

# Altivar 71

## Stirrer application

## Programming manual

Software V2.3IE40

Concast

11/2009





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# Before you begin

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Read and understand these instructions before performing any procedure on this drive.

## DANGER

### HAZARDOUS VOLTAGE

- Read and understand the Installation Manual before installing or operating the ATV71 drive. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical standards in force concerning protective grounding of all equipment.
- Many parts of this variable speed drive, including the printed circuit boards, operate at the line voltage. DO NOT TOUCH.  
Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- DO NOT short across terminals PA/+ and PC/- or across the DC bus capacitors.
- Install and close all the covers before applying power or starting and stopping the drive.
- Before servicing the variable speed drive
  - Disconnect all power.
  - Place a "DO NOT TURN ON" label on the variable speed drive disconnect.
  - Lock the disconnect in the open position.
- Disconnect all power including external control power that may be present before servicing the drive. WAIT 15 MINUTES to allow the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure given in the Installation Manual to verify that the DC voltage is less than 42 V. The drive LEDs are not accurate indicators of the absence of DC bus voltage.

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

## CAUTION

### DAMAGED EQUIPMENT

Do not operate or install any drive that appears damaged.

**Failure to follow this instruction can result in injury or equipment damage.**

# Documentation structure

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This manual describes only specific parameters and [CONCAST] (CO-) menu .

For other functions, refer to the following Altivar 71 technical documents. They are available on the Schneider Electric website ([www.schneider-electric.com](http://www.schneider-electric.com)) as well as on the CD-ROM supplied with the drive.

## Installation Manual

This describes how to assemble and connect the drive.

## Programming manual

This describes the functions, parameters and use of the drive terminal (integrated display terminal and graphic display terminal). The communication functions are not described in this manual, but in the manual for the bus or network used.

## Communication Parameters Manual

This manual describes:

- The drive parameters with specific information for use via a bus or communication network.
- The operating modes specific to communication (state chart).
- The interaction between communication and local control.

## Manuals for Modbus, CANopen, Ethernet, Profibus, INTERBUS, Uni-Telway, FIPIO and Modbus Plus, etc.

These manuals describe the assembly, connection to the bus or network, signaling, diagnostics, and configuration of the communication-specific parameters via the integrated display terminal or the graphic display terminal. They also describe the communication services of the protocols.

### INSTALLATION

- **1** Consult the Installation Manual



#### Tips:

- Before you start programming, complete the user setting tables, page [37](#).
- Perform an auto-tuning operation to optimize performance.
- If you get lost, return to the factory settings.



**Note:** Check that the wiring of the drive is compatible with its configuration.

### PROGRAMMING

- **2** Power up without run command
  - If you are using a separate power supply for the control section, follow the instructions on page [7](#).
- **3** Select the language, if the drive has a graphic display terminal
- **4** Configure the **[CONCAST]** (**[ C O N - ]**) menu
- **5** Start

## Setup - Preliminary recommendations

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### Turning on and configuring the drive

#### DANGER

##### UNINTENDED EQUIPMENT OPERATION

- Before turning on and configuring the Altivar 71, check that the PWR (POWER REMOVAL) input is deactivated (at state 0) in order to prevent unintended operation.
- Before turning on the drive, or when exiting the configuration menus, check that the inputs assigned to the run command are deactivated (at state 0) since they can cause the coil to start immediately.

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

#### CAUTION

##### INCOMPATIBLE LINE VOLTAGE

Before turning on and configuring the drive, ensure that the line voltage is compatible with the supply voltage range shown on the drive nameplate. The drive may be damaged if the line voltage is not compatible.

**Failure to follow this instruction can result in equipment damage.**

### Separate control section power supply

When the drive control section is powered independently of the power section (P24 and 0V terminals), whenever an option card is added or replaced, only the power section must be supplied with power next time the drive is powered up.

By default the new card would not be recognized and it would be impossible to configure it, thereby causing the drive to lock in fault mode.

### Power switching via line contactor

#### CAUTION

##### UNINTENDED EQUIPMENT OPERATION

- Avoid operating the contactor frequently (premature ageing of the filter capacitors).
- Cycle times < 60 s may result in damage to the pre-charge resistor.


**Failure to follow these instructions can result in equipment damage.**

# Setup - Preliminary recommendations

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## User adjustment and extension of functions

- The display unit and buttons can be used to modify the settings and to extend the functions described in the following pages.
- **Return to factory settings** is made easy by the [1.11 FACTORY SETTINGS] (FCS-) menu.
- There are three types of parameter:
  - Display: Values displayed by the drive
  - Adjustment: Can be changed during operation or when stopped
  - Configuration: Can only be modified when stopped and no braking is taking place. Can be displayed during operation.

 <b>DANGER</b>
<b>UNINTENDED EQUIPMENT OPERATION</b> <ul style="list-style-type: none"><li>• Check that changes made to the settings during operation do not present any danger.</li><li>• We recommend stopping the drive before making any changes.</li></ul> <p><b>Failure to follow these instructions will result in death or serious injury.</b></p>

## Starting

### Important:

- In factory settings mode, the coil can only be supplied with power once the "forward", "reverse" and "DC injection stop" commands have been reset:
  - On power-up or a manual fault reset or after a stop commandIf they have not been reset, the drive will display "nSt" but will not start.
- If the automatic restart function has been configured ([Automatic restart] (Atr) parameter in the [1.7 FAULT MANAGEMENT] (FLt-) menu), these commands are taken into account without a reset being necessary.

## Compatibility of functions

### Important:

This software version is specific. The compatibility between "common" functions of the drive and [1.14 CONCAST] (COn-) menu has not been tested.

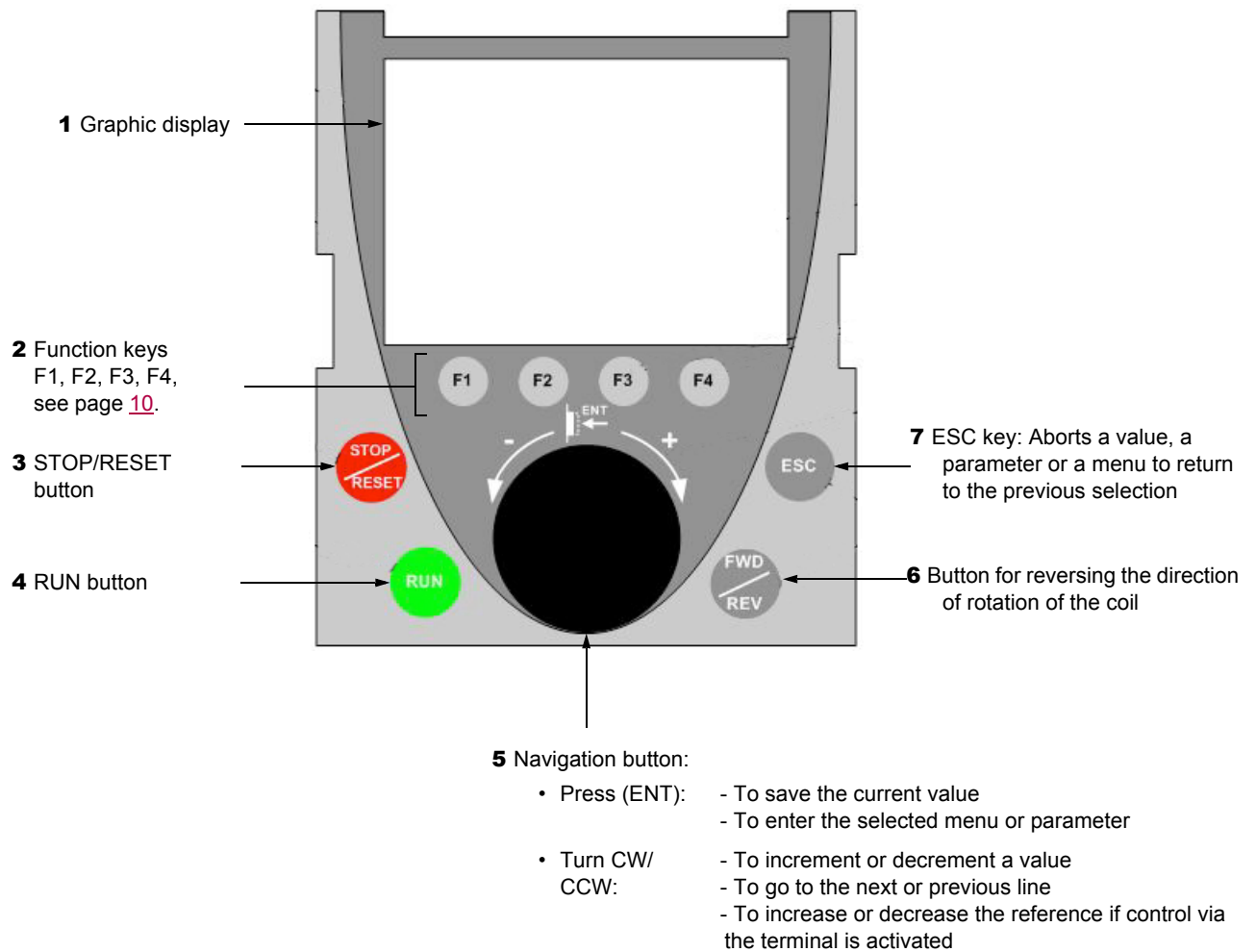
**The user must therefore ensure that these functions can be used at the same time.**



# Graphic display terminal

The graphic display terminal is a standard component on high-power drives. The graphic display terminal can be disconnected and connected remotely (on the door of an enclosure for example) using the cables and accessories available as options (see catalog).

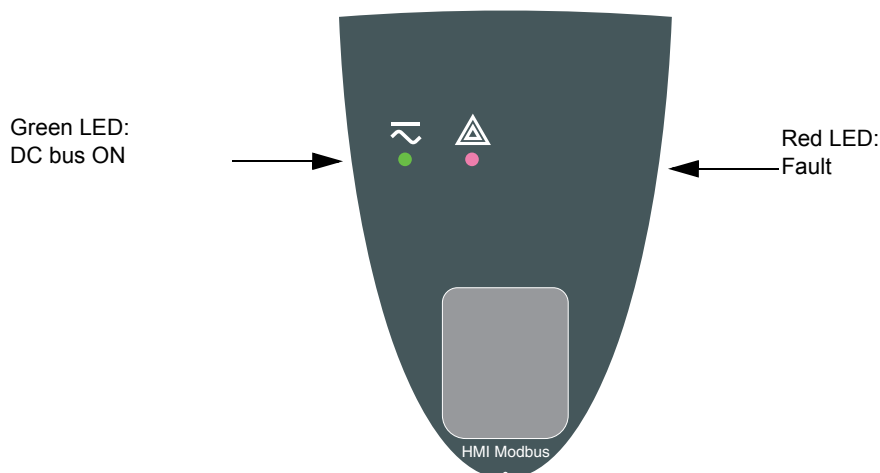
## Description of terminal



**Note:** Buttons 3, 4, 5 and 6 can be used to control the drive directly, if control via the terminal is activated.

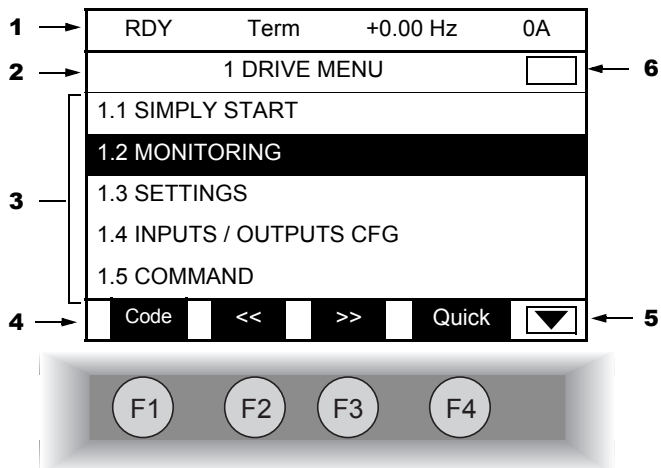
## Disconnected terminal

When the terminal is disconnected, 2 LEDs become visible:



# Graphic display terminal

## Description of the graphic screen



**1.** Display line. Its content can be configured; the factory settings show:

- The drive state
- The active control channel:
  - Term: Terminals
  - HMI: Graphic display terminal
  - MDB: Integrated Modbus
  - CAN: Integrated CANopen
  - NET: Communication card
  - APP: Controller Inside card
- Frequency reference
- Current in the coil

**2.** Menu line. Indicates the name of the current menu or submenu.

**3.** Menus, submenus, parameters, values, bar charts, etc., are displayed in drop-down window format on a maximum of 5 lines. The line or value selected by the navigation button is displayed in reverse video.

**4.** Section displaying the functions assigned to the F1 to F4 keys and aligned with them, for example:

- Code **F1** : Displays the code of the selected parameter, i.e., the code corresponding to the 7-segment display.
- HELP **F1** : Contextual help
- << **F2** : Navigate horizontally to the left, or go to previous menu/submenu or, for a value, go to the next digit up, displayed in reverse video.
- >> **F3** : Navigate horizontally to the right or go to next menu/submenu (going to the [2 ACCESS LEVEL] menu in this example) or, for a value, go to the next digit down, displayed in reverse video.
- Quick **F4** : Quick navigation.

The function keys are dynamic and contextual.

Other functions (application functions) can be assigned to these keys via the [\[1.5 COMMAND\]](#) menu.

- 5.**  Indicates that there are no more levels below this display window.  
 Indicates that there are more levels below this display window.

- 6.**  Indicates that this display window does not scroll further up.  
 Indicates that there are more levels above this display window.

## Drive state codes:

- ACC: Acceleration
- CLI: Current limit
- CTL: Controlled stop on input phase loss
- DCB: DC injection braking in progress
- DEC: Deceleration
- FLU: Coil fluxing in progress
- FST: Fast stop
- NLP: No line power (no line supply on L1, L2, L3)
- NST: Freewheel stop
- OBR: Auto-adapted deceleration
- PRA: Power Removal function active (drive locked)
- RDY: Drive ready
- RUN: Drive running
- SOC: Controlled output cut in progress
- TUN: Auto-tuning in progress
- USA: Undervoltage alarm

# Graphic display terminal

## Example configuration windows:

RDY	Term	+0.00Hz	0A
5 LANGUAGE			
English			
Français ✓			
Deutsch			
Español			
Italiano			
<<		>>	
		Quick	

Chinese

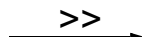
When only one selection is possible, the selection made is indicated by ✓  
Example: Only one language can be chosen.

PARAMETER SELECTION	
1.3 SETTINGS	
Ramp increment	<input checked="" type="checkbox"/>
Acceleration	<input checked="" type="checkbox"/>
Deceleration	<input type="checkbox"/>
Acceleration 2	<input type="checkbox"/>
Deceleration 2	<input type="checkbox"/>
Edit	

When multiple selection is possible, the selections made are indicated by   
Example: A number of parameters can be chosen to form the [\[1.12 USER MENU\] \(UMC-\)](#).

## Example configuration window for one value:

RDY	Term	+0.00Hz	0A
Acceleration			
9.51 s			
Min = 0.01		Max = 99.99	
<<		>>	
		Quick	



RDY	Term	+0.00Hz	0A
Acceleration			
951 s			
Min = 0.01		Max = 99.99	
<<		>>	
		Quick	

The << and >> arrows (keys F2 and F3) are used to select the digit to be modified, and the navigation button is rotated to increase or decrease this number.

# Graphic display terminal

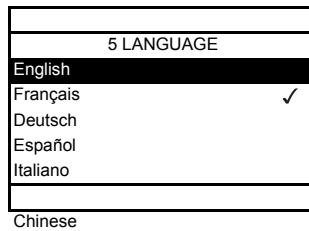
## First power-up - [5. LANGUAGE] menu

The first time the drive is powered up, the user will automatically be guided through the menus as far as [1. DRIVE MENU]. The parameters in the [1.1 SIMPLY START] submenu must be configured and auto-tuning performed before the coil is started up.

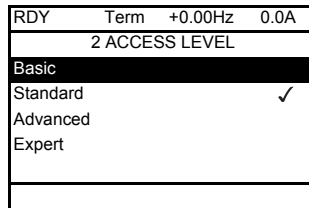


Display for 3 seconds following power-up

3 seconds

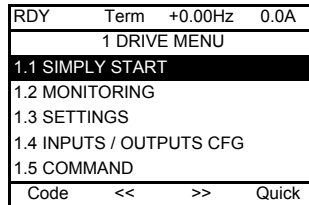


Automatically switches to [5 LANGUAGE] menu 3 seconds later. Select the language and press ENT.



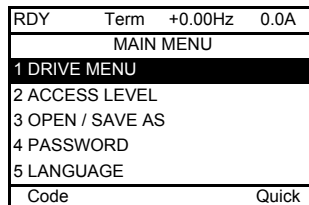
Switches to [2 ACCESS LEVEL] menu

Select the access level and press ENT.



Switches to [1 DRIVE MENU]

ESC



Press ESC to return to [MAIN MENU]

# Graphic display terminal

## Subsequent power ups



3 seconds ↓

RDY	Term	+38Hz	0.0A
1. DRIVE MENU			
1.1 SIMPLY START			
1.2 MONITORING			
1.3 SETTINGS			
1.4 INPUTS / OUTPUTS CFG			
1.5 COMMAND			
Code	<<	>>	Quick

Switches to [1. DRIVE MENU] 3 seconds later.

10 seconds ↓

RDY	Term	+38Hz	0.0A
Frequency ref.			
38 Hz			
Min=0		Max=60	
Quick			

If no operator inputs are made, switches to "Display" automatically 10 seconds later (the display will vary depending on the selected configuration).

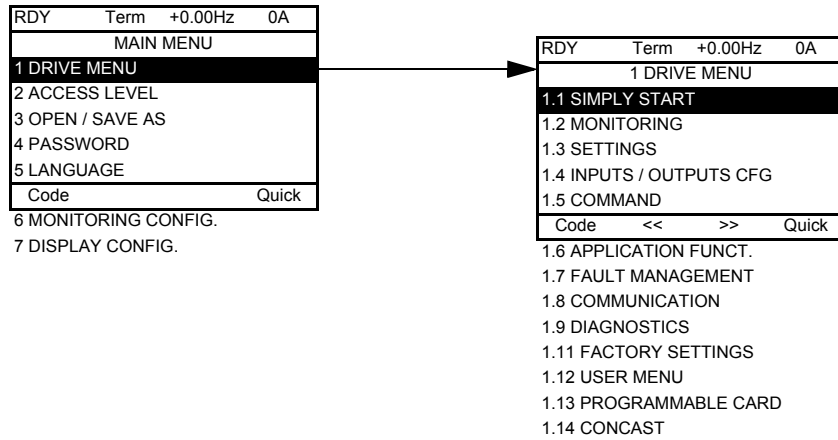
ENT or ESC ↓

RDY	Term	+38Hz	0.0A
MAIN MENU			
1 DRIVE MENU			
2 ACCESS LEVEL			
3 OPEN / SAVE AS			
4 PASSWORD			
5 LANGUAGE			
Code	Quick		

Users can return to [MAIN MENU] by pressing ENT or ESC.

# Graphic display terminal

## [MAIN MENU] - Menu mapping



## Content of [MAIN MENU] menus

[1 DRIVE MENU]	See next page
[2 ACCESS LEVEL]	Defines which menus can be accessed (level of complexity)
[3 OPEN / SAVE AS]	Can be used to save and recover drive configuration files
[4 PASSWORD]	Provides password protection for the configuration
[5 LANGUAGE]	Language selection
[6 MONITORING CONFIG.]	Customization of information displayed on the graphic display terminal during operation
[7 DISPLAY CONFIG.]	<ul style="list-style-type: none"> <li>• Customization of parameters</li> <li>• Creation of a customized user menu</li> <li>• Customization of the visibility and protection mechanisms for menus and parameters</li> </ul>

# Graphic display terminal

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## [1 DRIVE MENU]

RDY	Term	+0.00Hz	0A
1 DRIVE MENU			
1.1 SIMPLY START			
1.2 MONITORING			
1.3 SETTINGS			
1.4 INPUTS / OUTPUTS CFG			
1.5 COMMAND			
Code	<<	>>	Quick

1.6 APPLICATION FUNCT.  
1.7 FAULT MANAGEMENT  
1.8 COMMUNICATION  
1.9 DIAGNOSTICS  
1.11 FACTORY SETTINGS  
1.12 USER MENU  
1.13 PROGRAMMABLE CARD  
1.14 CONCAST

### Content of [1. DRIVE MENU] menus:

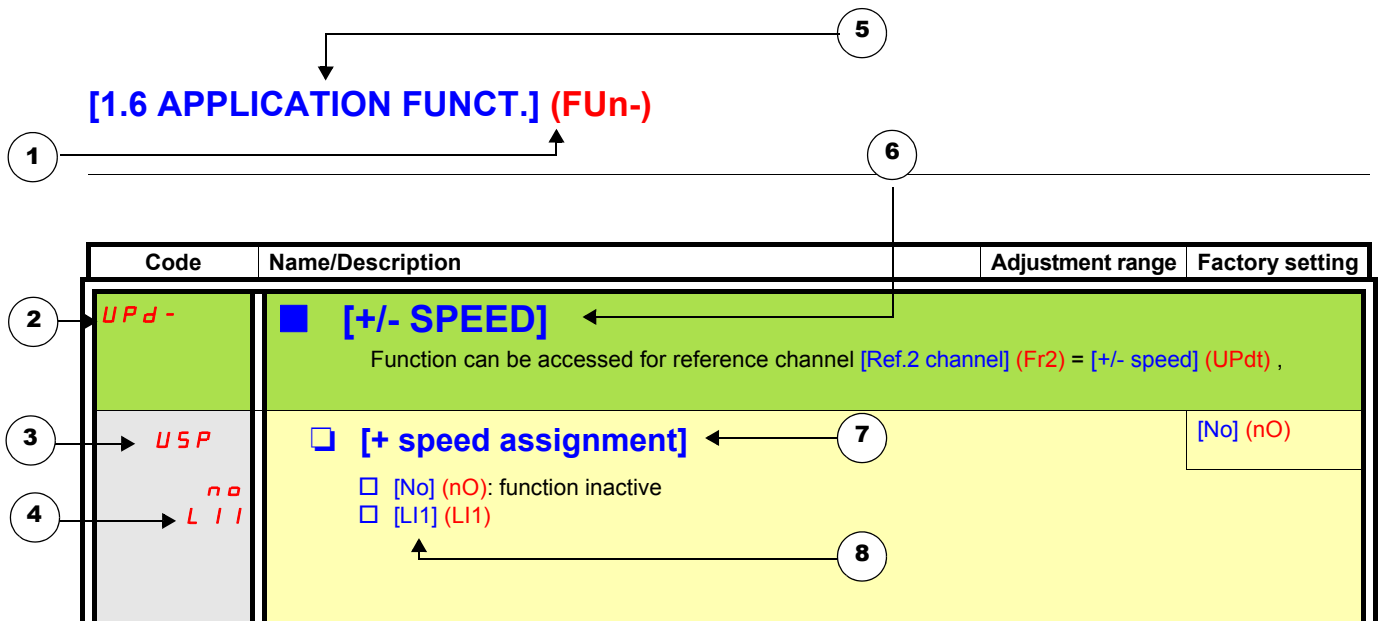
[1.1 SIMPLY START]:	Simplified menu for a quick start
[1.2 MONITORING]:	Visualization of current, coil and input/output values
[1.3 SETTINGS]:	Accesses the adjustment parameters, which can be modified during operation
[1.4 INPUTS / OUTPUTS CFG]:	I/O configuration (scaling, filtering, 2-wire control, 3-wire control, etc.)
[1.5 COMMAND]:	Configuration of command and reference channels (graphic display terminal, terminals, bus, etc.)
[1.6 APPLICATION FUNCT.]:	Configuration of application functions (e.g., preset speeds, PID, brake logic control, etc.)
[1.7 FAULT MANAGEMENT] :	Configuration of fault management
[1.8 COMMUNICATION]:	Communication parameters (fieldbus)
[1.9 DIAGNOSTICS]:	Coil/drive diagnostics
[1.11 FACTORY SETTINGS]:	Access to configuration files and return to factory settings
[1.12 USER MENU]:	Specific menu set up by the user in the [7. DISPLAY CONFIG.] menu
[1.13 PROGRAMMABLE CARD]:	Configuration of optional Controller Inside card
[1.14 CONCAST]:	Specific menu for Concast



# Structure of parameter tables

The parameter tables in the descriptions of the various menus can be used with both the graphic display terminal and the integrated display terminal. They, therefore, contain information for these two terminals in accordance with the description below.

**Example:**



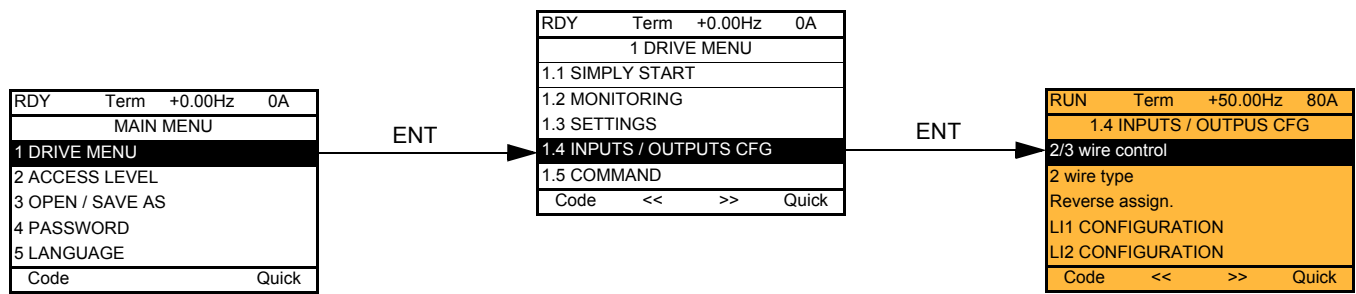
- |  |  |
|--|--|
| 1. Name of menu on 4-digit 7-segment display.    | 5. Name of menu on graphic display terminal.       |
| 2. Submenu code on 4-digit 7-segment display.    | 6. Name of submenu on graphic display terminal.    |
| 3. Parameter code on 4-digit 7-segment display.  | 7. Name of parameter on graphic display terminal.  |
| 4. Parameter value on 4-digit 7-segment display. | 8. Value of parameter on graphic display terminal. |



**Note :**

- The text in square brackets [ ] indicates what you will see on the graphic display terminal.
- The factory settings correspond to [Macro configuration] (CFG) = [Start/Stop] (StS). This is the macro configuration set at the factory.

## [1.4 INPUTS / OUTPUTS CFG] (I\_O-)



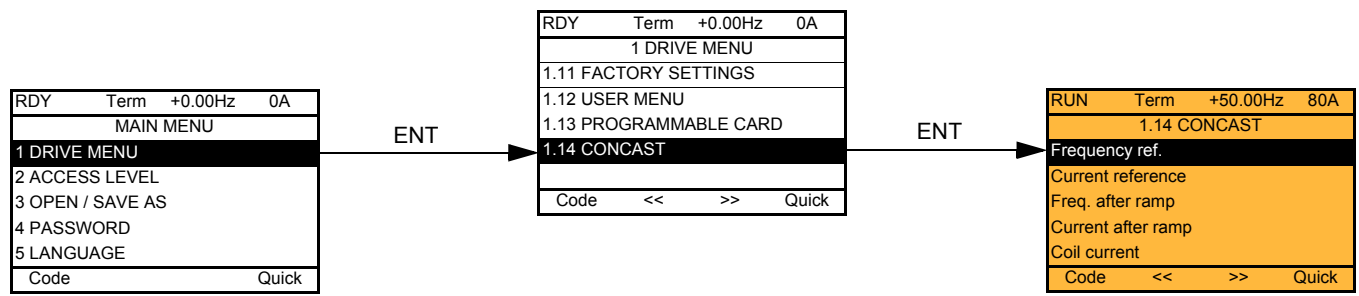
Code	Name/Description	Adjustment range	Factory setting
<b>W18</b> <input type="checkbox"/> [Min. current] ( ) Minimum current.	0.0 to 1500.0 A	0.0 A	
<b>W19</b> <input type="checkbox"/> [Max. current] ( ) Maximum current.	0.0 to 1500.0 A	According to the range (1)	
<b>W24</b> <input type="checkbox"/> [Trig level fast stop] Level fast stop activation <input type="checkbox"/> [LO] (LO) <input type="checkbox"/> [HIG] (HIG) ( )	-	[LO] (LO)	

 Parameter that can be modified during operation or when stopped.

(1) This table shows the factory setting for the parameter [Max. current] (W19) according to the drive rating.



Drive reference	W19 Factory setting (A)
ATV71HC20N4, ATV71HC22N4	522
ATV71HC25N4	600
ATV71HC28N4	682
ATV71HC31N4, ATV71HC35N4	821
ATV71HC40N4, ATV71HC45N4	1026
ATV71HC50N4	1321













# [1.14 CONCAST] (COn-)



## [1.14 CONCAST] (COn-)

The parameters in the [1.14 CONCAST] (drC-) menu can only be modified when the drive is stopped and no run command is present, with the following exception:

- Parameters containing the sign  in the code column can be modified with the drive running or stopped.
- Parameters containing the sign  in the code column are only in read access.

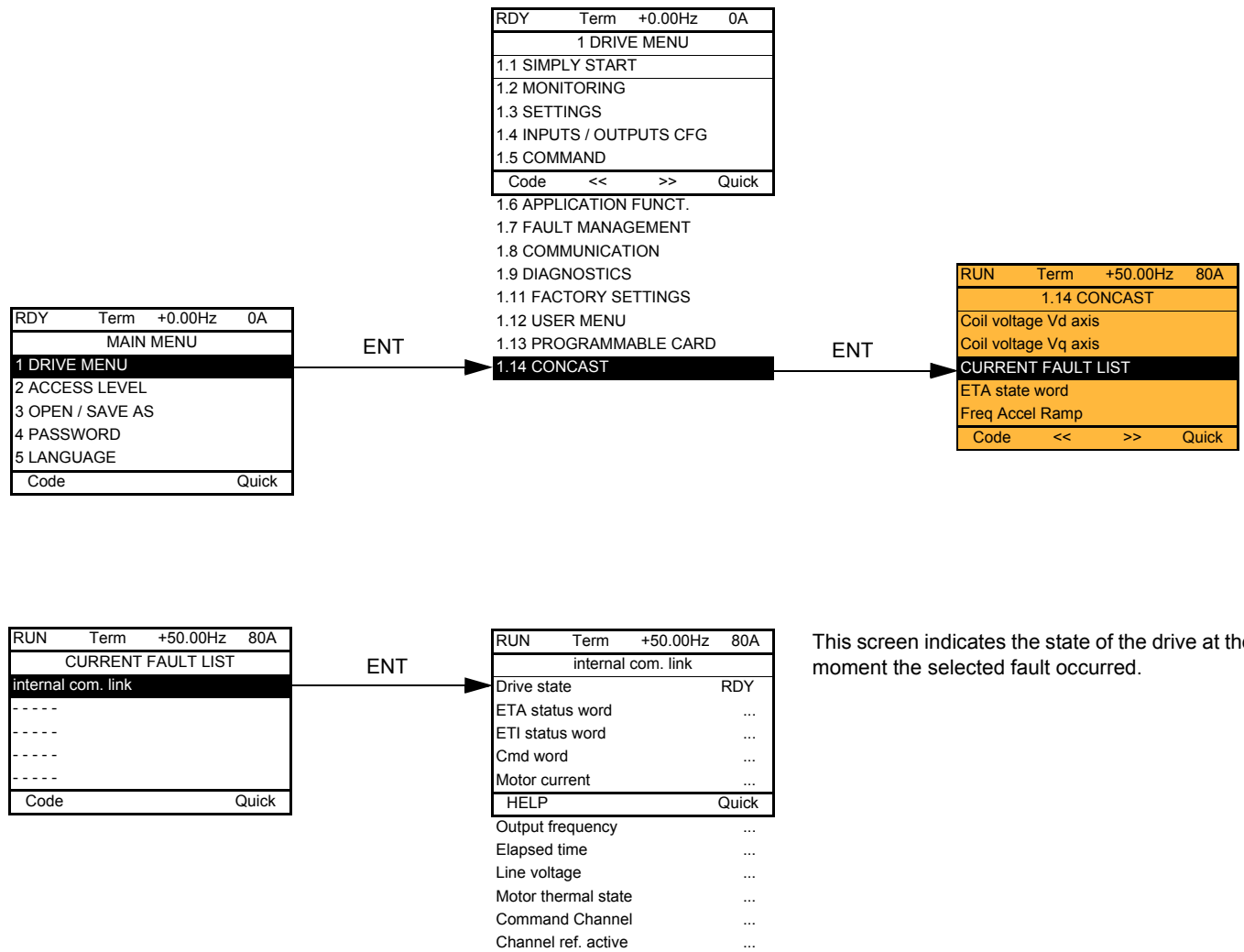
Code	Name/Description	Unit
<i>F r H</i> 	<b>[Frequency ref.]</b> : Frequency reference before ramp (signed value).	0,1 Hz
<i>L t r A</i> 	<b>[Current reference]</b> : Active Ligne current reference Ltr (signed value).	0,1 A
<i>F r D</i> 	<b>[Freq. after ramp]</b> : Ramp output frequency (signed value).	0,1 Hz
<i>W D 2</i> 	<b>[Current after ramp]</b> : Current in the coil.	0,1 A
<i>L C r</i> 	<b>[Coil current]</b> : Estimated coil current.	0,1 A
<i>U L n</i> 	<b>[Mains voltage]</b> : Main voltage (from DC bus).	0,1 V
<i>W D 3</i> 	<b>[Coil voltage]</b> : Voltage in the coil.	0,1 V
<i>W D 4</i> 	<b>[Coil active power]</b> : Coil active power.	0,1 kW
<i>W D 5</i> 	<b>[Coil reactive power]</b> : Output reactive power.	0,1 kVA
<i>W D 6</i> 	<b>[Coil power factor]</b> : Output power factor.	0,01 pf
<i>W D 7</i> 	<b>[Coil voltage Vd axis]</b> : Output voltage reference Vd.	0,1 V
<i>W D 8</i> 	<b>[Coil voltage Vq axis]</b> : Output voltage reference Vq.	0,1 V



Parameter only in read access.



# [1.14 CONCAST] (COn-)

## PFL - [CURRENT FAULT LIST]



This screen indicates the state of the drive at the moment the selected fault occurred.

## [1.14 CONCAST] (COn-)

Code	Name/Description
<p style="color: red; margin: 0;">E E A</p> 	<p> <b>[ETA state word]</b></p> <p><b>Possible values in the IO profile</b></p> <p><b>Note:</b> 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.</p> <p>bit 0:Reserved (= 0 or 1)</p> <p>bit 1:Ready = 0: Not ready, = 1: Ready</p> <p>bit 2:Running = 0: The drive will not start if a reference other than zero is applied. = 1: Running, if a reference other than zero is applied, the drive can start.</p> <p>bit 3:Fault = 0: No fault, = 1: Fault</p> <p>bit 4:Power section line supply present = 0: Power section line supply absent, = 1: Power section line supply present</p> <p>bit 5:Reserved (= 1)</p> <p>bit 6:Reserved (= 0 or 1)</p> <p>bit 7:Alarm = 0: No alarm, = 1: Alarm</p> <p>bit 8:Reserved (= 0)</p> <p>bit 9:Command via a network = 0: Command via the terminals or the graphic display terminal, = 1: Command via a network <b>Note:</b> The network can be integrated Modbus, CANopen, a communication card or the Controller Inside card. This is not necessarily the network via which the status word is read. Therefore, if the command comes from CANopen (CANopen command channel active) and the status word (ETA) is read via an Ethernet card, the data item "Control via a network" = 1. This does not mean that control can be carried out via the Ethernet card.</p> <p>bit 10:Reference reached = 0: The reference is not reached, = 1: The reference has been reached</p> <p>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 the "Low speed (LSP)" and "High speed (HSP)" parameters.</p> <p>bits 12 and 13: Reserved (= 0)</p> <p>bit 14:Stop via STOP key = 0: STOP key not pressed, = 1: Stop triggered by the STOP key on the graphic display terminal</p> <p>bit 15:Direction of rotation = 0: Forward rotation at output, = 1: Reverse rotation at output</p>



Parameter only in read access.

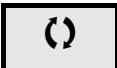
## [1.14 CONCAST] (COn-)

Code	Name/Description
	<p><b>Possible values in CiA402 profile</b></p> <p>bit 0:"Ready to switch on", awaiting power section line supply</p> <p>bit 1:"Switched on", ready</p> <p>bit 2:"Operation enabled", running</p> <p>bit 3:"Fault" = 0: No fault, = 1: Fault</p> <p>bit 4:"Voltage enabled", power section line supply present = 0: Power section line supply absent, = 1: Power section line supply present When the drive is powered by the power section only, this bit is always at 1.</p> <p>bit 5:Quick stop/Emergency stop</p> <p>bit 6:"Switched on disabled", power section line supply locked</p> <p>bit 7:Warning alarm = 0: No alarm, = 1: Alarm</p> <p>bit 8:Reserved (= 0)</p> <p>bit 9:Remote: command or reference via the network = 0: Command or reference via the terminals, = 1: Command or reference via the network</p> <p>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. When the drive stops, the reference has been reached.</p> <p>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.</p> <p>bit 12:Reserved (= 0)</p> <p>bit 13:Reserved (= 0)</p> <p>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</p> <p>bit 15:"Direction", direction of rotation = 0: Forward rotation at output, = 1: Reverse rotation at output</p>

## [1.14 CONCAST] (CO-)

Code	Name/Description	Adjustment range	Factory setting
<b>ACC</b> ( )	<input type="checkbox"/> <b>[Freq Accel Ramp]</b> Time to accelerate from 0 to the [Rated motor freq.] (FrS). Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	5.0 s
<b>DEC</b> ( )	<input type="checkbox"/> <b>[Freq Decel Ramp]</b> Time to decelerate from the [Rated motor freq.] (FrS) to 0. Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	5.0 s
<b>W09</b> ( )	<input type="checkbox"/> <b>[Current Accel Ramp]</b> Current acceleration	0.1 to 50.0 s	5.0 s
<b>W10</b> ( )	<input type="checkbox"/> <b>[Current Decel Ramp]</b> Current deceleration	0.1 to 50.0 s	5.0 s
<b>W11</b> nO YES	<input type="checkbox"/> <b>[ASM Mode]</b> Alternating stirring control <input type="checkbox"/> [No] (nO) <input type="checkbox"/> [Yes] (YES)	-	[No] (nO)
<b>W12</b> ( )	<input type="checkbox"/> <b>[Cw time ASM Mode]</b> ASM clockwise time	1 to 900 s	5 s
<b>W13</b> ( )	<input type="checkbox"/> <b>[C/Ctime ASM Mode]</b> ASM anti-clockwise time	1 to 900 s	5 s
<b>OPL</b> nO YES DRC	<input type="checkbox"/> <b>[Output Phase Loss]</b> <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [Yes] (YES): Tripping on OPF fault with freewheel stop. <input type="checkbox"/> [Output cut] (OAC): No fault triggered, but management of the output voltage in order to avoid an overcurrent when the link with the coil is re-established and catch on the fly performed (even if this function has not been configured).  <b>Note:</b> [Output Phase Loss] (OPL) is forced to [Yes] (YES) if brake logic control is configured (see ATV71 programming manual).	-	[Yes] (YES)
<b>W01</b>	<input type="checkbox"/> <b>[OutPhL Voltage]</b> Open circuit coil trip level.	50 to 500 V	200 V
<b>Odt</b> ( )	<input type="checkbox"/> <b>[OutPhL Time]</b> Output (coil) phase loss detection time	1 to 100 ms	10 ms
<b>W20</b> ( )	<input type="checkbox"/> <b>[OutputV in % InputV]</b> Field weakening	0 to 100 %	100 %

(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6000 s according to [Ramp increment] (Inr).

 Parameter that can be modified during operation or when stopped.



## [1.14 CONCAST] (CO<sub>n</sub>-)

### Command and reference channels

The parameters in [Cmd channel] (Cd1) and [Freq. ref. channel] (Fr1) 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:

Control	Reference
<ul style="list-style-type: none"> <li>Terminals: logic inputs LI</li> <li>Graphic display terminal</li> <li>Integrated Modbus</li> <li>Integrated CANopen</li> <li>Communication card</li> <li>Controller Inside card</li> </ul>	<ul style="list-style-type: none"> <li>Terminals: analog inputs AI, frequency input, encoder</li> <li>Graphic display terminal</li> <li>Integrated Modbus</li> <li>Integrated CANopen</li> <li>Communication card</li> <li>Controller Inside card</li> <li>+/- speed via the terminals</li> <li>+/- speed via the graphic display terminal</li> </ul>

### The behavior of the Altivar 71 can be adapted according to requirements:

- [Not separ.] (SIM): Command and reference are sent via the same channel.
- [Separate] (SEP): 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] (IO): 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 terminals remain active even if the terminals are not the active command channel.

 **Note :** The integrated Modbus channel has 2 physical communication ports:

- The Modbus network port
- The Modbus HMI port

The drive does not differentiate between these two ports, but recognizes the graphic display terminal irrespective of the port to which it is connected.

Code	Name/Description	Factory setting
<i>Cd1</i>	<input type="checkbox"/> <b>[Cmd channel]</b>	[Terminals] (tEr)
<i>tEr</i>	<input type="checkbox"/> [Terminals] (tEr): Terminals	
<i>LCC</i>	<input type="checkbox"/> [HMI] (LCC): Graphic display terminal	
<i>Mdb</i>	<input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus	
<i>CAn</i>	<input type="checkbox"/> [CANopen] (CAn): Integrated CANopen	
<i>nEt</i>	<input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted)	
<i>APP</i>	<input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted)	
	The parameter is available if [Profile] (CHCF) = [Separate] (SEP) or [I/O profile] (IO).	
<i>Fr1</i>	<input type="checkbox"/> <b>[Freq. ref. channel]</b>	[AI2] (AI2)
<i>AI1</i>	<input type="checkbox"/> [AI1] (AI1): Analog input	
<i>AI2</i>	<input type="checkbox"/> [AI2] (AI2): Analog input	
<i>AI3</i>	<input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted	
<i>AI4</i>	<input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted	
<i>LCC</i>	<input type="checkbox"/> [HMI] (LCC): Graphic display terminal	
<i>Mdb</i>	<input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus	
<i>CAn</i>	<input type="checkbox"/> [CANopen] (CAn): Integrated CANopen	
<i>nEt</i>	<input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted)	
<i>APP</i>	<input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted)	
<i>PI</i>	<input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted,	
<i>PG</i>	<input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted	

## [1.14 CONCAST] (CO-n-)

Code	Name/Description	Adjustment range	Factory setting
<b>Er I</b> <b>nO</b> <b>A I 1</b> <b>A I 2</b> <b>A I 3</b> <b>A I 4</b> <b>L C C</b> <b>M d b</b> <b>C A n</b> <b>n E t</b> <b>A P P</b> <b>P I</b> <b>P G</b>	<input type="checkbox"/> <b>[Current ref. channel]</b>  <input type="checkbox"/> [No] (nO): Not assigned (zero torque reference). <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 I/O card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 I/O card has been inserted <input type="checkbox"/> [HMI] (LCC): Graphic display terminal <input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus <input type="checkbox"/> [CANopen] (CAn): Integrated CANopen <input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted) <input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted) <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 I/O card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted 100% of the reference corresponds to 300% of the rated torque.	-	[AI2] (AI2) (1)
<b>W 1 4</b>	<input type="checkbox"/> <b>[Coil nom. voltage]</b>  Coil nominal voltage.	200 to 480 V	415 V
<b>W 1 5</b>	<input type="checkbox"/> <b>[Coil nom. current]</b>  Coil nominal current.	0.1 to 1500.0 A	According to drive rating
<b>W 1 6</b>	<input type="checkbox"/> <b>[Coil nom. frequency]</b>  Coil nominal frequency.	0.1 to 50 Hz	5 Hz
<b>W 1 7</b>	<input type="checkbox"/> <b>[Coil nom. Powerfact]</b>  Coil nominal powerfactor.	0.01 to 0.99 pf	0.30 pf
<b>L S P</b> ( )	<input type="checkbox"/> <b>[Min frequency]</b>  Coil frequency at minimum reference, can be set between 0 and [High speed] (HSP).	0.0 to 1600.0 Hz	0 Hz
<b>H S P</b> ( )	<input type="checkbox"/> <b>[Max frequency]</b>  Coil frequency at maximum reference, can be set between [Low speed] (LSP) and [Max frequency] (tFr). The factory setting changes to 60 Hz if [Standard mot. freq] (bFr) = [60Hz NEMA] (60).	0.0 to 100 Hz	5.0 Hz
<b>W 1 8</b> ( )	<input type="checkbox"/> <b>[Min. current]</b>  Minimum current.	0.0 to 1500.0 A	0.0 A
<b>W 1 9</b> ( )	<input type="checkbox"/> <b>[Max. current]</b>  Maximum current.	0.0 to 1500.0 A	According to the range (2)
<b>L F r</b> ( )	<input type="checkbox"/> <b>[HMI Frequency ref.]</b>  Frequency reference via the graphic display terminal.	-3276.7 to 3276.7 Hz	0 Hz
<b>L E r</b> ( )	<input type="checkbox"/> <b>[HMI current ref.]</b>  Current reference via the graphic display terminal.	0.0 to 1500.0 A	0.0 A

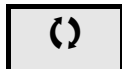
(1) If VW3A3202 extension card has been inserted, the factory setting is [AI4] (AI4).

(2) See table with factory setting for W19 page 18.

**( )** Parameter that can be modified during operation or when stopped.

## [1.14 CONCAST] (COOn-)

Code	Name/Description	Adjustment range	Factory setting
<b>PHr</b> <b>AbC</b> <b>ACb</b>	<input type="checkbox"/> <b>[Output Ph rotation]</b> <input type="checkbox"/> [ABC] (AbC): Forward <input type="checkbox"/> [ACB] (ACb): Reverse This parameter can be used to reverse the frequency direction of coil rotation without reversing the wiring.	-	[ABC] (AbC)
<b>W21</b> ( )	<input type="checkbox"/> <b>[BW Current loop]</b> Current loop Bandwidth.	0 to 1000 Hz	10 Hz
<b>W22</b> ( )	<input type="checkbox"/> <b>[Damp Current loop]</b> Current loop Damping.	0 to 1000 %	100 %
<b>W23</b> ( )	<input type="checkbox"/> <b>[Phase Comp. coeff.]</b> Field weakening.	0 to 100 %	15 %
<b>W25</b> <b>nO</b> <b>YES</b> ( )	<input type="checkbox"/> <b>[Freq. ramp reverse]</b> <input type="checkbox"/> [No] (nO) <input type="checkbox"/> [Yes] (YES) With or without ramp during reverse action.	-	[No] (nO)
<b>W26</b> <b>nO</b> <b>YES</b> ( )	<input type="checkbox"/> <b>[Freq ramp startstop]</b> <input type="checkbox"/> [No] (nO) <input type="checkbox"/> [Yes] (YES) With or without ramp for start and stop.	-	[Yes] (YES)

 Parameter that can be modified during operation or when stopped.

# Communication

Code	Low limit	High limit	Default value	Logic address	CANopen index
<i>A C C</i>	1	6000	50	9001	16#203C/2
<i>C d I</i>	1 = (tEr): Terminals 3 = (LCC): Graphic display terminal 10 = (Mdb): Integrated Modbus 20 = (CAn): Integrated CANopen 30 = (nEt): Communication card (if inserted) 31 = (APP): Controller Inside card (if inserted)		1	8423	16#2036/18
<i>d E C</i>	1	6000	50	9002	16#203C/3
<i>E t R</i>	see page 22		-	3201	16#2002/2
<i>F r I</i>	1 = (AI1): Analog input 2 = (AI2): Analog input 3 = (AI3): Analog input, if VW3A3202 extension card has been inserted 4 = (AI4): Analog input, if VW3A3202 extension card has been inserted 163 = (LCC): Graphic display terminal 164 = (Mdb): Integrated Modbus 167 = (CAn): Integrated CANopen 169 = (nEt): Communication card (if inserted) 170 = (APP): Controller Inside card (if inserted) 181 = (PI): Frequency input, if VW3A3202 extension card has been inserted 182 = (PG): Encoder input, if encoder card has been inserted		2	8413	16#2036/E
<i>F r H</i>	-16000	+16000	-	3203	16#2002/4
<i>F r D</i>	-		-	9021	16#203C/16
<i>H S P</i>	0	1000	50	3104	16#2001/5
<i>L C r</i>	0	65535	-	3204	16#2002/5
<i>L F r</i>	-32767	+32767	0	8502	16#2037/3
<i>L t r</i>	0	15000	0	8505	16#2037/6
<i>L t r R</i>	0	15000	-	8559	16#2037/3C
<i>L S P</i>	0	16000	0	3105	16#2001/6
<i>D d t</i>	1	100	10	7081	16#2028/52
<i>D P L</i>	0 = (nO): Function inactive 1 = (YES): Tripping on OPF fault with freewheel stop. 2 = (OAC): No fault triggered		1	9611	16#2042/C
<i>P H r</i>	0 = (AbC): Forward 1 = (ACb): Reverse		0	13401	16#2068/2
<i>t r I</i>	0 = (nO): Not assigned (zero torque reference). 1 = (AI1): Analog input 2 = (AI2): Analog input 3 = (AI3): Analog input, if VW3A3202 I/O card has been inserted 4 = (AI4): Analog input, if VW3A3202 I/O card has been inserted 163 = (LCC): Graphic display terminal 164 = (Mdb): Integrated Modbus 167 = (CAn): Integrated CANopen 169 = (nEt): Communication card (if inserted) 170 = (APP): Controller Inside card (if inserted) 181 = (PI): Frequency input, if VW3A3202 I/O card has been inserted 182 = (PG): Encoder input, if encoder card has been inserted		2	9221	16#203E/16
<i>U L n</i>	0	65535	-	3207	16#2002/8
<i>W D 1</i>	50	500	200	20501	16#20AF/2
<i>W D 2</i>	-	-	-	20502	16#20AF/3
<i>W D 3</i>	-	-	-	20503	16#20AF/4
<i>W D 4</i>	-	-	-	20504	16#20AF/5
<i>W D 5</i>	-	-	-	20505	16#20AF/6
<i>W D 6</i>	-	-	-	20506	16#20AF/7

# Communication

Code	Low limit	High limit	Default value	Logic address	CANopen index
W07	-	-	-	20507	16#20AF/8
W08	-	-	-	20508	16#20AF/9
W09	1	500	50	20509	16#20AF/A
W10	1	500	50	20510	16#20AF/B
W11	0 = (nO) 1 = (YES)		0	20511	16#20AF/C
W12	1	900	5	20512	16#20AF/D
W13	1	900	5	20513	16#20AF/E
W14	200	480	415	20514	16#20AF/F
W15	1	15000	-	20515	16#20AF/10
W16	1	500	50	20516	16#20AF/11
W17	1	99	30	20517	16#20AF/12
W18	0	15000	0	20518	16#20AF/13
W19	0	15000	According to the range (1)	20519	16#20AF/14
W20	0	100	100	20520	16#20AF/15
W21	0	1000	10	20521	16#20AF/16
W22	0	1000	100	20522	16#20AF/17
W23	0	100	15	20523	16#20AF/18
W24	0 = (LO) 1 = (HIG)		0	20524	16#20AF/19
W25	0 = (nO) 1 = (YES)		0	20525	16#20AF/1A
W26	0 = (nO) 1 = (YES)		1	20526	16#20AF/1B

(1) See table with factory setting for W19 page [18](#).

# Maintenance

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## Servicing

The Altivar 71 does not require any preventive maintenance. It is nevertheless advisable to perform the following regularly:

- Check the condition and tightness of the connections.
- Ensure that the temperature around the unit remains at an acceptable level and that ventilation is effective (average service life of fans: 3 to 5 years, depending on the operating conditions).
- Remove any dust from the drive.

## Assistance with maintenance, fault display

If a problem arises during setup or operation, first check that the recommendations relating to the environment, mounting and connections have been observed.

The first fault detected is saved and displayed, and the drive locks.

The drive switching to fault mode can be indicated remotely via a logic output or a relay, which can be configured in the [\[1.4 INPUTS / OUTPUTS CFG\] \(I-O-\)](#) menu, see, for example, [\[R1 CONFIGURATION\] \(r1-\)](#).

## Menu [\[1.9 DIAGNOSTICS\]](#) or menu [\[1.14 CONCAST\]](#)

This menu displays faults and their cause in plain text and can be used to carry out tests.

## Clearing the fault

Disconnect the drive power supply in the event of a non-resettable fault.

Wait for the display to disappear completely.

Find the cause of the fault in order to correct it.

The drive is unlocked after a fault:

- By switching off the drive until the display disappears completely, then switching on again
- Automatically in the scenarios described for the [\[AUTOMATIC RESTART\] \(Atr-\)](#) function.
- By means of a logic input or control bit assigned to the [\[FAULT RESET\] \(rSt-\)](#) function.
- By pressing the STOP/RESET button on the graphic display terminal

## Menu [\[1.2 MONITORING\] \(SUP-\)](#):

This is used to prevent and find the causes of faults by displaying the drive state and its current values. It can be accessed with the integrated display terminal.

## Spares and repairs:

Consult Schneider Electric product support.

# Faults - Causes - Remedies

## Drive does not start, no fault displayed

- If the display does not light up, check the power supply to the drive.
- The assignment of the "Fast stop" or "Freewheel" functions will prevent the drive starting if the corresponding logic inputs are not powered up. The ATV71 then displays [Freewheel] (nSt) in freewheel stop and [Fast stop] (FSt) in fast stop. This is normal since these functions are active at zero so that the drive will be stopped safely if there is a wire break.
- Make sure that the run command input or inputs are activated in accordance with the selected control mode ([2/3 wire control] (tCC) 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 communication bus, when the power supply is connected, the drive will display [Freewheel] (nSt) and remain in stop mode until the communication bus sends a command.

## Faults, which cannot be reset automatically

The cause of the fault must be removed before resetting by turning off and then back on.

AnF, brF, ECF, EnF, SOF, SPF and tnF faults can also be reset remotely by means of a logic input or control bit ([Fault reset] (rSF) parameter).

AnF, EnF, InFA, InFb, SOF, SPF, and tnF faults can be inhibited and cleared remotely by means of a logic input or control bit ([Fault inhibit assign.] (InH) parameter).

Fault	Name	Probable cause	Remedy
A I 2 F	[AI2 input]	<ul style="list-style-type: none"> <li>• Non-conforming signal on analog input AI2</li> </ul>	<ul style="list-style-type: none"> <li>• Check the wiring of analog input AI2 and the value of the signal.</li> </ul>
A n F	[Load slipping]	<ul style="list-style-type: none"> <li>• The encoder speed feedback does not match the reference</li> </ul>	<ul style="list-style-type: none"> <li>• Check the coil, gain and stability parameters.</li> <li>• Add a braking resistor.</li> <li>• Check the size of the coil/drive/load.</li> <li>• Check the encoder's mechanical coupling and its wiring.</li> </ul>
b D F	[DBR overload]	<ul style="list-style-type: none"> <li>• The braking resistor is under excessive stress</li> </ul>	<ul style="list-style-type: none"> <li>• Check the size of the resistor and wait for it to cool down</li> <li>• Check the [DB Resistor Power] (brP) and [DB Resistor value] (brU) parameters.</li> </ul>
b r F	[Brake feedback]	<ul style="list-style-type: none"> <li>• The brake feedback contact does not match the brake logic control</li> <li>• The brake does not stop the coil quickly enough (detected by measuring the speed on the "Pulse input" input).</li> </ul>	<ul style="list-style-type: none"> <li>• Check the feedback circuit and the brake logic control circuit</li> <li>• Check the mechanical state of the brake</li> <li>• Check the brake linings</li> </ul>
b U F	[DB unit sh. Circuit]	<ul style="list-style-type: none"> <li>• Short-circuit output from braking unit</li> <li>• Braking unit not connected</li> </ul>	<ul style="list-style-type: none"> <li>• Check the wiring of the braking unit and the resistor.</li> <li>• Check the braking resistor</li> <li>• The monitoring of this fault must be disabled by the [Brake res. fault Mgt.] (bUb) parameter if there is no resistor or braking unit connected to the drive.</li> </ul>
C r F 1	[Precharge]	<ul style="list-style-type: none"> <li>• Charging relay control fault or charging resistor damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Turn the drive off and then back on again</li> <li>• Check the internal connections</li> </ul>
C r F 2	[Thyr. soft charge]	<ul style="list-style-type: none"> <li>• DC bus charging fault (thyristors)</li> </ul>	<ul style="list-style-type: none"> <li>• Inspect/repair the drive</li> </ul>
E C F	[Encoder coupling]	<ul style="list-style-type: none"> <li>• Break in encoder's mechanical coupling</li> </ul>	<ul style="list-style-type: none"> <li>• Check the encoder's mechanical coupling</li> </ul>
E E F 1	[Control Eeprom]	<ul style="list-style-type: none"> <li>• Internal memory fault, control card</li> </ul>	<ul style="list-style-type: none"> <li>• Check the environment (electromagnetic compatibility)</li> <li>• Turn off, reset, return to factory settings</li> </ul>
E E F 2	[Power Eeprom]	<ul style="list-style-type: none"> <li>• Internal memory fault, power card</li> </ul>	<ul style="list-style-type: none"> <li>• Inspect/repair the drive</li> </ul>
E n F	[Encoder]	<ul style="list-style-type: none"> <li>• Encoder feedback fault</li> </ul>	<ul style="list-style-type: none"> <li>• Check [Number of pulses] (PGI) and [Encoder type] (EnS).</li> <li>• Check that the encoder's mechanical and electrical operation, its power supply and connections are all correct</li> <li>• If necessary, reverse the direction of coil rotation ([Output Ph rotation] (PHr) parameter) or the encoder signals</li> </ul>
F C F 1	[Out. contact. stuck]	<ul style="list-style-type: none"> <li>• The output contactor remains closed although the opening conditions have been met</li> </ul>	<ul style="list-style-type: none"> <li>• Check the contactor and its wiring</li> <li>• Check the feedback circuit</li> </ul>

# Faults - Causes - Remedies

## Faults, which cannot be reset automatically (continued)

Fault	Name	Probable cause	Remedy
<b>H d F</b>	[IGBT desaturation]	<ul style="list-style-type: none"> <li>Short-circuit or grounding at the drive output</li> </ul>	<ul style="list-style-type: none"> <li>Check the cables connecting the drive to the coil, and the coil insulation.</li> <li>Perform the diagnostic tests via the <a href="#">[1.9 DIAGNOSTICS]</a> menu.</li> </ul>
<b>IL F</b>	[internal com. link]	<ul style="list-style-type: none"> <li>Communication fault between option card and drive</li> </ul>	<ul style="list-style-type: none"> <li>Check the environment (electromagnetic compatibility)</li> <li>Check the connections</li> <li>Check that no more than 2 option cards (max. permitted) have been installed on the drive</li> <li>Replace the option card</li> <li>Inspect/repair the drive</li> </ul>
<b>I n F 1</b>	[Rating error]	<ul style="list-style-type: none"> <li>The power card is different from the card stored</li> </ul>	<ul style="list-style-type: none"> <li>Check the reference of the power card</li> </ul>
<b>I n F 2</b>	[Incompatible PB]	<ul style="list-style-type: none"> <li>The power card is incompatible with the control card</li> </ul>	<ul style="list-style-type: none"> <li>Check the reference of the power card and its compatibility.</li> </ul>
<b>I n F 3</b>	[Internal serial link]	<ul style="list-style-type: none"> <li>Communication fault between the internal cards</li> </ul>	<ul style="list-style-type: none"> <li>Check the internal connections</li> <li>Inspect/repair the drive</li> </ul>
<b>I n F 4</b>	[Internal-mftg zone]	<ul style="list-style-type: none"> <li>Internal data inconsistent</li> </ul>	<ul style="list-style-type: none"> <li>Recalibrate the drive (performed by Schneider Electric Product Support).</li> </ul>
<b>I n F 6</b>	[Internal - fault option]	<ul style="list-style-type: none"> <li>The option installed in the drive is not recognized</li> </ul>	<ul style="list-style-type: none"> <li>Check the reference and compatibility of the option.</li> </ul>
<b>I n F 7</b>	[Internal-hard init.]	<ul style="list-style-type: none"> <li>Initialization of the drive is incomplete</li> </ul>	<ul style="list-style-type: none"> <li>Turn off and reset.</li> </ul>
<b>I n F 8</b>	[Internal-ctrl supply]	<ul style="list-style-type: none"> <li>The control power supply is incorrect</li> </ul>	<ul style="list-style-type: none"> <li>Check the control section power supply</li> </ul>
<b>I n F 9</b>	[Internal- I measure]	<ul style="list-style-type: none"> <li>The current measurements are incorrect</li> </ul>	<ul style="list-style-type: none"> <li>Replace the current sensors or the power card.</li> <li>Inspect/repair the drive</li> </ul>
<b>I n F A</b>	[Internal-mains circuit]	<ul style="list-style-type: none"> <li>The input stage is not operating correctly</li> </ul>	<ul style="list-style-type: none"> <li>Perform the diagnostic tests via the <a href="#">[1.9 DIAGNOSTICS]</a> menu.</li> <li>Inspect/repair the drive</li> </ul>
<b>I n F b</b>	[Internal- th. sensor]	<ul style="list-style-type: none"> <li>The drive temperature sensor is not operating correctly</li> <li>The braking unit's temperature sensor is not operating correctly.</li> </ul>	<ul style="list-style-type: none"> <li>Replace the drive temperature sensor</li> <li>Inspect/repair the drive</li> <li>Replace the braking unit's temperature sensor</li> <li>Inspect/repair the braking unit</li> <li>The monitoring of this fault must be disabled by the <a href="#">[Brake res. fault Mgt.] (bUb)</a> parameter if there is no braking unit connected to the drive.</li> </ul>
<b>I n F C</b>	[Internal-time meas.]	<ul style="list-style-type: none"> <li>Fault on the electronic time measurement component</li> </ul>	<ul style="list-style-type: none"> <li>Inspect/repair the drive</li> </ul>
<b>I n F E</b>	[internal- CPU ]	<ul style="list-style-type: none"> <li>Internal microprocessor fault</li> </ul>	<ul style="list-style-type: none"> <li>Turn off and reset. Inspect/repair the drive.</li> </ul>
<b>O C F</b>	[Overcurrent]	<ul style="list-style-type: none"> <li>Parameters in the <a href="#">[SETTINGS] (SEt-)</a> and <a href="#">[1.4 MOTOR CONTROL] (drC-)</a> menus are not correct.</li> <li>Inertia or load too high</li> <li>Mechanical locking</li> </ul>	<ul style="list-style-type: none"> <li>Check the parameters.</li> <li>Check the size of the coil/drive/load.</li> <li>Check the state of the mechanism.</li> </ul>
<b>P r F</b>	[Power removal]	<ul style="list-style-type: none"> <li>Fault with the drive's "Power removal" safety function</li> </ul>	<ul style="list-style-type: none"> <li>Inspect/repair the drive</li> </ul>
<b>S C F 1</b>	[Motor short circuit]	<ul style="list-style-type: none"> <li>Short-circuit or grounding at the drive output</li> </ul>	<ul style="list-style-type: none"> <li>Check the cables connecting the drive to the coil, and the coil insulation.</li> <li>Perform the diagnostic tests via the <a href="#">[1.9 DIAGNOSTICS]</a> menu.</li> </ul>
<b>S C F 2</b>	[Impedant sh. circuit]	<ul style="list-style-type: none"> <li>Significant earth leakage current at the drive output if several coils are connected in parallel</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the switching frequency.</li> <li>Connect chokes in series with the coil.</li> </ul>
<b>S C F 3</b>	[Ground short circuit]		
<b>S O F</b>	[Overspeed]	<ul style="list-style-type: none"> <li>Instability or driving load too high</li> </ul>	<ul style="list-style-type: none"> <li>Check the coil, gain and stability parameters.</li> <li>Add a braking resistor.</li> <li>Check the size of the coil/drive/load.</li> <li>Check the parameters settings for the <a href="#">[FREQUENCY METER] (FqF-)</a> function, if it is configured</li> </ul>



## Faults - Causes - Remedies

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### Faults, which cannot be reset automatically (continued)

Fault	Name	Probable cause	Remedy
<i>S P F</i>	[Speed fdbck loss]	<ul style="list-style-type: none"><li>Encoder feedback signal missing</li><li>Signal on "Pulse input" missing, if the input is used for speed measurement</li></ul>	<ul style="list-style-type: none"><li>Check the wiring between the encoder and the drive</li><li>Check the encoder</li><li>Check the wiring of the input cable and the detector used</li></ul>
<i>E n F</i>	[Auto-tuning]	<ul style="list-style-type: none"><li>Special coil or coil whose power is not suitable for the drive</li><li>Coil not connected to the drive</li></ul>	<ul style="list-style-type: none"><li>Check that the coil/drive are compatible</li><li>Check that the coil is present during auto-tuning</li><li>If an output contactor is being used, close it during auto-tuning</li></ul>

## Faults - Causes - Remedies

### Faults that can be reset with the automatic restart function, after the cause has disappeared

These faults can also be reset by turning on and off or by means of a logic input or control bit ([Fault reset] (rSF) parameter). APF, CnF, COF, EPF1, EPF2, FCF2, LFF2, LFF3, LFF4, ObF, OHF, OLF, OPF1, OPF2, OSF, OtF1, OtF2, OtFL, PHF, PtF1, PtF2, PtFL, SLF1, SLF2, SLF3, SrF, SSF and tJF faults can be inhibited and cleared remotely by means of a logic input or control bit ([Fault inhibit assign.] (InH) parameter).

Fault	Name	Probable cause	Remedy
<b>APF</b>	[Application fault]	<ul style="list-style-type: none"> <li>Controller Inside card fault</li> </ul>	<ul style="list-style-type: none"> <li>Please refer to the card documentation</li> </ul>
<b>bLF</b>	[Brake control]	<ul style="list-style-type: none"> <li>Brake release current not reached</li> <li>Brake engage frequency threshold [Brake engage freq] (bEn) only regulated when brake logic control is assigned</li> </ul>	<ul style="list-style-type: none"> <li>Check the drive/coil connection</li> <li>Check the coil windings</li> <li>Check the [Brake release I FW] (lbr) and [Brake release I Rev] (lrd) settings.</li> <li>Apply the recommended settings for [Brake engage freq] (bEn).</li> </ul>
<b>CnF</b>	[Com. network]	<ul style="list-style-type: none"> <li>Communication fault on communication card</li> </ul>	<ul style="list-style-type: none"> <li>Check the environment (electromagnetic compatibility)</li> <li>Check the wiring.</li> <li>Check the time-out</li> <li>Replace the option card</li> <li>Inspect/repair the drive</li> </ul>
<b>COF</b>	[CANopen com.]	<ul style="list-style-type: none"> <li>Interruption in communication on the CANopen bus</li> </ul>	<ul style="list-style-type: none"> <li>Check the communication bus.</li> <li>Check the time-out</li> <li>Refer to the CANopen User's Manual</li> </ul>
<b>EPF1</b>	[External fit-LI/Bit]	<ul style="list-style-type: none"> <li>Fault triggered by an external device, depending on user</li> </ul>	<ul style="list-style-type: none"> <li>Check the device which caused the fault, and reset</li> </ul>
<b>EPF2</b>	[External fault com.]	<ul style="list-style-type: none"> <li>Fault triggered by a communication network</li> </ul>	<ul style="list-style-type: none"> <li>Check for the cause of the fault and reset</li> </ul>
<b>FCF2</b>	[Out. contact. open.]	<ul style="list-style-type: none"> <li>The output contactor remains open although the closing conditions have been met</li> </ul>	<ul style="list-style-type: none"> <li>Check the contactor and its wiring</li> <li>Check the feedback circuit</li> </ul>
<b>LcF</b>	[input contactor]	<ul style="list-style-type: none"> <li>The drive is not turned on even though [Mains V. time out] (LCt) has elapsed.</li> </ul>	<ul style="list-style-type: none"> <li>Check the contactor and its wiring</li> <li>Check the time-out</li> <li>Check the line/contactor/drive connection</li> </ul>
<b>LFF2</b>	[AI2 4-20mA loss]	<ul style="list-style-type: none"> <li>Loss of the 4-20 mA reference on analog input AI2, AI3 or AI4</li> </ul>	<ul style="list-style-type: none"> <li>Check the connection on the analog inputs.</li> </ul>
<b>LFF3</b>	[AI3 4-20mA loss]		
<b>LFF4</b>	[AI4 4-20mA loss]		
<b>ObF</b>	[Overbraking]		
<b>OHF</b>	[Drive overheat]	<ul style="list-style-type: none"> <li>Drive temperature too high</li> </ul>	<ul style="list-style-type: none"> <li>Check the coil load, the drive ventilation and the ambient temperature. Wait for the drive to cool down before restarting.</li> </ul>
<b>OLF</b>	[Motor overload]	<ul style="list-style-type: none"> <li>Triggered by excessive coil current</li> </ul>	<ul style="list-style-type: none"> <li>Check the setting of the coil thermal protection, check the coil load. Wait for the drive to cool down before restarting.</li> </ul>
<b>OPF1</b>	[1 output phase loss]	<ul style="list-style-type: none"> <li>Loss of one phase at drive output</li> </ul>	<ul style="list-style-type: none"> <li>Check the connections from the drive to the coil</li> </ul>

# Faults - Causes - Remedies

## Faults that can be reset with the automatic restart function, after the cause has disappeared (continued)

Fault	Name	Probable cause	Remedy
<b>DPF2</b>	[3 motor phase loss]	<ul style="list-style-type: none"> <li>Coil not connected or coil power too low</li> <li>Output contactor open</li> <li>Instantaneous instability in the coil current</li> </ul>	<ul style="list-style-type: none"> <li>Check the connections from the drive to the coil</li> <li>If an output contactor is being used, parameterize [Output Phase Loss] (OPL) = [Output cut] (OAC).</li> <li>Test on a low power coil or without a coil: In factory settings mode, coil 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 coil with the same rating as the drive (in particular for high power drives), deactivate coil phase loss detection [Output Phase Loss] (OPL) = [No] (nO)</li> <li>Check and optimize the following parameters: [IR compensation] (UFR), [Rated motor volt.] (UnS) and [Rated mot. current] (nCr) and perform [Auto-tuning] (tUn).</li> </ul>
<b>DSF</b>	[Mains overvoltage]	<ul style="list-style-type: none"> <li>Line voltage too high</li> <li>Disturbed mains supply</li> </ul>	<ul style="list-style-type: none"> <li>Check the line voltage</li> </ul>
<b>DEF1</b>	[PTC1 overheat]	<ul style="list-style-type: none"> <li>Overheating of the PTC1 probes detected</li> </ul>	<ul style="list-style-type: none"> <li>Check the coil load and coil size.</li> <li>Check the coil ventilation.</li> <li>Wait for the coil to cool before restarting</li> <li>Check the type and state of the PTC probes</li> </ul>
<b>DEF2</b>	[PTC2 overheat]	<ul style="list-style-type: none"> <li>Overheating of the PTC2 probes detected</li> </ul>	
<b>DEFL</b>	[LI6=PTC overheat]	<ul style="list-style-type: none"> <li>Overheating of PTC probes detected on input LI6</li> </ul>	
<b>PEF1</b>	[PTC1 probe]	<ul style="list-style-type: none"> <li>PTC1 probes open or short-circuited</li> </ul>	<ul style="list-style-type: none"> <li>Check the PTC probes and the wiring between them and the coil/drive</li> </ul>
<b>PEF2</b>	[PTC2 probe]	<ul style="list-style-type: none"> <li>PTC2 probes open or short-circuited</li> </ul>	
<b>PEFL</b>	[LI6=PTC probe]	<ul style="list-style-type: none"> <li>PTC probes on input LI6 open or short-circuited</li> </ul>	
<b>SCF4</b>	[IGBT short circuit]	<ul style="list-style-type: none"> <li>Power component fault</li> </ul>	<ul style="list-style-type: none"> <li>Perform a test via the [1.9 DIAGNOSTICS] menu.</li> <li>Inspect/repair the drive</li> </ul>
<b>SCF5</b>	[Motor short circuit]	<ul style="list-style-type: none"> <li>Short-circuit at drive output</li> </ul>	<ul style="list-style-type: none"> <li>Check the cables connecting the drive to the coil, and the coil's insulation</li> <li>Perform tests via the [1.9 DIAGNOSTICS] menu.</li> <li>Inspect/repair the drive</li> </ul>
<b>SLF1</b>	[Modbus com.]	<ul style="list-style-type: none"> <li>Interruption in communication on the Modbus bus</li> </ul>	<ul style="list-style-type: none"> <li>Check the communication bus.</li> <li>Check the time-out</li> <li>Refer to the Modbus User's Manual</li> </ul>
<b>SLF2</b>	[PowerSuite com.]	<ul style="list-style-type: none"> <li>Fault communicating with PowerSuite</li> </ul>	<ul style="list-style-type: none"> <li>Check the PowerSuite connecting cable.</li> <li>Check the time-out</li> </ul>
<b>SLF3</b>	[HMI com.]	<ul style="list-style-type: none"> <li>Fault communicating with the graphic display terminal</li> </ul>	<ul style="list-style-type: none"> <li>Check the terminal connection</li> <li>Check the time-out</li> </ul>
<b>SrF</b>	[TORQUE TIME OUT FLT]	<ul style="list-style-type: none"> <li>The time-out of the torque control function is attained</li> </ul>	<ul style="list-style-type: none"> <li>Check the function's settings</li> <li>Check the state of the mechanism</li> </ul>
<b>SSF</b>	[Torque/current lim]	<ul style="list-style-type: none"> <li>Switch to torque limitation</li> </ul>	<ul style="list-style-type: none"> <li>Check if there are any mechanical problems</li> <li>Check the parameters of [TORQUE LIMITATION] (tLA-) and the parameters of the [TORQUE OR I LIM. DETECT.] (tId-) fault).</li> </ul>
<b>EJF</b>	[IGBT overheat]	<ul style="list-style-type: none"> <li>Drive overheated</li> </ul>	<ul style="list-style-type: none"> <li>Check the size of the load/coil/drive.</li> <li>Reduce the switching frequency.</li> <li>Wait for the coil to cool before restarting</li> </ul>

# Faults - Causes - Remedies

## Faults that can be reset as soon as their causes disappear

The USF fault can be inhibited and cleared remotely by means of a logic input or control bit ([Fault inhibit assign.] (InH) parameter).

Fault	Name	Probable cause	Remedy
CFF	[Incorrect config.]	<ul style="list-style-type: none"> <li>Option card changed or removed</li> <li>Control card replaced by a control card configured on a drive with a different rating</li> <li>The current configuration is inconsistent</li> </ul>	<ul style="list-style-type: none"> <li>Check that there are no card errors.</li> <li>In the event of the option card being changed/removed deliberately, see the remarks below</li> <li>Check that there are no card errors.</li> <li>In the event of the control card being changed deliberately, see the remarks below</li> <li>Return to factory settings or retrieve the backup configuration, if it is valid.</li> </ul>
CFI	[Invalid config.]	<ul style="list-style-type: none"> <li>Invalid configuration</li> <li>The configuration loaded in the drive via the bus or communication network is inconsistent.</li> </ul>	<ul style="list-style-type: none"> <li>Check the configuration loaded previously.</li> <li>Load a compatible configuration</li> </ul>
dLF	[Dynamic load fault]	<ul style="list-style-type: none"> <li>Abnormal load variation</li> </ul>	<ul style="list-style-type: none"> <li>Check that the load is not blocked by an obstacle</li> <li>Removal of a run command causes a reset</li> </ul>
HCF	[Cards pairing]	<ul style="list-style-type: none"> <li>The [CARDS PAIRING] (PPI-) function, has been configured and a drive card has been changed</li> </ul>	<ul style="list-style-type: none"> <li>In the event of a card error, reinsert the original card</li> <li>Confirm the configuration by entering the [Pairing password] (PPI) if the card was changed deliberately</li> </ul>
PHF	[Input phase loss]	<ul style="list-style-type: none"> <li>Drive incorrectly supplied or a fuse blown</li> <li>Failure of one phase</li> <li>3-phase ATV71 used on a single-phase line supply</li> <li>Unbalanced load</li> </ul> <p>This protection only operates with the drive on load</p>	<ul style="list-style-type: none"> <li>Check the power connection and the fuses.</li> <li>Use a 3-phase line supply.</li> <li>Disable the fault by [Input phase loss] (IPL) = [No] (nO).</li> </ul>
USF	[Undervoltage]	<ul style="list-style-type: none"> <li>Line supply too low</li> <li>Transient voltage dip</li> </ul>	<ul style="list-style-type: none"> <li>Check the voltage and the parameters of [UNDERVOLTAGE MGT] (USb-)</li> </ul>

### Option card changed or removed

When an option card is removed or replaced by another, the drive locks in [Incorrect config.] (CFF) fault mode on power-up. If the card has been deliberately changed or removed, the fault can be cleared by pressing the ENT key twice, which **causes the factory settings to be restored** for the parameter groups affected by the card. These are as follows:

#### Card replaced by a card of the same type

- I/O cards: [Drive menu] (drM)
- Encoder cards: [Drive menu] (drM)
- Communication cards: only the parameters that are specific to communication cards
- Controller Inside cards: [Prog. card menu] (PLC)

#### Card removed (or replaced by a different type of card)

- I/O card: [Drive menu] (drM)
- Encoder card: [Drive menu] (drM)
- Communication card: [Drive menu] (drM) and parameters specific to communication cards
- Controller Inside card: [Drive menu] (drM) and [Prog. card menu] (PLC)

### Control card changed

When a control card is replaced by a control card configured on a drive with a different rating, the drive locks in [Incorrect config.] (CFF) fault mode on power-up. If the card has been deliberately changed, the fault can be cleared by pressing the ENT key twice, which **causes all the factory settings to be restored**.



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