10]** inFA : ***Internal error 10 (Mains)***, input phase loss circuit detected error
- **[Internal Error 11]** inFb : ***Internal error 11 (Temperature)***, thermal sensor detected error (OC or SC)
- **[Internal Error 14]** inFE : ***Internal error 14 (CPU)***, CPU detected error (ram, flash, task ...)
- **[Input Contactor]** LCF : ***input contactor***, line contactor detected error
- **[AI3 4-20mA loss]** LFF3 : ***AI3 4-20mA loss***
- **[DC Bus OverV]** obF : ***DC bus overvoltage***
- **[Overcurrent]** oCF : ***Overcurrent***
- **[Device Overheat]** oHF : ***Device overheating***
- **[Process Overload]** oLC : ***Process overload***
- **[Motor Overload]** oLF : ***Motor overload***
- **[Single out ph loss]** oPF 1 : ***Single output phase loss***
- **[Output Ph Loss]** oPF2 : ***Output phase loss***
- **[Supply Mains OverV]** oSF : ***Supply mains overvoltage***, oversupply detected error
- **[DI6=PTC Overheat]** otFL : ***DI6=PTC overheat***, motor overheating detected error from PTCL: standard product
- **[Input Phase Loss]** PHF : ***Input phase loss***
- **[DI6=PTC Probe Error]** PtFL : ***DI6=PTC probe detected error*** (OC or SC)
- **[Safety Func Error]** SAFF : ***Safety function detected error***
- **[Motor short circuit]** SCF 1 : ***Motor short circuit*** (hard detection)
- **[Ground Short Circuit]** SCF3 : ***Ground short circuit*** (hard detection)
- **[IGBT Short Circuit]** SCF4 : ***IGBT short circuit*** (hard detection)
- **[Mot Short Circuit]** SCF5 : ***Motor short circuit***, load short-circuit during Igon load sequence (hard detection)

HMI label	Settings	Factory setting
• **[Mdb Com Interrupt]** SLF1: ***Modbus communication interruption***, modbus local serial communication interruption • **[PC Com Interrupt]** SLF2: ***PC communication interruption***, PC Software communication interruption • **[HMI Com Interruption]** SLF3: ***HMI communication interruption*** • **[Motor Overspeed]** SoF: ***Motor overspeed*** • **[Torque Limit Error]** SSF: ***Torque limitation error*** • **[Device Overheat]** tJF: ***Device overheating*** • **[Autotuning Error]** tnF: ***Autotuning detected error*** • **[Proc Underload]** uLF: ***Process underload*** • **[Supply Mains UnderV]** uSF: ***Supply mains undervoltage*** • **[Damper Control Error]** duCF: ***Damper control error***		

[More error info] AF1-

Access
Parameters described below can be accessed by: dr1 ➡ Mon ➡ AF1

Additional detected error information.

HMI label	Settings	Factory setting
[Fdbus Com Interrupt] CnF	—	—
Fieldbus module Communication interruption, communication option module detected error code. This parameter is read-only. The detected error code remains saved in the parameter, even if the cause disappears. The parameter is reset after the drive is disconnected and then reconnected. The values of this parameter depend on the network module. Consult the manual for the corresponding module.		
[InternCom Error1] iLF1	—	—
Internal communication interruption 1, communication interruption between option module 1 and drive. This parameter is read-only. The detected error code remains saved in the parameter, even if the cause disappears. The parameter is reset after the drive is disconnected and then reconnected.		
[Safety fct ErrorReg] SFFE (1)	—	—

HMI label	Settings	Factory setting
Safety function error register • Bit0 = 1: Logic inputs debounce time-out (verify value of debounce time LIDT according to the application) • Bit1 Reserved • Bit2 = 1: Motor speed sign has changed during SS1 ramp • Bit3 = 1: Motor speed has reached the frequency limit threshold during SS1 ramp. • Bit4: Reserved • Bit5: Reserved • Bit6 = 1: Motor speed sign has changed • Bit7 = 1: Motor speed has reached the frequency limit threshold during SS1 ramp. • Bit8: Reserved • Bit9: Reserved • Bit10: Reserved • Bit11: Reserved • Bit12: Reserved • Bit13 = 1: Not possible to measure the motor speed (verify the motor wiring connection) • Bit14 = 1: Motor ground short-circuit detected (verify the motor wiring connection) • Bit15 = 1: Motor phase to phase short-circuit detected (verify the motor wiring connection)		
[Safety Error Reg1] SAF 1 (1)	—	—
Safety error register 1,application control error register. • Bit0 = 1: PWRM consistency detected error • Bit1 = 1: Safety functions parameters detected error • Bit2 = 1: Application auto test has detected an error • Bit3 = 1: Diagnostic verification of safety function has detected an error • Bit4 = 1: Logical input diagnostic has detected an error • Bit5 = 1: SMS or GDL safety functions detected error (Details in **[SAFF Subcode 4]** SF04 register , page 74) • Bit6 = 1: Application watchdog management active • Bit7 = 1: Motor control detected error • Bit8 = 1: Internal serial link core detected error • Bit9 = 1: Logical input activation detected error • Bit10 = 1: Safe Torque Off function has triggered an event • Bit11 = 1: Application interface has detected an error of the safety functions • Bit12 = 1: Safe Stop 1 function has detected an error of the safety functions • Bit13 = 1: Safely Limited Speed function has triggered an event • Bit14 = 1: Motor data is corrupted • Bit15 = 1: Internal serial link data flow detected error		
[Safety Error Reg2] SAF2 (1)	—	—

HMI label	Settings	Factory setting
Safety error register 2, motor Control error register • Bit0 = 1 : Consistency stator frequency verification has detected an error • Bit1 = 1 : Stator frequency estimation detected error • Bit2 = 1 : Motor control watchdog management is active • Bit3 = 1 : Motor control hardware watchdog is active • Bit4 = 1 : Motor control auto test has detected an error • Bit5 = 1 : Chain testing detected error • Bit6 = 1 : Internal serial link core detected error • Bit7 = 1 : Direct short-circuit detected error • Bit8 = 1 : PWM driver detected error • Bit9 = 1 : GDL internal detected error • Bit10 : Reserved • Bit11 = 1 : Application interface has detected an error of the safety functions • Bit12 = 1 : Reserved • Bit13: Reserved • Bit14 = 1 : Motor data is corrupted • Bit15 = 1 : Internal serial link data flow detected error		
[SAFF Subcode 0] SFD0 (1)	—	—
SAFF subcode 0, safety function error subregister 00 Appplication auto test error register • Bit0 : Reserved • Bit1 = 1 : Ram stack overflow • Bit2 = 1 : Ram address integrity detected error • Bit3 = 1 : Ram data access detected error • Bit4 = 1 : Flash Checksum detected error • Bit5 : Reserved • Bit6 : Reserved • Bit7 : Reserved • Bit8 : Reserved • Bit9 = 1 : Fast task overflow • Bit10 = 1 : Slow task overflow • Bit11 = 1 : Application task overflow • Bit12 : Reserved • Bit13 : Reserved • Bit14 = 1 : PWRM line is not activated during initialization phase • Bit15 = 1 : Application hardware Watch Dog is not running after initialization		
[SAFF Subcode 1] SFD1 (1)	—	—

HMI label	Settings	Factory setting
SAFF subcode 1, safety function error subregister 01 Logical input diagnostics error register • Bit0 = 1 : Management - state machine detected error • Bit1 = 1 : Data required for test management are corrupted • Bit2 = 1 : Channel selection detected error • Bit3 = 1 : Testing - state machine detected error • Bit4 = 1 : Test request is corrupted • Bit5 = 1 : Pointer to test method is corrupted • Bit6 = 1 : Incorrect test action provided • Bit7 = 1 : Detected Error in results collecting • Bit8 = 1 : LI3 detected error. Cannot activate safe function • Bit9 = 1 : LI4 detected error. Cannot activate safe function • Bit10 = 1 : LI5 detected error. Cannot activate safe function • Bit11 = 1 : LI6 detected error. Cannot activate safe function • Bit12 = 1 : Test sequence updated while a diagnostic is in progress • Bit13 = 1 : Detected error in test pattern management • Bit14 : Reserved • Bit15 : Reserved		
[SAFF Subcode 2] SF02 (1)	—	—
SAFF subcode 2, safety function error subregister 02 Application Watchdog Management detected error register • Bit0 = 1 : Fast task detected error • Bit1 = 1 : Slow task detected error • Bit2 = 1 : Application task detected error • Bit3 = 1 : Background task detected error • Bit4 = 1 : Safety fast task/input detected error • Bit5 = 1 : Safety slow task/input detected error • Bit6 = 1 : Safety app task/input detected error • Bit7 = 1 : Safety app task/treatment detected error • Bit8 = 1 : Safety background task detected error • Bit9 : Reserved • Bit10 : Reserved • Bit11 : Reserved • Bit12 : Reserved • Bit13 : Reserved • Bit14 : Reserved • Bit15 : Reserved		
[SAFF Subcode 3] SF03 (1)	—	—

HMI label	Settings	Factory setting
SAFF subcode 3, safety function error subregister 03 • Bit0 = 1 : Debounce time out • Bit1 = 1 : Input not consistent • Bit2 = 1 : Consistency check - state machine detected error • Bit3 = 1 : Consistency check - debounce timeout corrupted • Bit4 = 1 : Response time data detected error • Bit5 = 1 : Response time corrupted • Bit6 = 1 : Undefined consumer queried • Bit7 = 1 : Configuration detected error • Bit8 = 1 : Inputs are not in nominal mode • Bit9 : Reserved • Bit10 : Reserved • Bit11 : Reserved • Bit12 : Reserved • Bit13 : Reserved • Bit14 : Reserved • Bit15 : Reserved		
[SAFF Subcode 4] SF04 (1)	—	—
SAFF subcode 4, safety function error subregister 04 **[Trq/I Limit Timeout]** Sto detected error register • Bit0 = 1 : No signal configured • Bit1 = 1 : State machine detected error • Bit2 = 1 : Internal data detected error • Bit3 : Reserved • Bit4 : Reserved • Bit5 : Reserved • Bit6 : Reserved • Bit7 : Reserved • Bit8 = 1 : SMS overspeed detected error • Bit9 = 1 : SMS internal detected error • Bit10 : Reserved • Bit11 = 1 : GDL internal detected error 1 • Bit12 = 1 : GDL internal detected error 2 • Bit13 : Reserved • Bit14 : Reserved • Bit15 : Reserved		
[SAFF Subcode 5] SF05 (1)	—	—

HMI label	Settings	Factory setting
SAFF subcode 5, safety function error subregister 05 • Bit0 : Reserved • Bit1 : Reserved • Bit2 : Reserved • Bit3 : Reserved • Bit4 : Reserved • Bit5 : Reserved • Bit6 : Reserved • Bit7 : Reserved • Bit8 : Reserved • Bit9 : Reserved • Bit10 : Reserved • Bit11 : Reserved • Bit12 : Reserved • Bit13 : Reserved • Bit14 : Reserved • Bit15 : Reserved		
[SAFF Subcode 6] SFO6 (1)	—	—
SAFF subcode 6, safety function error subregister 06 • Bit0 : Reserved • Bit1 : Reserved • Bit2 : Reserved • Bit3 : Reserved • Bit4 : Reserved • Bit5 : Reserved • Bit6 : Reserved • Bit7 : Reserved • Bit8 : Reserved • Bit9 : Reserved • Bit10 : Reserved • Bit11 : Reserved • Bit12 : Reserved • Bit13 : Reserved • Bit14 : Reserved • Bit15 : Reserved		
[SAFF Subcode 7] SFO7 (1)	—	—

HMI label	Settings	Factory setting
SAFF subcode 7, safety function error subregister 07 Application Watchdog Management detected error register • Bit0 : Reserved • Bit1 : Reserved • Bit2 : Reserved • Bit3 : Reserved • Bit4 : Reserved • Bit5 : Reserved • Bit6 : Reserved • Bit7 : Reserved • Bit8 : Reserved • Bit9 : Reserved • Bit10 : Reserved • Bit11 : Reserved • Bit12 : Reserved • Bit13 : Reserved • Bit14 : Reserved • Bit15 : Reserved		
[SAFF Subcode 8] SF08 (1)	—	—
SAFF subcode 8, safety function error subregister 08 Application Watchdog Management detected error register • Bit0 = 1 : PWM task detected error • Bit1 = 1 : Fixed task detected error • Bit2 = 1 : ATMC watchdog detected error • Bit3 = 1 : DYNFCT watchdog detected error • Bit4 : Reserved • Bit5 : Reserved • Bit6 : Reserved • Bit7 : Reserved • Bit8 : Reserved • Bit9 : Reserved • Bit10 : Reserved • Bit11 : Reserved • Bit12 : Reserved • Bit13 : Reserved • Bit14 : Reserved • Bit15 : Reserved		
[SAFF Subcode 9] SF09 (1)	—	—

HMI label	Settings	Factory setting
SAFF subcode 9, safety function error subregister 09 Motor control Auto Test detected error register • Bit0 : Reserved • Bit1 = 1 : Ram stack overflow • Bit2 = 1 : Ram address integrity detected error • Bit3 = 1 : Ram data access detected error • Bit4 = 1 : Flash Checksum detected error • Bit5 : Reserved • Bit6 : Reserved • Bit7 : Reserved • Bit8 : Reserved • Bit9 = 1 : 1ms task overflow • Bit10 = 1 : PWM task overflow • Bit11 = 1 : Fixed task overflow • Bit12 : Reserved • Bit13 : Reserved • Bit14 = 1 : Unwanted interruption • Bit15 = 1 : Hardware WD is not running after initialization		
[SAFF Subcode 10] SF10 (1)	—	—
SAFF subcode 10, safety function error subregister 10 Motor control direct short-circuit detected error register • Bit0 = 1 : Ground short circuit - Configuration detected error • Bit1 = 1 : Phase to phase short circuit - Configuration detected error • Bit2 = 1 : Ground short circuit • Bit3 = 1 : Phase to phase short circuit • Bit4 : Reserved • Bit5 : Reserved • Bit6 : Reserved • Bit7 : Reserved • Bit8 : Reserved • Bit9 : Reserved • Bit10 : Reserved • Bit11 : Reserved • Bit12 : Reserved • Bit13 : Reserved • Bit14 : Reserved • Bit15 : Reserved		
[SAFF Subcode 11] SF11 (1)	—	—

HMI label	Settings	Factory setting
SAFF subcode 11, safety function error subregister 11 Motor Control dynamic check of activity detected error register • Bit0 = 1 : Application requested a diagnostic of direct short circuit • Bit1 = 1 : Application requested consistency verification of stator frequency estimation (voltage and current) • Bit2 = 1 : Application requested diagnostic of SpdStat provided by Motor Control • Bit3 : Reserved • Bit4 : Reserved • Bit5 : Reserved • Bit6 : Reserved • Bit7 : Reserved • Bit8 = 1 : Motor Control safe diagnostic of direct short circuit is enabled • Bit9 = 1 : Motor Control consistency check of stator frequency estimation is enabled • Bit10 = 1 : Motor Control diagnostic of SpdStat provided by Motor Control is enabled • Bit11 : Reserved • Bit12 : Reserved • Bit13 : Reserved • Bit14 : Reserved • Bit15 : Reserved		
[IGBT Warn Counter] tAC	—	—
IGBT warning counter, transistor alarm time counter (length of time the "IGBT temperature" alarm has been active).		
[Min. freq time] tAC2	—	—
Min IGBT frequency time. Transistor alarm time counter at minimum switching frequency (length of time the "IGBT temperature" alarm has been active after the drive has automatically reduced the switching frequency to the minimum value).		
[IGBT Warning Nb] nbJ ★	—	—
Number of IGBT warnings. Transistor alarm counter: number detected during lifecycle. Visible if **[3.1] [Access Level]** LAC is set to **[Expert]** EPr.		
[Service Message] SEr –	—	—
Refer to **[Service Message]** SEr – , page 348.		
[Clear Error History] rFLt	—	—
Clear error history. Reset all resetable previous detected errors. **[No]** no: Reset not active **[Yes]** YES: Reset in progress		

(1) Hexadecimal values are displayed on the Graphic display terminal

Example:

SFFE = **0x0008** in Hexadecimal

SFFE = Bit **3**

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[Password] Cod-

Access
Parameters described below can be accessed by: dr ➜ Mon ➜ Cod

HMI Password.

If you have lost your code, please contact Schneider Electric.

HMI label	Settings	Factory setting
[Status] CSt	—	—
Status, Status of the drive (lock/unlock). Information parameter, cannot be modified. • **[Locked]** LCK : The drive is locked by a password • **[Unlocked]** uLCK : The drive is not locked by a password		
[PIN code 1] Cod	—	—
Password code 1, confidential code. Enables the drive configuration to be protected using an access code. When access is locked by means of a code, only the parameters in the **[1.2] [MONITORING]** Mon — and **[1.1] [Reference speed]** rEF — menus can be accessed. The MODE key can be used to switch between menus. **NOTE:** Before entering a code, do not forget to make a careful note of it. **[OFF]** oFF : No access locking codes. • To lock access, enter a code (2 to 9,999). The display can be incremented using the jog dial. Then press ENT. **[ON]** on appears on the screen to indicate that access has been locked. **[ON]** on : A code is locking access (2 to 9,999). • To unlock access, enter the code (incrementing the display using the jog dial) and press ENT. The code remains on the display and access is unlocked until the next time the drive is turned off. Access is locked again the next time the drive is turned on. • If an incorrect code is entered, the display changes to **[ON]** on and access remains locked. Access is unlocked (the code remains on the screen). • To reactivate locking with the same code when access has been unlocked, return to **[ON]** on using the jog dial and then press ENT. **[ON]** on remains on the screen to indicate that access has been locked. • To lock access with a new code when access has been unlocked, enter the new code (increment the display using the jog dial) and then press ENT. **[ON]** on remains on the screen to indicate that access has been locked. • To clear locking when access has been unlocked, return to **[OFF]** oFF using the jog dial and then press ENT. **[OFF]** oFF remains on the display. Access is unlocked and remains so until the next restart.		
[PIN code 2] Cod2 ★	—	—
Password code 2, confidential code 2. Visible if **[3.1] [Access Level]** LAC is set to **[Expert]** EPr . **[OFF]** oFF : The value **[OFF]** oFF indicates that no password has been set **[Unlocked]** uLCK . **[ON]** on : The value **[ON]** on indicates that the drive configuration is protected and an access code must be entered to unlock it. Once the correct code has been entered, it remains on the display and the drive is unlocked until the next time the power supply is disconnected. **8888**: PIN code 2 is an unlock code known only to Schneider Electric Product Support.		
[Upload rights] uLr	—	—
Upload rights • **[Permitted]** uLr0 : Means that SoMove or the graphic display terminal can save the whole configuration (password, protections, configuration). When the configuration is edited, only the non protected parameters is accessible.		

HMI label	Settings	Factory setting
• **[Not allowed]** ULR 1: Means that SoMove or the graphic display terminal cannot save the configuration.		
[Download rights] dLr	—	—
Download rights • **[Locked drv]** dLr 0: Locked drive: means that the configuration can be downloaded only in a locked drive which configuration has the same password. If the passwords are different, download is not permitted. • **[Unlock. drv]** dLr 1: Unlocked drive: means that the configuration can be downloaded only in a drive without active password. • **[Not allowed]** dLr 2: Not allowed: the configuration cannot be downloaded. • **[Lock/unlock]** dLr 3: Lock. + Not: download is permitted following case 0 or case 1.		

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

1.3 [Configuration] CONF

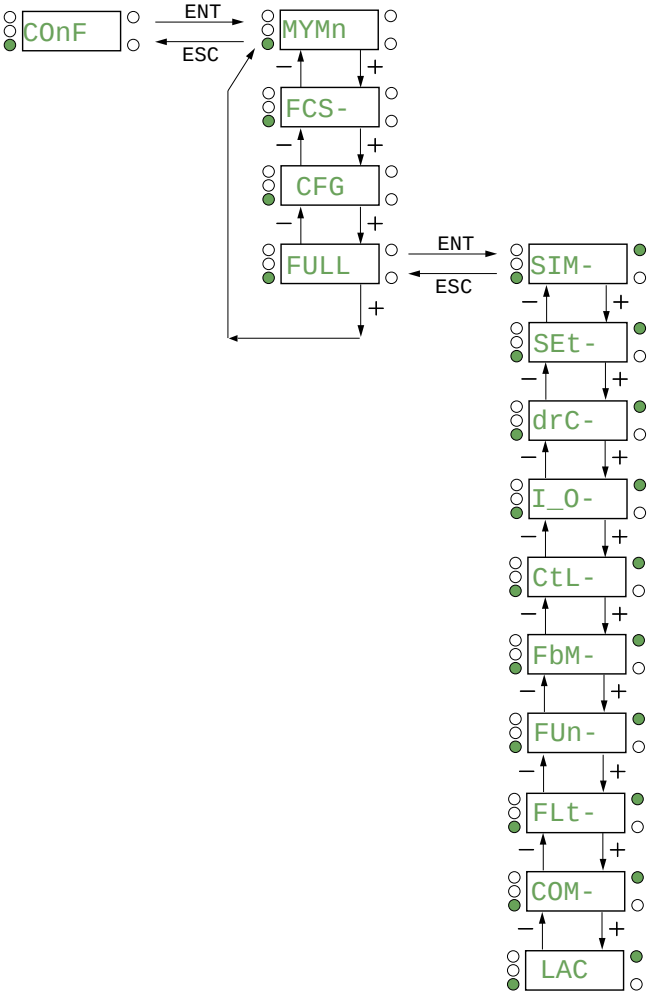
Introduction

Configuration mode includes 4 parts:

1. **[My menu]** MYMN — menu includes up to 25 parameters available for user to customize using the graphic display terminal or SoMove software.
2. Store/recall parameter set: These 2 functions are used to store and recall customer settings.
3. **[Macro-configuration]** CFG parameter , page 87 which allows to load predefined values for applications.
4. **[Full]** FULL —: This menu provides access to all other parameters. It includes 10 sub-menus:
   - **[Simply start]** SIM —, page 90
   - **[Settings]** SET —, page 97
   - **[Motor control]** drC —, page 113
   - **[Inputs / Outputs]** I_O —, page 135
   - **[control.stop]** CTL —, page 174
   - **[Function Blocks]** FBM —, page 180
   - **[Application function]** FUN —, page 188
   - **[Operating State Fault]** FLT —, page 279
   - **[Communication]** COM —
   - **[Access Level]** LAC , page 335

Organization Tree

Displayed parameter values are given as examples.



1.3.1 [My menu] MYMn-

Access
Parameters described below can be accessed by: dr ➜ CONF ➜MYMn

HMI label	Settings	Factory setting
This menu contains the parameters selected in the **[3.4] [Display config.]** dCF — **[Display config.]** dCF-, page 346 menu.		

1.3.2 [Factory settings] FCS-

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡FCS

Parameters List

HMI label	Settings	Factory setting
[Config. Source] FCS1 ★	—	**[Macro Config]** In1
Source configuration If the configuration switching function is configured, it is not possible to access **[Config 1]** CFG1 and **[Config 2]** CFG2. **NOTE:** To load the drive's presettings previously stored (**[Config 1]** Str1 or **[Config 2]** Str2), select the source configuration **[Config. Source]** FCS1 = **[Config 1]** CFG1 or **[Config 2]** CFG2 followed by a factory setting **[Go to Factory Settings]** GFS = **[Yes]** YES. **[Macro Config]** In1: Factory configuration, return to selected macro configuration **[Config 1]** CFG1: Configuration 1 **[Config 2]** CFG2: Configuration 2		
[Factory Setting Group] FrY —	—	—
Factory setting group Selection of menus to be loaded. See the multiple selection procedure Description of the HMI, page 29 for the integrated display terminal and the graphic display terminal . **NOTE:** In factory configuration and after a return to "factory settings", **[Factory Setting Group]** FrY is empty. **[All]** ALL: All parameters (the function blocks program is also erased) **[Device Configuration]** drM: The **[1] [Drive menu]** dr1 — menu without **[Communication]** CoM —. In the **[3.4] [Display config.]** dCF menu, **[Return std name]** GSP , page 348 returns to **[No]** no. **[Motor param]** Mot: Refer to Motor parameters . The following selections can only be accessed if **[Config. Source]** FCS1 is set to **[Macro Config]** In1. **[Comm. menu]** CoM: The **[Comm. menu]** CoM — menu without either **[Scan. IN1 address]** nMA1 to **[Scan. IN8 address]** nMA8 or **[Scan.Out1 address]** nCA1 to **[Scan.Out8 address]** nCA8. **[Display config.]** di5: The **[3.3] [MONITORING CONFIG.]** MCF — menu.		
[Go to Factory Settings] GFS ★  2 s	—	—
[Go to Factory Settings] **⚠WARNING** **UNANTICIPATED EQUIPMENT OPERATION** Verify that restoring the factory settings is compatible with the type of wiring used. **Failure to follow these instructions can result in death, serious injury, or equipment damage.** It is only possible to revert to the factory settings if at least one group of parameters has previously been selected. • **[No]** no: No • **[Yes]** YES: The parameter changes back to **[No]** no automatically as soon as the operation is complete.		

HMI label	Settings	Factory setting
[Save Configuration] SCS ★	—	**[No]** nO
Save configuration The active configuration to be saved does not appear for selection. For example, if it is **[Config 0]** Str0, only **[Config 1]** Str1 and **[Config 2]** Str2 appear. The parameter changes back to **[No]** nO as soon as the operation is complete. • **[No]** nO: No • **[Config 0]** Str0: Press and hold down the ENT key for 2 s • **[Config 1]** Str1: Press and hold down the ENT key for 2 s • **[Config 2]** Str2: Press and hold down the ENT key for 2 s		

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

1.3.3 [Macro-configuration] CFG —

What's in This Chapter

[Macro-configuration] CFG 87
[Macro-configuration] CFG : Assignment of the inputs/outputs 88
[Macro-configuration] CFG : Other configurations and settings.....88

[Macro-configuration] CFG

Access

Parameters described below can be accessed by: dr1 ➡ ConF

Parameters list

HMI label	Settings	Factory setting
[Macro Config] CFG ★ ⏳ 2 s	—	**[Start/Stop]** StS

Macro configuration

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that the selected macro configuration is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

- **[Start/Stop]** StS: Start/stop
- **[Gen. Use]** GEn: General use
- **[PID regul.]** PId: PID regulation
- **[Network C.]** nEt: Communication bus

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

⏳ 2 s: To change the assignment of this parameter, press the ENT key for 2 s.

Example of total return to factory settings

- **[Config. Source]** FCS1 is set to **[Macro Config]** In1
- **[Factory Setting Group]** FrY is set to **[All]** ALL
- **[Go to Factory Settings]** GFS is set to **[Yes]** YES

[Macro-configuration] CFG : Assignment of the inputs/ outputs

Input/ output	[Start/Stop]	[Gen. Use]	[PID regul.]	[Network C.]
AI1	**[Ref Freq 1 Config]**	**[Ref Freq 1 Config]**	**[Ref Freq 1 Config]** (PID reference)	**[Ref Freq 2 Config]** (**[Ref Freq 1 Config]** = integrated Modbus) (1)
AI2	**[No]**	**[Summing Input 2]**	**[PID feedback Assign]**	**[No]**
[AI3]	**[No]**	**[No]**	**[No]**	**[No]**
AOI	**[No]**	**[No]**	**[No]**	**[No]**
r1	**[No drive flt]**	**[No drive flt]**	**[No drive flt]**	**[No drive flt]**
r2	**[No]**	**[No]**	**[No]**	**[No]**
LI1 (2-wire)	**[Forward]**	**[Forward]**	**[Forward]**	**[Forward]**
LI2 (2-wire)	**[Run Reverse]**	**[Run Reverse]**	**[Run Reverse]**	**[Run Reverse]**
LI3 (2-wire)	**[No]**	**[Jog]**	**[PID Integral OFF]**	**[Ref Freq 2 switching]**
LI4 (2-wire)	**[No]**	**[Fault reset]**	**[2 preset PID ref.]**	**[Fault reset]**
LI5 (2-wire)	**[No]**	**[Torque limitation]**	**[4 preset PID ref.]**	**[No]**
LI6 (2-wire)	**[No]**	**[No]**	**[No]**	**[No]**
LI1 (3-wire)	**[Drive Running]**	**[Drive Running]**	**[Drive Running]**	**[Drive Running]**
LI2 (3-wire)	**[Forward]**	**[Forward]**	**[Forward]**	**[Forward]**
LI3 (3-wire)	**[Run Reverse]**	**[Run Reverse]**	**[Run Reverse]**	**[Run Reverse]**
LI4 (3-wire)	**[No]**	**[Jog]**	**[PID Integral OFF]**	**[Ref Freq 2 switching]**
LI5 (3-wire)	**[No]**	**[Fault reset]**	**[2 preset PID ref.]**	**[Fault reset]**
LI6 (3-wire)	**[No]**	**[Torque limitation]**	**[4 preset PID ref.]**	**[No]**
LOI	**[No]**	**[No]**	**[No]**	**[No]**
Graphic display terminal keys				
F1 key	**[No]**	**[No]**	**[No]**	Control via graphic display terminal
F2, F3, F4 keys	**[No]**	**[No]**	**[No]**	**[No]**

(1) To start with, integrated Modbus **[Modbus Address]** Add must first be configured.

In 3-wire control, the assignment of inputs LI1 to LI6 shifts.

NOTE: These assignments are reinitialized every time the macro configuration changes.

[Macro-configuration] CFG : Other configurations and settings

Return to factory settings:

Returning to factory settings with **[Config. Source]** FCS1 is set to **[Macro Config]** In1, page 84 returns the drive to the selected macro configuration. The **[Macro-configuration]** CFG parameter does not change, although **[Customized macro]** CCFG disappears.

NOTE: The factory settings that appear in the parameter tables correspond to **[Macro-configuration]** CFG = **[Start/Stop]** SE5. This is the macro configuration set at the factory.

1.3.4.1 [Full] FULL – – [Simply start] SIM–

Access

Parameters described below can be accessed by: dr I ➡ ConF ➡ FULL ➡ SIM

Parameters list

HMI label	Settings	Factory setting
[Simply start] SIM —		

⚠WARNING

LOSS OF CONTROL

- Fully read and understand the manual of the connected motor.
- Verify that all motor parameters are correctly set by referring to the nameplate and the manual of the connected motor.
- If you modify the value of one or more motor parameters after having performed autotuning, the value of the measured tune parameters is reset and you must re-perform autotuning.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[2/3-Wire Control] tCC 2s	—	**[2-Wire Control]** 2C

2/3-wire control , page 135

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

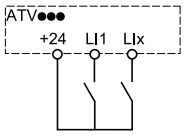
If this parameter is changed, the parameters **[Auto Fault Reset]** ATR and **[2-wire type]** TCT and the assignments of the digital and virtual inputs are partially reset to the factory setting.

- Verify that this change is compatible with the type of wiring used.

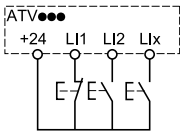
Failure to follow these instructions can result in death, serious injury, or equipment damage.

[2-Wire Control] 2C
2-wire control (level commands): This is the input state (0 or 1) or edge (0 to 1 or 1 to 0), which controls running or stopping.

Example of "source" wiring:



LI1: forward
LIx: reverse

HMI label	Settings	Factory setting
[3-Wire Control] 3C **3-wire control (pulse commands):**A "forward" or "reverse" pulse is sufficient to command starting, a "stop" pulse is sufficient to command stopping. Example of "source" wiring:  LI1: stop LI2: forward LIx: reverse		
[Macro-configuration] CFG ★ 2s	—	**[Start/Stop]** STS

Macro configuration , page 87

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that the selected macro configuration is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

- **[Start/Stop]** STS: ***Standard Start/Stop***
- **[Gen. Use]** GEN: ***General use***
- **[PID regul.]** PID: ***PID regulation***
- **[Network C.]** NET: ***Network communications***

[Customized macro] CCFG ★	—	—

Customized macro

Read-only parameter, only visible if at least one macro configuration parameter has been modified.

- **[No]** NO: ***No***
- **[Yes]** YES: ***Yes***

[Motor Standard] bFr	—	**[50 Hz] [IEC]** 50

Motor Standard

This parameter modifies the presets of the following parameters:**[Nom Motor Voltage]** UNS below,**[High Speed]** HSP , page 94, **[Motor Freq Thd]** FTD , **[Nominal Motor Freq]** FRS and **[Max Frequency]** tFr .

NOTE: Modifying this parameter resets the motor tune parameters and, **[Tune selection]** STUN is reset to **[Default]** tAb. Autotuning is needed to be performed again.

- **[50 Hz]** 50): ***50Hz motor frequency***
- **[60 Hz]** 60: ***60Hz motor frequency***

[InPhaseLoss Assign] IPL ★	—	Yes or No, according to drive rating

Input Phase Loss assignment

This parameter is only accessible in this menu on 3-phase drives.

If one phase disappears, the drive switches to detected error mode **[Input Phase Loss]** PHF , but if 2 or 3 phases disappear, the drive continues to operate until it trips on an undervoltage detected error (the drive trips in **[Input Phase Loss]** PHF if there is an input phase loss and if this leads to performance decrease).

See **[Input phase loss]** IPL

- **[Ignore]** NO: ***Ignore***, detected error ignored, to be used when the drive is supplied via a single-phase supply or by the DC bus

HMI label	Settings	Factory setting
• **[Freewheel Stop]** YES: ***Freewheel stop***		
[Nominal Motor Power] nPr ★	—	According to drive rating
Nominal motor power Rated motor power given on the nameplate, in kW if **[Motor Standard]** bFr is set to **[50 Hz]** 50, in HP if **[Motor Standard]** bFr is set to **[60 Hz]** 60. See **[Nominal Motor Power]** (nPr **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Nom Motor Voltage] unS ★	100 to 480 V	According to drive rating
Nominal motor voltage ATH230●●●M2: 100 to 240 V – ATH230●●●N4: 200 to 480 V. See **[Nom Motor Voltage]** unS **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Nom Motor Current] nCr ★	0.25 to 1.1 In (1)	According to drive rating and **[Motor Standard]** bFr
Nominal motor current See **[Nom Motor Current]** nCr **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Nominal Motor Freq] FrS ★	10 to 800 Hz	50 Hz
Nominal motor frequency The factory setting is 50 Hz, or preset to 60 Hz if **[Motor Standard]** bFr is set to 60 Hz. This parameter is not visible if **[Motor control type]** Ctt , page 113 is set to **[Synchronous motor]** SYn. See **[Nominal Motor Freq]** FrS **NOTE:** • The value of **[Nominal Motor Freq]** FrS is limited by **[High Speed]** HSP. • Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Nominal Motor Spd] nSP ★	0 to 65,535 rpm	According to drive rating
Nominal motor speed This parameter is not visible if **[Motor control type]** Ctt , page 113 is set to **[Synchronous motor]** SYn. See **[Nominal Motor Spd]** nSP 0 to 9,999 rpm then 10.00 to 60.00 krpm on the integrated display terminal. If, rather than the rated speed, the nameplate indicates the synchronous speed and the slip in Hz or as a %, calculate the rated speed as follows: Nominal speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$ or Nominal speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors). or		

HMI label	Settings	Factory setting
Nominal speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors) **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** STUN is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Max Frequency] tFr	10 to 599 Hz	60 Hz
Max frequency The factory setting is 60 Hz, or preset to 72 Hz if **[Motor Standard]** bFr is set to 60 Hz. The maximum value is limited by the following conditions: It must not exceed 10 times the value of **[Nominal Motor Freq]** FrS. To help prevent detected **[Motor Overspeed]** SOF error, it is recommended to have **[Max Frequency]** tFr equal to or higher than 110% of **[High Speed]** HSP. See **[Max Frequency]** tFr , page 113.		
[Autotuning] tUn	—	**[No Action]** nO
Autotuning For asynchronous motors . For synchronous motors .		
[Autotuning Status] tUS	—	**[Not Done]** tAb
Autotuning status This parameter is not saved at drive power off. It shows the Autotuning status since last power on. • **[Not Done]** tAb: ***Not done***, autotune is not done • **[Pending]** PEnd: ***Test is pending***, autotune has been requested but not yet performed • **[In Progress]** PrOG: ***Test in progress***, autotune is in progress • **[Error]** FAIL: ***Error detected***, autotune has detected a error • **[Autotuning Done]** donE: ***Autotuning Done***, the stator resistance measured by the auto-tuning function is used to control the motor		
[Tune selection] STUN	—	**[Default]** tAb
Tune selection • **[Default]** tAb: ***Default***, the default stator resistance value is used to control the motor • **[Measure]** MEAS: ***Measure***, the stator resistance measured by the auto-tuning function is used to control the motor • **[Custom]** CUS: ***Custom***, the stator resistance set manually is used to control the motor		
[Motor Th Current] ItH	0.2 to 1.1 In (1)	According to drive rating
Motor Thermal current See **[Motor Th Current]** ItH .		
[Acceleration] ACC	0.00 to 6,000 s (2)	3.0 s
Acceleration ramp time Time to accelerate from 0 to the **[Nominal Motor Freq]** FrS , page 92. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. See **[Acceleration]** ACC .		
[Deceleration] dEC	0.00 to 6,000 s (2)	3.0 s
Deceleration ramp time		

HMI label	Settings	Factory setting
Time to decelerate from the **[Nominal Motor Freq]** FrS , page 92 to 0. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. See **[Deceleration]** dEC .		
[Low Speed] LSP	0 to 599 Hz	0
Low speed Motor frequency at minimum reference, can be set between 0 and **[High Speed]** HSP. See **[Low Speed]** LSP .		
[High Speed] HSP	0 to 599 Hz	50 Hz
High speed Motor frequency at maximum reference, can be set between **[Low Speed]** LSP and **[Max Frequency]** tFr . The factory setting changes to 60 Hz if **[Motor Standard]** bFr is set to **[60 Hz]** 60. To help prevent detected **[Motor Overspeed]** SoF error, it is recommended to have **[Max Frequency]** tFr equal to or higher than 110% of **[High Speed]** HSP. See **[High Speed]** HSP .		

(1) In corresponds to the rated drive current indicated in the Installation manual and on the drive nameplate.

(2) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 s according to **[Ramp increment]** inr .

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

1.3.4.2 [Full] FULL – – [Settings] SET –

What's in This Chapter

With Integrated Display Terminal 96
[Settings] SET - parameters 97
Parameter settings for **[K speed loop filter]** SFC, **[Speed prop. gain]** SPG and **[Speed time integral]** S_IT 100
[Settings] SET - parameters (continued) 102

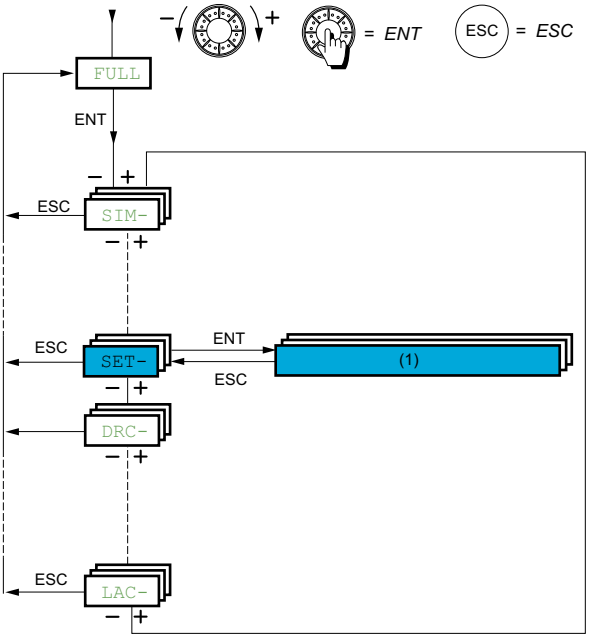
With Integrated Display Terminal

Access

Parameters described below can be accessed by: drI ➡ ConF ➡ FULL ➡ SET

It is recommend to stop the motor before modifying any of the settings.

From ConF menu



(1) : SETTINGS

The adjustment parameters can be modified with the drive running or stopped.

[Settings] SET - parameters

Access

Parameters described below can be accessed by: drI ➜ ConF ➜ FULL ➜ SET

Parameters list

HMI label	Settings	Factory setting
[Settings] SET —		
[Ramp increment] Inr	—	0.1
Ramp increment This parameter is valid for **[Acceleration]** ACC, **[Deceleration]** dEC, **[Acceleration 2]** AC2 and **[Deceleration 2]** dE2. See **[Ramp increment]** Inr . • **[0.01]** 0.01: Ramp up to 99.99 seconds • **[0.1]** 0.1: Ramp up to 999.9 seconds • **[1]** 1: Ramp up to 6,000 seconds		
[Acceleration] ACC	0.00 to 6,000 s (1)	3.0 s
Acceleration ramp time Time to accelerate from 0 to the **[Nominal Motor Freq]** Frs , page 92. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. See **[Acceleration]** ACC .		
[Deceleration] dEC	0.00 to 6,000 s (1)	3.0 s
Deceleration ramp time Time to decelerate from the **[Nominal Motor Freq]** Frs , page 92 to 0. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. See **[Deceleration]** dEC .		
[Acceleration 2] AC2 ★	0.00 to 6,000 s (1)	5 s
Acceleration 2 ramp time Time to accelerate from 0 to the **[Nominal Motor Freq]** Frs , page 92. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. See **[Acceleration 2]** AC2 .		
[Deceleration 2] dE2 ★	0.00 to 6,000 s (1)	5 s
Deceleration 2 Time to decelerate from the **[Nominal Motor Freq]** Frs , page 92 to 0. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. See **[Deceleration 2]** dE2 .		
[Begin Acc round] tA1 ★	0 to 100%	10%
Start ACC ramp rounding Rounding of start of acceleration ramp as a % of the **[Acceleration]** ACC or **[Acceleration 2]** AC2 ramp time. Visible if **[Ramp Type]** rPt is set to **[Customized]** CUS. See **[Begin Acc round]** tA1 .		
[End Acc round] tA2 ★	0 to 100%	10%
End ACC ramp rounding Rounding of end of acceleration ramp as a % of the **[Acceleration]** ACC or **[Acceleration 2]** AC2 ramp time. Can be set between 0 and 100% - **[Begin Acc round]** tA1.		

HMI label	Settings	Factory setting
Visible if **[Ramp Type]** rPt is set to **[Customized]** CUS. See **[End Acc round]** tA2 .		
[Begin Dec round] tA3 ★ (↻)	0 to 100%	10%
Start DEC ramp rounding		
Rounding of start of deceleration ramp as a % of the**[Deceleration]** dEC or **[Deceleration 2]** dE2 ramp time. Visible if **[Ramp Type]** rPt is set to **[Customized]** CUS. See **[Begin Dec round]** tA3 .		
[End Dec round] tA4 ★ (↻)	0 to 100%	10%
End DEC ramp rounding		
Rounding of end of deceleration ramp as a % of the **[Deceleration]** dEC or **[Deceleration 2]** dE2 ramp time. Can be set between 0 and 100% - **[Begin Dec round]** tA3. Visible if **[Ramp Type]** rPt is set to **[Customized]** CUS. See **[End Dec round]** tA4 .		
[Low Speed] LSP (↻)	0 to 599 Hz	0 Hz
Low speed		
Motor frequency at minimum reference, can be set between 0 and **[High Speed]** HSP , page 94. See **[Low Speed]** LSP , page 94.		
[High Speed] HSP (↻)	0 to 599 Hz	50 Hz
High speed		
Motor frequency at maximum reference, can be set between **[Low Speed]** LSP and **[Max Frequency]** tFr . The factory setting changes to 60 Hz if **[Motor Standard]** bFr is set to **[60 Hz]** 60. See **[High Speed]** HSP , page 94. To help prevent detected **[Motor Overspeed]** SOF error, it is recommended to have **[Max Frequency]** tFr equal to or higher than 110% of **[High Speed]** HSP.		
[High speed 2] HSP2 ★ (↻)	0 to 599 Hz	50 Hz
High speed 2		
Visible if **[2 High speed]** SH2 is not set to **[No]** no. See **[High speed 2]** HSP2 .		
[High speed 3] HSP3 ★ (↻)	0 to 599 Hz	50 Hz
High speed 3		
Visible if **[4 High speed]** SH4 is not set to **[No]** no. See **[High speed 3]** HSP3 .		
[High speed 4] HSP4 ★ (↻)	0 to 599 Hz	50 Hz
High speed 4		
Visible if **[4 High speed]** SH4 is not set to **[No]** no. See **[High speed 4]** HSP4 .		
[Motor Th Current] ItH (↻)	0.2 to 1.1 In (2)	According to drive rating
Motor Thermal current		
See **[Motor Th Current]** ItH , page 93		
[IR compensation] UFr (↻)	0 to 200%	100%
IR compensation		
See **[IR compensation]** UFr .		
[Slip compensation] SLP (↻)	0 to 300%	100%
Slip Compensation		

HMI label	Settings	Factory setting
See **[Slip compensation]** SLP .		
[K speed loop filter] SFC ★ (1)	0 to 100	65
K speed loop filter See **[K speed loop filter]** SFC .		
[Speed time integral] S itE ★ (1)	1 to 65,535 ms	63 ms
Speed time integral See **[Speed time integral]** S itE .		
[Speed prop. gain] SPG ★ (1)	0 to 1,000%	40%
Speed proportional gain See **[Speed prop. gain]** SPG		
[Inertia Factor] SPGu ★ (1)	0 to 1,000%	40%
Inertia factor See **[Inertia Factor]** SPGu .		

(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 s according to **[Ramp increment]** inr .

(2) In corresponds to the rated drive current indicated in the Installation manual or on the drive nameplate.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

(1) : Setting of this parameter can be done during operation or when stopped.

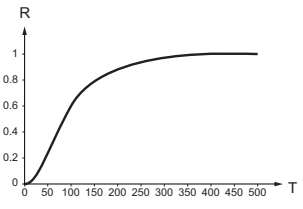
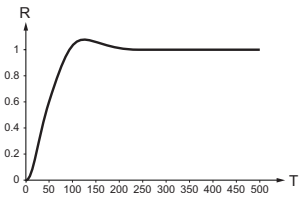
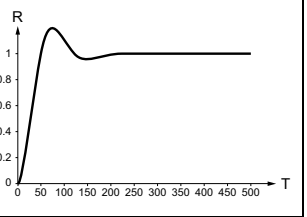
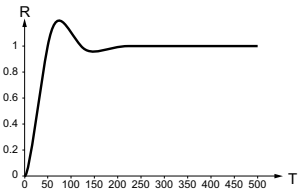
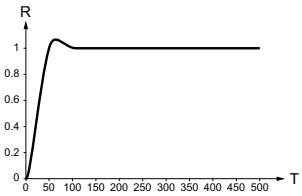
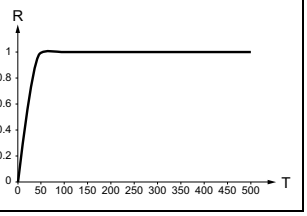
Parameter settings for [K speed loop filter] SFC, [Speed prop. gain] SPG and [Speed time integral] S itE

The following parameters can be accessed if **[Motor control type]** CtE , page 113 is set to **[SVC V]** VVC, **[Synchronous motor]** SYn or **[Energy Sav.]** nLd.

General Case: Setting for [K speed loop filter] SFC = 0

The regulator is an "IP" type with filtering of the speed reference, for applications requiring flexibility and stability (high inertia, for example).

- **[Speed prop. gain]** SPG affects excessive speed.
- **[Speed time integral]** S itE affects the passband and response time.

Initial response	**Reduction in SIT** ↘	**Reduction in SIT** ↘↘
		
Initial response	**Increase in SPG** ↗	**Increase in SPG** ↗↗
		

R : Reference division

T : Time in ms

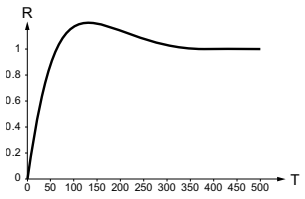
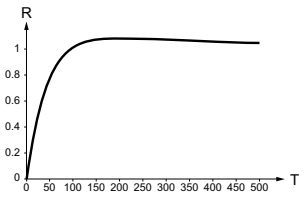
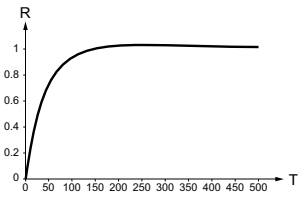
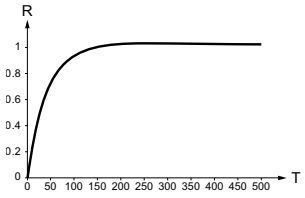
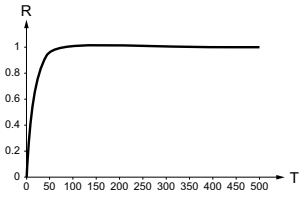
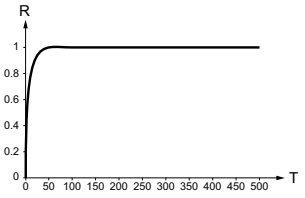
Special case: Parameter [K speed loop filter] SFC is not 0

This parameter must be reserved for specific applications that require a short response time (trajectory positioning or servo control).

- When set to 100 as described above, the regulator is a “PI” type, without filtering of the speed reference.
- Settings between 0 and 100 obtains an intermediate function between the settings below and those on the previous page.

Example: Setting for **[K speed loop filter]** SFC = 100

- **[Speed prop. gain]** SPG affects the passband and response time.
- **[Speed time integral]** S itE affects excessive speed.

Initial response	**Reduction in SIT** ↘	**Reduction in SIT** ↘↘
		
Initial response	**Increase in SPG** ↗	**Increase in SPG** ↗↗
		

R : Reference division

T : Time in ms

[Settings] SET - parameters (continued)

HMI label	Settings	Factory setting
[Ramp Divider] dCF ★ ( )	0 to 10	4
Fast Stop ramp Divider See **[Ramp Divider]** dCF .		
[DC Inj Level 1] IdC ★ ( )	0.1 to 1.1 In (1)	0.64 In (1)
DC injection level 1 Level of DC injection braking current activated via logic input or selected as stop mode. See **[DC Inj Level 1]** IdC .		
[DC Inj Time 1] tdI ★ ( )	0.1 to 30 s	0.5 s
DC injection time 1 Maximum current injection time **[DC Inj Level 1]** IdC. After this time, the injection current becomes **[DC Inj Level 2]** IdC2. See **[DC Inj Time 1]** tdI .		
[DC Inj Level 2] IdC2 ★ ( )	0.1 In to 1.1 In (1)	0.5 In (1)
DC injection level 2 Injection current activated by logic input or selected as stop mode, once period of time **[DC Inj Time 1]** tdI has elapsed. See **[DC Inj Level 2]** IdC2 .		
[DC Inj Time 2] tdC ★ ( )	0.1 to 30 s	0.5 s
DC injection time 2 Maximum injection time **[DC Inj Level 2]** IdC2 for injection selected as stop mode only. See **[DC Inj Time 2]** tdC .		
[Auto DC inj Level 1] SdC1 ★ ( )	0 to 1.1 In (1)	0.7 In (1)
Auto DC injection level 1 **NOTICE** **OVERHEATING** Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time. **Failure to follow these instructions can result in equipment damage.** Level of standstill DC injection current **[Auto DC injection]** AdC is not **[No]** no. Refer to **[Auto DC inj Level 1]** SdC1 .		
[Auto DC Inj Time 1] tdC1 ★ ( )	0.1 to 30 s	0.5 s
Auto DC injection time 1 **NOTICE** **OVERHEATING** Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time. **Failure to follow these instructions can result in equipment damage.**		

HMI label	Settings	Factory setting
This parameter can be accessed if **[Auto DC injection]** ADC is not **[No]** nO. if **[Motor control type]** CTT , page 113 is set to **[Synchronous motor]** SYn, this time corresponds to the zero speed maintenance time. Refer to **[Auto DC Inj Time 1]** tDC 1 .		
[Auto DC inj Level 2] SDC2 ★ ()	0 to 1.1 In (1)	0.5 In (1)
Auto DC injection level 2		

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

This parameter can be accessed if **[Auto DC injection]** ADC is not **[No]** nO. Refer to **[Auto DC inj Level 2]** SDC2 .		
[Auto DC Inj Time 2] tDC2 ★ ()	0 to 30 s	0 s
Auto DC injection time 2		

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

This parameter can be accessed if **[Auto DC injection]** ADC is not **[Yes]** YES. Refer to **[Auto DC Inj Time 2]** tDC2 .		
[Switching frequency] SFr ()	2 to 16 kHz	4.0 kHz
Switching frequency		

NOTICE

DAMAGE TO THE DRIVE

Verify that the switching frequency of the drive does not exceed 4 kHz if the EMC filter is disconnected for operation of the drive in an IT mains.

Failure to follow these instructions can result in equipment damage.

This applies to the following drive versions: ATH230•••2•

Refer to **[Switching frequency]** SFr .

Adjustment range: The maximum value is limited to 4 kHz if **[Motor surge limit.]** SVL parameter is configured.

NOTE: In the event of excessive temperature rise, the drive automatically reduces the switching frequency and reset it once the temperature returns to normal.

[Current Limitation] CL1 ★ ()	0 to 1.1 In (1)	1.1 In (1)
Current limitation		

HMI label	Settings	Factory setting

NOTICE

OVERHEATING

- Verify that the motor is properly rated for the maximum current to be applied to the motor.
- Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit.

Failure to follow these instructions can result in equipment damage.

Used to limit the motor current. Refer to **[Current Limitation]** CL1 .

NOTE: If the setting is less than 0.25 In, the drive may lock in detected **[Output phase loss]** OPL error mode if this has been enabled. If it is less than the no-load motor current, the motor cannot run.

[Current Limit2 Value] CL2 ★ ()	0 to 1.1 In (1)	1.1 In (1)

Current limitation 2 value

NOTICE

OVERHEATING

- Verify that the motor is properly rated for the maximum current to be applied to the motor.
- Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit.

Failure to follow these instructions can result in equipment damage.

Refer to **[Current Limit2 Value]** CL2 .

NOTE: If the setting is less than 0.25 In, the drive may lock in detected **[Output phase loss]** OPL error mode if this has been enabled. If it is less than the no-load motor current, the motor cannot run.

[Motor fluxing] FLU ★ () 2s	—	**[No]** FNO

Motor fluxing configure

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

If the parameter **[Motor fluxing]** FLU is set to **[Continuous]** FCT , fluxing is always active, even if the motor does not run.

- Verify that using this setting does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the flux current to be applied.

Failure to follow these instructions can result in equipment damage.

The parameter is visible if **[Motor control type]** CTT , page 113 is not set to **[Synchronous motor]** SYN,

To obtain rapid high torque on startup, magnetic flux needs to already have been established in the motor.

In **[Continuous]** FCT mode, the drive automatically builds up flux when it is powered up.

In **[Not continuous]** FNC mode, fluxing occurs when the motor starts up.

The flux current is greater than **[Nom Motor Current]** NCR when the flux is established and is then adjusted to the motor magnetizing current. Refer to **[Motor fluxing]** FLU .

HMI label	Settings	Factory setting
• **[Not continuous]** FnC: ***Not continuous*** • **[Continuous]** FCt: ***Continuous***. This option is not possible if **[Auto DC injection]** AdC is **[Yes]** YES or if **[Type of stop]** Stt is **[Freewheel]** nSt. • **[No]** Fno: ***No***, Function inactive.		
[Low Speed Timeout] tLS	0 to 999.9 s	0 s
Low speed timeout Maximum operating time at **[Low Speed]** LSP , page 94. Following operation at LSP for a defined period, a motor stop is requested automatically. The motor restarts if the reference is greater than LSP and if a run command is still present. Refer to **[Low Speed Timeout]** tLS . **NOTE:** A value of 0 indicates an unlimited period of time. **NOTE:** If **[Low Speed Timeout]** tLS is not 0, **[Type of stop]** Stt is forced to **[Ramp Stop]** rMP (only if a ramp stop can be configured).		
[Jog Frequency] JGF ★	0 to 10 Hz	10 Hz
Jog frequency Refer to **[Jog Frequency]** JGF .		
[Jog Delay] JGt ★	0 to 2.0 s	0.5 s
Jog delay Anti-repeat delay between 2 consecutive jog operations. Refer to **[Jog Delay]** JGt .		
[Preset speed 2] SP2 ★	0 to 599 Hz	10 Hz
Preset speed 2 See **[Preset speed 2]** SP2 .		
[Preset speed 3] SP3 ★	0 to 599 Hz	15 Hz
Preset speed 3 See **[Preset speed 3]** SP3 .		
[Preset speed 4] SP4 ★	0 to 599 Hz	20 Hz
Preset speed 4 See **[Preset speed 4]** SP4 .		
[Preset speed 5] SP5 ★	0 to 599 Hz	25 Hz
Preset speed 5 See **[Preset speed 5]** SP5 .		
[Preset speed 6] SP6 ★	0 to 599 Hz	30 Hz
Preset speed 6 See **[Preset speed 6]** SP6 .		
[Preset speed 7] SP7 ★	0 to 599 Hz	35 Hz
Preset speed 7 See **[Preset speed 7]** SP7 .		
[Preset speed 8] SP8 ★	0 to 599 Hz	40 Hz
Preset speed 8		

HMI label	Settings	Factory setting
See **[Preset speed 8]** SP8 .		
[Preset speed 9] SP9 ★ ()	0 to 599 Hz	45 Hz
Preset speed 9		
See **[Preset speed 9]** SP9 .		
[Preset speed 10] SP10 ★	0 to 599 Hz	50 Hz
Preset speed 10		
See **[Preset speed 10]** SP10 .		
[Preset speed 11] SP11 ★ ()	0 to 599 Hz	55 Hz
Preset speed 11		
See **[Preset speed 11]** SP11 .		
[Preset speed 12] SP12 ★ ()	0 to 599 Hz	60 Hz
Preset speed 12		
See **[Preset speed 12]** SP12 .		
[Preset speed 13] SP13 ★ ()	0 to 599 Hz	70 Hz
Preset speed 13		
See **[Preset speed 13]** SP13 .		
[Preset speed 14] SP14 ★ ()	0 to 599 Hz	80 Hz
Preset speed 14		
See **[Preset speed 14]** SP14 .		
[Preset speed 15] SP15 ★ ()	0 to 599 Hz	90 Hz
Preset speed 15		
See **[Preset speed 15]** SP15 .		
[Preset speed 16] SP16 ★ ()	0 to 599 Hz	100 Hz
Preset speed 16		
See **[Preset speed 16]** SP16 .		
[Multiplying coeff.] MFr ★ ()	0 to 100%	100%
Multiplying coefficient		
It can be accessed if **[Ref Freq 2 Multiply]** MA2, **[Ref Freq 3 Multiply]** MA3 has been assigned to the graphic display terminal. Refer to **[Multiplying coeff.]** MFr , page 42.		
[+/- Speed limitation] SrP ★ ()	0 to 50%	10%
+/- speed limitation		
Refer to **[+/- Speed limitation]** SrP .		
[PID Prop.Gain] rPG ★ ()	0.01 to 100	1
PID Proportional gain		
Refer to **[PID Prop.Gain]** rPG .		
[PID Intgl.Gain] rIG ★ ()	0.01 to 100	1

HMI label	Settings	Factory setting
PID controller integral gain		
Refer to **[PID Intgl.Gain]** rIG .		
[PID derivative gain] rdG ★ ()	0.00 to 100	0
PID derivative gain		
Refer to **[PID derivative gain]** rdG .		
[PID ramp] PrP ★ ()	0 to 99.9 s	0 s
PID ramp		
PID acceleration/deceleration ramp, defined to go from **[Min PID Process]** PIP1 to **[Max PID Process]** PIP2 and vice versa. Refer to **[PID ramp]** PrP .		
[PID Min Output] PoL ★ ()	-599 to 599 Hz	0 Hz
PID controller min. output		
Minimum value of regulator output in Hz. Refer to **[PID Min Output]** PoL .		
[PID Max Output] PoH ★ ()	0 to 599 Hz	60 Hz
PID controller max. output		
Maximum value of regulator output in Hz. Refer to **[PID Max Output]** PoH .		
[Min fbk Warning] PAL ★ ()	Refer to **[Min fbk Warning]** PAL (2)	100
Minimum feedback level warning		
Minimum monitoring threshold for regulator feedback. Refer to **[Min fbk Warning]** PAL .		
[Max fbk Warning] PAH ★ ()	Refer to **[Max fbk Warning]** PAH (2)	1,000
Maximum feedback level warning		
Maximum monitoring threshold for regulator feedback. Refer to **[Max fbk Warning]** PAH .		
[PID error Warning] PEr ★ ()	0 to 65,535 (2)	100
PID error warning		
Regulator error monitoring threshold. Refer to **[PID error Warning]** PEr .		
[Speed input %] PSr ★ ()	1 to 100%	100%
PID speed input % ref		
Multiplying coefficient for predictive speed input. Refer to **[Speed input %]** PSr .		
[Ref PID Preset 2] rP2 ★ ()	Refer to **[Ref PID Preset 2]** rP2 (2)	300
2nd PID preset reference		
Refer to **[Ref PID Preset 2]** rP2 .		
[Ref PID Preset 3] rP3 ★ ()	Refer to **[Ref PID Preset 3]** rP3 (2)	600
3rd PID preset reference		
Refer to **[Ref PID Preset 3]** rP3 .		
[Ref PID Preset 4] rP4 ★ ()	Refer to **[Ref PID Preset 4]** rP4 (2)	900

HMI label	Settings	Factory setting
4th PID preset reference		
Refer to **[Ref PID Preset 4]** rP4 .		
[Motor torque limit] tLIM ★ ()	0 to 300%	100%
Motoring torque limit		
Torque limitation in motor mode, as a % or in 0.1% increments of the rated torque in accordance with the **[Torque increment]** InCr parameter.		
Refer to **[Motor torque limit]** tLIM .		
[Gen. torque limit] tLIG ★ ()	0 to 300%	100%
Generator torque limit		
Torque limitation in generator mode, as a % or in 0.1% increments of the rated torque in accordance with the **[Torque increment]** InCr parameter.		
Refer to **[Gen. torque limit]** tLIG .		
[High Current Thd] CtHd ()	0 to 1.1 In (1)	In (1)
High current threshold		
Current threshold for **[Cur Thd Reached]** CtHA function assigned to a relay or a logic output. Refer to **[High Current Thd]** CtHd .		
[High torque thd.] ttH ()	-300% to +300%	100%
High torque threshold		
High torque threshold for **[High Torque Warn]** ttHA function assigned to a relay or a logic output, as a % of the rated motor torque. Refer to **[High torque thd.]** ttH .		
[Low torque thd.] ttL ()	-300% to +300%	50%
Low torque threshold		
Low torque threshold for **[Low Torque Warn]** ttLA function assigned to a relay or a logic output, as a % of the rated motor torque. Refer to **[Low torque thd.]** ttL .		
[Pulse warning thd.] FqL ★	0 Hz to 20,000 kHz	0 Hz
Pulse warning threshold		
Speed threshold measured by the **[Frequency meter]** FqF — function, assigned to a relay or a logic output (refer to **[Pulse Warn Thd Reached]** FqLA . Refer to **[Pulse warning thd.]** FqL .		
[Motor Freq Thd] Ftd ()	0.0 to 599 Hz	HSP
Motor frequency threshold		
Motor frequency threshold for **[Mot Freq High Thd]** FtA function assigned to a relay or a logic output, or used by the **[Parameters switching]** nLP — function . Refer to **[Motor Freq Thd]** Ftd .		
[Freq. threshold 2] F2d ()	0.0 to 599 Hz	HSP
Frequency threshold 2		
Motor frequency threshold for **[2nd Freq Thd Reached]** F2A function assigned to a relay or a logic output (), or used by the **[Parameters switching]** nLP — function . Refer to **[Freq. threshold 2]** F2d .		
[Freewheel stop Thd] FFt ★()	0.2 to 599 Hz	0.2 Hz
Freewheel stop threshold		
Speed threshold below which the motor switches to freewheel stop.		

HMI label	Settings	Factory setting
This parameter supports switching from a ramp stop or a fast stop to a freewheel stop below a low speed threshold. It can be accessed if **[Type of stop]** STT is set to **[Fast stop]** FST or **[Ramp Stop]** rMP and if **[Auto DC Injection]** AdC is not configured. Refer to **[Freewheel stop Thd]** FFT .		
[Motor Therm Thd] ttd	0 to 118%	100%
Motor thermal threshold Threshold for motor thermal alarm (logic output or relay). Refer to **[Motor Therm Thd]** ttd .		
[Skip Frequency] JPF	0 to 599 Hz	0 Hz
Skip frequency This parameter helps to prevent prolonged operation within an adjustable range around the regulated frequency. This function can be used to help to prevent a speed, which would cause resonance, being reached. Setting the function to 0 renders it inactive. Refer to **[Skip Frequency]** JPF .		
[Skip Frequency 2] JF2	0 to 599 Hz	0 Hz
Skip frequency 2 This parameter helps to prevent prolonged operation within an adjustable range around the regulated frequency. This function can be used to help to prevent a speed, which would cause resonance, being reached. Setting the function to 0 renders it inactive. Refer to **[Skip Frequency 2]** JF2 .		
[3rd Skip Frequency] JF3	0 to 599 Hz	0 Hz
3rd Skip frequency This parameter helps to prevent prolonged operation within an adjustable range around the regulated frequency. This function can be used to help to prevent a speed, which would cause resonance, being reached. Setting the function to 0 renders it inactive. Refer to **[3rd Skip Frequency]** JF3.		
[Skip Freq.Hysteresis] JFH ★	0.1 to 10 Hz	1 Hz
Skip Freq. hysteresis Parameter visible if at least one skip frequency **[Skip Frequency]** JPF , **[Skip Frequency 2]** JF2 or **[3rd Skip Frequency]** JF3 is different from 0. Skip frequency range: between JPF — JFH and JPF + JFH for example. This adjustment is common to the 3 frequencies JPF , JF2 , JF3 . Refer to **[Skip Freq.Hysteresis]** JFH .		
[Unld.Thr.Nom.Speed] LUn ★	20 to 100% of **[Nom Motor Current]** nCr	60%
Unld.Thr. at Nom. speed Underload threshold at rated motor frequency (**[Nominal Motor Freq]** Fr5 , page 92), as a % of the rated motor torque. Visible only if **[Unld Detect Delay]** ULt is not set to 0. Refer to **[Unld.Thr.Nom.Speed]** LUn .		
[Unld.Thr.0.Speed] LUL ★	0 to **[Unld.Thr.Nom.Speed]** LUn	0%
Unld.Thr. at O speed Underload threshold at zero frequency, as a % of the rated motor torque. Visible only if **[Unld Detect Delay]** ULt is not set to 0. Refer to **[Unld.Thr.0.Speed]** LUL .		
[Unld. FreqThr. Det.] rMUd ★	0 to 599 Hz	0 Hz

HMI label	Settings	Factory setting
Unld. Freq.Thr. Detection		
Underload detection minimum frequency threshold. Refer to **[Unld. FreqThr. Det.]** rNUd .		
[Hysteresis Freq] SrB ★()	0.3 to 599 Hz	0.3 Hz
Hysteresis frequency		
Maximum deviation between the frequency reference and the motor frequency, which defines steady state operation. Refer to **[Hysteresis Freq]** SrB .		
[Underload T.B.Rest.] FtU ★()	0 to 6 min	0 min
Unld time Before Restart		
Minimum time permitted between an underload being detected and any automatic restart. For an automatic restart to be possible, the value of **[Fault Reset Time]** tAr , page 285 must exceed that of this parameter by at least one minute. Refer to **[Underload T.B.Rest.]** FtU .		
[Overload Threshold] LoC ★()	70% to 150% of **[Nom Motor Current]** nCr	110%
Current overload threshold		
Overload detection threshold, as a % of the rated motor current **[Nom Motor Current]** nCr . This value must be less than the limit current for the function to work. Refer to **[Overload Threshold]** LoC . Visible only if **[Ovld Detection Delay]** toL is not set to 0. This parameter is used to detect an "application overload". This is not a motor or drive thermal overload.		
[Overload T.B.Rest.] FtO ★()	0 to 6 min	0 min
Ovld time Before Restart		
Minimum time permitted between an overload being detected and any automatic restart. For an automatic restart to be possible, the value of **[Fault Reset Time]** tAr , page 285 must exceed that of this parameter by at least one minute. Refer to **[Overload T.B.Rest.]** FtO , page 316.		
[Load correction] LbC ★()	0 to 599 Hz	0 Hz
Load correction		
Rated correction in Hz. See **[Load correction]** LbC .		
[Fan mode] FFM ()	—	**[Standard]** Std or **[Always]** run according to the drive.
Fan mode Depending on the software version, the fan of the device can be disabled.		

NOTICE

OVERHEATING

Verify that the ambient temperature does not exceed 40 °C (104 ° F) if the fan is disabled.

Failure to follow these instructions can result in equipment damage.

- **[Standard]** Std: ***Standard***, the fan starts and stops automatically according to the drive thermal state
- **[Always]** run: ***Always***, the fan is always activated
- **[Never]** StP: ***Never***, the fan is disabled

[Scale factor display] SdS ()	0.1 to 200	30

HMI label	Settings	Factory setting
Customer scale factor Used to display a value in proportion to the output frequency **[Motor Frequency]** rFr : the machine speed, the motor speed, etc The display shows (**[Cust. output value]** SPd3 = **[Scale factor display]** Sd5 x **[Motor Frequency]** rFr) / 1000 to 2 decimal places • If **[Scale factor display]** Sd5 ≤ 1, **[Cust. output value]** SPd1 is displayed (possible definition = 0.01) • If 1 < **[Scale factor display]** Sd5 ≤ 10, **[Cust. output value]** SPd2 is displayed (possible definition = 0.1) • If **[Scale factor display]** Sd5 > 10, **[Cust. output value]** SPd3 is displayed (possible definition = 1) • If **[Scale factor display]** Sd5 > 10 and **[Scale factor display]** Sd5 X **[Motor Frequency]** rFr > 9,999: example: for 24,223, display shows 24.22 - If **[Scale factor display]** Sd5 > 10 and **[Scale factor display]** Sd5 X **[Motor Frequency]** rFr > 65,535, display locked at 65.54 Example: Display motor speed for 4-pole motor, 1,500 rpm at 50 Hz (synchronous speed): **[Scale factor display]** Sd5 = 30 **[Cust. output value]** SPd3 = 1,500 at **[Motor Frequency]** rFr = 50 Hz		

(1) In corresponds to the rated drive current indicated in the Installation manual or on the drive nameplate.

(2) If a graphic display terminal is not in use, values greater than 9,999 is displayed on the 4-digit display with a period mark after the thousand digit, example: 15.65 for 15,650.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

1.3.4.3 [Full] FULL – – [Motor control] drC –

What's in This Chapter

[Motor control] drC - parameters 113
[Asynchronous motor] ASY — 115
[Asynchronous motor] ASY — : Expert mode 120
[Synchronous motor] SYn — 121
[Synchronous motor] SYn — : Expert mode 126
[Motor control] drC - parameters (continued) 128

[Motor control] drC - parameters

Access

Parameters described below can be accessed by: dr ➔ ConF ➔ FULL ➔ drC

The parameters in the **[Motor control]** drC — menu can only be modified when the drive is stopped and no run command is present, with the following exceptions:

- **[Autotuning]** tun , which may cause the motor to start up.
- Parameters containing the sign ( ) the code column, which can be modified with the drive running or stopped.

  NOTE: We recommend to perform auto-tuning if one of the following parameters are modified from their factory setting.

⚠WARNING

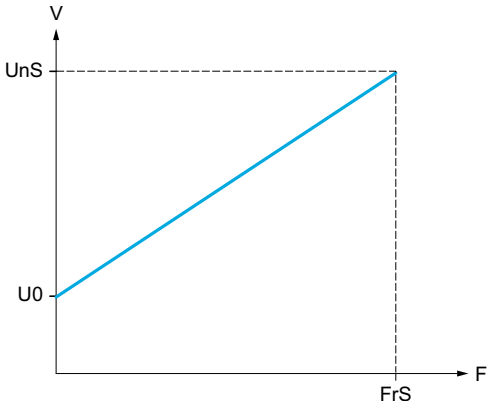
LOSS OF CONTROL

- Fully read and understand the manual of the connected motor.
- Verify that all motor parameters are correctly set by referring to the nameplate and the manual of the connected motor.
- If you modify the value of one or more motor parameters after having performed autotuning, the value of the measured tune parameters is reset and you must re-perform autotuning.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

HMI label	Settings	Factory setting
[Motor control] drC —		
[Motor Standard] bFr	-	**[50 Hz] [IEC]** 50
Motor Standard This parameter modifies the presets of the following parameters: **[High Speed]** HSP , page 94, **[Motor Freq Thd]** Ftd , **[Nom Motor Voltage]** unS, **[Nominal Motor Freq]** FrS and **[Max Frequency]** tFr . **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again. • **[50 Hz]** 50: ***50Hz motor frequency*** IEC • **[60 Hz]** 60: ***60Hz motor frequency*** NEMA		
[Max Frequency] tFr	10 to 599 Hz	60 Hz
Max frequency The factory setting is 60 Hz, or preset to 72 Hz if **[Motor Standard]** bFr is set to 60 Hz. The maximum value is limited by the following conditions: It must not exceed 10 times the value of **[Nominal Motor Freq]** FrS. To help prevent detected **[Motor Overspeed]** SoF error, it is recommended to have **[Max Frequency]** tFr equal to or higher than 110% of **[High Speed]** HSP.		
[Motor control type] Ctt	—	**[U/F VC Quad.]** uF9
Motor control type **NOTE:** Select law before entering parameter values. **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		

HMI label	Settings	Factory setting
[SVC V] V V C: Sensorless vector control with internal speed loop based on voltage feedback calculation. For applications needing high performance during starting or operation. **[Standard]** S t d: Standard motor law. For simple applications that do not require high performance. Simple motor control law keeping a constant Voltage Frequency ratio, with a possible adjustment of the curve bottom. This law is generally used for motors connected in parallel. Some specific applications with motors in parallel and high performance levels may require **[SVC V]** V V C.		



V : Voltage

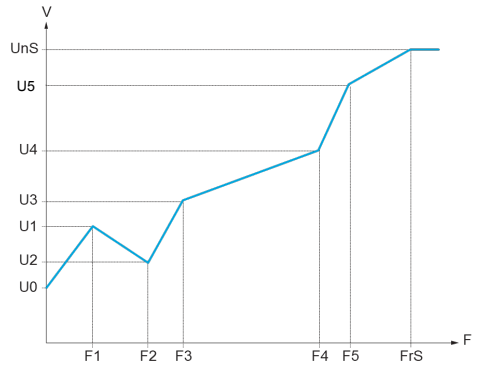
F : Frequency

NOTE: U0 is the result of an internal calculation based on motor parameters and multiplied by UFr (%). U0 can be adjusted by modifying UFr value.

[U/F VC 5pts] u F 5	—	—

U/F VC 5 point voltage/frequency

[U/F VC 5pts] u F 5: 5-segment V/F profile: As **[Standard]** S t d profile but also supports the avoidance of resonance (saturation).



The profile is defined by the values of parameters UnS, FrS, U0 to U5 and F1 to F5.

FrS > F5 > F4 > F3 > F2 > F1

V : Voltage

F : Frequency

NOTE:

- U0 is the result of an internal calculation based on motor parameters and multiplied by UFr (%). U0 can be adjusted by modifying UFr value.
- You must respect the constraint on the order of F1, F2, F3, F4, F5 and FrS otherwise an **[Invalid Config]** C F I event is triggered.

[Sync. mot.] S Y n: For synchronous permanent magnet motors with sinusoidal electromotive force (EMF) only. This selection makes the asynchronous motor parameters inaccessible, and the synchronous motor parameters accessible.

[U/F VC Quad.] u F 9: Variable torque. For pump and fan applications.

[Energy Sav.] n L d): Energy saving. For applications that do not require high dynamics.

[Asynchronous motor] ASY —

Access

Parameters described below can be accessed by: dr i ➜ ConF ➜ FULL ➜ drC ➜ ASY

Parameter list

HMI label	Settings	Factory setting
[Asynchronous motor] ASY —		
Only visible if **[Motor control type]** Ctt , page 113 is not set to **[Sync. mot.]** SYn.		
[Nominal Motor Power] nPr ★	According to drive rating	According to drive rating
Nominal motor power This parameter cannot be accessed if **[Motor control type]** Ctt , page 113 is set to **[Sync. mot.]** SYn. Rated motor power given on the nameplate, in kW if **[Motor Standard]** bFr is set to **[50 Hz]** 50, in HP if **[Motor Standard]** bFr is set to **[60 Hz]** 60. **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Motor 1 Cosinus Phi] Cos ★	0.5 to 1	According to drive rating
Motor 1 Cosinus Phi This parameter can be accessed if **[Motor param choice]** nPC is set to **[Motor 1 Cosinus Phi]** Cos. **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Nom Motor Voltage] unS ★	100 to 480 V	According to drive rating and **[Motor Standard]** bFr
Nominal motor voltage This parameter cannot be accessed if **[Motor control type]** Ctt , page 113 is set to **[Sync. mot.]** SYn. **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Nom Motor Current] nCr ★	0.25 to 1.1 In (1)	According to drive rating and **[Motor Standard]** bFr
Nominal motor current This parameter cannot be accessed if **[Motor control type]** Ctt , page 113 is set to **[Sync. mot.]** SYn. **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Nominal Motor Freq] FrS ★	10 to 800 Hz	50 Hz
Nominal motor frequency This parameter cannot be accessed if **[Motor control type]** Ctt , page 113 is set to **[Sync. mot.]** SYn. The factory setting is 50 Hz, or preset to 60 Hz if **[Motor Standard]** bFr is set to 60 Hz. **NOTE:** • The value of **[Nominal Motor Freq]** FrS is limited by **[High Speed]** HSP. • Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb. Autotuning is needed to be performed again.		

HMI label	Settings	Factory setting
[Nominal Motor Spd] n S P ★	0 to 65,535 rpm	According to drive rating

Nominal motor speed

This parameter cannot be accessed if **[Motor control type]** C t t , page 113 is set to **[Sync. mot.]** S Y n.

0 to 9,999 rpm then 10.00 to 65.53 krpm on the integrated display terminal.

If, rather than the rated speed, the nameplate indicates the synchronous speed and the slip in Hz or as a %, calculate the rated speed as follows:

Nominal speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$

or

Nominal speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors).

or

Nominal speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors)

NOTE: Modifying this parameter resets the motor tune parameters and, **[Tune selection]** S t u n is reset to **[Default]** t A b. Autotuning is needed to be performed again.

[Autotuning] t u n 2 s	—	**[No]** n o

Autotuning

⚠WARNING

UNEXPECTED MOVEMENT

Autotuning moves the motor in order to tune the control loops.

- Only start the system if there are no persons or obstructions in the zone of operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

During autotuning, noise development and oscillations of the system are normal.

⚠WARNING

LOSS OF CONTROL

- If you modify the value of one or more motor parameters after having performed autotuning, the value of the measured tune parameters is reset and you must re-perform autotuning.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

- Auto-tuning is only performed if no stop command has been activated. If a "freewheel stop" or "fast stop" function has been assigned to a logic input, this input must be set to 1 (active at 0).
- Auto-tuning takes priority over any run or prefluxing commands, which is taken into account after the auto-tuning sequence.
- If auto-tuning detects a error, the drive displays **[No Action]** n o and, depending on the configuration of **[Tuning Error Resp]** t n L , may switch to detected **[Autotuning Error]** t n F error mode.
- Auto-tuning may last for 1 to 2 seconds. Do not interrupt the process. Wait for the display to change to **[No Action]** n o.

NOTE: Motor thermal state has a big influence on tune result. Make the tune with the motor stopped and cold.

To redo a tune of the motor, wait that it is completely stopped and cold. Set first **[Autotuning]** t u n) to **[Erase Autotuning]** C L r), then redo the motor tuning.

HMI label	Settings	Factory setting
The use of the motor tuning without doing a **[Erase Autotuning]** CLr) first is used to get the thermal state estimation of the motor. In any case, the motor has to be stopped before performing a tune operation. Cable length has an influence on the Tune result. If the cabling is modified, it is necessary to redo the tune operation. **[No Action]** nO: Auto-tuning not in progress **[Apply Autotuning]** YES: Auto-tuning is performed immediatly if possible, then the parameter automatically changes to **[No Action]** nO. If the drive state does not allow the tune operation immediately, the parameter changes to **[No Action]** nO and the operation must be done again. **[Erase Autotuning]** CLr: The motor parameters measured by the auto-tuning function are reseted. The default motor parameters values are used to control the motor. **[Autotuning Status]** tuS is set to **[Not Done]** tAb.		
[Autotuning Status] tuS	—	**[Not Done]** tAb
Autotuning status (for information only, cannot be modified) This parameter is not saved at drive power off. It shows the Autotuning status since last power on. • **[Not Done]** tAb: ***Not done***, autotune is not done • **[Pending]** PEnd: ***Test is pending***, autotune has been requested but not yet performed • **[In Progress]** PrOG: ***Test in progress***, autotune is in progress • **[Error]** FAIL: ***Error detected***, autotune has detected a error • **[Autotuning Done]** donE: ***Autotuning Done***, the motor parameters measured by the auto-tuning function are used to control the motor		
[Tune selection] Stun	—	**[Default]** tAb
Tune selection (for information only, cannot be modified) • **[Default]** tAb: ***Default***, the default values are used to control the motor • **[Measure]** MEAS: ***Measure***, the values measured by the auto-tuning function are used to control the motor • **[Custom]** CuS: ***Custom***, the values set manually are used to control the motor **NOTE:** Tune of the motor increases significantly the performances.		
[Autotuning Usage] tunu	—	**[Therm mot]** tM
Autotuning usage		

HMI label	Settings	Factory setting
On some applications requiring high torque at low speeds, motor temperature has a significant influence on behavior and the ability to maintain performance optimization resulting from auto-tuning. Setting the **[Autotuning Usage]** TUNU parameter to **[Therm mot]** TM allows the stator resistance to be compensated according to the estimation of the thermal state of the motor but as the drive power-off time is not calculated, this setting should only be used if the drive is always powered on with a cold motor. If it is not possible to guarantee that the motor is cold every time the drive is powered up, setting the **[Autotuning Usage]** TUNU parameter to **[Cold tun]** CT is using an alternative method to compensate the stator resistance based on the estimation of the thermal state of the motor. In this case, the cold tuning must be carried out before setting **[Autotuning Usage]** TUNU = **[Cold tun]** CT and it should be noted that the cold tuning values are not included in the configuration transfer file. **⚠WARNING** **LOSS OF CONTROL DUE TO INCORRECT INITIALIZATION OF COLD TUNING VALUES** • Cold tuning must be carried out with a cold motor and only with **[Autotuning Usage]** TUNU = **[Therm mot]** TM. • Since the values corresponding to the cold tuning are not transferred during the configuration transfer, a new cold tuning with **[Autotuning Usage]** TUNU = **[Therm mot]** TM must be done again. **Failure to follow these instructions can result in death, serious injury, or equipment damage.** • **[No]** nO: ***No***, no thermal state estimation • **[Therm mot]** tM: ***Use the motor thermal evolution***, statoric thermal state estimation based on nominal current and current consumed by the motor • **[Cold tun]** Ct: ***Use the cold tune values***, Statoric thermal state estimation based on statoric resistance measured at the first cold tune and tune done at each power up **NOTE:** An autotuning must be performed before setting **[Autotuning Usage]** tunu to **[Cold tun]** Ct to get the references values of a cold tune.		
[Automatic autotune] AUt (↻) ⏳ 2 s	—	**[No]** nO
Automatic autotune		
⚠WARNING **UNEXPECTED MOVEMENT** If this function is activated, autotuning is performed each time the drive is switched on. • Verify that activating this function does not result in unsafe conditions. **Failure to follow these instructions can result in death, serious injury, or equipment damage.** The motor must be stopped when switching on the drive. **[Automatic autotune]** AUt is forced to **[Yes]** YES if **[Autotuning Usage]** tunu is set to **[Cold tun]** Ct. The value of motor statoric resistance measured during the tune is used to estimate the thermal state of the motor at power up. • **[No]** nO: ***No***, function deactivated • **[Yes]** YES: ***Yes***, a tune is automatically done at each power up • **[One]** OnE: ***At first run order***		
[Motor fluxing] FLU ★ (↻)(1) ⏳ 2 s	—	**[No]** FnO
Motor fluxing configure		

HMI label	Settings	Factory setting

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

If the parameter **[Motor fluxing]** FLU is set to **[Continuous]** FCT , fluxing is always active, even if the motor does not run.

- Verify that using this setting does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the flux current to be applied.

Failure to follow these instructions can result in equipment damage.

If **[Motor control type]** CtT , page 113 is set to **[Sync. mot.]** SYn, the factory setting is replaced by **[Not continuous]** FnC .

To obtain rapid high torque on startup, magnetic flux needs to already have been established in the motor.

In **[Continuous]** FCt mode, the drive automatically builds up flux when it is powered up.

In **[Not continuous]** FnC mode, fluxing occurs when the motor starts up

The flux current is greater than **[Nom Motor Current]** nCr (configured rated motor current) when the flux is established and is then adjusted to the motor magnetizing current.

- **[Not continuous]** FnC : ***Not continuous***
- **[Continuous]** FCt : ***Continuous***. This option is not possible if **[Auto DC Injection]** AdC is **[Yes]** YES or if **[Type of stop]** Stt is **[Freewheel Stop]** nSt .
- **[No]** Fno : Function inactive.

If **[Motor control type]** CtT , page 113 is set to **[Sync. mot.]** SYn, the **[Motor fluxing]** FLu parameter causes the alignment of the rotor and not the fluxing.

[Motor param choice] nPC ★	—	**[Nominal Motor Power]** nPr

Motor parameter choice

NOTE: Modifying this parameter resets the motor tune parameters and, **[Tune selection]** Stun is reset to **[Default]** tAb . Autotuning is needed to be performed again.

- **[Nominal Motor Power]** nPr
- **[Motor 1 Cosinus Phi]** Cos

(1) In corresponds to the rated drive current indicated in the Installation manual and on the drive nameplate.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Asynchronous motor] A S Y — : Expert mode

HMI label	Settings	Factory setting
[Asynchronous motor] A S Y —		
[AsyncMotor R Stator] r S A ★ (1)	0 to 65,535 mΩ	0 mΩ
AsyncMotor Stator resistance, cold state stator resistance (per winding), modifiable value. The factory setting is replaced by the result of the auto-tuning operation, if it has been performed.		
[AsyncMotor Lf Induct] L F A ★	0 to 655.35 mH	0 mH
AsyncMotor Leakage inductance, cold state leakage inductance, modifiable value. The factory setting is replaced by the result of the auto-tuning operation, if it has been performed.		
[Magnetizing Current] i d A ★	0 to 6,553.5 A	0 A
Magnetizing current. The factory setting is replaced by the result of the auto-tuning operation, if it has been performed.		
[Rotor Time Const] t r A ★	0 to 65,535 ms	0 ms
Rotor time constant. The factory setting is replaced by the result of the auto-tuning operation, if it has been performed.		

(1) On the integrated display unit: 0 to 9,999 then 10.00 to 65.53 (10,000 to 65,535).

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[Synchronous motor] SYn —

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ drC ➡ SYn

These parameters can be accessed if **[Motor control type]** Ctt , page 113 is set to **[Sync. mot.]** SYn. In this case, the asynchronous motor parameters cannot be accessed.

When the drive is chosen:

1- Enter the motor nameplate.

2 - Perform the tune.

- Do an **[Autotuning]** tun
- Check the state of the synchronous motor saliency (refer to **[Autotuning]** tun .

If **[Saliency mot. state]** SMot displays **[Med salient]** MLS or **[High salient]** HLS

- follow the procedure below **"3 - Improve the tune result"** and
- follow the procedure below **"4 - Adjust PHS"**

Or if **[Saliency mot. state]** SMot displays **[Low salient]** LLS

- follow the procedure below **"4 - Adjust PHS"**

3 - Improve the tune results.

NOTICE
OVERHEATING • Verify that the motor is properly rated for the maximum current to be applied to the motor. • Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit. **Failure to follow these instructions can result in equipment damage.**

- Set **[PSI Align Curr Max]** nCr conforming to the maximum motor current. The maximum value of **[PSI Align Curr Max]** nCr is limited by **[Current Limitation]** CL1. Without information set **[PSI Align Curr Max]** nCr to **[Auto]** Auto.
- Do a second **[Autotuning]** tun after the **[PSI Align Curr Max]** nCr modification.

4 - Adjust PHS.

Adjust **[Syn. EMF constant]** PHS to have optimal behavior.

- Start the motor at minimal stable frequency available on the machine (without load).
- Check and note the **[Relative d-axis error]** rdAE value.
  - If the **[Relative d-axis error]** rdAE value is lower than 0%, then **[Syn. EMF constant]** PHS may be increased.
  - If the **[Relative d-axis error]** rdAE value is upper than 0%, then **[Syn. EMF constant]** PHS may be reduced.

  [Relative d-axis error] rdAE value should be closed to 0%.
- Stop the motor for modify **[Syn. EMF constant]** PHS in accordance with the value of the **[Relative d-axis error]** rdAE (previously noted).

Advices:

The drive must be chosen to have enough current according to the need of behavior, but not too much, to have enough accuracy in the current measurement, especially with the high frequency signal injection (see **[HF inj. activation]** HFI).

Performances may be higher on high saliency motors by activating high frequency injection function (see **[HF inj. activation]** HFI).

Parameter list

HMI label	Settings	Factory setting
[Synchronous motor] SYn —		
[Sync Nominal I] nCrS ★	0.25 to 1.1 In (1)	According to drive rating
Sync motor nominal current **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** StUn is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Pole pairs] PPnS ★	1 to 50	According to drive rating
Pole pairs number (sync) **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** StUn is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Nom SyncMotor Spd] nSPS ★ (2)	0 to 48,000 rpm	According to drive rating
Nominal synchronous motor speed **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** StUn is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Nom Motor torque] tqS ★	0.1 to 6,553.5 Nm	According to drive rating
Nominal motor torque **NOTE:** Modifying this parameter resets the motor tune parameters and, **[Tune selection]** StUn is reset to **[Default]** tAb. Autotuning is needed to be performed again.		
[Autotuning] tUn 2 s	—	**[No]** nO
Autotuning		

⚠WARNING

UNEXPECTED MOVEMENT

Autotuning moves the motor in order to tune the control loops.

- Only start the system if there are no persons or obstructions in the zone of operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

During autotuning, noise development and oscillations of the system are normal.

⚠WARNING

LOSS OF CONTROL

- If you modify the value of one or more motor parameters after having performed autotuning, the value of the measured tune parameters is reset and you must re-perform autotuning.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

HMI label	Settings	Factory setting
• Auto-tuning is only performed if no stop command has been activated. If a "freewheel stop" or "fast stop" function has been assigned to a logic input, this input must be set to 1 (active at 0). • Auto-tuning takes priority over any run or prefluxing commands, which is taken into account after the auto-tuning sequence. • If auto-tuning detects a error, the drive displays **[No Action]** n o and, depending on the configuration of **[Tuning Error Resp]** t n L , may switch to detected**[Tune Error Status]** t n L error mode. • Auto-tuning may last for 1 to 2 seconds. Do not interrupt the process. Wait for the display to change to **[No Action]** n o . **NOTE:** Motor thermal state has a big influence on tune result. Make the tune with the motor stopped and cold. To redo a tune of the motor, wait that it is completely stopped and cold. Set first **[Autotuning]** t u n to **[Erase Autotuning]** C L r , then redo the motor tuning. The use of the motor tuning without doing a **[Erase Autotuning]** C L r first is used to get the thermal state estimation of the motor. In any case, the motor has to be stopped before performing a tune operation. Cable length has an influence on the Tune result. If the cabling is modified, it is necessary to redo the tune operation. • **[No Action]** n o : ***No action***, auto-tuning not in progress • **[Apply Autotuning]** Y E S : ***Apply autotuning***, auto-tuning is performed immediatly if possible, then the parameter automatically changes to **[No Action]** n o . If the drive state does not allow the tune operation immediately, the parameter changes to **[No]** n o and the operation must be done again. • **[Erase Autotuning]** C L r : ***Erase autotuning***, the motor parameters measured by the auto-tuning function are reseted. The default motor parameters values are used to control the motor. **[Autotuning Status]** t u S is set to **[Not Done]** t A b .		
[Autotuning Status] t u S	—	**[Not Done]** t A b
Autotuning status (for information only, cannot be modified) This parameter is not saved at drive power off. It shows the Autotuning status since last power on. • **[Not Done]** t A b : ***Not done***, autotune is not done • **[Pending]** P E n d : ***Test is pending***, autotune has been requested but not yet performed • **[In Progress]** P r o G : ***Test in progress***, autotune is in progress • **[Error]** F A I L : ***Error detected***, autotune has detected a error • **[Autotuning Done]** d o n E : ***Autotuning Done***, the motor parameters measured by the auto-tuning function are used to control the motor		
[Tune selection] S t u n	—	**[Default]** t A b
Tune selection (for information only, cannot be modified) **NOTE:** Tune of the motor increases significantly the performances. • **[Default]** t A b : ***Default***, the default values are used to control the motor • **[Measure]** M E A S : ***Measure***, the values measured by the auto-tuning function are used to control the motor • **[Custom]** C u S : ***Custom***, the values set manually are used to control the motor		
[Autotuning Usage] t u n u	—	**[Therm mot]** t M
Autotuning usage This parameter shows the way used to modify the motor parameters according to its estimated thermal state. • **[No]** n o : ***No***, no thermal state estimation • **[Therm mot]** t M : ***Use the motor thermal evolution***, statoric thermal state estimation based on nominal current and current consumed by the motor • **[Cold tun]** C t : ***Use the cold tune values***, statoric thermal state estimation based on statoric resistance measured at the first cold tune and tune done at each power up.		

HMI label	Settings	Factory setting
NOTE: An autotuning must be performed before setting **[Autotuning Usage]** tunu to **[Cold tun]** Ct to get the references values of a cold tune.		
[Automatic autotune] AUt 2 s	—	**[No]** no
Automatic autotune		

⚠WARNING

UNEXPECTED MOVEMENT

If this function is activated, autotuning is performed each time the drive is switched on.

- Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The motor must be stopped when switching on the drive.

[Automatic autotune] AUt is forced to **[Yes]** YES if **[Autotuning Usage]** tunu is set to **[Cold tun]** Ct. The value of motor statoric resistance measured during the tune is used to estimate the thermal state of the motor at power up.

- **[No]** no: ***No***, function deactivated
- **[Yes]** YES: ***Yes***, a tune is automatically done at each power up
- **[One]** onE: ***At first run order***

[Saliency mot. state] SMot★	—	—
Status of motor tune in term of saliency		

(for information only, cannot be modified)

Information on synchronous motor saliency.

This parameter can be accessed if **[Tune selection]** Stun is set to **[Measure]** MEAS.

NOTE: In case of motor with low saliency, the standard control law is advised.

- **[No info.]** no: ***No information***, tune not done
- **[Low salient]** LLS: ***Low saliency*** (Recommended configuration: **[Angle setting type]** ASt = **[PSI align.]** PS i or **[PSIO align.]** PS io and **[HF inj. activation]** HF i = **[No info.]** no).
- **[Med salient]** MLS: ***Medium saliency*** **[Angle setting type]** ASt = **[SPM align.]** SPMA is possible. **[HF inj. activation]** HF i = **[Yes]** YES could work).
- **[High salient]** HLS: ***High saliency*** **[Angle setting type]** ASt = **[IPM align.]** iPMA) is possible. **[HF inj. activation]** HF i = **[Yes]** YES is possible).

[Angle setting type] ASt★	—	**[PSIO align.]** PS io
Auto angle setting type		

Mode for measuring the phase-shift angle. Visible only if **[Motor control type]** Ctt is set to **[Sync. mot.]** SYn,

[PSI align.] PS i and **[PSIO align.]** PS io are working for all type of synchronous motors. **[SPM align.]** SPMA and **[IPM align.]** iPMA increase performances depending on the type of synchronous motor.

- **[IPM align.]** iPMA: ***IPM alignment***, alignment for IPM motor. Alignment mode for Interior-buried Permanent Magnet motor (usually, this kind of motor has a high saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
- **[SPM align.]** SPMA: ***SPM alignment***, Alignment for SPM motor. Mode for Surface-mounted Permanent Magnet motor (usually, this kind of motor has a medium or low saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
- **[PSI align.]** PS i: ***Pulse Signal injection***. Standard alignment mode by pulse signal injection.

HMI label	Settings	Factory setting
• **[PSIO align.]** P S i o: ***Pulse Signal injection - Optimized***. Standard optimized alignment mode by pulse signal injection. The phase shift angle measurement time is reduced after the first run order or tune operation, even if the drive has been turned off. • **[No align.]** n o: ***NO alignment***		
[HF inj. activation] H F i ★	—	**[No]** n o
Activation of HF injection Activation of high frequency signal injection in RUN. This function allows to estimate the motor speed in a view to have torque at low speed without speed feedback. **NOTE:** The more the saliency is high, the more the **[HF inj. activation]** H F i function is efficient. To help to ensure the performances, it could be necessary to adjust the speed loop parameters (**[K speed loop filter]** S F C, **[Speed time integral]** S i t and **[Speed prop. gain]** S P G) and the speed estimation phase locked loop (Expert parameters **[HF pll bandwidth]** S P b and **[HF pll dump. factor]** S P F). High frequency injection is not efficient with low saliency motors (see **[Saliency mot. state]** S M o t). It is advised to have 4 kHz of pwm frequency (**[Switching frequency]** S F r). In case of instability with no load, it is advised to decrease **[Speed prop. gain]** S P G and **[HF pll bandwidth]** S P b. Then, adjust the speed loop parameters to have the dynamic behavior and the PLL gains to have a good speed estimation at low speed. In case of instability with load, it could help to increase the **[Angle error Comp.]** P E C parameter (mainly for SPM motor). • **[No]** n o: ***No***, function deactivated • **[Yes]** Y E S: ***Yes***, high frequency injection is used for speed estimation		

(1) In corresponds to the rated drive current indicated in the Installation manual and on the drive nameplate.

(2) On the integrated display unit: 0 to 9,999 then 10.00 to 65.53 (10,000 to 65,536).

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Synchronous motor] S Y n — : Expert mode

HMI label	Settings	Factory setting
[Synchronous motor] S Y n —		
[SyncMotor Stator R] r S A S ★ ( ) (1)	0 to 65,535 mΩ	0 mΩ
Calculated SyncMotor Stator R. Cold state stator resistance (per winding). The factory setting is replaced by the result of the auto-tuning operation, if it has been performed. The value can be entered by the user, if he knows it.		
[Autotune L d-axis] L d S ★	0 to 655.35 mH	0 mH
Sync motor d inductance, axis "d" stator inductance in mH (per phase). On motors with smooth poles **[Autotune L d-axis]** L d S = **[Autotune L q-axis]** L 9 S = Stator inductance L. The factory setting is replaced by the result of the auto-tuning operation, if it has been performed.		
[Autotune L q-axis] L 9 S ★	0 to 655.35 mH	0 mH
Sync motor q inductance, axis "q" stator inductance in mH (per phase). On motors with smooth poles **[Autotune L d-axis]** L d S = **[Autotune L q-axis]** L 9 S = Stator inductance L. The factory setting is replaced by the result of the auto-tuning operation, if it has been performed.		
[Syn. EMF constant] P H S ★ (1)	0 to 6,553.5 mV/rpm	0 mV/rpm
Sync. EMF constant, is in 0.1mV/RPM (peak per phase). PHS adjustment allows to reduce the current in operation without load.		
[Sync Nominal Freq] F r S S ★ ( )	10 to 800 Hz	nSPS * PPnS / 60
Synchronous motor nominal freq, in Hz unit Automatically updated according to **[Nom SyncMotor Spd]** n S P S and **[Pole pairs]** P P n S data. A **[Sync Nominal Freq]** F r S S lower than the minimal value 10.0 Hz triggers a **[Incorrect Config]** C F F at the next power on. **NOTE:** • The value of **[Sync Nominal Freq]** F r S S is limited by **[High Speed]** H S P. • Modifying this parameter resets the motor tune parameters and, **[Tune selection]** S t u n is reset to **[Default]** t A b. Autotuning is needed to be performed again.		
[HF pll bandwidth] S P b ★	0 to 100 Hz	25 Hz
Bandwidth of the HF PLL, bandwidth of the stator frequency Pll.		
[HF pll dump. factor] S P F ★	0 to 200%	100%
Dumping factor of the HF PLL, dumping factor of the stator frequency Pll.		
[Angle error Comp.] P E C ★	0 to 500%	0%
Angle position error compensation, error compensation of the angle position in high frequency mode. It increases performances at low speed in generator and motor mode, particularly for SPM motors. **[Auto]** A u t o: The drive takes a value equal to the rated slip of the motor, calculated using the drive parameters.		
[HF injection freq.] F r i ★	250 to 1,000 Hz	500 Hz
Frequency of the HF injection signal It has an influence on the noise during angle shift measurement and speed estimation accuracy.		

HMI label	Settings	Factory setting
[HF current level] HIr ★	0 to 200%	25%
Current level of the HF injection signal Ratio for the current level of the high frequency injection signal. It has an influence on the noise during angle shift measurement and speed estimation accuracy.		
[PSI Align Curr Max] nCr ★	**[Auto]** Auto to 300%	**[Auto]** Auto
Maximum current of PSI alignment Current level in % of **[Sync Nominal I]** nCrS for **[PSI align.]** PS I and **[PSIO align.]** PS Io angle shift measurement modes. This parameter has an impact on the inductor measurement. **[PSI Align Curr Max]** nCr is used for tune operation. This current must be equal or higher than the maximum current level of the application, otherwise instability may occur. If **[PSI Align Curr Max]** nCr is set to **[Auto]** Auto , **[PSI Align Curr Max]** nCr = 150% of **[Sync Nominal I]** nCrS during the tune operation and 100% of **[Sync Nominal I]** nCrS during angle shift measurement in case of standard alignment **[PSI align.]** PS Ior **[PSIO align.]** PS Io.		
[Current Level Align] ILr ★	0 to 200%	50%
Current level of the HF alignment Current level in % of **[Sync Nominal I]** nCrS for high frequency phase-shift angle measurement IPMA type.		
[Boost level align.] SIr ★	0 to 200%	100%
Boost level for IPMA alignment Current level in % of **[Sync Nominal I]** nCrS for high frequency phase-shift angle measurement SPMA type.		
[Relative d-axis error] rdAE	-3276.7 to 3275.8 %	—
Relative d-axis error in % Use **[Relative d-axis error]** rdAE to adjust **[Syn. EMF constant]** PHS, **[Relative d-axis error]** rdAE should be closed to 0. If the **[Relative d-axis error]** rdAE value is lower than 0%, then **[Syn. EMF constant]** PHS, may be increased. If the **[Relative d-axis error]** rdAE value is upper than 0%, then **[Syn. EMF constant]** PHS, may be reduced.		

(1) On the integrated display unit: 0 to 9,999 then 10.00 to 65.53 (10,000 to 65,536).

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

( ) : Setting of this parameter can be done during operation or when stopped.

[Motor control] drC - parameters (continued)

Access

Parameters described below can be accessed by: dr1 ➜ ConF ➜ FULL ➜ drC

Parameters List

HMI label	Settings	Factory setting
[Speed prop. gain] SPG ★ ( )	0 to 1,000%	40%
Speed proportional gain Visible if **[Motor control type]** CtT is not set to **[Standard]** Std, **[U/F VC 5pts]** UF5 or **[U/F VC Quad.]** UF9.		
[Inertia Factor] SPGU ★ ( )	0 to 1,000%	40%
Inertia factor Visible if **[Motor control type]** CtT is set to **[Standard]** Std, **[U/F VC 5pts]** UF5 or **[U/F VC Quad.]** UF9.		
[Speed time integral] S1t ★ ( )	1 to 65,535 ms	63 ms
Speed time integral Visible if **[Motor control type]** CtT) is not set to **[Standard]** Std, **[U/F VC 5pts]** UF5 or **[U/F VC Quad.]** UF9.		
[K speed loop filter] SFC ★ ( )	0 to 100	65
K speed loop filter (0(IP) to 100(PI))		
[Spd est. filter time] FFH ★	0 to 100 ms	6.4 ms
Filter time of the estimated speed Accessible in Expert mode only.		
[Current Filter Time] CrtF ★	0 to 100 ms	3.2 ms
Filter time of the current Accessible in Expert mode only. Filter time of the current reference filter [of control law (if **[No]** no: stator natural frequency)].		
[IR compensation] UFr ( )	0 to 200%	100%
IR compensation Used to optimize torque at very low speed, or to adapt to special cases (for example: for motors connected in parallel, decrease **[IR compensation]** UFr. If there is insufficient torque at low speed, increase **[IR compensation]** UFr. A too high value can avoid the motor to start (locking) or change the current limiting mode.		
[Slip compensation] SLP ★ ( )	0 to 300%	100%
Slip Compensation This parameter cannot be accessed if **[Motor control type]** CtT is set to **[Sync. mot.]** SYn. This parameter is written at 0% when **[Motor control type]** CtT is set to **[U/F VC Quad.]** UF9. Adjusts the slip compensation around the value set by the rated motor speed.		

HMI label	Settings	Factory setting
The speeds given on motor nameplates are not necessarily exact. If slip setting is lower than actual slip: The motor is not rotating at the correct speed in steady state, but at a speed lower than the reference. If slip setting is higher than actual slip: The motor is overcompensated and the speed is unstable.		
[U1] u 1 ★	0 to 800 V according to rating	0 V
Volt point 1 on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		
[F1] F 1 ★	0 to 599 Hz	0 Hz
Freq point 1on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		
[U2] u 2 ★	0 to 800 V according to rating	0 V
Volt point 2 on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		
[F2] F 2 ★	0 to 599 Hz	0 Hz
Freq point 2 on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		
[U3] u 3 ★	0 to 800 V according to rating	0 V
Volt point 3 on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		
[F3] F 3 ★	0 to 599 Hz	0 Hz
Freq point 3 on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		
[U4] u 4 ★	0 to 800 V according to rating	0 V
Volt point 4 on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		
[F4] F 4 ★	0 to 599 Hz	0 Hz
Freq point 4 on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		
[U5] u 5 ★	0 to 800 V according to rating	0 V
Volt point 5 on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		
[F5] F 5 ★	0 to 599 Hz	0 Hz
Freq point 5 on 5pt V/F This parameter can be accessed if **[Motor control type]** C t t is set to **[U/F VC 5pts]** u F 5.		

HMI label	Settings	Factory setting
[Current Limitation] CL1 ★ (1)	0 to 1.1 In (1)	1.1 In (1)

Current limitation

NOTICE

OVERHEATING

- Verify that the motor is properly rated for the maximum current to be applied to the motor.
- Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit.

Failure to follow these instructions can result in equipment damage.

NOTE: If the setting is less than 0.25 In, the drive may lock in detected **[OutPhLoss Assign]** OPL error mode if this has been enabled. If it is less than the no-load motor current, the motor cannot run.

[Switch Freq Type] SFt	—	**[SFR type 1]** HF1

Switching frequency type

The motor switching frequency is modified (reduced) when the internal temperature of the drive is too high.

[SFR type 1] HF1: Heating optimization
Allows the system to adapt the switching frequency according to the motor frequency.

[SFR type 2] HF2: Motor noise optimization (for high switching frequency)
Allows the system to keep a constant chosen switching frequency **[Switching frequency]** SFr whatever the motor frequency **[Motor Frequency]** rFr.

In the event of overheating, the drive automatically decreases the switching frequency.

It is restored to its original value when the temperature returns to normal.

[Switching frequency] SFr (1)	2 to 16 kHz	4 kHz

Switching frequency

NOTICE

DAMAGE TO THE DRIVE

Verify that the switching frequency of the drive does not exceed 4 kHz if the EMC filter is disconnected for operation of the drive in an IT mains.

Failure to follow these instructions can result in equipment damage.

This applies to the following drive versions: ATH230•••M2

Switching frequency setting.

Adjustment range: The maximum value is limited to 4 kHz if **[Motor surge limit.]** SVL parameter is configured.

NOTE: In the event of excessive temperature rise, the drive is automatically reduce the switching frequency and reset it once the temperature returns to normal.

In case of high speed motor, it is advised to increase the Pulse Width Modulation (PWM) frequency **[Switching frequency]** SFr at 8, 12 or 16 kHz.

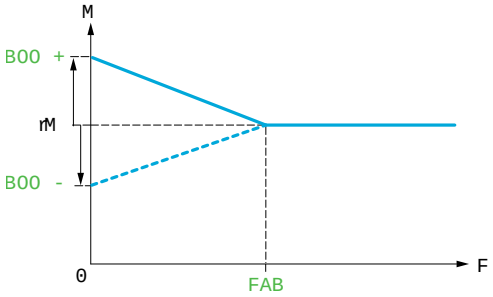
[Noise Reduction] nrd	—	**[No]** no

Motor Noise Reduction

Random frequency modulation helps to prevent any resonance, which may occur at a fixed frequency.

- **[No]** no: ***No***, fixed frequency
- **[Yes]** YES: ***Yes***, frequency with random modulation

[Boost activation] boA	—	**[Dynamic]** dYnA

HMI label	Settings	Factory setting
Boost activation • **[Inactive]** n o : ***Inactive***, no boost • **[Dynamic]** d Y n A : ***Dynamic*** • **[Static]** S t A t : ***Static***		
[Boost] b o o ★	-100 to 100%	0%
Boost This parameter can be accessed if **[Boost]** b o o is not set to **[No]** n o . Adjustment of the motor magnetizing current at low speed, as a % of the rated magnetizing current. This parameter is used to increase or reduce the time taken to establish the torque. It allows gradual adjustment up to the frequency set by **[Freq Boost]** F A b . Negative values apply particularly to tapered rotor motors.  **M** : Magnetizing current **F** : Frequency **IM** : Rated magnetizing current **FAB** : **[Freq Boost]** F A b b o o **+** : Positive **[Boost]** b o o **-** : Negative**[Boost]**		
[Freq Boost] F A b ★	0 to 599 Hz	0 Hz
Frequency boost This parameter can be accessed if **[Boost activation]** b o A is not set to **[No]** n o . Frequency above which the magnetizing current is no longer affected by **[Boost]** b o o .		
[Motor surge limit.] S V L	—	**[No]** n o
Motor surge limitation This function limits motor overvoltages and is useful in the following applications: • NEMA motors • Japanese motors • Spindle motors • Rewound motors This parameter can remain set to **[No]** n o for 230/400 V motors used at 230 V, or if the length of cable between the drive and the motor does not exceed: • 4 m with unshielded cables • 10 m with shielded cables **NOTE:** When **[Motor surge limit.]** S V L is set to **[Yes]** Y E S , the maximum switching frequency **[Switching frequency]** S F r is modified. • **[No]** n o : ***No***, function inactive • **[Yes]** Y E S : ***Yes***, function active		

HMI label	Settings	Factory setting
[Attenuation Time] S o P ★	—	10 µs

Attenuation time

Optimization parameter for transient overvoltages at the motor terminals. This parameter can be accessed if **[Motor surge limit.]** S V L is set to **[Yes]** Y E S.

[6 µs] 6 **[8 µs]** 8 **[10 µs]** 1 0: Set to 6, 8 or 10 µs, according to the following table.

NOTE: This parameter is useful for ATH230•••N4 drives.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

( ) : Setting of this parameter can be done during operation or when stopped.

The value of the **[Attenuation Time]** S o P parameter corresponds to the attenuation time of the cable used. It is defined to help to prevent the superimposition of voltage wave reflections resulting from long cable lengths. It limits overvoltages to twice the DC bus rated voltage.

The tables on the following page give examples of correspondence between the **[Attenuation Time]** S o P parameter and the length of the cable between the drive and the motor. For longer cable lengths, an output of the filter or a dV/dt filter must be used.

For motors in parallel, the sum of all the cable lengths must be taken into consideration. Compare the length given in the table row corresponding to the power for one motor with that corresponding to the total power, and select the shorter length.

Example: Two 7.5 kW (10 HP) motors

Take the lengths on the 15 kW (20 HP) table row, which are shorter than those on the 7.5 kW (10 HP) row, and divide by the number of motors to obtain the length per motor (with unshielded "Nexans" cable and SOP = 6, the result is 40/2 = 20 m maximum for each 7.5 kW (10 HP) motor).

In special cases (for example, different types of cable, different motor powers in parallel, different cable lengths in parallel, etc.), we recommend using an oscilloscope to check the overvoltage values obtained at the motor terminals.

To retain the overall drive performance, do not increase the S o P value unnecessarily.

Tables giving the correspondence between the S o P parameter and the cable length, for 400 V supply mains

					Maximum cable length in meters								
Reference	Motor power		Cable crosssection (minimum)		Unshielded "Nexans" cable Type H07 RN-F 4Gxx			Shielded "Nexans" cable Type GVCSTV-LS/LH			Shielded "BELDEN" cable Type 2950x		
	kW	HP	in mm²	A-W-G	S - o P = 10	S - o P = 8	S - o P = 6	S - o P = 10	S - o P = 8	S - o P = 6	S - o P = 10	S - o P = 8	S - o P = 6
ATH230U06N4	0.55	0.75	1.5	14	100 m	70 m	45 m	105 m	85 m	65 m	50 m	40 m	30 m
ATH230U07N4	0.75	1	1.5	14	100 m	70 m	45 m	105 m	85 m	65 m	50 m	40 m	30 m
ATH230U11N4	1.1	1.5	1.5	14	100 m	70 m	45 m	105 m	85 m	65 m	50 m	40 m	30 m

					Maximum cable length in meters								
ATH230U15N4	1.5	2	1.5	14	100 m	70 m	45 m	105 m	85 m	65 m	50 m	40 m	30 m
ATH230U22N4	2.2	3	1.5	14	110 m	65 m	45 m	105 m	85 m	65 m	50 m	40 m	30 m
ATH230U30N4	3	—	1.5	14	110 m	65 m	45 m	105 m	85 m	65 m	50 m	40 m	30 m
ATH230U40N4	4	5	2.5	12	110 m	65 m	45 m	105 m	85 m	65 m	50 m	40 m	30 m
ATH230U55N4	5.5	7.5	4	10	120 m	65 m	45 m	105 m	85 m	65 m	50 m	40 m	30 m
ATH230U75N4	7.5	10	6	8	120 m	65 m	45 m	105 m	85 m	65 m	50 m	40 m	30 m
ATH230D11N4	11	15	10	8	115 m	60 m	45 m	100 m	75 m	55 m	50 m	40 m	30 m
ATH230D15N4	15	20	16	6	105 m	60 m	40 m	100 m	70 m	50 m	50 m	40 m	30 m

‘For 230/400 V motors used at 230 V, the **[Motor surge limit.]** S U L parameter can remain set to **[No]** n o.

HMI label	Settings	Factory setting
[Braking level] U b r (↻)	335 to 995 V	According to drive rating voltage
Braking level Braking transistor command level (See **[Braking level]** U b r).		

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

(↻) : Setting of this parameter can be done during operation or when stopped.

1.3.4.4 [Full] F u L L – – [Inputs / Outputs] I _ o —

What's in This Chapter

[Inputs / Outputs] I _ o – 135
[DI1 Configuration] L I — 138
Configuration of analog inputs and Pulse input 141
Range (output values): For analog inputs only 142
Delinearization: For analog inputs only 145
[AI1 configuration] A I 1 — 146
[AI2 configuration] A I 2 — 148
[AI3 configuration] A I 3 150
[R1 Configuration] r I — 152
[LO1 CONFIGURATION] L o I — 156
[DQ1 configuration] d o I — 158
[AQ1 configuration] A o I — 161

[Inputs / Outputs] I_O-

Access

Parameters described below can be accessed by: dr I ➡ ConF ➡ FULL ➡ I_O

Name of the Inputs/outputs of the drive

The parameters in the **[Inputs / Outputs]** I_O — menu can only be modified when the drive is stopped and no run command is present.

The name of the inputs and outputs may differ from a tool to the other:

- 4-digit 7-segment display,
- code displayed on the terminals (Control Block),
- labels displayed on ATH230 DTM,
- labels displayed on Graphic Display Terminal (VW3A1111), and
- labels displayed on Remote Graphic Terminal (VW3A1101).

The following list shows a sum up of the different name used:

- **LI1…LI6 or DI1…DI6:** for logic input 1…6 or digital input 1…6,
  - **- LI5 or DI5** can be configured as a pulse input (PI or RP),
  - **LI6 or DI6**can be configured as a PTC (Positive Temperature Coefficient) using hardware switch SW2.
- **LO1 or DQ+/DQ-:** logic output or digital output,
- **AI1…AI3:** for analog inputs,
- **AQ1 or AO1:** for analog output,
- The analog output can be configured as a digital output (named **DO1 or DQ1**)
- **R1, R2:** for relay 1 and relay 2,
- **STO:** Safe Torque Off input.

For more information on the control terminals, refer to the installation manual .

Parameters list

HMI label	Settings	Factory setting
[Inputs / Outputs] I_O —		
[2/3-Wire Control] tCC 2 s	—	**[2-Wire Control]** 2C

2/3-wire control

⚠WARNING

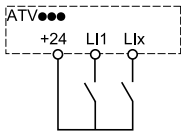
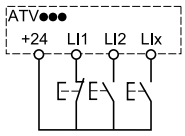
UNANTICIPATED EQUIPMENT OPERATION

If this parameter is changed, the parameters **[Auto Fault Reset]** ATR and **[2-wire type]** TCT and the assignments of the digital and virtual inputs are partially reset to the factory setting.

- Verify that this change is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[2-Wire Control] 2C
2-wire control (level commands): This is the input state (0 or 1) or edge (0 to 1 or 1 to 0) which controls running or stopping.

HMI label	Settings	Factory setting
Example of "source" wiring:  LI1: forward LIx: reverse **[3-Wire Control]** 3C **3-wire control (pulse commands):** A "forward" or "reverse" pulse is sufficient to command starting, a "stop" pulse is sufficient to command stopping Example of "source" wiring:  LI1: stop LI2: forward LIx: reverse		
[2-wire type] tCt ★  2 s	—	**[Transition]** trn
Type of 2-wire control **⚠WARNING** **UNANTICIPATED EQUIPMENT OPERATION** Verify that the parameter setting is compatible with the type of wiring used. **Failure to follow these instructions can result in death, serious injury, or equipment damage.** • **[Level]** LEL : ***Level***, state 0 or 1 is taken into account for run (1) or stop (0) • **[Transition]** trn : ***Transition***, a change of state (transition or edge) is necessary to initiate operation, to avoid accidental restarts after a break in the power supply • **[Level With Fwd Priority]** (PFo : ***Level with forward priority***, state 0 or 1 is taken into account for run or stop, but the "forward" input takes priority over the "reverse" input		
[Drive Running] run ★	—	**[No]** no
Drive running, assignment of the stop command. Visible only if **[2/3-Wire Control]** tCC is set to **[3-Wire Control]** 3C . **[DI1]** LI1 : Logical input LI1 if not in **[I/O profile]** IO **[CD00]** Cd00 : In **[I/O profile]** IO , can be switched with possible logic inputs **[OL01]** oL01 : Function blocks: Logical Output 01 ... **[OL10]** oL10 : Function blocks: Logical Output 10		
[Forward] Frd	—	**[DI1]** LI1
Forward input, assignment of the forward direction command. **[DI1]** LI1 : Logical input LI1 if not in **[I/O profile]** IO **[CD00]** Cd00 : In **[I/O profile]** IO , can be switched with possible logic inputs **[OL01]** oL01 : Function blocks: Logical Output 01 ...		

HMI label	Settings	Factory setting
[OL10] o L 10: Function blocks: Logical Output 10 **NOTE:** You can also use F1, F2, F3, and F4 to assign the forward direction command.		
[Reverse Assign] r r S	—	**[DI2]** L I2
Reverse assignment, assignment of the reverse direction command. **[Not Assigned]** n o: Not assigned **[DI1]** L I1: Logical input LI1 **[...] (...)**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173. (If **[Profile]** C H C F is set to **[Not separ.]** S I n or **[Separate]** S E P then **[CD11]** C d 1 1 up to **[CD15]** C d 15, **[C111]** C 1 1 1 up to **[C115]** C 1 15, **[C211]** C 2 1 1 up to **[C215]** C 2 15 and **[C311]** C 3 1 1 up to **[C315]** C 3 15 are not available). **NOTE:** You can also use F1, F2, F3, and F4 to assign the reverse direction command.		

[DI1 Configuration] LI1 —

Access

Parameters described below can be accessed by: drI ➜ CONF ➜ FULL ➜ I_O ➜ LI1

Parameters list

HMI label	Settings	Factory setting
[DI1 Configuration] LI1 —		
[DI1 assignment] LI1A	—	—

DI1 assignment

Read-only parameter, cannot be configured.

It displays all the functions that are assigned to input LI1 to check for multiple assignments.

- **[Not Assigned]** nO: ***Not assigned***
- **[Run]** rUn: **[Run]**
- **[Forward]** Frd: **[Forward]**
- **[Reverse]** rrS: ***Reverse direction***
- **[Ramp switching]** rPS: ***Ramp switching***
- **[Jog]** JOG: ***Jog***
- **[+ speed]** USP: ***Increase speed***
- **[-speed]** dSP: ***Decrease speed***
- **[2 preset speeds]** PS2: ***Select 2 preset speeds***
- **[4 preset speeds]** PS4: ***Select 4 preset speeds***
- **[8 preset speeds]** PS8: ***Select 8 preset speeds***
- **[Ref Freq 2 switching]** rFC: ***Reference frequency 2 switching***
- **[Freewheel Stop]** nST: ***Freewheel stop***
- **[DC injection]** dCI: ***DC inj. braking***
- **[Fast stop]** FST: ***Fast stop***
- **[Forced Local]** FLO: ***Forced local mode***
- **[Fault Reset]** rSF: ***Fault Reset***
- **[Autotuning]** tUN: ***Autotuning***
- **[Ref Freq stored]** SPM: ***Reference frequency stored***
- **[Pre Fluxing]** FLI: ***Pre fluxing***
- **[Auto / manual]** PAU: ***Auto/Manual switch***, PI(D) auto-manu
- **[PID Integral Disabled]** PIS: ***PID integral disabled***, integral shunting PI(D)
- **[2 preset PID ref.]** Pr2: ***Select 2 preset PID refs.***
- **[4 preset PID ref.]** Pr4: ***Select 4 preset PID refs.***
- **[Torque limitation]** tLA: ***Torque limitation***
- **[External Error]** EtF: ***External error***
- **[Out contact fdbk]** rCA: ***Output contact. feedback***
- **[2 config. switching]** CnF1: ***2 configuration switching***
- **[3 config. switching]** CnF2: Configuration switching 2
- **[2 parameter sets]** CHA1: Parameter switching 1
- **[3 parameter sets]** CHA2: Parameter switching 2

HMI label	Settings	Factory setting
• **[Analog trq limit]** tLC: Torque limitation: Activation (analog input) by a logic input • **[Cmd switching]** CCS: Command channel switching • **[Disable Error Detect]** inH: Detected error inhibition • **[16 preset speeds]** PS16: 16 preset speeds • **[Current limit 2]** LC2: Current limitation switching • **[Ref Freq 1B switching]** rCb: Reference channel switching (1 to 1B) • • **[Stop Fwd limit sw.]** SAF: Stop switch forward • **[Stop RV limit sw.]** SAr: Stop switch reverse • **[Fwd slowdown]** dAF: Slowdown attained forward • **[Rev slowdown]** dAr: Slowdown attained reverse • **[Disable limit sw.]** CLS: Limits switches clearing • **[Device Lock]** LES: Emergency stop • • **[Counter wobble]** SnC: Counter wobble synchronization • **[Product Restart]** rPA: Reset Product • **[2 HSP]** SH2: High Speed 2 • **[4 HSP]** SH4: High Speed 4 • **[Preset Speed 1]** FPS1: Function key preset speed 1 assignment • **[Preset Speed 2]** FPS2: Function key preset speed 2 assignment • **[PID Ref Freq 1]** FPr1: Function key preset PI 1 assignment • **[PID Ref Freq 2]** FPr2: Function key preset PI 2 assignment • **[+speed]** FUSP: Function key faster assignment • **[-speed]** FdSP: Function key slower assignment • **[T/K]** FtK: ***Terminal keypad***,function key bumpless assignment • **[+speed around Ref Freq]** uS1: ***Increase speed around reference frequency*** • **[-speed around Ref Freq]** dS1: ***Decrease speed around reference frequency*** • **[IL01]** IL01: ***IL01***, function blocks: Logical Input 1 ... • **[IL10]** IL10: ***IL10***, function blocks: Logical Input 10 • **[FB start]** FbrM: ***FB start***, function blocks: Run mode • **[STO Channel1]** Sto1: ***Safe torque Off channel1*** • **[STO Channel2]** Sto2: ***Safe torque Off channel2*** **NOTE:** Safety function channels are available for LI3-LI4 and LI5-LI6 only.		
[DI1 Delay] L1d	0 to 200 ms	0 ms
DI1 delay This parameter is used to take account of the change of the logic input to state 1 with a delay that can be adjusted between 0 and 200 milliseconds, to filter out possible interference. The change to state 0 is taken into account without delay.		
[DI2 Configuration] L2 — to **[DI6 Configuration]** L6 —		
All the logic inputs available on the drive are processed as in the example for LI1 above, up to LI6.		
[DI5 Configuration] L5 —		
Specific parameters for LI5 used as a pulse input.		
[RP assignment] PrA	—	—

HMI label	Settings	Factory setting
Pulse input assignment		
Read-only parameter, cannot be configured.		
It displays all the functions associated with the plse input to check, for example, for compatibility problems.		
Identical to **[AI1 assignment]** A I I A .		
[RP min value] P I L	0 to 20.00 kHz	0 kHz
Minimum pulse input, pulse input scaling parameter of 0% in Hz * 10 unit.		
[RP max value] P F r	0 to 20.00 kHz	20.00 kHz
RP maximum value, pulse input scaling parameter of 100% in Hz * 10 unit.		
[RP filter] P F I	0 to 1,000 ms	0 ms
RP filter, I/O ext Pulse input cutoff time of the low-filter.		
[DA1 Configuration] L A I — **[DA2 Configuration]** L A 2 —		
The 2 analog inputs AI1 and AI2 on the drive could be used as LI inputs and are processed as in the example for LI1 above.		

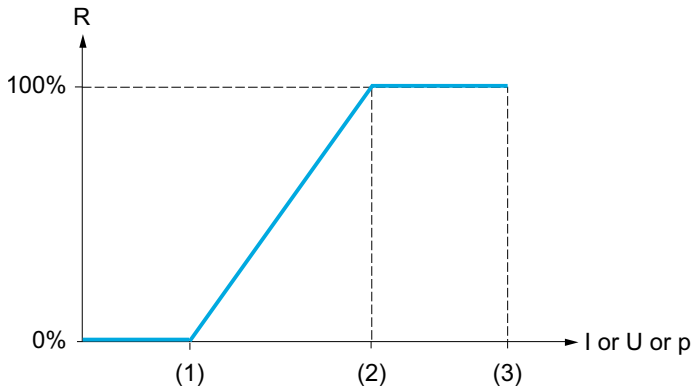
★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

Configuration of analog inputs and Pulse input

The minimum and maximum input values (in volts, mA, etc.) are converted to % to adapt the references to the application.
Minimum and maximum input values:

The minimum value corresponds to a reference of 0% and the maximum value to a reference of 100%. The minimum value may be greater than the maximum value:



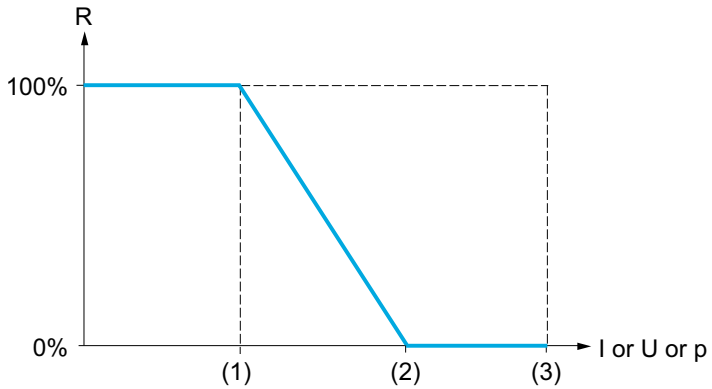
1. **[Min value]** CrLx or ULx or PIL
2. **[Max value]** CrHx or UHx or PFr
3. 20 mA or 10 V or 20.00 kHz

R: Reference

I: Current input

U: Voltage input

p: Pulse input



1. **[Max value]** CrHx or UHx or PFr
2. **[Min value]** CrLx or ULx or PIL
3. 20 mA or 10 V or 20.00 kHz

R: Reference

I: Current input

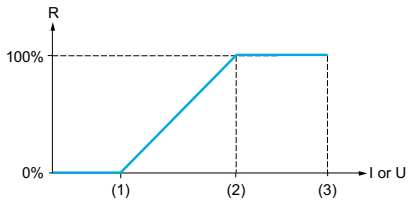
U: Voltage input

p: Pulse input

For +/- bidirectional inputs, the min. and max. are relative to the absolute value, for example +/- 2 to 8 V.

Range (output values): For analog inputs only

This parameter is used to configure the reference range to [0% —>100%] or [-100% —> +100%] to obtain a bidirectional output from a unidirectional input.



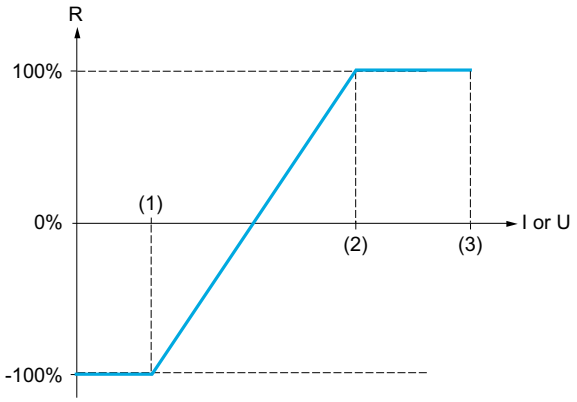
1. **[Min value]**
2. **[Max value]**
3. 20 mA or 10 V

R: Reference

I: Current input

U: Voltage input

Range : [0% —>100%]



1. **[Min value]**
2. **[Max value]**
3. 20 mA or 10 V

R: Reference

I: Current input

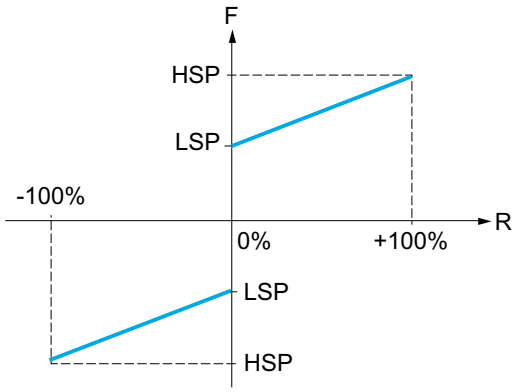
U: Voltage input

Range : [-100% —> +100%]

HMI label	Settings	Factory setting
[Ref Freq template] b S P	-	**[Standard]** b S d

Reference frequency template selection

[Standard] b S d

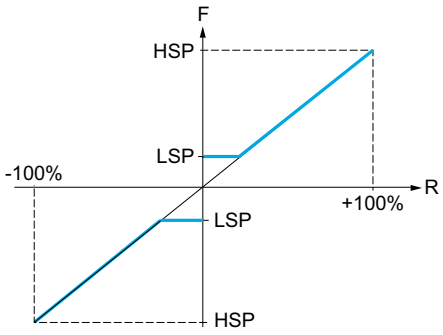


F: Frequency

R: Reference

At zero reference the frequency = LSP

[Pedestal] b L S

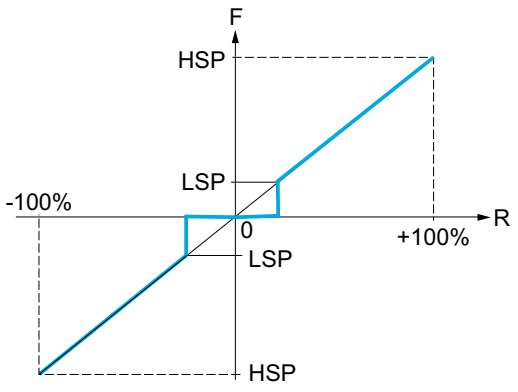


F: Frequency

R: Reference

At reference = 0 to LSP the frequency = LSP

[Deadband] b n S

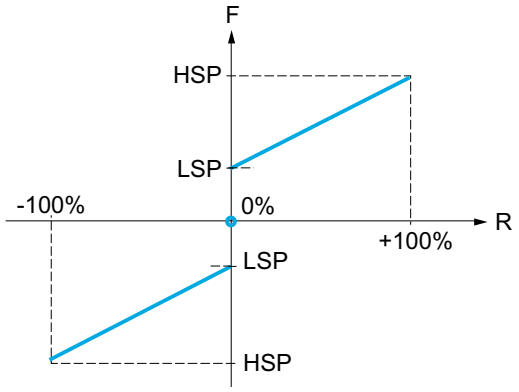


F: Frequency

R: Reference

At reference = 0 to LSP the frequency = 0

HMI label	Settings	Factory setting
[Deadband at 0%] b n S 0		



F: Frequency

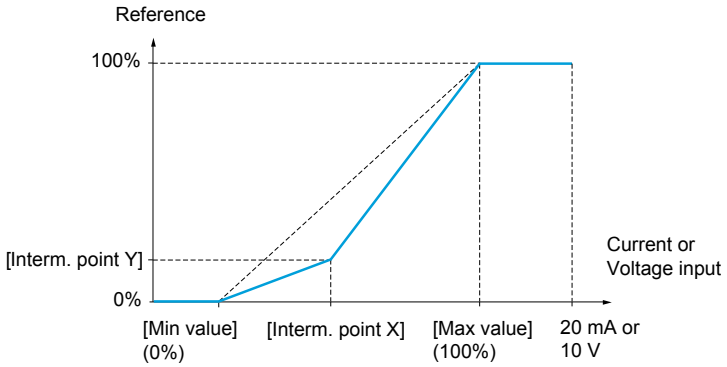
R: Reference

This operation is the same as **[Standard]** b S d except that in the following cases at zero reference, the frequency = 0:
The signal is less than **[Min value]** which is greater than 0 (example 1 V on a 2 - 10 V input)
The signal is greater than **[Min value]**, which is greater than **[Max value]** (example: 11 V on a 10 - 0 V input).
If the input range is configured as "bidirectional", operation remains identical to **[Standard]** b S d.
This parameter defines how the speed reference is taken into account, for analog inputs and Pulse input only. In the case of the PID regulator, this is the PID output reference.
The limits are set by the **[Low Speed]** L S P , page 94 and **[High Speed]** H S P parameters , page 94.

: Setting of this parameter can be done during operation or when stopped.

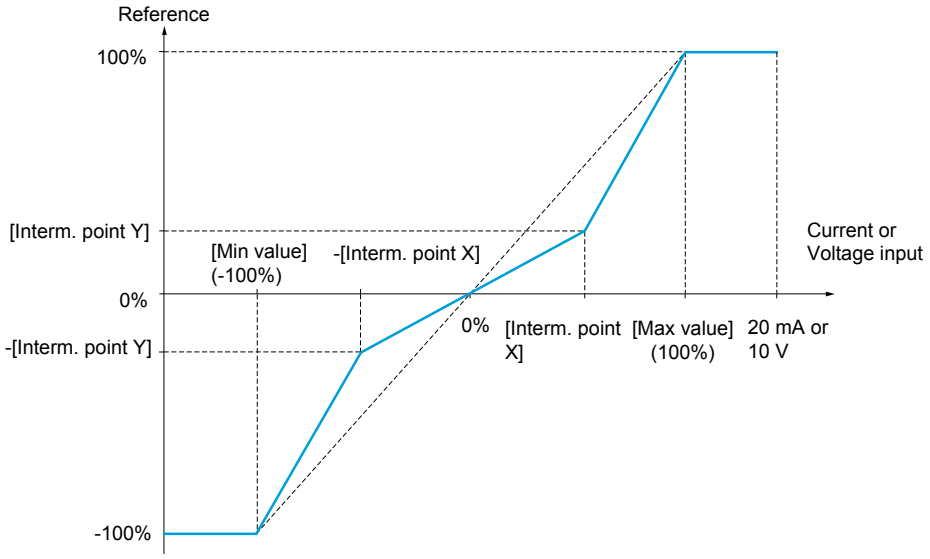
Delinearization: For analog inputs only

The input can be delinearized by configuring an intermediate point on the input/output curve of this input:
For range 0 V 100%



NOTE: For [Interm. point X], 0% corresponds to [Min value] and 100% to [Max value].

For range -100% V 100%



[AI1 configuration] AI1 —

Access

Parameters described below can be accessed by: dr1 ➜ ConF ➜ FULL ➜ I_O ➜ AI1

Parameters list

HMI label	Settings	Factory setting
[AI1 configuration] AI1 —		
[AI1 assignment] AI1A	-	-
AI1 assignment Read-only parameter, cannot be configured. It displays all the functions associated with input AI1 to check, for example, for compatibility problems. • **[No]** nO: ***No*** • **[AQ1 assignment]** AO1: ***AQ1 assignment***, analog output AO1 • **[Ref Freq 1]** Fr1: ***Reference frequency 1*** • **[Ref Freq 2]** Fr2: ***Reference frequency 2*** • **[Ref Freq 2 Sum]** SA2: ***Reference frequency 2 Summing*** • **[PID feedback]** PIF: ***PI controller feedback*** (PI control) • **[Torque limitation]** tAA: ***Torque limitation***, activation by an analog value • **[Subtract Ref Freq 2]** dA2: ***Subtract reference frequency 2*** • **[Manual PID ref.]** PIM: ***Manual PID reference***, manual speed reference of the PI(D) regulator (auto-man) • **[PID Ref Freq]** FPI: **[PID Ref Freq]**, speed reference of the PI(D) regulator (predictive reference) • **[Ref Freq 3 Sum]** SA3: ***Reference frequency 3 Summing*** • **[Ref Freq 1B]** Fr1b: ***Reference frequency 1B*** • **[Subtract Ref Freq 3]** dA3: ***Subtract reference frequency 3*** • **[Forced local]** FLoC: ***Forced loc mode channel*** • **[Ref Freq 2 multi]** MA2: ***Reference frequency 2 multiplier*** • **[Ref Freq 3 multi]** MA3: ***Reference frequency 3 multiplier*** • **[IA01]** IA01: ***IA01***, function blocks: Analog Input 01 ... • **[IA10]** IA10: ***IA10***, function blocks: Analog Input 10		
[AI1 Type] AI1t	-	**[Voltage]** 10U
Configuration of AI1 **[Voltage]** 10U: Positive voltage input 0 - 10 V (negative values are interpreted as zero: the input is unidirectional)		
[AI1 Min. Value] UIL1	0 to 10.0 V	0 V
AI1 voltage scaling parameter of 0%		
[AI1 Max Value] UIH1	0 to 10.0 V	10.0 V
AI1 voltage scaling parameter of 100%		
[AI1 filter] AI1F	0 to 10.00 s	0 s

HMI label	Settings	Factory setting
AI1 filter, interference filtering.		
[AI1 range] A I 1 L	—	**[0 - 100%]** P o S
Analog input 1 range • **[0 - 100%]** P o S: ***Positive only*** • **[+/- 100%]** n E G: ***Positive and negative***		
[AI1 X Interm. Point] A I 1 E	0 to 100%	0%
AI1 intermediate point X. Input delinearization point coordinate. Percentage of the physical input signal. • 0% corresponds to **[AI1 Min. Value]** u I 1 L. • 100% corresponds to **[AI1 Max Value]** u I 1 H.		
[AI1 Interm. point Y] A I 1 S	0 to 100%	0%
AI1 intermediate point Y Output delinearization point coordinate (frequency reference). Percentage of the internal frequency reference corresponding to the **[AI1 X Interm. Point]** A I 1 E percentage of physical input signal.		

[AI2 configuration] AI2—

Access

Parameters described below can be accessed by: drI ➡ ConF ➡ FULL ➡ I_O ➡ AI2

Parameters list

HMI label	Settings	Factory setting
[AI2 configuration] AI2 —		
[AI2 Assignment] AI2A	-	-
AI2 assignment Identical to **[AI1 assignment]** AI1A .		
[AI2 Type] AI2t	-	**[Voltage +/-]** nIOu
Configuration of AI2 **[Voltage]** IOu: ***Voltage***, positive voltage input 0 - 10 V (negative values are interpreted as zero: the input is unidirectional) **[Voltage +/-]** nIOu: ***AI bipolar volts selected***, positive and negative voltage input +/- 10 V (the input is bidirectional)		
[AI2 Min. Value] uiL2	0 to 10.0 V	0 V
AI2 voltage scaling parameter of 0%		
[AI2 Max value] uiH2	0 to 10.0 V	10.0 V
AI2 voltage scaling parameter of 100%		
[AI2 filter] AI2F	0 to 10.00 s	0 s
AI2 filter, interference filtering.		
[AI2 range] AI2L	—	**[0 - 100%]** Pos
Analog input 2 range This parameter is forced to **[0 - 100%]** Pos and can not be accessed if **[AI2 Type]** AI2t is set to **[Voltage +/-]** nIOu . • **[0 - 100%]** Pos: ***Positive only*** • **[+/- 100%]** nEG: ***Positive and negative***		
[AI2 X Interm. Point] AI2E	0 to 100%	0%
AI2 intermediate point X, input delinearization point coordinate. Percentage of the physical input signal. • 0% corresponds to **[AI2 Min. Value]** uiL2 if the range is 0 ➡ 100%. • 0% corresponds to **[AI2 Max value]** + **[AI2 Min. Value]**/ 2 if the range is -100% ➡ +100%. • 100% corresponds to **[AI2 Max value]** (uiH2)		
[AI2 Interm. point Y] AI2S	0 to 100%	0%
AI2 intermediate point Y Output delinearization point coordinate (frequency reference). Percentage of the internal frequency reference corresponding to the **[AI2 X Interm. Point]** AI2E percentage of physical input signal.		

[AI3 configuration] AI3

Access

Parameters described below can be accessed by: drI ➜ ConF ➜ FULL ➜ I_O ➜ AI3

Parameters list

HMI label	Settings	Factory setting
[AI3 configuration] AI3 —		
[AI3 Assignment] AI3A	-	-
AI3 assignment Identical to **[AI1 assignment]** AI1A .		
[AI3 Type] AI3t	-	**[Current]** 0A
Configuration of AI3 **[Current]** 0A: Current input 0 - 20 mA		
[AI3 Min. Value] CrL3	0 to 20.0 mA	0 mA
AI3 current scaling parameter of 0%		
[AI3 Max Value] CrH3	0 to 20.0 mA	20.0 mA
AI3 current scaling parameter of 100%		
[AI3 filter] AI3F	0 to 10.00 s	0 s
AI3 filter, interference filtering.		
[AI3 range] AI3L	—	**[0 - 100%]** Pos
Analog input 3 range **[0 - 100%]** Pos: ***Positive only***, unidirectional input **[+/- 100%]** nEG: ***Positive and negative***, bidirectional input Example: On a 4 - 20 mA input. 4 mA corresponds to reference -100%. 12 mA corresponds to reference 0%. 20 mA corresponds to reference +100%. Since AI3 is, in physical terms, a bidirectional input, the **[+/- 100%]** nEG configuration must only be used if the signal applied is unidirectional. A bidirectional signal is not compatible with a bidirectional configuration.		
[AI3 X Interm. point] AI3E	0 to 100%	0%
AI3 intermediate point X, input delinearization point coordinate. Percentage of the physical input signal. • 0% corresponds to **[AI3 Min. Value]** CrL3 if the range is 0 ➜ 100%. • 0% corresponds to (**[AI3 Max Value]** CrH3 — **[AI3 Min. Value]** CrL3) / **[AI3 Min. Value]** CrL3 if the range is -100% V +100%. • 100% corresponds to **[AI3 Max Value]** CrH3.		
[AI3 Y Interm. point] AI3S	0 to 100%	0%
AI3 intermediate point Y Output delinearization point coordinate (frequency reference). Percentage of the internal frequency reference corresponding to the **[AI3 X Interm. point]** AI3E percentage of physical input signal.		

HMI label	Settings	Factory setting
[Virtual AI1] A V I —		
[AIV1 assignment] A V I A	—	—
AIV1 assignment Virtual analog input 1 via the jog dial available on the front side of the product. Identical to **[AI1 assignment]** A I I A .		
[Virtual AI2] A V 2 —		
[AIV2 assignment] A V 2 A	—	—
AIV2 assignment Possible assignments for **[AIV2 Image input]** A I V 2: Virtual analog input 2 via communication channel, to be configured with **[AIV2 Channel Assign]** A I C 2. Identical to **[AIV1 assignment]** A V I A .		
[AIV2 Channel Assign] A I C 2 ★	—	**[No]** n o
Channel assignment for virtual Analog input AIV2 **[AIV2 assignment]** A V 2 A source channel. This parameter can also be accessed in the **[PID controller]** P I d — submenu. Scale: The value 8192 transmitted by this input is equivalent to 10 V on a 10 V input. • **[No]** n o: ***No***, not assigned • **[Modbus]** M d b: ***Modbus communication*** • **[Com. Module]** (n E t: ***Ext. communication module***		

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[R1 Configuration] r 1—

Access

Parameters described below can be accessed by: dr1 ➜ ConF ➜ FULL ➜ I_O ➜ r1

Parameters List

HMI label	Settings	Factory setting
[R1 Configuration] r1—		
[R1 Assignment] r1	—	**[Operating State Fault]** FLt

R1 assignment

[No] no: Not assigned. In this case, the output can be controlled via the internal parameter OL1R (refer to the communication parameter addresses file). By default, if an error (such as a communication interruption is detected), the output remains unchanged. Use the parameter **[Enable R1 fallback]** r1F to disable the output in case of error detection.

- **[Operating State Fault]** FLt: Drive error detection status (relay normally energized, and de-energized in the event of an error)

  [Drive Running] run: Drive running
- **[Mot Freq High Thd]** FtA: ***Motor frequency high threshold reached***
- **[High Speed Reached]** FLA: ***High speed reached***
- **[Cur Thd Reached]** CtA: ***Current threshold reached*** **[High Current Thd]** Ctd)
- **[Cur Thd Reached]** CtA: ***Current threshold reached***
- **[Motor Th Thd reached]** tSA: ***Motor thermal threshold reached***
- **[PID error Warning]** PEE: ***PID error warning***
- **[PID Fdbk Warn]** PFA: ***PID feedback warning***
- **[Mot Freq High Thd 2]** F2A: ***Motor frequency high threshold 2 reached*** **[Freq. threshold 2]** F2d
- **[Dev Th reached]** tAd: ***Device thermal threshold reached***
- **[Proc Undld Warn]** uLA: ***Process underload warning***
- **[Proc Overload Warn]** oLA: ***Process overload warning***
- **[High Torque Warn]** ttHA: ***High torque warning*** **[High torque thd.]** ttH
- **[Low Torque Warn]** ttLA: ***Low torque warning*** **[Low torque thd.]** ttL
- **[Run Forward]** nFrd: ***Run forward***
- **[Run Reverse]** nrrS: ***Run reverse***
- **[Mot2 Th Thd reached]** tS2: ***Motor 2 thermal threshold reached***
- **[Mot3 Th Thd reached]** tS3: ***Motor 3 thermal threshold reached***
- **[Neg Torque]** AtS: ***Negative torque*** (braking)
- **[Cnfg.0 act.]** CnF0: ***Configuration 0 active***
- **[Cnfg.1 act.]** CnF1: ***Configuration 1 active***
- **[Cnfg.2 act.]** CnF2: ***Configuration 2 active***
- **[set 1 active]** CFP1: ***Parameter set 1 active***
- **[set 2 active]** CFP2: ***Parameter set 2 active***
- **[set 3 active]** CFP3: ***Parameter set 3 active***
- **[DC charged]** dbL: ***DC bus charged***
- **[Power Removal State]** Prn: ***Power Removal state***, drive locked by "Safe Torque Off" input
- **[Pulse Warn Thd Reached]** F9LA: ***Pulse warning threshold reached*** **[Pulse warning thd.]** F9L

HMI label	Settings	Factory setting
• **[I present]** nCP: ***I present***, motor current present • **[Limit Switch Reached]** LSA: ***Limit switch reached*** • **[Warning Grp 1]** AG1: ***Warning group 1*** • **[Warning Grp 2]** AG2: ***Warning group 2*** • **[Warning Grp 3]** AG3: ***Warning group 3*** • **[DI6=PTC Warning]** PLA: ***DI6=PTC warning*** • **[Ext Error Warn]** EFA: ***External error warning*** • **[UnderV Warn]** USA: ***Undervoltage warning*** • **[Preventive UnderV Active]** UPA: ***Preventive undervoltage active*** • **[Device Th Warn]** tHA: ***Device thermal state warning*** • **[Lim T/I Reached]** SSA: ***Limit torque / I reached*** • **[Th Junction Warn]** tJA: ***Thermal junction warning*** • **[AI3 4-20 Warning]** AP3: ***AI3 4-20 Loss warning*** • **[Ready]** rdY: ***Ready*** • **[OL01]** oL01: ***OL01***, function blocks: Logical Output 01 ... • **[OL10]** oL10: ***OL10***, function blocks: Logical Output 10		
[R1 Delay time] r1d (1)	0 to 60,000 ms	0 ms
R1 delay time The change in state only takes effect once the configured time has elapsed, when the information becomes true. The delay cannot be set for the **[Operating State Fault]** FLt assignment, and remains at 0.		
[R1 Active at] r1S	—	**[1] (POS)**
R1 active level Configuration of the operating logic: • **[High Level]** POS: ***High level***, state 1 when the information is true • **[Low Level]** nEG: ***Low level***, state 0 when the information is true Configuration **[High Level]** POS cannot be modified for the **[Operating State Fault]** FLt assignment.		
[R1 Holding time] r1H	0 to 9,999 ms	0 ms
R1 holding time The change in state only takes effect once the configured time has elapsed, when the information becomes false. The holding time cannot be set for the **[Operating State Fault]** FLt assignment, and remains at 0.		
[Enable R1 fallback] r1F	—	**[No]** no
Enable relay 1 fallback If the output is controlled by fieldbus and has been enabled, transition to operating state Fault such as, but not limited to, communication interruption, will not disable the output if this parameter is set to **[No]** NO . **⚠WARNING** **LOSS OF CONTROL** • Verify that using this default setting does not result in unsafe conditions including communication interruption. • Set this parameter to **[Yes]** YES to disable the output if an error is triggered. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**		

HMI label	Settings	Factory setting
This parameter is forced to **[No]** nO if **[R1 Assignment]** r1 is set to a value different from **[No]** nO. **[Yes]** YES: Fallback feature enabled: The state of the relay can be controlled via a bit of OL1R (refer to the communication parameter addresses file). If an error is detected, the output is disabled. **NOTE:** If an error is detected, the process applied on the output (e.g. delays, active level) remains applied. **[No]** nO: Fallback feature disabled: When the output is assigned, the state of the output is defined according to its assignment. When the corresponding output is not assigned, the state of the output can be controlled via a bit of OL1R (refer to the communication parameter addresses file). If a error is detected, the output remains unchanged.		
[R2 Configuration] r2 —		
[R2 Assignment] r2	—	**[No]** nO
R2 assignment Identical to **[R1 Assignment]** r1 with the addition of: • • **[Sync wobble]** tSY: ***Sync wobble***, "Counter wobble" synchronization		
[R2 Delay time] r2d (1)	0 to 60,000 ms	0 ms
R2 delay time The delay cannot be set for the **[Operating State Fault]** FLt, assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.		
[R2 Active at] r2S	—	**[1] (POS)**
R2 active level Configuration of the operating logic: • **[High Level]** POS: ***High level***, state 1 when the information is true • **[Low Level]** nEG: ***Low level***, state 0 when the information is true The configuration **[High Level]** POS cannot be modified for the **[Operating State Fault]** FLt and **[DC charging]** dCO assignments.		
[R2 Holding time] r2H	0 to 9,999 ms	0 ms
R2 holding time The holding time cannot be set for the **[Operating State Fault]** FLt assignment, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.		

HMI label	Settings	Factory setting
[Enable R2 fallback] r 2 F	—	**[No]** n o

Enable relay 2 fallback
If the output is controlled by fieldbus and has been enabled, transition to operating state Fault such as, but not limited to, communication interruption, will not disable the output if this parameter is set to **[No]** NO .

⚠WARNING

LOSS OF CONTROL

- Verify that using this default setting does not result in unsafe conditions including communication interruption.
- Set this parameter to **[Yes]** YES to disable the output if an error is triggered.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This parameter is forced to **[No]** n o if **[R2 Assignment]** r 2 is set to a value different from **[No]** n o.

[Yes] Y E S: Fallback feature enabled: The state of the relay can be controlled via a bit of OL1R (refer to the communication parameter addresses file). If an error is detected, the output is disabled when **[Auto Fault Reset]** A t r is set to **[No]** n o, but when **[Auto Fault Reset]** A t r is set to **[Yes]** Y E S the output remains unchanged as long as the **[Fault Reset Time]** t A r has not been elapsed.

NOTE: If an error is detected, the process applied on the output (e.g. delays, active level) remains applied.

[No] n o: Fallback feature disabled: When the output is assigned, the state of the output is defined according to its assignment. When the corresponding output is not assigned, the state of the output can be controlled via a bit of OL1R (refer to the communication parameter addresses file). If a error is detected, the output remains unchanged.

[LO1 CONFIGURATION] LO1 —

Access

Parameters described below can be accessed by: dr1 ➜ CONF ➜ FULL ➜ I_O ➜ LO1

Parameters list

HMI label	Settings	Factory setting
[LO1 CONFIGURATION] LO1 —		
[LO1 assignment] LO1	—	**[No]** NO
LO1 assignment Identical to **[R1 Assignment]** R1 with the addition following parameter value (shown for information only as these selections can only be configured in the **[Application function]** FUN — menu): • **[Sync wobble]** SYY: ***Sync wobble***, "Counter wobble" synchronization • **[GDL]** GDL : ***GDL***, safety function		
[LO1 delay time] LO1D	0 to 60,000 ms (1)	0 ms
LO1 delay time The delay cannot be set for the **[No drive flt] FLt** assignment, and remains at 0. The change in state only takes effect after the configured time has elapsed, when the information becomes true. (1) 0 to 9,999 ms then 10.00 to 60.00 s on the integrated display terminal.		
[LO1 active at] LO1S	-	**[1] POS**
LO1 active level Configuration of the operating logic: • **[High Level]** POS: ***High level***, state 1 when the information is true • **[Low Level]** NEG: ***Low level***, state 0 when the information is true The configuration **[High Level]** POS cannot be modified for the **[No drive flt] FLt** assignment.		
[LO1 holding time] LO1H	0 to 9,999 ms	0
LO1 holding time The holding time cannot be set for the **[No drive flt] FLt** assignment, and remains at 0. The change in state only takes effect after the configured time has elapsed, when the information becomes false.		

HMI label	Settings	Factory setting
[Enable LO1 fallback] L o I F	—	**[No]** n o

Enable LO1 fallback
If the output is controlled by fieldbus and has been enabled, transition to operating state Fault such as, but not limited to, communication interruption, will not disable the output if this parameter is set to **[No]** NO .

⚠WARNING

LOSS OF CONTROL

- Verify that using this default setting does not result in unsafe conditions including communication interruption.
- Set this parameter to **[Yes]** YES to disable the output if an error is triggered.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This parameter is forced to **[No]** n o if **[LO1 assignment]** L o I is set to a value different from **[No]** n o.

[Yes] Y E S: Fallback feature enabled: The state of the relay can be controlled via a bit of OL1R (refer to the communication parameter addresses file). If an error is detected, the output is disabled.

NOTE: If an error is detected, the process applied on the output (e.g. delays, active level) remains applied.

[No] n o: Fallback feature disabled: When the output is assigned, the state of the output is defined according to its assignment. When the corresponding output is not assigned, the state of the output can be controlled via a bit of OL1R (refer to the communication parameter addresses file). If a error is detected, the output remains unchanged.

[DQ1 configuration] dO1 —

Use of analog output AO1 as a logic output

Analog output AO1 can be used as a logic output, by assigning DO1. In this case, when set to 0, this output corresponds to the AO1 min. value (0 V, or 0 mA for example), and when set to 1 to the AO1 max. value (10 V, or 20 mA for example). The electrical characteristics of this analog output remain unchanged. As these characteristics are different from logic output characteristics, check that it is still compatible with the intended application.

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ I_O ➡ dO1

Parameters list

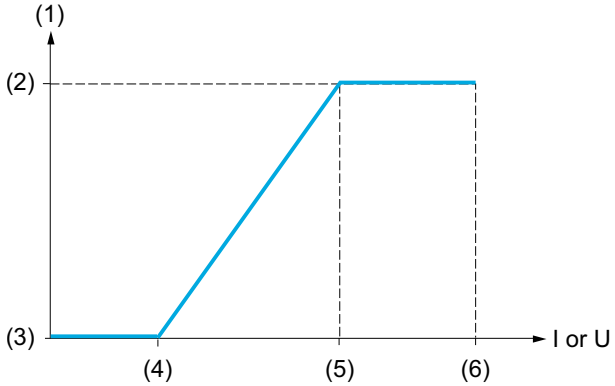
HMI label	Settings	Factory setting
[DQ1 configuration] dO1 —		
[DQ1 Assignment] dO1	—	**[No]** nO
DQ1 assignment Identical to **[R1 Assignment]** r1 with the addition following parameter value (shown for information only as these selections can only be configured in the **[Application function]** FUn — menu: • **[Sync wobble]** tSY: ***Sync wobble***, "Counter wobble" synchronization		
[DQ1 Delay time] dO1d	0 to 60,000 ms (1)	0 ms
DQ1 delay time The delay cannot be set for the **[No drive flt] FLt** assignment, and remains at 0. The change in state only takes effect after the configured time has elapsed, when the information becomes true.		
[DQ1 Active at] dO1S	-	**[1] POS**
DQ1 active level Configuration of the operating logic: • **[High Level]** POS: ***High level***, state 1 when the information is true • **[Low Level]** nEG: ***Low level***, state 0 when the information is true The configuration **[High Level]** POS cannot be modified for the **[No drive flt] FLt** assignment.		
[DQ1 Holding time] dO1H	0 to 9,999 ms	0 ms
DQ1 holding time The holding time cannot be set for the **[No drive flt] FLt** assignment, and remains at 0. The change in state only takes effect after the configured time has elapsed, when the information becomes false.		

(1) 0 to 9,999 ms then 10.00 to 60.00 s on the integrated display terminal.

Configuration of analog output

Minimum and maximum values (output values):

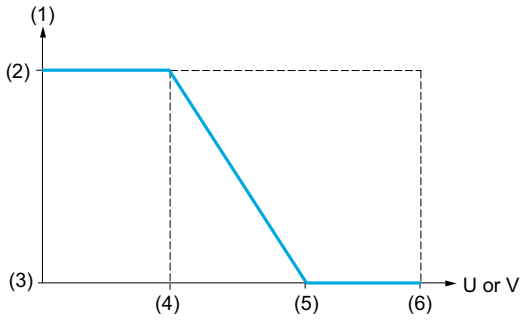
The minimum output value, in volts, corresponds to the lower limit of the assigned parameter and the maximum value corresponds to its upper limit. The minimum value may be greater than the maximum value.



1. Parameter assigned
2. Upper limit
3. Lower limit
4. **[Min Output]** AOLx or UOLx
5. **[Max Output]** AOHx or UOHx
6. 20 mA or 10V

I: Current

U: Voltage



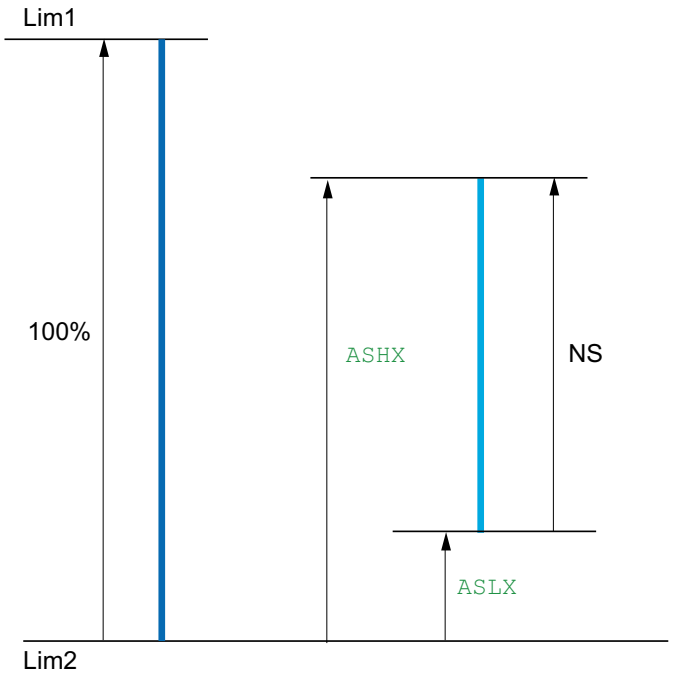
1. Parameter assigned
2. Upper limit
3. Lower limit
4. **[Max Output]** AOHx or UOHx
5. **[Min Output]** AOLx or UOLx
6. 20 mA or 10V

Scaling of the assigned parameter

The scale of the assigned parameter can be adapted in accordance with requirements by modifying the values of the lower and upper limits by means of two parameters for each analog output.

These parameters are given in %. 100% corresponds to the total variation range of the configured parameter, so: 100% = upper limit - lower limit For example, **[Sign. Torque]** STQ which varies between -3 and +3 times the rated torque, 100% corresponds to 6 times the rated torque.

- The **[Scaling AQx Min]** ASLX parameter modifies the lower limit: new value = lower limit + (range x ASLx). The value 0% (factory setting) does not modify the lower limit.
- The **[Scaling AQx Max]** ASHX parameter modifies the upper limit: new value = lower limit + (range x ASLx). The value 100% (factory setting) does not modify the upper limit.
- **[Scaling AQx Min]** ASLX must always be lower than **[Scaling AQx Max]** ASHX.



Lower limit of the assigned parameter

Lim1: Upper limit of the assigned parameter

Lim2: Lower limit of the assigned parameter

NS: New scale

Application example 2

The value of the motor current at the AO1 output is to be transferred with 0 - 20 mA, range 2 In motor, In motor being the equivalent of a 0.8 In drive.

The **[Motor Current]** oCr parameter varies between 0 and 2 times the rated drive current, or a range of 2.5 times the rated drive current.

[Scaling AQ1 Min] ASL1 must not modify the lower limit, which therefore remains at its factory setting of 0%.

[Scaling AQ1 Max] ASH1 must modify the upper limit by 0.5x the rated motor torque, or 100 - 100/5 = 80% (new value = lower limit + (range x ASH1).

[AQ1 configuration] AO1 —

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ I_O ➡ AO1

Parameters list

HMI label	Settings	Factory setting
[AQ1 configuration] AO1 —		
[AQ1 assignment] AO1	—	**[No]** nO

AQ1 assignment

- **[No]** nO: ***No***, not assigned. In this case, the output can be controlled via the internal parameter AO1R (refer to the communication parameter addresses file). By default, if an error (such as a communication interruption) is detected, the output remains unchanged. Use the parameter **[Enable AQ1 fallback]** AOF1 to disable the output in case of error detection.
- **[Motor Current]** oCr : ***Motor current***, between 0 and 2 In (In = rated drive current indicated in the Installation manual and on the drive nameplate)
- **[Motor Frequency]** oFr : ***Motor frequency***, from 0 to **[Max Frequency]** tFr
- **[Sig. O/P Frq.]** oFS : ***Signed output frequency***, between - **[Max Frequency]** tFr and + **[Max Frequency]** tFr
- **[Ramp Out.]** orP : ***Ramp output***, from 0 to **[Max Frequency]** tFr
- **[Motor Torq.]** tr9 : ***Motor torque***, between 0 and 3 times the rated motor torque
- **[Sign. Torque]** St9 : ***Signed torque***, between -3 and +3 times the rated motor torque. The + sign corresponds to the motor mode and the - sign to the generator mode (braking).
- **[sign Ramp]** orS : ***Signed ramp***, between - **[Max Frequency]** tFr and + **[Max Frequency]** tFr .
- **[PID Ref.]** oPS : ***PID reference*** between **[Min PID Process]** PIP1 and **[Max PID Process]** PIP2 .
- **[PID Feedbk]** oPF : ***PID feedback*** between **[Min PID feedback]** PIF1 and **[Max PID feedback]** PIF2
- **[PID Error]** oPE : ***PID error*** between- 5 % and + 5 % of **[Max PID feedback]** PIF2 - **[Min PID feedback]** PIF1
- **[PID Output]** oP1 : ***PID output*** between **[Low Speed]** LSP and **[High Speed]** HSP
- **[Mot Mech Pwr %]** oPr : ***Motor power in %***, between 0 and 2.5 times **[Nominal Motor Power]** nPr
- **[Motor volt.]** uoP : ***Motor voltage***, between 0 and **[Nom Motor Voltage]** unS
- **[Mot Thermal]** tHr : ***Motor thermal state***, between 0 and 200% of the rated thermal state
- **[Mot Therm2]** tHr2 : ***Motor thermal 2 state***, between 0 and 200 % of the rated thermal state
- **[Mot Therm3]** tHr3 : ***Motor thermal 3 state***, between 0 and 200 % of the rated thermal state
- **[Drv Thermal]** tHd : ***Drive thermal state***, between 0 and 200% of the rated thermal state
- **[Torque Lim.]** t9L : ***Torque limit***, between 0 and 3 times the rated motor torque
- **[DQ1]** do1 : ***Digital output 1***, assignment to a logic output. This assignment can only appear if **[DQ1 Assignment]** do1 has been assigned. This is the only possible choice in this case, and is only displayed for informational purposes.
- **[Torque 4Q]** t9nS : ***Master / slave torque***, between -3 and +3 times the rated motor torque. The + sign and the - sign correspond to the physical direction of the torque, regardless of mode (motor or generator).
- **[Free PID 1 Out Assign]** CPo1 : ***OA01***, free PID 1 output assignment
- **[OA01]** oA01 : ***OA01***, function blocks: Analog Output 01

...

- **[OA10]** oA10 : ***OA10***, function blocks: Analog Output 10

HMI label	Settings	Factory setting
[AQ1 Type] AO 1t	—	**[Current]** 0A
AQ1 Type • **[Voltage]** 10U: ***Voltage*** • **[Current]** 0A: ***Current***		
[AQ1 min output] AOL 1 ★	0 to 20.0 mA	0 mA
AQ1 min output value This parameter can be accessed if **[AQ1 Type]** AO 1t is set to **[Current]** 0A.		
[AQ1 max output] AOH 1 ★	0 to 20.0 mA	20.0 mA
AQ1 max output value This parameter can be accessed if **[AQ1 Type]** AO 1t is set to **[Current]** 0A.		
[AQ1 min Output] UOL 1 ★	0 to 10.0 V	0 V
AQ1 minimum output This parameter can be accessed if **[AQ1 Type]** AO 1t is set to **[Voltage]** 10U.		
[AQ1 max Output] UOH 1 ★	0 to 10.0 V	10.0 V
AQ1 maximum output This parameter can be accessed if **[AQ1 Type]** AO 1t is set to **[Voltage]** 10U.		
[Scaling AQ1 Min] ASL 1	0 to 100.0%	0%
Scaling AQ1 min, scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.		
[Scaling AQ1 Max] ASH 1	0 to 100.0%	100.0%
Scaling AQ1 max, scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.		
[AQ1 Filter] AO 1F	0 to 10.00 s	0 s
AQ1 filter, interference filtering. This parameter is forced to 0 if **[AQ1 assignment]** AO 1 is set to **[DQ1]** dO 1.		

HMI label	Settings	Factory setting
[Enable AQ1 fallback] AOFI	—	**[No]** NO

Enable AQ1 fallback
If the output is controlled by fieldbus and has been enabled, transition to operating state Fault such as, but not limited to, communication interruption, will not disable the output if this parameter is set to **[No]** NO .

⚠WARNING

LOSS OF CONTROL

- Verify that using this default setting does not result in unsafe conditions including communication interruption.
- Set this parameter to **[Yes]** YES to disable the output if an error is triggered.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This parameter is forced to **[No]** NO if **[AQ1 assignment]** AO1 is set to a value different from **[No]** NO.

[Yes] YES: Fallback feature enabled: The state of the relay can be controlled via a bit of AO1R (refer to the communication parameter addresses file). If an error is detected, the output is disabled.

NOTE: If an error is detected, the process applied on the output (e.g. delays, active level) remains applied.

[No] NO: Fallback feature disabled: When the output is assigned, the state of the output is defined according to its assignment. When the corresponding output is not assigned, the state of the output can be controlled via a bit of AO1R (refer to the communication parameter addresses file). If a error is detected, the output remains unchanged..

The following submenus group the alarms into 1 to 3 groups, each of which can be assigned to a relay or a logic output for remote signaling. These groups can also be displayed on the graphic display terminal (see **[3.3] [MONITORING CONFIG.]** MCF — menu , page 340) and viewed via the **[1.2] [MONITORING]** MON — menu 1.2 **[MONITORING]** MON-, page 43.

When one or a number of alarms selected in a group occurs, this alarm group is activated.

HMI label	Settings	Factory setting
[Warn grp 1 definition] A1C —		

Selection to be made from the following list:

- **[DI6=PTC Warning]** PLA: ***DI6=PTC warning***
- **[Ext Error Warn]** EFA: ***External error warning***
- **[UnderV Warn]** USA: ***Undervoltage warning***
- **[Cur Thd Reached]** CTA: ***Current threshold reached*** **[High Current Thd]** CTD
- **[Mot Freq High Thd]** FTA: ***Motor frequency high threshold reached*** **[Motor Freq Thd]** FTD
- **[Mot Freq High Thd 2]** F2A): ***Motor frequency high threshold 2 reached*** **[Freq. threshold 2]** F2D
- **[Ref Freq Reached]** SRA: ***Reference frequency reached***
- **[Motor Th Thd reached]** TSA: ***Motor thermal threshold reached***
- **[Mot2 Th Thd reached]** TS2: ***Motor 2 thermal threshold reached***
- **[Mot3 Th Thd reached]** TS3: ***Motor 3 thermal threshold reached***
- **[Preventive UnderV Active]** UPA: ***Preventive undervoltage active***
- **[High Speed Reached]** FLA: ***High speed reached***
- **[Device Th Warn]** THA: ***Device thermal state warning***
- **[PID error Warning]** PEE: ***PID error warning***
- **[PID Fdbk Warn]** PFA: ***PID feedback warning***
- **[AI3 4-20 Warning]** AP3: ***AI3 4-20 Loss warning***
- **[Lim T/I Reached]** SSA): ***Limit torque / I reached***

HMI label	Settings	Factory setting
• **[Dev Th reached]** t A d: ***Device thermal threshold reached*** • **[Th Junction Warn]** t J A: ***Thermal junction warning*** • **[Proc Undld Warn]** u L A: ***Process underload warning*** • **[Proc Overload Warn]** o L A: ***Process overload warning*** • **[High Torque Warn]** t t H A: ***High torque warning*** **[High torque thd.]** t t H . • **[Low Torque Warn]** t t L A: ***Low torque warning*** **[Low torque thd.]** t t L . • **[Pulse Warn Thd Reached]** F 9 L A: ***Pulse warning threshold reached***: **[Pulse warning thd.]** F 9 L . See the multiple selection procedure Description of the HMI, page 29 for the integrated display terminal, and the graphic display terminal .		
[Warn grp 2 definition] A 2 C —		
Identical to **[Warn grp 1 definition]** A 1 C — .		
[Warn grp 3 definition] A 3 C —		
Identical to **[Warn grp 1 definition]** A 1 C — .		

1.3.4.5 [Full] F u L L – – [Command] C t L —

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[Command] C t L – parameters list..... 174

Command and reference channels

Command and reference channels

The parameters in the **[Command]** C t L — menu can only be modified when the drive is stopped and no run command is present.

Run commands (forward, reverse, stop, etc.) and references can be sent using the following channels:

Command	Reference
Terminals: logic inputs LI or analog inputs used as logic inputs LA Function blocks Remote display terminal Graphic display terminal Integrated Modbus Communication module	Terminals: analog inputs AI, pulse input Function blocks Remote display terminal Graphic display terminal Integrated Modbus Communication module +/- speed via the terminals +/- speed via the graphic display terminal

If analog inputs are configured as digital inputs, the original configuration as analog inputs is not automatically removed.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that the configuration of an input as analog input is removed before configuring the affected input as a digital input.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: [LA1] LA1 and **[LA2] LA2**can be used as 2 logic inputs in source mode only.

- + 24 V power supply (max. 30 V)
- State 0 if < 7.5 V, state 1 if > 8.5 V

NOTE: The stop keys on the graphic display terminal or remote display can be programmed as non-priority keys. A stop key can only have priority if the **[Stop Key Enable]** P S t parameter in the **[Command]** C t L — menu **[Command]** C t L – parameters list, page 174 is set to **[Yes]** Y E S.

The behavior of the ATH230 can be adapted according to requirements:

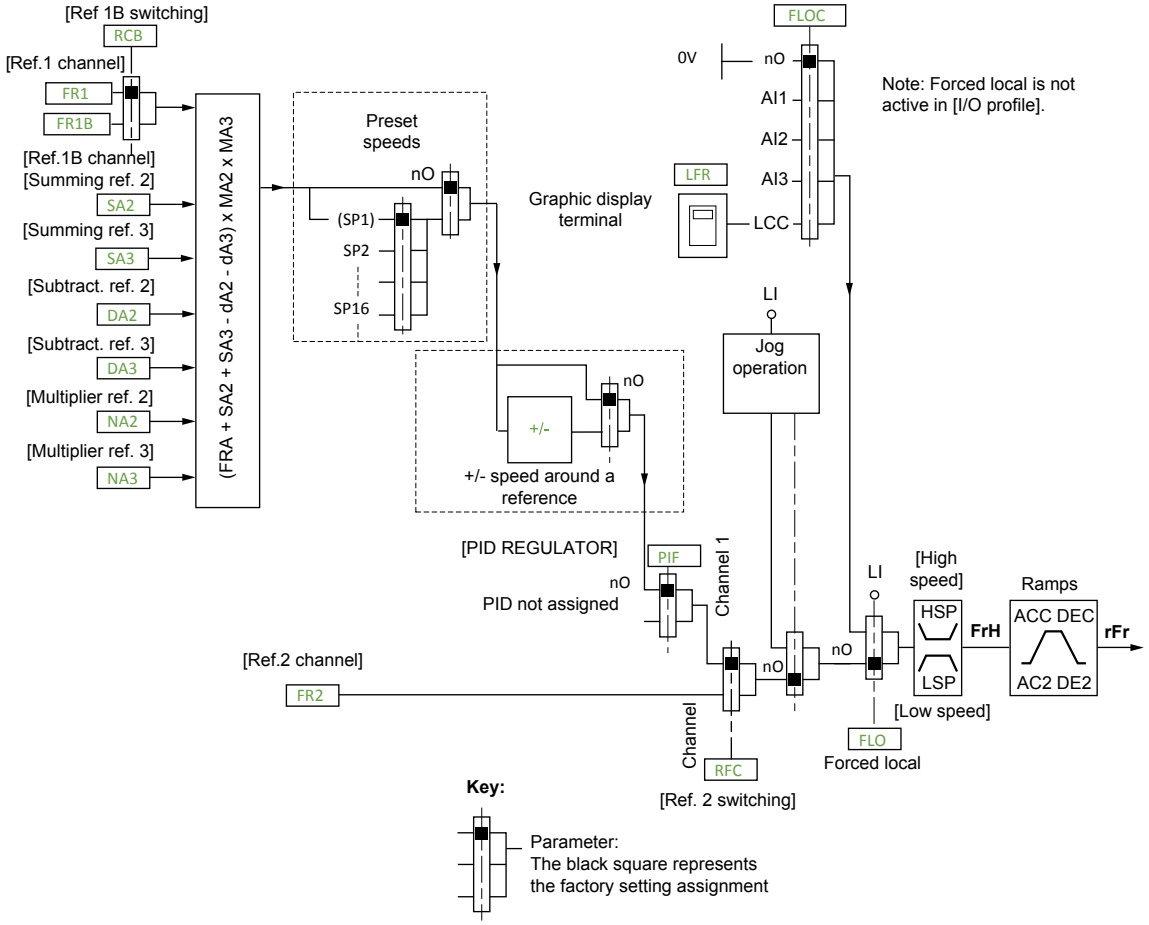
- **[Not separ.]** S i M: Command and reference are sent via the same channel.
- **[Separate]** S E P: Command and reference may be sent via different channels.

In these configurations, control via the communication bus is performed in accordance with the DRIVECOM standard with only 5 freely-assignable bits (see Communication Parameters Manual). The application functions cannot be accessed via the communication interface.

- **[I/O profile]** i o: The command and the reference can come from different channels. This configuration both simplifies and extends use via the communication interface. Commands may be sent via the logic inputs on the terminals or via the communication bus. When commands are sent via a bus, they are available on a word, which acts as virtual terminals containing only logic inputs. Application functions can be assigned to the bits in this word. More than one function can be assigned to the same bit.

  NOTE: Stop commands from the graphic display terminal or remote display terminal remain active even if the terminals are not the active command channel.

Reference channel for [Not separ.] SIM, [Separate] SEP and [I/O profile] IO configurations, PID not configured



[Ref Freq 1 Config] Fr1, **[Summing Input 2]** SA2, **[Summing Input 3]** SA3, **[Subtract Ref Freq 2]** dA2, **[Subtract Ref Freq 3]** dA3, **[Ref Freq 2 Multiply]** MA2, **[Ref Freq 3 Multiply]** MA3:

- Terminals, graphic display terminal, integrated Modbus, communication module

[Ref.1B channel] Fr1b, for **[Separate]** SEP and **[I/O profile]** IO:

- Terminals, graphic display terminal, integrated Modbus, communication module

[Ref.1B channel] Fr1b, for **[Not separ.]** SIM:

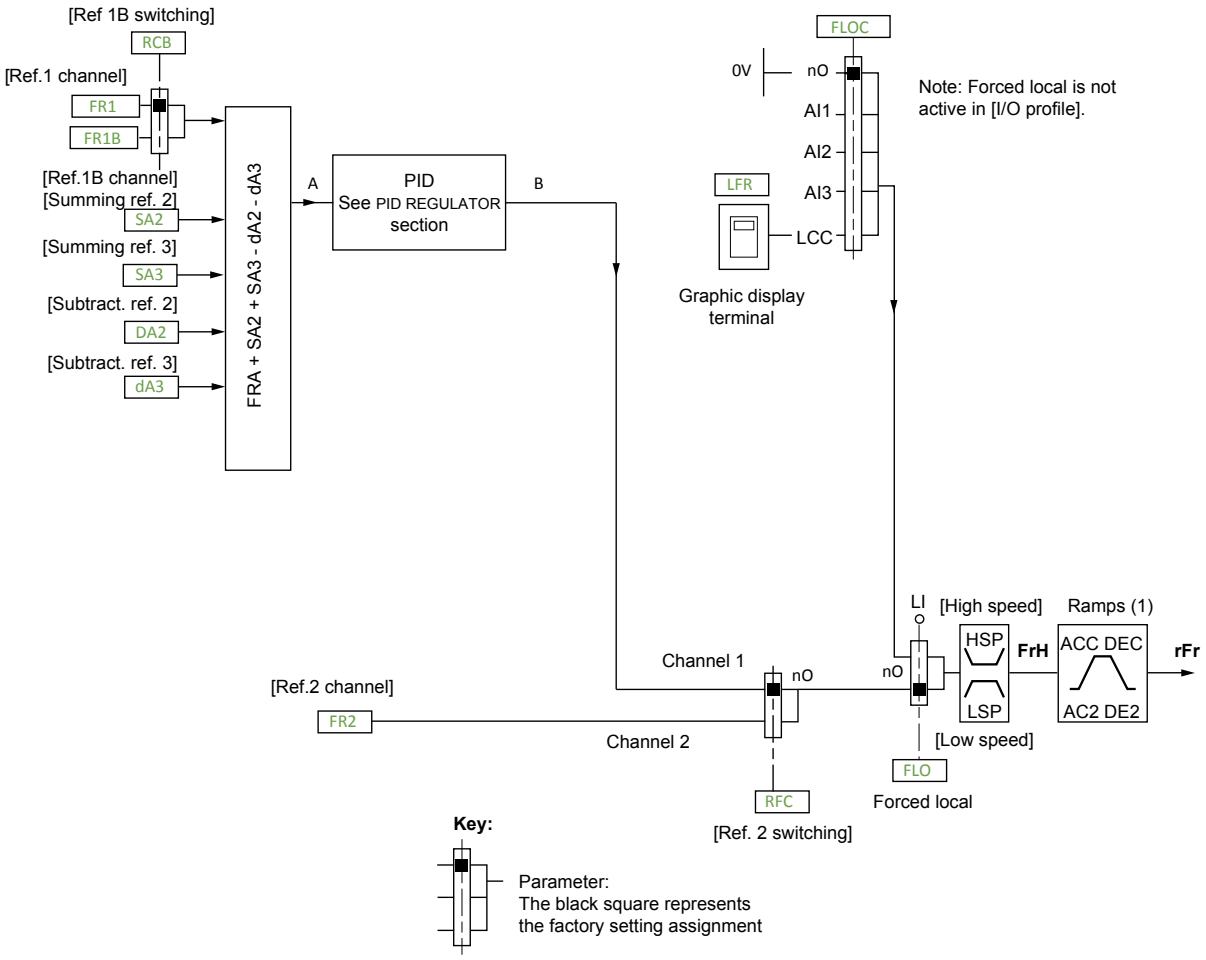
- Terminals, only accessible if **[Ref Freq 1 Config]** Fr1 = terminals

[Ref Freq 2 Config] Fr2:

- Terminals, graphic display terminal, integrated Modbus, communication module, and +/- speed

NOTE: [Ref.1B channel] Fr1b and **[Ref 1B switching]** rCb must be configured in the **[Application function]** Fun — menu.

Reference channel for [Not separ.] SIM, [Separate] SEP and [I/O profile] IO configurations, PID configured with PID references at the terminals



(1) Ramps not active if the PID function is active in automatic mode.

[Ref Freq 1 Config] Fr1:

- Terminals, graphic display terminal, integrated Modbus, communication module

[Ref.1B channel] Fr1b, for **[Separate]** SEP and **[I/O profile]** IO:

- Terminals, graphic display terminal, integrated Modbus, communication module

[Ref.1B channel] Fr1b, for **[Not separ.]** SIM:

- Terminals, only accessible if **[Ref Freq 1 Config]** Fr1 = terminals

[Summing Input 2] SA2, **[Summing Input 3]** SA3, **[Subtract Ref Freq 2]** dA2, **[Subtract Ref Freq 3]** dA3:

- Terminals only

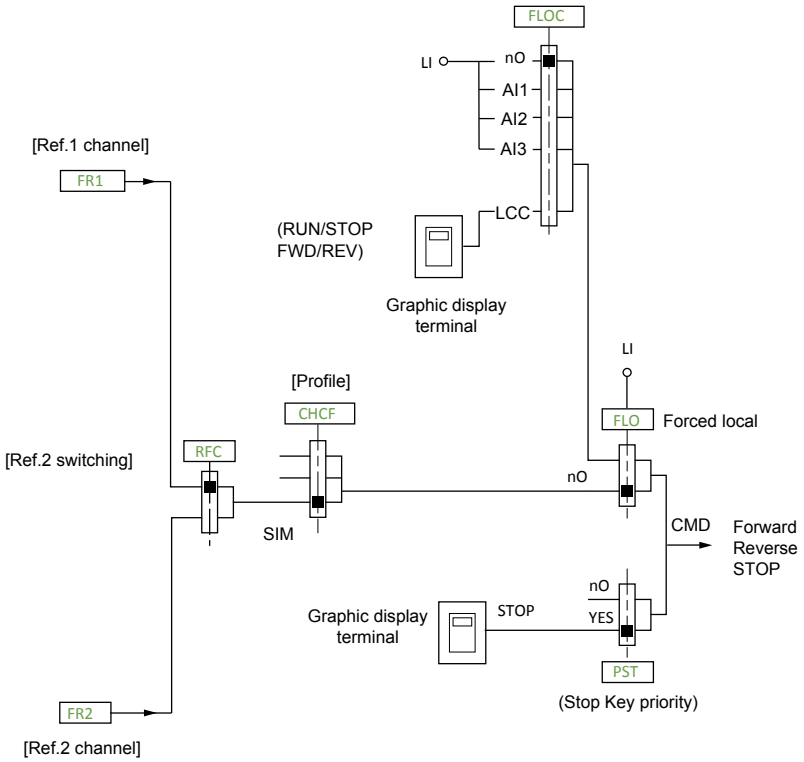
[Ref Freq 2 Config] Fr2:

- Terminals, graphic display terminal, integrated Modbus, communication module, and +/- speed

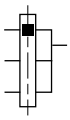
  NOTE: [Ref.1B channel] Fr1b and **[Ref 1B switching]** rCb must be configured in the **[Application function]** Fun — menu.

Command channel for [Not separ.] S i n configuration

Reference and command, not separate
The command channel is determined by the reference channel. Parameters **[Ref Freq 1 Config]** F r 1, **[Ref Freq 2 Config]** F r 2, **[Freq Switch Assign]** r F C, **[Forced Local Assign]** F L o and **[Forced Local Chan]** F L o C are common to reference and command.
Example: If the reference is **[Ref Freq 1 Config]** F r 1 = **[AI1]** A i 1 (analog input at the terminals), control is via **[DI NST Fwheel]** L i (logic input at the terminals).



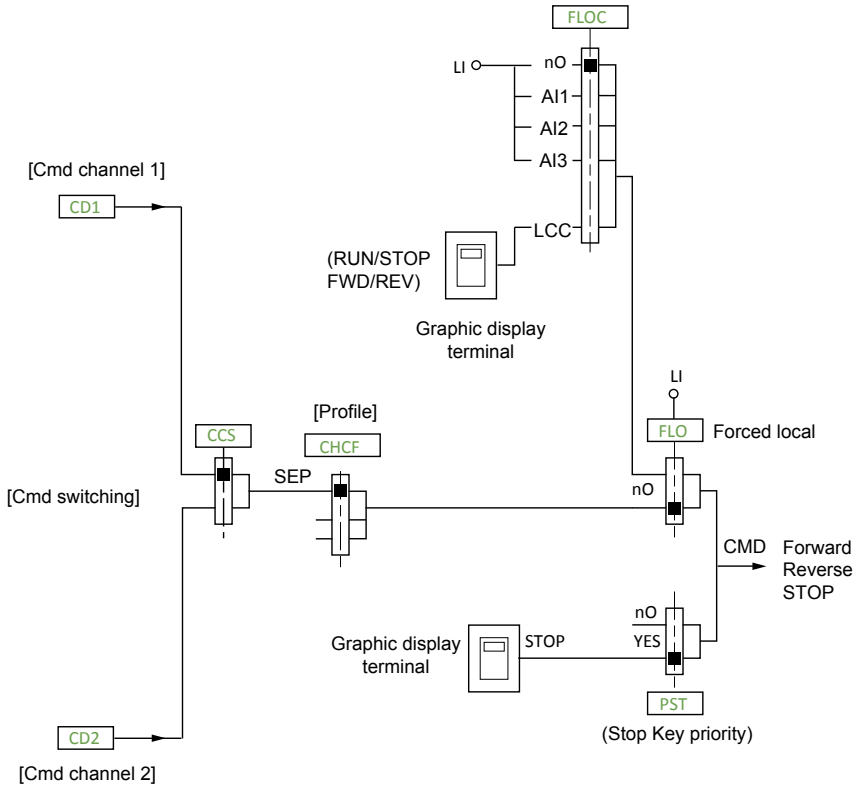
Key:



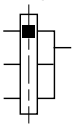
Parameter:
The black square represents the factory setting assignment

Command channel for [Separate] SEP configuration

Separate reference and command
Parameters **[Forced Local Assign]** FLO and **[Forced Local Chan]** FLOC are common to reference and command.
Example: If the reference is in forced local mode via **[AI1]** AI1 (analog input at the terminals), command in forced local mode is via **[DI NST Fwheel]** LI1 (logic input at the terminals).
The command channels **[Cmd channel 1]** Cd1 and **[Cmd channel 2]** Cd2 are independent of the reference channels **[Ref Freq 1 Config]** Fr1, **[Ref.1B channel]** Fr1b and **[Ref Freq 2 Config]** Fr2.



Key:



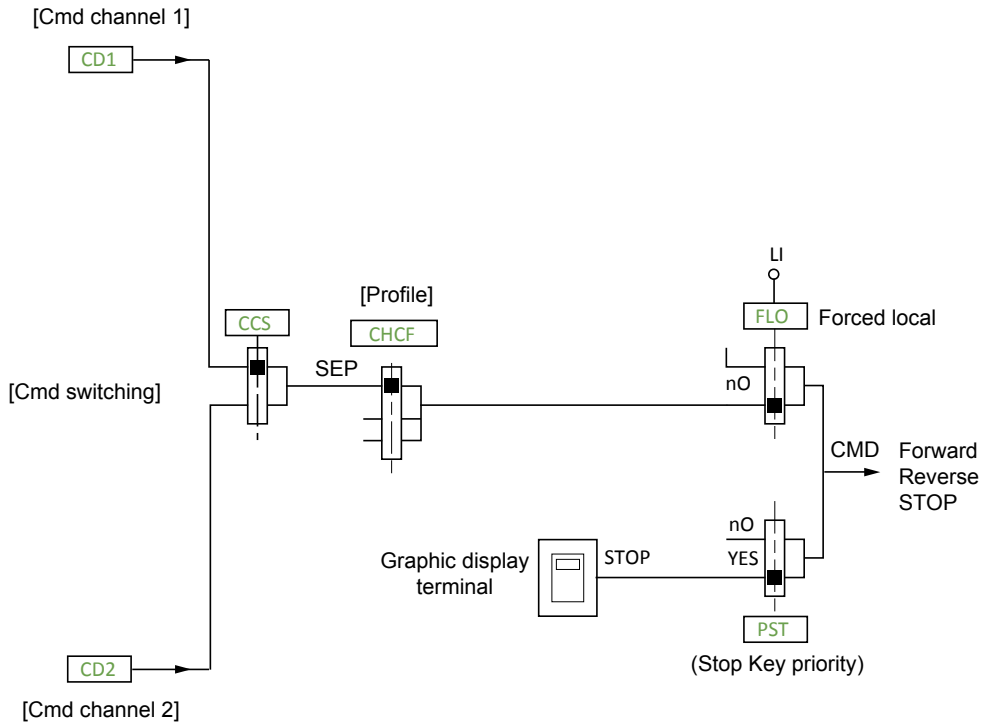
Parameter:
The black square represents the factory setting assignment, except for [Profile].

[Cmd channel 1] Cd1 **[Cmd channel 2]** Cd2:

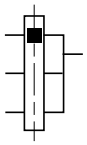
- Terminals, graphic display terminal, integrated Modbus, communication module

Command channel for [I/O profile] I O configuration

Separate reference and command, as in **[Separate]** S E P configuration
The command channels **[Cmd channel 1]** C d 1 and **[Cmd channel 2]** C d 2 are independent of the reference channels **[Ref Freq 1 Config]** F r 1, **[Ref.1B channel]** F r 1b and **[Ref Freq 2 Config]** F r 2.



Key:



Parameter:
The black square represents the factory setting assignment, except for [Profile].

[Cmd channel 1] C d 1 **[Cmd channel 2]** C d 2:

- Terminals, graphic display terminal, integrated Modbus, communication module

A command or an action can be assigned:

- To a fixed channel by selecting an **[DI NST Fwheel]** L I input or a Cxxx bit:
  - By selecting, for example, **[DI3]** L I 3, this action is triggered by **[DI3]** L I 3 regardless of which command channel is switched.
- To a switchable channel by selecting a CDxx bit:
  - By selecting, for example, **[CD11]** C d 1 1, this action is triggered by:
    [DI12] L I 12 if the terminals channel is active
    [C111] C 1 1 1 if the integrated Modbus channel is active
    [C311] C 3 1 1 if the communication module channel is active

If the active channel is the graphic display terminal, the functions and commands assigned to CDxx switchable internal bits are inactive.

NOTE: [CD06] C d 0 6 to **[CD13]** C d 1 3 can only be used for switching between 2 networks. They do not have equivalent logic inputs.

Terminals	Integrated Modbus	Communication module	Internal bit, can be switched
			CD00
LI2 (1)	C101 (1)	C301 (1)	CD01
LI3	C102	C302	CD02
LI4	C103	C303	CD03
LI5	C104	C304	CD04
LI6	C105	C305	CD05
-	C106	C306	CD06
-	C107	C307	CD07
-	C108	C308	CD08
-	C109	C309	CD09
-	C110	C310	CD10
-	C111	C311	CD11
-	C112	C312	CD12
LAI1	C113	C313	CD13
LAI2	C114	C314	CD14
-	C115	C315	CD15
OL01 to OL10			

(1) If **[2/3-Wire Control]** tCC , page 90 is set to **[3-Wire Control]** 3C, **[DI2]** LI2, **[C101]** C101and **[C301]** C301 cannot be accessed.

Assignment conditions for logic inputs and control bits

The following elements are available for every command or function that can be assigned to a logic input or a control bit:

[DI1] LI1 to **[DI6]** LI6	Logical inputs
[DAI1] LAI1 to **[DAI2]** LAI2	Virtual logic input
[C101] C101 to **[C110]** C110	With integrated **Modbus** in **[I/O profile]** IO configuration
[C111] C111 to **[C115]** C115	With integrated **Modbus** regardless of configuration
[C301] C301 to **[C310]** C310	With a **communication module** in **[I/O profile]** IO configuration
[C311] C311 to **[C315]** C315	With a **communication module** regardless of configuration
[CD00] CD00 to **[CD10]** CD10	In **[I/O profile]** IO configuration
[CD11] CD11 to **[CD15]** CD15	Regardless of configuration
[OL01] OL01 to **[OL10]** OL10	Regardless of configuration

NOTE: In **[I/O profile]** IO configuration, **[DI1]** LI1 cannot be accessed and if **[2/3-Wire Control]** tCC , page 90 is set to **[3-Wire Control]** 3C, **[DI2]** LI2, **[C101]** C101and **[C301]** C301 cannot be accessed either.

[Command] CTL – parameters list

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ CTL

Parameters list

HMI label	Settings	Factory setting
[Ref Freq Ch 1] Fr1	—	**[AI1]** AI1
Reference frequency channel 1 • **[AI1]** AI1: ***AI1***, analog input A1 • **[AI2]** AI2: ***AI2***, analog input A2 • **[AI3]** AI3: ***AI3***, analog input A3 • **[HMI]** LCC: ***Local HMI***, graphic display terminal or remote display terminal source • **[Modbus]** Mdb: ***Modbus communication*** • **[Com. Module]** nET: ***Ext. communication module*** • **[RP]** P1: ***Pulse input*** • **[AI Virtual 1]** AIV1: Virtual analog input 1 with the jog dial (only available if **[Profile]** CHCF is not set to **[Not separ.]** SIM • **[OA01]** oAO1: ***OA01***, function blocks: Analog Output 01 ... • **[OA10]** oA10: ***OA10***, function blocks: Analog Output 10		
[Reverse Disable] r1n	—	**[No]** no
Reverse direction disable Inhibition of movement in reverse direction, does not apply to direction requests sent by logic inputs. Reverse direction requests sent by logic inputs are taken into account. Reverse direction requests sent by the graphic display terminal are not taken into account. Reverse direction requests sent by the fieldbus are not taken into account. Any reverse speed reference originating from the PID, summing input, etc., is interpreted as a zero reference (0 Hz). • **[No]** no • **[Yes]** YES		
[Stop Key Enable] PSt 2 s	—	**[Yes]** YES
Stop key enable Setting this function to No disables the Stop key of the Plain Text Display Terminal if the setting of the parameter **[Command Channel]** CMDC is not **[HMI]** LCC. **⚠WARNING** **LOSS OF CONTROL** Only set this parameter to **[Stop Key No Priority]** NO if you have implemented appropriate alternative stop functions. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**		

HMI label	Settings	Factory setting
This is a freewheel stop. If the active command channel is the graphic display terminal, the stop is performed according to the **[Type of stop]** Stt irrespective of the configuration of **[Stop Key Enable]** PSt. • **[No]** no • **[Yes]** YES: Gives priority to the STOP key on the graphic display terminal when the graphic display terminal is not enabled as the command channel.		
[Profile] CHCF 2 s	—	**[Not separ.]** SIM
Channel mode config.		

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

Disabling **[I/O profile]** IO resets the device to the factory settings.

- Verify that restoring the factory settings is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

- **[Not separ.]** SIM: ***Combined channel mode***, reference and command, not separate
- **[Separate]** SEP: ***Separated channel mode***, separate reference and command. This assignment cannot be accessed in **[I/O profile]** Io.
- **[I/O profile]** Io: ***I/O mode***

[Command Switching] CCS ★	—	**[Cmd Channel 1]** Cd1
Command switching		

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example, inversion of the direction of rotation of the motor, sudden acceleration or stops.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This parameter can be accessed if **[Profile]** CHCF is set to **[Separate]** SEP or **[I/O profile]** Io.

If the assigned input or bit is at 0, channel **[Cmd Channel 1]** Cd1 is active.

If the assigned input or bit is at 1, channel **[Cmd Channel 2]** Cd2 is active.

If **[I/O profile]** Io is set to **[Not separ.]** SIM, only **[Cmd Channel 1]** Cd1 setting value is possible.

[Cmd Channel 1] Cd1: **[Cmd Channel 1]** Cd1 active (no switching)

[Cmd Channel 2] Cd2: **[Cmd Channel 2]** Cd2 active (no switching)

[DI1] LI1: Logical input LI1

[...] (...): See the assignment conditions (not **[CD00]** Cd00 to **[CD15]** Cd15).For more informations see Assignment conditions for logic inputs and control bits, page 173.

[Cmd Channel 1] Cd1 ★	—	**[Terminal]** tEr
Command channel 1		

This parameter can be accessed if **[Profile]** CHCF is set to **[Separate]** SEP or **[I/O profile]** Io.

- **[Terminal]** tEr: ***Terminal***
- **[HMI]** LCC: ***Local HMI***, graphic display terminal or remote display terminal

HMI label	Settings	Factory setting
• **[Modbus]** n d b: ***Modbus communication*** • **[Com. Module]** n E t: ***Ext. communication module***		
[Cmd Channel 2] C d 2 ★	—	**[Modbus]** n d b
Command channel 2 This parameter can be accessed if **[Profile]** C H C F is set to **[Separate]** S E P or **[I/O profile]** i o. • **[Terminal]** t E r: ***Terminal*** • **[HMI]** L C C: ***Local HMI***, graphic display terminal or remote display terminal • **[Modbus]** n d b: ***Modbus communication*** • **[Com. Module]** n E t: ***Ext. communication module***		
[Ref Freq 2 switching] r F C	—	**[Ref Freq Ch 1]** F r 1
Reference frequency 2 switching **⚠WARNING** **UNANTICIPATED EQUIPMENT OPERATION** This parameter can cause unintended movements, for example, inversion of the direction of rotation of the motor, sudden acceleration or stops. • Verify that the setting of this parameter does not cause unintended movements. • Verify that the setting of this parameter does not result in unsafe conditions. **Failure to follow these instructions can result in death, serious injury, or equipment damage.** If the assigned input or bit is at 0, channel **[Cmd Channel 1]** C d 1 is active. If the assigned input or bit is at 1, channel **[Cmd Channel 2]** C d 2 is active. **[Ref Freq Ch 1]** F r 1: **[Cmd Channel 1]** C d 1 active (no switching) **[Ref Freq Ch 2]** F r 2: **[Cmd Channel 2]** C d 2 active (no switching) **[DI1]** L i 1: Logical input LI1 **[...] ...**: See the assignment conditions (not **[CD00]** C d 0 0 to **[CD15]** C d 1 5) For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[Ref Freq Ch 2] F r 2	—	**[No]** n o
Reference frequency channel 2 • **[No]** n o: ***No*** Not assigned. If **[Profile]** C H C F is set to **[Not separ.]** S i M, the command is at the terminals with a zero reference. If **[Profile]** C H C F is set to **[Separate]** S E P or **[I/O profile]** i o, the reference is zero. • **[AI1]** A i 1: ***AI1***, analog input A1 • **[AI2]** A i 2: ***AI2***, analog input A2 • **[AI3]** A i 3: ***AI3***, analog input A3 • **[+/-Speed] UPDT**: +/- speed command • **[HMI]** L C C: ***Local HMI***, graphic display terminal or remote display terminal • **[Modbus]** n d b: ***Modbus communication*** • **[Com. Module]** n E t: ***Ext. communication module*** • **[RP]** P i: ***Pulse input*** • **[AI Virtual 1]** A i V 1: ***AI Virtual 1***, virtual analog input 1 with the jog dial • **[OA01]** o A 0 1: ***OA01***, function blocks: Analog Output 01 ... • **[OA10]** o A 1 0: ***OA10***, function blocks: Analog Output 10		

HMI label	Settings	Factory setting
[Copy Ch1-Ch2] CoP 2 s	—	**[No]** no

Copy Ch.1-Ch.2

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example, inversion of the direction of rotation of the motor, sudden acceleration or stops.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Can be used to copy the current reference and/or the command by means of switching, to avoid speed surges, for example.

If **[Profile]** CHCF , page 175 is set to **[Not separ.]** SIM or **[Separate]** SEP, copying is possible from channel 1 to channel 2.

Copying is possible from channel 2 to channel 1 if **[Ref Freq Ch 2]** Fr2 is set to **[Ref Freq via DI]** uPdt or set to **[HMI]** LCC with **[+speed]** FuSP or **[-speed]** FdSP assigned to **[Function key 1]** Fn1 or.... **[Function key 4]** Fn4.

If **[Profile]** CHCF is set to **[I/O profile]** io, copying is possible in both directions.

A reference or a command cannot be copied to a channel on the terminals.

The reference copied is **[Pre-Ramp Ref Freq]** FrH (before ramp) unless the destination channel reference is set via +/- speed. In this case, the reference copied is **[Motor Frequency]** rFr (after ramp).

- **[No]** no: ***No***, No copy
- **[Reference Freq]** SP: ***Copy reference frequency***
- **[Command]** Cd: ***Copy command***
- **[Cmd + Ref Freq]** ALL: ***Copy command & reference frequency***

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

As the graphic display terminal may be selected as the command and/or reference channel, its action modes can be configured.

The parameters on this page can only be accessed on the graphic display terminal, and not on the integrated display terminal.

Comments:

- The display terminal command/reference is only active if the command and/or reference channels from the terminal are active with the exception of **[T/K]** FtK (command via the display terminal), which takes priority over these channels. Press **[T/K]** FtK (command via the display terminal) again to revert control to the selected channel.
- Command and reference via the display terminal are impossible if the latter is connected to more than one drive.
- The JOG, preset speed and +/- speed functions can only be accessed if **[Profile]** CHCF is set to **[Not separ.]** SIM.

- The preset PID reference functions can only be accessed if **[Profile]** CHCF is set to **[Not separ.]** SIM or **[Separate]** SEP.
- The **[T/K]** FtK (command via the display terminal) can be accessed regardless of the **[Profile]** CHCF.

HMI label	Settings	Factory setting
[Function key 1] Fn1	—	**[No]** no
Graphic display terminal function key 1 • **[No]** no: ***No***, not assigned • **[FW JOG]** FJOG): JOG operation • **[Preset Speed 1]** FPS1: ***Preset speed 1***, press the key to run the drive at the 2nd preset speed **[Preset speed 2]** SP2 . Press STOP to stop the drive. • **[Preset Speed 2]** FPS2: ***Preset speed 2***, press the key to run the drive at the 3rd preset speed **[Preset speed 3]** SP3 . Press STOP to stop the drive. • **[PID Ref Freq 1]** FPr1: ***PID reference frequency 1***, sets a PID reference equal to the 2nd preset PID reference **[Ref PID Preset 2]** rP2 , without sending a run command. Only operates if **[Ref Freq Ch 1]** Fr1 is set to **[HMI]** LCC . Does not operate with the **[T/K]** FtK function. • **[PID Ref Freq 2]** FPr2: ***PID reference frequency 2***, sets a PID reference equal to the 3rd preset PID reference **[Ref PID Preset 3]** rP3 , without sending a run command. Only operates if **[Ref Freq Ch 1]** Fr1 is set to **[HMI]** LCC . Does not operate with the **[T/K]** FtK function. • **[+speed]** FUSP: ***Increase speed***, only operates if **[Ref Freq Ch 2]** Fr2 is set to **[HMI]** LCC . Press the key to run the drive and increase the speed. Press STOP to stop the drive. • **[-speed]** FdSP: ***Decrease speed***, only operates if **[Ref Freq Ch 2]** Fr2 is set to **[HMI]** LCC and if a different key has been assigned to **[+ speed]**. Press the key to run the drive and decrease the speed. Press STOP to stop the drive. • **[T/K]** FtK : ***Terminal keypad***, command via the display terminal: Takes priority over **[Command Switching]** CCS and over **[Ref Freq 2 switching]** rFC .		
[Function key 2] Fn2	—	**[No]** no
Graphic display terminal function key 2 Identical to **[Function key 1]** Fn1 , page 178.		
[Function key 3] Fn3	—	**[No]** no
Graphic display terminal function key 3 Identical to **[Function key 1]** Fn1 , page 178.		
[Function key 4] Fn4	—	**[No]** no
Graphic display terminal function key 4 Identical to **[Function key 1]** Fn1 , page 178.		
[HMI L/R cmd] bMP ★	—	**[Stop]** StoP
HMI local/remote command When the **[T/K]** FtK function is assigned to a key and that function is active, this parameter defines the behavior at the moment when control returns to the graphic display terminal or remote display terminal. • **[Stop]** StoP: Stops the drive (although the controlled direction of operation and reference of the previous channel are copied (to be taken into account on the next RUN command)). • **[Bumpless]** bUMP: Does not stop the drive (the controlled direction of operation and the reference of the previous channel are copied)		

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

1.3.4.6 [Full] F u L L – – [Function Blocks] F b n –

What's in This Chapter

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[ADL Containers] F A d — 185
[FB Parameters] F b P — 186

[Monit. Fun. Blocks] n F b —

Access

Parameters described below can be accessed by: d r i ➡ C o n F ➡ F u L L ➡ F b n

Parameters list

HMI label	Settings	Factory setting
[Monit. Fun. Blocks] n F b —		
NOTE: This section shows only what is possible to do with local or remote display on the drive. For advanced configuration using PC software, please refer to the dedicated Function blocks manual.		
[FB Status] F b S t	—	—
FunctionBlock status • **[Not Active]** i d L E : ***Not active***, no binary file in the target, the FB is waiting for a download • **[Check prog.]** C H E C : ***Check program*** • **[Stop]** S t o P : ***Stop***, the function blocks application is stopped • **[Init]** i n i t : ***Init***, check coherency between ATV Logic program and Function blocks parameters • **[Run]** r u n : ***Run***, the function blocks application is running • **[Error]** E r r : ***Error***, an internal error has been detected. The Function blocks application is in detected error state mode.		
[FB Error] F b F t	—	—
FunctionBlock error • **[No]** n o : ***No***, no error detected • **[Internal]** i n t : ***Internal***, Internal detected error • **[Binary file]** b i n : ***Binary file***, binary file corrupted • **[Intern para.]** i n P : ***Internal parameters***, internal parameter detected error • **[Para. RW]** P A r : ***Parameter access on read or write***, parameter access detected error • **[Calculation]** C A L : ***Calculation***, calculation detected error • **[AUX TO]** t o A u : ***TimeOut AUX task*** • **[Synch TO]** t o P P : ***TimeOut in synchronous tasks*** • **[Bad ADLC]** A d L : ***ADLC with bad parameter*** • **[Input Assign]** i n : ***Inputs assignment***, input not configured		

(1) If a graphic display terminal is not in use, values greater than 9,999 is displayed on the 4-digit display with a period mark after the thousand digit, for example, 15.65 for 15,650.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[FB Identification] FBI —

Access

Parameters described below can be accessed by: DRI ➡ CONF ➡ FULL ➡ FBN

Parameters list

HMI label	Settings	Factory setting
[FB Identification] FBI —		
[Program version] BVER ★	0 to 255	—
Program version		
[Program size] BNS ★	0 to 65,535	—
Program size		
[Prg. format version] BNV	0 to 255	—
Program format version		
[Catalogue version] CTV	0 to 65,535	—
Catalogue version		
[FB Activation] FBCD	—	—
FunctionBlock activation Allows to start and stop the function blocks manually. • **[FB Activation]** FBCD is forced to **[Stop]** STOP if there is no valid function blocks application in the drive memory. • **[FB Activation]** FBCD is set to **[Start]** STRT when the function blocks application switch to Run according to **[FB Start Mode]** FBRN configuration. **NOTE:** As soon as the function blocks are started, the drive is considered as in running state and the modification of configuration parameters is no longer possible. • **[Stop]** STOP: Function blocks application Stop command • **[Start]** STRT: Function blocks application Start command		
[FB Start Mode] FBRN 2 s	—	**[No]** NO

FunctionBlock start mode

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

If this parameter is set to **[Yes]** YES, function blocks are immediately executed after the drive is powered on. This can result in immediate movements.

- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Allows to choose the different ways of starting the Function blocks application.

NOTE: Modifications of this parameter are not taken into account if the Function blocks application is running.

- **[No]** NO: ***No***, function blocks application is controlled by **[FB Activation]** FBCD parameter

HMI label	Settings	Factory setting
• **[Yes]** YES: ***Yes***, function blocks application switches to run automatically at drive power on • **[DI1]** LI1: ***Digital input 1***, function blocks application switches to run on a rising edge of the logic input. It switch to stop on falling edge of the logic input. • **[...] ...**: See the assignment conditions **[OL01]** OL01 up to **[OL10]** OL10 and **[CD00]** CD00 up to **[CD15]** CD15 are not available).For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[FB Motor Stop Type] FBSN	—	**[Freewheel Stop]** YES
Motor stop type on FunctionBlock stop **⚠WARNING** **LOSS OF CONTROL** If **[FB Motor Stop Type]** FBSM is set to **[Ignore]** NO, the motor continues to run as it ran before the function block application was stopped. • Only set this parameter to **[Ignore]** NO if you have implemented appropriate stop functions to achieve a safe standstill of the motor. **Failure to follow these instructions can result in death, serious injury, or equipment damage.** Allows to setup the way of working of the drive when function blocks are stopped. • **[Ignore]** NO: ***Ignore***, the drive does not stop • **[Freewheel Stop]** YES: ***Freewheel stop*** • **[Ramp stop]** RMP: ***Ramp stop*** • **[Fast stop]** FST: ***Fast stop*** • **[DC injection]** DCI: ***DC injection***		
[FB DriveError Resp] FBDF	—	**[Stop]** STOP
FunctionBlock response to drive error, behavior of function blocks when the drive trips. • **[Stop]** STOP: ***Stop***, function blocks stops when the drive trips, outputs are released • **[Ignore]** IGN: ***Ignore***, function blocks continue to work when the drive trips (except CFF and INFE)		

(1) If a graphic display terminal is not in use, values greater than 9,999 is displayed on the 4-digit display with a period mark after the thousand digit, for example, 15.65 for 15,650.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Input Assignments] FbA —

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ FbN

Parameters list

HMI label	Settings	Factory setting
[Input Assignments] FbA —		
[IL01 Assignment] IL01	—	**[No]** no
Function blocks logic input 01 assignment Identical to **[R1 Assignment]** r1 not **[Limit Switch Reached]** LSA with the addition of the following parameter values (shown for information only as these selections can only be configured in the **[Application function]** Fun — menu): • **[Yes]** YES: ***Yes*** • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[Logic input x assignment] IL--	—	**[No]** no
[Logic input x assignment] IL-- All the Function Blocks logic inputs available on the drive are processed as in the example for **[IL01 Assignment]** IL01 above, up to **[IL10 Assignment]** IL10.		
[IA01 Assignment] IA01	—	**[No]** no
Function blocks analog input 01 assignment Possible assignment for the Function block analog input. • **[No]** no: ***No*** • **[AI1]** AI1: ***AI1***, analog input A1 • **[AI2]** AI2: ***AI2***, analog input A2 • **[AI3]** AI3: ***AI3***, analog input A3 • **[Motor Current]** oCr: ***Motor current*** • **[Motor Frequency]** oFr: ***Motor frequency*** • **[Ramp Out.]** orP: ***Ramp output*** • **[Motor Torq.]** tr9: ***Motor torque*** • **[Sign. Torque]** St9: ***Signed torque*** • **[sign Ramp]** or5: ***Signed ramp*** • **[PID Ref.]** oPS: ***PID reference*** • **[PID Feedbk]** oPF: ***PID feedbk*** • **[PID Error]** oPE: ***PID error*** • **[PID Output]** oP1: ***PID output*** • **[Mot Mech Pwr %]** oPr: ***Motor power in %*** • **[Mot Thermal]** tHr: ***Motor thermal state*** • **[Drv Thermal]** tHd: ***Drive thermal state*** • **[Torque 4Q]** t9M5: ***Master / slave torque*** • **[Sig. O/P Frq.]** oF5: ***Signed output frequency***		

HMI label	Settings	Factory setting
• **[Mot Therm2]** t H r 2: ***Motor thermal 2 state*** • **[Mot Therm3]** t H r 3: ***Motor thermal 3 state*** • **[Motor volt.]** u o P: ***Motor voltage*** • **[RP]** P I: ***Pulse input*** • **[AI Virtual 1]** A I V 1: ***AI Virtual 1***, virtual analog input 1 with the jog dial • **[DQ1]** d o 1: ***Digital output 1***, analog/logical output DO1 • **[AI Virtual 2]** A I V 2: ***AI Virtual 2***, virtual analog input 2 by the communication bus • **[OA01]** (o A O 1: ***OA01***, function blocks: Analog Output 01 ... • **[OA10]** o A 1 0: ***OA10***, function blocks: Analog Output 10		
[Analog input x assignment] IA--	—	**[No]** n o
[Analog input x assignment] IA-- All the Function blocks analog inputs available on the drive are processed as in the example for **[IA01]** I A O 1 above, up to **[IA10]** I A 1 0.		

(1) If a graphic display terminal is not in use, values greater than 9,999 is displayed on the 4-digit display with a period mark after the thousand digit, for example, 15.65 for 15,650.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[ADL Containers] F A d —

Access

Parameters described below can be accessed by: d r ı ➡ C o n F ➡ F u L L ➡ F b M

Parameters list

HMI label	Settings	Factory setting
[ADL Containers] F A d —		
ADL containers contain Modbus logical address of internal parameters of the drive. If the chosen address is valid, the display shows the parameter name instead of the address.		
LA01	3,015 to 64,299	0
ADL Container 01		
LA02	3,015 to 64,299	0
ADL Container 02		
LA03	3,015 to 64,299	0
ADL Container 03		
LA04	3,015 to 64,299	0
ADL Container 04		
LA05	3,015 to 64,299	0
ADL Container 05		
LA06	3,015 to 64,299	0
ADL Container 06		
LA07	3,015 to 64,299	0
ADL Container 07		
LA08	3,015 to 64,299	0
ADL Container 08		

(1) If a graphic display terminal is not in use, values greater than 9,999 is displayed on the 4-digit display with a period mark after the thousand digit, for example, 15.65 for 15,650.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[FB Parameters] F b P —

Access

Parameters described below can be accessed by: d r ➜ C o n F ➜ F u L L ➜ F b n

Parameters list

HMI label	Settings	Factory setting
[FB Parameters] F b P —		
Internal parameters available for the user program.		
[M001 Parameter] n 0 0 1 (1)	0 to 65,535	0
Function blocks M001 parameter, M001 parameter saved in EEprom		
[M002 Parameter] n 0 0 2 (1)	0 to 65,535	0
Function blocks M002 parameter, M002 parameter saved in EEprom		
[M003 Parameter] n 0 0 3 (1)	0 to 65,535	0
Function blocks M003 parameter, M003 parameter saved in EEprom		
[M004 Parameter] n 0 0 4 (1)	0 to 65,535	0
Function blocks M004 parameter, M004 parameter saved in EEprom		
[M005 Parameter] n 0 0 5 (1)	0 to 65,535	0
Function blocks M005 parameter, M005 parameter written in RAM		
[M006 Parameter] n 0 0 6 (1)	0 to 65,535	0
Function blocks M006 parameter, M006 parameter written in RAM		
[M007 Parameter] n 0 0 7 (1)	0 to 65,535	0
Function blocks M007 parameter, M007 parameter written in RAM		
[M008 Parameter] n 0 0 8 (1)	0 to 65,535	0
Function blocks M008 parameter, M008 parameter written in RAM		

(1) If a graphic display terminal is not in use, values greater than 9,999 is displayed on the 4-digit display with a period mark after the thousand digit, for example, 15.65 for 15,650.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

1.3.4.7 [Full] FULL – – [Application function] FUN–

What's in This Chapter

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Summary of [Application function] FUN–

Summary of functions:

Code	Name
rEF —	**[Ref Freq switch]**
oAI —	**[Ref. operations]**
rPt —	**[Ramp switching]**
Stt —	**[Stop configuration]**
AdC —	**[Auto DC injection]**
JoG —	**[Jog]**
PSS —	**[Preset speeds]**
uPd —	**[+/- speed]**
SrE —	**[+/- speed around ref]**
SPM —	**[Memo reference freq]**
FLI —	**[Fluxing by DI]**
PId —	**[PID controller]**
PrI —	**[PID preset references]**
toL —	**[Torque limitation]**
CLI —	**[2nd current limit.]**
I2t —	**[Current Limit Dyn]**
NLP —	**[Parameters switching]**
MMC —	**[Multimotors config]**
tnL —	**[Autotuning by DI]**
CHS —	**[High Speed Switching]**
dCC —	**[DC bus]**
RPR —	**[Run permissive]**
FMOR —	**[Fire modes]**
DMCT —	**[Damper control]**
CPID —	**[Additional PIDs]**

The parameters in the **[Application function]** FUN — menu can only be modified when the drive is stopped and there is no run command, except for parameters with a ( ) symbol in the code column, which can be modified with the drive running or stopped.

NOTE: Compatibility of functions
The choice of application functions may be limited by the number of I/O and by the fact that some functions are incompatible with others. Functions that are not listed in the table below are fully compatible.
If there is an incompatibility between functions, the first function configured helps to prevent the others being configured.
Each of the functions on the following pages can be assigned to one of the inputs or outputs.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

Multiple functions can be assigned to and simultaneously activated via a single input.

- Verify that assigning multiple functions to a single input does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

It is only possible to assign one input to several functions at **[Advanced]** A d V and **[Expert]** E P r .

Before assigning a command, reference or function to an input or output, the user must check that this input or output has not already been assigned and that another input or output has not been assigned to an incompatible function.

The drive factory setting or macro configurations automatically configure functions, **which may help to prevent other functions being assigned. In some case, it is necessary to unconfigure one or more functions to be able to enable another.** Check the compatibility table below.

Stop functions have priority over run commands.
Speed references via logic command have priority over analog references.

NOTE: This compatibility table does not affect commands that can be assigned to the keys of the graphic display terminal (see).

Compatibility table

	[AI1 Sensor config.] o A I —	[+/- speed] u P d — (3)	[Preset speeds] P S S —	[PID controller] P , d —	[Jog] J o G —	[Ref Freq switch] r E F —	[Skip Frequency] J P F	[Auto DC injection] A d C —	[Catch on the fly] F L r —	[DC injection] d C ,	[Fast stop] F S t	[Freewheel Stop] n S t	[+/- speed around ref] S r E —
[AI1 Sensor config.] o A I —			↑	• (2)	↑	↑	↑						
[+/- speed] u P d — (3)					•	↑	↑						
[Preset speeds] P S S —	←				↑	↑	↑						
[PID controller] P , d —	• (2)				•	↑	↑						•
[Jog] J o G —	←	•	←	•			↑	←					•
[Ref Freq switch] r E F —	←	←	←	←			↑						↑
[Skip Frequency] J P F	←	←	←	←	←	←							←
[Auto DC injection] A d C —					↑					↑		↑	

	[AI1 Sensor config.] oAI	[+/- speed] uPd — (3)	[Preset speeds] PSS	[PID controller] P,d	[Jog] JoG	[Ref Freq switch] rEF	[Skip Frequency] JPF	[Auto DC injection] AdC	[Catch on the fly] FLr	[DC injection] dC,	[Fast stop] FSt	[Freewheel Stop] nSt	[+/- speed around ref] SrE
[Catch on the fly] FLr —													
[DC injection] dC,								←			• (1)	↑	
[Fast stop] FSt										• (1)		↑	
[Freewheel Stop] nSt								←		←	←		
[+/- speed around ref] SrE —				•	•	←	↑						

(1) Priority is given to the first of these two stop modes to be activated.

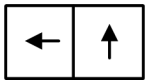
(2) Only the multiplier reference is incompatible with the PID regulator.

Incompatible functions

Compatible functions

Not applicable

Priority functions (functions which cannot be active at the same time):



The function indicated by the arrow has priority over the other.

Incompatible Functions

The following function is inaccessible or deactivated after an Automatic restart. This is only possible for control type if **[2/3-Wire Control]** tCC is set to **[2-Wire Control]** 2C and if **[2-wire type]** tCt is set to **[Level]** LEL or **[Level With Fwd Priority]** PFo. See **[2/3-Wire Control]** tCC , page 90.

The **[1.2] [MONITORING]** Mon — menu 1.2 **[MONITORING]** Mon-, page 43 can be used to display the functions assigned to each input to check their compatibility.

When a function is assigned, a ✓ appears on the graphic display terminal, as illustrated in the example below:

RDY Term 0.0 Hz 0.0 A
APPLICATION FUNCT.
REFERENCE SWITCH.
REF. OPERATIONS
RAMP
STOP CONFIGURATION

AUTO DC INJECTION			
Code	<<	>>	Quick

If you attempt to assign a function that is incompatible with another function that has already been assigned, an alarm message appears:

- With the graphic display terminal:

RDY Term +0.0 Hz 0.0 A
INCOMPATIBILITY
The function can't be assigned because an incompatible function is already selected. See programming book. ENT or ESC to continue

- With the integrated display terminal and the remote display terminal: COMP flashes until ENT or ESC is pressed.

  When you assign a logic input, an analog input, a reference channel or a bit to a function, pressing the HELP key displays the functions that may already have been activated by this input, bit or channel.

  When a logic input, an analog input, a reference channel or a bit that has already been assigned is assigned to another function, the following screens appear:

- With the graphic display terminal:

RDY Term 0.0 Hz 0.0 A
WARNING - ASSIGNED TO
Forward
ENT-Valid. ESC-Abort

If the access level permits this new assignment, pressing ENT confirms the assignment.

If the access level does not permit this new assignment, pressing ENT results in the following display:

RDY Term +0.0 Hz 0.0 A
ASSIGNMENT FORBIDDEN
Un-assign the present functions, or select "Advanced" access level

- With the integrated display terminal:
  The code for the first function, which is already assigned, is displayed flashing.

  If the access level permits this new assignment, pressing ENT confirms the assignment.

  If the access level does not permit this new assignment, pressing ENT has no effect, and the message continues to flash. It is only possible to exit by pressing ESC.

[Ref Freq switch] r E F —

Access

Parameters described below can be accessed by: **[Drive menu]** d r I ➡ **[Configuration]** C o n F ➡ **[Full]** F u L L ➡ **[Application function]** F u n ➡ **[Ref Freq switch]** r E F

Parameters list

HMI label	Settings	Factory setting
[Ref Freq switch] r E F —		
[Ref 1B switching] r C b	—	**[Ref Freq Ch 1]** F r 1

Select switching (1 to 1B)

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example, inversion of the direction of rotation of the motor, sudden acceleration or stops.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

See the reference channel diagrams PID not configured and PID configured with PID references at the terminals .

If the assigned input or bit is at 0, **[Ref Freq Ch 1]** F r 1 is active (see **[Ref Freq Ch 1]** F r 1 , page 174).

If the assigned input or bit is at 1, **[Ref.1B channel]** F r 1b is active.

[Ref 1B switching] r C b is forced to **[ch1 active] FR1** if **[Profile]** C H C F is set to **[Not separ.]** S I M with **[Ref Freq Ch 1]** F r 1 assigned via the terminals (analog inputs, pulse input). See **[Ref Freq Ch 1]** F r 1 , page 174.

[Ref Freq Ch 1] F r 1: No switching, **[Ref Freq Ch 1]** F r 1 active

[ch1B active] F r 1b: No switching, **[Ref.1B channel]** F r 1b active

[DI1] L I 1: Logical input LI1

[...] ...: See the assignment conditions (not **[CD00]** C d 0 0 to **[CD15]** C d 1 5). For more informations see Assignment conditions for logic inputs and control bits, page 173.

HMI label	Settings	Factory setting
[Ref.1B channel] FR Ib	—	**[No]** nO

Configuration ref. 1B

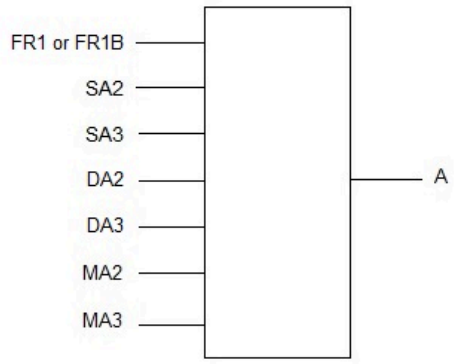
- **[No]** nO: ***No***
- **[AI1]** AI1: ***AI1***, analog input A1
- **[AI2]** AI2: ***AI2***, analog input A2
- **[AI3]** AI3: ***AI3***, analog input A3
- **[HMI]** LCC: ***Local HMI***, graphic display terminal or remote display terminal source
- **[Modbus]** Mdb: ***Modbus communication***
- **[Com. Module]** nEt: ***Ext. communication module***
- **[RP]** PI: ***Pulse input***
- **[AI Virtual 1]** AIV1: ***AI Virtual 1***, virtual analog input 1 with the jog dial (only available if **[Profile]** CHCF is set to **[Not separ.]** SIM)
- **[OA01]** oAO1: ***OA01***, function blocks: Analog Output 01

...

- **[OA10]** oA10: ***OA10***, function blocks: Analog Output 10

[AI1 Sensor config.] oAI —

Summing input / Subtracting input / Multiplier



A = (Fr1 or Fr1b + SA2 + SA3 - dA2 - dA3) x MA2 x MA3

- If **[Summing Input 2]** SA2, **[Summing Input 3]** SA3, **[Subtract Ref Freq 2]** dA2, **[Subtract Ref Freq 3]** dA3 are not assigned, they are set to 0.
- If **[Ref Freq 2 Multiply]** MA2, **[Ref Freq 3 Multiply]** MA3 are not assigned, they are set to 1.
- A is limited by the minimum **[Low Speed]** LSP and maximum **[High Speed]** HSP parameters.
- For multiplication, the signal on **[Ref Freq 2 Multiply]** MA2 or **[Ref Freq 3 Multiply]** MA3 is interpreted as a %. 100% corresponds to the maximum value of the corresponding input. If **[Ref Freq 2 Multiply]** MA2 or **[Ref Freq 3 Multiply]** MA3 is sent via the communication bus or graphic display terminal, an **[Multiplying coeff.]** MFr multiplication variable , page 341 must be sent via the bus or graphic display terminal.
- Reversal of the direction of operation in the event of a negative result can be inhibited (see **[Reverse Disable]** rIn , page 174).

Access

Parameters described below can be accessed by: **[Drive menu]** drI ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[AQ1 configuration]** oAI

Parameters list

HMI label	Settings	Factory setting
[AI1 Sensor config.] oAI —		
Reference = (Fr1 or Fr1b + SA2 + SA3 - dA2 - dA3) x MA2 x MA3. See the reference channel diagrams PID not configured and PID configured with PID references at the terminals . **NOTE:** This function cannot be used with certain other functions. Follow the instructions in compatibility of functions .		
[Summing Input 2] SA2	—	**[No]** nO

HMI label	Settings	Factory setting
Summing input 2 Selection of a reference to be added to **[Ref Freq Ch 1]** Fr1 or **[Ref.1B channel]** Fr1b. • **[No]** nO: ***No*** • **[AI1]** AI1: ***AI1***, analog input A1 • **[AI2]** AI2: ***AI2***, analog input A2 • **[AI3]** AI3: ***AI3***, analog input A3 • **[HMI]** LCC: ***Local HMI***, graphic display terminal or remote display terminal source • **[Modbus]** Mdb: ***Modbus communication*** • **[Com. Module]** nEt: ***Ext. communication module*** • **[RP]** P1: ***Pulse input*** • **[AI Virtual 1]** AIV1: ***AI Virtual 1***, virtual analog input 1 with the jog dial • **[AI Virtual 2]** AIV2: ***AI Virtual 2***, virtual analog input 2 by the communication bus • **[OA01]** oAO1: ***OA01***, function blocks: Analog Output 01 ... • **[OA10]** oA10: ***OA10***, function blocks: Analog Output 10		
[Summing Input 3] SA3	—	**[No]** nO
Summing input 3 Selection of a reference to be added to **[Ref Freq Ch 1]** Fr1 or **[Ref.1B channel]** Fr1b. Identical to **[Summing Input 2]** SA2 .		
[Subtract Ref Freq 2] dA2	—	**[No]** nO
Subtract reference frequency 2 Selection of a reference to be subtracted from **[Ref Freq Ch 1]** Fr1 or **[Ref.1B channel]** Fr1b. Identical to **[Summing Input 2]** SA2 .		
[Subtract Ref Freq 3] dA3	—	**[No]** nO
Subtract reference frequency 3 Selection of a reference to be subtracted from **[Ref Freq Ch 1]** Fr1 or **[Ref.1B channel]** Fr1b. Identical to **[Summing Input 2]** SA2 .		
[Ref Freq 2 Multiply] MA2	—	**[No]** nO
Reference frequency 2 multiply Selection of a multiplier reference **[Ref Freq Ch 1]** Fr1 or **[Ref.1B channel]** Fr1b. Identical to **[Summing Input 2]** SA2 . This parameter is incompatible with the PID regulator, **[No]** nO is the only setting possible		
[Ref Freq 3 Multiply] MA3	—	**[No]** nO
Reference frequency 3 multiply Selection of a multiplier reference **[Ref Freq Ch 1]** Fr1 or **[Ref.1B channel]** Fr1b. Identical to **[Summing Input 2]** SA2 . This parameter is incompatible with the PID regulator, **[No]** nO is the only setting possible		

[Ramp switching] rPt —

Access

Parameters described below can be accessed by: **[Drive menu]** drI ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[Ramp switching]** rPt

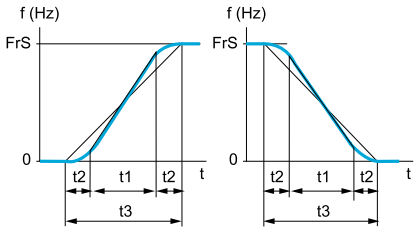
Parameters list

HMI label	Settings	Factory setting
[Ramp switching] rPt —		
[Ramp Type] rPt	—	**[Linear]** LIn

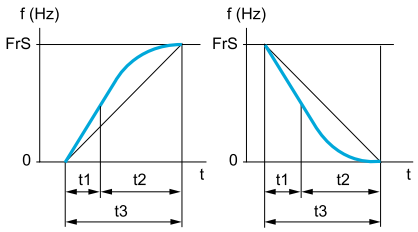
Type of ramp

- **[Linear]** LIn: ***Linear ramp***
- **[S-Ramp]** S: ***S-Ramp***
- **[U-Ramp]** U: ***U-Ramp***
- **[Customized]** CUS: ***Ramp customized***

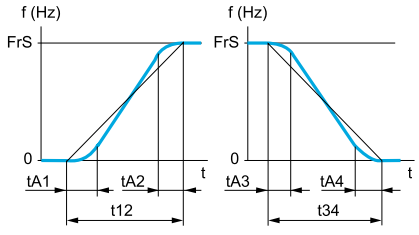
S ramps



The rounding coefficient is fixed,
t1 = 0.6 set ramp time (linear)
t2 = 0.4 set ramp time (round)
t3 = 1.4 set ramp time



The rounding coefficient is fixed,
t1 = 0.5 set ramp time (linear)
t2 = 1.0 set ramp time (round)
t3 = 1.5 set ramp time



tA1: adjustable from 0 to 100%
tA2: adjustable from 0 to (100% - tA1)
tA3: adjustable from 0 to 100%
tA4: adjustable from 0 to (100% - tA3)

t12 = ACC * (tA1(%) / 100 + tA2(%) / 100 + 1)
t34 = DEC * (tA3(%) / 100 + tA4(%) / 100 + 1)

[Ramp increment] inr (1)	—	**[0.1]** 0.1

Ramp increment

This parameter is valid for **[Acceleration]** ACC, **[Deceleration]** dEC, **[Acceleration 2]** AC2 and **[Deceleration 2]** dE2.

- **[0.01]** 0.01: ***hundredths of seconds***, ramp up to 99.99 seconds

HMI label	Settings	Factory setting
• **[0.1]** 0.1: ***Tenths of seconds***, ramp up to 999.9 seconds • **[1]** 1: ***seconds***, ramp up to 6,000 seconds		
[Acceleration] ACC (1)	0.00 to 6,000 s (2)	3.0 s
Acceleration ramp time Time to accelerate from 0 to the **[Nominal Motor Freq]** FrS , page 92. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.		
[Deceleration] dEC (1)	0.00 to 6,000 s (2)	3.0 s
Deceleration ramp time Time to decelerate from the **[Nominal Motor Freq]** FrS , page 92 to 0. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.		
[Begin Acc round] tA1 ★ (1)	0 to 100%	10%
Start ACC ramp rounding Rounding of start of acceleration ramp as a % of the **[Acceleration]** ACC or **[Acceleration 2]** AC2 ramp time. Can be set between 0 and 100%. This parameter can be accessed if the **[Ramp Type]** rPt is **[Customized]** CUS.		
[End Acc round] tA2 ★ (1)	0 to 100%	10%
End ACC ramp rounding Rounding of end of acceleration ramp as a % of the **[Acceleration]** ACC or **[Acceleration 2]** AC2 ramp time. Can be set between 0 and (100% - **[Begin Acc round]** tA1). This parameter can be accessed if the **[Ramp Type]** rPt is **[Customized]** CUS.		
[Begin Dec round] tA3 ★ (1)	0 to 100%	10%
Start DEC ramp rounding Rounding of start of deceleration ramp as a % of the **[Deceleration]** dEC or **[Deceleration 2]** dE2 ramp time. Can be set between 0 and 100%. This parameter can be accessed if the **[Ramp Type]** rPt is **[Customized]** CUS.		
[End Dec round] tA4 ★ (1)	0 to 100%	10%
End DEC ramp rounding Rounding of end of deceleration ramp as a % of the **[Deceleration]** dEC or **[Deceleration 2]** dE2 ramp time. Can be set between 0 and (100% - **[Begin Dec round]** tA3). This parameter can be accessed if the **[Ramp Type]** rPt is **[Customized]** CUS.		
[Ramp 2 Thd] Frt	0 to 599 Hz according to rating	0 Hz
Ramp 2 frequency threshold The 2nd ramp is switched if the value of **[Ramp 2 Thd]** Frt is not 0 (0 deactivates the function) and the output frequency is greater than **[Ramp 2 Thd]** Frt. Threshold ramp switching can be combined with **[Ramp Switch Assign]** rPS switching as follows:		

HMI label	Settings	Factory setting

LI or bit	Frequency	Ramp
0	< Frt	ACC, dEC
0	> Frt	AC2, dE2
1	< Frt	AC2, dE2
1	> Frt	AC2, dE2

[Ramp Switch Assign] r P S	—	**[No]** n o
Ramp switching assignment • **[No]** n o: ***No***, function not assigned • **[DI1]** L I 1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[Acceleration 2] A C 2 ★ (1)	0.00 to 6,000 s (2)	5.0 s
Acceleration 2 ramp time Time to accelerate from 0 to the **[Nominal Motor Freq]** F r S. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. This parameter can be accessed if **[Ramp 2 Thd]** F r t is greater than 0 or if **[Ramp Switch Assign]** r P S is assigned.		
[Deceleration 2] d E 2 ★ (1)	0.00 to 6,000 s (2)	5.0 s
Deceleration 2 Time to decelerate from **[Nominal Motor Freq]** F r S to 0. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. This parameter can be accessed if **[Ramp 2 Thd]** F r t is greater than 0 or if **[Ramp Switch Assign]** r P S is assigned.		
[Dec.Ramp Adapt] b r A	—	**[Yes]** Y E S

HMI label	Settings	Factory setting

Decel ramp adaptation

NOTICE

DAMAGE TO THE MOTOR

Only set this parameter to **[Yes]** YES or **[No]** NO if the connected motor is a permanent magnet synchronous motor. Other settings demagnetize permanent magnet synchronous motors.

Failure to follow these instructions can result in equipment damage.

Activating this function automatically adapts the deceleration ramp, if this has been set at a too low value according to the inertia of the load, which can cause an overvoltage detected error.

The function is incompatible with applications requiring:

- Positioning on a ramp.
- The use of a braking resistor (the resistor would not operate correctly).

[Dec.Ramp Adapt] BRA is forced to **[No]** NO.

[No] NO: Function inactive

[Yes] YES: Function active, for applications that do not require strong deceleration
The following selections appear depending on the rating of the drive and **[Motor control type]** CTT , page 113. They enable stronger deceleration to be obtained than with **[Yes]** (YES. Use comparative testing to determine your selection.

[High Torque] DYNA: Addition of a constant current flow component.
When **[Dec.Ramp Adapt]** BRA is configured on **[High torq. x] DYNX**, the dynamic performances for braking are improved by the addition of a current flow component. The aim is to increase the iron loss and magnetic energy stored in the motor.

(1) The parameter can also be accessed in the **[Settings]** SET — menu.

(2) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 s according to **[Ramp increment]** INR .

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

( ) : Setting of this parameter can be done during operation or when stopped.

[Stop configuration] STT —

Access

Parameters described below can be accessed by: **[Drive menu]** dr1 ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[Stop configuration]** STT

Parameters list

HMI label	Settings	Factory setting
[Stop configuration] STT —		
NOTE: Some types of stops cannot be used with all other functions. Follow the instructions in compatibility of functions .		
[Type of stop] STT	—	**[On Ramp]** rMP
Type of stop Stop mode on disappearance of the run command or appearance of a stop command. **NOTE:** if **[Low Speed Timeout]** tLS or **[Low Speed Timeout]** tLS is not 0, only ramp type stops may be configured. • **[On Ramp]** rMP: ***On ramp***, stop on ramp • **[Fast stop]** FST: ***Fast stop*** • **[Freewheel Stop]** nST: ***Freewheel stop*** • **[DC injection]** dC1: ***DC injection***. Available only if **[Motor control type]** CTT , page 113 is not set to **[Synchronous motor]** SYN.		
[Freewheel stop Thd] FFT ★ (1)	0.2 to 599 Hz	0.2 Hz
Freewheel stop threshold Speed threshold below which the motor switches to freewheel stop. This parameter supports switching from a ramp stop or a fast stop to a freewheel stop below a low speed threshold. This parameter can be accessed if **[Type of stop]** STT is set to **[Fast stop]** FST or **[On Ramp]** rMP and if **[Auto DC Injection]** AdC is not configured.		
[Freewheel Stop] nST	—	**[No]** no
Freewheel stop threshold The stop is activated when the input or the bit changes to 0. If the input returns to state 1 and the run command is still active, the motor restarts only if **[2/3-Wire Control]** tCC , page 90 is set to **[2-Wire Control]** 2C and if **[2-wire type]** tCT is set to **[Level]** LEL or **[Level With Fwd Priority]** PFO. If not, a new run command must be sent. • **[No]** no: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[Fast Stop Assign] FST	—	**[No]** no
Fast stop assignment The stop is activated when the input changes to 0 or the bit changes to 1 (bit in **[I/O profile]** IO at 0). If the input returns to state 1 and the run command is still active, the motor restarts only if **[2/3-Wire Control]** tCC , page 90 is set to **[2-Wire Control]** 2C and if **[2-wire type]** tCT is set to **[Level]** LEL or **[Level With Fwd Priority]** PFO. If not, a new run command must be sent.		

HMI label	Settings	Factory setting
NOTE: This function cannot be used with certain other functions. Follow the instructions in compatibility of functions . • **[No]** nO: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173. If **[Profile]** CHCF is set to **[Not separ.]** SIM then **[CD11]** CD11 up to **[CD15]** CD15, **[C111]** C111 up to **[C115]** C115, **[C211]** C211 up to **[C215]** C215 and **[C311]** C311 up to **[C315]** C315 are not available.		
[Ramp Divider] dCF ★ (1)	0 to 10	4
Fast Stop ramp Divider This parameter can be accessed if **[Type of stop]** STT is set to **[Fast stop]** FST and if **[Fast Stop Assign]** FSt is not **[No]** nO and if **[Stop type]** PAS is set to **[Fast stop]** FST. The ramp that is enabled **[Deceleration]** (dEC) or **[Deceleration 2]** dE2 is then divided by this coefficient when stop requests are sent. Value 0 corresponds to a minimum ramp time.		
[DC Injection Assign] dCI	—	**[No]** nO
DC injection assignment **⚠WARNING** **UNINTENDED MOVEMENT** • Do not use DC injection to generate holding torque when the motor is at a standstill. • Use a holding brake to keep the motor in the standstill position. **Failure to follow these instructions can result in death, serious injury, or equipment damage.** DC injection braking is initiated when the assigned input or bit changes to state 1. If the input returns to state 0 and the run command is still active, the motor restarts only if **[2/3-Wire Control]** tCC , page 90 is set to **[2-Wire Control]** 2C and if **[2-wire type]** tCt is set to **[Level]** LEL or **[Level With Fwd Priority]** PFO. If not, a new run command must be sent. **NOTE:** This function cannot be used with certain other functions. Follow the instructions in compatibility of functions . • **[No]** nO: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[DC Inj Level 1] IDC ★ (1) (3)	0.1 to 1.1 In (2)	0.64 In (2)
DC injection level 1 ***NOTICE*** **OVERHEATING** Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time. **Failure to follow these instructions can result in equipment damage.** Level of DC injection braking current activated via logic input or selected as stop mode. This parameter can be accessed if **[Type of stop]** STT is set to **[DC injection]** dCI or if **[DC Injection Assign]** dCI is not **[No]** nO.		

HMI label	Settings	Factory setting
[DC Inj Time 1] t d 1 ★ (1) (3)	0.1 to 30 s	0.5 s
DC injection time 1		

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

Maximum current injection time **[DC Inj Level 1]** I d C. After this time, the injection current becomes **[DC Inj Level 2]** I d C 2.

This parameter can be accessed if **[Type of stop]** S t t is set to **[DC injection]** d C 1 or if **[DC Injection Assign]** d C 1 is not set to **[No]** n o.

[DC Inj Level 2] I d C 2 ★ (1) (3)	0.1 In (2) to **[DC Inj Level 1]** I d C	0.5 In (2)
DC injection level 2		

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

Injection current activated by logic input or selected as stop mode, once period of time **[DC Inj Time 1]** t d 1 has elapsed.

This parameter can be accessed if **[Type of stop]** S t t is set to **[DC injection]** d C 1 or if **[DC Injection Assign]** d C 1 is not set to **[No]** n o.

[DC Inj Time 2] t d C ★ (1) (3)	0.1 to 30 s	0.5 s
DC injection time 2		

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

Maximum injection time **[DC Inj Level 2]** I d C 2 for injection, selected as stop mode only.

This parameter can be accessed if **[Type of stop]** S t t is set to c**[DC injection]** d C 1.

[SwitchOnDisable Stp] d o t d	—	**[Ramp Stop]** r M P
Type of switchOn Disable Stop, disable operation stop mode. • **[Freewheel Stop]** n S t: ***Freewheel stop***, disable drive function • **[Ramp Stop]** r M P: ***Ramp stop***, ramp stop then disable drive function		

(1) The parameter can also be accessed in the **[Settings]** S E t — menu.

(2) In corresponds to the rated drive current indicated in the Installation manual and on the drive nameplate.

(3) These settings are independent of the **[Auto DC injection]** A d C — function.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

[Auto DC injection] ADC —

Access

Parameters described below can be accessed by: **[Drive menu]** dr1 ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[Auto DC injection]** ADC

Parameters list

HMI label	Settings	Factory setting
[Auto DC injection] ADC —		
[Auto DC Injection] ADC 2 s	—	**[No]** no
Automatic DC injection		

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

If the parameter **[Auto DC Injection]** ADC is set to **[Continuous]** CT, DC injection is always active, even if the motor does not run.

- Verify that using this setting does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

UNINTENDED MOVEMENT

- Do not use DC injection to generate holding torque when the motor is at a standstill.
- Use a holding brake to keep the motor in the standstill position.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Automatic current injection on stopping (at the end of the ramp).

NOTE: There is an interlock between this function and **[Motor fluxing]** FLU. If **[Motor fluxing]** FLU is set to **[Continuous]** FCT, **[Auto DC Injection]** ADC must be **[No]** no.

NOTE: [Auto DC Injection] ADC is set to **[No]** no when **[Motor control type]** CTT, page 113 is set to **[Synchronous motor]** SYN.

[Auto DC Injection] ADC is forced to **[No]** no.

This parameter gives rise to the injection of current even if a run command has not been sent. It can be accessed with the drive running.

- **[No]** no: ***No DC injection***
- **[Yes]** YES: ***DC injection***, adjustable injection time
- **[Continuous]** CT: ***Continuous DC injection***

[Auto DC inj Level 1] SDC1 ★ (1)	0 to 1.1 In (2)	0.7 In (2)
Auto DC injection level 1		

HMI label	Settings	Factory setting

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

Level of standstill DC injection current **[Auto DC Injection]** AdC is not **[No]** nO.

[Auto DC Inj Time 1] tdC 1 ★ (1)	0.1 to 30 s	0.5 s

Auto DC injection time 1

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

Standstill injection time. This parameter can be accessed if **[Auto DC Injection]** AdC is not set to **[No]** nO.

If **[Motor control type]** Ctt , page 113 is set to **[Synchronous motor]** SYn, this time corresponds to the zero speed maintenance time.

[Auto DC inj Level 2] SdC2 ★ (1)	0 to 1.1 In (2)	0.5 In (2)

Auto DC injection level 2

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

This parameter can be accessed if **[Auto DC Injection]** AdC is not **[No]** nO.

[Auto DC Inj Time 2] tdC2 ★ (1)	0 to 30 s	0 s

HMI label	Settings	Factory setting

Auto DC injection time 2

NOTICE

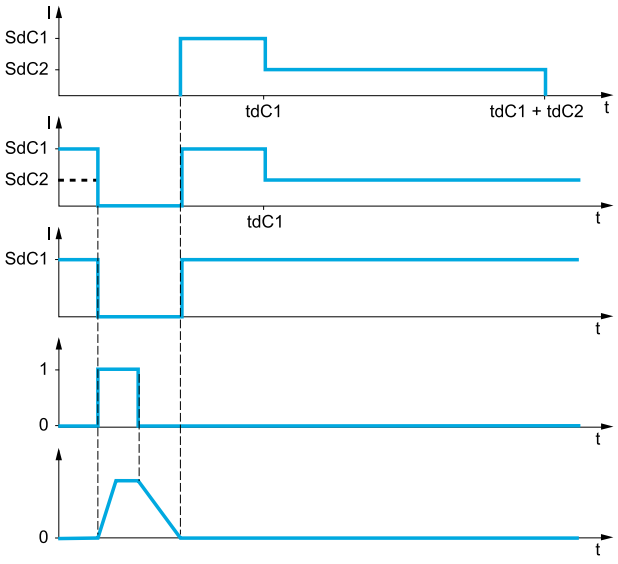
OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

2nd standstill injection time.

This parameter can be accessed if **[Auto DC Injection]** A d C is set to **[Yes]** Y E S.

AdC	SdC2	Operation
YES	X	
Ct	≠ 0	
Ct	= 0	
Run command		
Speed		

(1) The parameter can also be accessed in the **[Settings]** S E t — menu.

(2) In corresponds to the rated drive current indicated in the Installation manual and on the drive nameplate.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

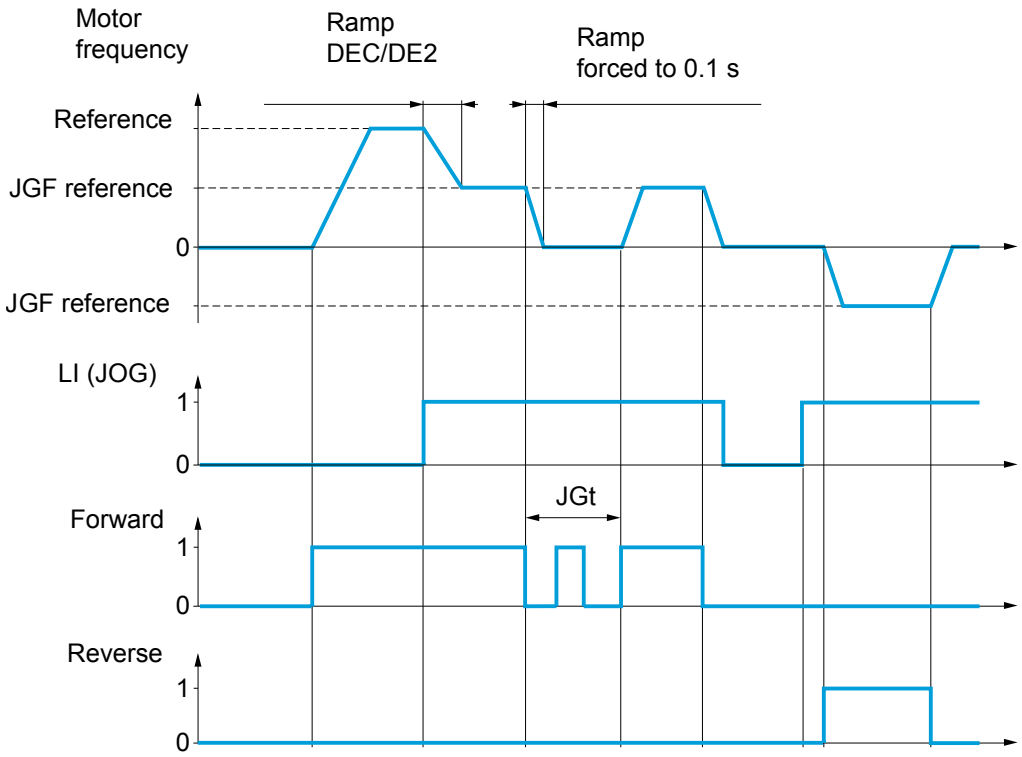
2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Jog] JOG —

Access

Parameters described below can be accessed by: **[Drive menu]** drI ➜ **[Configuration]** ConF ➜ **[Full]** FULL ➜ **[Application function]** FUn ➜ **[Jog]** JOG

Parameters list

HMI label	Settings	Factory setting
[Jog] JOG —		
NOTE: This function cannot be used with certain other functions. Follow the instructions in compatibility of functions .		
[Jog Assign] JOG	—	**[Not Assigned]** nO
Jog assignment, pulse operation. The JOG function is only active if the command channel and the reference channels are on the terminals. The function is active when the assigned input or bit is at 1. Example: 2-wire control operation (tCC = 2C).  • **[No]** nO: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173. (If **[Profile]** CHCF is set to **[Not separ.]** SIM or **[Separate]** SEP then **[CD11]** Cd11 up to **[CD15]** Cd15, **[C111]** C111 up to **[C115]** C115, **[C211]** C211 up to **[C215]** C215 and **[C311]** C311 up to **[C315]** C315 are not available).		
[Jog Frequency] JGF ★ ↻ (1)	0 to 10 Hz	10 Hz

HMI label	Settings	Factory setting
Jog frequency, reference in jog operation. This parameter can be accessed if **[Jog]** J o G is not set to **[No]** n o.		
[Jog Delay] J G t ★ (1)	0 to 2.0 s	0.5 s
Jog delay, anti-repeat delay between 2 consecutive jog operations. This parameter can be accessed if **[Jog]** J o G is not set to **[No]** n o.		

(1) The parameter can also be accessed in the **[Settings]** S E t — menu.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Preset speeds] PSS —

Preset speeds

2, 4, 8 or 16 speeds can be preset, requiring 1, 2, 3 or 4 logic inputs respectively.

NOTE:
You must configure 2 and 4 speeds to obtain 4 speeds.
You must configure 2, 4 and 8 speeds to obtain 8 speeds.
You must configure 2, 4, 8, and 16 speeds to obtain 16 speeds.

Combination table for preset speed inputs

16 speeds LI (PS16)	8 speeds LI (PS8)	4 speeds LI (PS4)	2 speeds LI (PS2)	Speed reference
0	0	0	0	Reference (1)
0	0	0	1	SP2
0	0	1	0	SP3
0	0	1	1	SP4
0	1	0	0	SP5
0	1	0	1	SP6
0	1	1	0	SP7
0	1	1	1	SP8
1	0	0	0	SP9
1	0	0	1	SP10
1	0	1	0	SP11
1	0	1	1	SP12
1	1	0	0	SP13
1	1	0	1	SP14
1	1	1	0	SP15
1	1	1	1	SP16

(1) See the diagram : Reference 1 = (SP1).

Access

Parameters described below can be accessed by: **[Drive menu]** DRI ➜ **[Configuration]** CONF ➜ **[Full]** FULL ➜ **[Application function]** FUN ➜ **[Preset speeds]** PSS

Parameters list

HMI label	Settings	Factory setting
[Preset speeds] PSS —		
NOTE: This function cannot be used with certain other functions. Follow the instructions in compatibility of functions .		
[2 Preset Freq] PS2	—	**[No]** NO
2 Preset Freq assignment • **[No]** NO: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1***		

HMI label	Settings	Factory setting
• **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[4 Preset Freq] P S 4	—	**[No]** n o
4 Preset Freq assignment Identical to **[2 Preset Freq]** P S 2 . To obtain 4 speeds, you must also configure 2 speeds.		
[8 Preset Freq] P S 8	—	**[No]** n o
8 Preset Freq assignment Identical to **[2 Preset Freq]** P S 2 . To obtain 8 speeds, you must also configure 2 and 4 speeds.		
[16 Preset Freq] P S 16	—	**[No]** n o
16 Preset Freq assignment Identical to **[2 Preset Freq]** P S 2 . To obtain 16 speeds, you must also configure 2, 4 and 8 speeds.		
[Preset speed 2] S P 2 ★ (1)	0 to 599 Hz	10 Hz
Preset speed 2 See the Combination table for preset PID references.		
[Preset speed 3] S P 3 ★ (1)	0 to 599 Hz	15 Hz
Preset speed 3 See the Combination table for preset PID references.		
[Preset speed 4] S P 4 ★ (1)	0 to 599 Hz	20 Hz
Preset speed 4 See the Combination table for preset PID references.		
[Preset speed 5] S P 5 ★ (1)	0 to 599 Hz	25 Hz
Preset speed 5 See the Combination table for preset PID references.		
[Preset speed 6] S P 6 ★ (1)	0 to 599 Hz	30 Hz
Preset speed 6 See the Combination table for preset PID references.		
[Preset speed 7] S P 7 ★ (1)	0 to 599 Hz	35 Hz
Preset speed 7 See the Combination table for preset PID references.		
[Preset speed 8] S P 8 ★ (1)	0 to 599 Hz	40 Hz
Preset speed 8 See the Combination table for preset PID references.		
[Preset speed 9] S P 9 ★ (1)	0 to 599 Hz	45 Hz
Preset speed 9		

HMI label	Settings	Factory setting
See the Combination table for preset PID references.		
[Preset speed 10] SP10 ★ (1)	0 to 599 Hz	50 Hz
Preset speed 10		
See the Combination table for preset PID references.		
[Preset speed 11] SP11 ★ (1)	0 to 599 Hz	55 Hz
Preset speed 11		
See the Combination table for preset PID references.		
[Preset speed 12] SP12 ★ (1)	0 to 599 Hz	60 Hz
Preset speed 12		
See the Combination table for preset PID references.		
[Preset speed 13] SP13 ★ (1)	0 to 599 Hz	70 Hz
Preset speed 13		
See the Combination table for preset PID references.		
[Preset speed 14] SP14 ★ (1)	0 to 599 Hz	80 Hz
Preset speed 14		
See the Combination table for preset PID references.		
[Preset speed 15] SP15 ★ (1)	0 to 599 Hz	90 Hz
Preset speed 15		
See the Combination table for preset PID references.		
[Preset speed 16] SP16 ★ (1)	0 to 599 Hz	100 Hz
Preset speed 16		
The appearance of these **[Preset speed x] SPX** parameters is determined by the number of speeds configured.		
See the Combination table for preset PID references.		
[Skip Frequency] JPF	0 to 599 Hz	0 Hz
Skip frequency		
This parameter helps to prevent prolonged operation within an adjustable range around the regulated frequency. This function can be used to help to prevent a critical speed, which would cause resonance, being reached. Setting the function to 0 renders it inactive.		
[Skip Frequency 2] JF2	0 to 599 Hz	0 Hz
Skip frequency 2		
This parameter helps to prevent prolonged operation within an adjustable range around the regulated frequency. This function can be used to help to prevent a critical speed, which would cause resonance, being reached. Setting the function to 0 renders it inactive.		
[3rd Skip Frequency] JF3	0 to 599 Hz	0 Hz
3rd Skip frequency		
This parameter helps to prevent prolonged operation within an adjustable range around the regulated frequency. This function can be used to help to prevent a critical speed, which would cause resonance, being reached. Setting the function to 0 renders it inactive.		

HMI label	Settings	Factory setting
[Skip Freq.Hysteresis] J F H ★ ( )	0.1 to 10 Hz	1 Hz
Skip Freq. hysteresis This parameter is visible if at least one skip frequency **[Skip Frequency]** J P F, **[Skip Frequency 2]** J F 2 or **[3rd Skip Frequency]** J F 3 is different from 0. Skip frequency range: between J P F – J F H and J P F + J F H, for example. This adjustment is common to the 3 frequencies J P F, J F 2, J F 3.		

(1) The parameter can also be accessed in the **[Settings]** S E t — menu.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

( ) : Setting of this parameter can be done during operation or when stopped.

[+/- speed] UPD —

+/- Speed

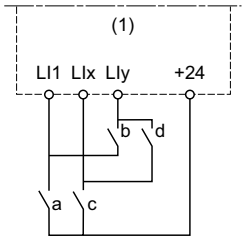
Two types of operations are available:

- **Use of single action keys:** Two logic inputs are required in addition to the operating direction(s). The input assigned to the “+ speed” command increases the speed, the input assigned to the “- speed” command decreases the speed.
- **Use of double action keys:** Only one logic input assigned to “+ speed” is required.

+/- speed with double-press buttons:
Description: 1 button pressed twice (2 steps) for each direction of rotation. A contact closes each time the button is pressed.

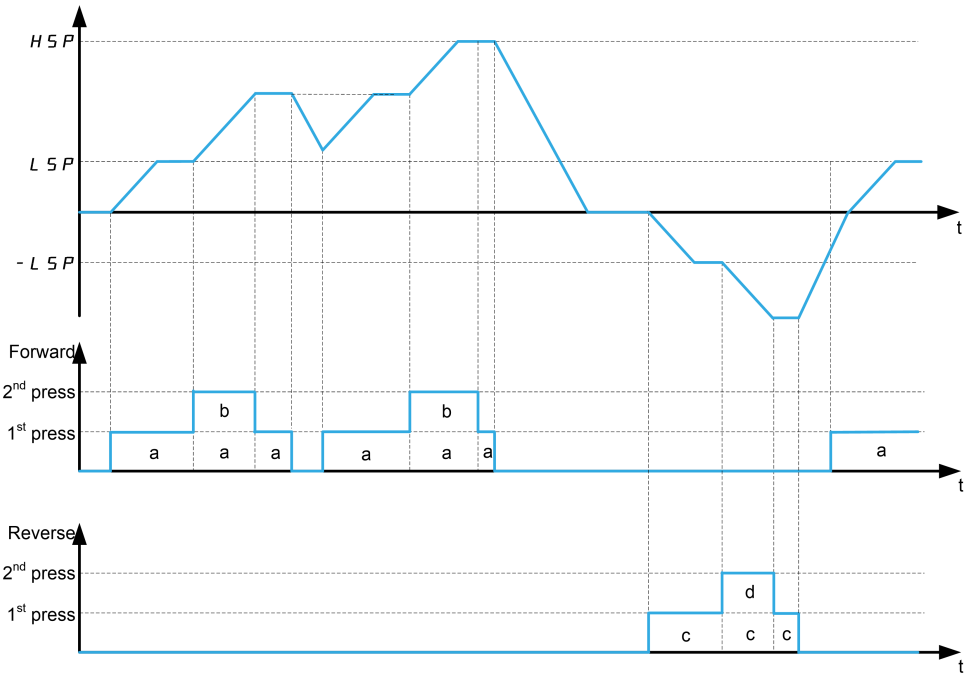
	Released (- speed)	1st press (speed maintained)	2nd press (faster)
Forward button	—	a	a and b
Reverse button	—	c	c and d

Example of wiring:



LI1: Forward
LIx: Reverse
LIy: + speed

1. ATVxxx control terminals



Do not use this +/-speed type with 3-wire control.
Whichever type of operation is selected, the max. speed is set by **[High Speed]** HSP , page 94.

NOTE:
If the reference is switched via **[Ref Freq 2 switching]** rFC , page 176 from any one reference channel to another reference channel with "+/- speed", the value of reference **[Motor Frequency]** rFr (after ramp) may be copied at the same time in accordance with the **[Copy Ch1-Ch2]** CoP parameter , page 177.

If the reference is switched via **[Ref Freq 2 switching]** rFC , page 176 from one reference channel to any other reference channel with "+/- speed", the value of reference **[Motor Frequency]** rFr (after ramp) is copied at the same time.

This helps to prevent the speed being incorrectly reset to zero when switching takes place.

Access

Parameters described below can be accessed by: **[Drive menu]** dr1 ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[+/- speed]** UPd

Parameters list

HMI label	Settings	Factory setting
[+/- speed] UPd —		
This function can be accessed if reference channel **[Ref Freq Ch 2]** Fr2 is set to **[+/-Speed] UPDT** , page 176. **NOTE:** This function cannot be used with certain other functions. Follow the instructions in compatibility of functions .		
[+ Speed Assign] USP	—	**[No]** no
+ speed assignment Function active if the assigned input or bit is at 1. • **[No]** no: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173. If **[Profile]** CHCF is set to **[Not separ.]** SIM or **[Separate]** SEP then **[CD11]** Cd11 up to **[CD15]** Cd15, **[C111]** C111 up to **[C115]** C115, **[C211]** C211 up to **[C215]** C215 and **[C311]** C311 up to **[C315]** C315 are not available.		
[- Speed Assign] dSP	—	**[No]** no
- speed assignment Assignment identical to **[+ Speed Assign]** USP. Function active if the assigned input or bit is at 1.		

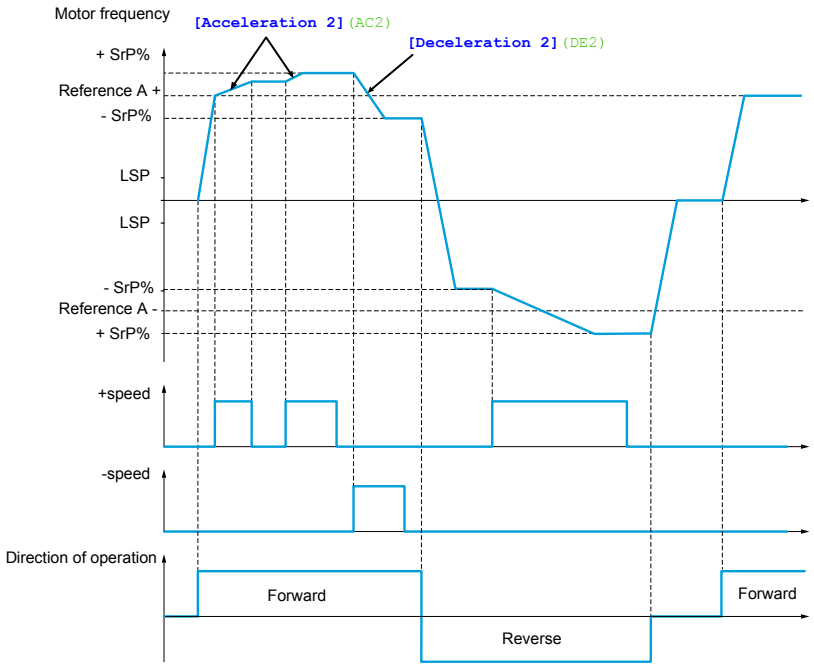
HMI label	Settings	Factory setting
[Ref Frequency Save] StR ★	—	**[No Save]** nO
Reference frequency save Associated with the "+/- speed" function, this parameter can be used to save the reference: • When the run commands disappear (saved to RAM). • When the supply mains or the run commands disappear (saved to EEPROM). Therefore, the next time the drive starts up, the speed reference is the last reference saved. • **[No Save]** nO: ***No save*** (the next time the drive starts up, the speed reference is **[Low Speed]** LSP , page 94 • **[Save to RAM]** rAM: ***Save to RAM*** • **[Save to EEPROM]** EEP: ***Save to EEPROM***		

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[+/- speed around ref] SRE —

+/- Speed around a reference

The reference is given by **[Ref Freq Ch 1]** FR1 or **[Ref.1B channel]** FR1B with summing/subtraction/multiplication functions and preset speeds if relevant (see the diagram). For improved clarity, call this reference A. The action of the +speed and -speed keys can be set as a % of this reference A. On stopping, the reference (A +/- speed) is not saved, so the drive restarts with reference A+ only. The maximum total reference is limited by **[High Speed]** HSP and the minimum reference by **[Low Speed]** LSP , page 94.
Example of 2-wire control:



Access

Parameters described below can be accessed by: **[Drive menu]** DRI ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[+/- speed around ref]** SRE

Parameters list

HMI label	Settings	Factory setting
[+/- speed around ref] SRE —		
This function can be accessed if reference channel **[Ref Freq Ch 1]** FR1. **NOTE:** This function cannot be used with certain other functions. Follow the instructions in incompatible functions .		
[+ Speed Assign] USI	—	**[No]** NO
+ speed assignment • **[No]** NO: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		

HMI label	Settings	Factory setting
[- Speed Assign] dS1	—	**[No]** nO
- speed assignment See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173. Assignment identical to **[+ Speed Assign]** US1. Function active if the assigned input or bit is at 1.		
[+/- Speed limitation] SrP ★ ↻	0 to 50%	10%
+/- speed limitation This parameter limits the variation range with +/- speed as a % of the reference. The ramps used in this function are **[Acceleration 2]** AC2 and **[Deceleration 2]** dE2. This parameter can be accessed if +/- speed is assigned.		
[Acceleration 2] AC2 ★ ↻ (1)	0.00 to 6,000 s (2)	5.00 s
Acceleration 2 ramp time Time to accelerate from 0 to the **[Nominal Motor Freq]** Fr5. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. This parameter can be accessed if **[+/- speed]** tUd is assigned.		
[Deceleration 2] dE2 ★ ↻ (1)	0.00 to 6,000 s (2)	5.00 s
Deceleration 2 Time to decelerate from the **[Nominal Motor Freq]** Fr5 to 0. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. This parameter can be accessed if **[+/- speed]** tUd is assigned.		

(1) The parameter can also be accessed in the **[Settings]** SEt — menu.

(2) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 s according to **[Ramp increment]** Inr .

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

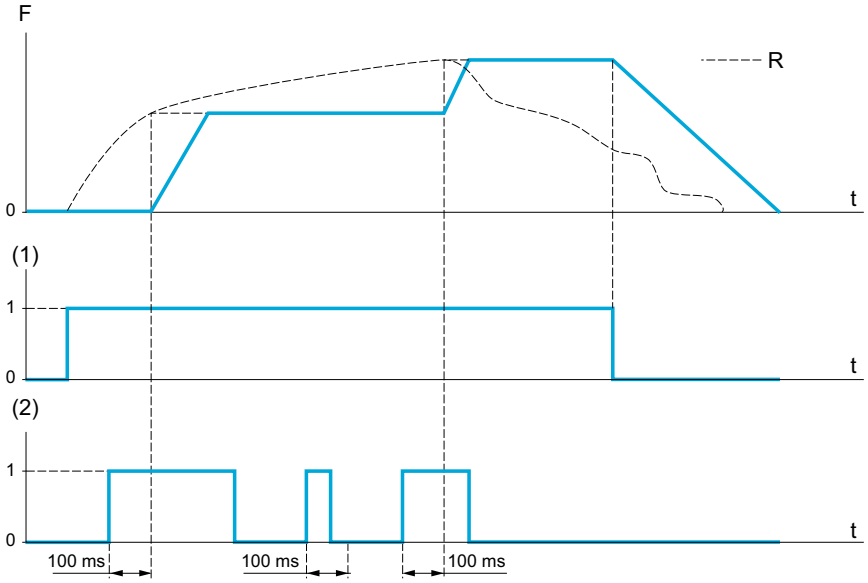
↻ : Setting of this parameter can be done during operation or when stopped.

[Memo reference freq] S P M —

Reference memorizing

Saving a speed reference value using a logic input command lasting longer than 0.1 s.

- This function is used to control the speed of several drives alternately via a single analog reference and one logic input for each drive.
- It is also used to confirm a line reference (communication bus or network) on several drives via a logic input. This allows movements to be synchronized by getting rid of variations when the reference is set.
- The reference is acquired 100 ms after the rising edge of the request. A new reference is not then acquired until a new request is made.



1. Run command
2. LIx (saved)

F: Motor frequency

R: Reference

Access

Parameters described below can be accessed by: **[Drive menu]** d r I ➜ **[Configuration]** C o n F ➜ **[Full]** F u L L ➜ **[Application function]** F u n ➜ **[Memo reference freq]** S P M

Parameters list

HMI label	Settings	Factory setting
[Memo reference freq] SPM —		
[Ref Freq Memo assign] SPM	—	**[No]** nO
Reference frequency memory assignment Assignment to a logic input. Function active if the assigned input is at active state. • **[No]** nO: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** ... • **[DI6]** LI6: ***Digital input 6*** • **[DAI1]** LAI1: ***Digital input AI1*** • **[DAI2]** LAI2: ***Digital input AI2*** • **[OL01]** OL01: ***OL01***, function blocks: Logical Output 01 ... • **[OL10]** OL10: ***OL10***, function blocks: Logical Output 10		

[Fluxing by DI] FLI —

Access

Parameters described below can be accessed by: **[Drive menu]** dri ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[Fluxing by DI]** FLI

Parameters list

HMI label	Settings	Factory setting
[Fluxing by DI] FLI —		
[Motor fluxing] FLU ★ (1) 2 s	—	**[No]** FNO
Motor fluxing configure		

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

If the parameter **[Motor fluxing]** FLU is set to **[Continuous]** FCT , fluxing is always active, even if the motor does not run.

- Verify that using this setting does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the flux current to be applied.

Failure to follow these instructions can result in equipment damage.

[Not continuous] FNC: ***Not continuous***

[Continuous] FCT: ***Continuous***
This option is not possible if **[Auto DC Injection]** ADC is **[Yes]** YES or if **[Type of stop]** STT is **[Freewheel Stop]** NST.

[No] FNO: Function inactive

To obtain rapid high torque on startup, magnetic flux needs to already have been established in the motor.

In **[Continuous]** FCT mode, the drive automatically builds up flux when it is powered up.

[Not continuous] FNC mode, fluxing occurs when the motor starts up.

The flux current is greater than **[Nom Motor Current]** NCR (configured rated motor current) when the flux is established and is then adjusted to the motor magnetizing current.

If **[Motor control type]** CTT , page 113 is set to **[Synchronous motor]** SYN, the **[Motor fluxing]** FLU parameter causes the alignment of the rotor and not the fluxing.

[Fluxing assignment] FLI ★	—	**[No]** NO
Fluxing input assignment		

HMI label	Settings	Factory setting

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the flux current to be applied.

Failure to follow these instructions can result in equipment damage.

Assignment is only possible if **[Motor fluxing]** FLU is set to **[Not continuous]** FNC.

If an LI or a bit is assigned to the motor fluxing command, flux is built up when the assigned input or bit is at 1.

If an LI or a bit has not been assigned, or if the assigned LI or bit is at 0 when a run command is sent, fluxing occurs when the motor starts.

[No] NO: Not assigned

[DI1] LI1: Logical input LI1

[...] ...: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.

[Angle setting type] ASt ★	—	**[PSIO align.]** PSIO

Auto angle setting type

Mode for measuring the phase-shift angle. Visible only if **[Motor control type]** CtT is set to **[Synchronous motor]** SYN.

[PSI align.] PSI and **[PSIO align.]** PSIO are working for all type of synchronous motors. **[SPM align.]** SPMA and **[IPM align.]** IPMA increase performances depending on the type of synchronous motor.

- **[IPM align.]** IPMA: ***IPM alignment***. Alignment mode for Interior-buried Permanent Magnet motor (usually, this kind of motor has a high saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
- **[SPM align.]** SPMA: ***SPM alignment***. Mode for Surface-mounted Permanent Magnet motor (usually, this kind of motor has a medium or low saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
- **[PSI align.]** PSI: ***Pulse Signal injection***. Standard alignment mode by pulse signal injection.
- **[PSIO align.]** PSIO: ***Pulse Signal injection - Optimized***. Standard optimized alignment mode by pulse signal injection. The phase-shift angle measurement time is reduced after the first run order or tune operation, even if the drive has been turned off.
- **[No align.]** NO: ***NO alignment***

(1) The parameter can also be accessed in the **[Settings]** SET — menu.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

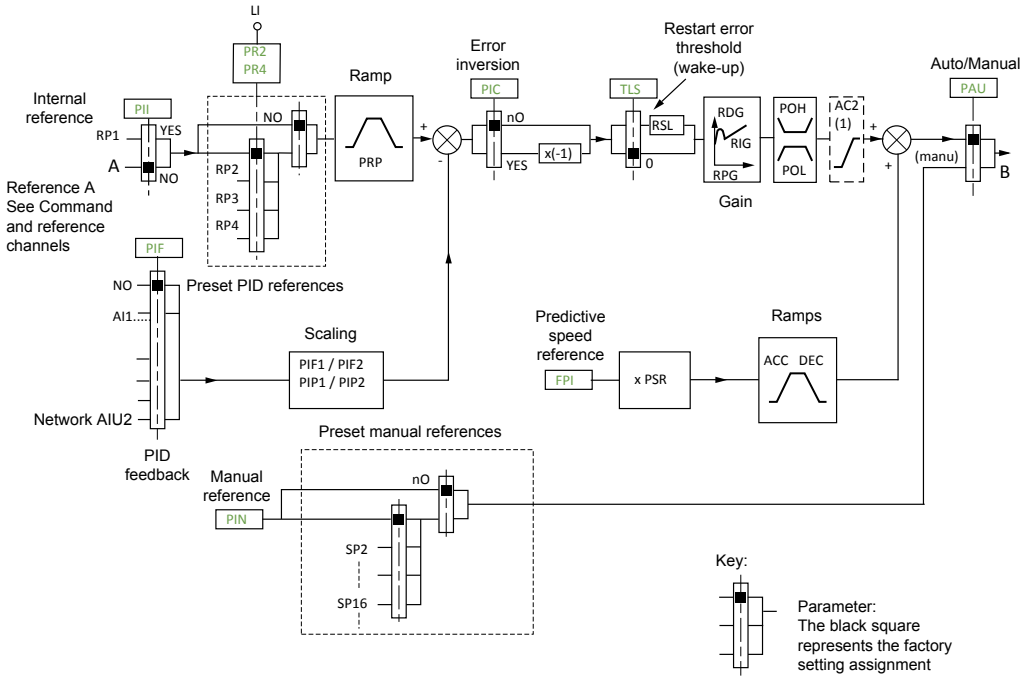
: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[PID controller] PID —

Block diagram

The function is activated by assigning an analog input to the PID feedback (measurement).



(1) Ramp AC2 is only active when the PID function starts up and during PID "wake-ups".

PID feedback

The PID feedback must be assigned to one of the analog inputs AI1 to AI3, to the pulse input, according to whether any extension modules have been inserted.

PID reference

The PID reference must be assigned to the following parameters: Preset references via logic inputs **[Ref PID Preset 2]** rP2, **[Ref PID Preset 3]** rP3, **[Ref PID Preset 4]** rP4
In accordance with the configuration of **[Intern PID Ref]** PI1:
Internal reference **[Internal PID ref]** rPI or Reference A **[Ref Freq Ch 1]** Fr1 or **[Ref.1B channel]** Fr1b, page 174.

Combination table for preset PID references

LI Pr4	LI Pr2	Pr2 = no	Reference
			rPI or A
0	0		rPI or A
0	1		rP2
1	0		rP3
1	1		rP4

A predictive speed reference can be used to initialize the speed on restarting the process.

Scaling of feedback and references

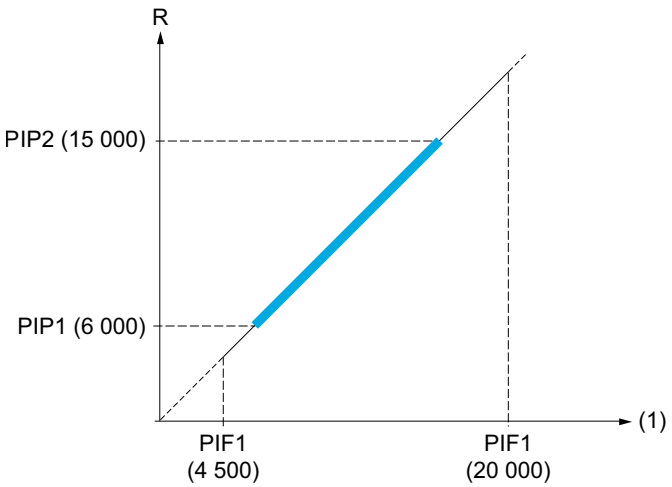
- **[Min PID feedback]** PIF1, **[Max PID feedback]** PIF2 parameters can be used to scale the PID feedback (sensor range). **This scale MUST be maintained for all other parameters.**
- **[Min PID Process]** PIP1, **[Max PID Process]** PIP2 parameters can be used to scale the adjustment range, for example the reference. **The adjustment range MUST remain within the sensor range.**

The maximum value of the scaling parameters is 32,767. To facilitate installation, we recommend using values as close as possible to this maximum level, while retaining powers of 10 in relation to the actual values.

Example (see graph below): Adjustment of the volume in a tank, between 6 m^3 and 15 m^3.

- Sensor used 4-20 mA, 4.5 m3 for 4 mA and 20 m3 for 20 mA, with the result that **[Min PID feedback]** PIF1 4,500 and **[Max PID feedback]** PIF2 = 20,000.
- Adjustment range 6 to 15 m3, with the result that **[Min PID Process]** PIP1 = 6,000 (min. reference) and **[Max PID Process]** PIP2 = 15,000 (max. reference).
- Example references:
  - rP1 (internal reference) = 9,500
  - rP2 (preset reference) = 6,500
  - rP3 (preset reference) = 8,000
  - rP4 (preset reference) = 11,200

The **[3.4] [Display config.]** dCF — menu can be used to customize the name of the unit displayed and its format.



1. PID feedback

Other parameters

- **[PID wake up thresh.]** rSL parameter: Can be used to set the detected PID error threshold, above which the PID regulator is reactivated (wake-up) after a stop due to the max. time threshold being exceeded at low speed **[Low Speed Timeout]** tLS

- Reversal of the direction of correction **[PID Inversion]** P , C : If **[PID Inversion]** P , C is set to **[No]** n o , the speed of the motor increases when the detected error is positive (for example: pressure control with a compressor. If **[PID Inversion]** P , C is set to **[Yes]** Y E S , the speed of the motor decreases when the detected error is positive (for example: temperature control using a cooling fan).
- The integral gain may be short-circuited by a logic input.
- An alarm on the PID feedback may be configured and indicated by a logic output.
- An alarm on the detected PID error may be configured and indicated by a logic output.

"Manual - Automatic" Operation with PID

This function combines the PID regulator, the preset speeds and a manual reference. Depending on the state of the logic input, the speed reference is given by the preset speeds or by a manual reference input via the PID function.

Manual reference

[Manual PID reference] P , M :

- Analog inputs AI1 to AI3
- Pulse input

Predictive speed reference

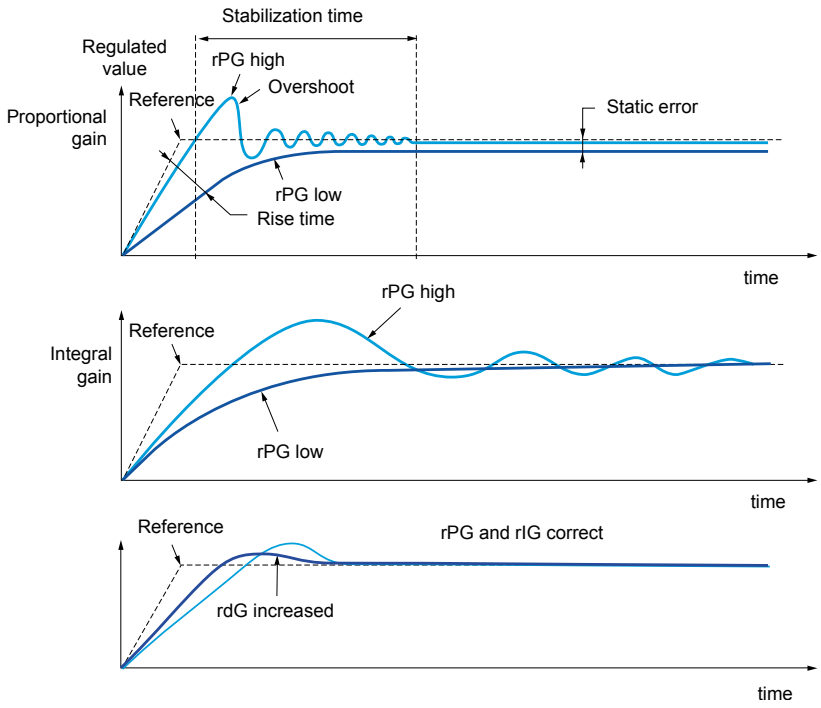
[Speed ref. assign.] F P , :

- **[AI1]** A , 1 : Analog input
- **[AI2]** A , 2 : Analog input
- **[AI3]** A , 3 : Analog input
- **[RP]** P , : Pulse input
- **[HMI]** L C C : Graphic display terminal or remote display terminal
- **[Modbus]** M d b : Integrated Modbus
- **[Com. Module]** n E t : Communication module (if inserted)

Setting up the PID regulator

1. **Configuration in PID mode.**
   See the diagram .
2. **Perform a test in factory settings mode.**
   To optimize the drive, adjust **[PID Prop.Gain]** r P G or **[PID Intgl.Gain]** r , G gradually and independently, and observe the effect on the PID feedback in relation to the reference.

3. **If the factory settings are unstable or the reference is incorrect.**
   - Perform a test with a speed reference in Manual mode (without PID regulator) and with the drive on load for the speed range of the system:
     - In steady state, the speed must be stable and comply with the reference, and the PID feedback signal must be stable.
     - In transient state, the speed must follow the ramp and stabilize quickly, and the PID feedback must follow the speed. If this is not the case, see the settings for the drive and/or sensor signal and wiring.
   - Switch to PID mode.
   - Set **[Dec.Ramp Adapt]** brA to **[No]** nO (no auto-adaptation of the ramp).
   - Set **[PID ramp]** PrP to the minimum permitted by the mechanism without triggering an **[Overbraking level]** ObF.
   - Set the integral gain **[PID Intgl.Gain]** rIG to minimum.
   - Leave the derivative gain **[PID derivative gain]** rdG at 0.
   - Observe the PID feedback and the reference.
   - Switch the drive ON/OFF a number of times or vary the load or reference rapidly a number of times.
   - Set the proportional gain **[PID Prop.Gain]** rPG to ascertain the compromise between response time and stability in transient phases (slight overshoot and 1 to 2 oscillations before stabilizing).
   - If the reference varies from the preset value in steady state, gradually increase the integral gain **[PID Intgl.Gain]** rIG, reduce the proportional gain **[PID Prop.Gain]** rPG in the event of instability (pump applications), find a compromise between response time and static precision (see diagram).
   - Lastly, the derivative gain may permit the overshoot to be reduced and the response time to be improved, although this is more difficult to obtain a compromise in terms of stability, as it depends on 3 gains.
   - Perform in-production tests over the whole reference range.



The oscillation frequency depends on the system kinematics.

Parameter	Rise time	Overshoot	Stabilization time	Detected Static error
rPG ↗	↘↘	↗	=	↘
rIG ↗	↘	↗↗	↗	↘↘
rdG ↗	=	↘	↘	=

Access

Parameters described below can be accessed by: **[Drive menu]** d r ı ➡ **[Configuration]** C o n F ➡ **[Full]** F u L L ➡ **[Application function]** F u n ➡ **[PID controller]** P ı d

Parameters list

HMI label	Settings	Factory setting
[PID controller] P ı d —		
NOTE: This function cannot be used with certain other functions. Follow the instructions in compatibility of functions .		
[PID feedback Assign] P ı F	—	**[No]** n o
PID controller feedback • **[No]** n o: ***No***, not assigned • **[AI1]** A ı 1: ***AI1***, analog input A1 • **[AI2]** A ı 2: ***AI2***, analog input A2 • **[AI3]** A ı 3: ***AI3***, analog input A3 • **[RP]** P ı: ***Pulse input*** • **[AI Virtual 1]** A ı V 1: ***AI Virtual 1***, virtual analog input 1 by the communication bus • **[AI Virtual 2]** A ı V 2: ***AI Virtual 2***, virtual analog input 2 by the communication bus • **[OA01]** o A 0 1: ***OA01***, function blocks: Analog Output 01 ... • **[OA10]** o A 1 0: ***OA10***, function blocks: Analog Output 10		
[AIV2 Channel Assign] A ı C 2 ★	—	**[No]** n o
Channel assignment for virtual Analog input AIV2 This parameter can be accessed if **[PID feedback Assign]** P ı F is set to **[AI Virtual 2]** A ı V 2. This parameter can also be accessed in the **[Inputs / Outputs]** ı _ o — menu. • **[No]** n o: ***No***, not assigned • **[Modbus]** M d b: ***Modbus communication*** • **[Com. Module]** n E t: ***Ext. communication module***		
[Min PID feedback] P ı F 1 ★ ❮❯ (1)	0 to **[Max PID feedback]** P ı F 2 (2)	100
Minimum PID feedback		
[Max PID feedback] P ı F 2 ★ ❮❯ (1)	**[Min PID feedback]** P ı F 1 to 32,767 (2)	1,000
Maximum PID feedback		

HMI label	Settings	Factory setting
[Min PID Process] PIP1 ★ (1)	**[Min PID feedback]** PIF1 to **[Max PID Process]** PIP2 (2)	150
Minimum PID process		
[Max PID Process] PIP2 ★ (1)	**[Min PID Process]** PIP1 to **[Max PID feedback]** PIF2 (2)	900
Maximum PID process		
[Intern PID Ref] PII ★	—	**[No]** NO
Internal PID reference • **[No]** NO: ***No***, the PID regulator reference is given by **[Ref Freq Ch 1]** FR1 or **[Ref.1B channel]** FR1B with summing/subtraction/multiplication functions (see the diagram . • **[Yes]** YES: ***Yes***, the PID regulator reference is internal via **[Internal PID ref]** rPI.		
[Internal PID ref] rPI ★	**[Min PID Process]** PIP1 to **[Max PID Process]** PIP2	150
Internal PID reference This parameter can also be accessed in the 1.2 **[MONITORING]** MON — menu.		
[PID Prop.Gain] rPG ★	0.01 to 100	1
PID Proportional gain		
[PID Intgl.Gain] rIG ★	0.01 to 100	1
PID controller integral gain		
[PID derivative gain] rdG ★	0.00 to 100	0
PID derivative gain		
[PID ramp] PrP ★ (1)	0 to 99.9 s	0 s
PID ramp PID acceleration/deceleration ramp, defined to go from **[Min PID Process]** PIP1 to **[Max PID Process]** PIP2 and vice versa.		
[PID Inversion] PIC ★	—	**[No]** NO
PID inversion Reversal of the direction of correction **[PID Inversion]** PIC: If **[PID Inversion]** PIC is set to **[No]** NO, the speed of the motor increases when the detected error is positive (example: pressure control with a compressor) If **[PID Inversion]** PIC is set to **[Yes]** YES, the speed of the motor decreases when the error is positive (example: temperature control using a cooling fan). • **[No]** NO: ***No*** • **[Yes]** YES: ***Yes***		
[PID Min Output] POL ★ (1)	- 599 to 599 Hz	0 Hz
PID controller min. output		
[PID Max Output] POH ★ (1)	0 to 599 Hz	60 Hz
PID controller max. output		

HMI label	Settings	Factory setting
[Min fbk Warning] P A L ★ (1)	**[Min PID feedback]** P , F 1 to **[Max PID feedback]** P , F 2 (2)	100
Minimum feedback level warning		
[Max fbk Warning] P A H ★ (1)	**[Min PID feedback]** P , F 1 to **[Max PID feedback]** P , F 2 (2)	1,000
Maximum feedback level warning		
[PID error Warning] P E r ★ (1)	0 to 65,535 (2)	100
PID error warning		
[PID Integral OFF] P , S ★	—	**[No]** n o
PID integral disabled If the assigned input or bit is at 0, the function is inactive (the PID integral is enabled). If the assigned input or bit is at 1, the function is active (the PID integral is disabled). • **[No]** n o: ***No***, not assigned • **[DI1]** L , 1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173		
[Speed ref. assign.] F P , ★	—	**[No]** n o
Speed ref. assignment PID regulator predictive speed input. • **[No]** n o: ***No***, not assigned • **[AI1]** A , 1: ***AI1***, analog input A1 • **[AI2]** A , 2: ***AI2***, analog input A2 • **[AI3]** A , 3: ***AI3***, analog input A3 • **[HMI]** L C C: Graphic display terminal or remote display terminal source • **[Modbus]** M d b: ***Modbus communication*** • **[Com. Module]** n E t: ***Ext. communication module*** • **[RP]** P ,: ***Pulse input*** • **[AI Virtual 1]** A , V 1: ***AI Virtual 1***, virtual analog input 1 with the jog dial • **[OA01]** o A 0 1: ***OA01***, function blocks: Analog Output 01 ... • **[OA10]** o A 1 0: ***OA10***, function blocks: Analog Output 10		
[Speed input %] P S r ★ (1)	1 to 100%	100%
PID speed input % ref Multiplying coefficient for predictive speed input. This parameter cannot be accessed if **[Speed ref. assign.]** F P , is set to **[No]** n o.		
[Auto/Manual assign.] P A u ★	—	**[No]** n o
Auto/Manual select input If the assigned input or bit is at 0, the PID is active. If the assigned input or bit is at 1, manual operation is active. • **[No]** n o: ***No***, not assigned		

HMI label	Settings	Factory setting
• **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173		
[Acceleration 2] AC2 ★ (1)	0.00 to 6,000 s (3)	5 s
Acceleration 2 ramp time Time to accelerate from 0 to the **[Nominal Motor Freq]** FR5. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application. Ramp AC2 is only active when the PID function starts up and during PID "wake-ups".		
[Manual PID reference] PIM ★	—	**[No]** NO
Manual PID reference Manual speed input. This parameter can be accessed if **[Auto/Manual assign.]** PAU is not set to **[No]** NO. The preset speeds are active on the manual reference if they have been configured. • **[No]** NO: ***No***, not assigned • **[AI1]** AI1: ***AI1***, analog input A1 • **[AI2]** AI2: ***AI2***, analog input A2 • **[AI3]** AI3: ***AI3***, analog input A3 • **[RP]** PI: ***Pulse input*** • **[AI Virtual 1]** AIV1: ***AI Virtual 1***, virtual analog input 1 with the jog dial • **[OA01]** OAO1: ***OA01***, function blocks: Analog Output 01 ... • **[OA10]** OA10: ***OA10***, function blocks: Analog Output 10		
[Low Speed Timeout] TLS (1)	0 to 999.9 s	0 s
Low speed timeout Maximum operating time at **[Low Speed]** LSP see **[Low Speed]** LSP, page 94. Following operation at **[Low Speed]** LSP for a defined period, a motor stop is requested automatically. The motor restarts if the reference is greater than **[Low Speed]** LSP and if a run command is still present. **NOTE:** A value of 0 indicates an unlimited period of time. If **[Low Speed Timeout]** TLS is not 0, **[Type of stop]** STT is forced to **[Ramp Stop]** RMP (only if a ramp stop can be configured).		
[PID wake up thresh.] rSL ★ 2 s	0.0 to 100.0	0

HMI label	Settings	Factory setting
PID wake up threshold		

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If the "PID" and "Low speed operating time" **[Low Speed Timeout]** t L S functions are configured at the same time, the PID regulator may attempt to set a speed lower than **[Low Speed]** L S P.

This results in unsatisfactory operation, which consists of starting, operating at low speed then stopping, and so on…

Parameter **[PID wake up thresh.]** r S L (restart detected error threshold) can be used to set a minimum detected PID error threshold for restarting after a stop at prolonged **[Low Speed]** L S P. **[PID wake up thresh.]** r S L is a percentage of the detected PID error (value depends on **[Min PID feedback]** P I F 1 and **[Max PID feedback]** P I F 2, see **[Min PID feedback]** P I F 1). The function is inactive if **[Low Speed Timeout]** t L S = 0 or if **[PID wake up thresh.]** r S L = 0.

(1) The parameter can also be accessed in the **[Settings]** S E t — menu.

(2) If a graphic display terminal is not in use, values greater than 9,999 is displayed on the 4-digit display with a period mark after the thousand digit, for example, 15.65 for 15,650.

(3) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 s according to **[Ramp increment]** I n r .

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[PID preset references] Pr 1 —

Access

Parameters described below can be accessed by: **[Drive menu]** dr 1 ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUn ➡ **[PID preset references]** Pr 1

Parameters list

HMI label	Settings	Factory setting
[PID preset references] Pr 1 —		
Function can be accessed if **[PID feedback Assign]** P1F is assigned.		
[2 PID Preset Assign] Pr2	—	**[No]** no
2 PID Preset assignment If the assigned input or bit is at 0, the function is inactive. If the assigned input or bit is at 1, the function is active. • **[No]** no: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173		
[4 PID Preset Assign] Pr4	—	**[No]** no
4 PID Preset assignment Check that **[2 PID Preset Assign]** Pr2 has been assigned before assigning this function. Identical to **[2 PID Preset Assign]** Pr2 . If the assigned input or bit is at 0, the function is inactive. If the assigned input or bit is at 1, the function is active.		
[Ref PID Preset 2] rP2 ★ (1)	**[Min PID Process]** P1P1 to **[Max PID Process]** P1P2 (2)	300
2nd PID preset reference This parameter can be accessed if **[2 PID Preset Assign]** Pr2 is assigned.		
[Ref PID Preset 3] rP3 ★ (1)	**[Min PID Process]** P1P1 to **[Max PID Process]** P1P2 (2)	600
3rd PID preset reference This parameter can be accessed if **[3 preset PID ref.] PR3** is assigned.		
[Ref PID Preset 4] rP4 ★ (1)	**[Min PID Process]** P1P1 to **[Max PID Process]** P1P2 (2)	900
4th PID preset reference This parameter can be accessed if **[4 PID Preset Assign]** Pr4 is assigned.		

(1) The parameter can also be accessed in the **[Settings]** SET — menu.

(2) If a graphic display terminal is not in use, values greater than 9,999 is displayed on the 4-digit display with a period mark after the thousand digit, for example, 15.65 for 15,650.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

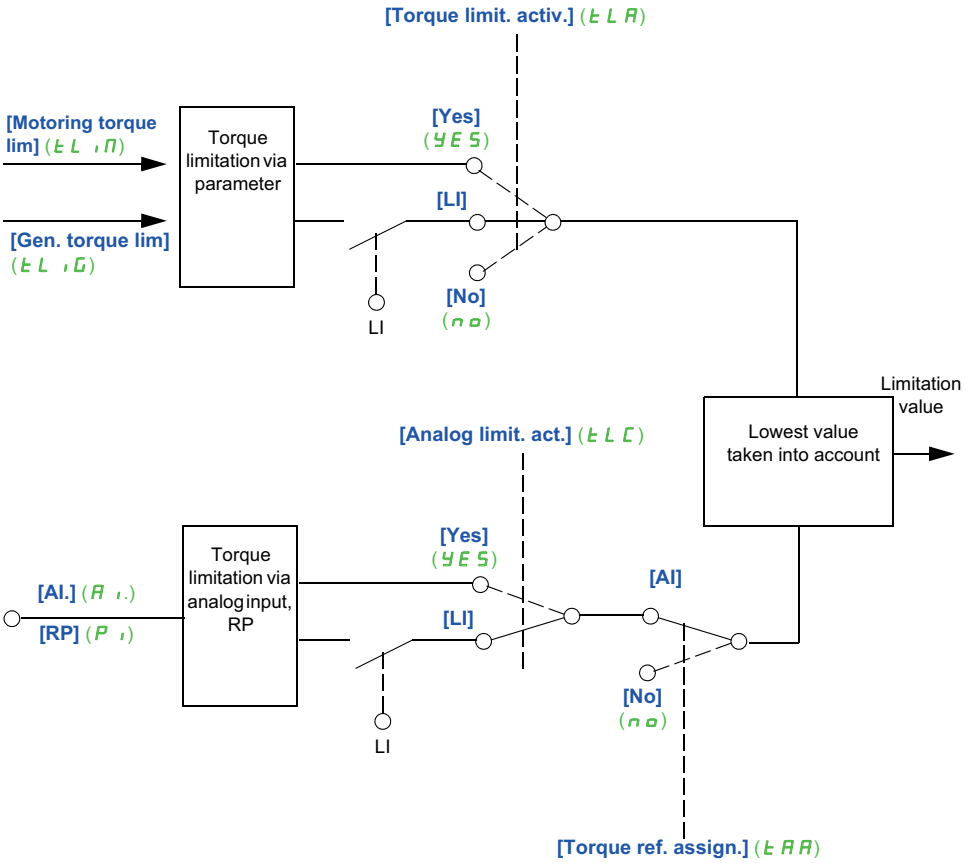
[Torque limitation] tOL —

Introduction

There are two types of torque limitation:

- With a value that is fixed by a parameter
- With a value that is set by an analog input (AI or pulse)

If both types are enabled, the lowest value is taken into account. The two types of limitation can be configured or switched remotely using a logic input or via the communication bus.



Access

Parameters described below can be accessed by: **[Drive menu]** dr I ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[Torque limitation]** tOL

Parameters list

HMI label	Settings	Factory setting
[Torque limitation] tOL —		
[Torque limit activ.] tLA	—	**[No]** no
Torque limit. activation If the assigned input or bit is at 0, the function is inactive.		

HMI label	Settings	Factory setting
If the assigned input or bit is at 1, the function is active. • **[No]** nO: ***No***, not assigned • **[Yes]** YES: ***Yes***, function always active • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173		
[Torque increment] INTP ★	—	**[1%]** 1
Torque increment This parameter cannot be accessed if **[Torque limit activ.]** TLA is set to **[No]** nO. Selection of units for the **[Motor torque limit]** TLIM and **[Gen. torque limit]** TLIG parameters. • **[0.1%]** 0.1: ***0.1%*** • **[1%]** 1: ***1%***		
[Motor torque limit] TLIM ★ ↻ (1)	0 to 300%	100%
Motoring torque limit This parameter cannot be accessed if **[Torque limit activ.]** TLA is set to **[No]** nO. Torque limitation in motor mode, as a % or in 0.1% increments of the rated torque in accordance with the **[Torque increment]** INTP parameter.		
[Gen. torque limit] TLIG ★ ↻ (1)	0 to 300%	100%
Generator torque limit This parameter cannot be accessed if **[Torque limit activ.]** TLA is set to **[No]** nO. Torque limitation in generator mode, as a % or in 0.1% increments of the rated torque in accordance with the **[Torque increment]** INTP parameter.		
[Ref Torque Assign] TAA	—	**[No]** nO
Reference torque assignment If the function is assigned, the limitation varies between 0% and 300% of the rated torque on the basis of the 0% to 100% signal applied to the assigned input. Examples: 12 mA on a 4-20 mA input results in limitation to 150% of the rated torque. 2.5 V on a 10 V input results in 75% of the rated torque. • **[No]** nO: ***No***, not assigned (function inactive) • **[AI1]** AI1: ***AI1***, analog input A1 • **[AI2]** AI2: ***AI2***, analog input A2 • **[AI3]** AI3: ***AI3***, analog input A3 • **[RP]** PI: ***Pulse input*** • **[AI Virtual 1]** AIV1: ***AI Virtual 1***, virtual analog input 1 with the jog dial • **[AI Virtual 2]** AIV2: ***AI Virtual 2***, virtual input via communication bus, to be configured via **[AIV2 Channel Assign]** AIC2 . • **[OA01]** OAO1: ***OA01***, function blocks: Analog Output 01 ... • **[OA10]** OA10: ***OA10***, function blocks: Analog Output 10		
[Analog limit activ.] TLC ★	—	**[Yes]** (YES)

HMI label	Settings	Factory setting
Torque analog limit. activ		
This parameter cannot be accessed if **[Torque limit activ.]** tLA is set to **[No]** no.		
Identical to **[Torque limit activ.]** tLA .		
If the assigned input or bit is at 0: The limitation is specified by the **[Motor torque limit]** tL iM and **[Gen. torque limit]** tL iG) parameters if **[Torque limit activ.]** tLA is set to **[No]** no.		
No limitation if **[Torque limit activ.]** tLA is set to **[No]** no.		
If the assigned input or bit is at 1: The limitation depends on the input assigned by **[Ref Torque Assign]** tAA.		
NOTE: If **[Torque limit activ.]** tLA and **[Ref Torque Assign]** tAA are enabled at the same time, the lowest value is taken into account.		

(1) The parameter can also be accessed in the **[Settings]** SEt — menu.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

[2nd current limit.] CL1 —

Access

Parameters described below can be accessed by: **[Drive menu]** DRI ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[2nd current limit.]** CL1

Parameters list

HMI label	Settings	Factory setting
[2nd current limit.] CL1 —		
[Current Limitation2] LC2	—	**[No]** NO
Current limitation 2 If the assigned input or bit is at 0, the first current limitation is active. If the assigned input or bit is at 1, the second current limitation is active. • **[No]** NO: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[Current Limit2 Value] CL2 ★ (↻)	0 to 1.1 In (1)	1.1 In (1)
Current limitation 2 value ***NOTICE*** **OVERHEATING** • Verify that the motor is properly rated for the maximum current to be applied to the motor. • Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit. **Failure to follow these instructions can result in equipment damage.** This parameter can be accessed if **[Current Limitation2]** LC2 is not set to **[No]** NO. The adjustment range is limited to 1.1 In. **NOTE:** If the setting is less than 0.25 In, the drive may lock in detected **[Output phase loss]** OPL error mode if this has been enabled (see **[Output phase loss]** OPL). If it is less than the no-load motor current, the motor cannot run.		
[Current Limitation] CL1 ★ (↻)	0 to 1.1 In (1)	1.1 In (1)

HMI label	Settings	Factory setting
Current limitation		

NOTICE

OVERHEATING

- Verify that the motor is properly rated for the maximum current to be applied to the motor.
- Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit.

Failure to follow these instructions can result in equipment damage.

This parameter can be accessed if **[Current Limitation2]** L C 2 is not set to **[No]** n o.

The adjustment range is limited to 1.1 In.

NOTE: If the setting is less than 0.25 In, the drive may lock in detected **[Output phase loss]** o P L error mode if this has been enabled (see **[Output phase loss]** o P L). If it is less than the no-load motor current, the motor cannot run.

(1) In corresponds to the rated drive current indicated in the Installation manual and on the drive nameplate.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

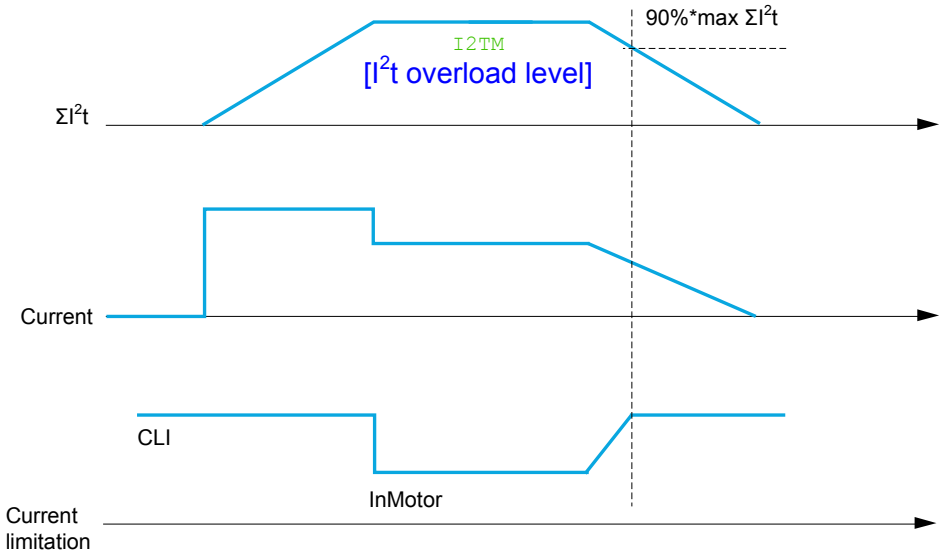
( ) : Setting of this parameter can be done during operation or when stopped.

[Current Limit Dyn] I 2 t —

DYN Current limit

Inside SoMove and with ATH230 DTM, If **BMP motors is selected this function is automatically configured.**

NOTE: The function remains configurable irrespective of **[Motor control type]** C t t setting value.



HMI label	Settings	Factory setting
[Current Limit Dyn] I 2 t —		
[I²t model activation] I 2 t A ★	—	**[No]** n o
I²t model activation for current limitation • **[No]** n o • **[Yes]** y E S when I²t ≥ Max ΣI²t, **[I2t overload level]** I 2 t n = 100 and current limitation is set to InMotor when I²t ≤ Max ΣI²t*90%, **[I2t overload level]** I 2 t n ≤ 90 and the current limitation is set to CLI This parameter can be accessed if **[Max Time of I2t]** I 2 t t is not set to **[0.00] 0.00**		
[Max Current of I2t] I 2 t I ★	—	1.1 In +1 (1)
Maximum current of I2t model		
[Max Time of I2t] I 2 t t	0.00 to 655.35	**[0.00] 0.00**
Maximum time of I2t model		

(1) In corresponds to the rated drive current indicated in the Installation manual or on the drive nameplate.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[Parameters switching] MLP —

Introduction

A set of 1 to 15 parameters from the **[Settings]** SET — menu [Settings] SET-parameters, page 97 can be selected and 2 or 3 different values assigned. These 2 or 3 sets of values can then be switched using 1 or 2 logic inputs or control word bits. This switching can be performed during operation (motor running).
It can also be controlled on the basis of 1 or 2 frequency thresholds, whereby each threshold acts as a logic input (0 = threshold not reached, 1 = threshold reached).

	Values 1	**Values 2**	**Values 3**
Parameter 1	Parameter 1	Parameter 1	Parameter 1
Parameter 2	Parameter 2	Parameter 2	Parameter 2
Parameter 3	Parameter 3	Parameter 3	Parameter 3
Parameter 4	Parameter 4	Parameter 4	Parameter 4
Parameter 5	Parameter 5	Parameter 5	Parameter 5
Parameter 6	Parameter 6	Parameter 6	Parameter 6
Parameter 7	Parameter 7	Parameter 7	Parameter 7
Parameter 8	Parameter 8	Parameter 8	Parameter 8
Parameter 9	Parameter 9	Parameter 9	Parameter 9
Parameter 10	Parameter 10	Parameter 10	Parameter 10
Parameter 11	Parameter 11	Parameter 11	Parameter 11
Parameter 12	Parameter 12	Parameter 12	Parameter 12
Parameter 13	Parameter 13	Parameter 13	Parameter 13
Parameter 14	Parameter 14	Parameter 14	Parameter 14
Parameter 15	Parameter 15	Parameter 15	Parameter 15
Input LI or bit or frequency threshold 2 values	0	1	0 or 1
Input LI or bit or frequency threshold 3 values	0	0	1

NOTE: Do not modify the parameters in the **[Settings]** SET — menu, because any modifications made in this menu (**[Settings]** SET —) is lost on the next power-up. The parameters can be adjusted during operation in the **[Parameters switching]** MLP — menu, on the active configuration.

NOTE: Parameter set switching cannot be configured from the integrated display terminal.

Parameters can only be adjusted on the integrated display terminal if the function has been configured previously via the graphic display terminal, by PC Software or via the bus or communication network. If the function has not been configured, the **[Parameters switching]** MLP — menu and the **[Set 1]** PS1 —, **[Set 2]** PS2 —, **[Set 3]** PS3 — submenus do not appear.

Access

Parameters described below can be accessed by: **[Drive menu]** DRI ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUN ➡ **[Parameters switching]** MLP

Parameters list

HMI label	Settings	Factory setting
[Parameters switching] NLP —		
[2 Parameter sets] CHA1	—	**[No]** no
Parameter set sel 1 Switching 2 parameter sets. • **[No]** no: ***No***, not assigned • **[Mot Freq High Thd]** FtA: ***Motor frequency high threshold reached***, switching via **[Motor Freq Thd]** Ftd • **[Mot Freq High Thd 2]** F2A: ***Motor frequency high threshold 2 reached***, switching via **[Freq. threshold 2]** F2d • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[3 Parameter sets] CHA2	—	**[No]** no
Parameter set sel 2 Identical to **[2 Parameter sets]** CHA1 . Switching 3 parameter sets. **NOTE:** To obtain 3 parameter sets, **[2 Parameter sets]** CHA1 must also be configured.		
[Parameter Selection] SPS	—	—
This parameter can only be accessed on the graphic display terminal if **[2 Parameter sets]** CHA1 is not set to **[No]** no. Making an entry in this parameter opens a window containing all the adjustment parameters that can be accessed. Select 1 to 15 parameters using ENT (a ✓ then appears next to the parameter). Parameter(s) can also be deselected using ENT. Example:		

PARAMETER SELECTION	
SETTINGS	
Ramp increment	✓

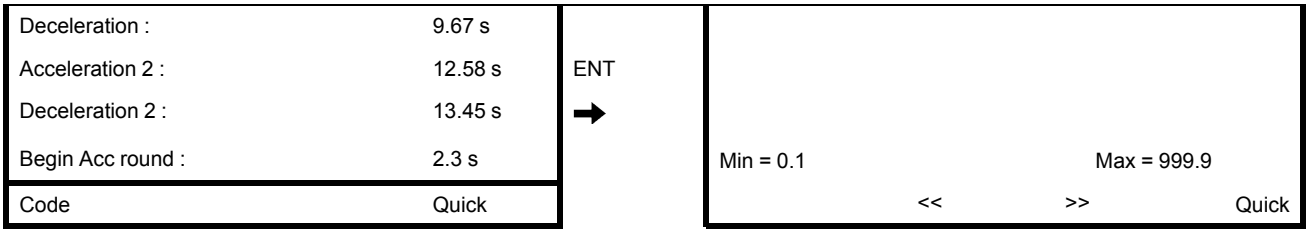
---------	✓

[Set 1] PS1 — ★	
This parameter can be accessed if at least 1 parameter has been selected in **[Parameter Selection]** SPS. Making an entry in this parameter opens a settings window containing the selected parameters in the order in which they were selected. With the graphic display terminal:	

RDY	Term	+0.0 Hz	0.0 A
SET1			
Acceleration :			9.51 s

RDY	Term	+0.0 Hz	0.0 A
Acceleration			
9.51 s			

HMI label	Settings	Factory setting



With the integrated display terminal:

Proceed as in the Settings menu using the parameters that appear.

- **[Param Set 1 Value 1]** S1O1: ***Parameter set 1 value 1***

...

- **[Param Set 1 Value 15]** S1I5: ***Parameter set 1 value 15***

[Set 2] PS2 — ★ ( )

This parameter can be accessed if at least 1 parameter has been selected in **[Parameter Selection]** SPS.

Identical to **[Set 1]** PS1 — .

- **[Param Set 2 Value 1]** S2O1: ***Parameter set 2 value 1***

...

- **[Param Set 2 Value 15]** S2I5: ***Parameter set 2 value 15***

[Set 3] PS3 — ★ ( )

This parameter can be accessed if **[3 Parameter sets]** CHA2 is not **[No]** no and if at least 1 parameter has been selected in **[Parameter Selection]** SPS.

Identical to **[Set 1]** PS1 — .

- **[Param Set 3 Value 1]** S3O1: ***Parameter set 3 value 1***

...

- **[Param Set 3 Value 15]** S3I5: ***Parameter set 3 value 15***

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

( ) : Setting of this parameter can be done during operation or when stopped.

NOTE: We recommend that a parameter set switching test is carried out while stopped and a check is made to verify that it has been performed correctly.

Some parameters are interdependent and in this case may be restricted at the time of switching. Interdependencies between parameters must be respected, **even between different sets**.

Example: The highest **[Low Speed]** LSP must be below the lowest **[High Speed]** HSP.

[Multimotors config] MMC —

Motor or configuration switching

[Multimotors config] MMC **—**

The drive may contain up to 3 configurations, which can be saved using the **[Factory settings]** FCS — menu , page 84.
Each of these configurations can be activated remotely, enabling adaptation to:

- 2 or 3 different motors or mechanisms (multimotor mode)
- 2 or 3 different configurations for a single motor (multiconfiguration mode)

The two switching modes cannot be combined.

NOTE: The following conditions MUST be observed:

- Switching may only take place when stopped (drive locked). If a switching request is sent during operation, it is not executed until the next stop.
- In the event of motor switching, the following additional conditions apply:
  - When the motors are switched, the power and control terminals concerned must also be switched as appropriate.
  - The maximum power of the drive must not be exceeded by any of the motors.
- All the configurations to be switched must be set and saved in advance in the same hardware configuration, this being the definitive configuration (option and communication modules). If you do not to follow this instruction, the drive locks on an **[Incorrect Config]** CFF state.

Menus and parameters switched in multimotor mode

- **[Settings]** SET —
- **[Motor control]** drC —
- **[Inputs / Outputs]** I_O —
- **[Command]** CTL —
- **[Application function]** FUN — with the exception of the **[Multimotors config]** MMC — function (to be configured once only)
- **[FAULT MANAGEMENT]** FLT —
- **[My menu]** MYMN —
- **[USER CONFIG.]**: The name of the configuration specified by the user in the **[Factory settings]** FCS — menu

Menus and parameters switched in multiconfiguration mode

As in multimotor mode, except for the motor parameters that are common to the 3 configurations:

- Rated current
- Thermal current
- Rated voltage
- Rated frequency
- Rated speed
- Rated power
- IR compensation
- Slip compensation

- Synchronous motor parameters
- Type of thermal monitoring
- Thermal state
- The auto-tuning parameters and motor parameters that can be accessed in expert mode
- Type of motor control

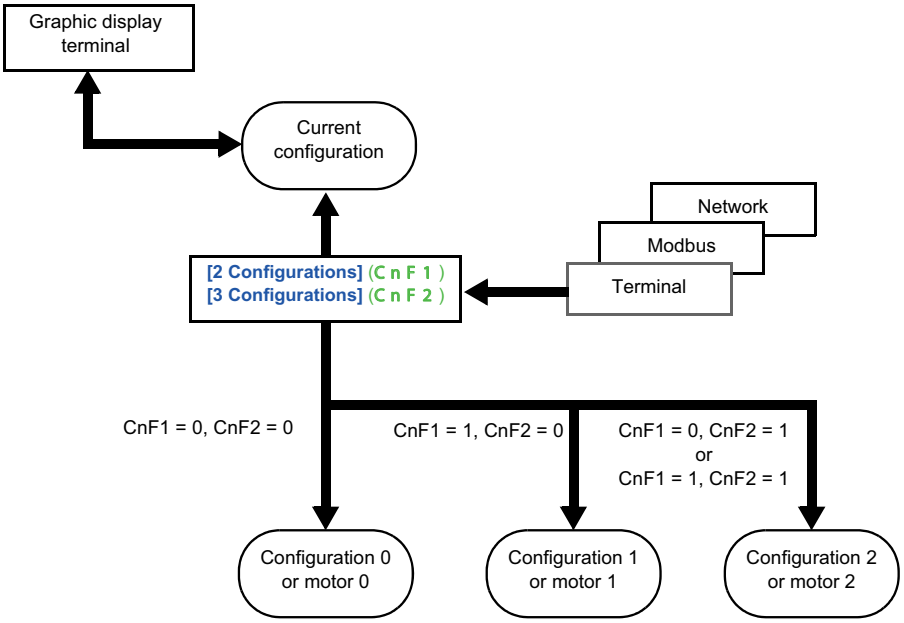
NOTE: No other menus or parameters can be switched.

Transfer of a drive configuration to another one, with graphic display terminal, when the drive uses [Multimotors config] MMC — function

Let A be the source drive and B the drive addressed. In this example, switching is controlled by logic input.

1. Connect graphic display terminal to the drive A.
2. Put logic input LI (**[2 Configurations]** CNF1) and LI (**[3 Configurations]** CNF2) to 0.
3. Download configuration 0 in a file of graphic display terminal (example: file 1 of the graphic display terminal).
4. Put logic input LI (**[2 Configurations]** CNF1) to 1 and leave logic input LI (**[3 Configurations]** CNF2) to 0.
5. Download configuration 1 in a file of graphic display terminal (example: file 2 of the graphic display terminal).
6. Put logic input LI (**[3 Configurations]** CNF2) to 1 and leave logic input LI (**[2 Configurations]** CNF1) to 1.
7. Download configuration 2 in a file of graphic display terminal (example: file 3 of the graphic display terminal).
8. Connect graphic display terminal to the drive B.
9. Put logic input LI (**[2 Configurations]** CNF1) and LI (**[3 Configurations]** CNF2) to 0.
10. Make a factory setting of the drive B.
11. Download the configuration file 0 in the drive (file 1 of graphic display terminal in this example).
12. Put logic input LI (**[2 Configurations]** CNF1) to 1 and leave logic input LI (**[3 Configurations]** CNF2) to 0.
13. Download the configuration file 1 in the drive (file 2 of graphic display terminal in this example).
14. Put logic input LI (**[3 Configurations]** CNF2) to 1 and leave logic input LI (**[2 Configurations]** CNF1) to 1.
15. Download the configuration file 2 in the drive (file 3 of graphic display terminal in this example).

NOTE: Steps 6, 7, 14 et 15 are necessary only if **[Multimotors config]** MMC — function is used with 3 configurations or 3 motors.

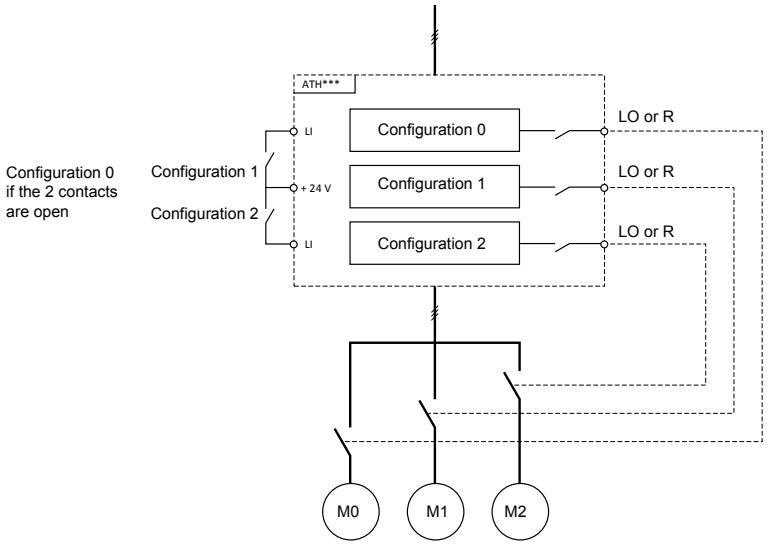


Switching command

Depending on the number of motors or selected configurations (2 or 3), the switching command is sent using one or two logic inputs. The table below lists the possible combinations.

LI 2 motors or configurations	LI 3 motors or configurations	Number of configurations or active motors
0	0	0
1	0	1
0	1	2
1	1	2

Schematic diagram for multimotor mode



Auto-tuning in multimotor mode

On Multi-Motor mode, autotuning parameters for each motor are handled and stored. However, it is necessary to firstly perform autotuning on each motor. This auto-tuning can be performed:

- Manually using a Digital input when the motor changes.
- Automatically on the selected motor at drive power-up if the **[Automatic autotune]** AUt on is set to **[Yes]** YES.

Motor thermal states in multimotor mode

The drive helps to protect the three motors individually. Each thermal state takes into account all stop times, if the drive power is not switched off.

NOTICE
MOTOR OVERHEATING When the drive is switched off, the thermal states of the connected motors are not saved. When the drive is switched on again, the drive is not aware of the thermal states of the connected motors. • Use separate temperature sensors for each connected motor for thermal monitoring. **Failure to follow these instructions can result in equipment damage.**

Configuration information output

In the **[Inputs / Outputs]** I_O — menu, a logic output can be assigned to each configuration or motor (2 or 3) for remote information transmission.

NOTE: As the **[Inputs / Outputs]** I_O — menu is switched, these outputs must be assigned in all configurations in which information is required.

Access

Parameters described below can be accessed by: **[Drive menu]** dr1 ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** FUn ➡ **[Multimotors config]** MMC

Parameters list

HMI label	Settings	Factory setting
[Multimotors config] MMC —		
[Multimotors] CHM	—	**[No]** no
Multimotors selection		

HMI label	Settings	Factory setting

NOTICE

MOTOR OVERHEATING

When the drive is switched off, the thermal states of the connected motors are not saved. When the drive is switched on again, the drive is not aware of the thermal states of the connected motors.

- Use separate temperature sensors for each connected motor for thermal monitoring.

Failure to follow these instructions can result in equipment damage.

Switching 2 parameter sets.

- **[No]** n o: ***No***, multiconfiguration possible
- **[Yes]** Y E S: ***Yes***, multimotor possible

[2 Configurations] C n F 1	—	**[No]** n o

2 configurations assignt.

Switching of 2 motors or 2 configurations.

- **[No]** n o: ***No***, no switching
- **[DI1]** L I 1: ***Digital input 1***
- **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.

(**[CD00]** C d 0 0 up to **[CD15]** C d 1 5, **[C101]** C 1 0 1 up to **[C110]** C 1 1 0and **[C301]** C 3 0 1 up to **[C310]** C 3 1 0 are not available).

[3 Configurations] C n F 2	—	**[No]** n o

3 configurations assignt.

Switching of 3 motors or 3 configurations.

Identical to **[2 Configurations]** C n F 1 .

NOTE: To obtain 3 motors or 3 configurations, **[2 Configurations]** C n F 1 must also be configured.

[Autotuning by DI] tnL —

Access

Parameters described below can be accessed by: **[Drive menu]** drI ➜ **[Configuration]** CONF ➜ **[Full]** FULL ➜ **[Application function]** FUN ➜ **[Autotuning by DI]** tnL

Parameters list

HMI label	Settings	Factory setting
[Autotuning by DI] tnL —		
[Autotuning Assign] tUL	—	**[No]** nO
Autotuning input assignment Auto-tuning is performed when the assigned input or bit changes to 1. **NOTE:** Auto-tuning causes the motor to start up. • **[No]** nO: ***No***, not assigned • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		

[High Speed Switching] CHS —

Access

Parameters described below can be accessed by: **[Drive menu]** dr1 ➜ **[Configuration]** CONF ➜ **[Full]** FULL ➜ **[Application function]** FUn ➜ **[High Speed Switching]** CHS

Parameters list

HMI label	Settings	Factory setting
[High Speed Switching] CHS —		
[2 High speed] SH2	—	**[No]** nO
2 high speed assign. • **[No]** nO: ***No***, function not assigned • **[Mot Freq High Thd]** FtA: ***Motor frequency high threshold reached*** • **[Mot Freq High Thd 2]** F2A: ***Motor frequency high threshold 2 reached*** • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[4 High speed] SH4	—	**[No]** nO
4 high speed assign. **NOTE:** To obtain 4 High speed, **[2 High speed]** SH2 must also be configured. Identical to **[2 High speed]** SH2 .		
[High Speed] HSP	0 to 599 Hz	50 Hz
High speed Motor frequency at maximum reference, can be set between **[Low Speed]** LSP and **[Max Frequency]** tFr . The factory setting changes to 60 Hz if **[Motor Standard]** bFr is set to **[60 Hz]** 60. To help prevent detected **[Motor Overspeed]** SOF error, it is recommended to have **[Max Frequency]** tFr equal to or higher than 110% of **[High Speed]** HSP.		
[High speed 2] HSP2 ★	0 to 599 Hz	50 Hz
High speed 2 Visible if **[2 High speed]** SH2 is not set to **[No]** nO. Identical to **[High Speed]** HSP .		
[High speed 3] HSP3 ★	0 to 599 Hz	50 Hz
High speed 3 Visible if **[4 High speed]** SH4 is not set to **[No]** nO. Identical to **[High Speed]** HSP .		
[High speed 4] HSP4 ★	0 to 599 Hz	50 Hz
High speed 4 Visible if **[4 High speed]** SH4 is not set to **[No]** nO. Identical to **[High Speed]** HSP .		

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

[DC bus] dCC —

Access

Parameters described below can be accessed by: **[Drive menu]** dr1 ➜ **[Configuration]** CONF ➜ **[Full]** FULL ➜ **[Application function]** FUn ➜ **[DC bus]** dCC

Parameters list

HMI label	Settings	Factory setting
[DC bus] dCC —		
[DC Bus chaining] dCCN	—	**[No]** no
DC Bus chaining mode • **[No]** no: ***No***, not assigned • **[Bus & Mains]** MA in: ***Bus and Mains***, the drive is supplied by both DC Bus and supply mains. • **[Only Bus]** bus: ***Only Bus***, the drive is supplied by DC Bus only. **⚠⚠DANGER** **GROUND FAULT MONITORING DISABLED, NO ERROR DETECTION** Setting this parameter to Main deactivates ground fault monitoring. • Only use this parameter after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application. • Implement alternative ground fault monitoring functions that do not trigger automatic error responses of the drive, but allow for adequate, equivalent responses by other means in compliance with all applicable regulations and standards as well as the risk assessment. • Commission and test the system with ground fault monitoring enabled. • During commissioning, verify that the drive and the system operate as intended by performing tests and simulations in a controlled environment under controlled conditions. **Failure to follow these instructions will result in death or serious injury.**		
[DC Bus compat.] dCCC ★	—	**[Altivar]** ALV
DC Bus compatibility Visible if **[DC Bus chaining]** dCCN above is not set to **[No]** no. **[Lexium]** LHM: At least one Lexium 32 drive is on the DC Bus chain. • For ATH•••M2 or ATH230•••M3 or ATH230•••S6, not depending on **[DC Bus compat.]** dCCC the parameters **[Mains voltage]** urES, **[Braking level]** Vbr are forced to their default value. • For ATH•••N4, if **[DC Bus compat.]** dCCC is set to **[Altivar]** ALV the parameters **[Mains voltage]** urES, **[Braking level]** Vbr are forced to their default value. • For ATH•••N4, if **[DC Bus compat.]** dCCC is set to **[Lexium]** LHM, **[Mains voltage]** urES is forced to its default value, **[Braking level]** Vbr is forced to 780 Vdc and the drive triggers in **[Overbraking level]** VobF at a DC Bus level of 820 Vdc instead of 880 Vdc to be compatible with Lexium 32 drives.		
[InPhaseLoss Assign] iPL ★	—	According to drive rating.
Input Phase Loss assignment, drive behaviour in case of input phase loss detected error. Cannot be accessed if drive rating is ATH•••M2. Visible if **3.1 [Access Level]** LAC is set to **[Expert]** EPr and **[DC Bus chaining]** dCCN above is set to **[No]** no.		

HMI label	Settings	Factory setting
• **[Ignore]** nO: ***Ignore***, detected error ignored • **[Freewheel Stop]** YES: ***Freewheel stop***, detected error with freewheel stop **[Input phase loss]** IPL is forced to **[Ignore]** nO if **[DC Bus chaining]** dCCN above is set to **[Only Bus]** bUS . (See **[Input phase loss]** IPL in the Programming Manual (DRI- > CONF > FULL > FLT- > IPL-).		
[Ground short circuit] SCL3 ★	—	**[Freewheel Stop]** YES
Ground short circuit detection Can be accessed for drives rating ATH230U55••• … D15•••. Visible if **3.1 [Access Level]** LAC is set to **[Expert]** EPr and **[DC Bus chaining]** dCCN above is set to **[No]** nO. • **[Ignore]** nO: ***Ignore***, detected error ignored • **[Freewheel Stop]** YES: ***Freewheel stop***, detected error with freewheel stop **[Ground short circuit]** SCL3 is forced to **[Ignore]** nO for ATH230U55••• … D15••• drives if **[DC Bus chaining]** dCCN above is set to **[Bus & Mains]** MAIn . **NOTE:** if **[Ground short circuit]** SCL3 is set to **[Ignore]** nO , integrated safety functions (except Safe Torque Off) for ATH230U55••• … D15••• drives cannot be used, otherwise the drive triggers in **[Safety Func Error]** SAFF state. **⚠⚠DANGER** **GROUND FAULT MONITORING DISABLED, NO ERROR DETECTION** Setting this parameter to **[Ignore]** NO deactivates ground fault monitoring. • Only use this parameter after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application. • Implement alternative ground fault monitoring functions that do not trigger automatic error responses of the drive, but allow for adequate, equivalent responses by other means in compliance with all applicable regulations and standards as well as the risk assessment. • Commission and test the system with ground fault monitoring enabled. • During commissioning, verify that the drive and the system operate as intended by performing tests and simulations in a controlled environment under controlled conditions. **Failure to follow these instructions will result in death or serious injury.**		
[Mains voltage] UrES ★	According to drive voltage rating	According to drive voltage rating
Evacuation mains voltage Visible if **3.1 [Access Level]** LAC is set to **[Expert]** EPr and **[DC Bus chaining]** dCCN above is set to **[No]** nO . For ATH230•••M2• or ATH230•••M3•: • **[200 Vac]** 200: 200 Volts AC • **[220 Vac]** 220: 220 Volts AC • **[230 Vac]** 230: 230 Volts AC • **[240 Vac]** 240: 240 Volts AC (factory setting) • **[Lexium]** LHM: **[Mains voltage]** UrES , **[Undervoltage level]** USL , **[Braking level]** VbrR are forced to their default value. For ATH230•••N4•: • **[380 Vac]** 380: 380 Volts AC • **[400 Vac]** 400: 400 Volts AC • **[460 Vac]** 460: 460 Volts AC • **[500Vac]** 500: 500 Volts AC (factory setting)		

HMI label	Settings	Factory setting
• **[Lexium]** LHM: **[Mains voltage]** urES, **[Undervoltage level]** USL are forced to their default value, **[Braking level]** Vbr is forced to 780 Vdc and the drive triggers in **[Overbraking level]** VobF at a DC Bus level of 820 Vdc instead of 880 Vdc. For ATH230•••S6: • **[525 Vac]** 525: 525 Volts AC • **[600 Vac]** 600: 600 Volts AC (factory setting) • **[Lexium]** LHM: **[Mains voltage]** urES, **[Undervoltage level]** USL , **[Braking level]** Vbr are forced to their default value.		
[Undervoltage level] USL ★	100 to 304 Vac	According to drive rating

Undervoltage level

Visible if 3.1 **[Access Level]** LAC is set to **[Expert]** EPr .

The factory setting is the maximal value of the adjustment range (see the table below).
The adjustment range is determined by the the following table:

		Adjustment range		
		Minimum Value		
Drive voltage rating	[Mains voltage] (urES)	[DC-Bus chaining] (dCCM) = [No] (nO)	[DC-Bus chaining] (dCCM) = [MAin](Bus & Main) or [buS] (Only Bus)	**Maximum value**
ATH230●●●M2 ATH230●●●M3	[200V ac] (200)	100 Vac	100 Vac	141 Vac
	[220V ac] (220)	120 Vac		
	[230V ac] (230)	131 Vac		
	[240V ac] (240) or [Lexium] (LHM)	141 Vac		
ATH230●●●N4	[380V ac] (380)	190 Vac	190 Vac	276 Vac
	[400V ac] (400)	204 Vac		
	[440V ac] (440)	233 Vac		
	[460V ac] (460)	247 Vac		
	[500V ac] (500) or [Lexium] (LHM)	276 Vac		
ATH230●●●S6	[525V ac] (525)	266 Vac	266 Vac	304 Vac
	[600V ac] (600) or [Lexium] (LHM)	304 Vac		

This parameter is also visible in (DRI- > CONF > FULL > FLT- > USB-).

HMI label	Settings	Factory setting
[Braking level] V b r ★ ↻	335 to 995 Vdc	According to drive rating

Braking level

Visible if 3.1 **[Access Level]** L A C is set to **[Expert]** E P r .

The factory setting is determined by the drive voltage rating :

- For ATH230●●●M2 : 395 Vdc
- For ATH230●●●M3 : 395 Vdc
- For ATH230●●●N4 : 820 Vdc
- For ATH230●●●S6 : 995 Vdc

The adjustment range is determined by the the following table:

		Adjustment range	
Drive voltage rang	[Mains voltage](urES)	minimum value	maximal value
ATH230●●●M2 ATH230●●●M3	[200V ac] (200)	335 Vdc	395 Vdc
	[220V ac] (220)	365 Vdc	
	[230V ac] (230)	380 Vdc	
	[240V ac] (240) or [Lexium] (LHM)	395 Vdc	
ATH230●●●N4	[380V ac](380)	698 Vdc	820 Vdc
	[400V ac](400)	718 Vdc	
	[440V ac](440)	759 Vdc	
	[460V ac](460)	779 Vdc	
	[500V ac](500)	820 Vdc	
	[Lexium](LHM)	780 Vdc	780 Vdc
ATH230●●●S6	[525V ac](525)	941 Vdc	995 Vdc
	[600V ac](600) or [Lexium] (LHM)	995 Vdc	

This parameter is also visible in (DRI- > CONF > FULL > DRC-).

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

↻ : Setting of this parameter can be done during operation or when stopped.

[HVAC functions] HVAC

[Run permissive] rPr – Menu

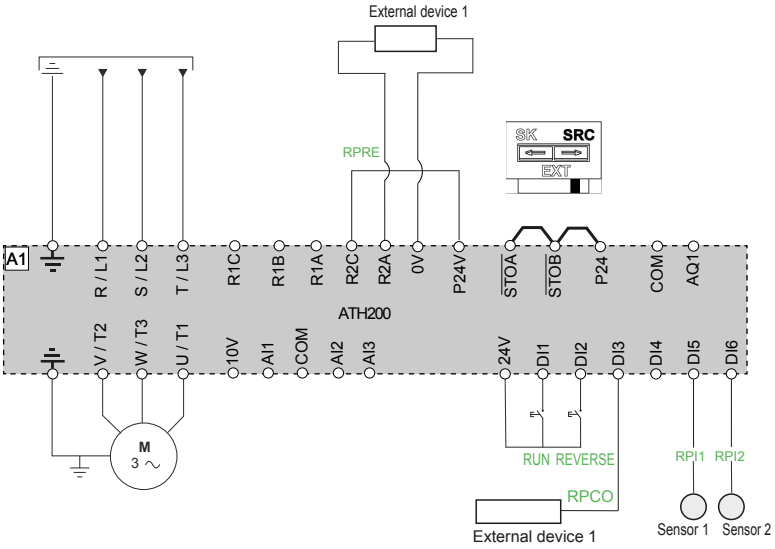
Access

[Drive menu] dr1 ➡ **[Configuration]** CONF ➡ **[Full]** FULL ➡ **[Application function]** Fun ➡ **[HVAC functions]** HVA ➡ **[Run permissive]** rPr

About This Menu

Run Permissive is a mechanism that prevents the motor from starting unless specific conditions are met.
The Run Permissive function prevents the drive from running the motor until validation from an external device is received.

Example Of Wiring Diagram Of The Function :



Example of configuration :

- **[Run Perm Assign]** rPCo is assigned to **[DI3]** LI3.
- **[Run Perm Int 1 Assign]** rPI1 is assigned to **[DI5]** LI5.
- **[Run Perm Int 2 Assign]** rPI2 is assigned to **[DI6]** LI6.
- **[Run Perm Out Assign]** rPrE is controlled via relay output **[R2]** r2.

1. When configured, run order will not run the motor but it will activate the digital output selected with **[Run Perm Out Assign]** rPrE.
2. Then this digital output will activate an external device depending on the wiring.
3. This external device will send a confirmation to a dedicated DI chosen with **[Run Perm Assign]** rPCo.
4. When this digital input is active, the drive shall run the motor to the active setpoint.

Step by step on how to configure Run Permissive :

Step	Action
1	Configure run permissive function : • Go to **[Run Perm Enable]** r P E n parameter. • Select the option **Yes**.
2	Choose the output for run permissive request : • Go to **[Run Perm Out Assign]** r P r E parameter.
3	Choose the digital input for run permissive confirmation : • Go to **[Run Perm Assign]** r P C o parameter.
4	Select the stop mode : • Go to **[Run Perm Stop Mode]** r P S t parameter.
5	Select the input switch for run permissive interlock : • Go to **[Run Perm Int 1 Assign]** r P I 1 and **[Run Perm Int 2 Assign]** r P I 2 parameters.
6	Choose the tag : • Go to **[Run Perm Tag]** r P t 0 parameter.
7	Choose the Interlock tags : • Go to **[Run Perm Int 1 Tag]** r P t 1 and **[Run Perm Int 2 Tag]** r P t 2 parameters.

[Run Perm Enable] RPEN

Configure run permissive.

Setting	Code / Value	Description
[No]	n o	Run permissive not configured.. **Factory settings**
[Yes]	Y E S	Run permissive configured..

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

.

- Take into account that the motor's run command may be delayed as long as the start conditions are not fully met.
- Verify that this behavior does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Note:

- Damper Control function is incompatible with Run Permissive function.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Run Perm Assign] RPCO

Configure digital source for run permissive confirmation.

This parameter is accessible only if **[Run Perm Enable]** r P E n and **[Run Perm Out Assign]** r P r E are not assigned to **[No]** n o .

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI6]**	LI1...LI6	Digital input DI1...DI6 used at high level
[DAI1]	LA1	Analog input AI1
[DAI2]	LA2	Analog input AI2
[CD11]... **[CD15]**	Cd11... Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C111]... **[C115]**	C111... C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C311]... **[C315]**	C311... C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration

Note :

- In the event of a confirmation loss while running, a stop is triggered based on the configuration of the **[Run Perm Stop Mode]** rPSt parameter.
- If the run command remains active (in case of 2-wire control), the drive returns to **[Wait Confirm]** PErM status.

[Run Perm Out Assign] RPRE

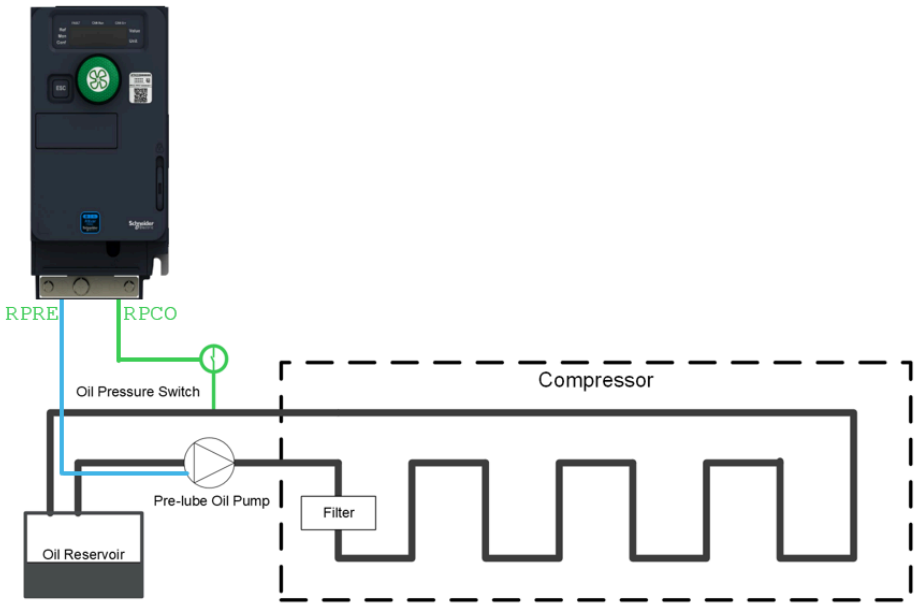
Select the digital output for run permissive request.

Setting	Code / Value	Description
[No]	nO	Not assigned **Factory setting**
[R2]	r2	Relay output R2
[LO1]	LO1	Logical output LO1
[DQ1 configura-tion]	dO1	Analogical/Logical output DO1

Note:

- When this digital output becomes active, the drive enters the status **[Wait Confirm]** PErM.

Example Of Configuration Of The Parameter :



For example, the **[Run Perm Out Assign]** r P r E input can be used to activate a pre-lubrication pump that delivers oil to the compressor. Once the oil has filled all the passages and sufficient pressure is reached, a feedback signal from the oil pressure sensor can be used as the **[Run Perm Assign]** r P C o input, allowing the drive to start the motor.

[Run Perm Stop Mode] r P S t

Select the stop mode when run permissive signal is lost.

Setting	Code / Value	Description
[Yes]	Y E S	Device is stopped in freewheel **Factory setting**
[Fallback Speed]	L F F	Fallback speed
[Ramp stop]	r M P	Ramp stop
[Fast stop]	F S t	Fast stop.

Depending on the type of command, the restart of the connected motor will be allowed under different conditions. In 2-wire terminal command mode:

- Regardless of the RPST parameter setting, the restart will be allowed as soon as the start condition input becomes active.
- If the RPST parameter is set to any value other than Freewheel Stop, the restart will be allowed as soon as the start condition input becomes active.

In all other command types, including fieldbus:

- If the RPST parameter is set to Freewheel Stop, the restart will not be allowed when the start condition input becomes active. To allow a restart, a new run command sequence (1) must be applied.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Ensure that allowing automatic restart without applying a new run command sequence (1) does not result in unsafe conditions..

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(1) By switching the run command OFF and then ON again.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Run Perm Int 1 Assign] rPI1

Select run permissive interlock 1 source.

This parameter is accessible only if **[Run Perm Enable]** rPEN is not assigned to **[No]** nO.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI6]**	LI1...LI6	Digital input DI1...DI6 used at high level
[DAI1]	LAI1	Analog input AI1
[DAI2]	LAI2	Analog input AI2
[CD11]... **[CD15]**	Cd11... Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C111]... **[C115]**	C111... C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C311]... **[C315]**	C311... C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration

[Run Perm Int 2 Assign] rPI2

Select run permissive interlock 2 source.

This parameter is accessible only if **[Run Perm Enable]** rPEN is not assigned to **[No]** nO.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI6]**	LI1...LI6	Digital input DI1...DI6 used at high level
[DAI1]	LAI1	Analog input AI1
[DAI2]	LAI2	Analog input AI2
[CD11]... **[CD15]**	Cd11... Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C111]... **[C115]**	C111... C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C311]... **[C315]**	C311... C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration

[Run Perm Tag] rPTO

Run permissive tag.

This parameter is accessible only if **[Run Perm Out Assign]** rPrE is configured and **[Run Perm Enable]** rPEN is not assigned to **[No]** nO.

Setting	Code / Value	Description
[Run Permissive]	rPMS	Run Permissive. **Factory setting**
[Damper Closed]	dPES	Damper End Switch
[Valve Opened]	VLoP	Valve open.
[Pre-Lube Cycle]	PrLu	Pre-lube cycle.

[Run Perm Int 1 Tag] rPt 1

Configure Interlock 1 tags.

This parameter is accessible only if **[Run Perm Int 1 Assign]** rPi1 is configured and **[Run Perm Enable]** rPEn is not assigned to **[No]** no.

Setting	Code / Value	Description
[Interlock Opened]	inoP	Interlock Open. **Factory setting**
[Overpressure]	oVPu	Overpressure.
[Vibration]	Vibr	Vibration.
[Freeze State]	FrES	Freeze stat.
[Motor Disconnected]	MdSo	Motor disconnected.
[Low Suction Pressure]	LSPr	Low suction pressure.

[Run Perm Int 2 Tag] rPt2

Configure Interlock 2 tags.

This parameter is accessible only if **[Run Perm Int 2 Assign]** rPi2 is configured and **[Run Perm Enable]** rPEn is not assigned to **[No]** no.

Setting	Code / Value	Description
[Interlock Opened]	inoP	Interlock Open. **Factory setting**
[Overpressure]	oVPu	Overpressure.
[Vibration]	Vibr	Vibration.
[Freeze State]	FrES	Freeze stat.
[Motor Disconnected]	MdSo	Motor disconnected.
[Low Suction Pressure]	LSPr	Low suction pressure.

[Fire modes] FMor – Menu

Access

[Drive menu] drI ➡ **[Configuration]** ConF ➡ **[Full]** FULL ➡ **[Application function]** Fun ➡ **[HVAC functions]** HVA ➡ **[Fire modes]** FMor

About This Menu

In rare cases, the monitoring functions of the device may be unwanted because they impede the purpose of the application. A typical example is a smoke extractor fan operating as a part of a fire protection system. If a fire occurs, the smoke extractor fan should operate as long as possible, even if, for example, the permissible ambient temperature of the device is exceeded. In such applications, damage to or destruction of the device may be acceptable as collateral damage, for example, to keep other damage from occurring whose hazard potential is assessed to be more severe.

A setting for the digital inputs is provided to disable certain monitoring functions in such applications so that automatic error detection and automatic error responses of the device are no longer active. You must implement alternative monitoring functions for disabled monitoring functions that allow operators and/or master control systems to adequately respond to conditions which correspond to detected errors. For example, if overtemperature monitoring of the device is disabled, the device of a smoke extractor fan may itself cause a fire if errors go undetected. An overtemperature condition can be, for example, signaled in a control room without the device being stopped immediately and automatically by its internal monitoring functions.

⚠DANGER

MONITORING FUNCTIONS DISABLED, NO ERROR DETECTION

- Only set **[Mode Selection]** FMM to **[Not Forced]** or **[Forced]** after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Implement alternative monitoring functions for disabled monitoring functions that do not trigger automatic error responses of the drive but allow for adequate, equivalent responses by other means in compliance with all applicable regulations and standards as well as the risk assessment.
- Commission and test the system with the monitoring functions enabled.
- During commissioning, verify that the drive and the system operate as intended by performing tests and simulations in a controlled environment under controlled conditions.

Failure to follow these instructions will result in death or serious injury.

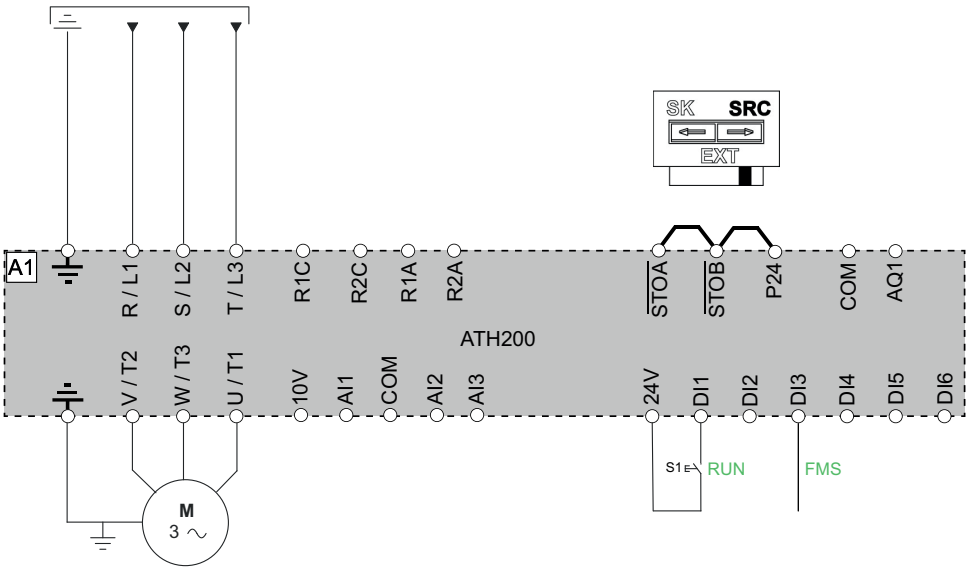
The **[Fire modes]** FMOD menu includes two selectable modes:

- **[Not Forced]** FNRE Mode: The drive ignores the **inhibitable** errors and continues on the basic control command as its main frequency control setpoint.
- **[Forced]** FORC Mode: The drives ignores the **inhibitable** errors. The drive overrides the basic control command with the selected preset control mode.

While these modes are designed to be mostly used in the event of fire, smoke or heat purge, it can be used in any other application that requires ignoring the **inhibitable** errors that normally triggers the power drive system.

We present an example of the wiring diagram of the function and a step-by-step guide to configure the function for a scenario where we need to run the motor at the setpoint frequency **[Forced Mode Freq]** FMFF on the fire trigger signal:

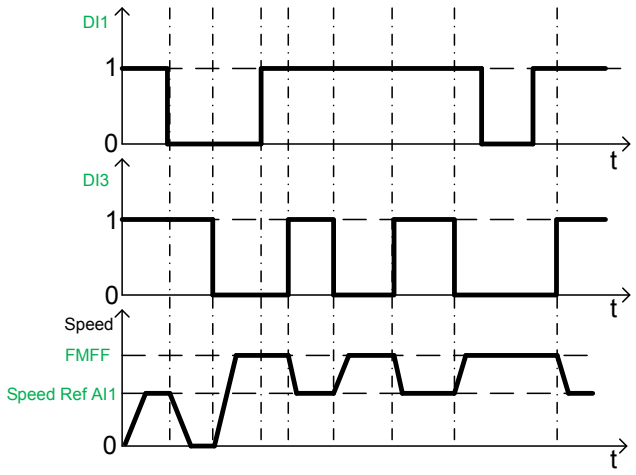
- **[Fire Mode Assign]** FMS is assigned to **[DI3]** LI3.
- **[2-wire type]** TCT is assigned to **[Level]** LEL .
- **[Forward]** Frd is assigned to **[DI1]** LI1, and can be controlled using the **S1** interrupter.



The following table presents a step by step example on how to configure the Fire Mode function:

Step	Action
1	Go to the Fire Modes Menu.
2	Activate **[Forced]** Mode: • Go to **[Mode Selection]** FMM and select **[Forced]** FORC . • Go to **[Fire Mode Assign]** FMS and select **[DI3]** LI3.
3	Set the activation of the function to be **[FM On Level]**: • Go to **[Fire Mode Activation]** FMTN parameter. • Select **[FM On Level]** LEL .
4	Set the control logic to be on a setpoint frequency controlled by **[Forced Mode Freq]** : • Go to **[Forced Mode Select]** FMFS . • Select **[Constant Freq Ref]** CST . • Set **[Forced Mode Freq]** FMFF .
5	**Optional**: • The error response behavior can be changed from the **[Stop]** factory setting, by going and choosing one of the options in **[Fire Mode ErrorResp]** FMFB . • Fire Mode parameters can be locked to prevent changes during the activation of the function by going to **[Forced Settings Lock]** FML and selecting **[Yes]**.
6	You can check the status of the function by going to**[Fire Mode Status]** FMST .

The following figure presents the behavior of the system (Wiring diagram + step-by-step configuration):



tcc= 2 wire and tct=level

[Mode Selection] F M M

The parameter **[Mode Selection]** F M M is used to select the desired operating mode. The process requires a double confirmation to avoid unintended selection of the function.

Only one mode can be selected at a time:

Setting	Code / Value	Description
[No]	n o	Fire mode and force mode unselected **Factory setting**
[Not Forced]	F i r E	Fire mode selected / Force mode unselected
[Forced]	F o r C	Force mode selected / Fire mode unselected

⚠DANGER

MONITORING FUNCTIONS DISABLED, NO ERROR DETECTION

- Only set **[Mode Selection]** F M M to **[Not Forced]** or **[Forced]** after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Implement alternative monitoring functions for disabled monitoring functions that do not trigger automatic error responses of the drive but allow for adequate, equivalent responses by other means in compliance with all applicable regulations and standards as well as the risk assessment.
- Commission and test the system with the monitoring functions enabled.
- During commissioning, verify that the drive and the system operate as intended by performing tests and simulations in a controlled environment under controlled conditions.

Failure to follow these instructions will result in death or serious injury.

During **[Forced]** F o r C Mode, parameter monitoring via fieldbus communication remains active(It is always possible to disable the monitoring of the fieldbus by the parameters **[Modbus Error Resp]** S L L , **[Fdbus Interrupt Resp]** C L L , **[Eth Error Response]** E t H L , depending on the type of fieldbus). Additionally, pass-through I/O points-including analog outputs, relay outputs, and digital inputs controlled via field bus-continue to function normally, allowing data to pass through the drive without interruption.

NOTE: Pass-through I/O refers to free I/O points not assigned to internal drive functions. These can be accessed and controlled via communication protocols, such as by an upstream PLC, and used as additional I/O resources.

When the Fire Mode function is set to **[Forced]** FORCE mode, any Stop command coming from the fieldbus, the embedded terminal display, or the graphic terminal display is ignored.

⚠WARNING

LOSS OF CONTROL

- Verify that this behaviour does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

These functions and actions have priority over **[Forced]** FOrC Mode:

- STO (Safety Torque Off)
- **[Device Lock]** LES
- Power off or **[Product restart]** rP
- Deactivating Force Mode if **[FM On Level]** LEL is selected.
- Damper control :
  - If damper control is configured, it will have priority over Force Mode for a maximum **[Damper Opening time]** dCot (or less in case feedback mode is configured and is activated before using **[Damper Input Assign]** dCFI)
  - This means the motor can start with a delay with force mode, but it will eventually start after **[Damper Opening time]** dCot time even if the damper is not opened.

NOTE: [Mode Selection] is not compatible with **[Disable Error Detect]** InH:

- If **[Disable Error Detect]** InH is set to a value different than NO, then **[Mode Selection]** is locked to the NO value.
- If **[Mode Selection]** FMM is set to a value different from NO, then **[Disable Error Detect]** InH is locked to the NO value.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Fire Mode Assign] FMS

The trigger of the Fire Modes function is done with the **[Fire Mode Assign]** FMS parameter.

NOTE: [Fire Mode Assign] FMS cannot be assigned to the same inputs as **[Drive Running]** run and**[Forward]** Frd and**[Reverse Assign]** rrS.

The following table presents the list of the possible assignations:

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI6]**	LI1...LI6	Digital input DI1...DI6 used according to **[Fire Mode Activation]** FMtn configuration
[DAI1]	LAI1	Logical input AI1
[DAI2]	LAI2	Logical input AI2

NOTE: While having **[Fire Mode Activation]** FMTN **= [FM On Level]** LEL , if the assigned input is:

- **0**: Fire mode is enabled.
- **1**: Fire mode is disabled.

While **[Fire Mode Activation]** FMTN **= [FM On Transition]** TRN ,If the transition to the assigned input is :

- **0**to **1**: Fire mode is enabled.
- **1**to **0**: Fire mode is not disabled.(so once activated only a power off can stop the drive.)

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

- After assigning a digital input to the parameter **[Fire Mode Assign]** FMS, verify that the setting of the parameter **[Fire Mode Activation]** FMTN is appropriate for your application.
- Depending on the configuration of **[Fire Mode Activation]** FMTN, the function may be activated either by a transition or by a level signal. Verify that it does not result in unsafe conditions by performing extensive commissioning tests.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[Forced Mode Select] FMFS

On the activation of **[Forced]** FORC Mode the drive uses a predefined control configuration that overrides the basic control command. The table below outlines the various configuration options available in **[Forced Mode Select]** FMFS for defining Force Mode behavior

Setting	Code / Value	Description
[Constant Freq Ref]	CST	Forced at a constant speed level and adjusted by the parameter **[Forced Mode Freq]** **Factory settings**
[Max Freq Forward Ref]	FRD	Forced forward at maximum speed (HSP).
[Max Freq Reverse Ref]	REV	Forced reverse at maximum speed (HSP).
[Analog Input Ref]	FAI	Forced to an analog input, that can be assigned in **[Forced Mode AI]**.
[Forced To Stop]	STP	Forced to Stop according to the chosen behavior in **[Fire Stop Mode]**.
[Preset Speed Ref]	LVL	Forced at preset levels in **[Application function]** ➡ **[Preset speeds]**.
[+/- Speed Ref]	REG	Forced at +/- speed function.
[PID Ref]	PID	Forced at PID controller.

[Fire Mode Activation] FMTN

If **[Forced]** FORC Mode was selected and an input was assigned to **[Fire Mode Assign]** FMS, then the **[Fire Mode Activation]** FMTN Menu will appear. It allows the user to choose the type of activation of **[Forced]** FORC Mode:

Setting	Code / Value	Description
[FM On Level]	LEL	Sets the option to validate the input on the change of level. **Factory settings**
[FM On Transition]	trn	Sets the option to validate the input on the transition, so **once activated only a power off can stop the drive.**

[Forced Mode Freq] FMFF

Select the force mode frequency when **[Forced Mode Select]** FMFS is set to **[Constant Freq Ref]** CST.

Setting	Description
–500.0Hz....500.0Hz	Setting range **Factory setting**: 50.0Hz

NOTE: If the picked value is :

- In this range [-500.0 Hz ... 0 Hz]:
  - The minimum value of this parameter is (-**[High Speed]** HSP)
  - The maximum value of this parameter is (-**[Low Speed]** LSP)
- In this range [0.0 Hz ... 500.0 Hz]:
  - The minimum value of this parameter is (**[Low Speed]** LSP)
  - The maximum value of this parameter is (**[High Speed]** HSP)

[Forced Mode AI] FMFA

Select the analog source when **[Forced Mode Select]** FMFS is set to **[Analog Input Ref]** FAI.

Setting	Code / Value	Description
[No]	no	Not assigned **Factory setting**
[AI3]	AI3	Assigned to analog input 3.

[Fire Stop Mode] FMSb

Select the stop mode for fire function when **[Forced Mode Select]** FMFS is set to **[Forced To Stop]** STP.

Setting	Code / Value	Description
[Freewheel Stop]	YES	Freewheel stop. **Factory settings**
[Ramp Stop]	rMP	Ramp stop.
[Configured Stop]	Stt	Stop according to **[Type of stop]** Stt parameter but without tripping. In this case, the detected error relay does not open and the drive is ready to restart as soon as the detected error has been removed, according to the restart conditions of the active command channel.
[Fallback Speed]	LFF	Fallback speed.

[Fire Mode ErrorResp] F M F b

Errors can be divided into two groups in the case of Fire Modes function:

- **Inhibitable errors**: These errors are ignored both in **[Forced]** F o r C and **[Not Forced]** F n r E Modes, they are presented as the codes listed in the **second** and **third** rows of the error codes table.
- **Non-inhibitabe errors**: These errors require a power reset to be cleared and they are listed in the **first** and **last** row of the error codes table.

The **[Fire Mode ErrorResp]** F M F b parameter allows the user to configure up to three error response modes for Fire Modes:

Setting	Code / Value	Description
[Test]	t E S t	• In this Mode errors are handled according to standard drive behavior. • This Mode is intended for testing Fire Mode functionality without enabling error inhibition, reducing the risk of drive damage. • On this Mode, the status of the function is still well monitored. **NOTE:** The test mode setting is not saved across power cycles (ON/OFF). At each device restart, the mode is automatically reset to:**[Stop]** S t o P
[Restart]	r E S t A r t	• In this Mode **inhibitable** errors are ignored, and warnings are reset automatically. • In the event of a **non-inhibitable** error, the drive triggers, then automatically resets the error and attempts to restart. • The restart process continues in a loop until the function is manually disabled. **NOTE:** • The user cannot select **[Restart]** r E S t A r t if the **[Fire Mode Activation]** F M t n parameter is set to **[FM On Transition]** t r n • The Restart setting does not run again the motor in Forced mode, it is necessary to trigger again the Forced mode by Digital input set for the parameter **[Fire Mode Assign]** F M S.
[Stop]	S t o P	• In this Mode **inhibitable** errors are ignored, and their warnings are automatically reset when they occur. • If a **non-inhibitable** error (e.g. short circuit) occurs, the drive triggers and stops. To restart the drive, Fire Mode must be disabled, and a power reset is required. **Factory setting**

[Forced Settings Lock] F M L

Select whether the parameters settings have to be locked or not during Force mode.

Setting	Code / Value	Description
[No]	n o	Parameters settings not locked during force mode. **Factory settings**
[Yes]	Y E S	Parameters settings locked during force mode.

[Forced Settings Lock] F M L Lock the Fire mode function settings once it is activated.

[Fire Mode Status] F M S t

The current mode status is reflected by the **[Fire Mode Status]** F M S t parameter, which updates according to the following conditions:

Note :

- If **[Fire Mode Assign]** F M S is triggered and **[Mode Selection]** F M M is set to **FORCE**, then **[Fire Mode Status]** F M S t is set to **FORCE**.
- If **[Fire Mode Assign]** F M S is triggered and **[Mode Selection]** F M M is set to **FIRE**, then **[Fire Mode Status]** F M S t is set to **FIRE**.

Setting	Code / Value	Description
[Fire Mode Disabled]	n o n E	Fire mode not configured
[Fire Mode Ready]	r d Y	Fire function is configured but not running
[Fire Mode Active]	F i r E	Fire mode running (Fire mode function is running)
[Forced Mode Active]	F o r C	Force mode running (Force Fire mode function is running)

[Damper control] dMC – Menu

Access

[Drive menu] dr ➜ **[Configuration]** ConF ➜ **[Full]** FULL ➜ **[Application function]** Fun ➜ **[HVAC functions]** HVA ➜ **[Damper control]** dMC

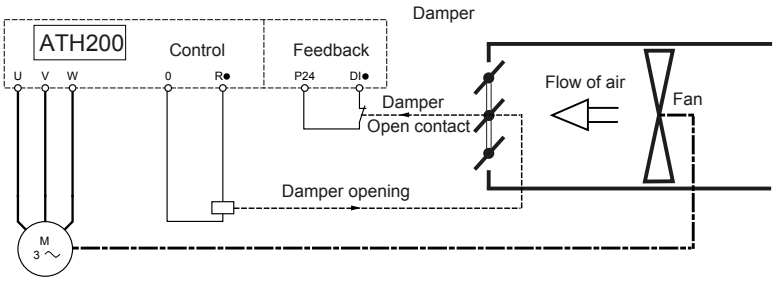
About This Menu

The Damper Control function allows the HVAC system to automatically manage airflow by opening or closing dampers, which act like valves inside air ducts. Before the fan starts operating, the system helps to ensure the damper is in the correct position. This helps:

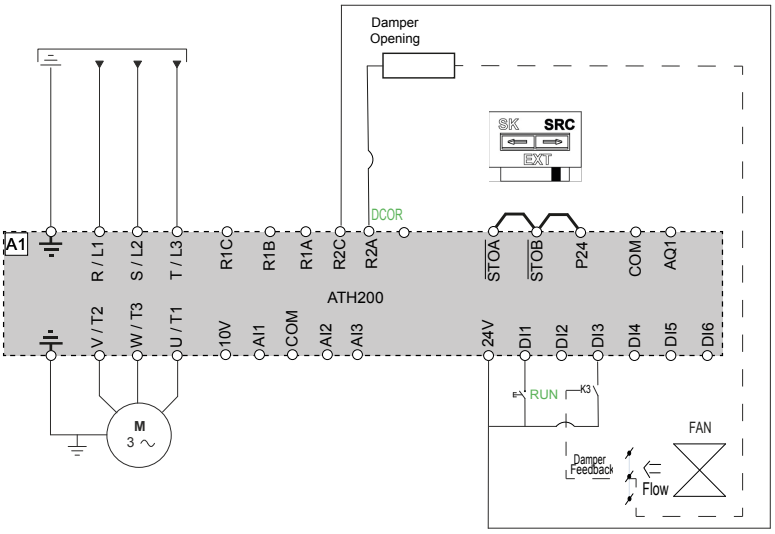
- **Direct air efficiently** to the right areas
- **Prevent damage** to the system by avoiding airflow blockages
- **Improve energy efficiency** by only using airflow where it's needed

In short, this function helps to ensure your ventilation system works smoothly and safely by preparing the airflow path before the fan starts.
It can operate in two modes:

- **No feedback Mode**: The drive waits a fixed time before starting the fan.
- **Feedback Mode**: The drive waits for a confirmation signal from the damper before starting the fan.



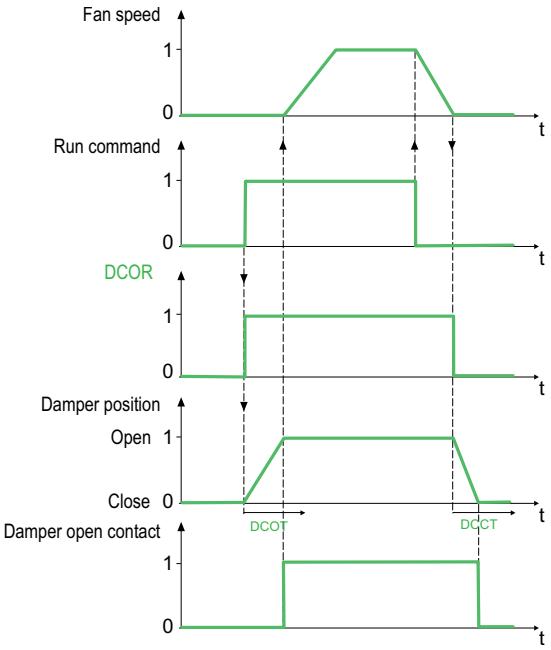
Example of wiring diagram of the function with no feedback:



- **[Damper Input Assign]** dCF1 is assigned to **[DI3]** L13.
- Damper feedback is given to **K3** by damper control.

Step by step on how to configure Damper Control :

Step	Action
1	Configure Output Relay for Damper Control • Go to **[Damper Out Assign]** d C o r parameter. • Select the digital output or relay that will control the damper.
2	Choose Feedback Mode (Optional) • Go to **[Damper Input Assign]** d C F 1 parameter.
3	Set Damper Opening and Closing Times • **[Damper Opening time]** d C o t : Time allowed for damper to open • **[Damper Closing Time]** d C C t : Time allowed for damper to close
4	Define Error Behavior • Go to **[Damper ErrorResp]** d C F b parameter.
5	Activate the Function • Ensure the selected output relay is active when a run command is issued. • The drive will: ◦ Wait for the damper to open (based on time of feedback) ◦ Start the fan only when damper is confirmed open or time expires
6	Monitor Errors and Warnings • **[Damper Control Warn]** d o A : Damper unwillingly open • **[Damper Control Error]** d u C F : Damper unwillingly closed
7	Fire Mode Override (if applicable) • Fire mode can override the **[Damper Control Error]** d u C F



[Damper Out Assign] d C o r

Configure the output relay for damper control

If the parameter **[Damper Input Assign]** DCFI is set to No, the motor will start after the delay defined in the parameter **[Damper Opening time]** DCOT has elapsed.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Make sure your wiring diagram accounts for potential failures, such as an unintended disconnection of the output assigned to **[Damper Out Assign]** DCOR. These failures must be properly managed to prevent the motor from starting when the damper status is incorrect.
- Verify that this behavior does not result in unsafe conditions. Whenever possible, prefer using an input assigned to the parameter **[Damper Input Assign]** DCFI.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[No]	nO	Not assigned **Factory setting**
[R2]	r2	Relay output R2
[LO1]	Lo1	Logic output 1
[DQ1 Assignment]	do1	Digital output DQ11...DQ12 if VW3A3203 I/O extension module has been inserted

Note :

- Damper Control function is incompatible with Run Permissive function.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Damper Input Assign] dCFI

Configure the feedback mode

This parameter can be accessed if **[Damper Out Assign]** dCOr is assigned to a relay or digital output.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI6]**	LI1...LI6	Digital input DI1...DI6 used at high level
[DAI1]	LAI1	Analog input AI1
[DAI2]	LAI2	Analog input AI2
[CD11]... **[CD15]**	Cd11... Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]... **[C110]**	C101... C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]... **[C115]**	C111... C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C301]... **[C310]**	C301... C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]... **[C315]**	C311... C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration

[Damper Opening time] d C o t & [Damper Closing Time] d C C t

Set damper opening & closing time

These parameters can be accessed if **[Damper Out Assign]** d C o r is assigned to a relay or digital output.

Setting	Description
1...300 s	Setting range **Factory setting**: 60 s

[Damper ErrorResp] d C F b

Configure error response

This parameter can be accessed if **[Damper Out Assign]** d C o r is assigned to a relay or digital output.

Setting	Code / Value	Description
[Not Assigned]	n o	Ignore
[Freewheel Stop]	Y E S	Freewheel stop **Factory setting**
[Ramp stop]	r M P	Stop on ramp

[Additional PIDs] CPid– Menu

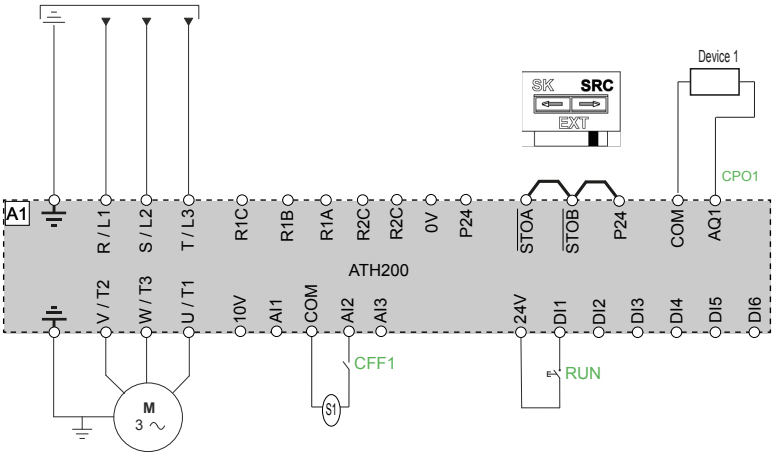
Access

[Drive menu] drI ➜ **[Configuration]** CONF ➜ **[Full]** FULL ➜ **[Application function]** Fun ➜ **[HVAC functions]** HVA ➜ **[Additional PIDs]** CPid

About This Menu

Provide one additional PID regulator for regulation of water or air flow or a pressure with an external sensor.

Example Of Wiring Diagram Of The Function :



- **[Free PID 1 Assign]** CFFI is assigned to **[AI2]** AI2.
- **[Free PID 1 Out Assign]** CPOI is assigned to **[AQ1 configuration]** AOI.

Step by step on how to configure Additional PIDs Function :

Step	Action
1	Configure the feedback : • Go to **[Free PID 1 Assign]** CFFI parameter. • Select the assignement **[AI2]** AI2. • Set **[Free PID 1 Assign]** CFFI Complementary PID Min feedback • Set **[Free PID 1 Max Fdbk]** CF2I Complementary PID Max feedback • Set the value of **[Free PID 1 Low Warn]** FLI • Set the value of **[Free PID 1 High Warn]** FHI • Set the value of **[Free PID 1 P Gain]** rPGI • Set the value of **[Free PID 1 I Gain]** rIGI • Set the value of **[Free PID 1 D Gain]** rdGI
2	Assign **[Free PID 1 Out Assign]** CPOI to an output.
3	To see the monitoring feedback: • Go to **[Free PID 1 Feedback]** CPFI parameter. and see the value.

[Free PID 1 Feedback] CPFI

Feedback monitoring.

Setting	Description
—	PID feedback monitoring value **Factory setting**: —

[Free PID 1 Output] PO1

Monitoring the output for the PID.

Setting	Description
[0,01%]	PID output monitoring value **Factory setting**: —

[Free PID 1 Setpoint] CP11

Configure the setpoint.

Setting	Description
0...32767	Setting range **Factory setting**: 100

The setpoint is entered with limited respectively between **[Free PID 1 Min Fdbk]** CF11/ **[Free PID 1 Max Fdbk]** CF21.

[Free PID 1 Assign] CFF1

Configure the feedback.

Setting	Code / Value	Description
[No]	no	Not assigned **Factory setting**
[AI1]...**[AI3]**.	AI1...AI3	Assigned to analog input.
[AI Virtual 1]...**[AI Virtual 2]**.	AIV1...AIV2	Assigned to virtual analog input.

[Free PID 1 Min Fdbk] CF11

Configure the **[Free PID 1 Min Fdbk]** CF11.

Setting	Description
0...32767	Setting range **Factory setting**: 100

This parameter defines the range of the feedback measured in the application.

Note

- if the value of **[Free PID 1 Feedback]** CPF1 is below **[Free PID 1 Low Warn]** FL1, the **[Free PID 1 Low Warn]** CFL1 warning is raised

[Free PID 1 Max Fdbk] CF21

Configure the **[Free PID 1 Max Fdbk]** CF21 .

Setting	Description
0...32767	Setting range **Factory setting**: 1000

This parameter defines the range of the feedback measured in the application.

Note

- if the value of **[Free PID 1 Feedback]** CPF1 is above **[Free PID 1 High Warn]** FH1, the **[Free PID 1 High Warn]** CFH1 warning is raised

[Free PID 1 Inversion] PIC1

This parameter is used to determine the computation of the PID error.

Setting	Code / Value	Description
[No]	no	PID error not inverted. **Factory settings**
[Yes]	YES	PID error inverted.

[Free PID 1 P Gain] rPG1

This parameter is used to determine the proportional computation of the PID error.

Setting	Description
0,01...100,00	Setting range **Factory setting**: 1,00

[Free PID 1 I Gain] rIG1

This parameter is used to determine the integral gain computation of the PID error.

Setting	Description
0,01...100,00	Setting range **Factory setting**: 1,00

[Free PID 1 D Gain] rdG1

This parameter is used to determine the derivative computation of the PID error.

Setting	Description
0...100,00	Setting range **Factory setting**: 0,00

[Free PID 1 Ramp] P r P I

Configure the ramp for the setpoint.

Set this parameter to the minimum permitted by the mechanism for a smooth operation.

Setting	Description
0...99,9 s	Setting range **Factory setting**: 0,0

[Free PID 1 Low Warn] F L I

Configure the threshold value of low alarm .

Setting	Description
0...32767	Setting range **Factory setting**: 100

[Free PID 1 High Warn] F H I

Configure the threshold value of high alarm .

Setting	Description
0...32767	Setting range **Factory setting**: 1000

1.3.4.8 [Full] F u L L – – [FAULT MANAGEMENT] F L t –

What's in This Chapter

With integrated display terminal 279
[PTC management] P t C — 281
[Fault reset] r S t — 283
[Auto Fault Reset] A t r — 285
[Warning setting] A L S — 287
[Catch on the fly] F L r — 288
[Motor thermal monit] t H t — 289
[Output phase loss] o P L — 292
[Full] I P L — 293
[Drive overheat] o H L — 294
[Thermal warning stop] S A t — 296
[External error] E t F — 297
[UnderV handling] u S b — 298
[IGBT tests] t I t — 300
[4-20 mA loss] L F L — 301
[Error detect disabling] I n H — 302
[Fieldbus monitoring] C L L — 305
[Torque or I limit detect] t I d — 308
[Frequency meter] F q F — 309
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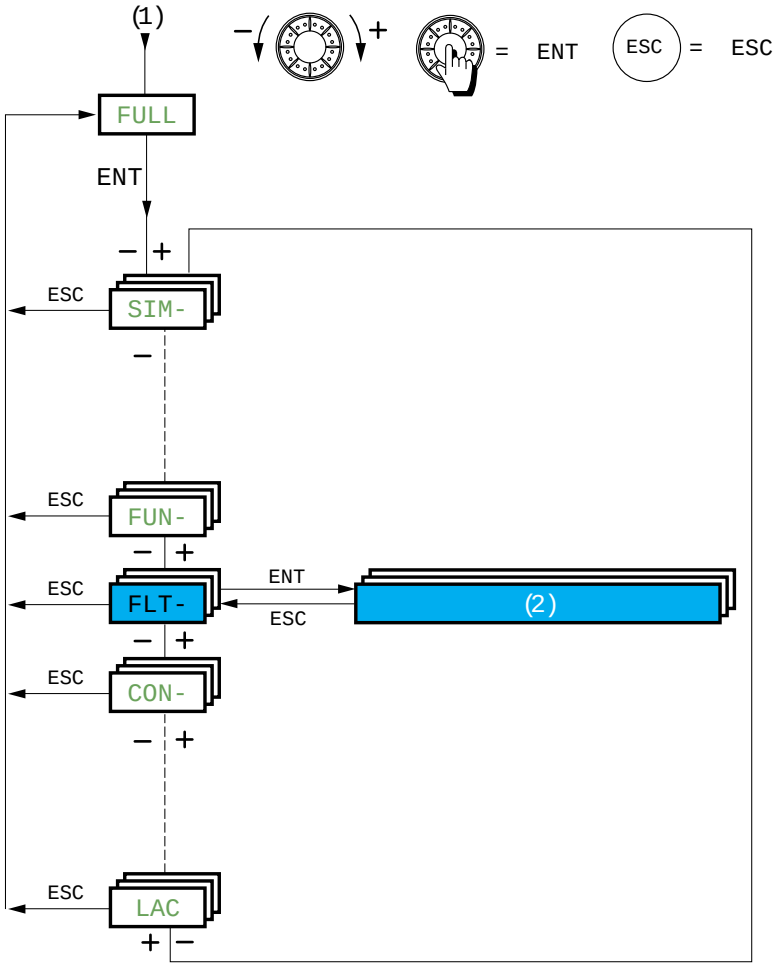
[Process overload] o L d — 315
[Fallback speed] L F F — 317
[Ramp divider] F S t — 318
[DC injection] d C I — 319

With integrated display terminal

Summary of functions:

Code	Name
P t C —	**[PTC management]**
r S t —	**[Fault reset]**
A t r —	**[Auto Fault Reset]**
A L S —	**[Warning setting]**
F L r —	**[Catch on the fly]**
t H t —	**[Motor thermal monit]**
o P L —	**[Output phase loss]**
i P L —	**[Input phase loss]**
o H L —	**[Drive overheat]**
S A t —	**[Thermal warning stop]**
E t F —	**[External error]**
u S b —	**[UnderV handling]**
t i t —	**[IGBT tests]**
L F L —	**[4-20 mA loss]**
i n H —	**[Error detect disabling]**
C L L —	**[Fieldbus monitoring]**
t i d —	**[Torque or I limit detect]**
F q F —	**[Frequency meter]**
t n F —	**[Autotuning error]**
P P i —	**[Boards pairing]**
u L d —	**[Process underload]**
o L d —	**[Process overload]**
L F F —	**[Fallback speed]**
F S t —	**[Ramp divider]**
d C i —	**[DC injection]**



1. From CONF — menu
2. Detected error management

The parameters in the **[FAULT MANAGEMENT]** FLt — menu can only be modified when the drive is stopped and there is no run command, except for parameters with a ↻ symbol in the code column, which can be modified with the drive running or stopped.

[PTC management] PtC —

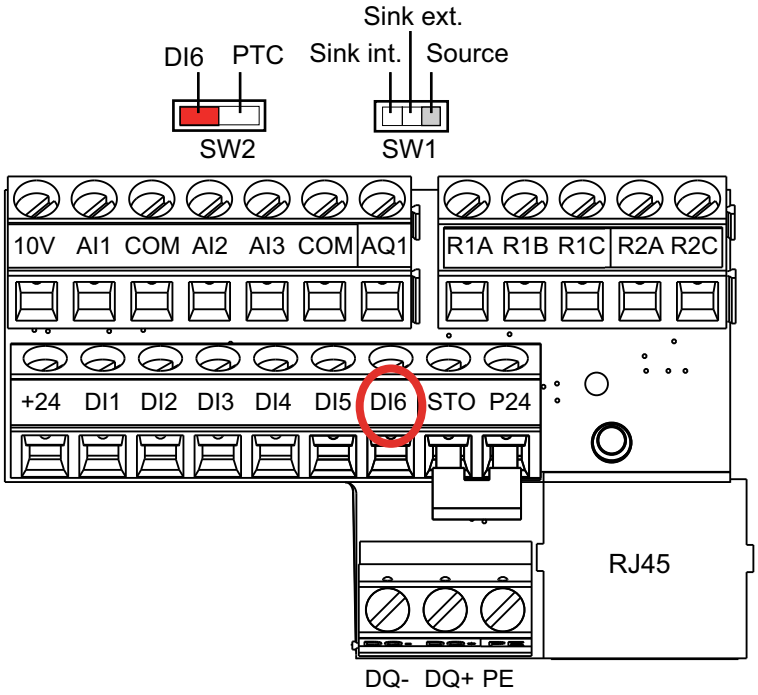
PTC probe

1 set of PTC probe can be managed by the drive to help to protect the motor: on logic input LI6 converted for this use by switch SW2 on the control block.
The PTC probe is monitored for the following detected errors:

- Motor overheating
- Sensor break
- Sensor short-circuit

Monitoring via PTC probe does not disable monitoring via I^2t calculation performed by the drive (the two types of monitoring can be combined).

ATH230●●●●●



NOTE:

DIx =LX

DQx = LOx

AQ1 = AO1

Access

Parameters described below can be accessed by: drI ➡ ConF ➡ FULL ➡ FLt ➡ PtC

Parameters list

HMI label	Settings	Factory setting
[PTC management] P t C —		
[PTC Fdbk Handling] P t C L	—	**[No]** n o
PTC probe feedback handling Check first that the switch SW2 on the control block is set to PTC. • **[No]** n o: ***No management***, not used • **[Always]** A S: ***Always***, PTC probe are monitored permanently, even if the power supply is not connected (as long as the control remains connected to the power supply) • **[Power ON]** r d S: ***Power ON***, PTC probe are monitored while the drive power supply is connected • **[Motor ON]** r S: ***Motor ON***, PTC probe are monitored while the motor power supply is connected		

[Fault reset] rSt —

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ FLt ➡ rSt

Parameters list

HMI label	Settings	Factory setting
[Fault reset] rSt —		
[Fault Reset Assign] rSF	—	**[No]** no

Fault reset input assignment

Detected errors are cleared manually when the assigned input or bit changes to 1, if the cause of the detected error has disappeared.

The STOP/RESET key on the graphic display terminal performs the same function.

Following detected errors can be cleared manually : ASF, brF, CnF, dLF, EPF1, EPF2, FbES, FCF2, inF9, inFA, inFb, LCF, LFF3, obF, oHF, oLC, oLF, oPF1, oPF2, oSF, otFL, PHF, PtFL, SCF4, SCF5, SLF1, SLF2, SLF3, SoF, SSF, tJF, tnF and uLF.

NOTE: If **[Extended Fault Reset]** HrFC is set to **[Yes]** YES, the additional following detected error can be cleared manually: oCF, SCF1, SCF3.

- **[No]** no: ***No***, function inactive
- **[DI1]** LI1: ***Digital input 1***
- **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.

(If **[Profile]** CHCF is set to **[Not separ.]** SIM or **[Separate]** SEP then **[CD11]** Cd11 up to **[CD15]** Cd15, **[C111]** C111 up to **[C115]** C115, **[C211]** C211 up to **[C215]** C215 and **[C311]** C311 up to **[C315]** C315 are not available).

[Prod Restart Assign] rPA ★	—	**[No]** no

Product restart assignment
The Restart function performs a Fault Reset and then restarts the device. During this Restart procedure, the device goes through the same steps as if it had been switched off and on again. Depending on the wiring and the configuration of the device, this may result in immediate and unanticipated operation.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

The Restart function performs a Fault Reset and restarts the device.

- Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This parameter can only be modified if 3.1 **[Access Level]** LAC is set to **[Expert]** EPr mode.

Drive reinitialization via logic input. Can be used to reset all detected errors without having to disconnect the drive from the power supply. The drive is reinitialized on a rising edge (change from 0 to 1) of the assigned input. The drive can only be reinitialized when locked.

To assign reinitialization, press and hold down the ENT key for 2 s.

- **[No]** no: ***No***, function inactive
- **[DI1]** LI1: ***Digital input 1***

[...] ...

HMI label	Settings	Factory setting
• **[DI6]** L i 6: ***Digital input 6*** • **[DAI1]** L A i 1: ***Digital input AI1*** • **[DAI2]** L A i 2: ***Digital input AI2*** • **[OL01]** o L O 1: ***OL01***, function blocks: Logical Output 01 **[...] ...** • **[OL10]** o L 1 0: ***OL10***, function blocks: Logical Output 10		
[Product restart] r P ★	—	**[No]** n o

Product restart
The Restart function performs a Fault Reset and then restarts the device. During this Restart procedure, the device goes through the same steps as if it had been switched off and on again. Depending on the wiring and the configuration of the device, this may result in immediate and unanticipated operation.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

The Restart function performs a Fault Reset and restarts the device.

- Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This parameter can only be modified if 3.1 **[Access Level]** L A C is set to **[Expert]** E P r mode.

Drive reinitialization. Can be used to reset all detected errors without having to disconnect the drive from the power supply.

- **[No]** n o: ***No***, function inactive
- **[Yes]** y E S: ***Yes***, Reinitialization. Press and hold down the ENT key for 2 s. The parameter changes back to **[No]** n o automatically as soon as the operation is complete. The drive can only be reinitialized when locked.

[Extended Fault Reset] H r F C ★	—	**[No]** n o

Extended fault reset activation

NOTICE

INOPERATIVE DRIVE

- Verify that enabling this parameter does not result in equipment damage.
- Before resetting the detected error, identify and correct the cause of the error.

Failure to follow these instructions can result in equipment damage.

This parameter can only be modified if **[3.1] [Access Level]** L A C is set to **[Expert]** E P r mode.

Can be used to select the access level of **[Fault Reset Assign]** r S F to reset detected errors without having to disconnect the drive from the power supply.

NOTE: If **[Extended Fault Reset]** H r F C is set to **[Yes]** y E S , the additional following detected error can be cleared manually: o C F , S C F 1, S C F 3.

- **[No]** n o: ***No***, function inactive
- **[Yes]** y E S: ***Yes***, function active

[Auto Fault Reset] Atr —

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ FLt ➡ Atr

Parameters list

HMI label	Settings	Factory setting
[Auto Fault Reset] Atr —		
[Auto Fault Reset] Atr 2 s	—	**[No]** no

Automatic fault reset
This function can be used to automatically perform individual or multiple Fault Resets. If the cause of the error that has triggered the transition to the operating state Fault disappears while this function is active, the device resumes normal operation. While the Fault Reset attempts are performed automatically, the output signal "Operating state Fault" is not available. If the attempts to perform the Fault Reset are not successful, the device remains in the operating state Fault and the output signal "Operating state Fault" becomes active.

⚠WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Verify that activating this function does not result in unsafe conditions.
- Verify that the fact that the output signal "Operating state Fault" is not available while this function is active does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The error relay remains activated if this function is active. The speed reference and the operating direction must be maintained. Use 2-wire control **[2/3-Wire Control]** tCC is set to **[2-Wire Control]** 2C and **[2-wire type]** tCt is set to **[Level]** LEL, see **[2/3-Wire Control]** tCC , page 90.

If the restart has not taken place once the configurable time **[Fault Reset Time]** tAr has elapsed, the procedure is aborted and the drive remains locked until it is turned off and then on again.

The error codes , page 377, which permit this function, are listed.

- **[No]** no: ***No***, function inactive
- **[Yes]** YES: ***Yes***, automatic restart, after locking in detected error state, if the detected error has disappeared and the other operating conditions permit the restart. The restart is performed by a series of automatic attempts separated by increasingly longer waiting periods: 1 s, 5 s, 10 s, then 1 minute for the following attempts.

[Fault Reset Time] tAr ★	—	**[5 minutes]** 5

HMI label	Settings	Factory setting
Fault Reset time		
This parameter appears if **[Auto Fault Reset]** A t r is set to **[Yes]** y E S. It can be used to limit the number of consecutive restarts on a recurrent detected error. • **[5 minutes]** 5: ***5 minutes*** • **[10 minutes]** 1 0: ***10 minutes*** • **[30 minutes]** 3 0: ***30 minutes*** • **[1 hour]** 1 H: ***1 hour*** • **[2 hours]** 2 H: ***2 hours*** • **[3 hours]** 3 H: ***3 hours*** • **[Unlimited]** C t: ***Unlimited***		

(1) In corresponds to the rated drive current indicated in the Installation manual and on the drive nameplate.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Warning setting] ALS —

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ FLt ➡ ALS

Parameters list

HMI label	Settings	Factory setting
[Warning setting] ALS —		
[High Current Thd] CtD (1)	0 to 1.1 In (1)	INV
High current threshold		
[Motor Freq Thd] FtD	0 to 599 Hz	50 Hz
Motor frequency threshold		
[Freq. threshold 2] F2D	0 to 599 Hz	50 Hz
Frequency threshold 2		
[High torque thd.] ttH	-300 to 300%	100%
High torque threshold		
[Low torque thd.] ttL	-300 to 300%	50%
Low torque threshold		
[Pulse warning thd.] F9L ★	0 to 20,000 Hz	0 Hz
Pulse warning threshold Visible if **[Frequency meter]** F9F is not **[No]** no.		

(1) In corresponds to the rated drive current indicated in the Installation manual and on the drive nameplate.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Catch on the fly] FLr —

Access

Parameters described below can be accessed by: drI ➜ ConF ➜ FULL ➜ FLt ➜ FLr

Parameters list

HMI label	Settings	Factory setting
[Catch on the fly] FLr —		
NOTE: This function cannot be used with certain other functions. Follow the instructions in **[Application function]** Fun — Summary of **[Application function]** Fun–, page 188.		
[Catch On Fly] FLr	—	**[No]** no
Catch on fly Used to enable a smooth restart if the run command is maintained after the following events: • Loss of supply mains or disconnection. • Clearance of current detected error or automatic restart. • Freewheel stop. The speed given by the drive resumes from the estimated speed of the motor at the time of the restart, then follows the ramp to the reference speed. This function requires 2-wire level control. When the function is operational, it activates at each run command, resulting in a slight delay of the current (0.5 s max). If the speed of the motor drops to zero before increasing to reference speed after a catch on the fly use, slightly increasing **[Current Filter Time]** CrtF allows the drive to restart at it's current speed. • **[No]** no: ***No***, function inactive • **[Yes]** YES: ***Yes***, function active		

[Motor thermal monit] t H t —

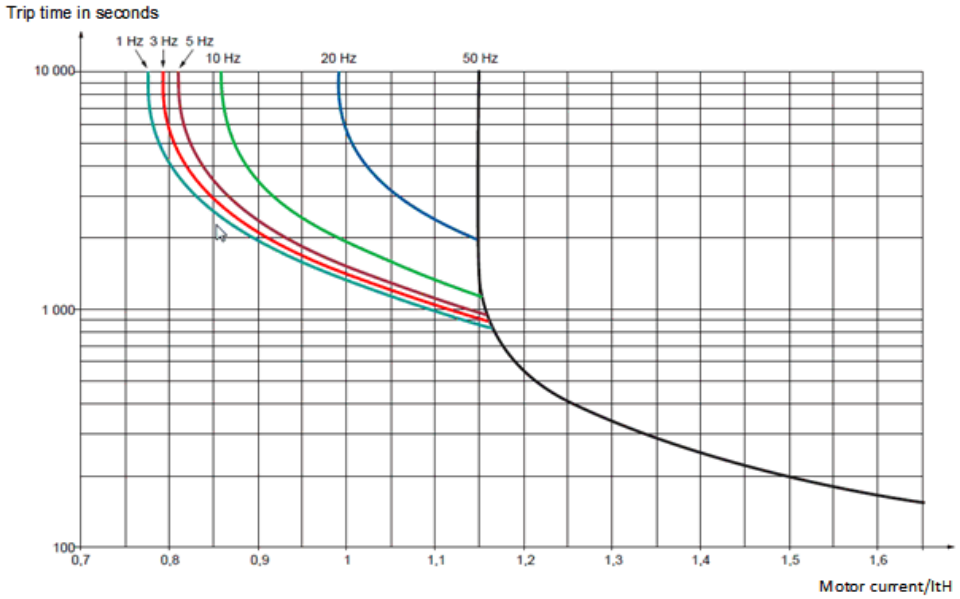
Motor thermal monitoring function

Thermal monitoring by calculating the I²t.

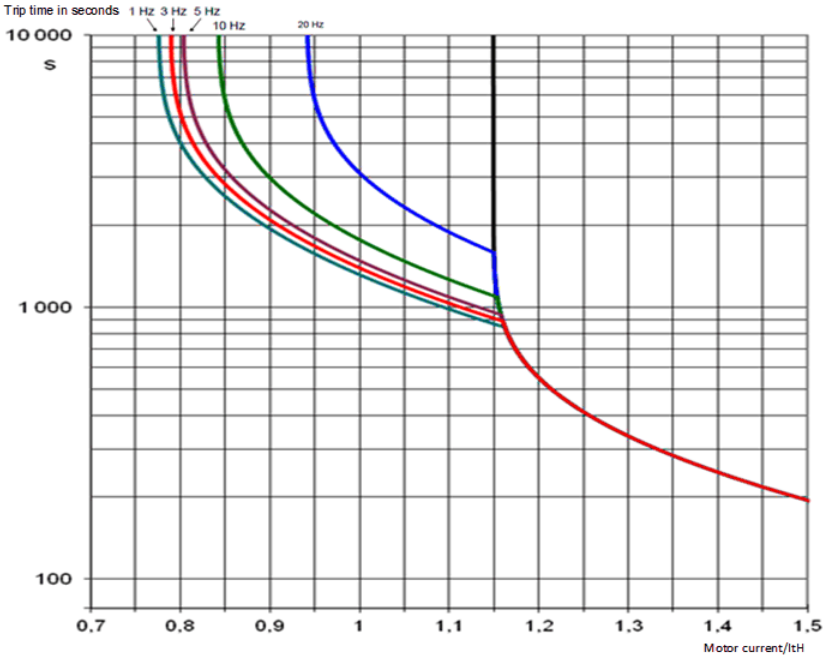
NOTE: The motor thermal state is not saved when the drive is switched off.

- Self-cooled motors: The tripping curves depend on the motor frequency.
- Force-cooled motors: Only the 50 Hz tripping curve needs to be considered, regardless of the motor frequency.

The following curves represent the triggering time in seconds: (50Hz)



The following curves represent the triggering time in seconds: (60Hz)



NOTICE

MOTOR OVERHEATING

Install external thermal monitoring equipment under the following conditions:

- If a motor with a nominal current of less than 20% of the nominal current of the drive is connected.
- If you use the function Motor Switching.

Failure to follow these instructions can result in equipment damage.

Access

Parameters described below can be accessed by: d r - ➡ C o n F ➡ F u L L ➡ F L t ➡ t H t

Parameters list

HMI label	Settings	Factory setting
[Motor thermal monit] t H t —		
[Motor Thermal Mode] t H t	—	**[Self cooled]** A C L
Motor thermal monitoring mode **NOTE:** The detected error occurs when the thermal state reaches 118% of the rated state and reactivation occurs when the state falls back below 100%. • **[No]** n o: ***No thermal monitoring*** • **[Self cooled]** A C L : ***Self cooled motor***, for self-cooled motors • **[Force-cool]** F C L : ***Force cooled motor***, for force-cooled motors		
[Motor Therm Thd] t t d (1)	0 to 118%	100%
Motor thermal threshold, threshold for motor thermal alarm (logic output or relay).		
[Motor2 Therm Thd] t t d 2	0 to 118%	100%
Motor 2 thermal threshold, threshold for motor 2 thermal alarm (logic output or relay).		
[Motor3 Therm Thd] t t d 3	0 to 118%	100%
Motor 3 thermal threshold, threshold for motor 3 thermal alarm (logic output or relay).		
[MotorTemp ErrorResp] o L L	—	**[Freewheel Stop]** Y E S
Motor overtemp error response **NOTICE** **OVERHEATING** Depending on the settings of this parameter, the error response to detected errors is disabled or the transition to the operating state Fault is suppressed if an error is detected. • Verify that the settings of this parameter do not result in equipment damage. • Implement alternative, equivalent monitoring functions for disabled monitoring functions. **Failure to follow these instructions can result in equipment damage.** Type of stop in the event of a detected motor thermal error. • **[Ignore]** n o: ***Ignore***, detected error ignored		

HMI label	Settings	Factory setting
• **[Freewheel Stop]** y E S: ***Freewheel stop*** • **[Configured Stop]** S t t: ***Configured stop [STT] parameter***, stop according to configuration of **[Type of stop]** S t t , without tripping. In this case, the operating state fault relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-Wire Control]** t C C and **[2-wire type]** t C t , page 136 if control is via the terminals). Configuring an alarm for this detected error is recommended (assigned to a logic output, for example) to indicate the cause of the stop. • **[Fallback Speed]** L F F: ***Fallback speed***, change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (2) • **[Speed maintain]** r L S: ***Speed maintained***, the drive maintains the speed being applied when the detected error occurred, as long as the detected error is present and the run command has not been removed (2) • **[Ramp stop]** r M P: ***Ramp stop*** • **[Fast stop]** F S t: ***Fast stop*** • **[DC injection]** d C I: ***DC injection***. This type of stop cannot be used with certain other functions. See the table .		
[Motor Th State Memo] M t M	—	**[No]** n o
Motor thermal state memo • **[No]** n o: ***No***, motor thermal state is not stored at power off • **[Yes]** y E S: ***Yes***, motor thermal state is stored at power off		

[Output phase loss] oPL —

Access

Parameters described below can be accessed by: drI ➜ ConF ➜ FULL ➜ FLt ➜ oPL

Parameters list

HMI label	Settings	Factory setting
[Output phase loss] oPL —		
[OutPhLoss Assign] oPL ⏳ 2 s	—	**[OPF Error]** YES
Output Phase Loss assignment		

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

If output phase monitoring is disabled, phase loss and, by implication, accidental disconnection of cables, are not detected.

- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

NOTE: [OutPhLoss Assign] oPL is set to **[Function Inactive]** nO when **[Motor control type]** CtT, page 113 is set to **[Sync. mot.]** SYn. For other **[Motor control type]** CtT configurations, **[OutPhLoss Assign]** oPL is forced to **[OPF Error]** YES

- **[Function Inactive]** nO: ***Function inactive***
- **[OPF Error]** YES: ***OPF error Triggered***, tripping on **[OutPhLoss Assign]** oPL with freewheel stop
- **[No Error]** oAC: ***No error triggered***, no event triggered, but management of the output voltage to avoid an overcurrent when the link with the motor is re-established and catch on the fly performed (even if this function has not been configured.

The drive switches to **[Output cut]** SoC state after **[OutPhaseLoss Delay]** odt time. Catch on fly is possible as soon as the drive is in Stand by output cut **[Output cut]** SoC state.

[OutPhaseLoss Delay] odt ↻	0.5 to 10 s	0.5 s
Output Phase Loss delay		

Time delay for taking the **[OutPhLoss Assign]** oPL detected error into account.

[Full] iPL —

Access

Parameters described below can be accessed by: dr i ➡ ConF ➡ FULL ➡ FLt ➡ iPL

Parameters list

HMI label	Settings	Factory setting
[Input phase loss] iPL —		
[InPhaseLoss Assign] iPL ★ ⏳ 2 s	—	According to drive rating
Input Phase Loss assignment Cannot be accessed if drive rating is ATH230●●●M2. In this case, no factory settings value. Factory setting : **[Freewheel Stop]** YES for drive rating ATH230●●●N4. If 1 phase disappears and if this leads to performance decrease, the drive switches to detected error mode **[Input Phase Loss]** PHF. If 2 or 3 phases disappear, the drive trips in **[Input Phase Loss]** PHF. • **[Ignore]** no: ***Ignore***, detected error ignored • **[Freewheel Stop]** YES: ***Freewheel stop***, detected error with freewheel stop		

[Drive overheat] oHL —

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ FLT ➡ oHL

Parameters list

HMI label	Settings	Factory setting
[Drive overheat] oHL —		
[DriveTemp ErrorResp] oHL	—	**[Freewheel Stop]** YES
Drive overtemp error response		

NOTICE

OVERHEATING

Depending on the settings of this parameter, the error response to detected errors is disabled or the transition to the operating state Fault is suppressed if an error is detected.

- Verify that the settings of this parameter do not result in equipment damage.

Failure to follow these instructions can result in equipment damage.

Behavior in the event of the drive overheating.

NOTE: An error occurs when the thermal state reaches 118% of the rated state and reactivation occurs when the state falls back below 90%.

- **[Ignore]** no: ***Ignore***, detected error ignored
- **[Freewheel Stop]** YES: ***Freewheel stop***
- **[Configured Stop]** STT: ***Configured stop [STT] parameter***, stop according to configuration of **[Type of stop]** STT , without tripping. In this case, the operating state fault relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-Wire Control]** tCC and **[2-wire type]** tCt , page 136 if control is via the terminals). Configuring an alarm for this detected error is recommended (assigned to a logic output, for example) to indicate the cause of the stop.
- **[Fallback Speed]** LFF: ***Fallback speed***, change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (2)
- **[Speed maintain]** rLS: ***Speed maintained***, the drive maintains the speed being applied when the detected error occurred, as long as the detected error is present and the run command has not been removed (2)
- **[Ramp stop]** rMP: ***Ramp stop***
- **[Fast stop]** FST: ***Fast stop***
- **[DC injection]** dC1: ***DC injection***. This type of stop cannot be used with certain other functions. See the table.

[Dev Thermal Warning] tHA	0 to 118%	100%
Device thermal state warning		

Threshold for drive thermal alarm (logic output or relay).

(1) The parameter can also be accessed in the **[Settings]** SEt menu.

(2) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.


2 s: To change the assignment of this parameter, press the ENT key for 2 s.

[Thermal warning stop] SAt —

Deferred stop on thermal alarm

This function helps to prevent the drive stopping between two steps of the process if the drive or motor overheats, by authorizing operation until the next stop. At the next stop, the drive is locked until the thermal state falls back to a value, which undershoots the set threshold by 20%. Example: A threshold set at 80% enables reactivation at 60%.
One thermal state threshold must be defined for the drive, and one thermal state threshold for the motor(s), which triggers the deferred stop.

Access

Parameters described below can be accessed by: dr ➡ ConF ➡ FULL ➡ FLt ➡ SAt

Parameters list

HMI label	Settings	Factory setting
[Thermal warning stop] SAt —		
[Thermal Warn stop] SAt	—	**[No]** no
Thermal warning stop Thermal alarm stop function allow to set a custom alarm thermal level for the drive or the motor. When one of these levels is reached, the drive trips in freewheel stop. • **[No]** no: ***No***, function inactive (in this case, the following parameters cannot be accessed) • **[Yes]** YES: ***Yes***, freewheel stop on drive or motor thermal alarm		
[Dev Thermal Warning] tHA	0 to 118%	100%
Device thermal state warning, thermal state threshold of the drive tripping the deferred stop.		
[Motor Therm Thd] ttd	0 to 118%	100%
Motor thermal threshold, thermal state threshold of the motor tripping the deferred stop.		
[Motor2 Therm Thd] ttd2	0 to 118%	100%
Motor 2 thermal threshold, thermal state threshold of the motor 2 tripping the deferred stop.		
[Motor3 Therm Thd] ttd3	0 to 118%	100%
Motor 3 thermal threshold, thermal state threshold of the motor 3 tripping the deferred stop.		

[External error] EtF —

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ FLt ➡ EtF

Parameters list

HMI label	Settings	Factory setting
[External error] EtF —		
[Ext Error assign] EtF	—	**[No]** no
External error assignment If the assigned bit is at 0, there is no external error detected. If the assigned bit is at 1, there is an external error detected. Logic can be configured via **[Ext Error Condition]** LEt if a logic input has been assigned. • **[No]** no: ***No***, function inactive • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		
[Ext Error Condition] LEt ★	—	**[Active high]** HIG
External error condition Parameter can be accessed if the detected external error has been assigned to a logic input. It defines the positive or negative logic of the input assigned to the detected error. • **[Active low]** LO: ***Active low***, triggering on falling edge (change from 1 to 0) of the assigned input • **[Active high]** HIG: ***Active high***, triggering on rising edge (change from 0 to 1) of the assigned input		
[Ext Error Resp] EPL	—	**[Freewheel Stop]** YES
Device response to external error Type of stop in the event of a detected external error. • **[Ignore]** no: ***Ignore***, detected external error ignored • **[Freewheel Stop]** YES: ***Freewheel stop*** • **[Configured Stop]** Stt: ***Configured stop [STT] parameter***, stop according to configuration of **[Type of stop]** Stt , without tripping. In this case, the operating state fault relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-Wire Control]** tCC and **[2-wire type]** tCt , page 136 if control is via the terminals). Configuring an alarm for this detected error is recommended (assigned to a logic output, for example) to indicate the cause of the stop. • **[Fallback Speed]** LFF: ***Fallback speed***, change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1) • **[Speed maintain]** rLS: ***Speed maintained***, the drive maintains the speed being applied when the detected error occurred, as long as the detected error is present and the run command has not been removed (1) • **[Ramp stop]** rMP: ***Ramp stop*** • **[Fast stop]** FSt: ***Fast stop*** • **[DC injection]** dCI: ***DC injection***. This type of stop cannot be used with certain other functions. See the table .		

[UnderV handling] uSb —

Access

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ FLt ➡ uSb

Parameters list

HMI label	Settings	Factory setting
[UnderV handling] uSb —		
[Undervoltage Resp] uSb	—	**[Error Triggered]** 0
Response to undervoltage, behavior of the drive in the event of an undervoltage. • **[Error Triggered]** 0: ***Error triggered***, the drive trips and the detected external error signal is triggered (the operating state fault relay assigned to **[No drive flt] FLT** is opened) • **[Error Triggered w/o Relay]** 1: ***Error triggered w/o relay***, the drive trips but the detected external error signal is not triggered (the operating state fault relay assigned to **[No drive flt] FLT** remains closed) • **[Warning Triggered]** 2: ***Warning Triggered***, alarm and operating state fault relay remain closed. The alarm can be assigned to a logic output or a relay		
[Mains voltage] urES	According to drive voltage rating	According to drive voltage rating
Evacuation mains voltage See **[Mains voltage]** urES .		
[Undervoltage level] uSL	100 to 304 V	According to drive rating
Undervoltage level, detected undervoltage error level setting in Volts. The factory setting is determined by the drive voltage rating. See **[Undervoltage level]** uSL .		
[UnderVolt timeout] uSt	0.2 s to 999.9 s	0.2 s
Undervoltage timeout, time delay for taking undervoltage detected error into account.		
[UnderV. prevention] StP	—	**[Inactive]** no
Ctrld stop on power loss, behavior in the event of the undervoltage prevention level being reached. • **[Inactive]** no: ***Inactive*** • **[Maintain DC Bus]** nMS: ***Maintain DC Bus***, this stop mode uses the inertia to maintain the DC bus voltage as long as possible • **[Ramp Stop]** rMP: ***Ramp Stop***, stop following an adjustable ramp **[Max stop time]** StM • **[Freewheel Stop]** LnF: ***Locked in freewheel stop without error***, lock (freewheel stop) without detected error		
[UnderV. restart tm] tSM ★ ( )	1.0 s to 999.9 s	1.0 s
Undervolt. restart time Time delay before authorizing the restart after a complete stop for **[UnderV. prevention]** StP = **[Ramp Stop]** rMP, if the voltage has returned to normal.		
[Prevention level] uPL ★	141 to 368 V	According to drive rating
Under V prevention level Undervoltage prevention level setting in Volts, which can be accessed if **[UnderV. prevention]** StP is not **[Inactive]** no. The adjustment range and factory setting are determined by the drive voltage rating and the **[Mains voltage]** urES value.		

HMI label	Settings	Factory setting
[Max stop time] S t n ★ ( )	0.01 to 60.00 s	1.00 s
Maximum stop time Ramp time if **[UnderV. prevention]** S t P is set to **[Ramp Stop]** r n P.		
[DC bus maintain time] t b S ★ ( )	1 to 9,999 s	9,999 s
DC bus maintain time DC bus maintain time if **[UnderV. prevention]** S t P is set to **[Maintain DC Bus]** n n S.		

[IGBT tests] tit —

Access

Parameters described below can be accessed by: drI ➜ ConF ➜ FULL ➜ FLt ➜ tit

Parameters list

HMI label	Settings	Factory setting
[IGBT tests] tit —		
[Out Short Circuit Test] Strt	—	**[No]** no
Output short circuit test • **[No]** no: ***No***, no test • **[Yes]** YES: ***Yes***, the IGBTs are tested on power up and every time a run command is sent. These tests cause a slight delay (a few ms). In the event of a detected error, the drive locks. The following errors can be detected: ◦ Drive output short-circuit (terminals U-V-W): SCF display. ◦ IGBT inoperable: xtF, where x indicates the number of the IGBT concerned. ◦ IGBT short-circuited: x2F, where x indicates the number of the IGBT concerned.		

(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

[4-20 mA loss] L F L —

Access

Parameters described below can be accessed by: d r i ➡ C o n F ➡ F u L L ➡ F L t ➡ L F L

Parameters list

HMI label	Settings	Factory setting
[4-20 mA loss] L F L —		
[AI3 4-20mA loss] L F L 3	—	**[Ignore]** n o
Response to 4-20mA loss on AI3		

- **[Ignore]** n o: ***Ignore***, detected error ignored. This is the only possible configuration if **[AI3 Min. Value]** C r L 3 is not greater than 3 mA
- **[Freewheel Stop]** Y E S: ***Freewheel stop***
- **[Configured Stop]** S t t: ***Configured stop [STT] parameter***, stop according to configuration of **[Type of stop]** S t t , without interruption. In this case, the operating state fault relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-Wire Control]** t C C and **[2-wire type]** t C t , page 136 if control is via the terminals). Configuring an alarm for this detected error is recommended (assigned to a logic output, for example) to indicate the cause of the stop.
- **[Fallback Speed]** L F F: ***Fallback speed***, change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
- **[Speed maintain]** r L S: ***Speed maintained***, the drive maintains the speed being applied when the detected error occurred, as long as the detected error is present and the run command has not been removed (1)
- **[Ramp stop]** r M P: ***Ramp stop***
- **[Fast stop]** F S t: ***Fast stop***
- **[DC injection]** d C i: ***DC injection***. This type of stop cannot be used with certain other functions. See the table .

(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

[Error detect disabling] i n H —

Access

Parameter can be accessed in [Expert] E P r mode

Parameters described below can be accessed by: d r i ➡ C o n F ➡ F u L L ➡ F L t ➡ i n H

Parameters list

HMI label	Settings	Factory setting
[Error detect disabling] i n H —		
[Disable Error Detect] i n H ★ ⏳ 2 s	—	**[No]** n o

Disable error detection

In rare cases, the monitoring functions of the device may be unwanted because they impede the purpose of the application. A typical example is a smoke extractor fan operating as a part of a fire protection system. If a fire occurs, the smoke extractor fan should operate as long as possible, even if, for example, the permissible ambient temperature of the device is exceeded. In such applications, damage to or destruction of the device may be acceptable as collateral damage, for example, to keep other damage from occurring whose hazard potential is assessed to be more severe.

A parameter is provided to disable certain monitoring functions in such applications so that automatic error detection and automatic error responses of the device are no longer active. You must implement alternative monitoring functions for disabled monitoring functions that allow operators and/or master control systems to adequately respond to conditions which correspond to detected errors. For example, if overtemperature monitoring of the device is disabled, the device of a smoke extractor fan may itself cause a fire if errors go undetected. An overtemperature condition can be, for example, signaled in a control room without the device being stopped immediately and automatically by its internal monitoring functions.

In rare cases, the monitoring functions of a device may be undesirable because they interfere with the intended operation of the application. For example, there may be situations where the device must continue running even if certain limits, such as permissible ambient temperature, are exceeded. In such applications, damage to or destruction of the device may be considered acceptable to prevent more severe consequences. A parameter is available to disable specific monitoring functions in these cases, so that automatic error detection and automatic error responses are no longer active. When disabling these functions, you must implement alternative monitoring measures that allow operators and/or supervisory control systems to respond appropriately to conditions that would normally trigger an error. For instance, if overtemperature monitoring is disabled, the condition should still be signaled to a control system without the device being stopped automatically by its internal protection mechanisms

⚠ DANGER

ERROR DETECTION FUNCTIONS DISABLED, NO ERROR DETECTION

- Only use this parameter after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Implement alternative monitoring functions for disabled monitoring functions that do not trigger automatic error responses of the device, but allow for adequate, equivalent responses by other means in compliance with all applicable regulations and standards as well as the risk assessment.
- Commission and test the system with the monitoring functions enabled.
- During commissioning, verify that the device and the system operate as intended by performing tests and simulations in a controlled environment under controlled conditions.

Failure to follow these instructions will result in death or serious injury.

If the assigned input or bit is at 0, detected error monitoring is active. If the assigned input or bit is at 1, detected error monitoring is inactive. If an error is already active, it will be cleared when a rising edge (change from 0 to 1) occurs on the assigned input or bit.

It can result in immediate start if the Run command is active on level (**[2/3-Wire Control]** t C C is set to 2 C and **[2-wire type]** t C t is set to L E L)

NOTE:

HMI label	Settings	Factory setting
• The Safe Torque Off function and any detected errors that help to prevent any form of operation are not affected by this function. • If you want to activate this function on low level, prefer to use **Fire Mode function** setting to **"not forced"**. Following detected errors are disabled: AnF, CnF, CrF, dLF, EnF, EPF1, EPF2, FCF2, inFA, inFb, LFF3, obF, oHF, oLC, oLF, oPF1, oPF2, oSF, otFL, PHF, PtFL, SLF1, SLF2, SLF3, SoF, SSF, tJF, tnF and uLF. • **[No]** no: ***No***, function inactive • **[DI1]** LI1: ***Digital input 1*** • **[...] ...**: See the assignment conditions. For more informations see Assignment conditions for logic inputs and control bits, page 173.		

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

[Fieldbus monitoring] C L L —

Access

Parameter can be accessed in [Expert] E P r mode

Parameters described below can be accessed by: d r i ➡ C o n F ➡ F u L L ➡ F L t ➡ C L L

Parameters list

HMI label	Settings	Factory setting
[Fieldbus monitoring] C L L —		
[Fdbus Interrupt Resp] C L L	—	**[Freewheel Stop]** y E S

Response to Fieldbus module communication interruption

⚠WARNING

LOSS OF CONTROL

If this parameter is set to **[Ignore]**, fieldbus module communication monitoring is disabled.

- Only use this setting after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Only use this setting for tests during commissioning.
- Verify that communication monitoring has been re-enabled before completing the commissioning procedure and performing the final commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Behavior of the drive in the event of a communication interruption with a communication module.

- **[Ignore]** n o: ***Ignore***, detected error ignored
- **[Freewheel Stop]** y E S: ***Freewheel stop***
- **[Configured Stop]** S t t: ***Configured stop [STT] parameter***, stop according to configuration of **[Type of stop]** S t t , without interruption. In this case, the operating state fault relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-Wire Control]** t C C and **[2-wire type]** t C t , page 136 if control is via the terminals). Configuring an alarm for this detected error is recommended (assigned to a logic output, for example) to indicate the cause of the stop
- **[Fallback Speed]** L F F: ***Fallback speed***, change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
- **[Speed maintain]** r L S: ***Speed maintained***, the drive maintains the speed being applied when the detected error occurred, as long as the detected error is present and the run command has not been removed (1)
- **[Ramp stop]** r M P: ***Ramp stop***
- **[Fast stop]** F S t: ***Fast stop***
- **[DC injection]** d C i: ***DC injection***. This type of stop cannot be used with certain other functions. See the table .

HMI label	Settings	Factory setting
[Modbus Error Resp] S L L	—	**[Freewheel Stop]** y E S

Response to Modbus interruption

⚠WARNING

LOSS OF CONTROL

If this parameter is set to **[Ignore]**, Modbus communication monitoring is disabled.

- Only use this setting after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Only use this setting for tests during commissioning.
- Verify that communication monitoring has been re-enabled before completing the commissioning procedure and performing the final commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Behavior of the drive in the event of a communication interruption with integrated Modbus.

- **[Ignore]** n o: ***Ignore***, detected error ignored
- **[Freewheel Stop]** y E S: ***Freewheel stop***
- **[Configured Stop]** S t t: ***Configured stop [STT] parameter***, stop according to configuration of **[Type of stop]** S t t , without interruption. In this case, the operating state fault relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-Wire Control]** t C C and **[2-wire type]** t C t , page 136 if control is via the terminals). Configuring an alarm for this detected error is recommended (assigned to a logic output, for example) to indicate the cause of the stop.
- **[Fallback Speed]** L F F: ***Fallback speed***, change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
- **[Speed maintain]** r L S: ***Speed maintained***, the drive maintains the speed being applied when the detected error occurred, as long as the detected error is present and the run command has not been removed (1)
- **[Ramp stop]** r M P: ***Ramp stop***
- **[Fast stop]** F S t: ***Fast stop***
- **[DC injection]** d C I: ***DC injection***. This type of stop cannot be used with certain other functions. See the table.

[Torque or I limit detect] tId —

Access

Parameter can be accessed in [Expert] EPr mode

Parameters described below can be accessed by: dr1 ➡ ConF ➡ FULL ➡ FLt ➡ tId

Parameters list

HMI label	Settings	Factory setting
[Torque or I limit detect] tId —		
[Trq/I limit. stop] SSb	—	**[Ignore]** no
Stop type - torque/I limit, behavior in the event of switching to torque or current limitation. • **[Ignore]** no: ***Ignore***, detected error ignored • **[Freewheel Stop]** YES: ***Freewheel stop*** • **[Configured Stop]** Stt: ***Configured stop [STT] parameter***, stop according to configuration of **[Type of stop]** Stt , without interruption. In this case, the operating state fault relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-Wire Control]** tCC and **[2-wire type]** tCt , page 136 if control is via the terminals). Configuring an alarm for this detected error is recommended (assigned to a logic output, for example) to indicate the cause of the stop. • **[Fallback Speed]** LFF: ***Fallback speed***, change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1) • **[Speed maintain]** rLS: ***Speed maintained***, the drive maintains the speed being applied when the detected error occurred, as long as the detected error is present and the run command has not been removed (1) • **[Ramp stop]** rMP: ***Ramp stop*** • **[Fast stop]** FSt: ***Fast stop*** • **[DC injection]** dC1: ***DC injection***. This type of stop cannot be used with certain other functions. See the table .		
[Trq/I Limit Timeout] Sto	0 to 9,999 ms	1,000 ms
Torque/I limit. timeout (If **[Trq/I limit. stop]** SSb has been configured) Time delay for taking SSF limitation into account.		

(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

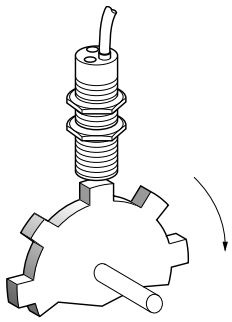
[Frequency meter] F 9 F —

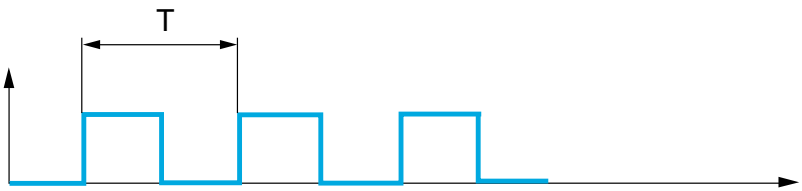
Use of the "Pulse input" input to measure the speed of rotation of the motor

This function uses the "Pulse input" input and can only be used if the "Pulse input" input is not being used for another function.

Example of use

An indexed disk driven by the motor and connected to a proximity sensor can be used to generate a frequency signal that is proportional to the speed of rotation of the motor.





Time in seconds

When applied to the "Pulse input" input, this signal supports:

- Measurement and display of the motor speed: signal frequency = 1/T. This frequency is displayed by means of the **[Measured Freq]** F 9 S parameter , page 45.
- Overspeed detection (if the measured speed exceeds a preset threshold, the drive triggers a detected error).
- Detection of a speed threshold that can be adjusted using **[Pulse warning thd.]** F 9 L and is assignable to a relay or logic output .

Access

Parameters described below can be accessed by: d r 1 ➡ C o n F ➡ F u L L ➡ F L t ➡ F 9 F

Parameters list

HMI label	Settings	Factory setting
[Frequency meter] F 9 F —		
[Frequency meter] F 9 F	—	**[No]** n o
Frequency meter, activation of the speed measurement function.		

HMI label	Settings	Factory setting
• **[No]** n o: ***No***, function inactive. In this case, none of the function parameters can be accessed • **[Yes]** y E S: ***Yes***, function active, assignment only possible if no other functions have been assigned to the "Pulse input" input		
[Pulse scal. divider] F 9 C	1.0 to 100.0	1.0
Pulse scaling divisor The frequency measured is displayed by means of the **[Measured Freq]** F 9 S parameter , page 45.		
[Overspd. pulse thd.] F 9 A	—	**[No]** n o
Overspd. pulse threshold Activation and adjustment of overspeed monitoring: **[Motor Overspeed]** S o F. • **[No]** n o: No overspeed monitoring • **[1 Hz to 20.00 kHz] -**: Adjustment of the frequency tripping threshold on the "Pulse input" input divided by **[Pulse scal. divider]** F 9 C.		
[Pulse overspd delay] t d S	0.0 s to 10.0 s	0.0 s
Pulse Overspeed delay, time delay for taking overspeed detected error into account.		
[Level fr. pulse ctrl] F d t	—	**[No]** n o
Level freq. pulse ctrl This parameter is forced to **[No]** n o • **[No]** n o: No monitoring of speed feedback		
[Pulse thd. wo Run] F 9 t	—	**[No]** n o
Pulse threshold wo Run This parameter is forced to **[No]** n o • **[No]** n o: No brake monitoring		
[Pulse wo Run delay] t 9 b	0.0 s to 10.0 s	0.0 s
Pulse without Run delay		

[Autotuning error] tnF —

Access

Parameters described below can be accessed by: dr1 ➔ ConF ➔ FULL ➔ FLt ➔ tnF

Parameters list

HMI label	Settings	Factory setting
[Autotuning error] tnF —		
[Tuning Error Resp] tnL	—	**[Freewheel Stop]** YES
Response to Autotuning error • **[Ignore]** no: ***Ignore***, detected error ignored • **[Freewheel Stop]** YES: ***Freewheel stop***		

(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

[Boards pairing] PPI —

Card pairing

Function can only be accessed in **[Expert]** EPr mode.
This function is used to detect whenever a module has been replaced or the software has been modified in any way.
When a pairing password is entered, the parameters of the module currently inserted are stored. On every subsequent power-up, these parameters are verified and, in the event of a discrepancy, the drive locks in detected HCF error mode. Before the drive can be restarted, you must revert to the original situation or re-enter the pairing password.
The following parameters are verified:

- The type of module for: all modules.
- The software version for: the control block, the communication modules.
- The serial number for: the control block.

Access

Parameters described below can be accessed by: drI ➡ ConF ➡ FULL ➡ FLt ➡ PPI

HMI label	Settings	Factory setting
[Boards pairing] PPI —		
[Pairing password] PPI ★	**[OFF]** oFF to 9,999	**[OFF]** oFF
Pairing password • **[OFF]** oFF: value signifies that the module pairing function is inactive • **-**: The **[ON]** on value signifies that module pairing is active and that an access code must be entered to start the drive in the event of a module pairing detected error . As soon as the code has been entered, the drive is unlocked and the code changes to **[ON]** on. The PPI code is an unlock code known only to Schneider Electric Product Support.		

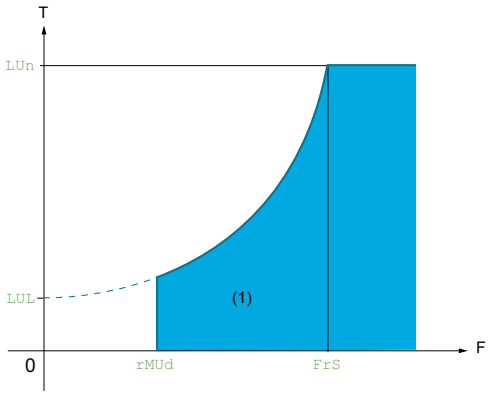
★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[Process underload] uLd —

Process underload detected error

A process underload is detected when the next event occurs and remains pending for a minimum time **[UnId Detect Delay]** uLt), which is configurable:

- The motor is in steady state and the torque is below the set underload limit (**[UnId.Thr.0.Speed]** LuL, **[UnId.Thr.Nom.Speed]** Lun, **[UnId. FreqThr. Det.]** rMud parameters).
- The motor is in steady state when the offset between the frequency reference and motor frequency falls below the configurable threshold **[Hysteresis Freq]** Srb.



Between zero frequency and the rated frequency, the curve reflects the following equation:
torque = LuL + ((Lun — LuL) x frequency)²)/ (rated frequency)²

The underload function is not active for frequencies below **[UnId. FreqThr. Det.]** rMud.

T: Torque as a % of the rated torque

F: Frequency

1. Underload zone

A relay or a logic output can be assigned to the signaling of this detected error in the **[Inputs / Outputs]** I_O — menu.

Access

Parameters described below can be accessed by: dr i ➡ ConF ➡ FULL ➡ FLt ➡ uLd

Parameters list

HMI label	Settings	Factory setting
[Process underload] uLd —		
[UnId Detect Delay] uLt	0 to 100 s	0 s
Underload detection delay A value of 0 deactivates the function and makes the other parameters inaccessible.		
[UnId.Thr.Nom.Speed] Lun ★ ( )	20 to 100%	60%
UnId.Thr. at Nom. speed Underload threshold at rated motor frequency (**[Nominal Motor Freq]** FrS , page 92), as a % of the rated motor torque.		

HMI label	Settings	Factory setting
[Unld.Thr.0.Speed] L u L ★ (↻)	0 to **[Unld.Thr.Nom.Speed]** L u n	0%
Unld.Thr. at O speed, underload threshold at zero frequency, as a % of the rated motor torque.		
[Unld. FreqThr. Det.] r N u d ★ (↻)	0 to 599 Hz	0 Hz
Unld. Freq.Thr. Detection, minimum frequency underload detection threshold.		
[Hysteresis Freq] S r b ★ (↻)	0.3 to 599 Hz	0.3 Hz
Hysteresis frequency, maximum deviation between the frequency reference and the motor frequency, which defines steady state operation.		
[Underload ErrorResp] u d L ★	—	**[Freewheel Stop]** Y E S
Response to underload error • **[Ignore]** n o: ***Ignore***, detected error ignored • **[Freewheel Stop]** Y E S: ***Freewheel stop*** • **[Ramp stop]** r M P: ***Ramp stop*** • **[Fast stop]** F S t: ***Fast stop***		
[Underload T.B.Rest.] F t u ★ (↻)	0 to 6 min	0 min
Unld time Before Restart This parameter cannot be accessed if **[Underload ErrorResp]** u d L is set to **[Ignore]** n o. Minimum time permitted between an underload being detected and any automatic restart. To allow an automatic restart, the value of **[Fault Reset Time]** t A r , page 285 must exceed this parameter by at least one minute.		

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

(↻) : Setting of this parameter can be done during operation or when stopped.

[Process overload] o L d —

Process overload detected error

A process overload is detected when the next event occurs and remains pending for a minimum time **[OvId Detection Delay]** t o L , which is configurable:

- The drive is in current limitation mode.
- The motor is in steady state and the current is above the set overload threshold **[Overload Threshold]** L o C .

The motor is in steady state when the offset between the frequency reference and motor frequency falls below the configurable threshold **[Hysteresis Freq]** S r b.

A relay or a logic output can be assigned to the signaling of this detected error in the **[Inputs / Outputs]** I _ O — menu.

Access

Parameters described below can be accessed by: d r I ➡ C o n F ➡ F u L L ➡ F L t ➡ o L d

Parameters list

HMI label	Settings	Factory setting
[Process overload] o L d —		
[OvId Detection Delay] t o L	0 to 100 s	0 s
Overload detection delay A value of 0 deactivates the function and makes the other parameters inaccessible.		
[Overload Threshold] L o C ★ ( ) (1)	70 to 150%	110%
Current overload threshold Overload detection threshold, as a % of the rated motor current **[Nom Motor Current]** n C r , page 92. This value must be less than the limit current for the function to work.		
[Hysteresis Freq] S r b ★ ( ) (1)	0 to 599 Hz	0.3 Hz
Hysteresis frequency, maximum deviation between the frequency reference and the motor frequency, which defines steady state operation.		
[Overload ErrorResp] o d L ★	—	**[Freewheel Stop]** Y E S
Response to overload error • **[Ignore]** n o : ***Ignore***, detected error ignored • **[Freewheel Stop]** Y E S : ***Freewheel stop*** • **[Ramp stop]** r M P : ***Ramp stop*** • **[Fast stop]** F S t : ***Fast stop***		

HMI label	Settings	Factory setting
[Overload T.B.Rest.] F t o ★ ( ) (1)	0 to 6 min	0 min
Ovld time Before Restart This parameter cannot be accessed if **[Overload ErrorResp]** o d L is set to **[Ignore]** n o . Minimum time permitted between an overload being detected and any automatic restart. To allow an automatic restart, the value of **[Fault Reset Time]** t A r must exceed this parameter by at least one minute.		

[Fallback speed] LFF —

Access

Parameters described below can be accessed by: dr1 ➔ ConF ➔ FULL ➔ FLt ➔ LFF

Parameters list

HMI label	Settings	Factory setting
[Fallback speed] LFF —		
[FallbackSpeed] LFF	0 to 599 Hz	0 Hz
Fall back speed		

[Ramp divider] FSt —

Access

Parameters described below can be accessed by: dr1 ➜ ConF ➜ FULL ➜ FLt ➜ FSt

Parameters list

HMI label	Settings	Factory setting
[Ramp divider] FSt —		
[Ramp Divider] dCF ★ (1)	0 to 10	4
Fast Stop ramp Divider The ramp that is enabled (**[Deceleration]** dEC or **[Deceleration 2]** dE2) is then divided by this coefficient when stop requests are sent. Value 0 corresponds to a minimum ramp time.		

[DC injection] dC I —

Access

Parameters described below can be accessed by: dr I ➡ ConF ➡ FULL ➡ FLt ➡ dC I

Parameters list

HMI label	Settings	Factory setting
[DC injection] dC I —		
[DC Inj Level 1] IdC ★ (1) (3)	0.1 to 1.1 In (2)	0.64 In (2)
DC injection level 1		
NOTICE **OVERHEATING** Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time. **Failure to follow these instructions can result in equipment damage.**		
Level of DC injection braking current activated via logic input or selected as stop mode.		
[DC Inj Time 1] tdI ★ (1) (3)	0.1 to 30 s	0.5 s
DC injection time 1		
NOTICE **OVERHEATING** Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time. **Failure to follow these instructions can result in equipment damage.**		
Maximum current injection time **[DC Inj Level 1]** IdC. After this time, the injection current becomes **[DC Inj Level 2]** IdC2.		
[DC Inj Level 2] IdC2 ★ (1) (3)	0.1 In (2) to **[DC Inj Level 1]** IdC	0.5 In (2)
DC injection level 2		
NOTICE **OVERHEATING** Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time. **Failure to follow these instructions can result in equipment damage.**		
Injection current activated by logic input or selected as stop mode, once period of time **[DC Inj Time 1]** tdI has elapsed.		
[DC Inj Time 2] tdC ★ (1) (3)	0.1 to 30 s	0.5 s

HMI label	Settings	Factory setting

DC injection time 2

NOTICE

OVERHEATING

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time.

Failure to follow these instructions can result in equipment damage.

Maximum injection time **[DC Inj Level 2]** IdC2 for injection, selected as stop mode only.

This parameter can be accessed if **[Type of stop]** Stt is set to **[DC injection]** dCI.

(1) The parameter can also be accessed in the **[Settings]** SEt — and **[Application function]** Fun — menus.

(2) In corresponds to the rated drive current indicated in the Installation manual and on the drive nameplate.

(3) These settings are independent of the **[Auto DC injection]** AdC — function.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

: Setting of this parameter can be done during operation or when stopped.

1.3.4.9 [Full] F u L L – – [Communication] C o n –

What's in This Chapter

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[Modbus Fieldbus] M d I 323
BACnet MS/TP parameters 324
BACnet IP parameters 327
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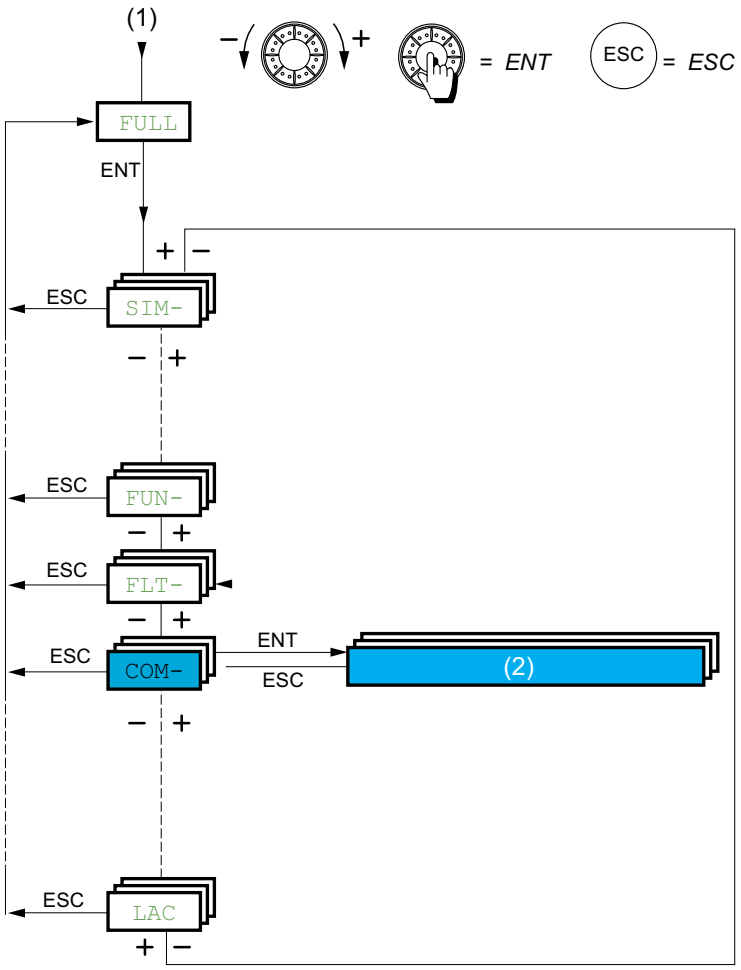
With integrated display terminal



1. From CONF — menu
2. Communication

[Modbus Fieldbus] n d I

Access

For controlling the drive via Mobus, refer to ATH200 Modbus manual, page 12 for more information.

The parameters are accessible in the **[Communication]** C o n – → **[Modbus Fieldbus]** n d I- menu.

Switch mode between Modbus and BACnet MS/TP

The parameters are accessible in the **[Communication]** C o n – → **[Emb Serial Line]** S P C - .

The parameter **[Embedded Protocol]** C o n defines the Serial fieldbus switch mode.

The list presents the parameter settings:

- **[Bacnet MS/TP]** E b n
- **[Modbus]** n d b

To be take into account, apply a power cycle of the product.

[Modbus Address] A d d

This parameter is used to set the Modbus address.

NOTE: The modification of communication parameters is taken into account after a power cycle of the drive.

The table presents the parameter settings:

Settings	Code	Value	Factory settings	Access	Logic address
[OFF]	o F F	0	o F F	R/W	16#1771 = 6001
[1 to 247]	1...2 4 7	1...247			

[Modbus Baud Rate] t b r

This parameter defines the baud rate at which data is transferred.

NOTE: The modification of communication parameters is taken into account after a power cycle of the drive.

The table presents the parameter settings:

Settings	Code	Value	Factory settings	Access	Logic address
[4800 bps]	4 K 8	24	19.2 Kbps	R/W	16#1773 = 6003
[9600 bps]	9 K 6	28			
[19200 bps]	1 9 K 2	32			
[38.4 Kbps]	3 8 K 4	36			

[Modbus Format] t F o

This parameter is used to define the data format.

NOTE: The modification of communication parameters is taken into account after a power cycle of the drive.

The table presents the parameter settings:

Settings	Code	Value	Description	Factory settings	Access	Logic address
[8-O-1]	8 o 1	2	8 data bits, odd parity, 1 stop bit	8 E 1	R/W	16#17734 = 6004
[8-E-1]	8 E 1	3	8 data bits, even parity, 1 stop bit			
[8-N-1]	8 n 1	4	8 data bits, no parity, 1 stop bit			
[8-N-2]	8 n 2	5	8 data bits, no parity, 2 stop bits			

[ModbusTimeout] t t o

This parameter is used to set the Modbus timeout.

NOTE: The modification of communication parameters is taken into account after a power cycle of the drive.

The table presents the parameter settings:

Settings	Code	Value	Factory settings	Access	Logic address
[0.1...30.0]	0.1...30.0	1...300	10 s	R/W	16#17735 = 6005

BACnet MS/TP parameters

Switch mode between Modbus and BACnet MS/TP

The parameters are accessible in the **[Communication]** C o M – → **[Emb Serial Line]** S P C - .

The parameter **[Embedded Protocol]** C o M defines the Serial fieldbus switch mode.

The list presents the parameter settings:

- **[Bacnet MS/TP]** E b M
- **[Modbus]** M d b

To be take into account, apply a power cycle of the product.

Access

For controlling the drive via BACnet, refer to ATH200 BACnet manual, page 12 for more information.

The parameters are accessible in the **[Communication]** C o M – → **[Bacnet MS/TP]** E b M - menu.

Note

- When BACnet MS/TP is enabled, the keypad is unavailable and SoMove cannot connect.

[MS/TP Address] b A d r

This parameter defines the BACnet MS/TP subordinates address of the drive.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
0...127	0... 1 2 7	0	R/W	16#7210 = 29200

[MS/TP Baudrate] b b d r

This parameter defines the BACnet MS/TP baud rate.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[Automatic]	A u t o	**[Automatic]**	R/W	16#7211 = 29201
[9600 bsp]	9 6 0 0			
[19200 bps]	1 9 2 0 0			
[38.4 Kbps]	3 8 4 0 0			
[76.8 Kbps]	7 6 8 0 0			

[MS/TP Frame Format] b F o r

This parameter displays the BACnet MS/TP frame format.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[8-N-1]	8 n 1	**[8-N-1]**	R	16#7212 = 29202

[MS/TP Timeout] b t L P

This parameter defines the BACnet MS/TP fieldbus timeout.

NOTE: A **[Mdb Com Interrupt]** S L F 1 error is triggered if the fieldbus module does not received any BACnet messages at its address within a defined time period defined by **[MS/TP Timeout]** b t L P parameter.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[0.1...60.0 s]	1...6 0 0	4.0 s	R/W	16#7213 = 29203

[MS/TP Inst Nb High] b I n H

This parameter defines the BACnet MS/TP device instance number.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[0...4194]	0...4 1 9 4	1	R/W	16#7214 = 29204

[MS/TP Inst Nb Low] b I n L

This parameter defines the BACnet MS/TP device instance number.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[0...999]	0...9 9 9	1	R/W	16#7215 = 29205

[MS/TP Max Master Nb] b n n n

This parameter defines the max manager device address on the BACnet MS/TP subnetwork.

NOTE: It is recommended to set **[MS/TP Max Master Nb]** to **[MS/TP Address]** + 1.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[1...127]	1... 1 2 7	1	R/W	16#7217 = 29207

[MS/TP Max info frame] b n I F

This parameter defines the maximum number of frames that can be send before passing token to the next manager.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[1...100]	1... 1 0 0	10	R/W	16#7218 = 29208

[MS/TP APDU Retries] A P d r

This parameter displays the number of retries on APDU packets.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[1...10]	1... 1 0	3	R	16#7228 = 29224

[MS/TP APDU Timeout] A P d t

This parameter displays the timeout on APDU send before a resend is executed.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[1...100 s]	1... 1 0 0	60 s	R	16#7229 = 29225

[MS/TP Rx frame count] b t F r

This parameter displays the total number of received frames.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[0...65535]	0...6 5 5 3 5	–	R	16#7219 = 29209

[MS/TP Tx frame count] b t F 5

This parameter displays the total number of transmitted frames.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[0...65535]	0...6 5 5 3 5	–	R	16#721A = 29210

[MS/TP Error Frames] b E F C

This parameter displays the total number of incorrect frames received.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[0...65535]	0...6 5 5 3 5	–	R	16#721B = 29211

BACnet IP parameters

Access

For controlling the drive via BACnet, refer to ATH200 BACnet manual, page 12 for more information.

The parameters are accessible in the **[Communication]** C o n – → **[Comm module]** C b d – menu.

[Device Name] P A n M

This parameter is used to set the device name.

[MAC @] M A C

This parameter displays the MAC address of the BACnet IP port in the format **[MM-MM-MM-XX-XXXX]**.

[IP mode] I P M

This parameter is used to select the IP address assignment method.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
• **[Fixed]** : Manually set the IP address. • **[DHCP]** : Automatically gets the IP address from the DHCP server using the device name.	• M A n u • d H C P	**[DHCP]**	R/W	16#FBC2 = 64250

[IP address] I P C 1, I P C 2, I P C 3, I P C 4

This parameter is used to set the IP address and can be edited only when the IP mode is set to fixed address.

The modification of this parameter setting is only effective when you restart the drive if **[IP mode]** I P M is set to **[Fixed]** M A n u.

The table presents the parameter settings:

Factory settings	Access	Logic address
-	R/W	I P C 1: 16#FAD4 = 64212 I P C 2: 16#FAD5 = 64213 I P C 3: 16#FAD6 = 64214 I P C 4: 16#FAD7 = 64215

[Mask] I P M 1, I P M 2, I P M 3, I P M 4

This parameter can be edited only when the IP mode is set to fixed address.

The modification of this parameter setting is only effective when you restart the drive if **[IP mode]** I P M is set to **[Fixed]** M A n u.

The table presents the parameter settings:

Factory settings	Access	Logic address
-	R/W	I P M 1: 16#FAD8 = 64216 I P M 2: 16#FAD9 = 64217 I P M 3: 16#FADA = 64218 I P M 4: 16#FADB = 64219

[Gateway] IPG1, IPG2, IPG3, IPG4

This parameter can be edited only when the IP mode is set to fixed address.

The modification of this parameter setting is only effective when you restart the drive if **[IP mode]** IPM is set to **[Fixed]** MANU.

The table presents the parameter settings:

Factory settings	Access	Logic address
-	R/W	IPG1: 16#FADC = 64220 IPG2: 16#FADD = 64221 IPG3: 16#FADE = 64222 IPG4: 16#FADF = 64223

[MonitorIPAddress] IPA1, IPA2, IPA3, IPA4

This parameter can be accessed only when **[IP mode]** IPM is set to fixed address.

This is the current IP setting taken into account by the drive.

The table presents the parameter settings:

Factory settings	Access	Logic address
-	R/W	IPA1: 16#FAFC = 64252 IPA2: 16#FAFD = 64253 IPA3: 16#FAFE = 64254 IPA4: 16#FAFF = 64255

[MonitorIPMask] IPS1, IPS2, IPS3, IPS4

This parameter can be accessed only when **[IP mode]** IPM is set to fixed address.

This is the current IP Mask.

The table presents the parameter settings:

Factory settings	Access	Logic address
-	R	IPS1: 16#FB00 = 64256 IPS2: 16#FB01 = 64257 IPS3: 16#FB02 = 64258 IPS4: 16#FB03 = 64259

[MonitorIPGateway] IPT1, IPT2, IPT3, IPT4

This parameter can be accessed only when **[IP mode]** , P M is set to fixed address.

This is the current IP Gateway obtained from the network.

The table presents the parameter settings:

Factory settings	Access	Logic address
-	R	IPT1: 16#FB04 = 64260 IPT2: 16#FB05 = 64261 IPT3: 16#FB06 = 64262 IPT4: 16#FB07 = 64263

[Bacnet IP Mode] b A , M

This parameter defines the BACnet IP manager mode.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[Bacnet Normal] **[Bacnet Foreign]**	n o r M F o r E	**[Bacnet Normal]**	R/W	16#FB23 = 64291

[Bacnet IP UDP port] b A , u

This parameter defines the BACnet IP UDP port.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[1...65535]	1...6 5 5 3 5	**[47808]**	R/W	16#FB24 = 64292

[Bacnet IP Time-Out] b A t t

This parameter defines the BACnet IP fieldbus timeout.

NOTE: A **[Fdbus Com Interrupt]** C n F error is triggered if the fieldbus module does not received any BACnet messages at its address within a defined time period defined by **[Bacnet IP Time-Out]** b A t t parameter.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[0.1...60.0 s]	1...6 0 0	4.0 s	R/W	16#FB26 = 64294

[Bacnet Instance High] b A o H

This parameter defines the BACnet IP device instance number.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[0...4194]	0 ... 4 1 9 4	1	R/W	16#FB22 = 64290

[Bacnet Instance Low] b A o L

This parameter defines the BACnet IP device instance number.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[0...999]	0 ... 9 9 9	1	R/W	16#FB21 = 64289

[IP APDU Retries] A P r 1

This parameter displays the number of retries on APDU packets.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[1...10]	1 ... 1 0	3	R	16#FB27 = 64295

[IP APDU Timeout] A P t 1

This parameter displays the timeout on APDU send before a resend is executed.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[1...100 s]	1 ... 1 0 0	60 s	R	16#FB2A = 64298

[APDU Seg Timeout] A P S 1

This parameter displays the segment timeout on APDU send before a resend is executed.

The table presents the parameter settings:

Settings	Code	Factory settings	Access	Logic address
[1...100 s]	1 ... 1 0 0	50 s	R	16#FB2A = 64298

[Forced local] LCF —

Access

Parameters described below can be accessed by: dr1 ➜ ConF ➜ FULL ➜ FLt ➜ LCF

Parameters list

HMI label	Settings	Factory setting
[Forced local] LCF —		
[Forced Local Assign] FLo	—	**[No]** no
Forced local assignment, forced local mode is active when the input is at state 1. **[Forced Local Assign]** FLo is forced to **[No]** no if **[Profile]** CHCF is set to **[I/O profile]** io , page 175. • **[No]** no: ***No***, Function inactive • **[DI1]** LI1: ***Digital input 1*** **[...] ...** • **[DI6]** LI6: ***Digital input 6*** • **[DAI1]** LAI1: ***Digital input AI1*** • **[DAI2]** LAI2: ***Digital input AI2*** • **[OL01]** oL01: ***OL01***, function blocks: Logical Output 01 **[...] ...** • **[OL10]** oL10: ***OL10***, function blocks: Logical Output 10		
[Forced Local Chan] FLoC	—	**[No]** no
Forced Local channel assignment • **[No]** no: ***No***, not assigned (control via the terminals with zero reference) • **[AI1]** AI1: ***AI1***, Analog input • **[AI2]** AI2: ***AI2***, Analog input • **[AI3]** AI3: ***AI3***, Analog input • **[HMI]** LCC: ***Local HMI***, assignment of the reference and command to the graphic display terminal or remote display terminal. Reference: **[Ref Frequency]** LFr , page 45. Command: RUN/STOP/FWD/REV keys. **[RP]** PI: ***Pulse input*** **[OA01]** oA01: ***OA01***, Function blocks: Analog Output 01 ... **[OA10]** oA10: ***OA10***, Function blocks: Analog Output 10		
[Time-out forc. local] FLot ★	0.1 to 30 s	10.0 s
Time-out forc. local 0.1 to 30 s. This parameter can be accessed if **[Forced Local Assign]** FLo is not set to **[No]** no. Time delay before communication monitoring is resumed on leaving forced local mode.		

[Access Level] L A C

See **[3.1] [Access Level]** L A C **[Access Level]** L A C , page 335 .

2. [Interface] iEF-

What's in This Chapter

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[LANGUAGE] LnG 339
[MONITORING CONFIG.] MCF 340
[Display config.] dCF- 346

[Access Level] L A C

Access

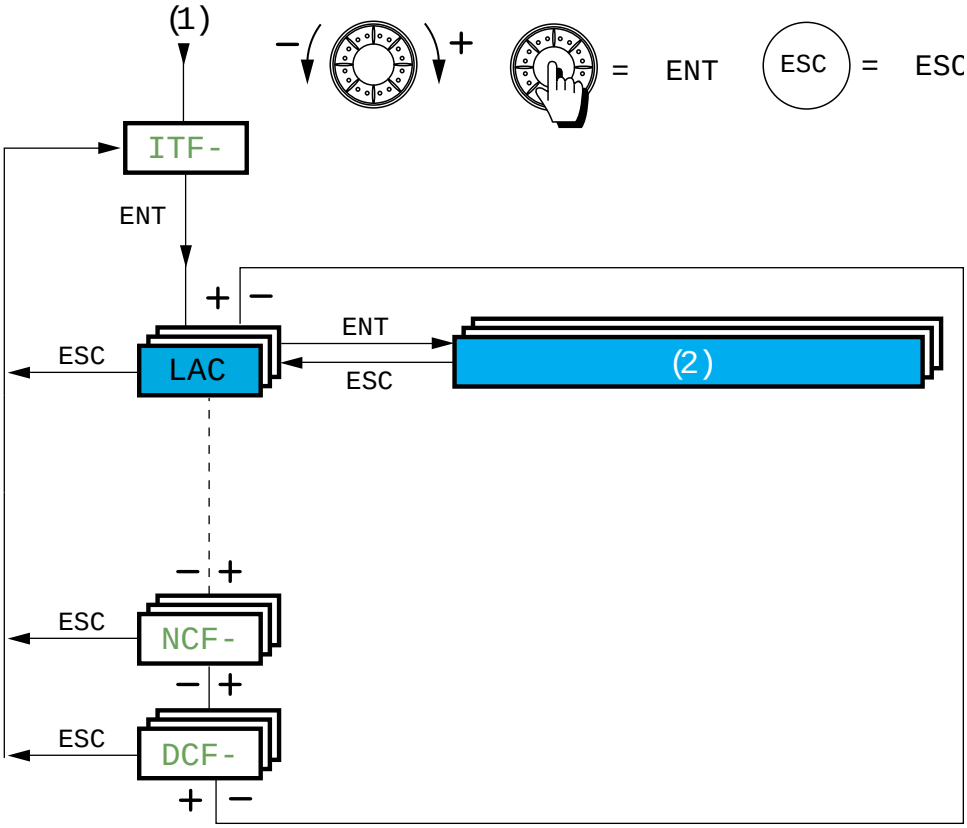
Parameters described below can be accessed by: **[Interface]**.

About This Menu

Displayed parameters depend on drive settings.

: Setting of this parameter can be done during operation or when stopped.

With Integrated Display Terminal



1. From I E F - menu
2. Access level

3.1 [Access Level] LAC

HMI Label	Settings	Factory setting
[Access Level] LAC	–	**[Standard]** Std
Access level		
[Basic] bAS: Limited access to **[Simply start]** SIM-, **1.2 [MONITORING]** Mon-, **[Settings]** SET-,		
[Factory settings] FCS-, **5 [Password]** Cod and **3.1 [Access Level]** LAC- menus. Only one function can be assigned to each input.		
[Standard] Std: Access to all menus on the integrated display terminal. Only one function can be assigned to each input.		
[Advanced] AdV: Access to all menus on the integrated display terminal. Several functions can be assigned to each input.		
[Expert] EPr: Access to all menus on the integrated display terminal and access to additional parameters. Several functions can be assigned to each input.		

Comparison of the menus that can be accessed on the graphic display terminal/integrated display terminal

				Access level			
				[Basic] bAS	**[Standard]** Std	**[Advanced]** AdV	**[Expert]** EPr
1 [Drive menu] drI-							
	1.1 [Reference speed] rEF-						
	1.2 [MONITORING] Mon-						
		[MONIT. MOTOR] MMo-					
		[I/O Map] ioM-					
		[MONIT. SAFETY] SAF-					
		[Monit. Fun. Blocks] MFb-					
		[Communication map] CMM-					
		[MONIT. PI] MPI-					
		[Power-On time] PEt-					
		[Warnings] ALr-(1)					
		[Other State] SSt-(1)					
		[Warnings] Cod-					
	1.3 [Configuration] ConF						
		[My menu] MYMn-					
		[Factory settings] FCS-					
		[Full] FULL-					
			[Simply start] SIM-				
			[Settings] SEt-				
			[Function Blocks] FbM-				
2[Identification] oId- (1)							
3[Interface] iEF- (1)							
	3.1 [Access Level] LAC-						
	3.2 [LANGUAGE] LnG-						
4[Open / Save as] trA- (1)							
5[Password] Cod- (1)							
A single function can be assigned to each input.							
1 [Drive menu] drI-	**1.2 [MONITORING]** Mon-	**[Diagnostics]** dGt-					
	1.3 [Configuration] ConF	**[Full]** FULL-					
			[Motor control] drC-				
			[Input/Output] io-				
			[Command] CtL-				
			[Application function] Fun-				
			[FAULT MANAGEMENT] FLt-				
			[Communication] CoM-				
3[Interface] iEF- (1)	**3.3 [MONITORING CONFIG.]** MCF-						

A single function can be assigned to each input.

3.4 [Display config.] dCF- (1)

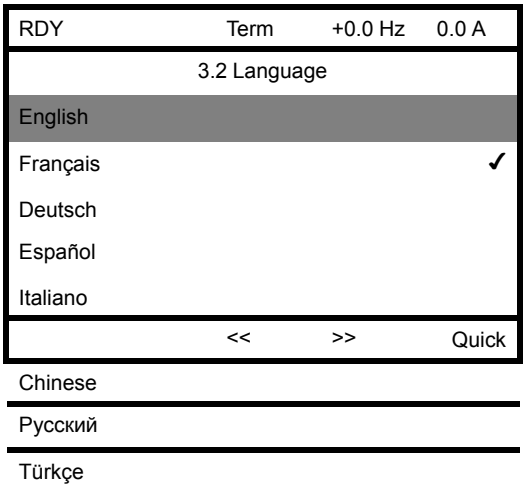
Several functions can be assigned to each input.

Expert parameters

Several functions can be assigned to each input.

(1) Can be accessed only with graphic display terminal.

[LANGUAGE] LnG



When only one selection is possible, the selection made is indicated by ✓

Example: Only one language can be chosen.

About This Menu

Displayed parameters depend on drive settings.

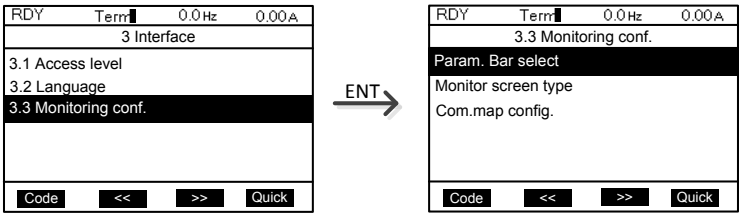
() : Setting of this parameter can be done during operation or when stopped.

3.2 [LANGUAGE] LnG

HMI Label	Settings	Factory setting
[LANGUAGE] LnG ()	–	**[Language 0]** LnG0
Language selection Current language index. **[Language 0]** LnG0 ... **[Language 9]** LnG9		

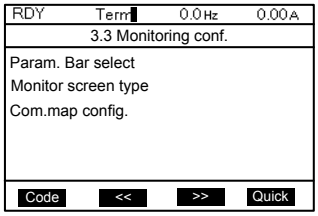
[MONITORING CONFIG.] nCF

This menu can only be accessed with the graphic display terminal.



This can be used to configure the information displayed on the graphic display screen during operation.

[Param. Bar Select]: Selection of 1 to 2 parameters displayed on the top line (the first 2 cannot be modified).



[MONITOR SCREEN TYPE]: Selection of parameters displayed in the centre of the screen and the display mode (digital values or bar graph format).

[Com. map config.]: Selection of the words displayed and their format.

Access

Parameters described below can be accessed by: **[Interface]** ➡ **[MONITORING CONFIG.]**

About This Menu

Displayed parameters depend on drive settings.

★ : These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

( ) : Setting of this parameter can be done during operation or when stopped.

[MONITORING CONFIG.] nCF —

HMI Label	Settings	Factory setting
3.3 [MONITORING CONFIG.] nCF -		

[Param. Bar Select]

HMI Label	Settings	Factory setting
[Param. Bar Select] PbS-		
[AI1]	in V	
[AI2]	in V	
[AI3]	in mA	
[AO1]	in V	
[ETA state world]		
[Alarm groups]		
[Frequency ref.]	in Hz: parameter displayed in factory configuration	
[Output frequency]	in Hz	
[Motor current]	in A: parameter displayed in factory configuration	
[Motor speed]	in rpm	
[Motor voltage]	in V	
[Motor power]	in W	
[Motor torque]	as a %	
[Mains voltage]	in V	
[Motor thermal state]	as a %	
[Drv. thermal state]	as a %	
[Consumption]	in Wh or kWh depending on drive rating	
[Run time]	in hours (length of time the motor has been switched on)	
[Power on time]	in hours (length of time the drive has been switched on)	
[IGBT alarm counter]	in seconds (total time of IGBT overheating alarms)	
[Min. freq time]	in seconds	
[PID reference]	as a %	
[PID feedback]	as a %	
[PID error]	as a %	
[PID Output]	in Hz	
[Config. active]	CNF0, 1 or 2	
[Utilised param. set]	SET1, 2 or 3	

Select the parameter using ENT (a ✓ then appears next to the parameter). Parameter(s) can also be deselected using ENT.

1 or 2 parameters can be selected.

Example:

PARAM. BAR SELECT
MONITORING
----✓

----✓

HMI Label	Settings	Factory setting

Access

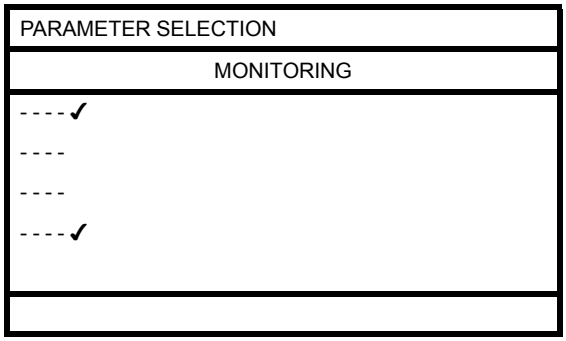
Parameters described below can be accessed by: **[Interface]** ➜ **[MONITORING CONFIG.]** ➜ **[MONITOR SCREEN TYPE]**

[MONITOR SCREEN TYPE]

HMI Label	Settings	Factory setting
[Display value type] MdE	–	**[Digital]** dEC
HMI displayed value type		
[Digital] dEC		
[Bar graph] bAr		
[List] LiSt		
[Motor param choice] MPC ★		
[AI1]	in V	
[AI2]	in V	
[AI3]	in mA	
[AO1]	in V	
[ETA state world]		
[Alarm groups]		
[Frequency ref.]	in Hz: parameter displayed in factory configuration	
[Output frequency]	in Hz	
[Pulse in. work. freq.]	in A: parameter displayed in factory configuration	
[Motor current]	in Hz	
[Motor speed]	in rpm	
[Motor voltage]	in V	
[Motor power]	in W	
[Motor torque]	as a %	
[Mains voltage]	in V	
[Motor thermal state]	as a %	
[Drv. thermal state]	as a %	
[Consumption]	in Wh or kWh depending on drive rating	
[Run time]	in hours (length of time the motor has been switched on)	
[Power on time]	in hours (length of time the drive has been switched on)	
[IGBT alarm counter]	in seconds (total time of IGBT overheating alarms)	

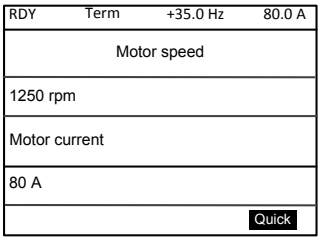
HMI Label	Settings	Factory setting
[Min. freq time]	in seconds	
[PID reference]	as a %	
[PID feedback]	as a %	
[PID error]	as a %	
[PID Output]	in Hz	

Select the parameter(s) using ENT (a ✓ then appears next to the parameter). Parameter(s) can also be deselected using ENT.

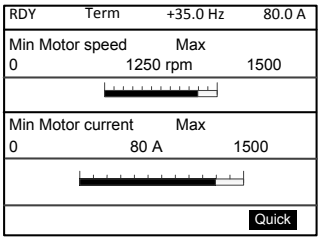


Examples include:

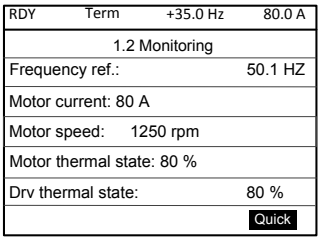
Display of 2 digital values



Display of 2 bar graphs



Display of a list of 5 values



Access

Parameters described below can be accessed by: **[Interface]** ➡ **[MONITORING CONFIG.]** ➡ **[Com. map config.]**

[Com. map config.]

HMI Label	Settings	Factory setting
[Com. map config.] AdL-		
[Word 1 add. select.] iAd1	—	0
HMI logical address 1 sel. Select the address of the word to be displayed by pressing the << and >> (F2 and F3) keys and rotating the jog dial.		
[Format word 1] FAd1	—	**[Hex]** HEX
Format address 1 Format of word 1.		

HMI Label	Settings	Factory setting
[Hex] HEX **[Signed]** SIG **[Unsigned]** nSG		
[Word 2 add. select.] iAd2	—	0
HMI logical address 2 sel. Select the address of the word to be displayed by pressing the << and >> (F2 and F3) keys and rotating the jog dial.		
[Format word 2] FAd2	—	**[Hex]** HEX
Format address 2 Format of word 2. **[Hex]** HEX **[Signed]** SIG **[Unsigned]** nSG		
[Word 3 add. select.] iAd3	—	0
HMI logical address 3 sel. Select the address of the word to be displayed by pressing the << and >> (F2 and F3) keys and rotating the jog dial.		
[Format word 3] FAd3	—	**[Hex]** HEX
Format address 3 Format of word 3. **[Hex]** HEX **[Signed]** SIG **[Unsigned]** nSG		
[Word 4 add. select.] iAd4	—	0
HMI logical address 4 sel. Select the address of the word to be displayed by pressing the << and >> (F2 and F3) keys and rotating the jog dial.		

HMI Label	Settings	Factory setting
[Format word 4] F Rd4	—	**[Hex]** HEX

Format address 4

Format of word 4.

[Hex] HEX

[Signed] SıG

[Unsigned] nSG

It is possible to view the selected words in the **[Communication map]** submenu of the **1.2 [MONITORING]** menu.

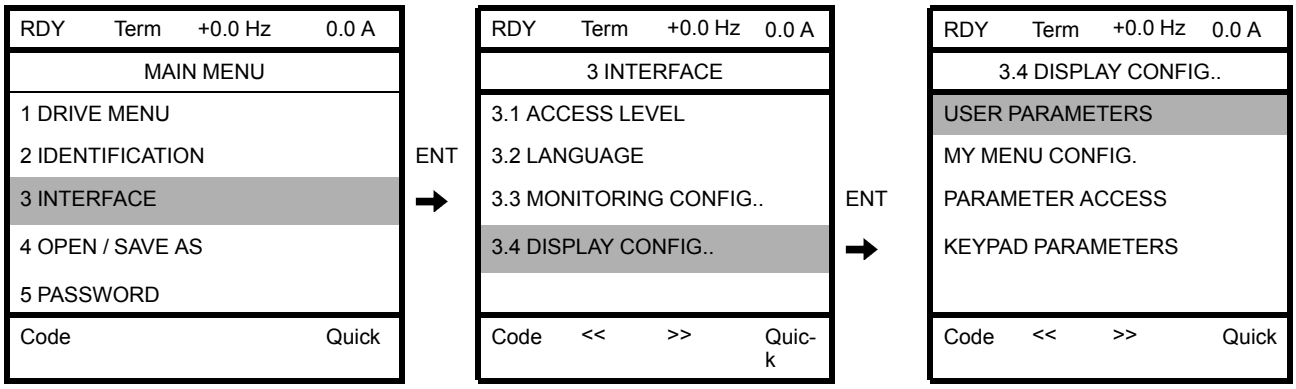
Example:

RDY	Term	+35.0 Hz	80.0 A
COMMUNICATION MAP			

W3141: F230 Hex			
	<<	>>	Quick

[Display config.] dCF-

This menu can only be accessed with the graphic display terminal. It can be used to customize parameters or a menu and to access parameters.

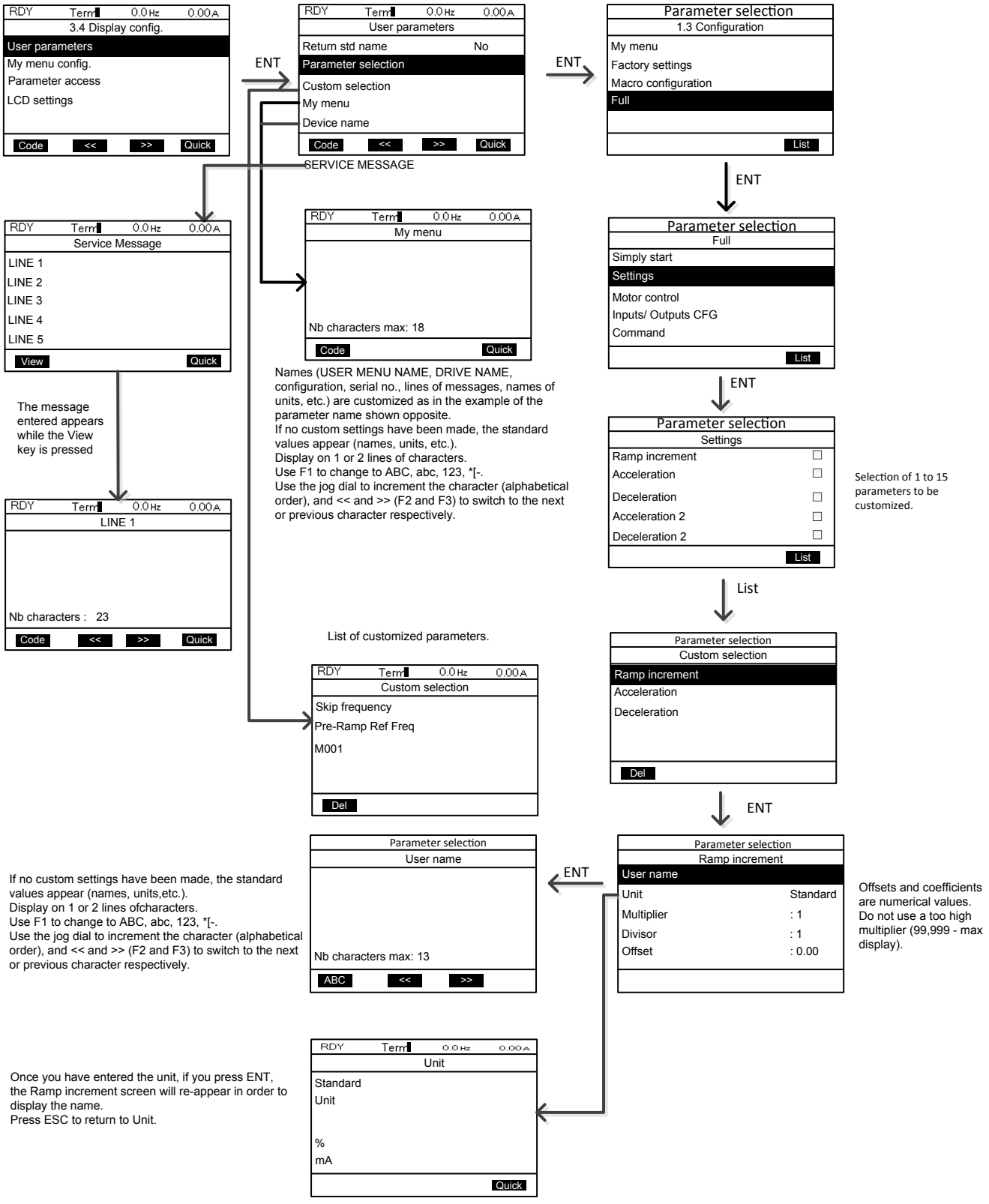


- **USER PARAMETERS**: Customization of 1 to 15 parameters.
- **MY MENU**: Creation of a customized menu.
- **PARAMETER ACCESS**: Customization of the visibility and protection mechanisms of menus and parameters.
- **KEYPAD PARAMETERS**: Adjustment of the contrast and stand-by mode of the graphic display terminal (parameters stored in the terminal rather than in the drive).

HMI Label	Settings	Factory setting
3.4[Display config.] dCF-		

[User parameters]

If **[Return std name]** is set to **[Yes]**, the display reverts to standard but the custom settings remain stored.



Access

Parameters described below can be accessed by: **[Interface]** ➡ **[Display config.]** ➡ **[User parameters]**

About This Menu

Displayed parameters depend on drive settings.

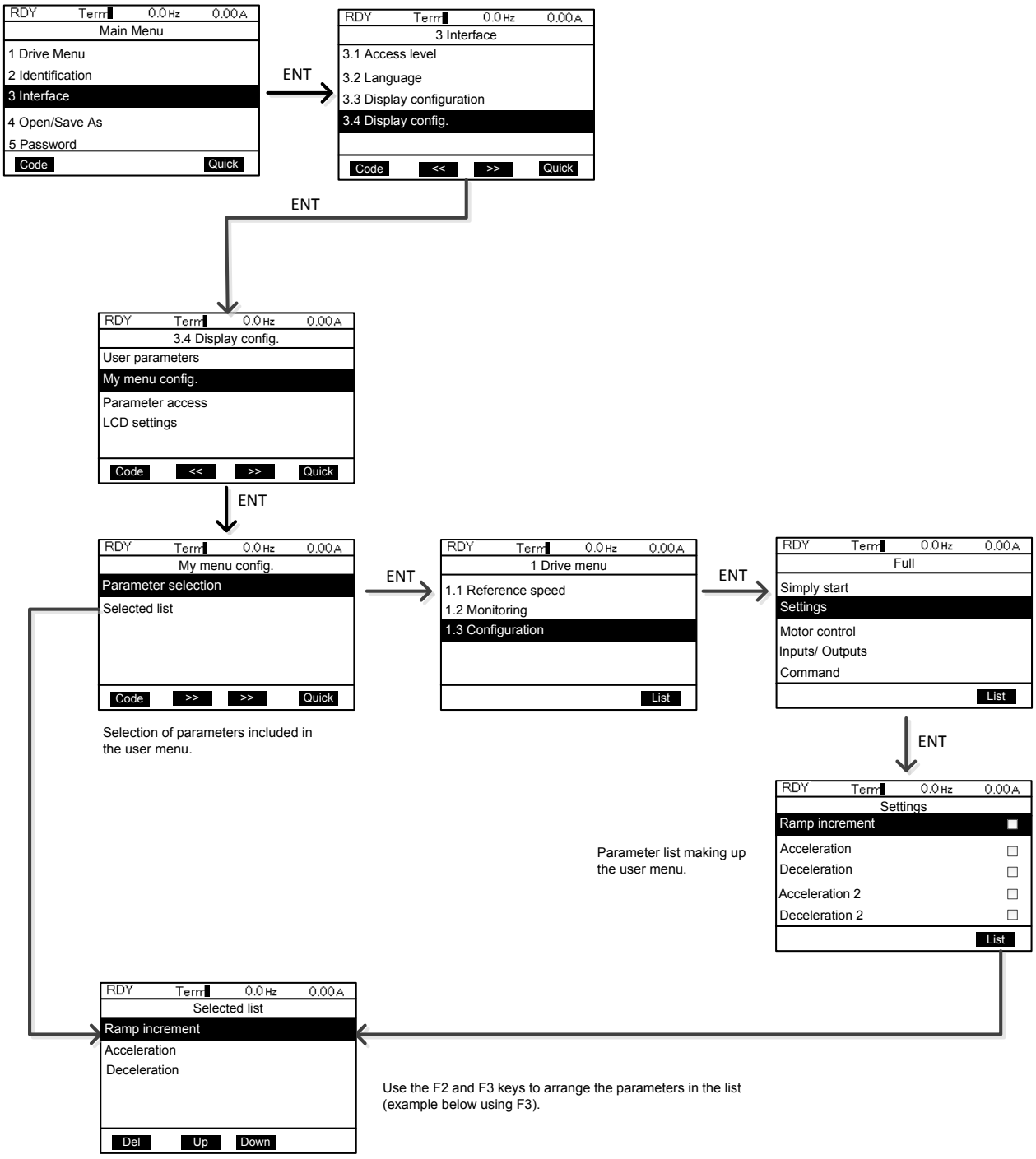
(): Setting of this parameter can be done during operation or when stopped.

[User parameters] CUP-

HMI Label	Settings	Factory setting
[User parameters] CUP-		
[Return std name] GSP ()	—	**[No]** no
Return standard name Display standard parameters instead of customised ones. **[No]** no **[Yes]** YES		
[My menu] MYMn		
[Device Name] PAn		
[Service Message] SEr-		
[LINE 1] SML01		
[LINE 2] SML02		
[LINE 3] SML03		
[LINE 4] SML04		
[LINE 5] SML05		
[CONFIGURATION 0] CFN01		
[CONFIGURATION 1] CFN02		
[CONFIGURATION 2] CFN03		
[SERIAL NUMBER] PSN		

[My menu config.] MYC-

NOTE: This parameter is only accessible in expert level.

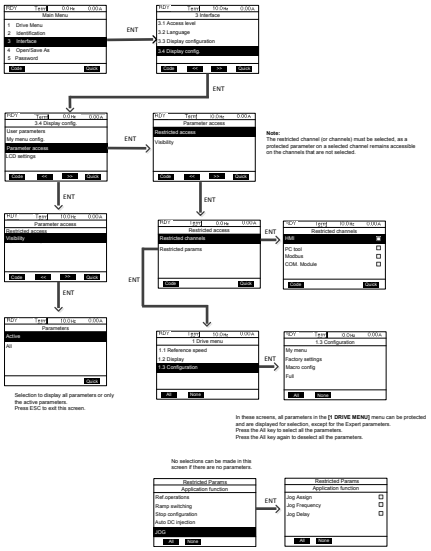


HMI Label	Settings	Factory setting
[My menu config.] nyC-		

Access

Parameters described below can be accessed by: **[Interface]** ➡ **[Display config.]** ➡ **[Parameter access]** ➡ **[Restricted access]** ➡ **[Restricted channels]**

[Parameter access] PAC-



NOTE:

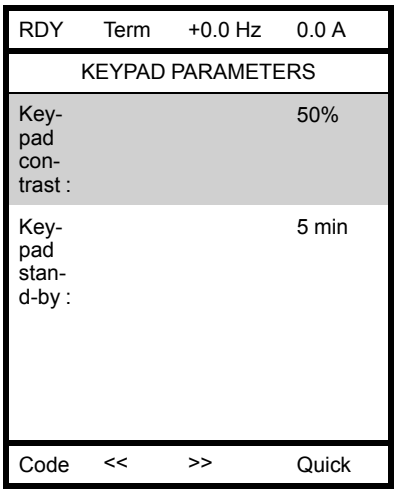
The protected parameters are no longer accessible and are not, therefore, displayed for the selected channels.

HMI Label	Settings	Factory setting
[Parameter access] PAC-		
[Restricted access] Pro-		
[Restricted channels] PCd-		
[HMI] Con: Graphic display terminal or remote display terminal **[PC TOOL]** PWS: PC Software **[MODBUS]** Mdb: Integrated Modbus **[COM. Module]** nEt: Communication module (if inserted)		
[Visibility] Vis-		
[Parameters] PVis	—	**[Active]** ACt
Parameters Parameter visibility: only active ones, or all parameters. **[Active]** ACt **[All]** ALL		

Access

Parameters described below can be accessed by: **[Interface]** ➡ **[Display config.]** ➡ **[LCD settings]**

[LCD settings] CnL-

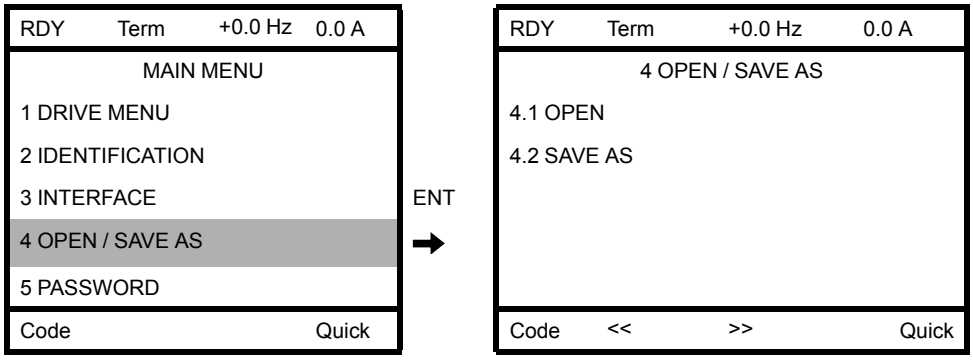


[LCD settings] CnL-

HMI Label	Settings	Factory setting
[LCD settings] CnL-		
[Screen contrast] CrSt	0 to 100%	50%
Screen contrast		
[Stand-by Delay] CSby	**[No]** no to 10 min	5 min
Stand-by delay Graphic keypad standby delay. **[No]** no		

3. [Open / Save as] Ł r A-

This menu can only be accessed with the graphic display terminal.



[4.1 OPEN]: To download one of the 4 files from the graphic display terminal to the drive.

[4.2 SAVE AS]: To download the current drive configuration to the graphic display terminal.

4 OPEN / SAVE AS				
4,1 OPEN				
File 1			Used	
	None All Drive configura-tion			
		VERIFY THAT THE DRIVE WIRING IS OK ESC = abort ENT = continue		
			TRANSFER IN PROGRESS	
				DONE
	Motor parameters Communi-cation			
File 2			Empty	
File 3			Empty	
File 4			Empty	
4.2 SAVE AS				
File 1			Used	
File 2			Free	
	TRANSFER IN PRO-GRESS			
		DONE		
File 3			Free	
File 4			Free	

NOTE: Opening an empty file has no effect.

NOTE: Opening an empty file has no effect.

Saving to a used file deletes and replaces the configuration contained in this file.

Various messages may appear when the download is requested:

- **[TRANSFER IN PROGRESS]**
- **Error messages if download not possible**
- **[DONE]**
- **[Motor parameters are NOT COMPATIBLE. Do you want to continue?]**: In this case, the download is possible, but the parameters are restricted.

Download Group

[None]:		No parameters
[All]:		All parameters in all menus
[Drive configuration]:		The entire **1 [Drive menu]** without **[Communication]**
[Motor parameters]:	**[Nom Motor Voltage]** u n S	In the **[Motor control]** d r C - menu
	[Nominal Motor Freq] F r S	
	[Nom Motor Current] n C r	
	[Nominal Motor Spd] n S P	
	[Motor 1 Cosinus Phi] C o S	
	[Nominal Motor Power] n P r	
	[Motor param choice] M P C	
	[Tune selection] S t u n	
	[Motor Th Current] I t H	
	[IR compensation] u F r	
	[Slip compensation] S L P	
	[AsyncMotor R Stator] r S A	
	[AsyncMotor Lf Induct] L F A	
	[Rotor Time Const] t r A	
	[Sync Nominal I] n C r S	
	[Nom SyncMotor Spd] n S P S	
	[Pole pairs] P P n S	
	[Syn. EMF constant] P H S	
	[Autotune L d-axis] L d S	
	[Autotune L q-axis] L q S	
	[Sync Nominal Freq] F r S S	
	[SyncMotor Stator R] r S A S	
	[Nom Motor torque] t q S	
	[U1] u 1	
	[F1] F 1	
	[U2] u 2	
	[F2] F 2	
	[U3] u 3	
	[F3] F 3	
	[U4] u 4	
	[F4] F 4	
	[U5] u 5	

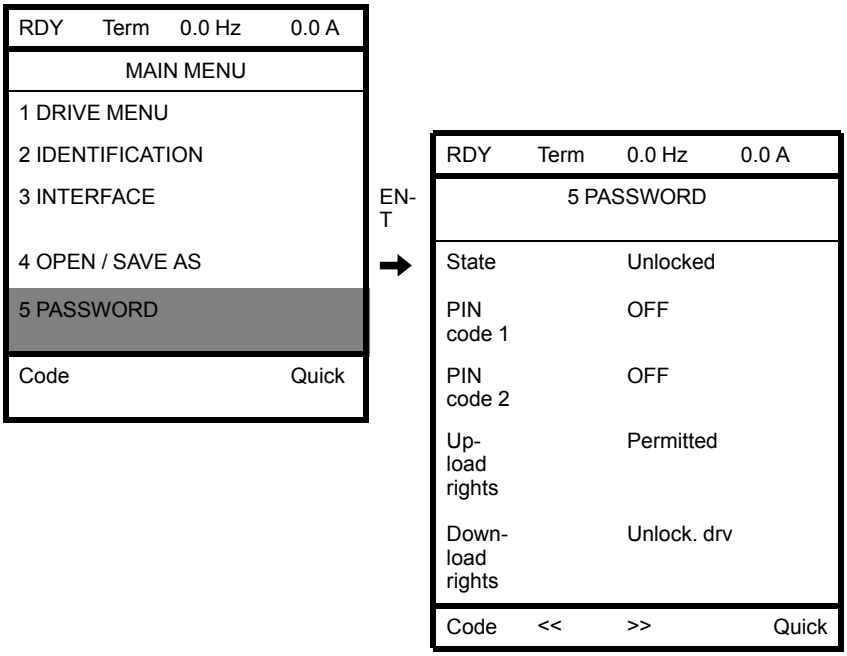
	[F5] F5	
	The motor parameters that can be accessed in **[Expert]** EPr mode .	
	[Motor Th Current] ItH	
[Communication] :		All the parameters in the **[Communication]** menu

4. [Password] COD-

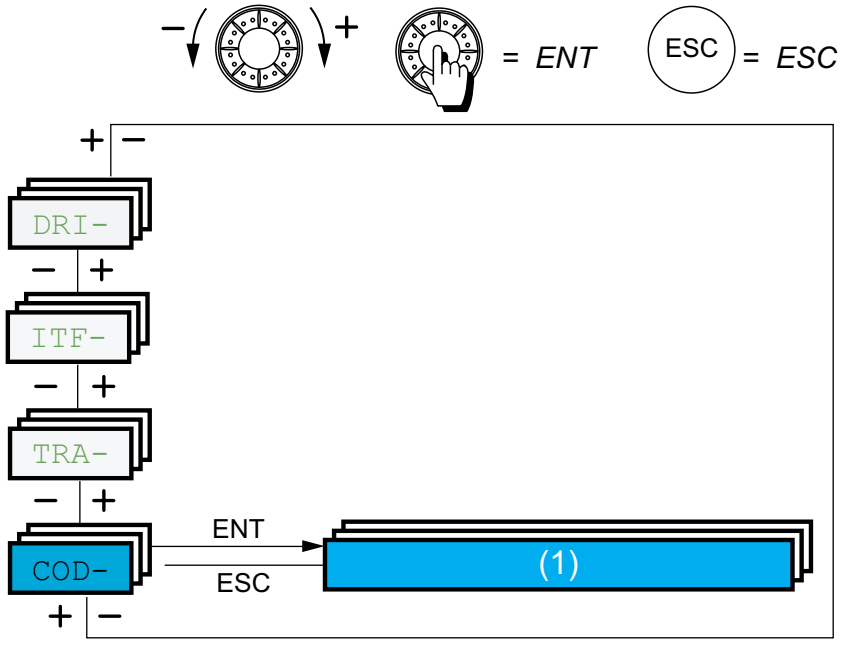
What's in This Chapter

Multipoint Screen 357

With Graphic Display Terminal



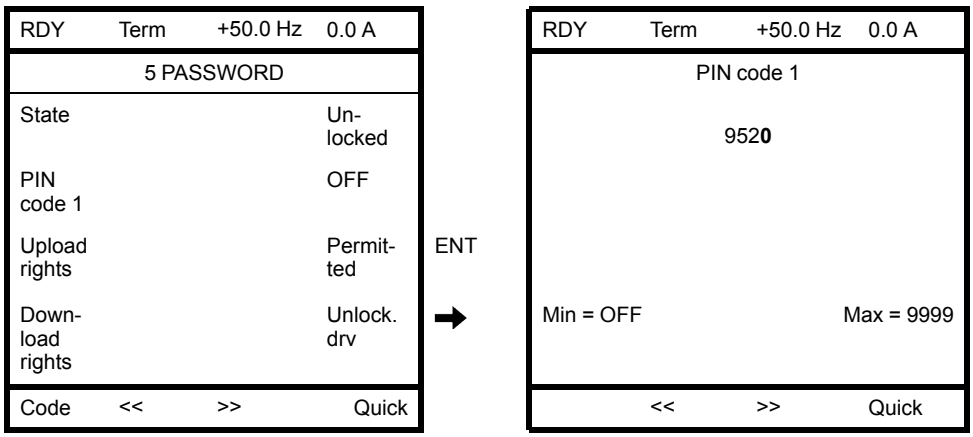
With Integrated Display Terminal



1. Password

Enables the configuration to be protected with an access code or a password to be entered to access a protected configuration.

Example with graphic display terminal:



- The drive is unlocked when the PIN codes are set to **[Unlocked]** OFF (no password) or when the correct code has been entered. All menus are visible.
- Before protecting the configuration with an access code, you must:
  - Define the **[Upload rights]** ULr and **[Download rights]** dLr.
  - Make a note of the code and keep it in a place where you are able to find it.
- The drive has 2 access codes, enabling 2 access levels to be set up:
  - PIN code 1 is a public unlock code: 6969.
  - PIN code 2 is an unlock code known only to Schneider Electric Product Support. It can only be accessed in **[Expert]** EPr mode.
  - Only one PIN1 or PIN2 code can be used, the other must remain set to **[OFF]** oFF.

NOTE: When the unlock code is entered, the user access code appears.

The following items are access-protected:

- Return to factory settings **[Factory settings]** (FCS-) menu.
- The channels and parameters protected by the **[My menu]** MYMn- as well as the menu itself.
- The custom display settings (**3.4 [Display config.]** dCF- menu).

Access

Parameters described below can be accessed by: **[Drive menu]** ➡ **[MONITORING]**➡ **[Password]**

[Password] COD-

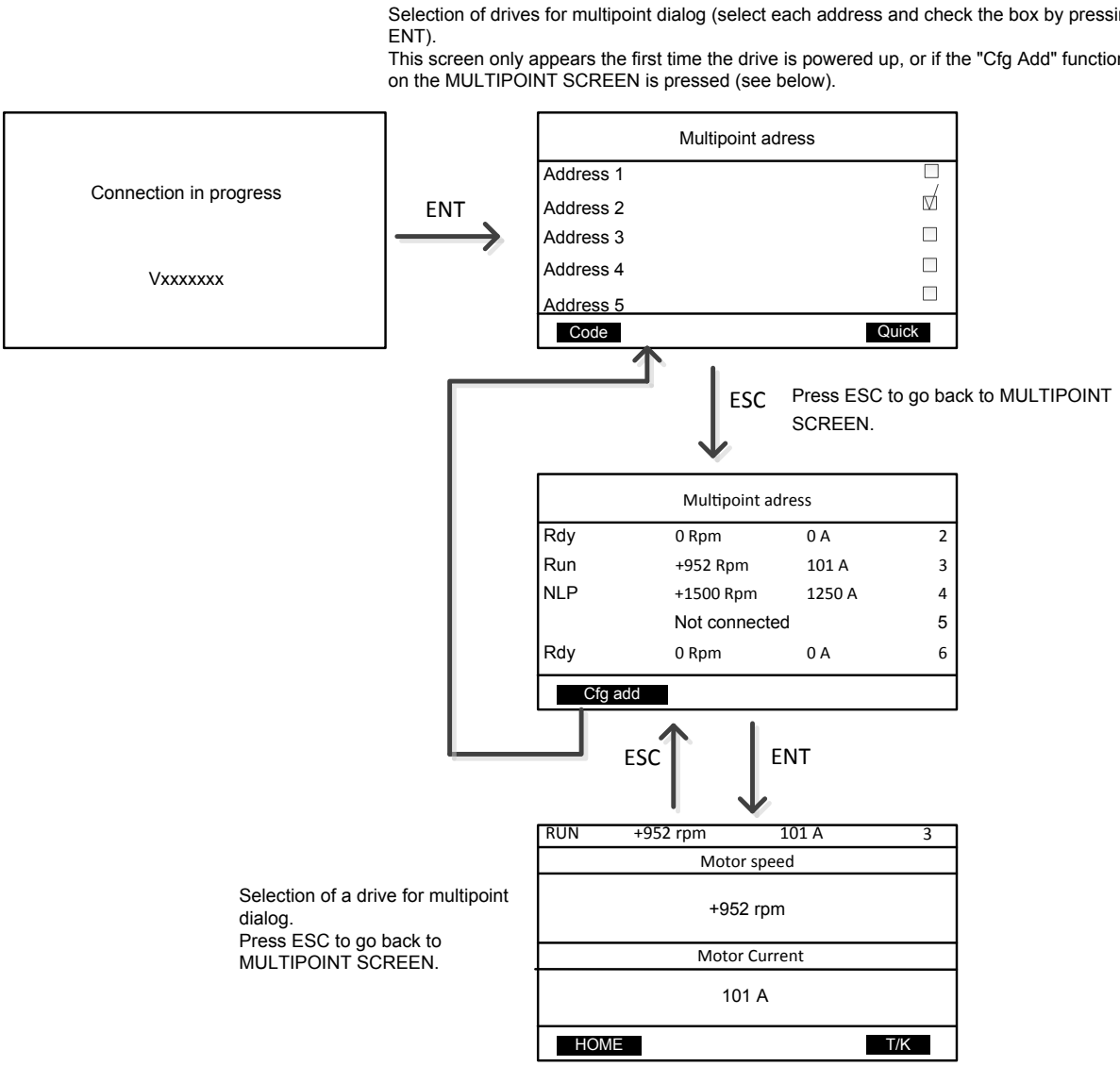
HMI label	Setting	Factory setting
[State] CST	–	**[Unlocked]** ULCK
CST Status of the drive (lock/unlock). Information parameter, cannot be modified. **[Locked]** LCK : The drive is locked by a password. **[Unlocked]** ULCK : The drive is not locked by a password. **NOTE:** If the drive is locked, the downloading or uploading of the configuration is not allowed.		
[PIN code 1] Cod	**[OFF]** oFF to 9999	**[OFF]** oFF

HMI label	Setting	Factory setting
Password code 1 1st access code. The value **[OFF]** oFF indicates that no password has been set **[Unlocked]** ULCK. The value **[ON]** on indicates that the drive is protected and an access code must be entered to unlock it. After the correct code has been entered, it remains on the display and the drive is unlocked until the next time the power supply is disconnected. PIN code 1 is a public unlock code: 6969.		
[PIN code 2] Cod2	**[OFF]** oFF to 9999	**[OFF]** oFF
Password code 2 This parameter can only be accessed in **[Expert]** EPr mode. 2nd access code. The value **[OFF]** oFF indicates that no password has been set **[Unlocked]** ULCK. The value **[ON]** on indicates that the drive is protected and an access code must be entered to unlock it. After the correct code has been entered, it remains on the display and the drive is unlocked until the next time the power supply is disconnected. PIN code 2 is an unlock code known only to Schneider Electric Product Support. When **[PIN code 2]** Cod2 is not set to **[OFF]** oFF, the **1.2 [MONITORING]** Mon- menu is the only one visible. Then if **[PIN code 2]** Cod2 is set to **[OFF]** oFF (drive unlocked), all menus are visible. If the display settings are modified in **3.4 [Display config.]** dCF- menu, and if **[PIN code 2]** Cod2 is not set to **[OFF]** oFF, the visibility configured is kept. Then if **[PIN code 2]** Cod2 is set to OFF (drive unlocked), the visibility configured in **3.4 [Display config.]** dCF- menu is kept.		
[Upload rights] uLr	–	**[Permitted]** uLr0
Upload rights Reads or copies the current configuration to the drive. **[Permitted]** uLr0: The current drive configuration can be uploaded to the graphic display terminal or PC Software. **[Not allowed]** uLr1: The current drive configuration can only be uploaded to the graphic display terminal or PC Software if the drive is not protected by an access code or if the correct code has been entered.		
[Download rights] dLr	–	**[Unlock. drv]** dLr1
Download rights Writes the current configuration to the drive or downloads a configuration to the drive. **[Locked drv]** dLr0: A configuration file can only be downloaded to the drive if the drive is protected by an access code, which is the same as the access code for the configuration to be downloaded. **[Unlock. drv]** dLr1: A configuration file can be downloaded to the drive or a configuration in the drive can be modified if the drive is unlocked (access code entered) or is not protected by an access code. **[Not allowed]** dLr2: Download is not authorized. **[Lock/unlock]** dLr3: Combination of **[Locked drv]** dLr0 and **[Unlock. drv]** dLr1.		

Multipoint Screen

Communication is possible between a graphic display terminal and a number of drives connected on the same bus. The addresses of the drives must be configured in advance in the **[Communication]** CoM- menu using the **[Modbus Address]** Add parameter .

When a number of drives are connected to the same graphic display terminal, it automatically displays the following screens:



In multipoint mode, the command channel is not displayed. From left to right, the state, then the 2 selected parameters, and finally the drive address appear.

All menus can be accessed in multipoint mode. Only drive control via the graphic display terminal is not authorized, apart from the Stop key, which locks all the drives.

If there is an error detected on a drive, this drive is displayed.

Maintenance and Diagnostics

What's in This Part

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Diagnostics and Troubleshooting

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⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Read and understand the instructions in **Product Related Information** chapter before performing any procedure in this chapter.

Failure to follow these instructions will result in death or serious injury.

Error Code

Introduction

- If the display does not light up, verify the supply mains to the drive.
- The assignment of the fast stop or freewheel functions help to prevent the drive starting if the corresponding digital inputs are not switched on. The drive then displays **[Freewheel]** nSt in freewheel stop and **[Fast stop]** FSt in fast stop. This is a normal behavior since these functions are active at zero so that the drive is stopped if there is a wire break.
- Verify that the run command input is activated in accordance with the selected control mode (**[2/3-Wire Control]** tCC , page 90 and **[2-wire type]** tCt parameters).
- If an input is assigned to the limit switch function and this input is at zero, the drive can only be started up by sending a command for the opposite direction..
- If the reference channel or command channel is assigned to a fieldbus, when the supply mains is connected, the drive displays **[Freewheel]** nSt. It remains in stop mode until the fieldbus sends a command.

HMI Label	Settings	Factory setting
[Diagnostics] dGt-		
This menu can only be accessed with the graphic display terminal. It displays detected errors and their cause in plain text and can be used to carry out tests, see Diagnostics **[Diagnostics]** dGt-, page 64.		

Clearing the Detected error

Follow these steps in the event of a non resettable detected error:

Step	Action
1	Disconnect all power, including external control power that may be present.
2	Lock all power disconnects in the open position.
3	Wait 15 minutes to allow the DC bus capacitors to discharge (the drive LEDs are not indicators of the absence of DC bus voltage).
4	Measure the voltage of the DC bus between the PA/+ and PC/- terminals to ensure that the voltage is less than 42 Vdc.
5	If the DC bus capacitors do not discharge completely, contact your local Schneider Electric representative. Do not repair or operate the drive.
6	Find and correct the cause of the detected error.
7	Restore power to the drive to confirm that the detected error has been rectified.

In the event of a resettable detected error, the drive can be reset after the cause is cleared:

- By switching off the drive until the display disappears completely, then switching on again.
- Automatically in the scenarios described for the **[Auto Fault Reset]** Atr-function.
- By means of a logic input or control bit assigned to the **[Fault reset]** rSt-function.
- By pressing the **STOP**/**RESET** key on the graphic display terminal if the active channel command is the HMI (see **[Cmd Channel 1]** Cd1, page 175).

How To Clear the Error Codes?

The following table summarizes the possibilities to clear a detected error:

How to clear the error code	List of the cleared detected errors
Error detection codes which require a power reset after the detected error is cleared The cause of the detected error must be removed before resetting by turning off and then back on. ASF, brF, SoF, and tnF detected errors can also be cleared remotely by means of a logic input or control bit (**[Fault Reset Assign]** rSF parameter).	AnF, ASF, , brF, CrF1, EEF1, EEF2, FCF1, HdF, iLF, inF1, inF2, inF3, inF4, inF6, inF9, inFA, inFb, inFE, SAFF, SoF,
Error detection codes that can be cleared with the automatic restart function after the cause has disappeared These detected errors can also be cleared by turning on and off or by means of a logic input or control bit (**[Fault Reset Assign]** rSF parameter.	CnF, duCF, EPF1, EPF2, FbES, FCF2, LCF, LFF3, obF, oHF, oLF, oLC, oPF1, oPF2, oSF, otFL, PtFL, SCF4, SCF5, SLF1, SLF2, SLF3, SSF, tJF, tnF, uLF
Error detection codes that are cleared as soon as their cause disappears	CFF, CFI, CFI2, CSF, dLF, FbE, HCF, PHF, uSF
If **[Extended Fault Reset]** HRFC is set to YES: • Use the digital input or the control bit assigned to **[Fault Reset Assign]** RSF.	oCF, SCF1, SCF3

[Load slipping] AnF

Load slipping error

Probable Cause	The difference between the output frequency and the speed feedback is not correct.
Remedy	• Check the motor, gain and stability parameters. • Add a braking resistor. • Check the size of the motor/drive/load. • Check the encoder's mechanical coupling and its wiring. • Check the setting of parameters.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Angle Error] AnF

Angle error

Probable Cause	It occurs during the phase-shift angle measurement, if the motor phase is disconnected or if the motor inductance is too high.
Remedy	Check the motor phases and the maximum current allowed by the drive.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATR Atr or manually with the **[Fault Reset Assign]** RSF r SF parameter after its cause has been removed.

[Incorrect Config] CFF

Incorrect configuration error

Probable Cause	• Option module changed or removed. • Control block replaced by a control block configured on a drive with a different rating. • The current configuration is inconsistent.
Remedy	• Check that there are no detected module errors. • In the event of the option module being changed/removed deliberately, see the remarks below. • Return to factory settings 1.3.2 **[Factory settings]** FCS-, page 84 or retrieve the backup configuration, if it is valid.
Clearing the Error Code	This detected error is cleared as soon as its cause has been removed.

[Invalid Configuration] CF 1

Invalid configuration error

Probable Cause	Invalid configuration. The configuration loaded in the drive via the bus or communication network is inconsistent.
Remedy	• Check the configuration loaded previously. • Load a compatible configuration.
Clearing the Error Code	This detected error is cleared as soon as its cause has been removed.

[Conf Transfer Error] CF 12

Configuration transfer error

Probable Cause	Invalid configuration. The configuration loaded in the drive via the bus or communication network is inconsistent.
Remedy	• Check the configuration loaded previously. • Load a compatible configuration.
Clearing the Error Code	This detected error is cleared as soon as its cause has been removed.

[Fdbus Com Interrupt] CnF

Fieldbus module communication interruption error

Probable Cause	Communication interruption on communication module.
Remedy	• Check the environment (electromagnetic compatibility). • Check the wiring. • Check the time-out. • Replace the option module. • Contact Schneider Electric Product Support.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[Precharge Capacitor] CrF 1

Precharge capacitor error

Probable Cause	Charging relay control detected error or charging resistor damaged.
Remedy	• Turn the drive off and then turn on again. • Check the internal connections. • Contact Schneider Electric Product Support.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Ch Switch Error] C S F

Channel switching detected error

Probable Cause	Switch to not valid channels.
Remedy	Check the function parameters.
Clearing the Error Code	This detected error is cleared as soon as its cause has been removed.

[Damper Closed Error] d u C F

Damper control error

Probable Cause	Damper should be opened but is blocked in closed position.
Remedy	• Check if the relay is correctly connected to the damper or if the damper is obstructed. • Verify the feedback signal coming from the damper.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFr SF parameter after its cause has been removed.

[EEprom Control] E E F 1

EEprom control error

Probable Cause	Internal memory detected error, control block.
Remedy	• Check the environment (electromagnetic compatibility). • Turn off, reset, return to factory settings • Contact Schneider Electric Product Support.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[EEprom Power] E E F 2

EEprom power error

Probable Cause	Internal memory detected error, power board.
Remedy	• Check the environment (electromagnetic compatibility). • Turn off, reset, return to factory settings • Contact Schneider Electric Product Support.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[External Error] EPF1

External error

Probable Cause	Event triggered by an external device, depending on user.
Remedy	Check the device which caused the triggering and reset.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRFLr or manually with the **[Fault Reset Assign]** RSFr5F parameter after its cause has been removed.

[Fdbus External Error] EPF2

Fieldbus external detected error

Probable Cause	Event triggered by a communication network.
Remedy	Check for the cause of the triggering and reset.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRFLr or manually with the **[Fault Reset Assign]** RSFr5F parameter after its cause has been removed.

[Fct Block Error] FbE

Function block error

Probable Cause	Function block detected error.
Remedy	See **[FB Error]** FbFt for more details.
Clearing the Error Code	This detected error is cleared as soon as its cause has been removed.

[Fct Block StopError] FbE5

Function block stop error

Probable Cause	Function blocks have been stopped while motor was running.
Remedy	Check **[FB Motor Stop Type]** Fb5M configuration.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRFLr or manually with the **[Fault Reset Assign]** RSFr5F parameter after its cause has been removed.

[Boards Compatibility] HCF

Boards compatibility error

Probable Cause	The **[Boards pairing]** PPI - function has been configured and a drive card has been changed.
Remedy	• In the event of a card error, reinsert the original card. • Confirm the configuration by entering the **[Pairing password]** PPI if the card was changed deliberately.
Clearing the Error Code	This detected error is cleared as soon as its cause has been removed.

[IGBT Desaturation] HdF

IGBT desaturation error

Probable Cause	Short-circuit or grounding at the drive.
Remedy	Check the cables connecting the drive to the motor, and the motor insulation.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Link Error] ILF

Internal link error

Probable Cause	Communication interruption between option module and drive.
Remedy	• Check the environment (electromagnetic compatibility). • Check the connections. • Replace the option module. • Contact Schneider Electric Product Support.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Error 1] InF1

Internal error 1 (Rating)

Probable Cause	The power board is different from the board stored.
Remedy	Check the reference of the power board.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Error 2] inF2

Internal error 2 (Soft)

Probable Cause	The power board is incompatible with the control block.
Remedy	Check the reference of the power board and its compatibility.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Error 3] inF3

Internal error 3 (Intern Comm)

Probable Cause	Communication interruption between the internal cards.
Remedy	• Check the internal connections. • Contact Schneider Electric Product Support.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Error 4] inF4

Internal error 4 (Manufacturing)

Probable Cause	Internal data inconsistent.
Remedy	Re-calibrate the drive (performed by Schneider Electric Product Support).
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Error 6] inF6

Internal error 6 (Option)

Probable Cause	The option installed in the drive is not recognized.
Remedy	• Check the reference and compatibility of the option. • Check that the option is well inserted into the ATH230.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Error 9] ıոF9

Internal error 9 (Measure)

 Probable Cause	The current measurements are incorrect.
 Remedy	• • Replace the current sensors or the power board. • • Contact Schneider Electric Product Support.
 Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Error 10] ıոFA

Internal error 10 (Mains)

 Probable Cause	The input stage is not operating correctly.
 Remedy	Contact Schneider Electric Product Support.
 Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Error 11] ıոFb

Internal error 11 (Temperature)

 Probable Cause	The drive temperature sensor is not operating correctly.
 Remedy	• Replace the drive temperature sensor. • Contact Schneider Electric Product Support.
 Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Internal Error 14] ıոFE

Internal error 14 (CPU) error

 Probable Cause	Internal microprocessor detected error.
 Remedy	• Turn off and reset. • Contact Schneider Electric Product Support.
 Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Input Contactor] LCF

Input contactor error

 Probable Cause	The drive is not turned on even though **[Mains V. time out]** LCt has elapsed.
 Remedy	• Check the contactor and its wiring. • Check the time-out. • Check the supply mains /contactor /drive connection.
 Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[AI3 4-20mA loss] LFF3

AI3 4-20mA loss error

 Probable Cause	Loss of the 4-20 mA reference on analog input AI3.
 Remedy	Check the connection on the analog inputs.
 Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[DC Bus Overvoltage] obF

DC bus overvoltage error

 Probable Cause	• Braking too sudden or driving load. • Supply voltage too high.
 Remedy	• Increase the deceleration time. • Install a braking resistor if necessary. • Activate the **[Dec.Ramp Adapt]** brA function, if it is compatible with the application. • Check the supply voltage.
 Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[Overcurrent] oCF

Overcurrent error

Probable Cause	• Parameters in the **[Settings]** SEt- and **[Motor control]** drC- menus are not correct. • Inertia or load too high. • Mechanical locking.
Remedy	• Check the parameters. • Check the size of the motor/drive/load. • Check the state of the mechanism. • Decrease **[Current Limitation]** CLI. • Increase the switching frequency.
Clearing the Error Code	● If the parameter **[Extended Fault Reset]** HRFC HrFC is set to **[No]** NOno : This detected error requires a power reset. ● If the parameter **[Extended Fault Reset]** HRFC HrFC is set to **[Yes]** YES YES : This detected error can be cleared manually with the **[Fault Reset Assign]** RSFr SF parameter after its cause has been removed.

[Drive Overheating] oHF

Drive overheating error

Probable Cause	Drive temperature too high.
Remedy	Check the motor load, the drive ventilation and the ambient temperature. Wait for the drive to cool down before restarting.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATR AtR or manually with the **[Fault Reset Assign]** RSFr SF parameter after its cause has been removed.

[Process Overload] oLC

Process overload error

Probable Cause	Process overload.
Remedy	• Check and remove the cause of the overload. • Check the parameters of the **[Process overload]** oLd- function.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATR AtR or manually with the **[Fault Reset Assign]** RSFr SF parameter after its cause has been removed.

[Motor Overload] oLF

Motor overload error

Probable Cause	Triggered by excessive motor current.
Remedy	Check the setting of the motor thermal monitoring, check the motor load. Wait for the motor to cool down before restarting.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATR AtR or manually with the **[Fault Reset Assign]** RSFr SF parameter after its cause has been removed.

[Single Output Phase Loss] oPF 1

Single output phase loss error

Probable Cause	Loss of one phase at drive output.
Remedy	Check the connections from the drive to the motor.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFr SF parameter after its cause has been removed.

[Output Phase Loss] oPF 2

Output phase loss error

Probable Cause	• Motor not connected or motor power too low. • Output contactor open. • Instantaneous instability in the motor current.
Remedy	• Check the connections from the drive to the motor. • If an output contactor is being used, set **[Output phase loss]** oPL to **[No Error]** oAC. • • Test on a low power motor or without a motor: In factory settings mode, motor phase loss detection is active **[Output phase loss]** oPL = **[Yes]** YES. To check the drive in a test or maintenance environment, without having to use a motor with the same rating as the drive (in particular for high power drives), deactivate motor phase loss detection **[Output phase loss]** oPL = **[No]** nO. • Check and optimize the following parameters: **[IR compensation]** UFr , page 98, **[Nom Motor Voltage]** UnS and **[Nom Motor Current]** nCr , page 92 and perform **[Autotuning]** tUn , page 93.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFr SF parameter after its cause has been removed.

[Supply Mains OverV] oSF

Supply mains overvoltage error

Probable Cause	• Supply voltage too high. • Disturbed mains supply.
Remedy	Check the supply voltage.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFr SF parameter after its cause has been removed.

[DI6=PTC Overheat] oHFL

DI6=PTC overheat error

Probable Cause	Overheating of PTC probes detected on input DI6.
Remedy	• Check the motor load and motor size. • Check the motor ventilation. • Wait for the motor to cool before restarting. • Check the type and state of the PTC probes.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRHr or manually with the **[Fault Reset Assign]** RSFr5F parameter after its cause has been removed.

[Input Phase Loss] PHF

Input phase loss error

Probable Cause	• Drive incorrectly supplied or a fuse blown. • One phase missing. • 3-phase ATH230 used on a single-phase supply mains. • Unbalanced load. This monitoring only operates with the drive on load.
Remedy	Check the power connection and the fuses. Use a 3-phase supply mains. Disable the detected error by **[InPhaseLoss Assign]** iPL , page 91 = **[No]** nO.
Clearing the Error Code	This detected error is cleared as soon as its cause has been removed.

[DI6=PTC Probe Error] PtFL

DI6=PTC probe error

Probable Cause	PTC probe on input DI6 open or short-circuited.
Remedy	Check the PTC probe and the wiring between it and the motor/drive.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRHr or manually with the **[Fault Reset Assign]** RSFr5F parameter after its cause has been removed.

[Safety fct error] SAFF

Safety function detected error

Probable Cause	• Debounce time exceeded. • Incorrect configuration.
Remedy	• Check the safety functions configuration. • Check the ATH230 Integrated safety Functions manual. • Contact Schneider Electric Product Support.
Clearing the Error Code	This detected error requires a power reset of the device after its cause has been removed.

[Motor short circuit] SCF 1

Motor short circuit error

Probable Cause	Short-circuit or grounding at the drive output.
Remedy	• Check the cables connecting the drive to the motor, and the motor insulation. • Reduce the switching frequency. • Connect chokes in series with the motor. • Increase the **[Time to restart]** tbr . • Increase the switching frequency.
Clearing the Error Code	● If the parameter **[Extended Fault Reset]** HRFCHrFC is set to **[No]** NOno : This detected error requires a power reset. ● If the parameter **[Extended Fault Reset]** HRFCHrFC is set to **[Yes]** YESYES : This detected error can be cleared manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[Ground Short Circuit] SCF 3

Ground short circuit error

Probable Cause	Significant earth leakage current at the drive output if several motors are connected in parallel.
Remedy	• Check the cables connecting the drive to the motor, and the motor insulation. • Reduce the switching frequency. • Connect chokes in series with the motor. • Increase the **[Time to restart]** tbr . • Reduce the switching frequency.
Clearing the Error Code	● If the parameter **[Extended Fault Reset]** HRFCHrFC is set to **[No]** NOno : This detected error requires a power reset. ● If the parameter **[Extended Fault Reset]** HRFCHrFC is set to **[Yes]** YESYES : This detected error can be cleared manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[IGBT Short Circuit] SCF4

IGBT short circuit error

Probable Cause	Power component detected error.
Remedy	Contact Schneider Electric Product Support.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[Motor Short Circuit] SCF5

Motor short circuit error

Probable Cause	Short-circuit at drive output.
Remedy	• Check the cables connecting the drive to the motor, and the motor insulation. • Contact Schneider Electric Product Support.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[Modb Com Interrupt] SLF1

Modbus communication interruption error

Probable Cause	Communication interruption on the Modbus or BACnet bus.
Remedy	• Verify the communication settings on the devices (Drive, PLC, switches, repeater...). • Check for duplicate communication addresses. • Verify the environment (electromagnetic compatibility). • Verify the fieldbus wiring (continuity, cable type, grounding, and shielding). • Verify the terminating resistor. • Verify that the value set on meets the requirements of your application. • Refer to the Modbus or BACnet manual.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[PC com Interruption] SLF2

PC communication interruption error

Probable Cause	Communication interruption with PC Software.
Remedy	• Check the PC Software connecting cable. • Check the time-out.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[HMI com Interruption] SLF3

HMI communication interruption error

Probable Cause	Communication interruption with the graphic display terminal or remote display terminal.
Remedy	• Check the terminal connection. • Check the time-out.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[Motor Overspeed] SoF

Motor overspeed error

Probable Cause	• Instability or driving load too high. • If a downstream contactor is used, the contacts between the motor and the drive have not been closed before applying a Run command. • The overspeed threshold (corresponding to 110 % of **[Max Frequency]** tFr) has been reached.
Remedy	• • Check the motor, gain and stability parameters. • • Add a braking resistor. • • Check the size of the motor/drive/load. • • Check the parameters settings for the **[Frequency meter]** F9F- function, if it is configured. • • Verify and close the contacts between the motor and the drive before applying a Run command. • • Verify the consistency between **[Max Frequency]** tFr and **[High Speed]** HSP. It is recommended to have at least **[Max Frequency]** tFr ≥ 110% * **[High Speed]** HSP.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[Torque Limit Error] SSF

Torque limitation error

Probable Cause	Switch to torque or current limitation.
Remedy	• Check if there are any mechanical problems. • Check the parameters of **[Torque limitation]** toL- and the parameters of the **[Torque or I limit detect]** tid-.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFrSF parameter after its cause has been removed.

[IGBT Overheating] ɛFJ

IGBT overheating

Probable Cause	Drive overheated.
Remedy	• Check the size of the load/motor/drive. • Reduce the switching frequency. • Wait for the motor to cool before restarting.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFr5F parameter after its cause has been removed.

[Autotuning Error] ɛnF

Autotuning detected error

Probable Cause	• Special motor or motor whose power is not suitable for the drive. • Motor not connected to the drive. • Motor not stopped
Remedy	• Check that the motor/drive are compatible. • Check that the motor is present during auto-tuning. • If an output contactor is being used, close it during auto-tuning. • Check that the motor is stopped during tune operation.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFr5F parameter after its cause has been removed.

[Process Underload] uLF

Process underload error

Probable Cause	Process underload.
Remedy	Check and remove the cause of the underload. Check the parameters of the **[Process underload]** uLd- function.
Clearing the Error Code	This detected error can be cleared with the **[Auto Fault Reset]** ATRAtr or manually with the **[Fault Reset Assign]** RSFr5F parameter after its cause has been removed.

[Supply Mains UnderV] u5F

Supply mains undervoltage error

Probable Cause	• Supply mains too low. • Transient voltage dip.
Remedy	Check the voltage and the parameters of **[UnderV handling]** u5b- .
Clearing the Error Code	This detected error is cleared as soon as its cause has been removed.

Error detection codes Displayed on the Remote Display Terminal

HMI label	Name	Description
InIt	**[Initialization in progress]**	The microcontroller is initializing. Search underway for communication configuration.
COM.E (1)	**[Communication error]**	Time out detected error (50 ms). This message is displayed after 20 attempts at communication.
A-17 (1)	**Alarm button]**	A key has been held down for more than 10 seconds. The keypad is disconnected. The keypad wakes up when a key is pressed.
CLr (1)	**Confirmation of detected error faukreset]**	This is displayed when the STOP key is pressed once if the active command channel is the remote display terminal.
dEU.E (1)	**[Drive disparity]**	The drive brand does not match that of the remote display terminal.
rOM.E (1)	**[ROM anomaly]**	The remote display terminal detects a ROM anomaly on the basis of checksum calculation.
rAM.E (1)	**[RAM anomaly]**	The remote display terminal detects a RAM anomaly.
CPU.E (1)	**Other detected errors]**	Other detected errors.
(1) - Flashing		

Option Module Changed or Removed

When an option module is removed or replaced by another, the drive locks in detected **[Incorrect Config]** CFF error mode at power-on. If the module has been deliberately changed or removed, the detected error can be cleared by pressing the **ENT** key twice, which causes the factory settings 1.3.2 **[Factory settings]** FCS-, page 84 to be restored for the parameter groups affected by the module. This can be done using a module replaced by a module of the same type.

Example: Communication modules: only the parameters that are specific to communication modules.

Control Block Changed

When a control block is replaced by a control block configured on a drive with a different rating, the drive locks in detected **[Incorrect Config]** CFF error mode at power-on. If the control block has been deliberately changed, the detected error can be cleared by pressing the **ENT** key twice, which causes all the factory settings to be restored.

Maintenance

Limitation of Warranty

The warranty does not apply if the product has been opened, except by Schneider Electric services.

Servicing

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Read and understand the instructions in **Safety Information** chapter before performing any procedure in this chapter.

Failure to follow these instructions will result in death or serious injury.

The temperature of the products described in this manual may exceed 80 °C (176 °F) during operation.

⚠WARNING

HOT SURFACES

- Ensure that any contact with hot surfaces is avoided.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity of hot surfaces.
- Verify that the product has sufficiently cooled down before handling it.
- Verify that the heat dissipation is sufficient by performing a test run under maximum load conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠WARNING

INSUFFICIENT MAINTENANCE

Verify that the maintenance activities described below are performed at the specified intervals.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Adherence to the environmental conditions must be ensured during operation of the drive. In addition, during maintenance, verify and, if appropriate, correct all factors that may have an impact on the environmental conditions.

Optimizing the continuity of operation

Environment	Part concerned	Action	Interval (1)
Knock on the product	Housing - control block (LED - display)	Perform a visual inspection	At least every year
Corrosion	Terminals - connector - screws - EMC plate	Inspect and clean if required	
Dust	Terminals - fans - blowholes		

Environment	Part concerned	Action	Interval (1)
Temperature	Around the product	Check and correct if required	
Cooling	Fan	Check the fan operation	
		Replace the fan	After 3 to 5 years, depending on the operating conditions
Vibration	Terminal connections	Check tightening at recommended torque	At least every year
(1) – Maximum maintenance intervals from the date of commissioning. Reduce the intervals between maintenance to adapt maintenance to the environmental conditions, the operating conditions of the drive, and to any other factor that may influence the operation and/ or maintenance requirements of the drive.			

NOTE: The fan operation depends on the drive thermal state. The drive may be running and the fan does not.

Spares and Repairs

Serviceable product. Please contact your Customer Care Center on:

www.se.com/CCC.

Long Time Storage

If the drive was not connected to mains for an extended period of time, the capacitors must be restored to their full performance before the motor is started.

Refer Initial steps, page 38 for more details.

Fan Replacement

It is possible to order a new fan for the drive maintenance, see the catalog numbers on www.se.com.

Fans may continue to run for a certain period of time even after power to the product has been disconnected.

⚠CAUTION

RUNNING FANS

Verify that fans have come to a complete standstill before handling them.

Failure to follow these instructions can result in injury or equipment damage.

Annex

What's in This Part

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Index of Parameter Codes 383

Index of Functions

The following table represents the parameter codes:

Function	Page
[2-Wire Control] 2 C	**[2/3-Wire Control]** t C C , page 90
[2nd current limit.]	**[2nd current limit.]** C L 1-
[3-Wire Control] 3 C	**[2/3-Wire Control]** t C C , page 90
[+/- speed]	**[+/- speed]** u P d-
[+/- speed around ref]	**[+/- speed around ref]** S r E-
[Auto DC injection]	**[Auto DC injection]** A d C-
[Automatic restart]	**[Auto Fault Reset]** A t r-
[Autotuning]	**[Autotuning]** t u n , page 93
[Autotuning by DI]	**[Autotuning by DI]** t n L-
[DC bus]	**[DC bus]** d C C-
[Catch on the fly]	**[Catch on the fly]** F L r-
Command and reference channels	Command and reference channels
Deferred stop on thermal alarm	Deferred stop on thermal alarm
[Drive overheat]	**[Drive overheat]** o H L-
[Factory settings]	**[Factory settings]** F C S- 1.3.2 **[Factory settings]** F C S-, page 84
[Fault reset]	**[Fault reset]** r S t-
[Fluxing by DI]	**[Fluxing by DI]** F L 1-
[Current Limit Dyn]	**[Current Limit Dyn]** I 2 t-
[Jog]	**[Jog]** J o G-
Motor or configuration switching **[Multimotors config]** M M C-	Motor or configuration switching **[Multimotors config]** M M C-
Motor thermal monitoring	Motor thermal monitoring
[Noise Reduction]	**[Noise Reduction]** n r d
[Overload ErrorResp]	**[Overload ErrorResp]** o d L
[Parameters switching]	**[Parameters switching]** M L P-
5 **[Password]**	**[Password]** COD- **[Password]** COD-, page 356
[PID controller]	**[PID controller]** P I d-
Preset speeds	Preset speeds
PTC probe	PTC probe
[Ramp switching]	**[Ramp switching]** r P t-
[Ref Freq switch]	**[Ref Freq switch]** r E F-
[RP assignment]	**[RP assignment]** P I A
Reference memorizing	Reference memorizing
[Stop configuration]	**[Stop configuration]** S t t-
Stop at distance calculated after deceleration limit switch	Stop at distance calculated after deceleration limit switch
Summing input / Subtracting input / Multiplier	Summing input / Subtracting input / Multiplier
Synchronous motor parameters	Synchronous motor parameters
Torque limitation	Torque limitation

Function	Page
[Underload ErrorResp]	**[Underload ErrorResp]** ␣ d L
Use of the "Pulse input" input to measure the speed of rotation of the motor	Use of the "Pulse input" input to measure the speed of rotation of the motor

Index of Parameter Codes

The following table represents the parameter codes:

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] MOn-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] COM-	3 [Interface] ItF-
AC2						Yes					Yes Yes Yes			
ACC					Yes, page 93	Yes					Yes			
AdC											Yes			
Ad- Co													Yes	
Add													Yes	
A- I1A		Yes, page 47						Yes						
A- I1C		Yes, page 47												
A- I1E								Yes						
A- I1F		Yes, page 48						Yes						
A- I1S								Yes						
A- I1t								Yes						
A- I2A			Yes, page 48					Yes						
A- I2C			Yes, page 48											
A- I2E								Yes						
A- I2F			Yes, page 49					Yes						
A- I2S								Yes						
A- I2t								Yes						
A- I3A		Yes, page 49						Yes						
A- I3C		Yes, page 49												

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
A-I3E								Yes						
A-I3F		Yes, page 49						Yes						
A-I3L								Yes						
A-I3S								Yes						
A-I3t								Yes						
AI-C2								Yes			Yes			
AI-VI	Yes, page 42	Yes, page 45												
ALGr		Yes, page 61												
AMOC													Yes	
AOI		Yes, page 50						Yes						
AOIC		Yes, page 50												
AOIF		Yes, page 50						Yes						
AOIt								Yes						
AOFI								Yes						
AOHI		Yes, page 50						Yes						
AOLI		Yes, page 50						Yes						
APH		Yes, page 60												
ASHI		Yes, page 50						Yes						
ASLI		Yes, page 50						Yes						
AStt							Yes				Yes			
Atr												Yes		
Aut							Yes Yes							

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] MOn-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
AV1A								Yes						
AV2A								Yes						
bCI											Yes			
bdCo													Yes	
bEd											Yes			
bEn						Yes					Yes			
bEt						Yes					Yes			
bFr					Yes, page 91		Yes							
biP											Yes			
bIr						Yes					Yes			
bMP									Yes, page 178					
bmS		Yes, page 53								Yes				
bmV		Yes, page 53								Yes				
boA							Yes							
boo							Yes							
brA											Yes			
brHO											Yes			
brHI											Yes			
brH2											Yes			
brr											Yes			
brt						Yes					Yes			
bSP								Yes						
bSt											Yes			
bV-Er		Yes, page 53								Yes				
CC-FG					Yes, page 91									
CCS									Yes, page 175					
Cdl									Yes, page 175					

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
Cd2									Yes, page 176					
CFG				Yes, page 87	Yes, page 91									
CF-PS		Yes, page 61												
CH-AI											Yes			
CH-A2											Yes			
CH-CF									Yes, page 175					
CHM											Yes			
CL2						Yes					Yes			
CLI						Yes	Yes				Yes			
CLL												Yes		
CLo											Yes			
CLS											Yes			
CM-dC		Yes, page 54												
Cn-FI											Yes			
Cn-F2											Yes			
Cn-FS		Yes, page 60												
Cod		Yes, page 79												
Co-d2		Yes, page 79												
CoL												Yes		
CoP									Yes, page 177					
Cor											Yes			
CoS							Yes							
CPI											Yes			
CP2											Yes			
Cr-H3		Yes, page 49						Yes						

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S1A-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbA-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
Cr-L3		Yes, page 49						Yes						
Cr-St														Yes, page 351
Cr-tF							Yes							
CS-by														Yes, page 351
CSt		Yes, page 79												Yes, page 356
Ctd						Yes						Yes		
Ctt							Yes							
CtV		Yes, page 54								Yes				
dA2											Yes			
dA3											Yes			
dAF											Yes			
dAL											Yes			
dA-nF								Yes				Yes		
dAr											Yes			
dAS											Yes			
dbS											Yes			
dC-CC											Yes			
dC-CM											Yes			
dC-CI		Yes, page 66												
dCF						Yes					Yes	Yes		
dC1											Yes			
dE2						Yes					Yes Yes			
dEC					Yes, page 94	Yes					Yes			
dLb												Yes		
dLr		Yes, page 80												Yes, page 357
do1								Yes						
d-old								Yes						

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S IM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
d-oIH								Yes						
d-oIS								Yes						
dPI		Yes, page 64												
dP2		Yes, page 67												
dP3		Yes, page 67												
dP4		Yes, page 67												
dP5		Yes, page 67												
dP6		Yes, page 67												
dP7		Yes, page 67												
dP8		Yes, page 68												
dr-CI		Yes, page 66												
dSF											Yes			
dSI											Yes			
dSP											Yes			
dtF											Yes			
Ebo											Yes			
EPL												Yes		
Enu								Yes						
EnS								Yes						
Er-Co													Yes	
EtF												Yes		
FI							Yes							
F2							Yes							
F2d							Yes							
F3							Yes							
F4							Yes							
F5							Yes							

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S im-	[Settings] SEt-	[Motor control] drC-	[Input/Output] io-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] itF-
FAb							Yes							
FA-d1														Yes, page 343
FA-d2														Yes, page 344
FA-d3														Yes, page 344
FA-d4														Yes, page 345
FA-nF								Yes				Yes		
Fb-Cd										Yes				
Fb-dF										Yes				
Fb-Ft		Yes, page 53								Yes, page 180				
Fb-rM										Yes				
Fb-SM										Yes				
Fb-St		Yes, page 53								Yes, page 180				
FC-Si			Yes, page 84											
Fdt												Yes		
FFH							Yes							
FFM						Yes								
FFt						Yes					Yes			
FLi											Yes			
FLo													Yes	
FL-oC													Yes	
FL-ot													Yes	
FLr												Yes		
FLu						Yes	Yes				Yes			
Fn1									Yes, page 178					
Fn2									Yes, page 178					

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
Fn3									Yes, page 178					
Fn4									Yes, page 178					
FPI											Yes			
F9A												Yes		
F9C												Yes		
F9F												Yes		
F9L						Yes						Yes		
F9S		Yes, page 45												
F9t												Yes		
Fr1									Yes, page 174					
F-r1b											Yes			
Fr2									Yes, page 176					
FrH	Yes, page 42	Yes, page 45 Yes, page 55												
Fri							Yes							
FrS					Yes, page 92		Yes							
Fr-SS							Yes							
Frt											Yes			
FrY			Yes, page 84											
FSt											Yes			
Ftd						Yes						Yes		
Fto						Yes						Yes		
Ftu						Yes						Yes		
GFS			Yes, page 84											
GSP														Yes, page 348

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S1n-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
HF1							Yes							
H1r							Yes							
Hr-FC												Yes		
HSP					Yes, page 94	Yes					Yes			
HS-P2						Yes					Yes			
HS-P3						Yes					Yes			
HS-P4						Yes					Yes			
I2-tA											Yes			
I2-tM		Yes, page 46												
I2-t1											Yes			
I2-tt											Yes			
I-AO1										Yes				
I-AO2										Yes				
I-AO3										Yes				
I-AO4										Yes				
I-AO5										Yes				
I-AO6										Yes				
I-AO7										Yes				
I-AO8										Yes				
I-AO9										Yes				
I-AI0										Yes				
IA-d1														Yes, page 343
IA-d2														Yes, page 344
IA-d3														Yes, page 344

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
IA-d4														Yes, page 344
Ibr						Yes					Yes			
Ib-rA											Yes			
IdA							Yes							
IdC						Yes					Yes	Yes		
Id-C2						Yes					Yes	Yes		
I-L01										Yes				
I-L02										Yes				
I-L03										Yes				
I-L04										Yes				
I-L05										Yes				
I-L06										Yes				
I-L07										Yes				
I-L08										Yes				
I-L09										Yes				
I-L10										Yes				
ILr							Yes							
InH												Yes		
Inr						Yes					Yes			
In-tP											Yes			
IPL					Yes, page 91						Yes	Yes		
ItH					Yes, page 93	Yes								
JdC						Yes					Yes			
JF2						Yes					Yes			
JF3						Yes					Yes			
JFH						Yes					Yes			
JGF						Yes					Yes			
JGt						Yes					Yes			
JoG											Yes			

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S1n-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
JPF						Yes					Yes			
L1A		Yes, page 46						Yes						
L1d								Yes						
L2A		Yes, page 47						Yes						
L2d								Yes						
L3A		Yes, page 47						Yes						
L3d								Yes						
L4A		Yes, page 47						Yes						
L4d								Yes						
L5A		Yes, page 47						Yes						
L5d								Yes						
L6A		Yes, page 47						Yes						
L6d								Yes						
LA01										Yes				
LA02										Yes				
LA03										Yes				
LA04										Yes				
LA05										Yes				
LA06										Yes				
LA07										Yes				
LA08										Yes				
L-A1A		Yes, page 47						Yes						
L-A1d								Yes						
L-A2A		Yes, page 47						Yes						
L-A2d								Yes						
LA-nF								Yes				Yes		
LAC														Yes, page 336

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
LbC						Yes	Yes							
Lb-C1							Yes							
Lb-C2							Yes							
Lb-C3							Yes							
LbF							Yes							
LC2											Yes			
LCr		Yes, page 46												
LCt											Yes			
LdS							Yes							
LES											Yes			
LEt												Yes		
LFA							Yes							
LFF												Yes		
LF-L3												Yes		
LFr	Yes, page 42	Yes, page 45												
LF-r1		Yes, page 59												
LF-r2		Yes												
LF-r3		Yes, page 59												
LIS1		Yes, page 47												
LIS2														
LnG														Yes, page 339
Lol									Yes					
L-old									Yes					
L-olF									Yes					
L-olH									Yes					
L-olS									Yes					
LoC						Yes						Yes		

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S im-	[Settings] SEt-	[Motor control] drC-	[Input/Output] io-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] itF-
LP1											Yes			
LP2											Yes			
L95							Yes							
LSP					Yes, page 94	Yes								
LuL						Yes						Yes		
Lun						Yes						Yes		
M0-01										Yes				
M0-02										Yes				
M0-03										Yes				
M0-04										Yes				
M0-05										Yes				
M0-06										Yes				
M0-07										Yes				
M0-08										Yes				
MI-Ct		Yes, page 58												
MI-EC		Yes, page 58												
MS-Lo											Yes			
MS-tP											Yes			
MA2											Yes			
MA3											Yes			
MCr							Yes							
Mdt														Yes, page 342
MFr	Yes, page 42	Yes, page 45				Yes								
MMF		Yes, page 45												
MPC							Yes							
MtM												Yes		
nb-rP		Yes												

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S IM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
nb-tP		Yes												
nC1		Yes, page 58												
nC2		Yes, page 58												
nC3		Yes, page 59												
nC4		Yes, page 59												
nC5		Yes, page 59												
nC6		Yes, page 59												
nC7		Yes, page 59												
nC8		Yes, page 59												
nC-A1													Yes	
nC-A2													Yes	
nC-A3													Yes	
nC-A4													Yes	
nC-A5													Yes	
nC-A6													Yes	
nC-A7													Yes	
nC-A8													Yes	
nCr					Yes, page 92		Yes							
nC-r5							Yes							
nL5											Yes			
nM1		Yes, page 58												
nM2		Yes, page 58												

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] MOn-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S IM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
nM3		Yes, page 58												
nM4		Yes, page 58												
nM5		Yes, page 58												
nM6		Yes, page 58												
nM7		Yes, page 58												
nM8		Yes, page 58												
nM-A1													Yes	
nM-A2													Yes	
nM-A3													Yes	
nM-A4													Yes	
nM-A5													Yes	
nM-A6													Yes	
nM-A7													Yes	
nM-A8													Yes	
nM-tS		Yes												
nPr					Yes, page 92		Yes							
nrd							Yes							
nSP					Yes, page 92		Yes							
nS-PS							Yes							
nSt											Yes			
nt-Id													Yes	
ntJ		Yes, page 78												
odL												Yes		

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
odt												Yes		
oHL												Yes		
oLL												Yes		
oPL												Yes		
oPr		Yes, page 46												
oSP											Yes			
otr		Yes, page 46												
PAH						Yes					Yes			
PAL						Yes					Yes			
PAS											Yes			
PAu											Yes			
PCd														Yes, page 350
PEr						Yes					Yes			
PES											Yes			
PFI		Yes, page 51						Yes						
PFr		Yes, page 51						Yes						
PGI								Yes						
PHS							Yes							
PIA		Yes, page 51						Yes						
PIC											Yes			
PIF											Yes			
PI-FI											Yes			
PI-F2											Yes			
PII											Yes			
PIL		Yes, page 51						Yes						
PIM											Yes			
PI-PI											Yes			
PI-P2											Yes			
PIS											Yes			

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
PoH						Yes					Yes			
PoL						Yes					Yes			
PPI												Yes		
PP-nS							Yes							
Pr2											Yes			
Pr4											Yes			
Pr-St											Yes			
PrP						Yes					Yes			
P-S16											Yes			
PS2											Yes			
PS4											Yes			
PS8											Yes			
PSr						Yes					Yes			
PSt									Yes, page 174					
Pt-CL												Yes		
PtH		Yes, page 60												
PV-IS														Yes, page 350
9SH						Yes					Yes			
9SL						Yes					Yes			
r1								Yes						
r1d								Yes						
r1F								Yes						
r2F								Yes						
r1H								Yes						
r1S								Yes						
r2								Yes						
r2d								Yes						
r2H								Yes						
r2S								Yes						
rCA											Yes			
rCb											Yes			
rd-AE							Yes							
rdG						Yes					Yes			

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] MON-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SET-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] FUN-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
rE-CI		Yes												
rFC									Yes, page 176					
rF-CC		Yes, page 55												
rF-Lt		Yes, page 78												
rFr		Yes, page 45												
rIG						Yes					Yes			
rIn									Yes, page 174					
rM-Ud						Yes						Yes		
rP												Yes		
r-P11		Yes												
r-P12		Yes												
r-P13		Yes												
r-P14		Yes												
rP2						Yes					Yes			
r-P21		Yes												
r-P22		Yes												
r-P23		Yes												
r-P24		Yes												
rP3						Yes					Yes			
r-P31		Yes												
r-P32		Yes												
r-P33		Yes												
r-P34		Yes												
rP4						Yes					Yes			
rPA												Yes		

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SET-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
rPC	Yes, page 42	Yes, page 60												
rPE		Yes, page 60												
rPF		Yes, page 60												
rPG						Yes					Yes			
rPI	Yes, page 42	Yes, page 60									Yes			
rPo		Yes, page 60												
rPr		Yes, page 60												
rPS											Yes			
rPt											Yes			
rrS								Yes, page 137						
rSA							Yes							
rS-AS							Yes							
rSF												Yes		
rSL											Yes			
rS-tL											Yes			
rtH		Yes, page 60												
rtr											Yes			
run								Yes, page 136						
SI-01											Yes			
SI-02											Yes			
SI-03											Yes			
SI-04											Yes			
SI-05											Yes			
SI-06											Yes			
SI-07											Yes			

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] MOn-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
SI-08											Yes			
SI-09											Yes			
SI-10											Yes			
SI-11											Yes			
SI-12											Yes			
SI-13											Yes			
SI-14											Yes			
SI-15											Yes			
S2-01											Yes			
S2-02											Yes			
S2-03											Yes			
S2-04											Yes			
S2-05											Yes			
S2-06											Yes			
S2-07											Yes			
S2-08											Yes			
S2-09											Yes			
S2-11											Yes			
S2-12											Yes			
S2-13											Yes			
S2-14											Yes			
S2-15											Yes			
S3-01											Yes			
S3-02											Yes			
S3-03											Yes			

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S1n-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbN-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoN-	3 [Interface] ItF-
S304											Yes			
S305											Yes			
S306											Yes			
S307											Yes			
S308											Yes			
S309											Yes			
S310											Yes			
S311											Yes			
S312											Yes			
S313											Yes			
S314											Yes			
S315											Yes			
SA2											Yes			
SA3											Yes			
SA-F1		Yes, page 71												
SA-F2		Yes, page 71												
SAL											Yes			
SAr											Yes			
SAt												Yes		
SCL											Yes			
SC-L3											Yes			
SC-S1			Yes, page 85											
Sd-C1						Yes					Yes Yes			
Sd-C2						Yes					Yes			
Sdd												Yes		
Sd-1F		Yes, page 45												

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SET-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
SdS						Yes								
S-F00		Yes, page 72												
S-F01		Yes, page 72												
S-F02		Yes, page 73												
S-F03		Yes, page 73												
S-F04		Yes, page 74												
S-F05		Yes, page 74												
S-F06		Yes, page 75												
S-F07		Yes, page 75												
S-F08		Yes, page 76												
S-F09		Yes, page 76												
S-F10		Yes, page 77												
S-F11		Yes, page 77												
SFC						Yes	Yes							
SFd											Yes			
SF-FE		Yes, page 52												
SFr						Yes	Yes							
SFt							Yes							
SH2											Yes			
SH4											Yes			
Sir							Yes							
SIt						Yes	Yes							
SLL												Yes		
SLP						Yes	Yes							

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] MOn-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
SL-SS		Yes												
SM-ot							Yes							
SnC											Yes			
SoP							Yes							
S-P10						Yes					Yes			
S-P11						Yes					Yes			
S-P12						Yes					Yes			
S-P13						Yes					Yes			
S-P14						Yes					Yes			
S-P15						Yes					Yes			
S-P16						Yes					Yes			
SP2						Yes					Yes			
SP3						Yes					Yes			
SP4						Yes					Yes			
SP5						Yes					Yes			
SP6						Yes					Yes			
SP7						Yes					Yes			
SP8						Yes					Yes			
SP9						Yes					Yes			
SPb							Yes							
SP-d1		Yes, page 61												
SP-d2		Yes, page 61												
SP-d3		Yes, page 61												
SPG						Yes	Yes							
SP-Gu						Yes	Yes							
SPM											Yes			
S-r11		Yes, page 66												
S-r12 to		Yes, page 67												

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S IM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
S-r18														
S-r21		Yes, page 66												
S-r22 to S-r28		Yes, page 67												
Sr-A1		Yes, page 66												
Sr-A2 to Sr-A8		Yes, page 67												
Sr-b1		Yes, page 66												
Sr-b2 to Sr-b8		Yes, page 67												
Sr-C1		Yes, page 66												
Sr-C2 to Sr-C8		Yes, page 67												
Sr-d1		Yes, page 66												
Sr-d2 to Sr-d8		Yes, page 67												
Sr-E1		Yes, page 66												
Sr-E2 to Sr-E8		Yes, page 67												
Sr-F1		Yes, page 67												
Sr-F2 to Sr-F8		Yes, page 67												
Sr-G1		Yes, page 67												
Sr-G2 to		Yes, page 67												

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S1n-	[Settings] SEt-	[Motor control] drC-	[Input/Output] I-O	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
Sr-CB														
Sr-H1		Yes, page 67												
Sr-H2 to Sr-HB		Yes, page 67												
Sr-I1		Yes, page 67												
Sr-I2 to Sr-IB		Yes, page 67												
Sr-J1		Yes, page 67												
Sr-J2 to Sr-JB		Yes, page 67												
Sr-K1		Yes, page 67												
Sr-K2 to Sr-KB		Yes, page 67												
Sr-L1		Yes, page 67												
Sr-L2 to Sr-LB		Yes, page 67												
Srb						Yes						Yes Yes		
SrP						Yes					Yes			
S-S1S		Yes												
SSb												Yes		
Std											Yes			
St-Fr		Yes, page 45												
StM												Yes		
Sto												Yes		
St-oS		Yes, page 51												
StP												Yes		

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] S IM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
Str											Yes			
St-rt												Yes		
Stt											Yes			
St-un					Yes, page 93		Yes Yes							
SVL							Yes							
tA1						Yes					Yes			
tA2						Yes					Yes			
tA3						Yes					Yes			
tA4						Yes					Yes			
tAA											Yes			
tAC		Yes, page 78												
tA-C2		Yes, page 78												
tA-nF								Yes				Yes		
tAr												Yes		
tbE						Yes					Yes			
tbo											Yes			
tbr													Yes	
tbS												Yes		
tCC					Yes, page 90			Yes, page 135						
tCt								Yes, page 136						
tdC						Yes					Yes	Yes		
td-C1						Yes					Yes			
td-C2						Yes					Yes			
tdi						Yes					Yes	Yes		
tdn											Yes			
tdS												Yes		
tE-C1		Yes												
tFo													Yes	
tFr					Yes, page 93			Yes						

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] MOn-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
tHA												Yes Yes		
tHd		Yes, page 46												
tHr		Yes, page 46												
tHt												Yes		
tLA											Yes			
tLC											Yes			
tLd												Yes		
tL-IG						Yes					Yes			
tL-IM						Yes					Yes			
tnL						Yes					Yes			
tLS												Yes		
toL												Yes		
toS											Yes			
t-P11		Yes												
t-P12		Yes												
t-P13		Yes												
t-P14		Yes												
t-P21		Yes												
t-P22		Yes												
t-P23		Yes												
t-P24		Yes												
t-P31		Yes												
t-P32		Yes												
t-P33		Yes												
t-P34		Yes												
t96												Yes		
t95							Yes							
trA							Yes							

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] Mon-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
trH						Yes					Yes			
trL						Yes					Yes			
tSM												Yes		
tSY											Yes			
ttd						Yes						Yes Yes		
tt-d2												Yes Yes		
tt-d3												Yes Yes		
ttH						Yes						Yes		
ttL						Yes						Yes		
tto												Yes		
ttr						Yes				Yes				
tuL										Yes				
tun					Yes, page 93		Yes Yes							
tu-nu							Yes Yes							
tuP										Yes				
tuS					Yes, page 93		Yes Yes							
u1							Yes							
u2							Yes							
u3							Yes							
u4							Yes							
u5							Yes							
Vbr											Yes		Yes	
udL												Yes		
uFr						Yes	Yes							
ui-H1		Yes, page 48						Yes						
ui-H2		Yes, page 48						Yes						
ui-L1		Yes, page 48						Yes						
ui-L2		Yes, page 48						Yes						

Code	1.1 [Reference speed] rEF-	1.2 [MONITORING] MOn-	[Factory settings] FCS-	[Macro Config] CFG-	[Simply start] SIM-	[Settings] SEt-	[Motor control] drC-	[Input/Output] IO-	[Command] CtL-	[Function Blocks] FbM-	[Application function] Fun-	[FAULT MANAGEMENT] FLt-	[Communication] CoM-	3 [Interface] ItF-
uLn		Yes, page 45												
uLr		Yes, page 79												
uLt												Yes		
unS					Yes, page 92		Yes							
uo-Hi		Yes, page 50						Yes						
uo-Li		Yes, page 50						Yes						
uoP		Yes, page 46												
uPL												Yes		
ur-ES											Yes	Yes		
uSb												Yes		
uSi											Yes			
uSL											Yes	Yes		
uSP											Yes			
uSt												Yes		

Glossary

D

Display terminal:

The display terminal menus are shown in square brackets.

For example: **[Communication]**

The codes are shown in round brackets.

For example: COM-

Parameter names are displayed on the display terminal in square brackets.

For example: **[Fallback Speed]**

Parameter codes are displayed in round brackets.

For example: LFF

E

Error :

Discrepancy between a detected (computed, measured, or signaled) value or condition and the specified or theoretically correct value or condition.

F

Factory setting:

Machine status in factory settings when the product was shipped.

Fault Reset:

A function used to restore the drive to an operational state after a detected error is cleared by removing the cause of the error so that the error is no longer active.

Fault:

Fault is an operating state. If the monitoring functions detect an error, a transition to this operating state is triggered, depending on the error class. A "Fault reset" is required to exit this operating state after the cause of the detected error has been removed.

M

Monitoring function:

Monitoring functions acquire a value continuously or cyclically (for example, by measuring) in order to check whether it is within permissible limits. Monitoring functions are used for error detection.

P

Parameter:

Device data and values that can be read and set (to a certain extent) by the user.

PELV:

Protective Extra Low Voltage, low voltage with isolation. For more information: IEC 60364-4-41.

PLC:

Programmable logic controller.

Power stage:

The power stage controls the motor. The power stage generates current for controlling the motor.

W

Warning:

If the term is used outside the context of safety instructions, a warning alerts to a potential error that was detected by a monitoring function. A warning does not cause a transition of the operating state.

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JPS43207.01