

TeSys model U

Motor starters - open version

Catalogue
May

05



- 1** – TeSys model U
Motor starters - open version
- 2** – Altistart U01 soft starters and TeSys model U



1 - TeSys model U

Motor starters - open version

Selection guide	pages 1/2 and 1/3
■ Presentation	pages 1/4 to 1/7
■ Application examples	pages 1/8 to 1/13
■ Reversing and non-reversing powers bases	pages 1/14 and 1/15
■ Add-on contact blocks and auxiliary contact modules	page 1/16
■ Power connection pre-wired system	page 1/17
■ Control units and multifunction control units	pages 1/18 to 1/21
■ PowerSuite software workshop	pages 1/22 to 1/25
■ Model U controllers	pages 1/26 to 1/29
■ Parallel wiring module and pre-wired coil connection components	pages 1/30 and 1/31
■ Model U starter-controller	pages 1/32 and 1/33
■ Modbus communication module and pre-wired coil connection components	pages 1/34 and 1/35
■ Communication gateways LUF P	pages 1/36 and 1/37
■ Characteristics	pages 1/38 to 1/45
■ Curves	pages 1/46 to 1/49
■ Selection guide	pages 1/50 and 1/51
■ Dimensions	pages 1/52 and 1/53
■ Schemes	pages 1/54 to 1/61
■ Basic schemes	pages 1/62 to 1/65

Function performed		Function not performed	
Selectable overload class			
Detection of overtorque, no-load running, long starting times			
Earth fault protection (equipment protection only)			
Protection against phase imbalance			
Protection against phase loss			
Fault differentiation			With contact block
Reset on thermal overload		Manual or automatic	Manual
Alarms (thermal overload, overcurrent, ...)			
Indication of motor load			
Protection function parameter entry			
"Log" function, monitoring			
Remote motor starter status and commands via serial or parallel link			
Motor starter management via serial link (status, commands, selection and parameter entry for alarms, log, monitoring)			Modbus port built-in
Isolation function			
Protection against overloads and short-circuits			
Power at 400 V		0.06...75 kW	0.06...450 kW
With circuit-breaker		0.06...75 kW	0.06...450 kW
With fuses			0.06...110 kW

Magnetic circuit-breaker or fuses



Contactor



Thermal overload relay



Magnetic circuit-breaker or fuses



Contactor



Electronic thermal overload relay



Magnetic circuit-breaker or fuses



Contactor



Multifunction protection relay



Thermal magnetic circuit-breaker



Contactor



		With function module		Indication on front panel, processing by communication	
Manual		Remote or automatic with function module		Reset parameters can be set to manual or automatic	
		With function module		Indication on front panel, processing by communication	
		With function module		Indication on front panel, processing by communication	
				Indication on front panel, processing by communication	
With communication module or control splitter box	With AS-Interface or Modbus communication module	With AS-Interface or Modbus communication module (indication of motor load and thermal overload alarm only with Modbus communication module)			
	(1)	(1)		(1)	
				With Modbus communication module	
0.06...11 kW	0.06...15 kW	0.06...15 kW	16.5...450 kW 0.06...450 kW	0.06...15 kW	16.5...450 kW 0.06...450 kW

Quickfit solution



Starter-controller with standard control unit



Starter-controller with advanced control unit



Magnetic circuit-breaker or fuses



Contactor



Controller with advanced control unit



Starter-controller with multifunction control unit



Magnetic circuit-breaker or fuses



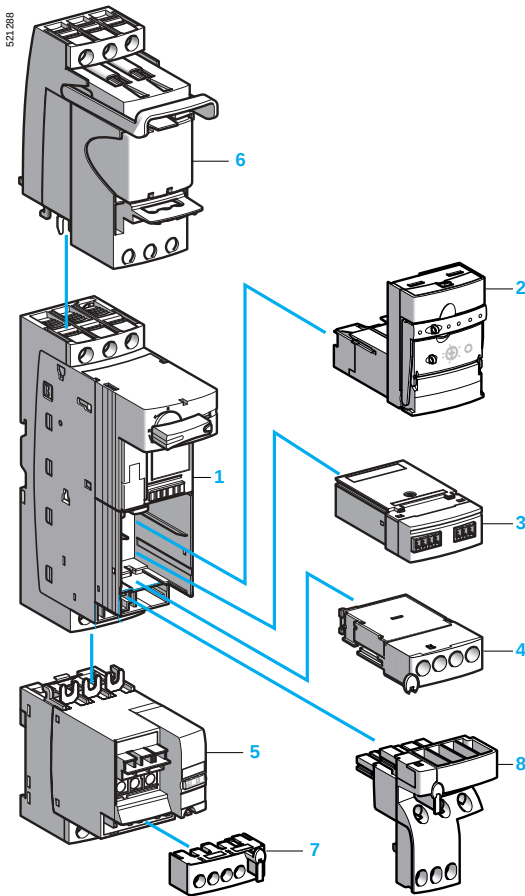
Contactor



Controller with multifunction control unit



(1) Parallel wiring module



Presentation

The TeSys model U starter controller is a D.O.L. starter (1) which performs the following functions:

- protection and control of single-phase or 3-phase motors:
 - breaking function,
 - overload and short-circuit protection,
 - thermal overload protection and power switching,
- control of the application:
 - protection function alarms,
 - application monitoring (running time, number of faults, motor current values, ...),
 - logs (last 5 faults saved, together with motor parameter values).

These functions can be added by selecting control units and function modules which simply clip into the power base. The product can therefore be customised at the last moment. Setting-up accessories simplify or completely eliminate wiring between components.

Basic starter-controller

Consists of a power base and a control unit.

Power base 1

Is independent of the control voltage and of the motor power.

It incorporates the breaking function with a breaking capacity of 50 kA at 400 V, total coordination (continuity of service) and the switching function.

- 2 ratings are available: 0...12 A and 0...32 A.
- Non-reversing (LUB) and reversing (LU2B).

Control units 2

These must be selected according to the control voltage, the power of the motor to be protected and the type of protection required.

- **Standard** control unit (LUCA): satisfies the basic protection requirements for motor starters: thermal overload and short-circuit (for details see page 1/5).
- **Advanced** control unit (LUCB, LUCC or LUCD): allows additional advanced functions such as alarm, fault differentiation, ... (for details see page 1/6).
- **Multifunction** control unit (LUCM): suitable for the most sophisticated control and protection requirements (for details see page 1/7).

The control units are interchangeable without rewiring and without using tools. They have a wide range of adjustment (range of 4) and low heat dissipation.

Control options

Function modules can be used to increase the functions of the starter-controller.

Function modules 3

Must be used with advanced control units.

4 types are available:

- thermal overload alarm (LUF W10),
 - thermal fault and manual reset (LUF DH11),
 - thermal fault and automatic or remote reset (LUF DA01 and LUF DA10),
 - indication of motor load (LUF V), which can also be used with the multifunction control unit.
- All alarm and fault information processed by these modules is available on digital contacts.

Communication modules 3

The information processed is exchanged:

- via a parallel bus:
 - parallel wiring module (LUF C00),
- via a serial bus:
 - AS-Interface module (ASILUF C5),
 - Modbus modules (LUL C031 and LUL C032).

They must be used in conjunction with a **24 V control unit and require a 24 V control voltage**. Connection to other protocols such as FIPIO, Profibus-DP and DeviceNet is possible via gateway modules (LUF P).

Auxiliary contact modules (LUFN) 3

3 possible configurations 2 N/O, 1 N/O + 1 N/C or 2 N/C.

Add-on contact blocks 4

Indicate the following status of power base: ready, fault and pole status.

Power options

Reverser block 5

Allows a non-reversing power base to be converted to reversing operation.

The reverser block (LU2M) is mounted directly beneath the power base without modifying the width of the product (45 mm). The reverser block LU6M is mounted separately from the power base when the height available is limited.

Limiter-disconnector LUA LB 6

This unit is mounted directly on the power base. It allows the breaking capacity to be increased up to 130 kA at 400 V.

Setting-up accessories

Plug-in terminal blocks 7

The control terminal blocks are of the plug-in type, so allowing wiring to be prepared away from the machine or the replacement of products without rewiring.

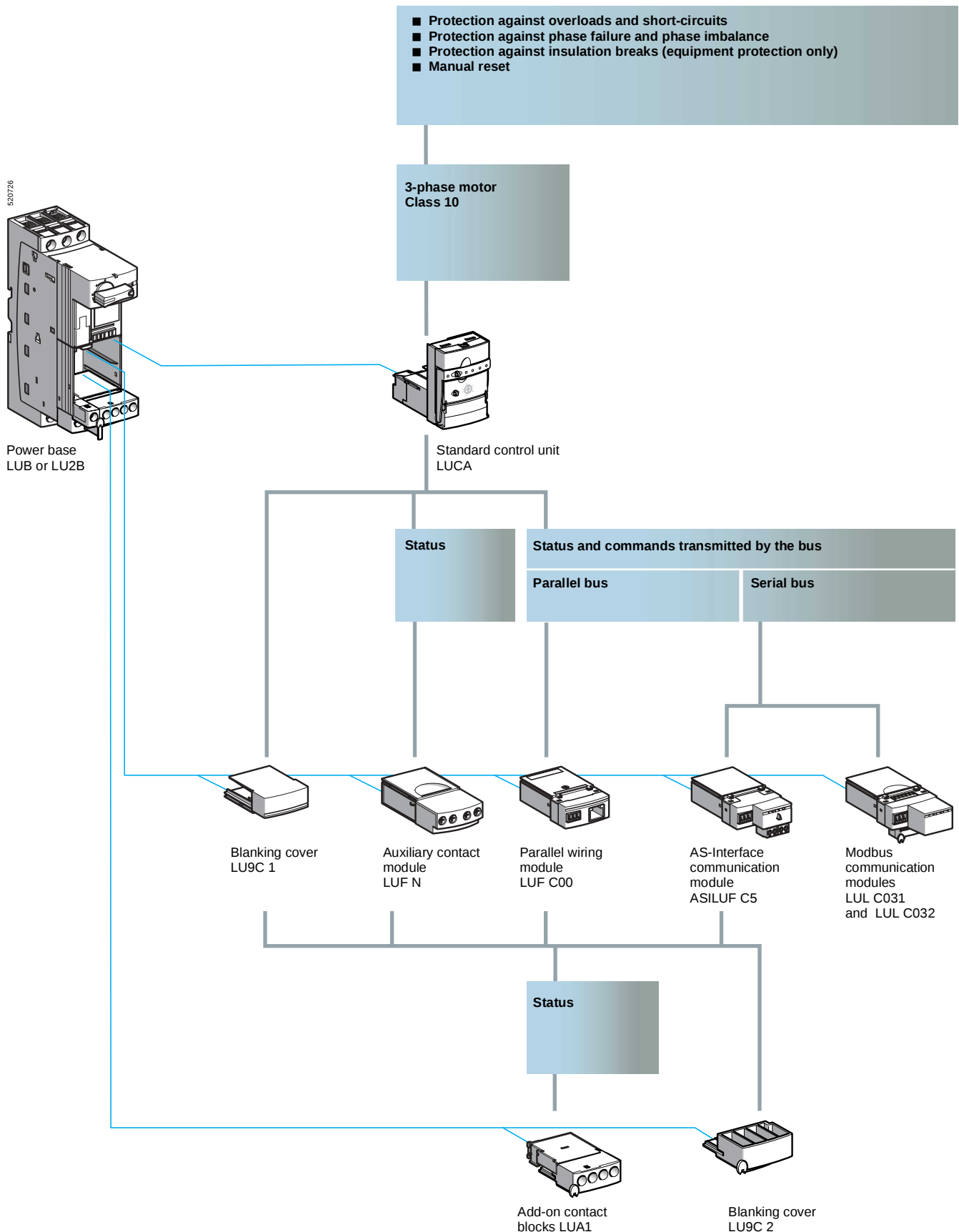
Control circuit pre wiring system 8

Numerous pre-wired accessories provide simple, clip-in connections (e.g. connection of reverser control terminals, ...

(1) For use with resistive and inductive loads. Control of d.c. or capacitive loads is not possible.

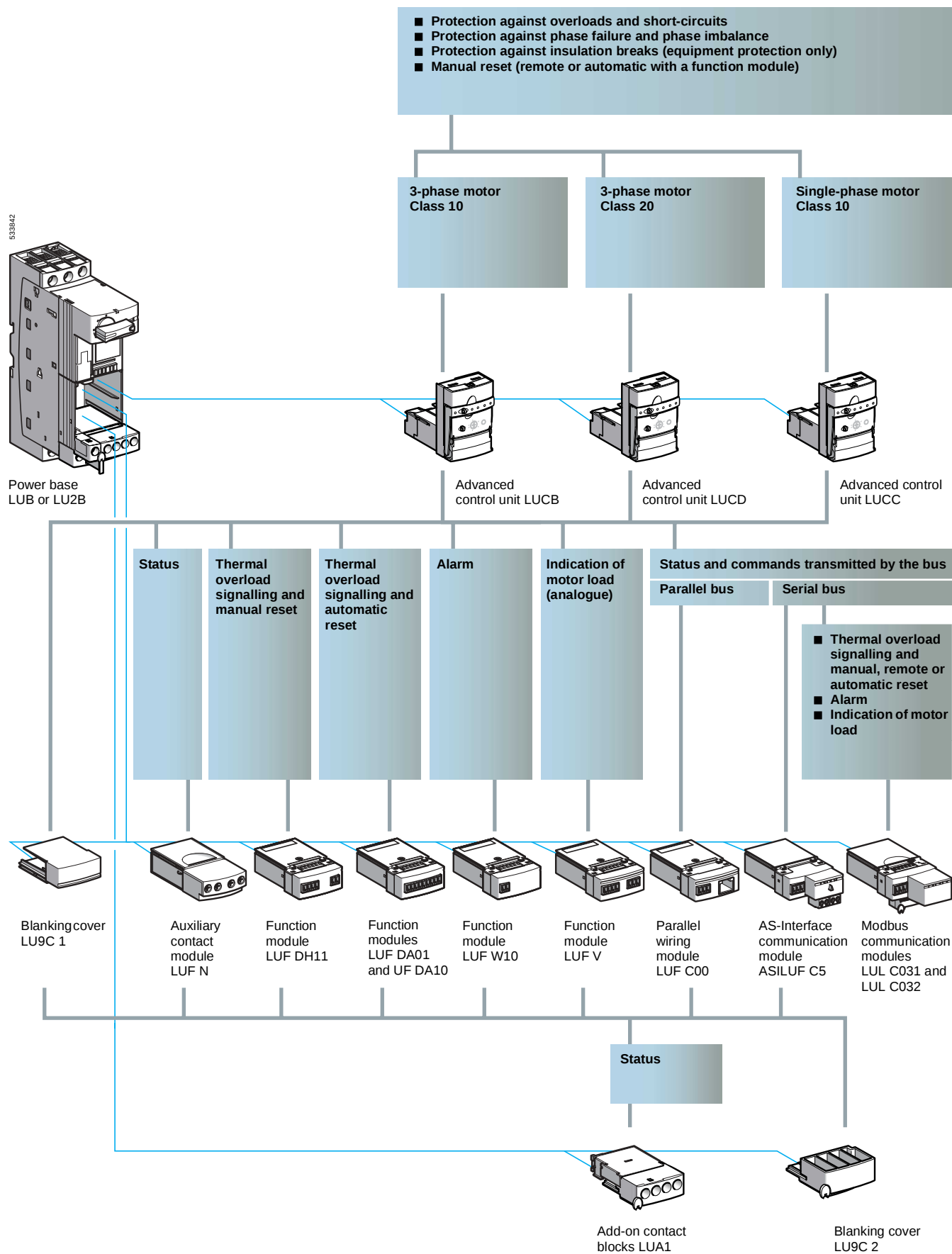
TeSys motor starters - open version

Model U starter-controller
with standard control unit



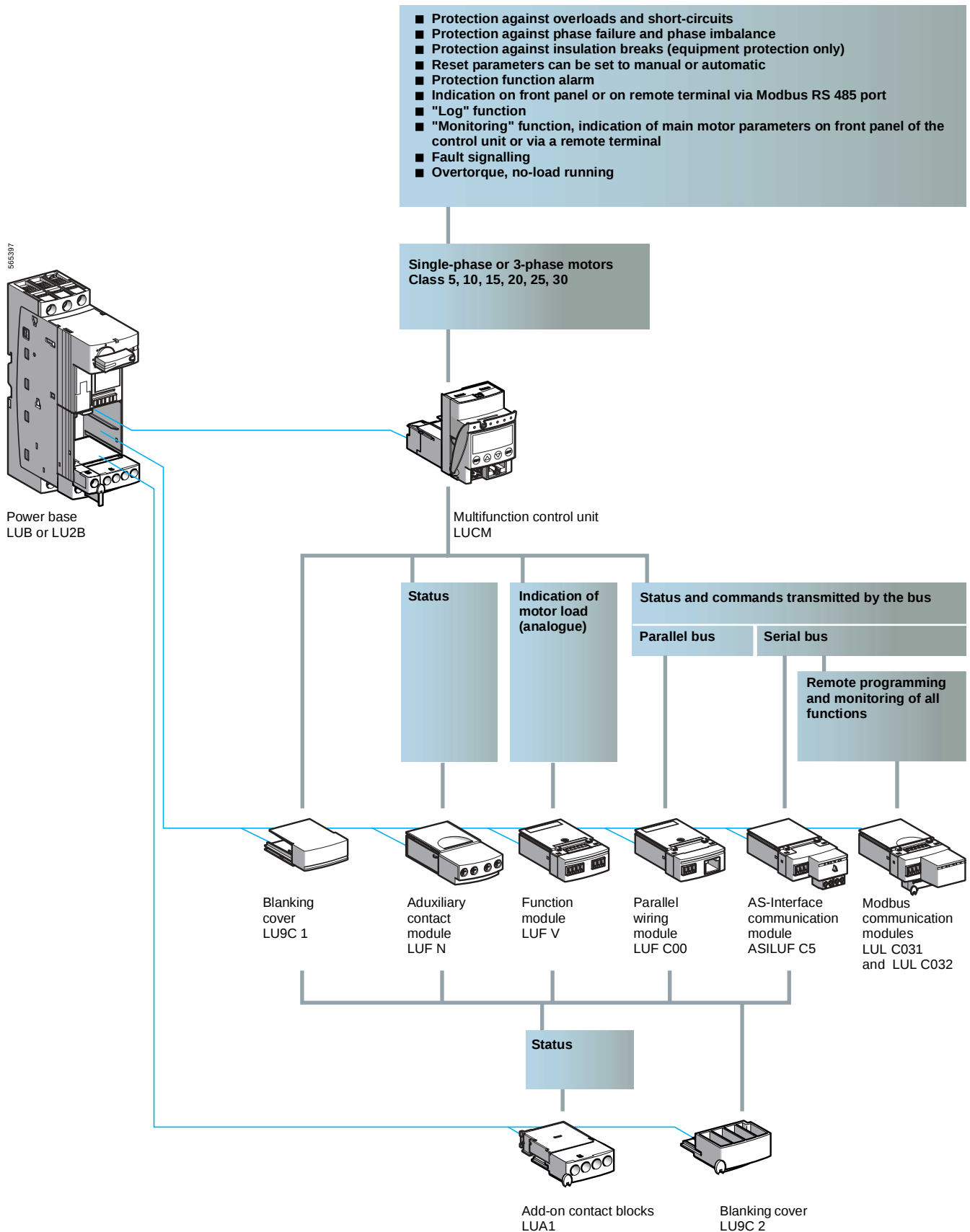
TeSys motor starters - open version

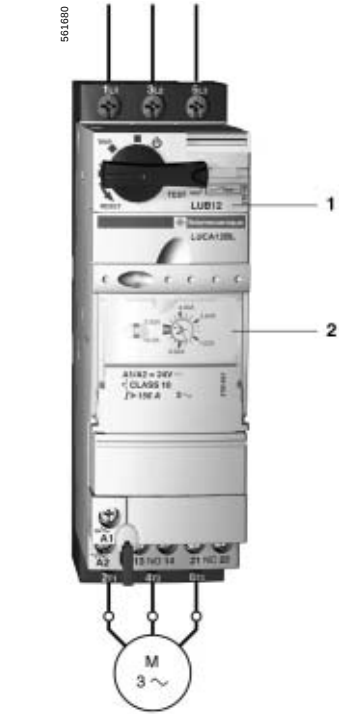
Model U starter-controller
with advanced control unit



TeSys motor starters - open version

Model U starter-controller
with multifunction control unit





Application

Starting and protection of a pump.

Operating conditions

- Power: 4 kW at 400 V.
- In: 9 A.
- Maximum of 10 class 10 starts per hour.
- Duty class S3.
- 3-wire control:
 - Start button (S2),
 - Stop button (S1),
- Control circuit voltage: ~ 230 V.

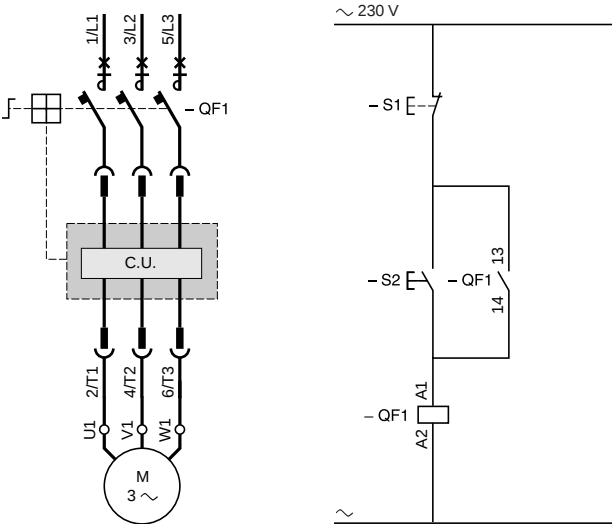
Products used

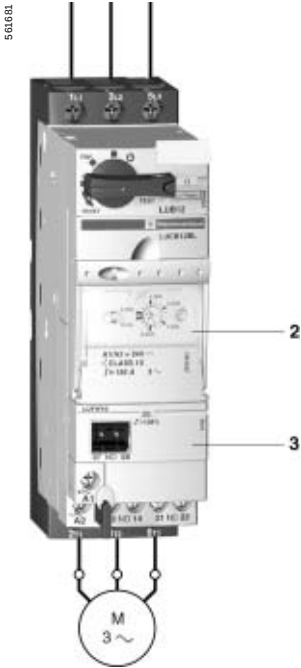
Products used	Item	Quantity	Reference	Page
Power base 12 A with screw clamp connections	1	1	LUB 12	1/14
Standard control unit	2	1	LUCA 12FU	1/19

Functions performed

- Short-circuit protection with level of protection of 50 kA at 400 V.
- Total coordination of protection devices conforming to EN 60947-6-2 (continuity of service) in case of a short-circuit.
- Electronic protection against thermal overloads with an adjustment range of 4.
- Load switching (2 million operating cycles in category AC-43 at In).
- Indication of motor status by N/C or N/O contact.
- Interlock between the motor starter control and the selector knob position; not possible to start the motor when the knob is in the OFF position.

Scheme





Application

Expansion of an existing installation for improved control of its operation.

Operating conditions

Monitor the status of the motor and obtain alarm signalling by a digital contact in order to improve operation of the pump and anticipate a complete stoppage due to thermal overload.

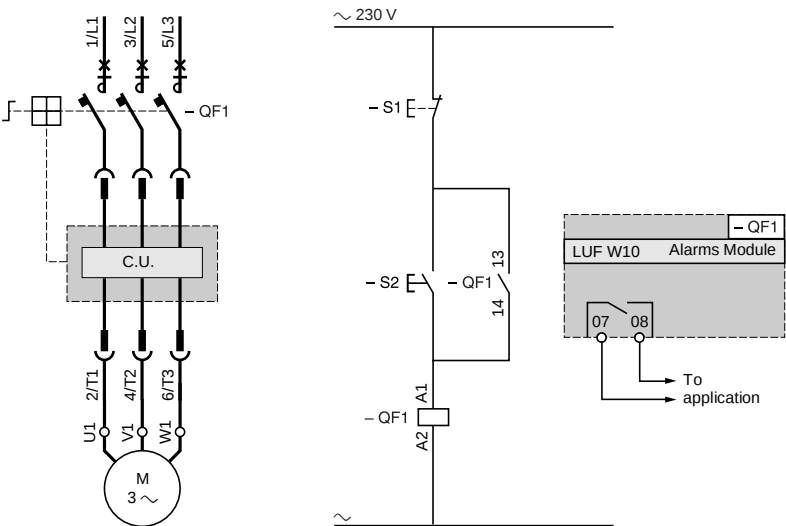
Additional products used

Products used	Item	Quantity	Reference	Page
Replace the standard control unit with an advanced control unit and insert a thermal overload alarm function module.				
Advanced control unit	2	1	LUCB 12FU	1/19
Alarm function module	3	1	LUF W10	1/21

Functions performed

- Alarm information is generated by the advanced control unit and is processed by the thermal overload alarm function module to make it usable.
- The advanced control unit includes a thermal trip Test button on its front panel.

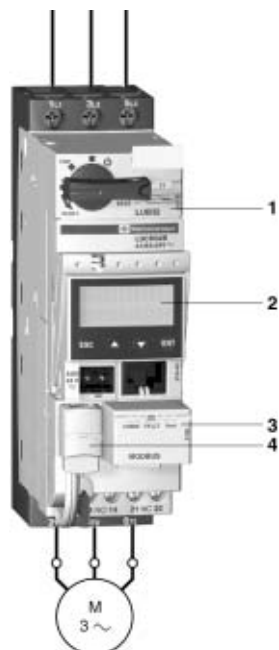
Scheme



Other versions

The advanced control unit can provide other functions, depending on the type of function modules used (instead of the LUF W module described above):

- thermal fault signalling with function modules LUF DA01, LUF DA10 or LUF DH11,
- indication of motor load with the function module LUF V2. This module delivers a 4-20 mA, analogue signal which is proportional to the average 3-phase current drawn by the motor. This allows the load current to be monitored and provides access to other application functions using this value, or to predictive or preventive maintenance possibilities (replacement of the motor before it breaks down).



Modbus profile IEC 64915		
Commands (Register 704)		Status (Register 455)
Forward running	Bit 0	Ready (available)
Reverse running	Bit 1	Poles closed
Reserved	Bit 2	Fault
Reset	Bit 3	Alarms
Reserved	Bit 4	Tripped
Connection test	Bit 5	Reserved reset enabled
Reserved	Bit 6	A1-A2 powered
Reserved	Bit 7	Motor running
Reserved	Bit 8	Motor current % (bit 0)
Reserved	Bit 9	Motor current % (bit 1)
Reserved	Bit 10	Motor current % (bit 2)
Reserved	Bit 11	Motor current % (bit 3)
Reserved 3-phase control	Bit 12	Motor current % (bit 4)
Reserved	Bit 13	Motor current % (bit 5)
Reserved	Bit 14	Reserved
Reserved	Bit 15	Motor starting

Application

Monitoring operation of a surface pump in a water treatment plant to avoid running empty, which could lead to destruction of the pump.

Operating conditions

- Power: 15 kW at 400 V.
- In: 28.5 A.
- Duty class S1.
- Control circuit voltage: $\sim$ 24 V.
- Control-command by PLC and serial link using the Modbus protocol.

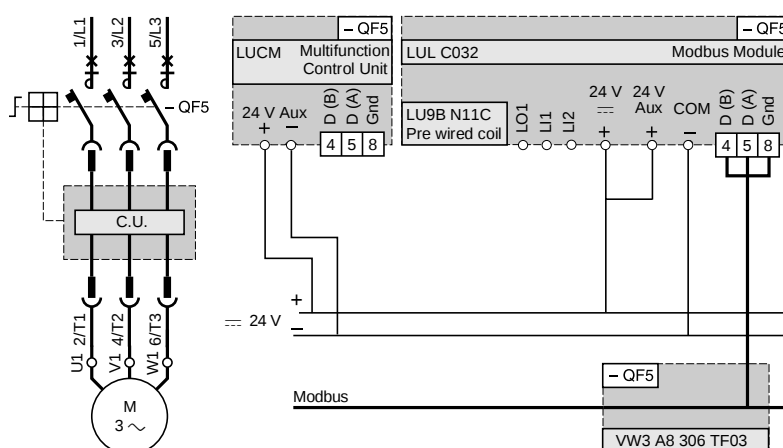
Products used

Products used	Item	Quantity	Reference	Page
Power base 32 A without connections	1	1	LUB 320	1/14
Multifunction control unit	2	1	LUCM 32BL	1/20
Modbus communication module	3	1	LUL C032	1/34
Pre-wired coil connection	4	1	LU9B N11C	1/35
Connection of communication module output terminals to the coil terminals				
Connection cable for connecting the communication module to the serial bus	—	1	VW3 A8 306 R●●	1/35
T-junction	—	1	VW3 A8 306 TF03	1/35

Functions performed

- Short-circuit protection with level of protection of 50 kA at 400V.
- Total coordination of protection devices conforming to EN 60947-6-2 (continuity of service) in case of a short-circuit.
- Electronic protection against thermal overloads with an adjustment range of 4.
- Load ing (1.5 million operating cycles in category AC-43 at In).
- Measurement of load current and detection of no-load running by the multifunction control unit.
- Interlock between the motor starter control and the selector knob position; not possible to start the motor when the knob is in the OFF position.
- No-load running or operation under load. To use this function, the following parameters must be entered:
 - trip: the answer yes/no enables or disables the function,
 - time before tripping: the time period during which the value of the current must be below the tripping threshold in order to cause tripping (adjustable from 1 to 200 s).
 - tripping threshold: value as a % of the load current ratio in relation to the setting current. If the ratio remains below this threshold for the time specified in the previous parameter, the product trips (adjustable from 30 to 100 %).
- Indication of the various motor starter status and currents.

Schemes



Other functions

The multifunction control unit incorporates other control and protection functions, such as: monitoring and control of phase current, alarm, ...

Module LUL C032 also provides a programmable output and two programmable discrete inputs.

520967



Application

Starting and control of a packing machine conveyor belt.

Operating conditions

- Power: 0.37 kW at 400 V.
- In: 0.98 A.
- Duty class S1.
- Control circuit voltage: $\sim$ 24 V
- Control and command by the AS-Interface cabling system.

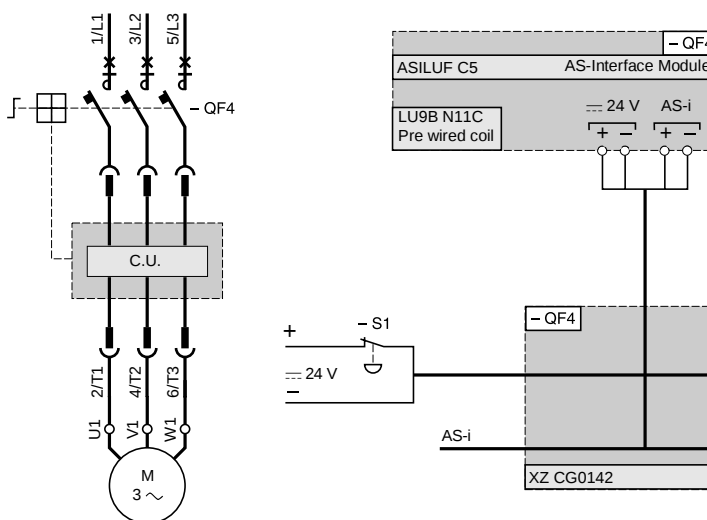
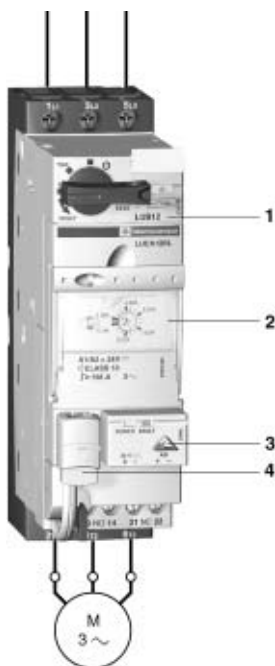
Products used

Products used	Item	Quantity	Reference	Page
Power base 12 A without connections	1	1	LUB 120	1/14
Standard control unit	2	1	LUCA 1XBL	1/19
AS-Interface Communication module	3	1	ASILUF C5	1/32
Tap-off for connecting the communication module to the serial bus	—	1	XZ CG0142	1/33
Pre-wired coil connection Connection of communication module output terminals to the coil terminals	4	1	LU9B N11C	1/33

Functions performed

- Short-circuit protection with level of protection of 50 kA at 400 V.
- Total coordination of protection devices conforming to EN 60947-6-2 (continuity of service) in case of a short-circuit.
- Electronic protection against thermal overloads with an adjustment range of 4.
- Load switching (2 million operating cycles in category AC-43 at In).
- Indication of motor status by N/C or N/O contact.
- Interlock between the motor starter control and the selector knob position; not possible to start the motor when the knob is in the OFF position.
- Start/Stop commands and Ready, Running and Stopped motor status are transmitted by the bus. The AS-Interface 7.D.F.O profile of the new AS-Interface V2 protocol, implemented in the starter-controller, ensures total compatibility with that of the LF enclosed starter range.
- Indication of module operation and communication status by 2 LEDs on the front panel of the communication module.
- Addressing of the module is achieved using adjustment console ASI Terv2 or console XZ MC11. Using pre-wired coil connector LU9B N11C avoids having to wire the control connections. However, easy access to the control connector on the front panel of the starter allows any control schemes required by the user to be included in the line (local controls, emergency stop, safety contact,)

Scheme





Application

Manual control of a 2-position turntable.

Operating conditions

- Power: 2.2 kW at 400 V.
- In: 6 A.
- 30 starts per hour
- Duty class S4.
- 3-wire control:
 - Pushbutton for Position 1 (S1),
 - Pushbutton for Position 2 (S2),
 - Stop button (S5),
- Stopping at the positions is achieved by limit switches S3 and S4.
- Control circuit voltage: ~ 115 V.

Products used

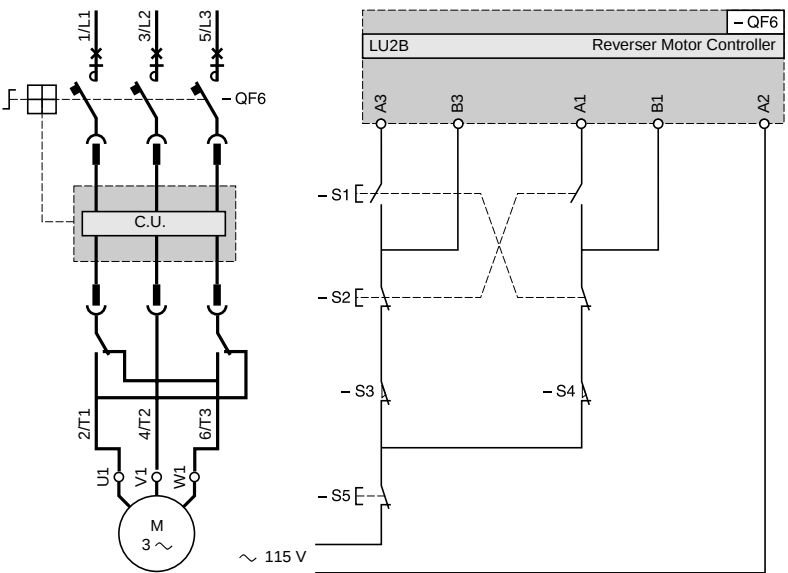
Products used	Item	Quantity	Reference	Page
Power base reversing, 12 A with screw clamp connections	1	1	LU2B 12FU	1/15
Standard control unit	2	1	LUCA 12FU	1/19

Functions performed

- Short-circuit protection with level of protection of 50 kA at 400V.
- Total coordination of protection devices conforming to EN 60947-6-2 (continuity of service) in case of a short-circuit.
- Electronic protection against thermal overloads with an adjustment range of 4.
- Load switching (2 million operating cycles in category AC-43 at In).
- Interlock between the motor starter control and the selector knob position; not possible to start the motor when the knob is in the OFF position.

Electrical interlocking is ensured by pre-wired connector LU9M R1C (item 3) included on base LU2B 12. The design of the reversing power block makes mechanical interlocking unnecessary.

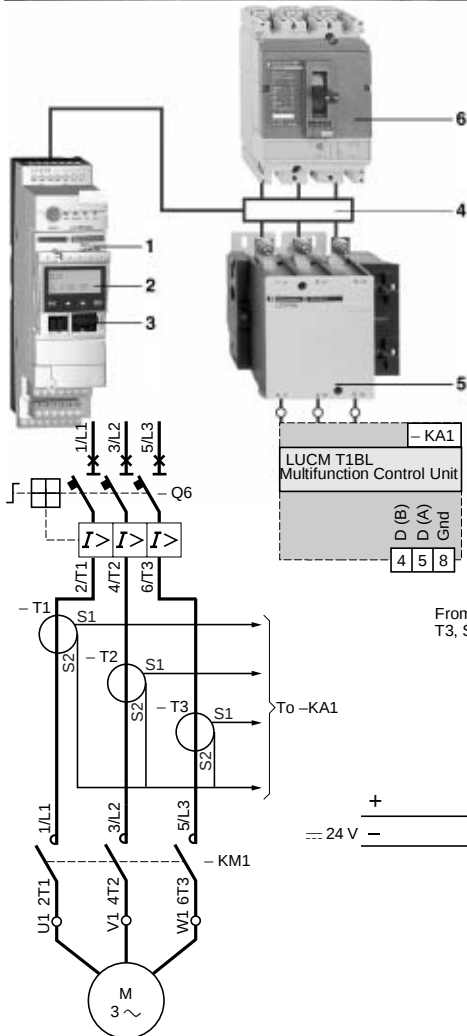
Scheme (manual control)



520973



521790



Application

Monitoring blockage of a rock crusher by monitoring the motor current.

Operating conditions

- Power: 90 kW at 400 V.
- In: 185 A.
- Duty class S1.
- Control circuit voltage: ~ 230 V
- Control-command by PLC and serial link using the Modbus protocol.

Products used

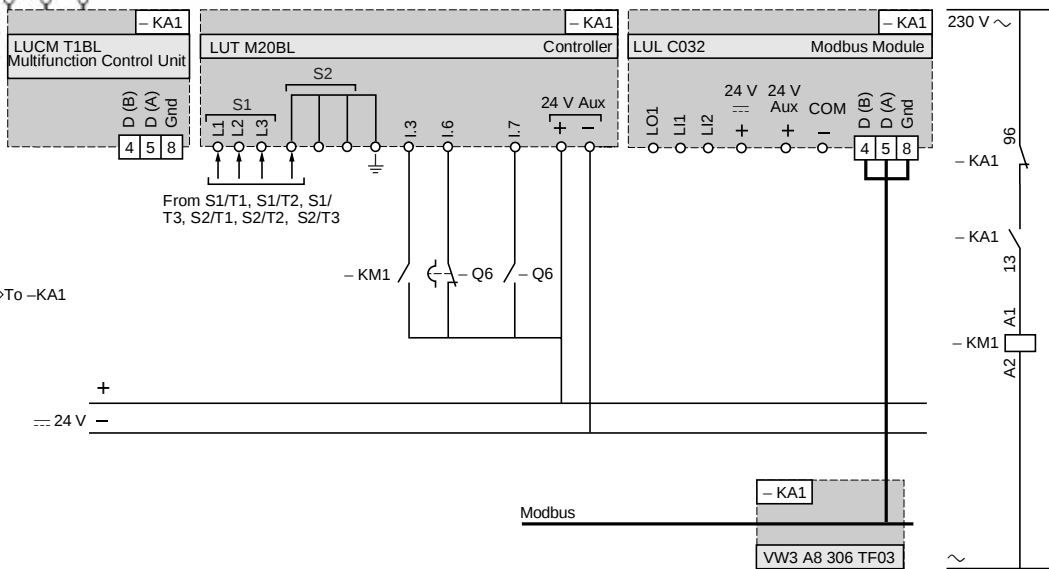
Products used	Item	Quantity	Reference	Page
Controller	1	1	LUT M20BL	1/27
Multifunction control unit	2	1	LUCM T1BL	1/27
Modbus communication module	3	1	LUL C032	1/34
Current transformers	4	3	LUT C4001	1/27
Contacteur	5	1	LC1 F185P7	—
Circuit-breaker	6	1	NS 250HMA	—

Functions performed

- Short-circuit protection with level of protection of 70 kA at 400V.
- Electronic protection against thermal overloads with an adjustment range of 4.
- Detection of crusher blockage by monitoring the induced overcurrent. To use the "over torque or jam" function, the following parameters must be entered :
 - trip: the answer yes/no enables or disables the function,
 - time before tripping: the time period during which the value of the current must be above the tripping threshold in order to cause tripping (adjustable from 1 to 30 s).
 - tripping threshold: value as a % of the load current ratio in relation to the setting current. If the ratio remains above this threshold for the time specified in the previous parameter, the product trips (adjustable from 100 to 800 %).

It is possible to set the parameter for an alarm at a preset threshold under the same conditions as above.

Scheme



Other functions

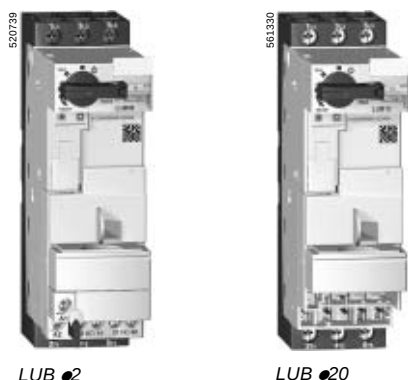
The multifunction control unit incorporates other control and protection functions, such as: monitoring and control of phase currents, alarm, ...

Communication module LUL C032 also provides a programmable output and two programmable inputs.

TeSys motor starters - open version

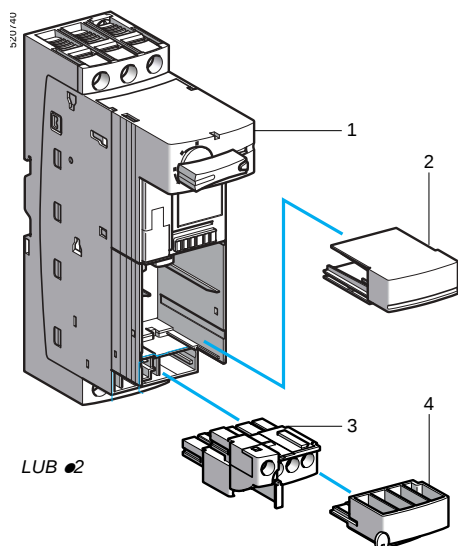
Model U starter-controllers

Non-reversing power bases



LUB 02

LUB 020



LUB 02

Two versions of control connection are available:

- **connection by screw terminals**, plug-in control terminal block,
- **without connection**. This version enables wiring to be prepared in advance and is recommended when a communication module is required (allowing the use of control connection prewiring accessories) or when a reverser block is to be mounted by the customer.

Power bases for non-reversing D.O.L. starting ⁽¹⁾

Connection	Item	Rating			Reference	Weight
Power	Control	(2)	≤ 440 V	500 V	690 V	
			A	A	A	kg

These bases have 2 auxiliary contacts: 1 N/O (13-14) and 1 N/C (21-22) which indicate the closed or open position of the power poles.

A low power internal contact allows power supply to the control unit to be switched off when the control knob is no longer in the ON position.

The power bases must be used in conjunction with a control unit, see pages 1/18 to 1/20.

Screw clamp terminals	Screw clamp terminals	1 + 2 + 3 + 4	12	12	9	LUB 12	0.900
			32	23	21	LUB 32	0.900
	Without connections	1 + 2	12	12	9	LUB 120	0.865
			32	23	21	LUB 320	0.865

Terminal block for power bases without connections

Connection	For base	Item (2)	Reference	Weight
Screw clamp terminals	LUB 120 or 320	3 + 4	LU9B N11	0.045

(1) Rated breaking capacity for operation on short-circuit (Ics), see table below.
For higher values, use current limiters, see page 1/17.

Volts	230	440	500	690 (3)
kA	50	50	10	4

(2) The various sub-assemblies are supplied assembled but they are easy to separate, as shown in the illustration.

(3) For 690 V, use phase barrier LU9 SP0.

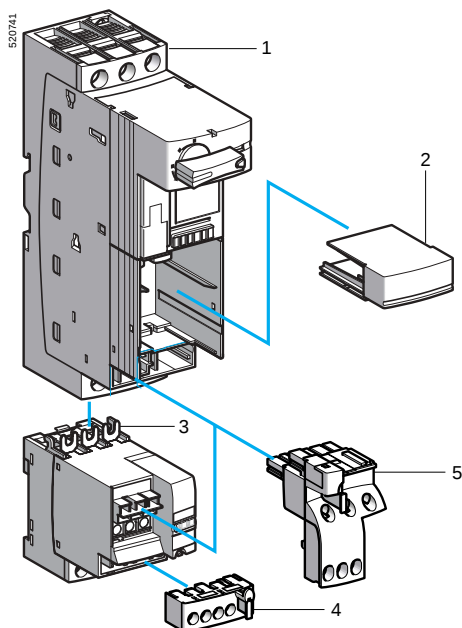
Other versions

Power bases without built-in short-circuit protection device (short-circuit protection by circuit-breaker or separate fuses).

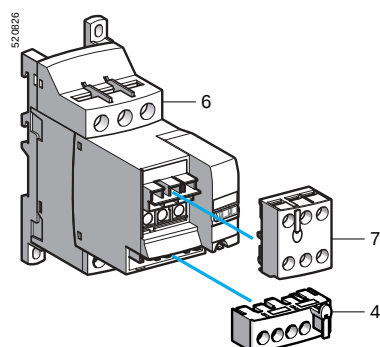
Please consult your Regional Sales Office.



LU2B ●●



LU2B ●●



LU6M + LU9 M1 + LU9M R1

Two versions of control connection are available:

- **connection by screw terminals**, plug-in control terminal block,
- **without connection**. This version enables wiring to be prepared in advance and is recommended when a communication module is required, allowing the use of control connection pre-wiring accessories.

Power bases for reversing D.O.L. starting, pre-assembled

Connection		Item	Rating			Reference, to be completed	Weight
Power	Control	(1)	≤ 440 V	500 V	690 V	(2)	
			A	A	A		kg

These bases have two N/O common point contacts (81-82-84) which indicate non-reversing and reversing operating status.

Screw clamp terminals	Screw clamp terminals	1 + 2 + 3	12	12	9	LU2B 12●●	1.270
		+ 4 + 5	32	23	21	LU2B 32●●	1.270
	Without connections + 5	1 + 2 + 3	12	12	9	LU2B A0●●	1.270
			32	23	21	LU2B B0●●	1.250

Power bases for reversing D.O.L. starting, for customer assembly

A reverser block should preferably be combined with a non-reversing power base without connections to create a reversing starter-controller.

The built-in N/O (13-14) and N/C (21-22) contacts are used for electrical interlocking between the reverser block and the base; they are therefore no longer available as output contacts.

The reverser block has two N/O common point contacts (81-82-84) which indicate non-reversing and reversing operating status.

32 A reverser block	Connection		Item (1)	Reference, to be completed (2)	Weight kg
	Power	Control			
For mounting directly beneath the power base	Screw clamp terminals	Without connections	3	LU2M B0●●	0.400
For mounting separately from the base (screw or rail fixing)	Screw clamp terminals	Without connections	6	LU6M B0●●	0.425

Accessories

Description	Item	Application	Reference	Weight
				kg
Control terminal block	4	Reversing power base without connections LU2B A0●● or B0●●	LU9 M1	0.025
		Reverser block LU2M B0●● for direct mounting beneath power base	LU9 M1	0.025
		Reverser block LU6M B0●● for mounting separately from power base	LU9 M1	0.025
		Reverser block LU6M B0●● for mounting separately from power base	LU9M R1	0.030

Control circuit pre-wiring components

Description	Item	Reference	Weight
			kg
Pre-wired connector (3)	5	LU9M R1C	0.035

(1) The various sub-assemblies are supplied assembled but they are easy to separate, as shown in the illustration.

(2) Select the same control voltage as that of the control unit.

Standard control circuit voltages:

Volts	24	48...72	110...240
—	BL	—	—
~	B	—	—
— or ~	—	ES (4)	FU (5)

(3) For control connection between a power base and a reverser block, for direct mounting.

(4) — : 48...72 V, ~ : 48 V.

(5) — : 110...220 V, ~ : 110...240 V.

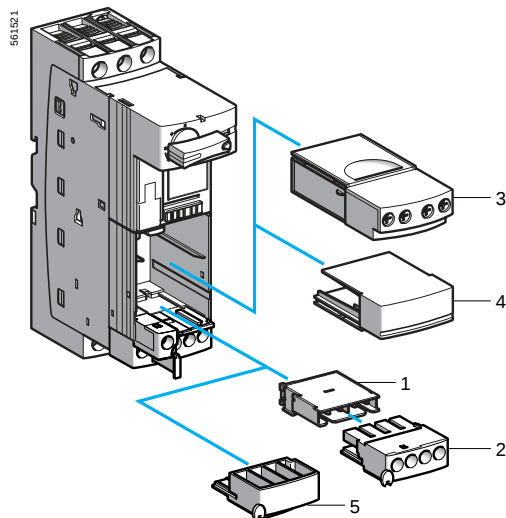
Other versions Power bases without built-in short-circuit protection device (short-circuit protection by circuit-breaker or separate fuses). Please consult your Regional Sales Office.

Contact states

Product status	Position of control handle	Indication on front panel	N/O pole contact	N/C pole contact	N/O contact any fault	N/C contact any fault	⊕ N/O contact product ready
References of add-on contact blocks and auxiliary contact modules Terminal referencing	—	—	—	LUF N11 31-32	LUA1 C20 97-98	LUA1 C11 95-96	LUA1 C20 17-18
	or	—	—	LUF N02 31-32 41-42	LUA1 C200 no terminal block	LUA1 C110 no terminal block	LUA1 C200 no terminal block
	or	—	LUF N20 33-34 43-44	LU9B N11 21-22	—	—	LUA1 C11 17-18
	or	—	LUF N11 43-44	—	—	—	LUA1 C110 no terminal block
	or	—	LU9B N11 13-14	—	—	—	—
Off	OFF 	0					
Ready to operate		0					
Start		1					
Tripped on short-circuit	TRIP 	I >>					
Tripped on thermal overload	Manual reset mode TRIP 	0					
	Automatic reset on thermal overload fault mode 	0					
	Remote reset mode 	0					

N/O contact  in closed position. N/O contact  in open position

References



LUB + LUA1 + LUF N

Add-on contact blocks

Signalling and composition	Connection	Item	Reference	Weight kg
1 N/C fault signalling contact (95-96) and 1 N/O contact (53-54) indicating status of starter-controller power poles	Screw clamp terminals	1 + 2	LUA1 D11 ▲	0.030
	Without connections	1	LUA1 D110 ▲	0.012
1 N/C fault signalling contact (95-96) and 1 N/O contact (17-18) indicating control handle in "ready" position ⊕	Screw clamp terminals	1 + 2	LUA1 C11	0.030
	Without connections	1	LUA1 C110	0.012
1 N/O fault signalling contact (97-98) and 1 N/O contact (17-18) indicating control handle in "ready" position ⊕	Screw clamp terminals	1 + 2	LUA1 C20	0.030
	Without connections	1	LUA1 C200	0.012

Auxiliary contact modules for connection by screw clamp terminals

Module with 2 contacts indicating the status of the starter-controller power poles
Operation: ~ or = 24...250 V, I th: 5 A

Composition	Item	Reference	Weight kg
2 N/O contacts (33-34 and 43-44)	3	LUF N20	0.050
1 N/C contact (31-32) and 1 N/O contact (43-44)	3	LUF N11	0.050
2 N/C contacts (31-32 and 41-42)	3	LUF N02	0.050

Accessories

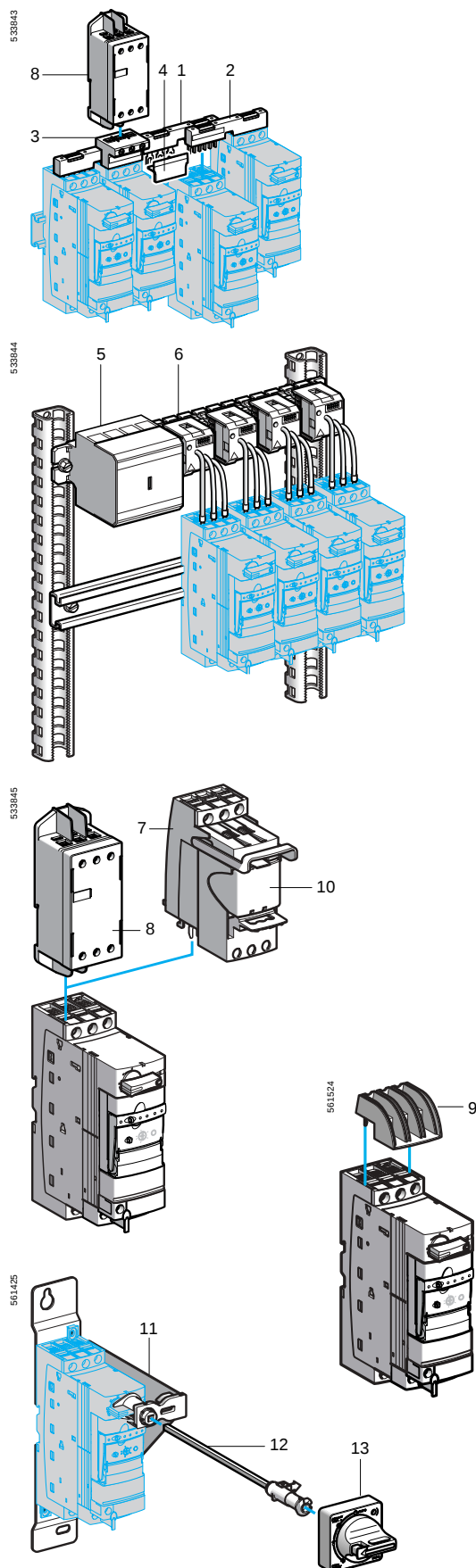
Description	For use on	Item	Reference	Weight kg
Screw clamp terminal blocks	LUA1 D110	2	LU9B D11 ▲	0.022
	LUA1 C110	2	LU9B C11	0.022
	LUA1 C200	2	LU9B C20	0.022
Blanking covers	Location for auxiliary contact, communication or function module	4	LU9C 1	0.020
	Location for add-on contact blocks	5	LU9C 2	0.010

▲ Available 1st half 2006.

TeSys motor starters - open version

Model U starter-controllers

Power connection pre-wired system, limiter blocks and accessories



Pre-wired system for power connections up to 63 A

Description	Application	Pitch mm	Item	Sold in lots of	Unit reference	Weight kg
Sets of 3-pole 63 A busbars	2 tap-offs	45	2	1	GV2 G245	0.036
		54	–	1	GV2 G254	0.038
	3 tap-offs	45	–	1	GV2 G345	0.058
		54	–	1	GV2 G354	0.060
	4 tap-offs	45	1	1	GV2 G445	0.077
		54	–	1	GV2 G454	0.085
	5 tap-offs	54	–	1	GV2 G554	0.100
Protective end cover	For unused busbar outlets	–	4	5	GV1 G10	0.005
Terminal block for supply to one or more busbar sets	Connection from the top	–	3	1	GV1 G09	0.040

Pre-wired system for power connections up to 160 A

The busbar system can be screw-mounted onto any type of support.

Set of 4-pole busbars: 3-phase + neutral or 3-phase + common

Number of tap-offs at 18 mm intervals	Item	Length mm	For mounting in enclosure width mm	Reference	Weight kg
18	5	452	800	AK5 JB144	0.900

Removable 3-phase power sockets

Number of points used on the busbar system	Thermal current	Item	Cable lengths	Sold in lots of	Unit reference	Weight kg
2	16	6	200	6	AK5 PC13 (1)	0.040
	32	6	250	6	AK5 PC33 (1)	0.045
			1000	6	AK5 PC33L (1)	0.060

Limiter blocks and accessories

Application	Item	Breaking capacity I _q ≤ 440 V 690 V		Mounting	Unit reference	Weight kg
		kA	kA			
Limiter-disconnector (3) (6)	7 + 10	130	70	Direct on power base	LUA LB1 (2)	0.310
Current limiters (3)	8	100	35	Separate	LA9 LB920	0.320
Limiter cartridge	10	130	70	Limiter-disconnector	LUA LF1	0.135
Clip-in marker holder	–	–	–	On power base, on reverser block, on parallel link splitter box	LAD 90 (4)	0.001

Phase barrier

Phase barrier LU9 SP0 must be used:

■ To build a UL 508 type E certified starter (Self Protected Starter).

Without the phase barrier, the starter-controller is certified UL 508.

■ If the starter-controller is to be used on an operational voltage of 690 V.

Description	Item	Application	Mounting	Reference	Weight kg
Phase barrier	9	LUB or LU2B 12 or 120 LUB or LU2B 32 or 320 LUA LB1	Direct on terminals L1, L2, L3	LU9 SP0	0.030

Door interlock mechanisms

Description	Item	Reference	Weight kg
Fixing kit (5) (7)	11 + 12	LU9 AP00	0.490
Door-mounted black handle/blue front plate, IP54	13	LU9 AP11	0.150
Door-mounted red handle/yellow front plate, IP54	13	LU9 AP12	0.150

(1) The maximum permissible peak current for power sockets AK5 PC●● is 6 kA.

When used in association with power bases LUB●●, the prospective short-circuit current must not exceed 7 kA

(2) Supplied with limiter cartridge.

(3) These devices make it possible to increase the breaking capacity of the power base.

(4) Sold in lots of 100.

(5) The fixing kit includes a shaft extension (maximum depth 508 mm).

(6) The limiter must be mounted on an LUB or LU2B power base. The limiter can therefore not be common to several motor starters.

(7) To use the fixing kit with a D.O.L. reversing power base, only reverser block LU6 M must be used.

Operating characteristics

Control units		Standard	Advanced		Multifunction	
		LUCA	LUCB	LUCC	LUCD	LUCM
Thermal overload protection						
Overcurrent protection		14.2 x the setting current			3 to 17 x the setting current	
Short-circuit protection		14.2 x the max. current				
Protection against phase loss						
Protection against phase imbalance						
Earth fault detection (equipment protection only)						
Tripping class		10	10	20	5...30	
Motor type		3-phase	Single-phase	3-phase	Single-phase and 3-phase	
Thermal overload test function						
Overtorque						
No-load running						
Long starting times						
Reset mode	Manual				Parameters can be set	
	Automatic or remote		With function module or parameters can be set via the bus with a communication module, see chart below.	Parameters can be set		
				Parameters can be set via the bus with a communication module (see below).		
Alarm			Thermal overload alarm only with function module or communication module, see below.	Possible for each type of fault. Indication on front panel of the control unit, via remote terminal, via PC or via PDA (1).		
				With communication modules to make use of these alarms via a bus, see below.		
"Log" function					Log of the last 5 trips. Number of starts, number of trips, number of operating hours.	
"Monitoring" function					Display of main motor parameters on front panel of the control unit via remote terminal, via PC or via PDA (1).	

With function modules (2)

Thermal overload alarm		With module LUF W	
Thermal overload signalling and manual reset		With module LUF DH11	
Thermal overload signalling and automatic or remote reset		With modules LUF DA01 and LUF DA10	
Indication of motor load (analogue)		With module LUF V	

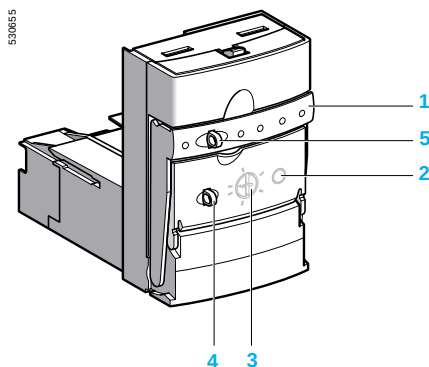
With communication module or via Modbus port on control unit LUCM (2)

Starter status (ready, running, fault)	With any communication module		
Reset mode		Parameters can be set via the bus	
Alarm		With Modbus modules LUL C031 and LUL C032 (thermal overload alarm only).	With Modbus module LUL C031 and LUL C032 and Modbus port on the control unit (alarm possible for all types of fault).
Remote reset via the bus			
Indication of motor load			
Fault signalling and differentiation			
Remote programming and monitoring of all functions		With Modbus modules LUL C031 and LUL C032 and Modbus port on the control unit.	
"Log" function			
"Monitoring" function			

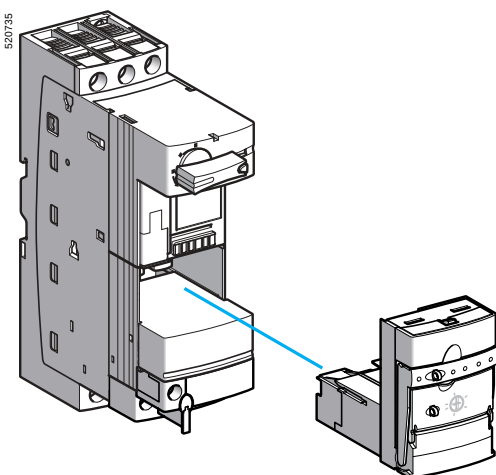
 Built-in function  Function provided with accessory

(1) PDA: Personal Digital Assistant.

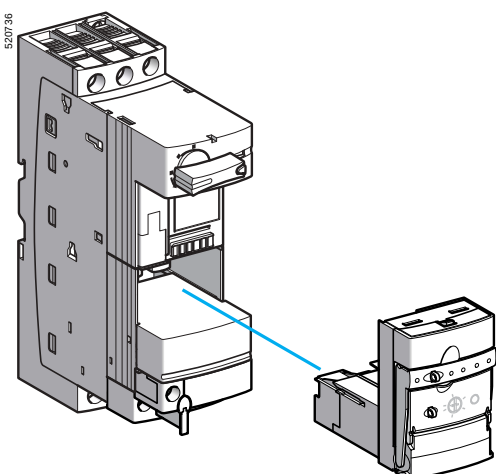
(2) Mounting possibilities: 1 function module **or** 1 communication module.



LUCA ●●●●
LUCB ●●●●



LUB ●2 + LUCA ●●●●



LUB ●2 + LUCB ●●●●

Description

- 1 Extraction and locking handle
- 2 Test button (on advanced control unit only)
- 3 Ir adjustment dial
- 4 Locking of settings by sealing the transparent cover
- 5 Sealing of locking handle

Standard control units

Maximum standard power ratings of 3-phase motors 50/60 Hz			Setting range	Clip-in mounting on power base Rating	Reference to be completed by adding the voltage code (1)	Weight
400/415 V	500 V	690 V				
kW	kW	kW	A	A		kg
0.09	—	—	0.15...0.6	12 and 32	LUCA X6●●	0.135
0.25	—	—	0.35...1.4	12 and 32	LUCA 1X●●	0.135
1.5	2.2	3	1.25...5	12 and 32	LUCA 05●●	0.135
5.5	5.5	9	3...12	12 and 32	LUCA 12●●	0.135
7.5	9	15	4.5...18	32	LUCA 18●●	0.135
15	15	18.5	8...32	32	LUCA 32●●	0.135

Advanced control units

Pressing the Test button on the front panel simulates tripping on thermal overload.

Class 10 for 3-phase motors

0.09	—	—	0.15...0.6	12 and 32	LUCB X6●●	0.140
0.25	—	—	0.35...1.4	12 and 32	LUCB 1X●●	0.140
1.5	2.2	3	1.25...5	12 and 32	LUCB 05●●	0.140
5.5	5.5	9	3...12	12 and 32	LUCB 12●●	0.140
7.5	9	15	4.5...18	32	LUCB 18●●	0.140
15	15	18.5	8...32	32	LUCB 32●●	0.140

Class 10 for single-phase motors

—	—	—	0.15...0.6	12 and 32	LUCC X6●●	0.140
0.09	—	—	0.35...1.4	12 and 32	LUCC 1X●●	0.140
0.55	—	—	1.25...5	12 and 32	LUCC 05●●	0.140
2.2	—	—	3...12	12 and 32	LUCC 12●●	0.140
4	—	—	4.5...18	32	LUCC 18●●	0.140
7.5	—	—	8...32	32	LUCC 32●●	0.140

Class 20 for 3-phase motors

0.09	—	—	0.15...0.6	12 and 32	LUCD X6●●	0.140
0.25	—	—	0.35...1.4	12 and 32	LUCD 1X●●	0.140
1.5	2.2	3	1.25...5	12 and 32	LUCD 05●●	0.140
5.5	5.5	9	3...12	12 and 32	LUCD 12●●	0.140
7.5	9	15	4.5...18	32	LUCD 18●●	0.140
15	15	18.5	8...32	32	LUCD 32●●	0.140

(1) Standard control circuit voltages:

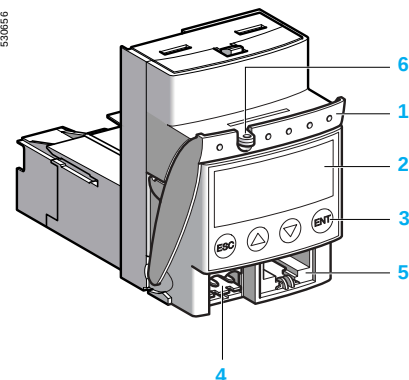
Volts	24	48...72	110...240
—	BL (2), (3)	—	—
—	B	—	—
— or —	—	ES (4)	FU (5)

(2) Voltage code to be used for a starter-controller with communication module.

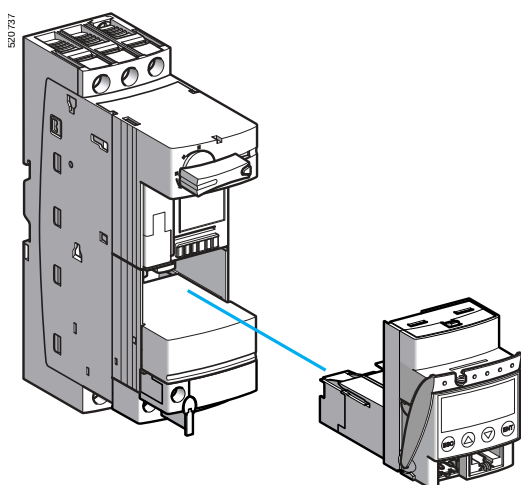
(3) d.c. voltage with maximum ripple of $\pm 10\%$.

(4) — : 48...72 V, ~ : 48 V.

(5) — : 110...220 V, ~ : 110...240 V.



LUCM ●●BL



LUB ●2 + LUCM ●●BL



XBT NU400

Description

- 1 Extraction and locking handle
- 2 Built-in display window (2 lines, 12 characters)
- 3 4-button keypad
- 4 --- 24 V auxiliary power supply
- 5 Modbus RS485 communication port. Connection by RJ45 connector.
- 6 Sealing of locking handle

The display window 2 and keypad 3 allow:

- in configuration mode: local configuration of protection functions and alarms,
- in run mode: display of parameter values and events.

The Modbus communication port 5 is used to connect:

- an operator terminal,
- a PC,
- a Personal Digital Assistant (PDA).

Multifunction control units

Parameter entry, monitoring of parameter values and consultation of logs are carried out:

- either on the front panel, using the built-in display window/keypad,
- or via an operator terminal,
- or via a PC or a PDA with PowerSuite software,
- or remotely, via a Modbus communication bus.

Programming of the product via the keypad requires a --- 24 V auxiliary power supply.

Maximum standard power ratings of 3-phase motors 50/60 Hz			Setting range	Clip-in mounting on power base Rating	Reference (1)	Weight
400/415 V	500 V	690 V				
kW	kW	kW	A	A		kg
0.09	—	—	0.15...0.6	12 and 32	LUCM X6BL	0.175
0.25	—	—	0.35...1.4	12 and 32	LUCM 1XBL	0.175
1.5	2.2	3	1.25...5	12 and 32	LUCM 05BL	0.175
5.5	5.5	9	3...12	12 and 32	LUCM 12BL	0.175
7.5	9	15	4.5...18	32	LUCM 18BL	0.175
15	15	18.5	8...32	32	LUCM 32BL	0.175

TeSys model U user's manual (2)

Application	Language	Reference	Weight kg
On CD-Rom	Multi-language (3)	LU9 CD1	0.022

Operator terminal

This compact Magelis terminal enables the parameters of multifunction control unit LUCM to be read and modified.

It is supplied pre-configured to provide dialogue with 8 model U starter-controllers (Modbus protocol, application pages and alarm pages loaded).

Starter-controller alarm and fault management takes priority.

Language	Display window	Supply voltage	Reference	Weight kg
Multi-language (3)	4 lines of 20 characters	--- 24 V	XBT NU400	0.150

Connecting cable (4)

Function	Length	Type	Reference	Weight kg
Connects terminal XBT NU400 to a multifunction control unit.	2.5 m	SUB-D 25-way female - RJ45	XBT Z938	0.200

(1) Input voltage --- 24 V with maximum ripple of $\pm 10\%$.

(2) The CD-Rom contains user's manuals for the AS-Interface and Modbus communication modules, multifunction control units and gateway modules, as well as the gateway programming software.

(3) English, French, German, Italian, Spanish

(4) If a terminal is used with several control units, this cable can be connected to a Modbus hub or to T-junctions (see page 1/35).

TeSys motor starters - open version

Model U starter-controllers

Function modules

Function modules

Output	Item	Application	Reference	Weight kg
--------	------	-------------	-----------	--------------

Thermal overload signalling and manual reset

Module LUF DH11 makes it possible to differentiate thermal overload and short-circuit faults. (The short-circuit fault can then be signalled via add-on contact blocks LUA1 C). The module includes two contacts for thermal overload signalling, as well as an LED on the front panel.

To reset the motor starter, the operator must use the rotary knob on the power base. The module can only be used with an advanced control unit and requires an $\sim/\text{---}$ 24...240 V external power supply.

1 N/O + 1 N/C	3	$\sim$ or --- 24...250 V	LUF DH11	0.060
---------------	---	-----------------------------------	----------	-------

Thermal overload signalling and automatic or remote reset

These modules make it possible to differentiate thermal overload and short-circuit faults. (The short-circuit fault can then be signalled via add-on contact blocks LUA1 C).

The modules include one contact for thermal overload signalling, as well as an LED on the front panel. A second contact (terminals Z1-Z2) must be wired in series with terminal A1 of the motor starter. In the event of a thermal overload fault, this wiring allows motor control to be switched off. The rotary knob on the power base will then stay in the "ready position" $\odot$.

Resetting of the motor starter is automatic after the required motor cooling time if terminals X1-X2 are linked by a strap, or remote by pulsed closing of a volt-free contact connected to terminals X1-X2.

These modules can only be used with an advanced control unit and require an $\sim/\text{---}$ 24...240 V external power supply.

Note : Terminals X1-X2 are not isolated from the signalling module power supply.

1 N/C	4	$\sim$ or --- 24...250 V	LUF DA01	0.055
1 NO	4	$\sim$ or --- 24...250 V	LUF DA10	0.055

Thermal overload alarm

Through load shedding, this module makes it possible to avoid stoppages in operation due to overload tripping.

Imminent thermal overload tripping is displayed as soon as the thermal state exceeds the threshold of 105 % (hysteresis = 5 %).

Signalling is possible via an LED on the front panel of the module and externally by an N/O relay output.

It can only be used with an advanced control unit, from which it takes its power.

1 N/O	1	$\sim$ or --- 24...250 V	LUF W10	0.055
-------	---	-----------------------------------	---------	-------

Indication of motor load

This module provides a signal which is representative of the motor load status (I average/I_r).

■ I average = average value of the rms currents in the 3 phases,

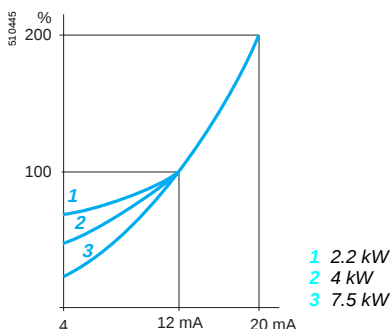
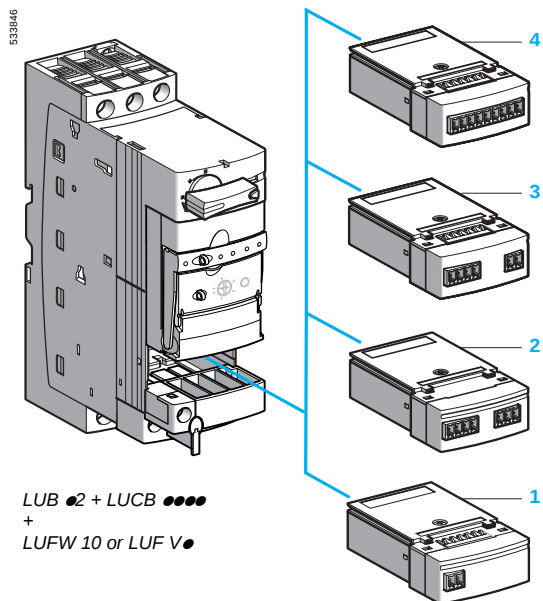
■ I_r = value of the setting current.

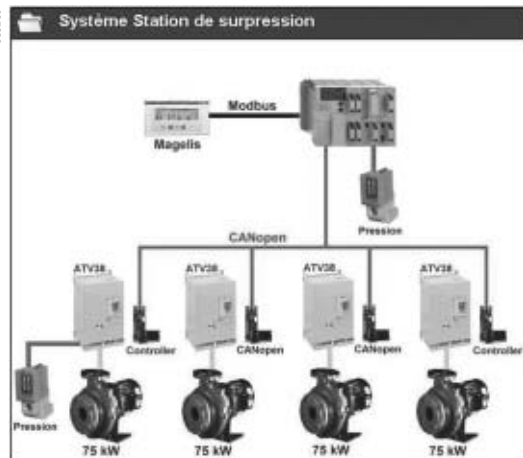
The value of the signal (4-20 mA) corresponds to a load status of 0 to 200 % (0 to 300 % for a single-phase load).

It can be used with an advanced or multifunction control unit.

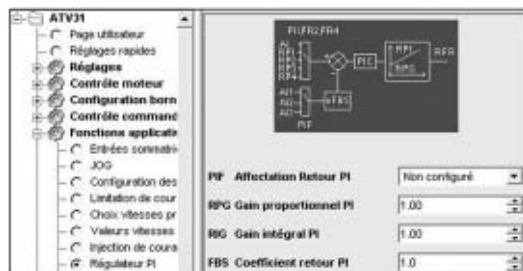
Module LUF V2 requires a --- 24 V external power supply.

4 - 20 mA	2	—	LUF V2	0.050
-----------	---	---	--------	-------

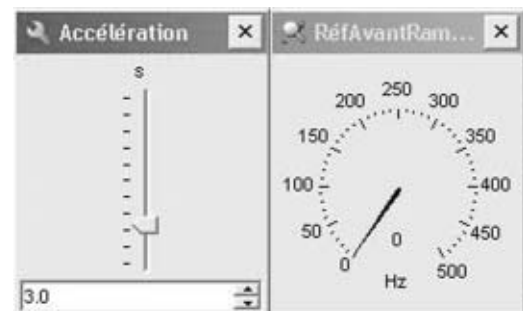




PowerSuite screen on PC
Management of the installed base



PowerSuite screen on PC
View of PI regulator function parameters



PowerSuite screen on PC
Monitoring control panel (cursor, gauge)

Presentation

The PowerSuite software workshop is a user-friendly tool designed for setting up control devices for the following Telemecanique brand motors:

- TeSys model U controller-starters
- Altistart soft start/soft stop units
- Altivar variable speed drives

It includes various functions designed for setup phases such as:

- Preparing configurations (for PC)
- Start-up (for PC and Pocket PC)
- Maintenance (for PC and Pocket PC)

In order to simplify the start-up and maintenance phases, the PowerSuite software workshop can use the Bluetooth® wireless link.

PowerSuite software workshop for PC

Functions (1)

Preparing configurations

The PowerSuite software workshop can be used on its own to generate the device configuration. It can be:

- Saved, printed and exported to office automation software
- Exchanged between a PC and a Pocket PC using standard synchronization software such as Microsoft ActivSync®

The PowerSuite software workshop can also be used to convert:

- An Altivar 28 drive configuration to an Altivar 31 drive configuration
- An Altivar 58 or Altivar 58F drive configuration to an Altivar 71 drive configuration

Setup

When the PC is connected to the device, the PowerSuite software workshop can be used to:

- Transfer the generated configuration
- Adjust
- Monitor: This option has been enhanced with new functions such as:
 - The oscilloscope
 - The high speed oscilloscope (minimum time base: 2 ms)
 - Display of communication parameters
- Control
- Save the final configuration

Maintenance

In order to simplify maintenance operations, the PowerSuite software workshop can be used to:

- Compare the configuration of a device currently being used with a saved configuration
- Manage the user's installed base of equipment, in particular:
 - Organize the installed base into folders (electrical equipment, machinery, workshops, etc)
 - Store maintenance messages
 - Simplify Ethernet connection by storing the IP address

User interface

The PowerSuite software workshop can be used to:

- Present the device parameters arranged by function in the form of illustrated views of diagrams or simple tables
- Customize the parameter names
- Create:
 - A user menu (choice of particular parameters)
 - Monitoring control panels with graphic elements (cursor, gauges)
- Perform sort operations on the parameters
- Display text in five languages (English, French, German, Italian and Spanish). The language changes immediately and there is no need to restart the program.

It also has online contextual help:

- On the PowerSuite tool
- On the device functions by direct access to the user's manuals.

(1) Some functions are not available for all devices. See the table of function availability, page 1/23.

Availability of functions for the PowerSuite software workshop for PC

Functions not listed in the table are available for all devices.

Function available with devices	Controller-starter	Soft start/ soft stop unit	Drives					
	TeSys model U	ATS 48	ATV 11	ATV 31	ATV 38	ATV 58 ATV 58F	ATV 68	ATV 71
Monitoring								
Oscilloscope								
High speed oscilloscope								
Display of communication parameters								
Control								
Customization of parameter names								
Creation of a user menu								
Creation of monitoring control panels								
Sort operation on parameters								

Functions available
Functions not available

Connections

Modbus communication bus

The PowerSuite software workshop for PC can be connected directly to the device terminal port or Modbus network port via the serial port on the PC.

Two types of connection are possible:

- With a single device (point-to-point connection)
- With a number of devices (multidrop connection)

Note: The Altivar 68 drive uses a specific protocol for point-to-point connection. Multidrop connection is not available.

Ethernet TCP/IP communication network

The PowerSuite software workshop for PC can be connected to an Ethernet network. In this case, the devices can be accessed:

- Using a 174 CEV 300 20 Ethernet-Modbus bridge
- Using a VW A3 310 communication card for the Altivar 71 drive
- Using a VW3 A58 310 communication card for the Altivar 38, 58 and 58F drives

Bluetooth® wireless link (2)

The PowerSuite software workshop for PC can communicate via a Bluetooth® radio link with a device equipped with a Bluetooth® - Modbus VW3 A8 114 adaptor. The adaptor plugs into the device terminal port or Modbus network port, and has a range of 10 m (class 2).

If the PC does not have Bluetooth® technology, use the VW3 A8 115 USB-Bluetooth® adaptor.

Remote maintenance

Using a simple Ethernet connection, the PowerSuite software workshop can be used for remote monitoring and diagnostics.

When devices are not connected to the Ethernet network, or it is not directly accessible, various remote transmission solutions may be possible (modem, teleprocessing gateway, etc). Please consult your Regional Sales Office.

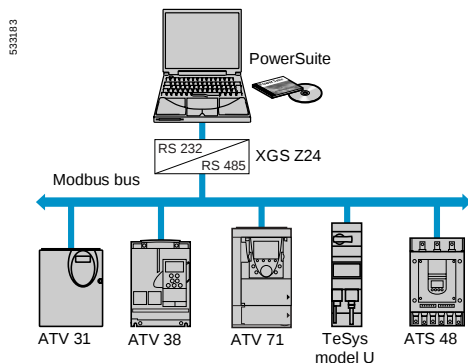
Hardware and software environments

The PowerSuite software workshop for PC can operate in the following PC environments and configurations:

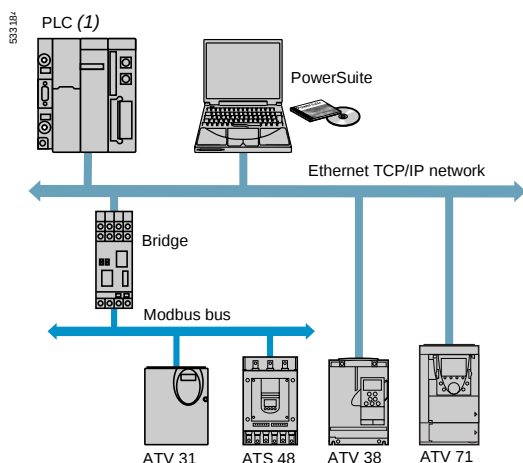
- Microsoft Windows® 98 SE, Microsoft Windows® 2000, Microsoft Windows® XP
- Pentium III, 800 MHz, hard disk with 300 Mb available, 128 Mb RAM
- SVGA or higher definition monitor

(1) Please consult our specialist "Automation platform Modicon Premium and Unity - PL7 software" and "Automation platform Modicon TSX Micro - PL7 software" catalogues.

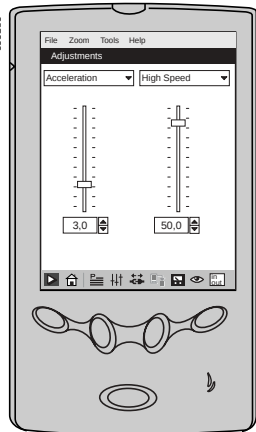
(2) Not available for Altivar 11 and Altivar 68 drives.



Modbus multidrop connection



Ethernet connection



PowerSuite screen on Pocket PC
Adjustments

PowerSuite software workshop for Pocket PC (1)

Functions

Start-up

When the Pocket PC is connected to the device, the PowerSuite software workshop can be used to:

- Transfer the configuration
- Adjust
- Monitor (2)
- Control (2)
- Save the final configuration

Maintenance

It can be used to compare the configuration of a device currently being used with a saved configuration.

User interface

The PowerSuite software workshop for Pocket PC can be installed in a single language selected from the five available (English, French, German, Italian and Spanish).

Connections

Modbus communication bus

The PowerSuite software workshop for Pocket PC can be connected directly to the device terminal port or Modbus network port via the serial port on the Pocket PC.

The Modbus connection kit is connected via the Pocket PC serial synchronization cable. This cable must be ordered from the supplier of the Pocket PC.

It can only be connected to a single device, in point-to-point connection.

Hardware and software environments

The PowerSuite software workshop version V2.0.0 for Pocket PC is compatible with Pocket PCs equipped with a Microsoft Windows® for Pocket PC 2002 or Microsoft Windows Mobile™ 2003 operating system and an ARM or XSCALE processor.

Performance tests for the PowerSuite software workshop version V2.0.0 have been carried out with the following Pocket PCs:

- Hewlett Packard® IPAQ 2210
- Compaq® IPAQ series 3800 and 3900
- Hewlett Packard® Jornada series 560

(1) The PowerSuite software workshop for Pocket PC is not compatible with the Altivar 68 and Altivar 71 variable speed drives.

(2) Not available for the Altivar 11 variable speed drive.

References

PowerSuite software workshop for PC or Pocket PC

Description	Composition	Reference	Weight kg
PowerSuite CD-ROM	1 program for PC and for Pocket PC in English, French, German, Italian and Spanish - Technical documentation - ABC configurator program for the LUF P● communication gateways	VW3 A8 104	0.100
PowerSuite update CD-ROM (1)	1 program for PC and for Pocket PC in English, French, German, Italian and Spanish - Technical documentation and ABC configurator program	VW3 A8 105	0.100
Connection kit for PC serial port	1 x 3 m cable with 2 RJ 45 connectors 1 RS 232/RS 485 converter with one 9-way female SUB-D connector and one RJ 45 connector 1 RJ45/9-way SUB-D adaptor for connecting ATV 38/58/58F drives 1 RJ45/9-way SUB-D adaptor for connecting ATV 68 drives 1 converter for the ATV 11 drive, with one 4-way male connector and one RJ45 connector	VW3 A8 106	0.350
Connection kit for Pocket PC serial port (2)	1 x 0.6 m cable with 2 RJ 45 connectors 1 RS 232/RS 485 converter with one 9-way male SUB-D connector and one RJ 45 connector 1 RJ45/9-way SUB-D adaptor for connecting ATV 38/58/58F drives 1 converter for the ATV 11 drive, with one 4-way male connector and one RJ45 connector	VW3 A8 111	0.300
Modbus-Bluetooth® adaptor (3)	1 Bluetooth® adaptor (10 m range, class 2) with 1 RJ45 connector 1 x 0.1 m cable with 2 RJ 45 connectors for PowerSuite 1 x 0.1 m cable with 1 RJ 45 connector and 1 mini DIN connector, for TwidoSoft 1 RJ45/9-way SUB-D adaptor for connecting ATV 38/58/58F drives	VW3 A8 114	0.155
USB-Bluetooth® adaptor for PC	This adaptor is required for a PC which is not equipped with Bluetooth® technology. It is connected to a USB port on the PC. Range of 10 m (class 2).	VW3 A8 115	0.290
RS 232-RS 485 interface	1 Modbus multidrop converter for connection to screw terminals. Requires a 24 V ~ (20...30 V), 20 mA power supply (4).	XGS Z24	0.105

(1) Updates a version ≥ V1.40 with the latest available version. For versions < V1.40, you should order the PowerSuite CD-ROM, VW3 A8 104.

(2) This kit connects to the serial synchronization cable, which must be ordered separately from the supplier of the Pocket PC.

(3) Can also be used to communicate between a Twido PLC and the TwidoSoft software workshop.

(4) Please consult our specialist "Interfaces, I/O splitter box and power supply" catalogue.

Compatibility

Connection	Controller-starter	Soft start/soft stop unit	Drives					
	TeSys model U	ATS 48	ATV 11	ATV 31	ATV 38	ATV 58 ATV 58F	ATV 68	ATV 71
Compatibility of the PowerSuite software workshop for PC with the following devices (minimum version)								
Modbus serial link (ATV 68: specific protocol)	V1.40	V1.30	V1.40	V2.0	V1.40	V1.0	V1.50	V2.2
Ethernet (device equipped with an Ethernet TCP/IP card)					V1.50	V1.50		V2.2
Ethernet via Modbus Ethernet bridge		V1.50		V2.0	V1.50	V1.50		V2.2
Bluetooth®		V2.2		V2.2	V2.2	V2.2		V2.2
Compatibility of the PowerSuite software workshop for Pocket PC with the following devices (minimum version)								
Modbus serial link	V1.50	V1.30	V1.40	V2.0	V1.40	V1.20		
Compatibility of the PowerSuite software workshop with Pocket PCs								
Connection	Operating system	Performance tested models	PowerSuite software versions					
			V2.0	V1.50	V1.40	V1.30		
Modbus serial link	Windows Mobile™ 2003 for Pocket PC	Hewlett Packard® IPAQ 2210						
	Windows® for Pocket PC 2002	Compaq® IPAQ series 3800, 3900						
		Hewlett Packard® Jornada series 560						
	Windows® for Pocket PC 2000	Hewlett Packard® Jornada 525, 545, 548						
	Windows® CE	Hewlett Packard® Jornada 420						

Compatible devices and/or software versions

Incompatible devices and/or software versions

Presentation

Above 32 A, the model U controller provides a motor starter management solution identical to that provided by TeSys model U starter-controllers.

Used in conjunction with a short-circuit protection device and a contactor, it provides a motor starter whose functions are the same as those of a TeSys model U starter-controller and, in particular, provides the following functions: overload protection, motor starter control and application monitoring.

Composition

It consists of a control unit whose adjustment range is compatible with the secondary of current transformers, plus a control base which also allows fitment of a function module or a communication module.

It requires a $\sim$ 24 V external power supply.

The secondaries of current transformers, the $\sim$ 24 V power supply, the 10 inputs and the 5 outputs are connected by screw terminal block.

Combinations providing type 2 coordination

With circuit-breaker

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 400/415 V		Circuit-breaker (1)			Contactor	Model U controller	Current transformers
P kW	I _e A	Reference	Rating A	I _{rm} (2) A	Reference (3)	Reference	Reference
18,5	35	NS80HMA	50	500	LC1 D40	LUTM + LUC●	3 x LUT C0501
22	42	NS80HMA	50	650	LC1 D50	LUTM + LUC●	3 x LUT C1001
30	57	NS80HMA	80	880	LC1 D65	LUTM + LUC●	3 x LUT C1001
37	69	NS80HMA	80	1040	LC1 D80	LUTM + LUC●	3 x LUT C1001
45	81	NS100HMA	100	1300	LC1 D95	LUTM + LUC●	3 x LUT C1001
55	100	NS160HMA	150	1350	LC1 D115	LUTM + LUC●	3 x LUT C2001
75	135	NS160HMA	150	1800	LC1 D150	LUTM + LUC●	3 x LUT C2001
90	165	NS250HMA	220	2200	LC1 F185	LUTM + LUC●	3 x LUT C2001
110	200	NS250HMA	220	2640	LC1 F225	LUTM + LUC●	3 x LUT C4001
132	240	NS400HMA	320	3200	LC1 F265	LUTM + LUC●	3 x LUT C4001
160	285	NS400HMA	320	4160	LC1 F330	LUTM + LUC●	3 x LUT C4001
200	352	NS630HMA	500	5000	LC1 F400	LUTM + LUC●	3 x LUT C4001
220	388	NS630HMA	500	5500	LC1 F400	LUTM + LUC●	3 x LUT C4001
250	437	NS630HMA	500	6000	LC1 F500	LUTM + LUC●	3 x LUT C8001

With fuses

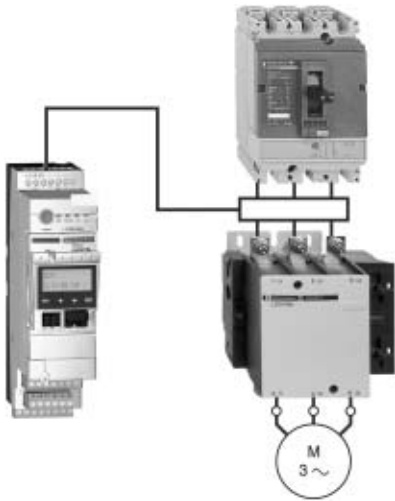
Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 400/415 V		Switch disconnecter-fuse	aM fuses		Contactor	Model U controller	Current transformers
P kW	I _e A	Reference	Size	Rating A	Reference (3)	Reference	Reference
18,5	35	GS1 F	14 x 51	40	LC1 D40	LUTM + LUC●	3 x LUT C0501
22	42	GS1 J	22 x 58	50	LC1 D50	LUTM + LUC●	3 x LUT C1001
30	57	GS1 J	22 x 58	80	LC1 D65	LUTM + LUC●	3 x LUT C1001
37	69	GS1 J	22 x 58	100	LC1 D80	LUTM + LUC●	3 x LUT C1001
45	81	GS1 J	22 x 58	100	LC1 D95	LUTM + LUC●	3 x LUT C1001
55	100	GS1 L	T0	125	LC1 D115	LUTM + LUC●	3 x LUT C2001
75	135	GS1 L	T0	160	LC1 D150	LUTM + LUC●	3 x LUT C2001
90	165	GS1 N	T1	200	LC1 F185	LUTM + LUC●	3 x LUT C2001
110	200	GS1 N	T1	250	LC1 F225	LUTM + LUC●	3 x LUT C4001
132	240	GS1 QQ	T2	315	LC1 F265	LUTM + LUC●	3 x LUT C4001
160	285	GS1 QQ	T2	400	LC1 F330	LUTM + LUC●	3 x LUT C4001
200	352	GS1 S	T3	500	LC1 F400	LUTM + LUC●	3 x LUT C4001
220	388	GS1 S	T3	500	LC1 F400	LUTM + LUC●	3 x LUT C4001
250	437	GS1 S	T3	500	LC1 F500	LUTM + LUC●	3 x LUT C8001
315	555	GS1 S	T3	630	LC1 F630	LUTM + LUC●	3 x LUT C8001

(1) Product marketed under the Merlin Gerin brand.

(2) I_{rm}: setting current of the magnetic trip

(3) For reversing operation, replace the prefix LC1 with LC2.

532093



LUT M + LUCM T1BL + LUTC ●●

References

Control bases (control circuit voltage $\approx$ 24 V)

Connection	Control	For use with contactor	Reference	Weight kg
Screw	Screw	LC1 D●●	LUT M10BL	0.800
		LC1 F●●●	LUT M20BL	0.800

Control units

Description	Class	For motor type	Setting range	Reference	Weight kg
Advanced	10	3-phase	0.35...1.05	LUCB T1BL	0.140
	20	3-phase	0.35...1.05	LUCD T1BL	0.140
Multifunction	5 to 30	3-phase	0.35...1.05	LUCM T1BL	0.175

Current transformers

Operating current		Reference	Weight kg
Primary	Secondary		
30	1	LUT C0301	0.200
50	1	LUT C0501	0.200
100	1	LUT C1001	0.200
200	1	LUT C2001	0.200
400	1	LUT C4001	0.430
800	1	LUT C8001	0.600

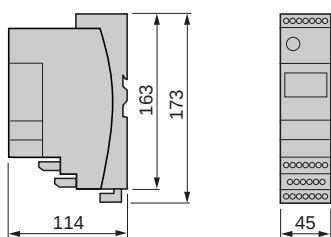
Function modules and communication modules

The TeSys model U controller is compatible with the modules listed below.

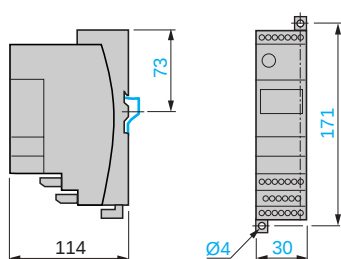
- Thermal overload alarm module LUF W10 (1), see page 1/21.
- Motor load indication module LUF V2, see page 1/21.
- Modbus communication module LUL C032.

(1) Module LUF W10 is only compatible with control units **LUCB T1BL** and **LUCD T1BL**.

Dimensions

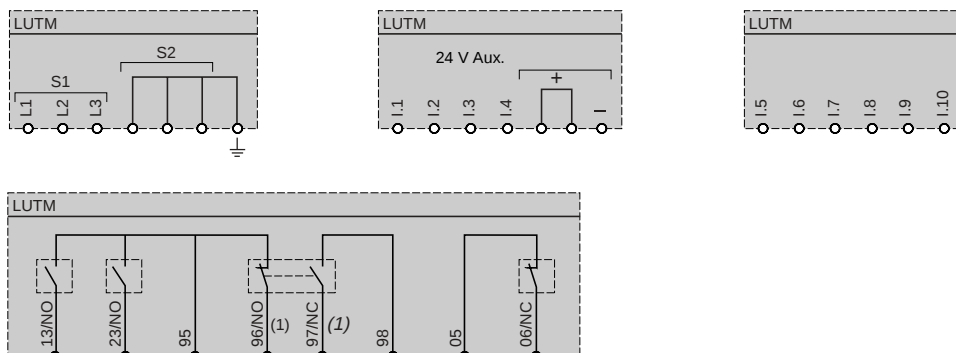


Mounting

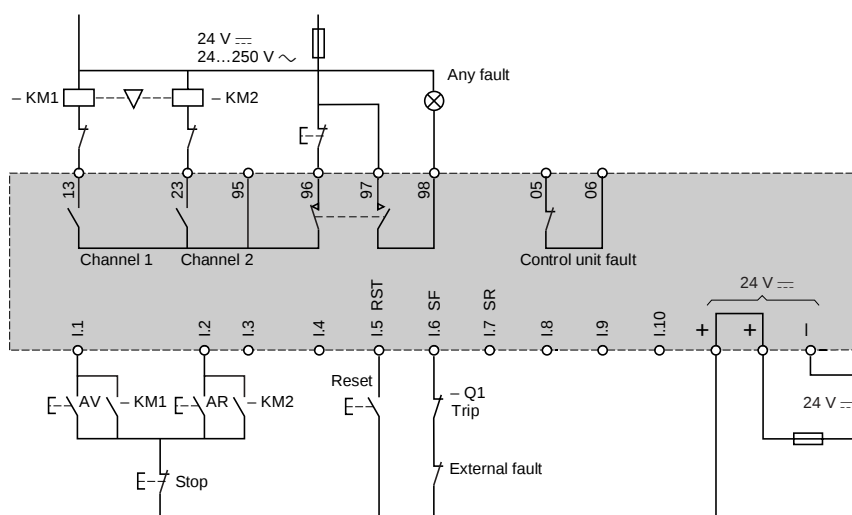


Schemes

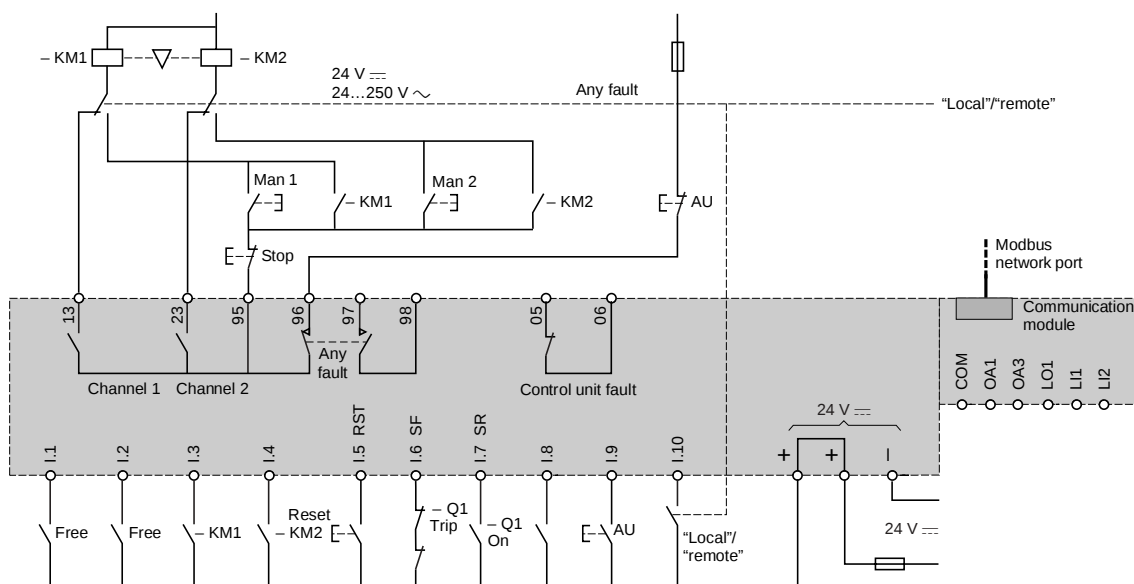
Reversing controller LUT M



3-wire control, pulsed start with maintaining contact



Control for Modbus communication module LUL C032

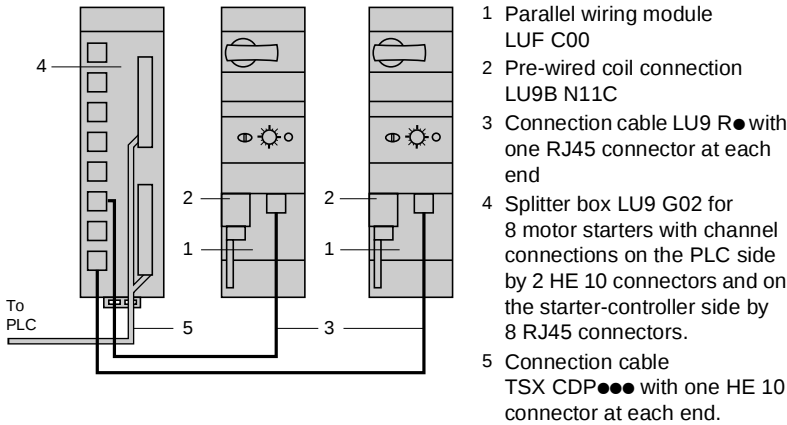


(1) The contacts are represented with controller powered up and not in a fault condition.

TeSys motor starters - open version
Model U starter-controllers
Parallel wiring module and pre-wired coil connection
components

Parallel type connection

Architecture



Parallel wiring module

The parallel wiring system makes it possible to connect starter-controllers to the PLC I/O modules quickly and without any need for tools. It replaces traditional screw terminal and single wire connections. It is used with the Telefast pre-wired system (1).

The parallel wiring module provides the status and command information for each starter-controller. It must be used with an LUB 12 or LU2B 12BL power base and a 24 V control unit LUC B/D/C/M BL.

Splitter box LU9 G02 distributes information from the PLC I/O modules to each of the starter-controllers connected to it.

This splitter box is optimised for use with card TSX DMZ28DTK.

When used in conjunction with the Advantys STB distributed I/O solution, the model U starter-controller is ideal in decentralised automation architectures (2).

The use of dedicated parallel interface module STB EPI 2145 allows remote connection of 4 starter-controllers.

Each of the module's 4 channels has:

- 2 outputs: control of starter forward and reverse running,
- 3 inputs: position of the rotary knob, fault indication and position of the poles.

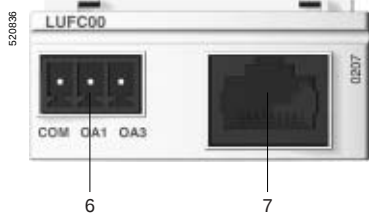
Connection to the dedicated module is by means of the following cables:

- RJ45 LU9R, for lengths less than 3 metres,
- 490 NTW 000, for lengths greater than 3 metres.

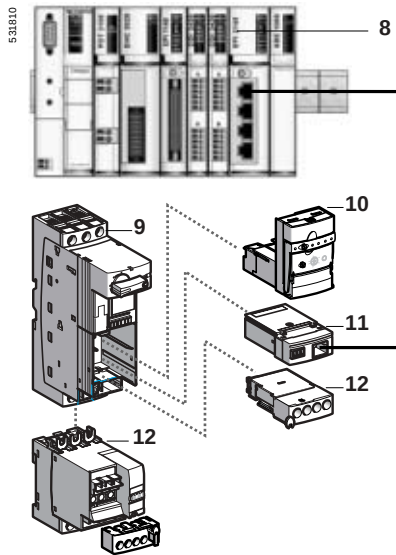
Description	Item	Reference	Weight kg
Parallel wiring module	1	LUF C00	0.045

(1) Please consult our "Power Control and connection components catalogue".

(2) Please consult our "Distributed I/O Advantys STB, the open device integration I/O system" catalogue.



- 6 Outputs for starter commands
7 RJ45 connector for connecting to splitter box

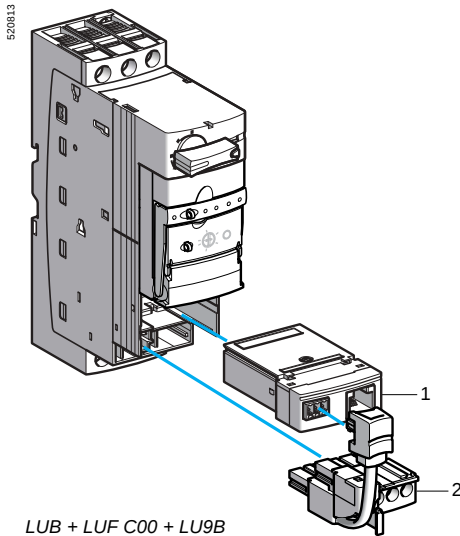


- 8 Dedicated parallel interface module (STB EPI 2145)
9 Power base
10 24 V control unit (LUC B/D/C/M BL)
11 Parallel wiring module (LUF C00),
12 Options: add-on contact blocks, reverser blocks

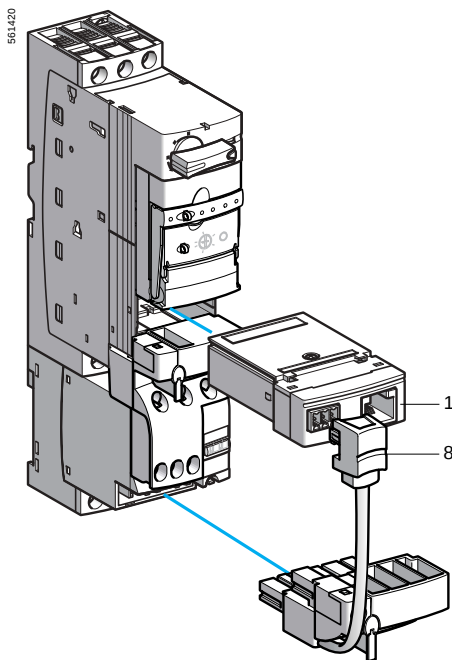
TeSys motor starters - open version

Model U starter-controllers

Parallel wiring module and pre-wired coil connection components



LUB + LUF C00 + LU9B



LU2B + LUF C00 + LU9M

Pre-wired components simplify wiring and reduce wiring errors.

Connection of communication module output terminals to the coil terminals

By pre-wired connector or wire link.

■ Pre-wired connector: pre-wired coil connection

The use of a power base without pre-wired connections is recommended.

Description	For use with power base	Item	Reference	Weight kg
Pre-wired coil connection	LUB ●●	2	LU9B N11C	0.045
	LU2B ●●	8	LU9M RC	0.030

■ Wire link:

Allows insertion, for example, of an emergency stop control or a voltage interface. This type of connection must be used for a reversing starter-controller assembled using an LU6M reverser block for separate mounting. When reverser block LU6M and the power base are mounted side-by-side, a pre-wired connector LU9M RC may be used.

Connection of parallel wiring module to the PLC

No tools are required to connect the parallel wiring module to the PLC. Connection is via a splitter box which allows up to 8 starter-controllers to be connected; a maximum of 4 reversing starters per splitter box is allowed.

The splitter box requires a $\sim$ 24 V power supply.

Splitter block

Connectors		Item	Reference	Weight kg
PLC side (16I/12O)	Starter-controller side			
2 x HE 10	8 x RJ45	4	LU9 G02 (1)	0.260

Connection cables to the splitter box

Connectors	Item	Length m	Reference	Weight kg
2 x RJ45 connectors	3	0.3	LU9 R03	0.045
		1	LU9 R10	0.065
		3	LU9 R30	0.125

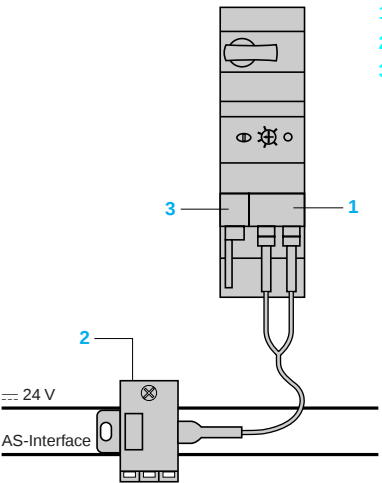
Connection cables from splitter box to PLC

Type of connection		Gauge	C.s.a.	Length	Reference	Weight		
PLC side	Splitter box side							
		AWG	mm²	m		kg		
HE 10 20-way	HE 10 20-way	22	0.324	0.5	TSX CDP 053	0.085		
				1	TSX CDP 103	0.150		
				2	TSX CDP 203	0.280		
				3	TSX CDP 303	0.410		
				5	TSX CDP 503	0.670		
		28	0.080	1	ABF H20 H100	0.080		
				2	ABF H20 H200	0.140		
				3	ABF H20 H300	0.210		
		Bare wires	HE 10 20-way	22	0.324	3	TSX CDP 301	0.400
						5	TSX CDP 501	0.660

(1) Allows "run" and "fault" status of each starter-controller to be fed back to the PLC and transmits commands.

Series type connection

Architecture



- 1 Communication module ASI LUF C5
- 2 Tap-off XZ CG0142
- 3 Pre-wired coil connection LU9B N11C

Information transmitted by the AS-Interface system

AS-Interface profile		7.D.F.0	
Data bits (command)	Bit value	= 0	= 1
	Command D0 (O)	Stop forward	Forward running
	Command D1 (O)	Stop reverse	Reverse running
	Command D2 (O)	Not used	Not used
	Command D3 (O)	Not used	Not used
Data bits (status)	Bit value	= 0	= 1
	Status D0 (I)	Not ready or fault	Ready
	Status D1 (I)	Stopped	Running
	Status D2 (I)	Not used	Not used
	Status D3 (I)	Not used	Not used

AS-Interface communication module

The AS-Interface communication module makes it easy to connect starter-controllers to the AS-Interface cabling system, and therefore allows remote control and command of these starter-controllers.

The various operating states of the module (AS-Interface voltage present, communication fault, addressing fault,...) are indicated on the front panel by 2 LEDs (green 4 and red 5).

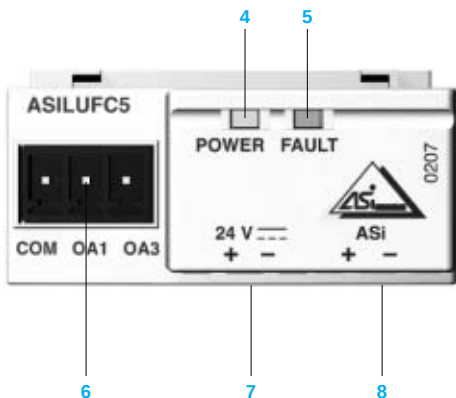
Operation of the module is continuously monitored by auto-testing, in a way that is totally transparent to the user.

The incorporation of AS-Interface V.2.1 functions allows diagnostics to be performed on the module, either remotely via the line or locally via the ASI Terv2 addressing terminal.

The communication module must be connected to a 24 V auxiliary supply and must be used in conjunction with a 24 V control unit, LUC●●●BL. The product is supplied with a yellow connector 6 for connection to the AS-Interface system, a black connector 7 for connection to the 24 V auxiliary supply and a black connector 8 for connection of the outputs.

Description	Item	Reference	Weight kg
Communication module	1	ASI LUF C5	0.065

531118

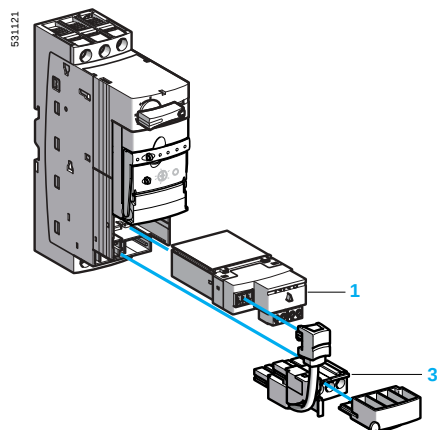


- 4 Green LED: AS-Interface voltage present
- 5 Red LED: AS-Interface or module fault
- 6 Yellow connector for connection to the AS-Interface system
- 7 Black connector for connection to 24 V auxiliary power supply
- 8 Outputs for starter commands

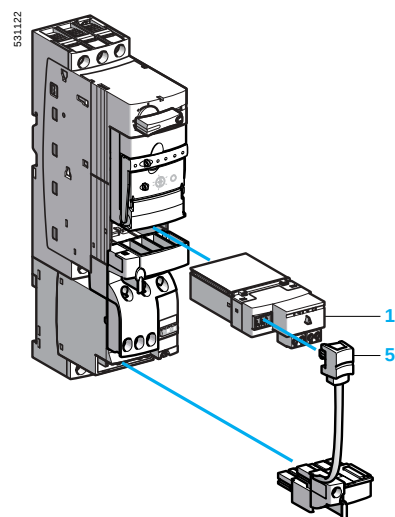
AS-Interface cabling system

Dedicated components

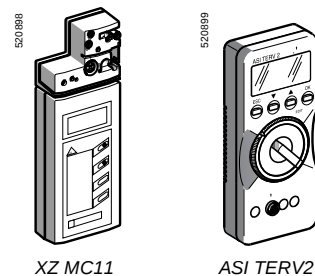
TeSys Model U starter-controllers



LUB + ASILUF C5 + LU9B

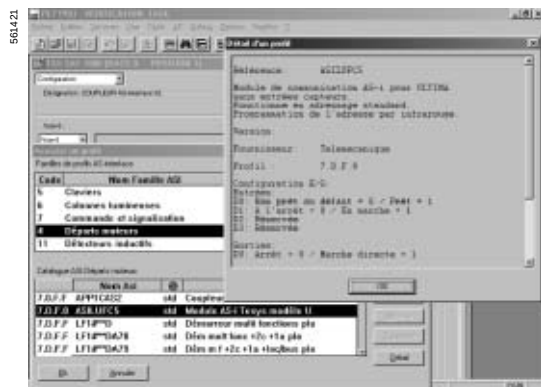


LU2B + ASILUF C5 + LU9M



XZ MC11

ASI Terv2



Configuration example with Premium TSX SAY 1000 module

Pre-wired components simplify wiring and reduce wiring errors.

Connection of communication module output terminals to the coil terminals

By pre-wired connector or wire link.

■ Pre-wired connector: pre-wired coil connection

The use of a power base without pre-wired control circuit connections is recommended.

Description	For use with power base	Item	Reference	Weight kg
Pre-wired coil connection	LUB ●●	3	LU9B N11C	0.045
	LU2B ●●	5	LU9M RC	0.030

■ Wire link

Allows insertion, for example, of an emergency stop control or a voltage interface. This type of connection must be used for a reversing starter-controller assembled using an LU6M reverser block for separate mounting. When reverser block LU6M and the power base are mounted side-by-side, a pre-wired coil connection LU9M RC may be used.

Connection of the communication module (1)

Achieved by using a tap-off for connection to 2 ribbon cables:

- 1 for AS-Interface (yellow).
- 1 for separate ± 24 V supply (black).

Description	Length m	Reference	Weight kg
Tap-off	2	XZ CG0142	0.265

Consoles and cable adapters

Description	Reference	Weight kg
Addressing terminal Battery operated. Battery charger supplied AS-Interface V.1 and V.2.1 compatible	XZ MC11	0.550
Adjustment and diagnostics console Runs on LR6 batteries Allows addressing of AS-Interface V.2.1 interfaces and diagnostics	ASI Terv2	0.500
Cable adapter For console XZ MC11	XZ MG12	0.070

Software set-up

AS-Interface configuration is carried out using PL7 Micro/Junior/Pro software. From the module declaration screen, it is possible to configure all the slave devices corresponding to all the AS-Interface I/O.

Configuration is carried out by following the instructions on the screen.

TeSys model U user's manual (2)

Application	Language	Reference	Weight kg
On CD-Rom	Multi-language (3)	LU9 CD1	0.022

(1) Degree of protection IP 54. Connection by $4 \times 0.34 \text{ mm}^2$ wires.

Black wire: + 24 V.

White wire: 0 V.

Blue wire: AS-Interface (-).

Brown wire: AS-Interface (+).

(2) The CD-Rom contains user's manuals for the AS-Interface and Modbus communication modules, multifunction control units and gateway modules, as well as the gateway programming software.

(3) English, French, German, Italian, Spanish

TeSys motor starters - open version

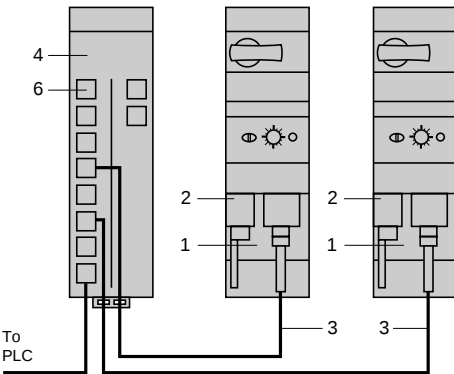
Model U starter-controllers

Modbus communication modules and pre-wired coil connection components

Series type connection

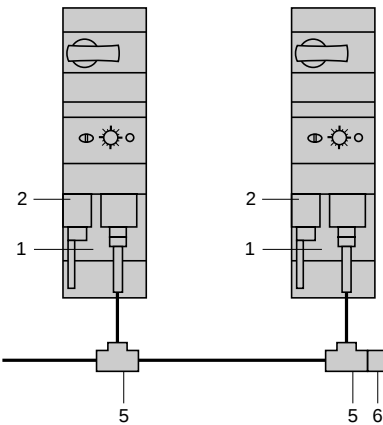
Architecture

■ Star topology



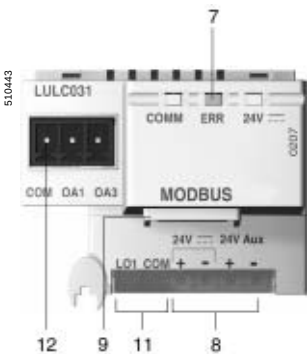
- 1 Communication module LUL C031 or LUL C032
- 2 Pre-wired coil connection LU9B N11C
- 3 Connection cable with one RJ45 connector at each end VW3 A8 306 R●●
- 4 Modbus hub LU9 GC3 with channel connections to PLC and to starter-controller with RJ45 connectors
- 6 Line terminator VW3 A8 306 R

■ Bus topology

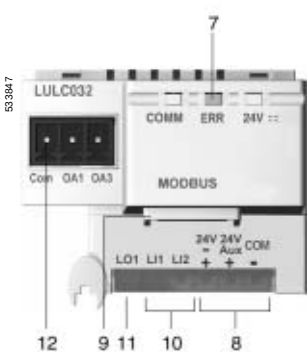


- 1 Communication module LUL C031 or LUL C032
- 2 Pre-wired coil connection LU9B N11C
- 5 T-junction VW3 A8 306 TF●●
- 6 Line terminator VW3 A8 306 R

LUL C031



LUL C032



- 7 Module status signalling LED
- 8 24 V supply connection
- 9 RJ45 connector for RS485 Modbus link
- 10 2 discrete inputs
- 11 1 discrete output
- 12 Outputs for starter commands

Information carried by the bus

Depends on the type of control unit used.

Control unit	Standard	Advanced	Multifunction
Starter status (ready, running, fault)			
Alarms (overcurrent, ...)			
Thermal overload alarm			
Remote reset via the bus			
Indication of motor load			
Fault signalling and differentiation			
Remote programming and monitoring of all functions			
"Log" function			
"Monitoring" function			
Start and Stop commands			

Functions performed

For more detailed information, please refer to User's Manual LU9 CD1, see page opposite.

Modbus communication modules

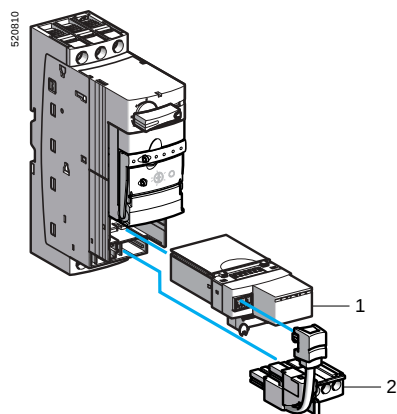
Communication modules LUL C031 and LUL C032 enable the model U starter-controller to be connected to the Modbus network. They must have a 24 V supply and must be used in conjunction with a 24 V control unit, LUC●●BL. They incorporate a 0.5 A, 24 V discrete output for local command requirements. Module LUL C032 also has two configurable discrete inputs.

Description	Item	Reference	Weight kg
Communication module	1	LUL C031	0.080
	1	LUL C032	0.080

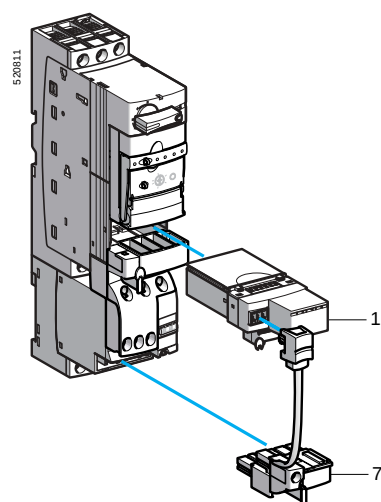
TeSys motor starters - open version

Model U starter-controllers

Modbus communication modules and pre-wired coil connection components



LUB + LUL C03● + LU9B



LU2B + LUL C03● + LU9M

Pre-wired components simplify wiring and reduce wiring errors.

Connection of communication module output terminals to the coil terminals

By pre-wired connector or wire link.

■ Pre-wired connector: pre-wired coil connection

The use of a power base without pre-wired control circuit connections is recommended.

Description	For use with power base	Item	Reference	Weight kg
Pre-wired coil connection	LUB ●●	2	LU9B N11C	0.045
	LU2B ●●	7	LU9M RC	0.030

■ Wire link:

Allows insertion, for example, of an emergency stop control or a voltage interface. This type of connection must be used for a reversing starter-controller assembled using an LU6M reverser block for separate mounting. When reverser block LU6M and the power base are mounted side-by-side, a pre-wired connector LU9M RC may be used.

Connection of communication modules on the serial bus

Achieved either by means of a Modbus hub or using T-junctions.

Description	Length m	Item	Reference	Weight kg
Modbus hub 8 slaves	—	4	LU9 GC3	0.260
Cables fitted with 2 x RJ45 connectors	0.3	3	VW3 A8 306 R03	0.045
	1	3	VW3 A8 306 R10	0.065
	3	3	VW3 A8 306 R30	0.125
T-junctions (1)	0.3	5	VW3 A8 306 TF03	0.032
	1	5	VW3 A8 306 TF10	0.032
RS 485 line terminator	—	6	VW3 A8 306 R	0.012

TeSys model U user's manual (2)

Application	Language	Reference	Weight kg
On CD-Rom	Multi-language (3)	LU9 CD1	0.022

(1) Fitted with 2 RJ45 female connectors (bus side) and a 0.3 m or 1 m length cable supplied with an RJ45 male connector (station side).

(2) The CD-Rom contains user's manuals for the AS-Interface and Modbus communication modules, multifunction control units and gateway modules, as well as the gateway programming software.

(3) English, French, German, Italian, Spanish

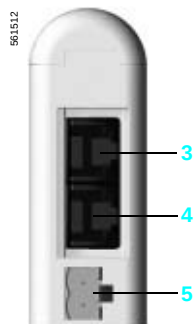
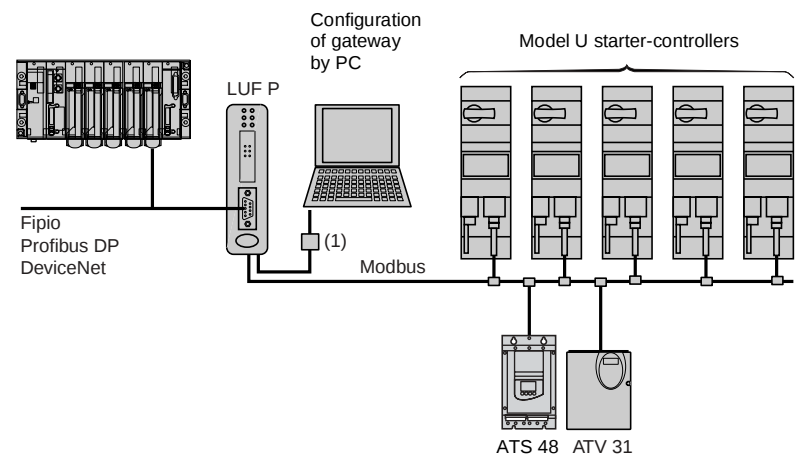
Presentation

Communication gateways LUF P allow connection between Modbus and field buses such as Fipio, Profibus DP or DeviceNet.

After configuration, these gateways manage information which can be accessed by the Modbus bus and make this information available for read/write functions (command, monitoring, configuration and adjustment) on the field buses.

An LUF P communication gateway consists of a box which can be clipped onto a 35 mm omega rail, allowing connection of up to 8 Slaves connected on the Modbus bus.

Example of architecture



(1) Connection kit for PowerSuite software workshop.

Description

Front panel of the product

- 1 LED indicating :
 - communication status of the Modbus buses,
 - gateway status,
 - communication status of the Fipio, Profibus DP or DeviceNet bus.
- 2 Connectors for connection to Fipio, Profibus DP or DeviceNet buses.

Underside of product

- 3 RJ45 connector for connection on the Modbus bus
- 4 RJ45 connector for link to a PC
- 5 24 V power supply

Software set-up

For the Fipio bus, software set-up of the gateway is performed using either PL7 Micro/Junior/Pro software or ABC Configurator software.

For the Profibus DP and DeviceNet buses, software set-up is performed using ABC Configurator.

This software is included:

- in the PowerSuite software workshop for PC (see page 1/25),
- in the TeSys model U user's manual.

Characteristics

Bus type		Fipio	Profibus DP	DeviceNet
Environment	Conforming to IEC 60664	Degree of pollution: 2		
Ambient air temperature	Around the device	°C	+ 5...+ 50	
Degree of protection		IP 20		
Electromagnetic compatibility	Emission	Conforming to IEC 50081-2: 1993		
	Immunity	Conforming to IEC 61000-6-2: 1999		
Number of Modbus slaves which can be connected		≤ 8		
Connection	Modbus	By RJ45 connector conforming to Schneider Electric RS485 standard		
	To a PC	By RJ45 connector, with PowerSuite connection kit		
	Field bus	By SUB D9 female connector	By SUB D9 female connector	By 5-way removable screw connector
Supply		V	External supply, --- 24 ± 10 %	
Consumption	Max.	mA	280	
	Typical	mA	100	
Indication/diagnostics			By LED on front panel	
Services	Profile	FED C32 or FED C32P	–	–
	Command	26 configurable words (1)	122 configurable words	256 configurable words
	Monitoring	26 configurable words (1)	122 configurable words	256 configurable words
	Configuration and adjustment	By gateway mini messaging facility (PKW)		

(1) If the gateway is configured using PL7 and not ABC Configurator, the I/O capacity is limited to a total of 26 words.

References

Description	For use with	With bus type	Reference	Weight kg
Communication gateways	TeSys Model U starter-controllers, Altistart 48, Altivar 31	Fipio/Modbus	LUF P1	0.245
		Profibus DP/Modbus	LUF P7	0.245
		DeviceNet/Modbus	LUF P9	0.245

Connection accessories

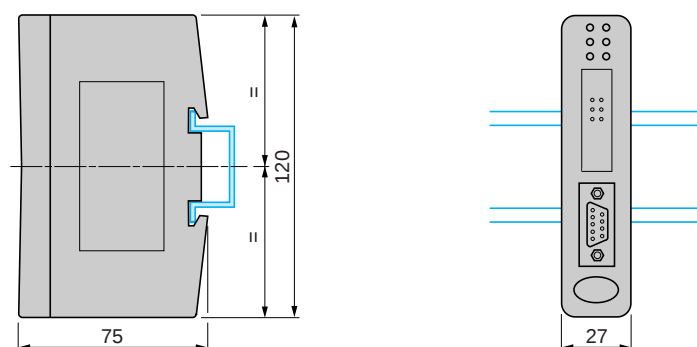
Description	For use with	Length m	Connectors	Reference	Weight kg
 TSX FP ACC 12	Modbus	3	1 RJ45 type connector and one end with stripped wires	VW3 A8 306 D30	0.150
		0.3	2 RJ45 type connectors	VW3 A8 306 R03	0.050
		1	2 RJ45 type connectors	VW3 A8 306 R10	0.050
		3	2 RJ45 type connectors	VW3 A8 306 R30	0.150
 490 NAD 911 03	Fipio	–	1 SUB-D 9 male connector	TSX FP ACC12	0.040
		–	1 SUB-D 9 male connector	490 NAD 911 04	–
		–	1 SUB-D 9 male connector	490 NAD 911 03	–

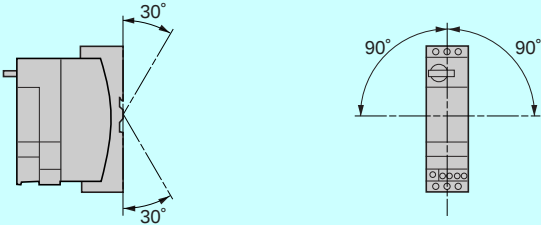
Documentation

Description	Medium	Language	Reference	Weight kg
User's manual for TeSys model U range (2)	CD-Rom	Multilingual : English, French, German, Italian, Spanish	LU9 CD1	0.022

(2) This CD-Rom contains user's manuals for AS-Interface and Modbus communication modules, multifunction control units and gateways, as well as for the gateway programming software, ABC Configurator.

Dimensions



Environment			
Product certifications			UL, CSA Pending: BV, GL, LROS, DNV, PTB
Conforming to standards			IEC/EN 60947-6-2, CSA C22-2 N°14, Type E UL 508 type E: with phase barrier LU9 SP0
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3	V	690
	Conforming to UL508, CSA C22-2 n°14	V	600
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-6-2	kV	6
Safety separation of circuits SELV	Conforming to IEC/EN 60947-1 appendix N	V	Between the control or auxiliary circuit and the main circuit: 400 Between the control and auxiliary circuits: 400
Degree of protection Conforming to IEC/EN 60947-1 (protection against direct finger contact)	Front panel outside connection zone		IP 40
	Front panel and wired terminals		IP 20
	Other faces		IP 20
Protective treatment	Conforming to IEC/EN 60068		"TH"
	Conforming to IEC/EN 60068-2-30	Cycles	12
	Conforming to IEC/EN 60068-2-11	h	48
Ambient air temperature around the device	Storage	°C	- 40...+ 85
	Operation	°C	Power bases and standard and advanced control units: - 25...+ 70. (At temperatures above 60°C and up to 70°C, for Ie = 32 A, leave a minimum gap of 9 mm between products). Power bases and multifunction control units: - 25...+ 60. (At temperatures above 45 °C, leave a minimum gap of 9 mm between products. At temperatures above 55 °C up to 60 °C, leave a gap of 20 mm between products.)
Maximum operating altitude		m	2000
Operating positions	In relation to normal vertical mounting plane		
Flame resistance	Conforming to UL 94		V2
	Conforming to IEC/EN 60695-2-12	°C	960 (parts supporting live components) °C 650
Environmental restrictions			Cadmium and silicone-free, recyclable
Shock resistance 1/2 sine wave = 11 ms	Conforming to IEC/EN 60068-2-27 (1)		Power poles open: 10 gn Power poles closed: 15 gn
Vibration resistance 5...300 Hz	Conforming to IEC/EN 60068-2-6 (1)		Power poles open: 2 gn Power poles closed: 4 gn
Immunity to electrostatic discharge	Conforming to IEC/EN 61000-4-2	kV	In open air: 8 - Level 3
		kV	On contact: 8 - Level 4
Immunity to radiated high-frequency disturbance	Conforming to IEC/EN 61000-4-3	V/m	10 - Level 3
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	kV	All circuits except for serial link: 4 - Level 4
		kV	Serial link: 2 - Level 3
Immunity to dissipated shock waves	Conforming to IEC/EN 60947-6-2 Uc ~ 24...240 V, Uc --- 48...220 V Uc = 24 V ---		Common mode Serial mode
		kV	2 1
			Not applicable
Immunity to conducted high-frequency disturbance	Conforming to IEC/EN 61000-4-6	V	10

(1) Without modifying the contact states, in the most unfavourable direction.

Power base and control unit type			LUB 12 + LUCA or LUCB or LUCC or LUCD	LUB 32 + LUCA or LUCB or LUCC or LUCD	LUB 12 + LUCM	LUB 32 + LUCM	LU2M LU6M
Power circuit connection characteristics							
Connection to Ø 4 mm screw clamp terminals							
Flexible cable without cable end	1 conductor	mm ²	2.5...10	2.5...10	2.5...10	2.5...10	2.5...10
	2 conductors	mm ²	1.5...6	1.5...6	1.5...6	1.5...6	1.5...6
Flexible cable with cable end	1 conductor	mm ²	1...6	1...6	1...6	1...6	1...6
	2 conductors	mm ²	1...6	1...6	1...6	1...6	1...6
Solid cable without cable end	1 conductor	mm ²	1...10	1...10	1...10	1...10	1...10
	2 conductors	mm ²	1...6	1...6	1...6	1...6	1...6
Screwdriver			Philips n° 2 or flat screwdriver: Ø 6 mm				
Tightening torque			N.m	1.9...2.5	1.9...2.5	1.9...2.5	1.9...2.5
Control circuit connection characteristics							
Connection to Ø 3 mm screw clamp terminals							
Flexible cable without cable end	1 conductor	mm ²	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
	2 conductors	mm ²	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
Flexible cable with cable end	1 conductor	mm ²	0.34...1.5	0.34...1.5	0.34...1.5	0.34...1.5	0.34...1.5
	2 conductors	mm ²	0.34...1.5	0.34...1.5	0.34...1.5	0.34...1.5	0.34...1.5
Solid cable without cable end	1 conductor	mm ²	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
	2 conductors	mm ²	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
Screwdriver			Philips n° 1 or flat screwdriver: Ø 5 mm				
Tightening torque			N.m	0.8...1.2	0.8...1.2	0.8...1.2	0.8...1.2
Control circuit characteristics							
Rated voltage of control circuit	~ 50/60 Hz	V	24...240	24...240	—	—	—
	—	V	24...220	24...220	24	24	—
Voltage limits Operation	— 24 V (1)	V	20...27	20...27	20...28	20...28	—
	~ 24 V	V	20...26.5	20...26.5	—	—	—
Drop-out	~ or — 48...72 V	V	~ 38.5...72, — 38.5...93	—	—	—	—
	~ 110...240 V	V	~ 88...264	~ 88...264	—	—	—
	— 110...220 V	V	— 88...242	— 88...242	—	—	—
	— 24 V	V	14.5	14.5	14.5	14.5	—
Typical consumption	~ 24 V	mA	130	220	150	200	120
	~ 24 V	mA	140	220	—	—	2360
	~ or — 48...72 V	mA	280	280	—	—	2300
	~ 110...240 V, — 110...220 V	mA	280	280	—	—	1000
I rms sealed	— 24 V	mA	60	80	70	75	120
	~ 24 V	mA	70	90	—	—	(2)
	~ or — 48...72 V	mA	35	45	—	—	(2)
	~ 110...240 V, — 110...220 V	mA	35	25	—	—	(2)
Heat dissipation		W	2	3	1.7	1.8	—
Operating time	Closing	ms	24 V : 70 ; 48 V : 60 ; ≥ 72 V : 50		75	65	—
	Opening	ms	35	35	35	35	—
Resistance to micro-breaks		ms	3	3	3	3	—
Resistance to voltage drops IEC/EN 61000-4-11			At least 70 % of Uc for 500 ms				—
Mechanical durability		In millions of operating cycles	15	15	15	15	—
Maximum operating rate		In operating cycles per hour	3600	3600	3600	3600	—
Main pole characteristics							
Number of poles			3	3	3	3	—
Isolation function To IEC/EN 60947-1	Possible		Yes	Yes	Yes	Yes	—
	Padlocking		1 padlock with Ø 6.9 mm shank				
Rated thermal current		A	12	32	12	32	—
Rated operating current (Ue ≤ 440V)	To IEC/ In cat. AC-41		θ ≤ 70°C: 12A	θ ≤ 70°C: 32A	θ ≤ 55°C: 12A	θ ≤ 55°C: 32A	—
	EN 60947-6-2 In cat. AC-43		θ ≤ 70°C: 12A	θ ≤ 70°C: 32A	θ ≤ 55°C: 12A	θ ≤ 55°C: 32A	—
Rated operating voltage		V	690 (3)	690 (3)	690 (3)	690 (3)	—
Frequency limits		Hz	40...60	40...60	40...60	40...60	—
Power dissipated in the power circuits	Operating current	A	3 6 9 12	18 25 32			—
	Power dissipated in all three poles	W	0.1 0.3 0.6 1.1	2.4 4.6 7.5			—
Rated breaking capacity on short-circuit		V	230 440	500 690			—
		kA	50 50	10 4			—
Total breaking time		ms	2 2	2			—
Thermal stress limit		kA²s	90	120	90	120	—

(1) Voltage with maximum ripple of ± 10 %.

(2) No consumption sealed. (3) For 690 V, use phase barrier LU9 SP0.

Specific characteristics of power bases LU2B and reverser blocks LU2M or LU6M

Duration of inrush phase	~ 50/60 Hz	ms	25
	---	ms	15
Maximum operating time	Without change of direction	ms	75
	With change of direction	ms	150

General characteristics of auxiliary contacts

Conventional thermal current (I _{th})	For ambient temperature $\theta < 70^\circ\text{C}$	A	5
Frequency of the operating current		Hz	Up to 400
Minimum switching capacity $\lambda = 10^{-8}$	U min	V	17
	I min	mA	5
Short-circuit protection	Conforming to IEC/EN 60947-5-1	A	gG fuse: 4
Short-time rating	Permissible for	1 s	A 30
		500 ms	A 40
		100 ms	A 50
Insulation resistance		m Ω	10
Non-overlap time	Guaranteed between N/C and N/O contacts	ms	2 (on energisation and on de-energisation)

Specific characteristics of auxiliary contacts built-into the power base

Linked contacts	Conforming to IEC/EN 60947-4-1		Each power base has 1 N/O contact and 1 N/C contact which are mechanically linked
Mirror contact	Conforming to draft standard IEC/EN 60947-1		The N/C contact fitted in each power base reliably represents the state of the power contacts (safety scheme)
Rated operating voltage (U _e)		V	Up to ~ 690; --- 250
Rated insulation voltage (U _i)	Conforming to IEC/EN 60947-5-1	V	690
	Conforming to UL, CSA	V	600

Specific characteristics of auxiliary contacts in modules LUF N, of auxiliary contacts LUA1 and of reverser blocks LU2M and LU6M

Rated operating voltage (U _e)		V	Up to ~ 250; --- 250
Rated insulation voltage (U _i)	Conforming to IEC/EN 60947-5-1	V	250
	Conforming to UL, CSA	V	250

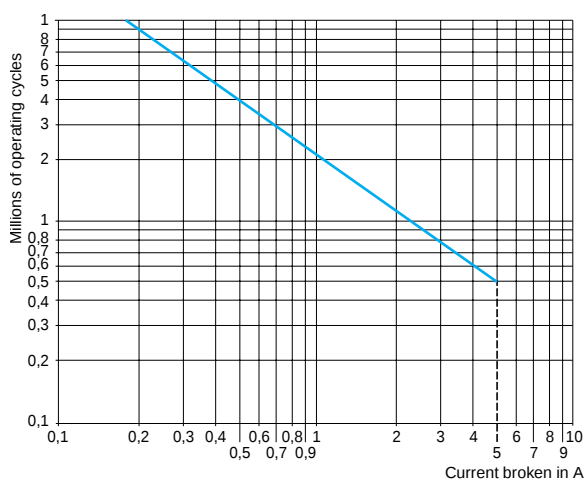
Operational power of contacts

Conforming to IEC/EN 60947-5-1

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \phi 0.7$) = 10 times the power broken ($\cos \phi = 0.4$).

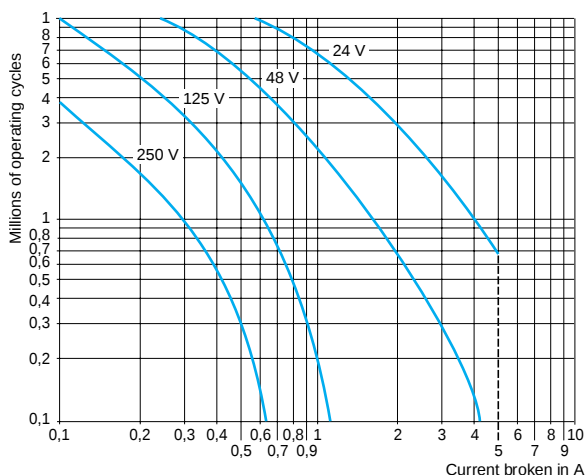
	V	24	48	115	230	400	440	600
1 million operating cycles	VA	60	120	280	560	960	1050	1440
3 million operating cycles	VA	16	32	80	160	280	300	420
10 million operating cycles	VA	4	8	20	40	70	80	100



d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	125	250
W		120	90	75	68
W		70	50	38	33
W		25	18	14	12



Characteristics of standard control units LUCA

Protection	Motor type		3-phase
	Conforming to standard		IEC/EN 60947-6-2, UL 508, CSA C22-2 n°14
Overload protection	Tripping class conforming to UL 508, IEC/EN 60947-6-2		10
	Frequency limits of the operating current	Hz	40...60
	Temperature compensation	°C	- 25...+ 70
	Protection against phase imbalance		With
Short-circuit protection	Tripping threshold		14.2 x Ir (setting current)
	Tripping tolerance		± 20 %

Characteristics of advanced control units LUCB, LUCC and LUCD

Control unit type		LUCB	LUCC	LUCD
Protection	Motor type	3-phase	Single-phase	3-phase
	Conforming to standard	IEC/EN 60947-6-2, UL 508, CSA C22-2 n°14	IEC/EN 60947-6-2, UL 508, CSA C22-2 n°14	IEC/EN 60947-6-2, UL 508, CSA C22-2 n°14
Overload protection	Tripping class conforming to UL 508, IEC/EN 60947-6-2	10	10	20
	Frequency limits of the operating current	Hz	40...60	40...60
	Temperature compensation	°C	- 25...+ 70	- 25...+ 70
	Protection against phase imbalance	Yes	—	Yes
Short-circuit protection	Tripping threshold	14.2 x Ir max.	14.2 x Ir max.	14.2 x Ir max.
	Tripping tolerance	± 20 %	± 20 %	± 20 %

Characteristics of multifunction control units LUCM

Protection	Motor type		Selectable: single-phase or 3-phase
	Conforming to standard		IEC/EN 60947-6-2, UL 508
Overload protection	Tripping class conforming to UL 508, IEC/EN 60947-6-2		5, 10, 15, 20, 25, 30 (selectable)
	Frequency limits of the operating current	Hz	40...60
	Temperature compensation	°C	- 25...+ 55
Communication interface for terminal on enclosure door	Physical interface		RS 485 multi-drop
	Connector		RJ45 on front panel
	Protocol		Modbus RTU
	Maximum transmission speed	bit/s	19 200 (self-configuration up to this value)
	Maximum return time	ms	200
Display	Type		LCD, 2 lines of 12 characters
	Language version		Multilanguage (English, French, German, Italian, Spanish)
	Accuracy		± 5 %
	Resolution		1 % of Ir
Auxiliary supply	External type	V	— 24, with maximum ripple of ± 10 %.
	Heat dissipation	W	0.8

Configuration table for protection devices and alarms on multifunction control units LUCM

	Tripping	Alarm	Adjustment of tripping threshold		Adjustment of time before tripping		Adjustment of alarm threshold	
	Factory setting	Factory setting	Range	Default value	Range	Default value	Range	Default value
Overcurrent	Activated (1)	—	3...17 Ir	14.2	—	—	—	—
Overload	Activated (1)	Activated	0.15...32 A (2) Ir min		Class: 5...30	5	10...100 % of the thermal state	85 %
Earth fault	Activated	Activated	0.2...5 Ir min	0.3 Ir min	0.1...1.2 s	0.1 s	0.2...5 Ir min	0.3 Ir min
Phase imbalance	Activated	Activated	10...30 %	10 %	0.2...20 s	5 s	10...30 %	10 %
Torque limitation	Deactivated	Deactivated	1...8 Ir	2 Ir	1...30 s	5 s	1...8 Ir	2 Ir
No-load running	Deactivated	Deactivated	0.3...1 Ir	0.5 Ir	1...200 s	10 s	0.3...1 Ir	0.5 Ir
Long starting times	Deactivated	Deactivated	1...8 Ir	Ir	1...200 s	10 s	1...8 Ir	Ir

Configuration of additional functions on multifunction control units LUCM

	Factory setting	Setting range
Reset	Manual	Manual, automatic or remote
Time before reset	120 s	1...1000 s
Type of load	3-phase motor	3-phase motor, single-phase motor
	Self-cooled	Self-cooled, force cooled
Language	English	English, French, German, Italian, Spanish
Display	Average current	Average current, thermal state of motor, current in phase 1 / 2 / 3, earth leakage current, phase imbalance, cause of last 5 faults

(1) This function cannot be deactivated.

(2) The setting range depends on the rating of the control unit used.

Characteristics of limiter-disconnector LUA LB1

Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1	V	690
Conventional thermal current (Ith) conforming to standard IEC/EN 60947-1	A	32
Operating threshold I rms	kA	50
Breaking capacity	V	440 690
	kA	130 70
Mounting		Directly on the upstream terminals of the starter-controller
Connection		
Solid cable	1 conductor	mm ² 1.5...10
	2 conductors	mm ² 1.5...6
Flexible cable without cable end	1 conductor	mm ² 1...10
	2 conductors	mm ² 1...6
Flexible cable with cable end	1 conductor	mm ² 1...6
	2 conductors	mm ² 1...6
Screwdriver		Phillips n°2 or flat screwdriver Ø 6 mm
Tightening torque	N.m	1.9...2.5

Characteristics of current limiter LA9 LB920

Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1	V	690
Conventional thermal current (Ith) conforming to standard IEC/EN 60947-1	A	63
Operating threshold I rms	A	1000
Breaking capacity	V	440 690
	kA	100 35
Mounting		Separate
Connection		
Solid cable	1 conductor	mm ² 1.5...25
	2 conductors	mm ² 1.5...10
Flexible cable without cable end	1 conductor	mm ² 1.5...25
	2 conductors	mm ² 2.5...10
Flexible cable with cable end	1 conductor	mm ² 1.5...16
	2 conductors	mm ² 1.5...4
Screwdriver		Phillips n°2 or flat screwdriver Ø 6 mm
Tightening torque	N.m	2.2

Characteristics of thermal overload alarm function module LUF W10

Activation threshold		Fixed at 88% of the thermal tripping state
Hysteresis between activation and switching off		5 %
Indication		By LED on front panel
Supply		Powered by the control unit
Discrete output characteristics	Type	N/O contact
	AC-15	230 V max; 400 VA 100 000 operating cycles
	DC-13	24 V; 50 W 100 000 operating cycles
Conventional thermal current (Ith)	For ambient temperature $\theta < 70\text{ }^{\circ}\text{C}$	A 2
Short-circuit protection	Conforming to IEC/EN 60947-5-1	A gG fuse: 2

Characteristics of thermal overload fault signalling and reset modules

Module type		LUF DH11	LUF DA01	LUF DA10
Fault signalling		By LED on front panel		
External power supply	V	~/= 24...240		
Module consumption	mA	7 at = 24 1.1 at ~ 240		
Discrete outputs	Type	1 N/C + 1 N/O	1 N/C	1 N/O
	AC-15	230 V max; 400 VA 100 000 operating cycles		
	DC-13	24 V; 50 W 100 000 operating cycles		
Conventional thermal current (Ith)	For ambient temperature $\theta < 70\text{ }^{\circ}\text{C}$	A	2	
Short-circuit protection	Conforming to IEC/EN 60947-5-1	A	gG fuse: 2	
Reset input	Conductor c.s.a.	mm ²	0.2 min	
	Length	m	500 (R = 50 Ω , L = 52.8 mH, Cp = 93 pF)	

Characteristics of motor load indication function module LUF V2

Analogue output			4 - 20 mA
Signal delivered			Value of I average/I _r ratio within the range of 0 to 2 for LUCB and LUCD Value of I average/I _r ratio within the range of 0 to 3 for LUCC
Load impedance	Minimum	kΩ	–
	Maximum	Ω	500
	Typical	Ω	100
Signal characteristics with advanced control unit	Precision		± 6 %
Signal characteristics with multifunction control unit	Precision		± 10 %
	Resolution		1 % of I _r
Supply			External --- 24 V

Characteristics of AS-Interface communication module ASILUF C5

Product certification			AS-Interface V2.1 n° 52901
AS-Interface profile			7.D.F.0
Ambient air temperature		°C	Operation - 25...+ 70
AS-Interface supply		V	29.5...31.5
Current consumption By the AS-Interface system		mA	Normal operation: 25
		mA	Fault condition: 30
Auxiliary supply		V	--- 24 ± 30 %
Current consumption On 24 V supply for the outputs		mA	200
Number of outputs			2 dedicated to starter-controller coil operation
Switching capacity of the solid state outputs			0.5 A/24 V (outputs protected against short-circuits)
Indication/diagnostics			By 2 LEDs on front panel

Characteristics of Modbus communication modules LUL C03●

Module type			LUL C031	LUL C032
Physical interface			RS 485 multi-drop	
Connector			RJ45 on front panel	
Protocol			Modbus RTU	
Maximum transmission speed		bit/s	19 200 (self-configuration up to this value)	
Maximum return time		ms	30	
Addressing			By switches: from 0...31	
Ambient air temperature		°C	Operation - 25...+55	
Logic inputs	Number		–	2 (to be assigned according to configuration)
	Supply		–	--- 24
	Input current	mA	–	7
Nominal input values	Voltage	V	--- 24 (positive logic)	
	Current	mA	7	
Response time	Change to state 1	ms	10 (± 30 %)	
	Change to state 0	ms	10 (± 30 %)	
Input type			Resistive	
Solid state outputs	Number		3, of which 2 dedicated to starter-controller coil operation	
	Supply	V	--- 24	
	Max. current	mA	500	
Protection	gl fuse	A	1	
Current consumption On 24 V supply for the outputs		mA	200	
Switching capacity of the solid state outputs			0.5 A/24 V	
Indication/diagnostics			By 3 LEDs on front panel	

Connection characteristics

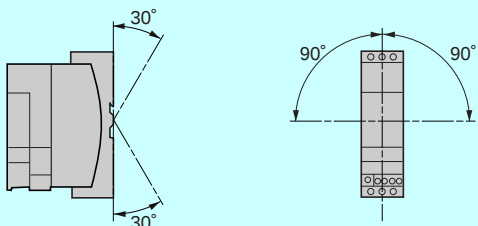
Module type			LUF W10, DH11, DA01 and DA10	LUF V2	ASILUF C5 Inputs and 24 V auxiliary	Outputs	LUL C031 LUL C032	LUFC 00
Connectors		Pitch	5.08	3.81	5.08	3.81	3.81	3.81
Flexible cable without cable end	1 conductor	mm²	0.2...1.5	0.14...1	0.2...1.5	0.14...1	0.14...1	0.14...1
		mm²	0.2...1	0.14...0.75	0.2...1	0.14...0.75	0.14...0.75	0.14...0.75
Flexible cable with cable end	Without insulated ferrule	1 conductor	mm²	0.25...1.5	0.25...1	0.25...1.5	0.25...1	0.25...1
		2 identical conductors	mm²	0.25...1	0.25...0.34	0.25...1	0.25...0.34	0.25...0.34
	With insulated ferrule	1 conductor	mm²	0.25...1.5	0.25...0.5	0.25...1.5	0.25...0.5	0.25...0.5
		2 identical conductors (1)	mm²	0.5...1	0.5	0.5...1	0.5	0.5
Solid cable without cable end	1 conductor	mm²	0.2...1.5	0.14...1	0.2...1.5	0.14...1	0.14...1	0.14...1
	2 identical conductors	mm²	0.2...1	0.14...0.5	0.2...1	0.14...0.5	0.14...0.5	0.14...0.5
Conductor size		1 conductor		AWG 24 to AWG 16	AWG 26 to AWG 16	AWG 24 to AWG 16	AWG 26 to AWG 16	AWG 26 to AWG 16
Tightening torque		N.m	0.5...0.6	0.22...0.25	0.5...0.6	0.22...0.25	0.22...0.25	0.22...0.25
Flat screwdriver		mm	3.5	2.5	3.5	2.5	2.5	2.5

(1) Use a double cable end.

References :
pages 1/21 to 1/31

Dimensions :
pages 1/52 and 1/53

Schemes :
pages 1/54 to 1/57

Environment				
Control base and control unit type		LUT M + LUCB T1BL or LUCD T1BL without LUL C		LUT M + LUCM T1BL or LUL C
Product certifications			UL, CSA Pending: BV, GL, LROS, DNV, PTB	
Conforming to standards			IEC/EN 60947-4-1, UL 508, CSA C22-2 N°14	
Rated insulation voltage of the outputs (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3	V	250	
	Conforming to UL508, CSA C22-2 n°14	V	250	
Rated impulse withstand voltage of the outputs (Uimp)	Conforming to IEC/EN 60947-4-1	kV	4	
Degree of protection To IEC/EN 60947-1 (protection against direct finger contact)	Front panel (outside connection zone)		IP 40	
	Front panel and wired terminals		IP 20	
	Other faces		IP 20	
Protective treatment	Conforming to IEC/EN 60068		“TH”	
	Conforming to IEC/EN 60068-2-30	Cycles	12	
	Conforming to IEC/EN 60068-2-11	h	48	
Ambient air temperature around the device	Storage	°C	- 40...+ 85	
	Operation	°C	- 25...+ 70	- 25...+ 60
Maximum operating altitude		m	2000	
Operating positions Without derating	In relation to normal vertical mounting plane			
Flame resistance	Conforming to UL 94		V2	
	Conforming to IEC/EN 60695-2-12	°C	960 (parts supporting live components)	
		°C	650	
Shock resistance 1/2 sine wave = 11 ms (1)	Conforming to IEC/EN60068-2-27 (1)		15 gn	
Vibration resistance 5...300 Hz (1)	Conforming to IEC/EN 60068-2-6 (1)		4 gn	
Immunity to electrostatic discharge	Conforming to IEC/EN 61000-4-2	kV	In open air: 8 - Level 3	
		kV	On contact: 6 - Level 3	
Immunity to radiated fields	Conforming to IEC/EN 61000-4-3	V/m	10 - Level 3	
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	kV	CT outputs and inputs: 4 - Level 4	
		kV	Inputs and supply: 2 - Level 3	
Immunity to radio electrical fields	Conforming to IEC/EN 61000-4-6	V	10	
Control base and control unit relays				
Immunity to dissipated shock waves	Conforming to IEC/EN 60947-4-1		Common mode	Serial mode
	Output relays / power line	kV	4	2
	Inputs	kV	2	1
	Serial communication	kV	2	–

(1) Without modifying the contact states, in the most unfavourable direction.

Control supply characteristics

Operating voltage		V	--- 20.4...28.8
Power consumption		W	2 max
Associated protection		A	gG fuse, 0.5
Connection			
Connectors	Pitch	mm	5
Flexible cable without cable end	1 conductor	mm ²	0.2...2.5
	2 identical conductors	mm ²	0.2...1.5
Flexible cable with cable end			
Without insulated ferrule	1 conductor	mm ²	0.25...2.5
	2 identical conductors	mm ²	0.25...1
With insulated ferrule	1 conductor	mm ²	0.25...2.5
	2 identical conductors (1)	mm ²	0.5...1.5
Solid cable without cable end	1 conductor	mm ²	0.2...2.5
	2 identical conductors	mm ²	0.2...1
Conductor size	1 conductor		AWG 24 to AWG 12
Tightening torque		N.m	0.5...0.6
Flat screwdriver		mm	3

Input characteristics

Operating voltage	V	--- 24
Logic inputs		Logic state 1: I ≥ 6 mA - 16 V Logic state 0: I ≤ 1.5 mA - 5 V

Discrete output characteristics

Control base type		LUT M10BL	LUT M20BL
Type		Single break volt-free contacts	
Load	a.c. supply	C 300	B 300
	d.c. supply	24 V/5 A	24 V/5 A
Permissible power in cat. AC-15	For 500 000 operating cycles	VA 180	500
Permissible power in cat. DC-13	For 500 000 operating cycles	W 30	30
Associated protection		A gG fuse, 4	gG fuse, 4
For use in association with contactor (2)		Control voltage --- 24 V: LP1K, LC1 D09...D95. Control voltage --- 24...240 V: LC1K, LC1D.	Control voltage ~ 100...240 V: LC1K, LC1D, LC1 F185...F500

Characteristics of external current transformers

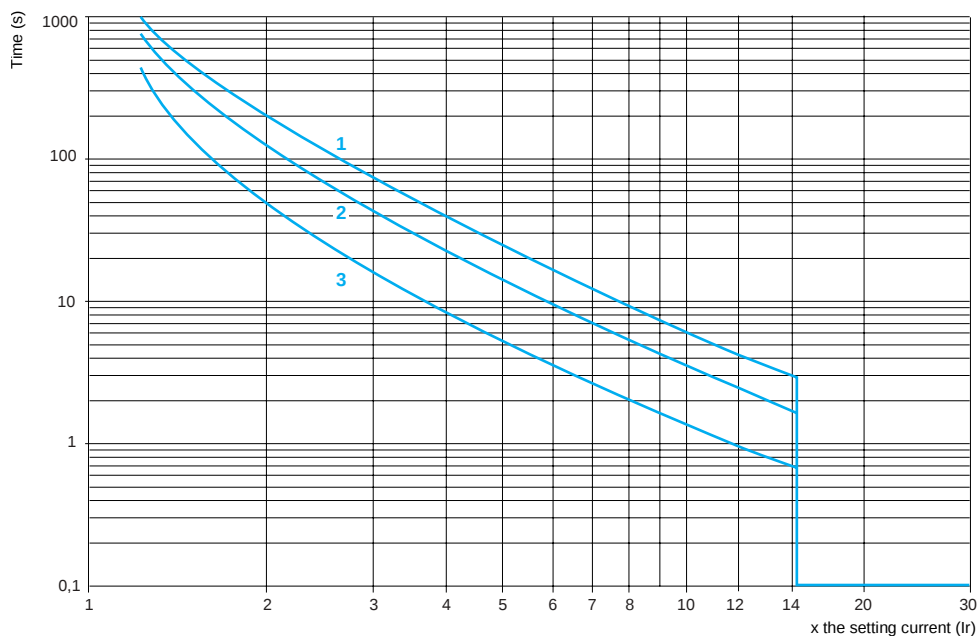
Precision		Class 5P					
Precision limit factor		10					
Maximum operating temperature	°C	70					
Transformer ratio		30/1	50/1	100/1	200/1	400/1	800/1
Hole diameter	mm	28	22	35	32	—	—
Maximum wire c.s.a.	mm ²	30 x 10	30 x 10	40 x 10	65 x 32	38 x 127	53 x 127

(1) Use a double cable end.

(2) For other combinations, use an intermediate relay between the output of controller LUTM and the contactor coil.

Tripping curves for control units LUCA, LUCB, LUCD

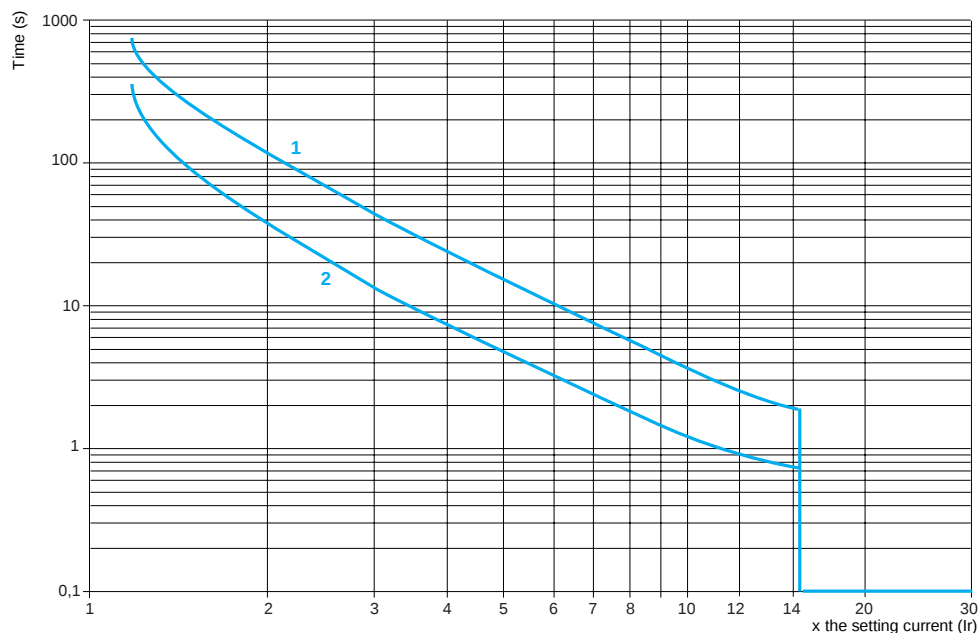
Average operating times at 20 °C according to multiples of the setting current, tolerance : $\pm 20\%$.



- 1 LUCD, 3 poles from cold state, class 20.
- 2 LUCA, LUCB, 3 poles from cold state, class 10.
- 3 LUCA, LUCB, LUCD, 3 poles from hot state.

Tripping curves for control units LUCC

Average operating times at 20 °C according to multiples of the setting current, tolerance : $\pm 20\%$.

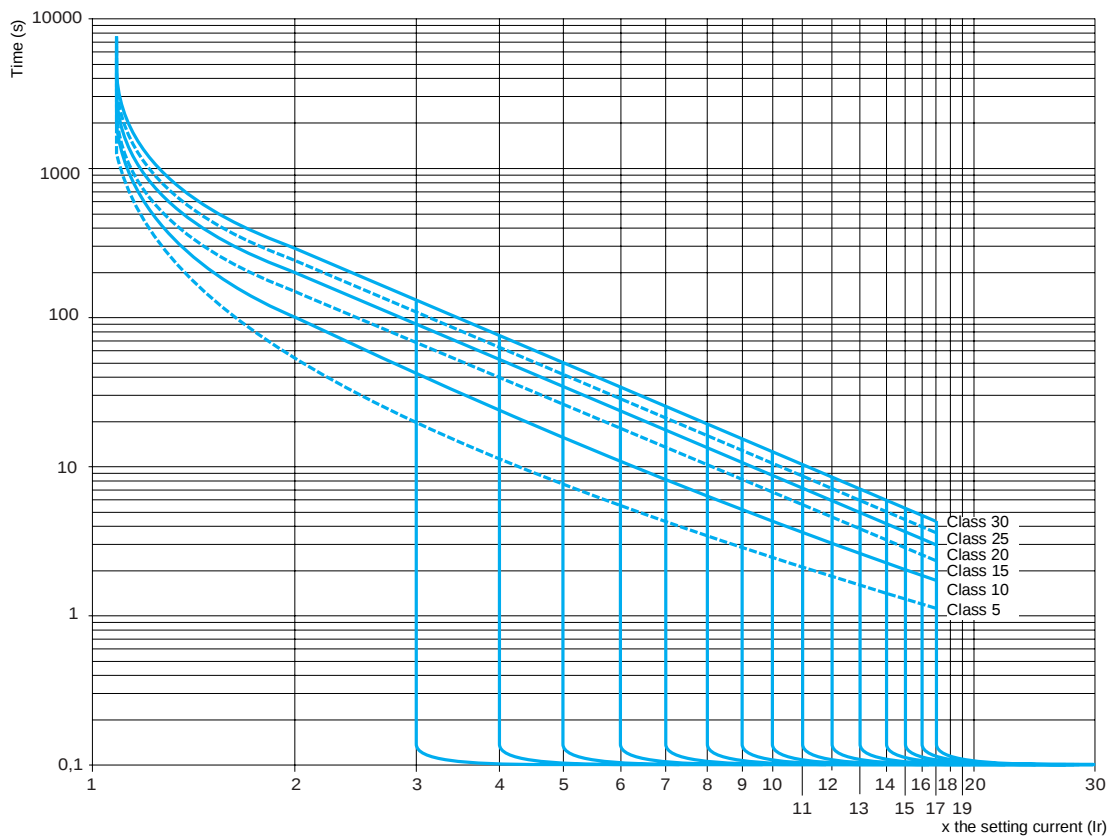


- 1 LUCC, single-phase, cold state.
- 2 LUCC, single-phase, hot state.

Tripping curves for control units LUCM

Cold state curves

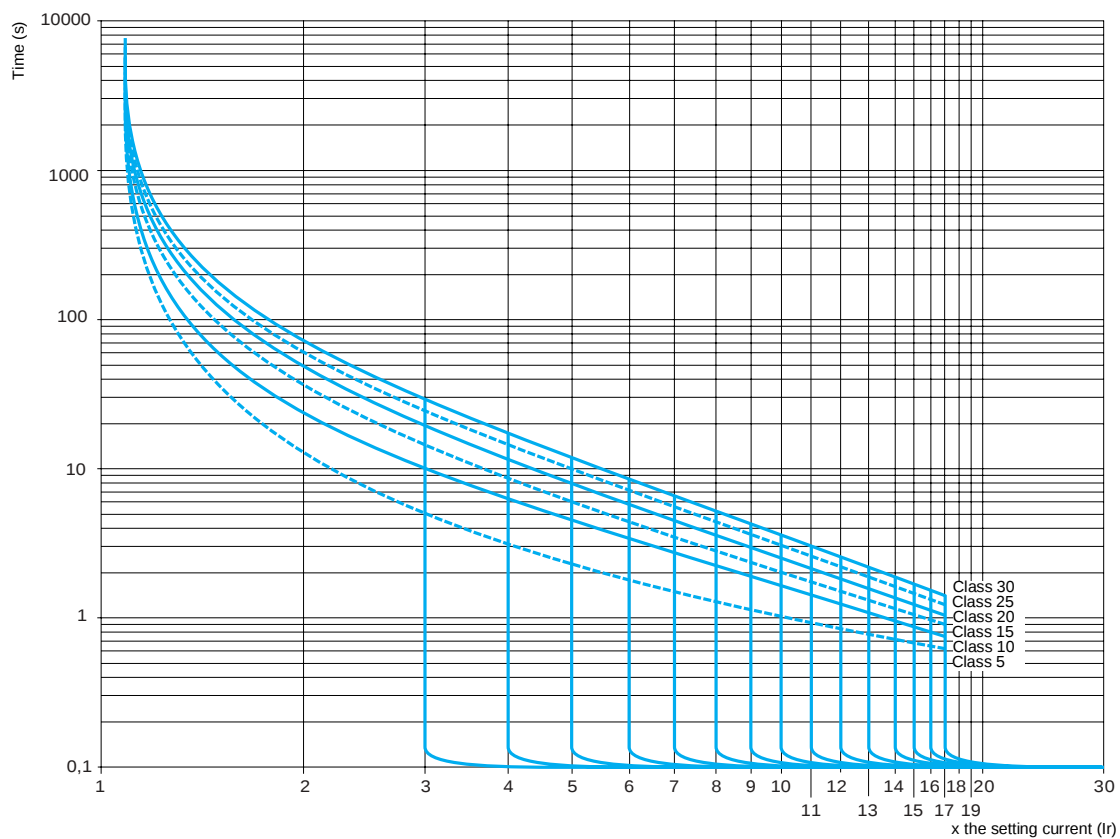
Average operating times at 20 °C according to multiples of the setting current, tolerance : $\pm 20\%$.



Tripping curves for control units LUCM

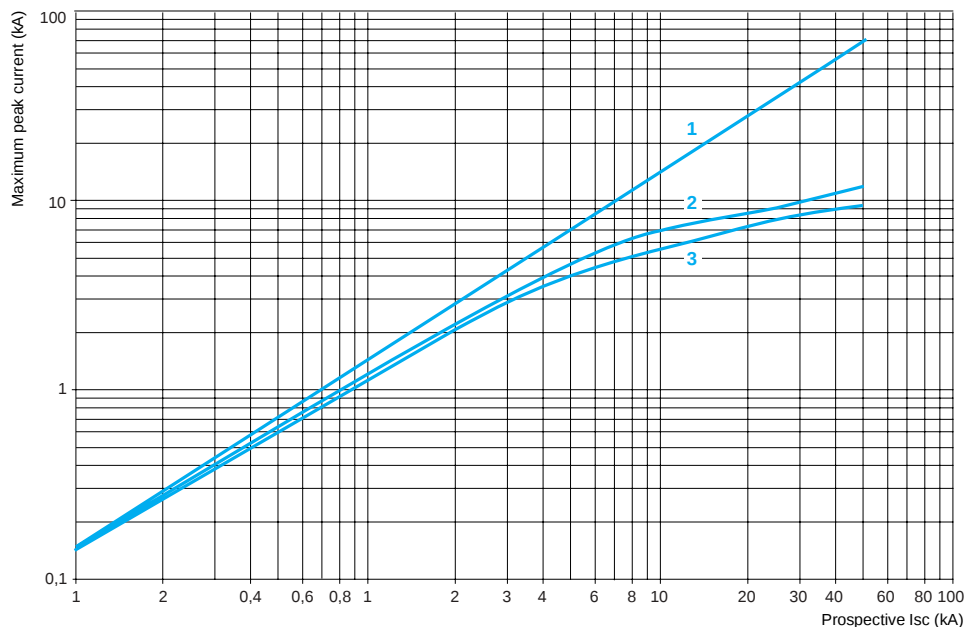
Hot state curves

Average operating times at 20 °C according to multiples of the setting current, tolerance : $\pm 20\%$



Current limitation on short-circuit

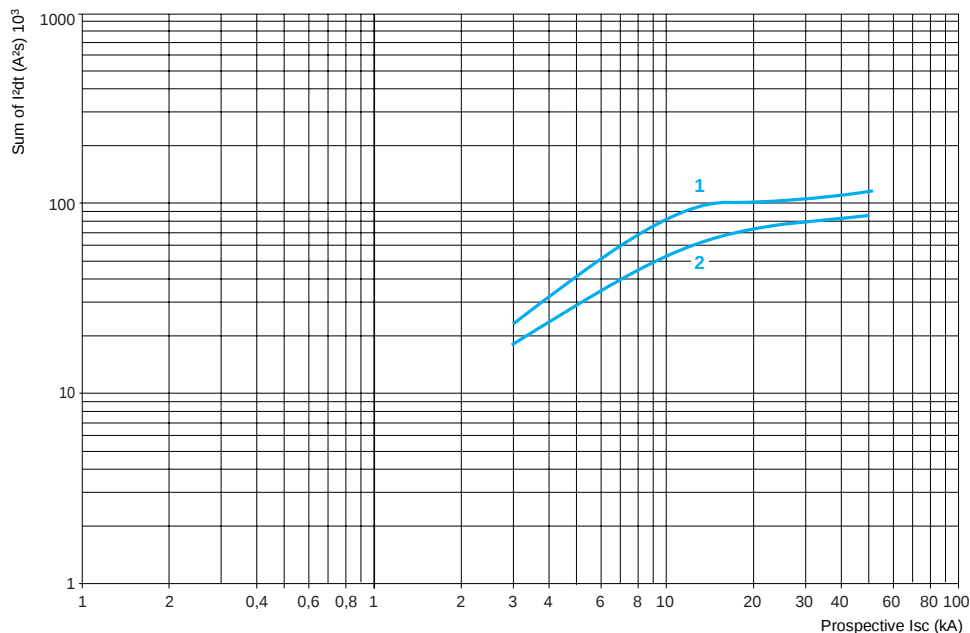
$U_e = 460 \text{ V}$



- 1 Maximum peak current
- 2 32 A power base
- 3 12 A power base

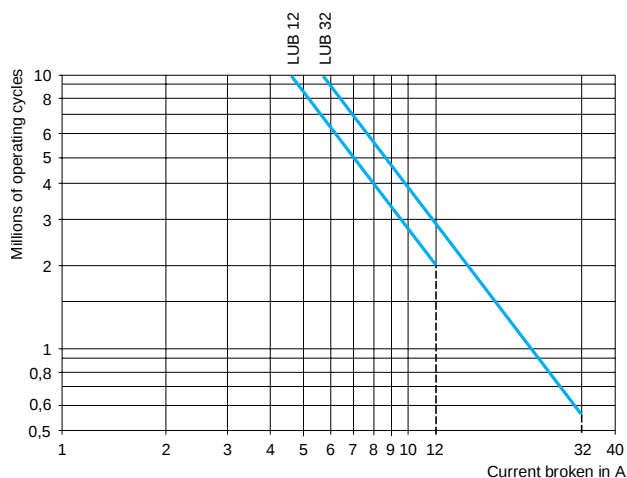
Thermal limit on short-circuit

$U_e = 460 \text{ V}$



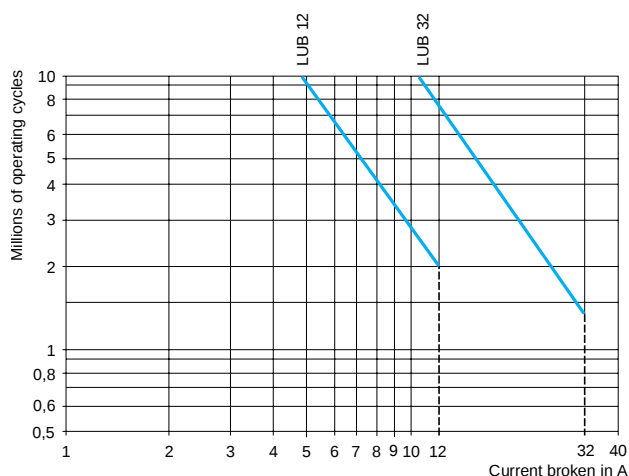
- 1 32 A power base
- 2 12 A power base

Use in category AC-41

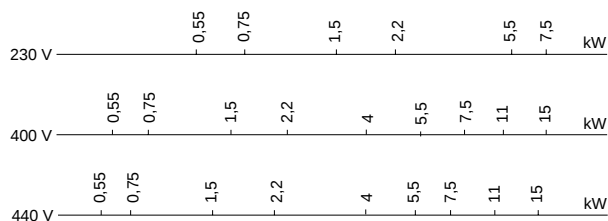
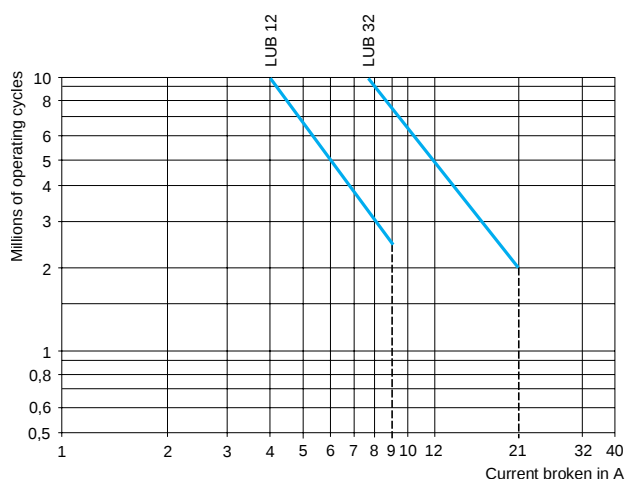


Use in category AC-43

Ue ≤ 440 V

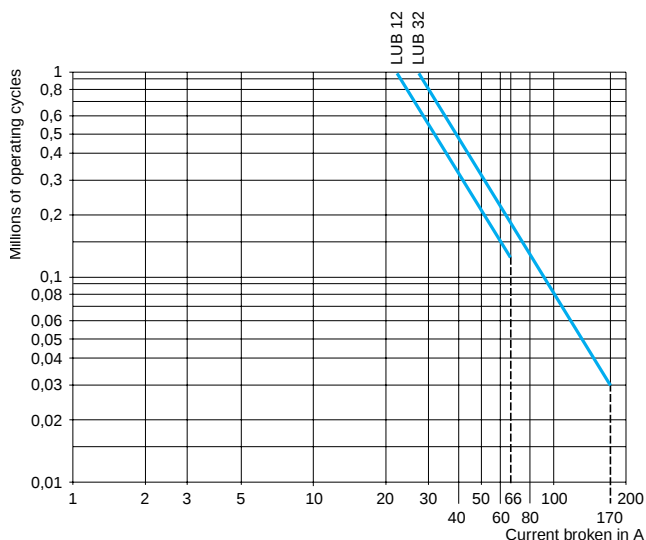


Ue = 690 V

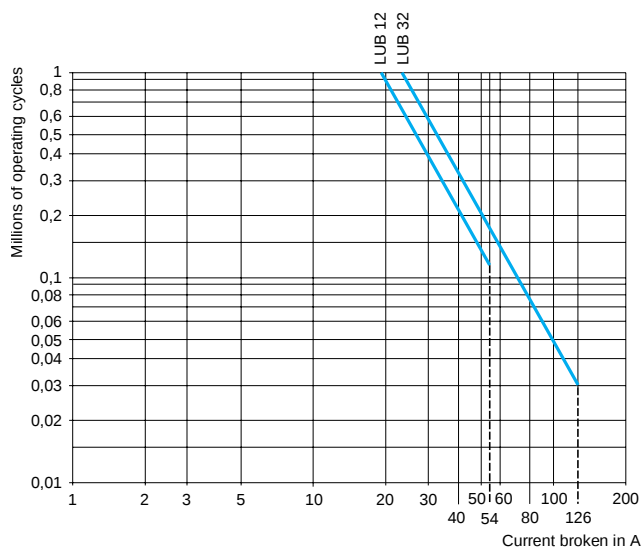


Use in category AC-44

$U_e \leq 440 \text{ V}$

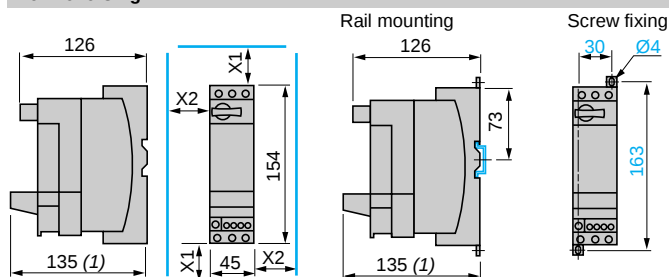


$U_e = 690 \text{ V}$

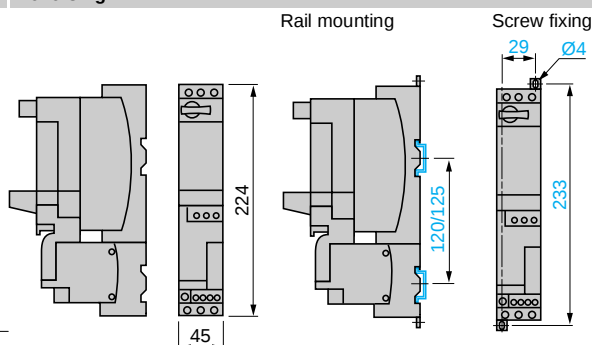


Starter-controllers

Non-reversing



Reversing

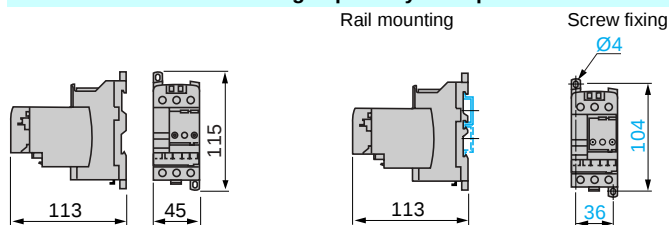


Minimum electrical clearance:

X1 = 50 mm for Ue = 440 V and 70 mm for Ue = 500 and 690 V,
X2 = 0

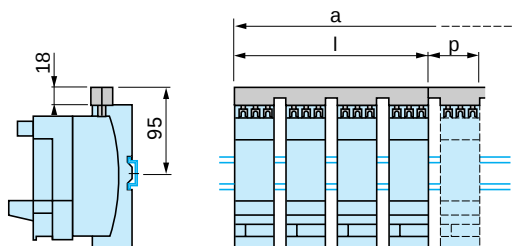
(1) Maximum depth (with Modbus communication module)

Reverser block for mounting separately from power base



Sets of busbars and plug-in power sockets

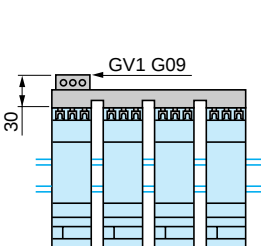
GV2 G445 and GV2 G454



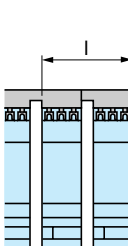
	I	P
GV2 G445 (2 x 45)	179	45
GV2 G454 (2 x 54)	206	54

	a			
Number of tap-offs	5	6	7	8
GV2 G445 (2 x 45)	224	269	314	359
GV2 G454 (2 x 54)	260	314	368	422

GV2 G... with terminal block GV1 G09

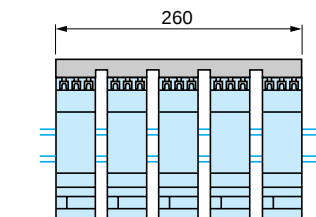


GV2 G245 and G254

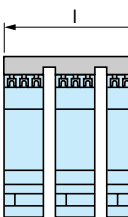


	I
GV2 G245 (2 x 45)	89
GV2 G254 (2 x 54)	98

GV2 G554

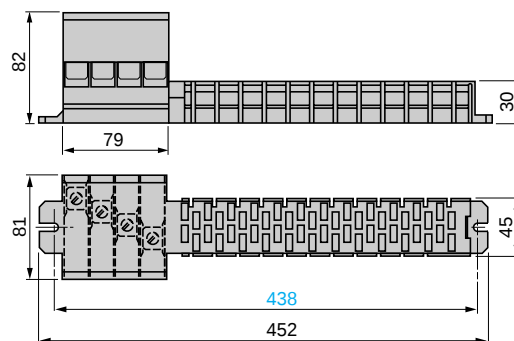


GV2 G345 and G354

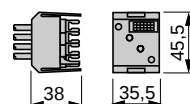


	I
GV2 G345 (2 x 45)	134
GV2 G354 (2 x 54)	152

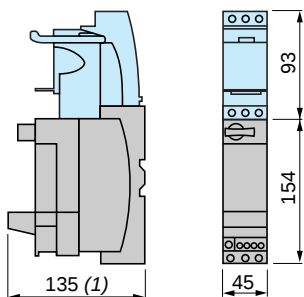
AK5 JB144



AK5 PC13, PC33, PC33L

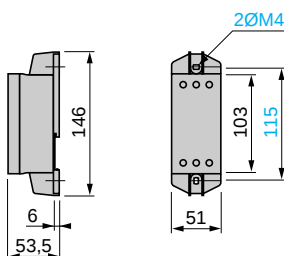


Limiter-disconnector LUA LB1 Disconnecter LUA LB10



(1) Maximum depth (with Modbus communication module).

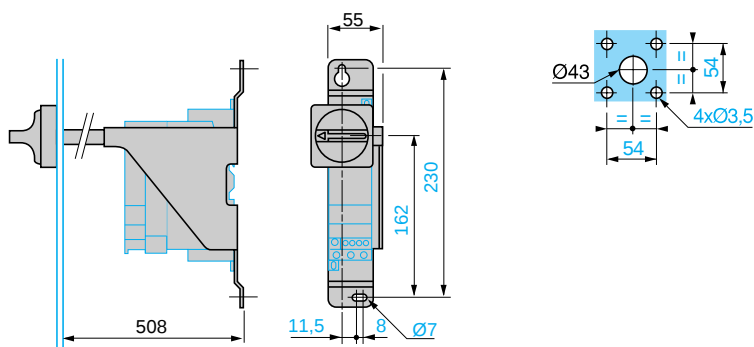
Current limiter LA9 LB920



Door interlock mechanisms

LU9 AP00

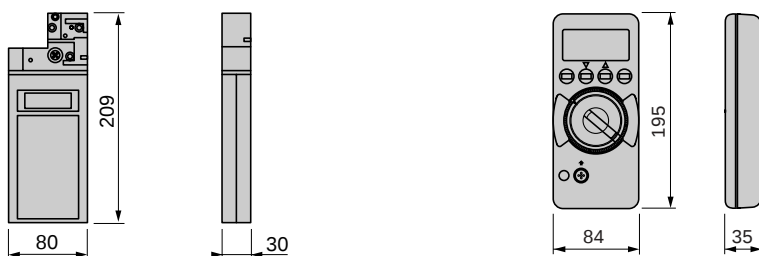
Door cut-out



Addressing consoles

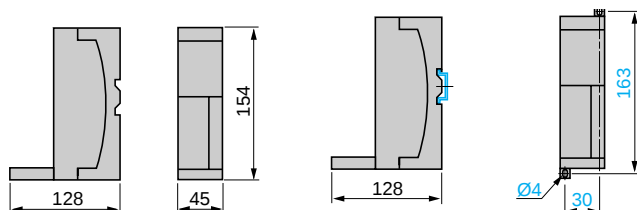
XZ MC11

ASI Terv2



Modbus hub LU9 CG3

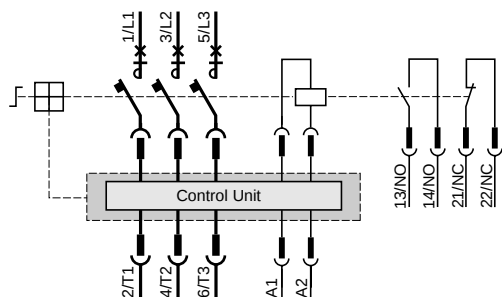
Splitter box LU9 G02



Starter-controllers, 12 or 32 A

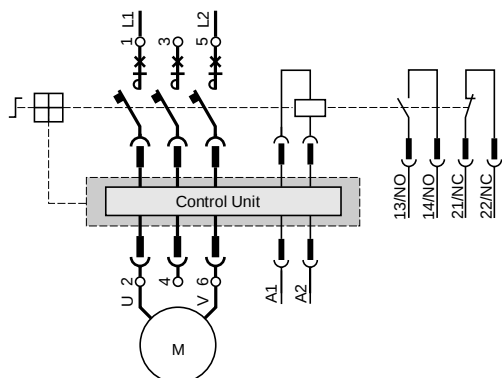
With standard, advanced or multifunction control unit

Non-reversing

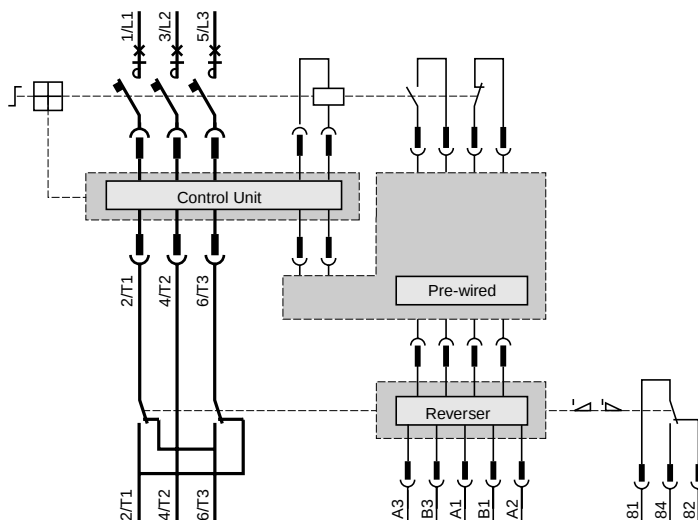


With control unit LUCC or LUCM

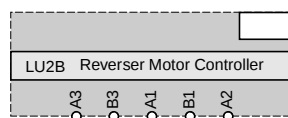
Connection of a single-phase motor



Reversing

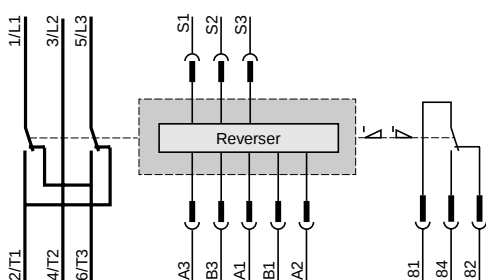


Control terminal block

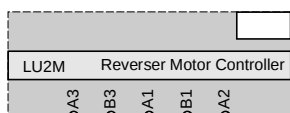


Reverser blocks

LU2M

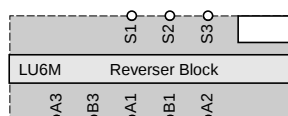


Control terminal block

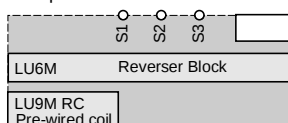


LU6M

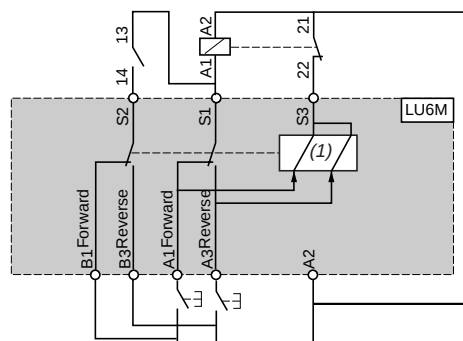
Control terminal blocks



With pre-wired connector LU9M RC



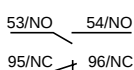
Basic scheme



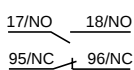
- S1 Start next stage
- S2 Electrical interlocking
- S3 Maintaining contact
- B1 Maintain forward running
- B3 Maintain reverse running
- A1 Pulse forward running
- A2 Common
- A3 Pulse reverse running
- (1) Electronically operated bistable electromagnet.

Add-on contact blocks

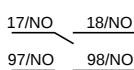
LUA1 D11



LUA1 C11

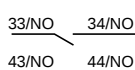


LUA1 C20

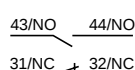


Add-on contact modules

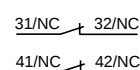
LUFN 20



LUFN 11



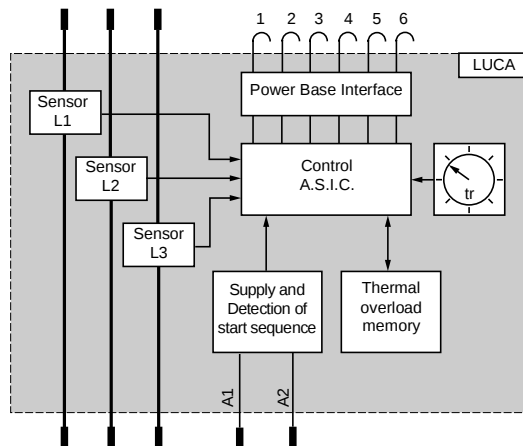
LUFN 02



Control units

Standard control unit LUCA

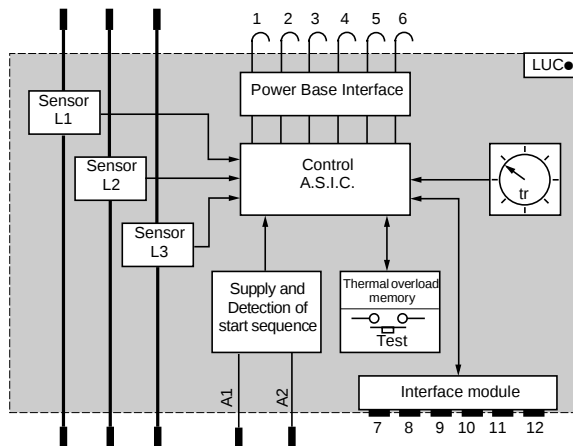
Basic scheme



- 1 and 2 Trips
- 3 and 4 Electromagnet
- 5 Power base rating
- 6 N/C

Advanced control unit (LUCB, LUCC, LUCD)

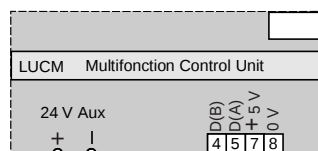
Basic scheme



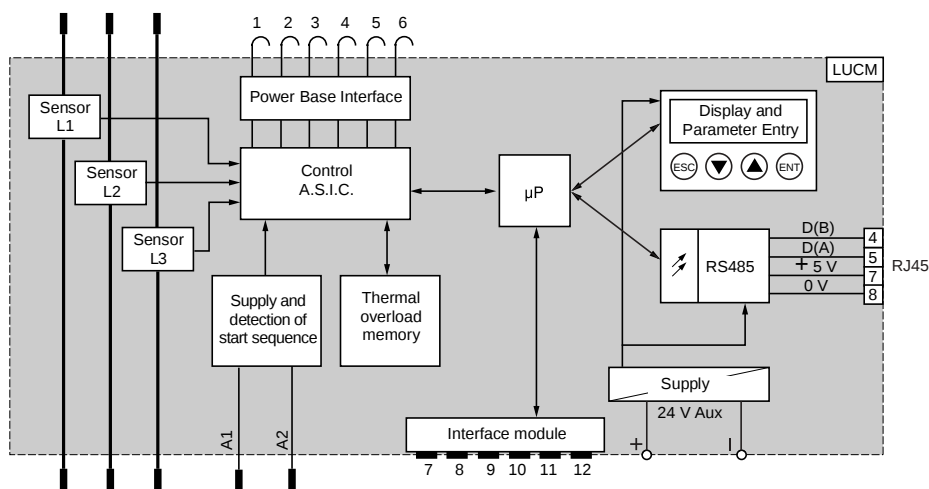
- 1 and 2 Trips
- 3 and 4 Electromagnet
- 5 Power base rating
- 6 N/C
- 7 Weight
- 8 Thermal status/Set
- 9 Reset mode/Reset
- 10 (Im/Ir)
- 11 Vc2
- 12 Vc1

Multifunction control unit LUCM

Control terminal block



Basic scheme

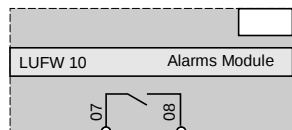


- 1 and 2 Trips
- 3 and 4 Electromagnet
- 5 Power base rating
- 6 N/C
- 7 Weight
- 8 N/C
- 9 Weight
- 10 (Im/Ir)
- 11 Rx/Tx
- 12 Vc1

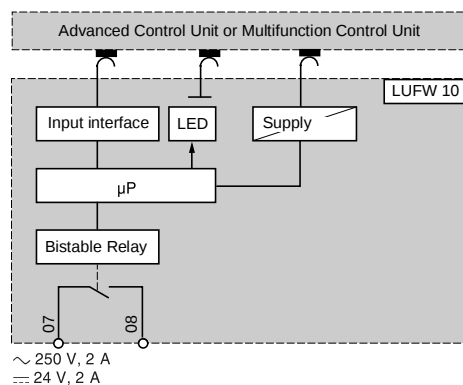
Function modules

Alarm

LUF W10



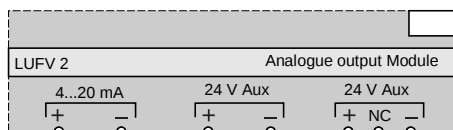
Basic scheme



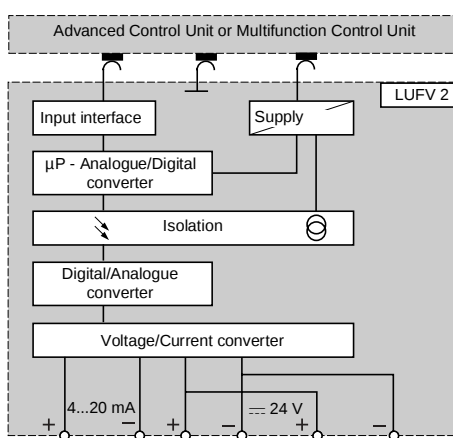
Indication of motor load

LUFV 2

4-20 mA output



Basic scheme

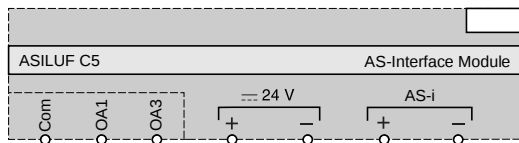


100 Ω < load < 500 Ω = 30 V max and 40 mA min

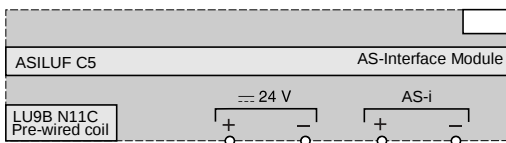
Communication modules

Communication module ASILUFC5

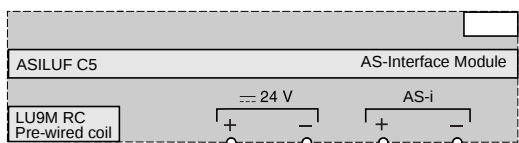
Without pre-wired coil connection



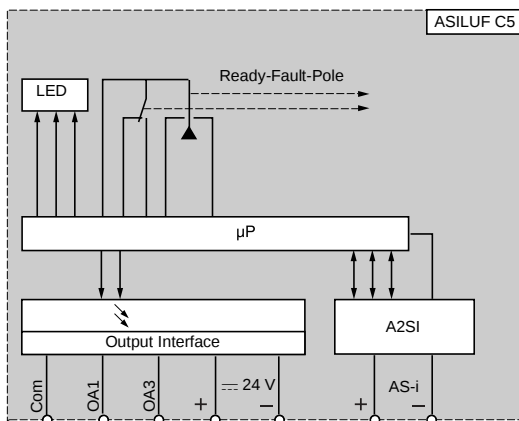
With pre-wired coil connection LU9B N11C



With pre-wired coil connection LU9M RC



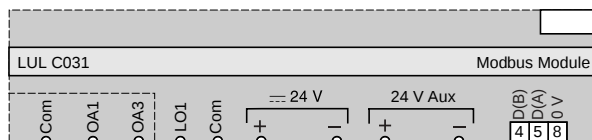
Basic scheme



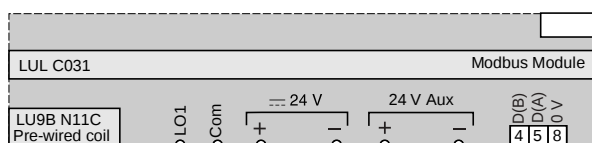
Communication modules (continued)

Modbus communication modules LUL C031

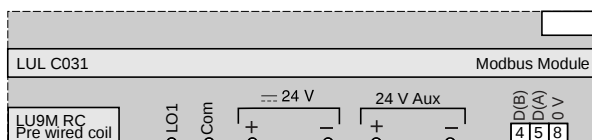
Without pre-wired coil connection



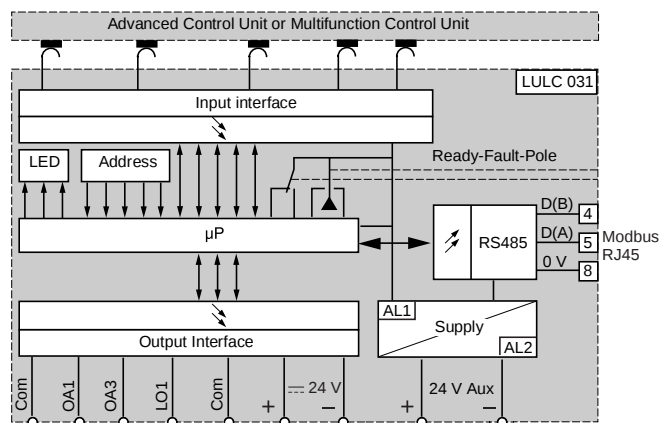
With pre-wired coil connection LU9B N11C



With pre-wired coil connection LU9M RC

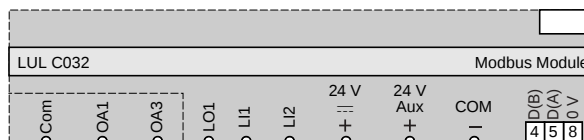


Basic scheme

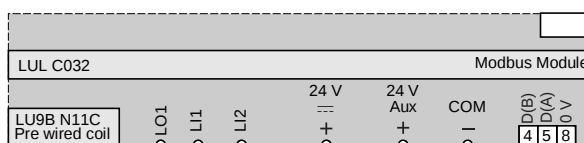


Modbus communication modules LUL C032

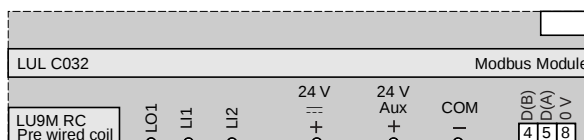
Without pre-wired coil connection



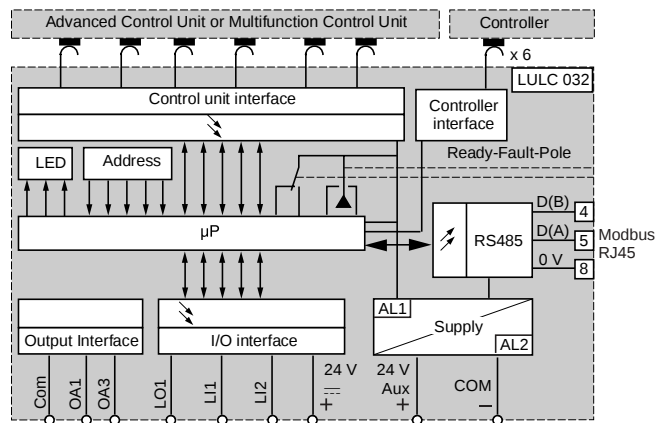
With pre-wired coil connection LU9B N11C



With pre-wired coil connection LU9M RC



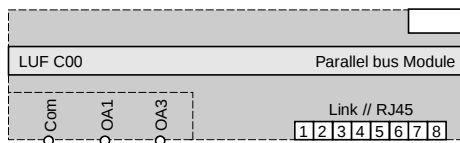
Basic scheme



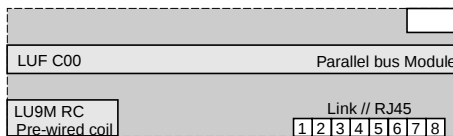
Communication modules (continued)

Parallel wiring modules

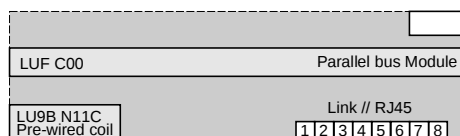
Without pre-wired coil connection



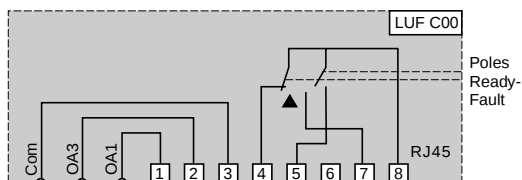
With pre-wired coil connection LU9M RC



With pre-wired coil connection LU9B N11C



Basic scheme

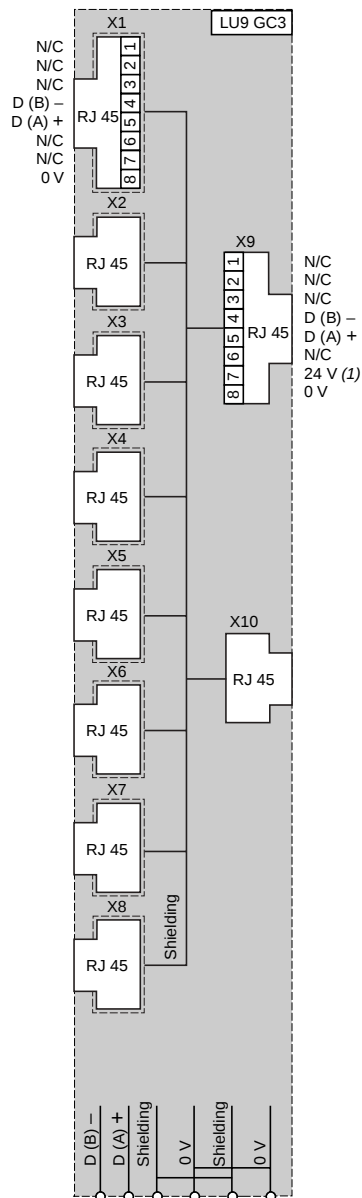


- 1 Forward running
- 2 Reverse running
- 3 Output common
- 4 Knob in position
- 5 Pole state
- 6 Reserved
- 7 Fault
- 8 Input common

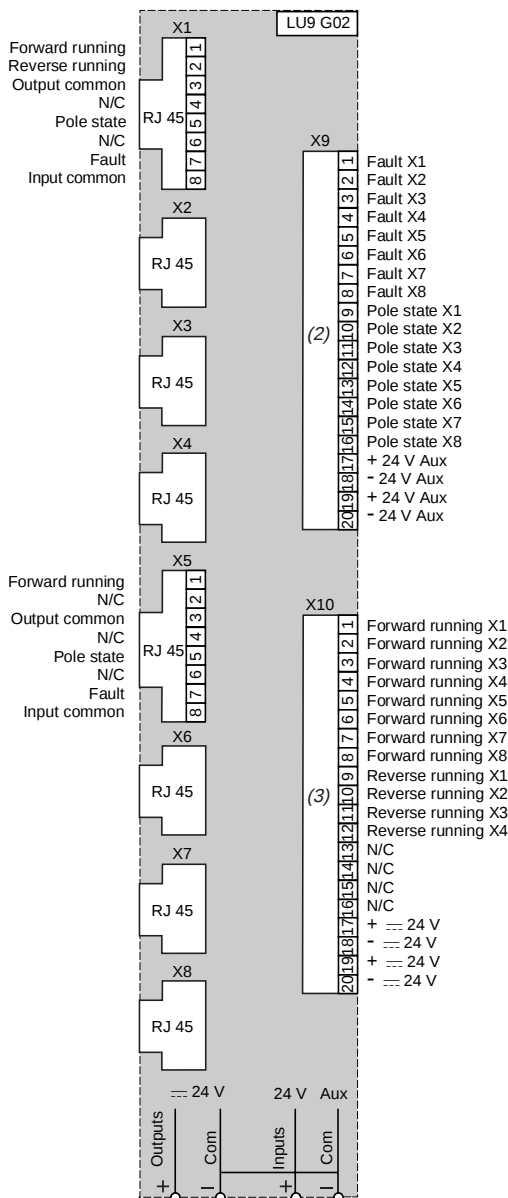
Communication modules (continued)

Wiring hub and splitter box

Modbus hub LU9G C3



Parallel wiring splitter box LU9 G02

Colours of
TSX CDP connection cable
wires (4)

- 1 White
- 2 Brown
- 3 Green
- 4 Yellow
- 5 Grey
- 6 Pink
- 7 Blue
- 8 Red
- 9 Black
- 10 Violet
- 11 Grey-pink
- 12 Red-blue
- 13 White-green
- 14 Brown-green
- 15 White-yellow
- 16 Yellow-brown
- 17 White-grey
- 18 Grey-brown
- 19 White-pink
- 20 Pink-brown

(1) Not connected on connectors X1 to X8. Only present on RJ45 IN and OUT connectors.

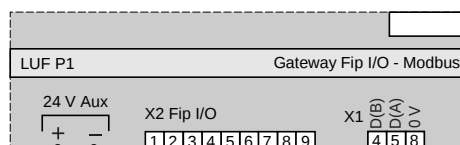
(2) 20-way HE 10 input connector.

(3) 20-way HE 10 output connector.

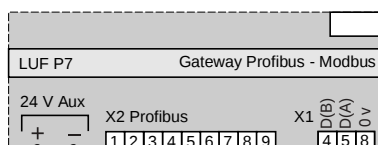
(4) Correspondence between wire colours and HE 10 connector pin numbers.

Gateways

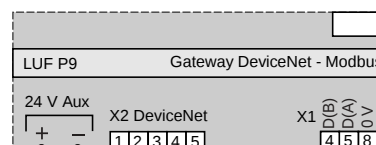
LUF P1



LUF P7



LUF P9



Data profile under AS-Interface

Control unit present in the product				Standard	Advanced	Multifunction
Status		D0	Ready (available)			
		D1	Poles closed (running)			
Commands		D0	Forward running			
		D1	Reverse running			

Register addresses accessible under Modbus

Control unit present in the product				Standard	Advanced	Multifunction
Marking	Register 0...Register 99	Words...Bits	Commercial reference, serial number, software version			
Log	Register 100...Register 450	Words...Bits	Fault log, Operating log, Log of last 5 trips			
Status	Register 451...Register 464	Words...Bits	Alarm signalling (bits), Fault signalling (bits)			
Values	Register 465...Register 473	Words	Irms phase 1, phase 2, phase 3. Motor load, thermal status Earth leakage current. Phase imbalance and phase failure			
	Register 474...Register 599	Words...Bits	Reserved			
Configuration	Register 600...Register 699	Words...Bits	Protection and alarm thresholds, fallback mode and reset mode			
Commands	Register 700...Register 714	Words...Bits	Commands			

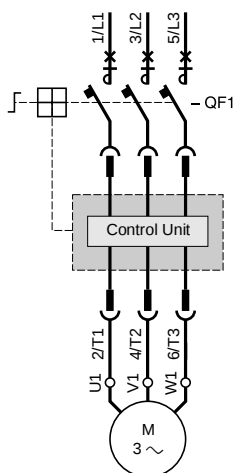
Status and values	Register 452	Bit 0	Short-circuit fault			
		Bit 1	Overcurrent fault			
		Bit 2	Thermal overload fault			
	Register 455	Bit 0	Ready (available)			
		Bit 1	Poles closed			
		Bit 2	Fault			
		Bit 3	Alarms			
		Bit 4	Tripped ("TRIP" position)			
		Bit 5	Fault acknowledgement allowed			
		Bit 6	Reserved			
		Bit 7	Motor running			
		Bit 8	Motor current % (bit 0)			
		Bit 9	Motor current % (bit 1)			
		Bit 10	Motor current % (bit 2)			
		Bit 11	Motor current % (bit 3)			
		Bit 12	Motor current % (bit 4)			
		Bit 13	Motor current % (bit 5)			
		Bit 14	Reserved			
		Bit 15	Motor starting			
	Register 461	Bit 3	Thermal overload alarm			
	Register 465	Word	Thermal status value			
	Register 466	Word	Motor load value (Im/Ir)			

Configuration	Register 602	Bit 0	Manual reset on thermal overload fault			
		Bit 1	Remote reset on thermal overload fault			
		Bit 2	Automatic reset on thermal overload fault			
	Register 682	Value 0	Fallback mode validation			
		Value 1	Outputs OA1 and OA3 unchanged			
		Value 2	Outputs OA1 and OA3 forced to 0			
		Value 3	Outputs OA1 and OA3 unchanged, signalling existence of communication failure			
		Value 4	Outputs OA1 forced to 1 and OA3 unchanged			
		Value 5	Outputs OA3 forced to 1 and OA1 unchanged			

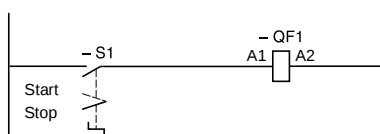
Commands	Register 700	Bit 0	LO1 output command			
	Register 704	Bit 0	OA1 output command			
		Bit 1	OA3 output command			
		Bit 2	Reserved			
		Bit 3	Fault acknowledgement			
		Bit 4	Reserved			
		Bit 5	Trip test			
		Bit 6...15	Reserved			

 Data accessible

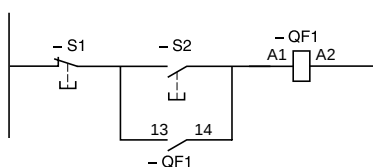
Non-reversing starter-controllers LUB



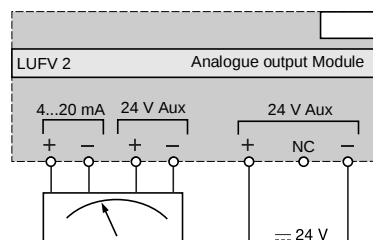
2-wire control via 2-position switch



3-wire control, pulsed start with maintaining contact

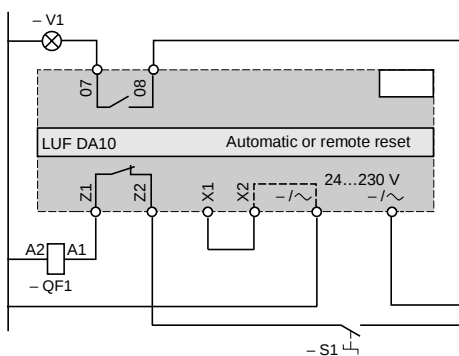


Connection of a motor load indicator module LUFV 2

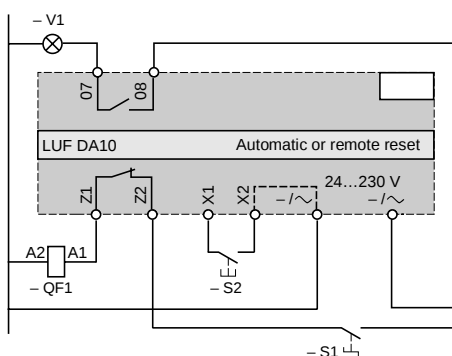


Connection of thermal overload fault signalling modules LUF DA10

Automatic reset

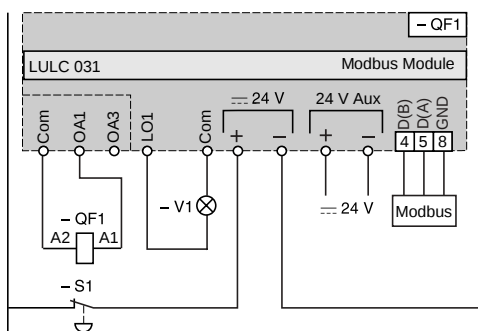


Remote reset



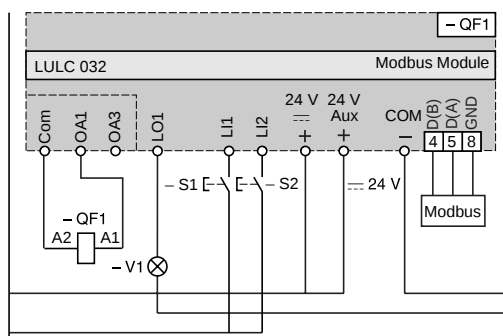
Control via Modbus communication module LULC 031

Without pre-wired coil connection



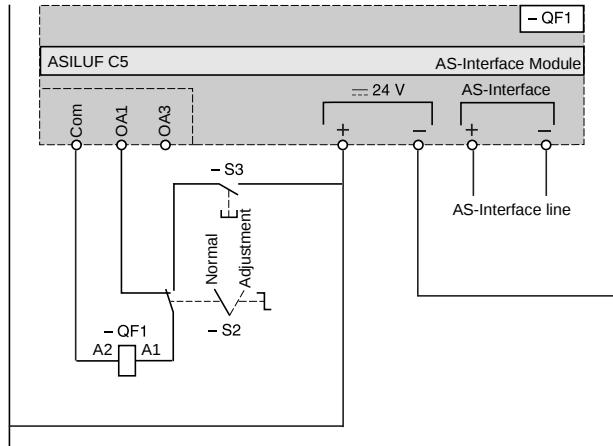
Control via Modbus communication module LULC 032

Without pre-wired coil connection

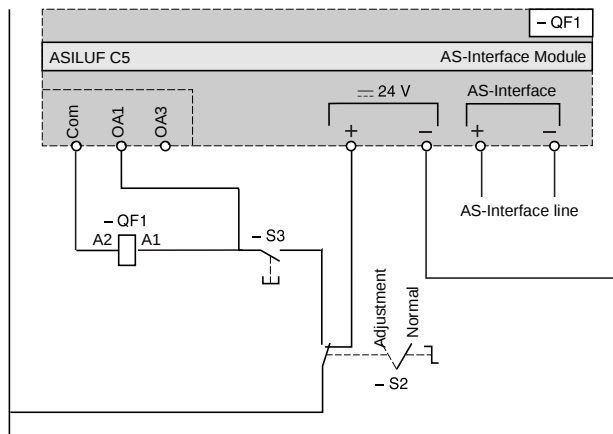


Control via communication module ASIL UFC5

Without pre-wired coil connection
With local control



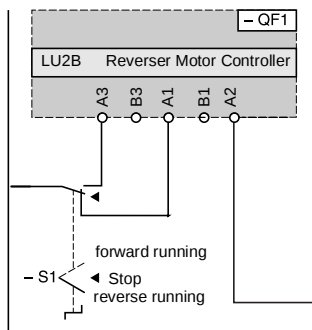
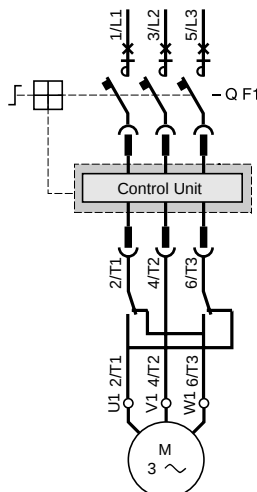
Without pre-wired coil connection
With local control



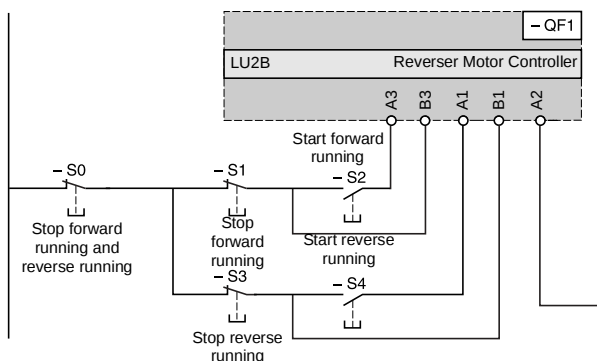
The diagram illustrates the connection of the AS-Interface module to the Multifunction Control Unit (LUCM). The AS-Interface module (top) has terminals for Com, OA1, OA3, 24 V, and AS-Interface. The Multifunction Control Unit (bottom) has terminals for 24 V, Aux, and RJ45 (D(B), D(A), GND). The AS-Interface module is connected to the Multifunction Control Unit via an AS-Interface line. The Multifunction Control Unit is also connected to a Bus Modbus RS 485.

Reversing starter-controllers LUB

2-wire control via 3-position switch



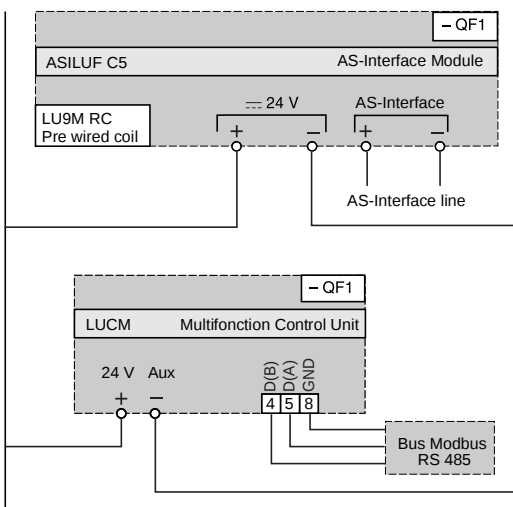
3-wire control, pulsed start with maintaining contact



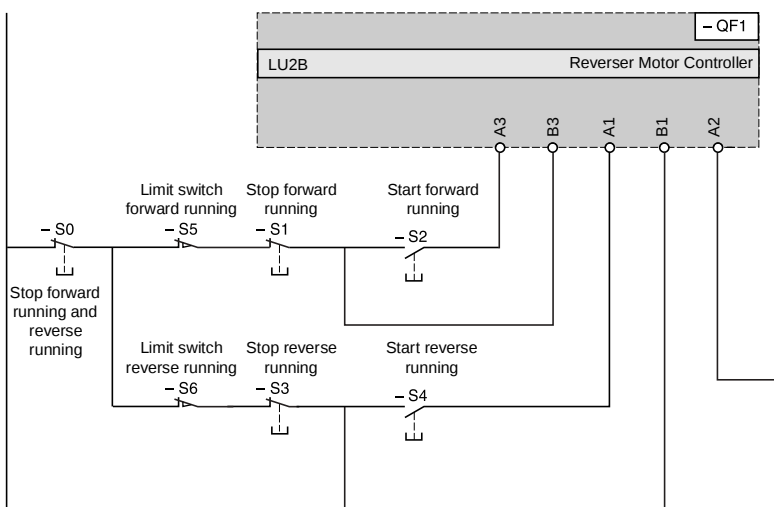
Control via communication module ASIL UFC5

With pre-wired coil connection LU9M RC

With multifunction control unit LUCM



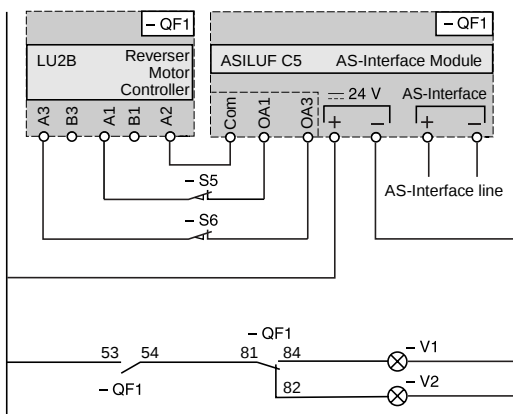
3-wire control, pulsed start with maintaining contact and limit switches



Control via communication module ASILUFC5

Without pre-wired coil connection

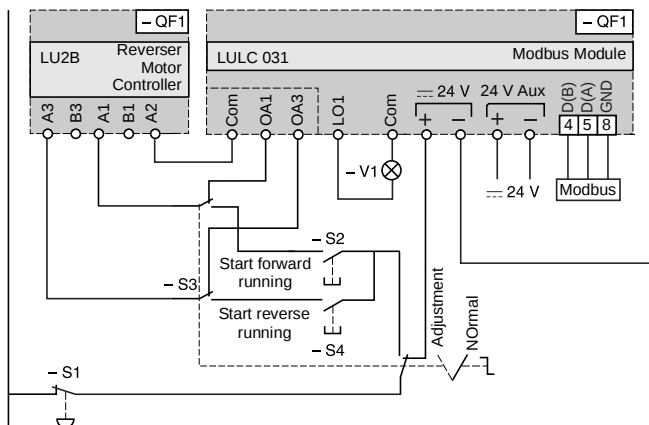
With running direction pilot lights and limit switches



Reversing starter controllers LU2B (continued)

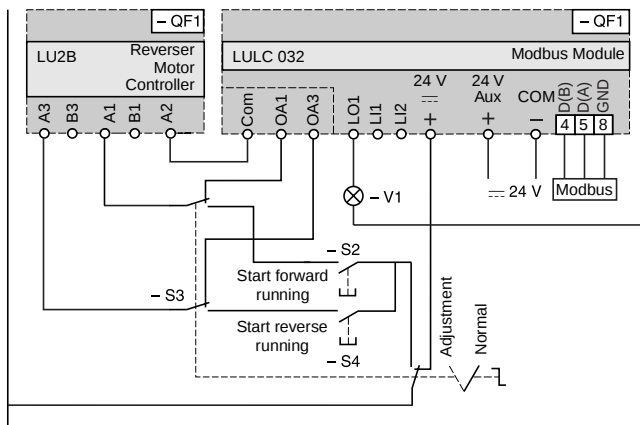
Control via Modbus communication module LULC 031

Without pre-wired coil connection
With local control

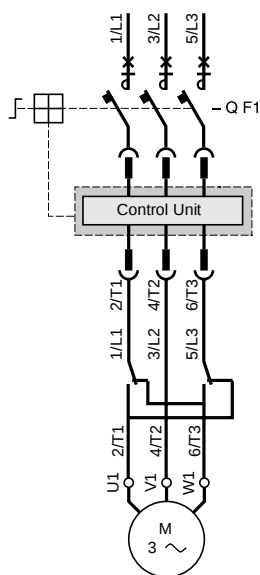


Control via Modbus communication module LULC 032

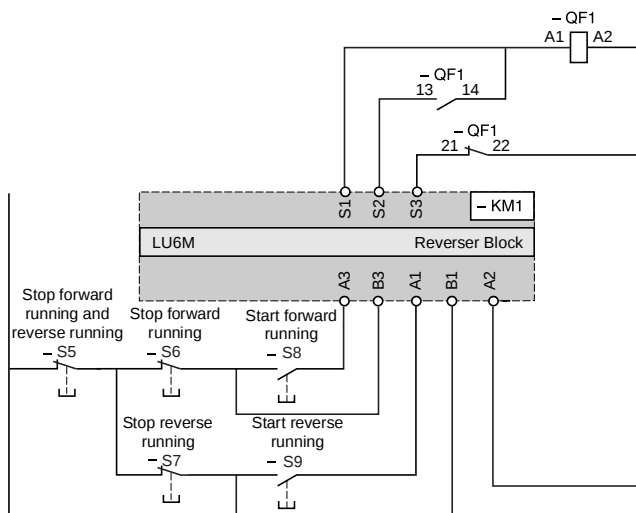
Without pre-wired coil connection
With local control



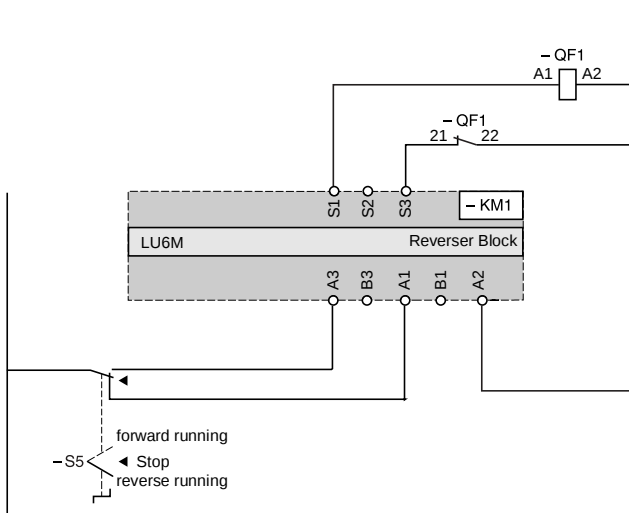
Reversing starter-controllers LUB + LU6M



3-wire control, pulsed start with maintaining contact



2-wire control via 3-position switch



2

2 - Altistart U01 soft starters and TeSys model U

■ References	page 2/2
■ Dimensions	page 2/3
■ Schemes	pages 2/4 to 2/7

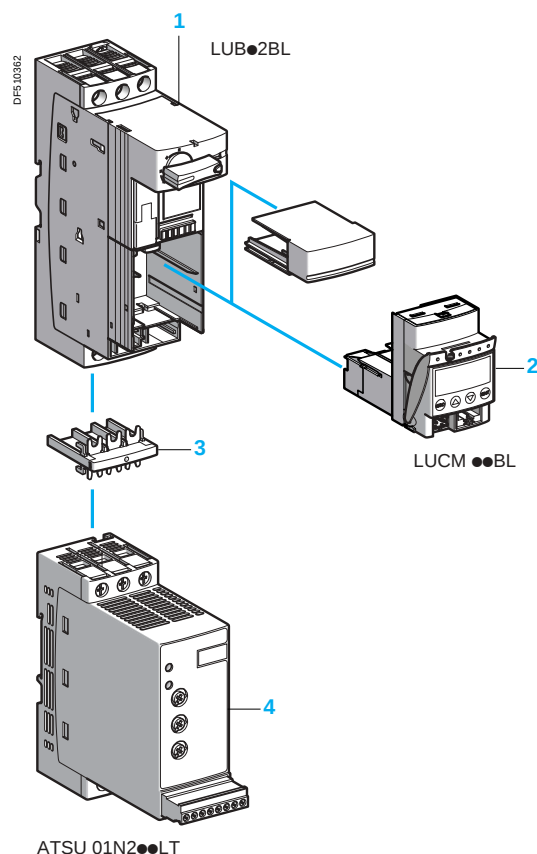
Soft starters for asynchronous motors

Altistart U01 and TeSys model U

DF531714



ATSU 01N222LT



ATSU 01N222LT

Soft start/soft stop unit for 0.75 to 15 kW motors

(can be combined with the TeSys model U starter)

Motor				Starter		
Motor power (1)				Nominal current	Reference	Weight
230 V 230 V		400 V	460 V			
kW	HP	kW	HP	A		kg
3-phase supply voltage: 200...480 V 50/60 Hz						
0.75	1	1.5	2	6	ATSU 01N206LT	0.340
1.1	1.5	2.2	3			
		3				
1.5	2	—	5	9	ATSU 01N209LT	0.340
—	—	4	—			
2.2	3	5.5	7.5	12	ATSU 01N212LT	0.340
3	—	—	—			
4	5	7.5	10	22	ATSU 01N222LT	0.490
5.5	7.5	11	15			
7.5	10	15	20	32	ATSU 01N232LT	0.490

Accessories

Description	Used for starter	Reference	Weight kg
Power connector between ATSU 01N222LT and TeSys model U	ATSU 01N222LT	VW3 G4104	0.020

TeSys model U starter and soft start unit combinations

Numerous possibilities for combinations and options are offered.

Motor power			Soft starter	TeSys model U	
230 V	400 V	460 V		Power base	Control unit (2)
kW/HP	kW	HP			
0.75/1	1.5	2	ATSU 01N206LT	LUB 12	LUC 05BL
1.1/1.5	2.2/3	3	ATSU 01N206LT	LUB 12	LUC 12BL
1.5/2	—	—	ATSU 01N209LT	LUB 12	LUC 12BL
—	4	5	ATSU 01N209LT	LUB 12	LUC 12BL
2.2/3	—	—	ATSU 01N212LT	LUB 12	LUC 12BL
3/—	5.5	7.5	ATSU 01N212LT	LUB 32	LUC 18BL
4/5	7.5	10	ATSU 01N222LT	LUB 32	LUC 18BL
5.5/7.5	11	15	ATSU 01N222LT	LUB 32	LUC 32BL
7.5/10	15	20	ATSU 01N232LT	LUB 32	LUC 32BL

Example of a starter-motor combination with:

- 1 non-reversing power base for DOL starting (LUB 2BL)
- 2 control unit (LUCM 2BL)
- 3 power connector (VW3 G4104)
- 4 Altistart U01 soft start/soft stop unit (ATSU 01N222LT)

(1) Standard motor power ratings, HP power ratings indicated according to standard UL 508.

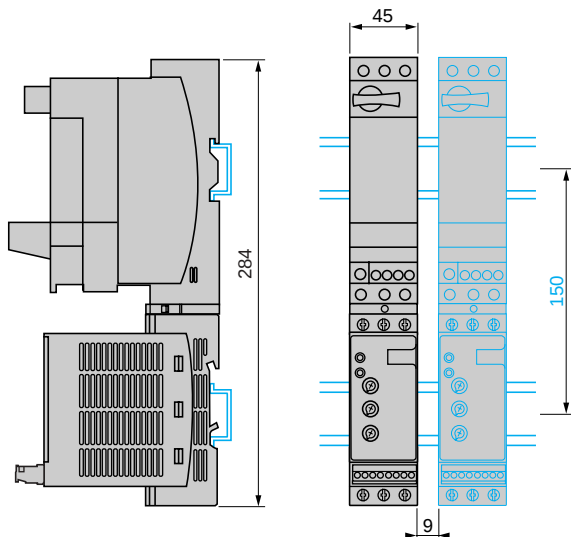
(2) Depending on the configuration of the chosen TeSys model U starter, replace the ● with A for standard, B for expandable, and M for multifunction.

Soft starters for asynchronous motors

Altistart U01 and TeSys model U

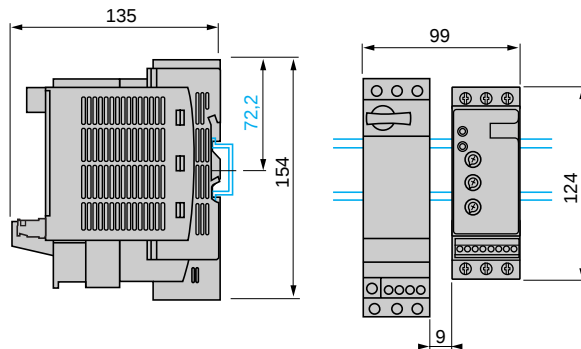
**TeSys model U combination (non-reversing power base) and
ATSU 01N206LT to ATSU 01N212LT**

Mounting on  (35 mm) rail with VW3 G4104 connector



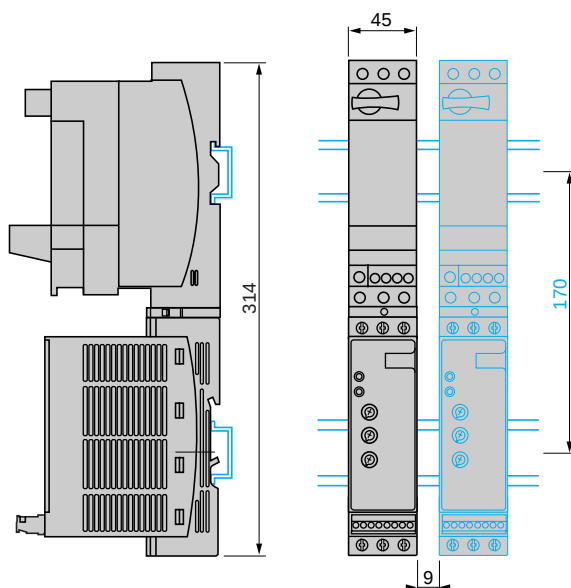
**TeSys model U combination (non-reversing or reversing power
base) and ATSU 01N206LT to ATSU 01N212LT**

Side by side mounting



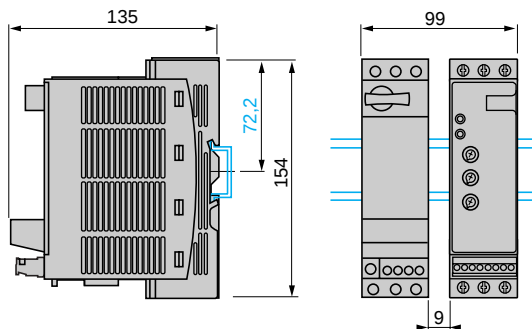
**TeSys model U combination (non-reversing power base) and
ATSU 01N222LT to ATSU 01N232LT**

Mounting on  (35 mm) rail with VW3 G4104 connector

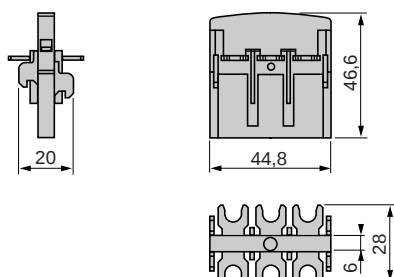


**TeSys model U combination (non-reversing or reversing power
base) and ATSU 01N222LT to ATSU 01N232LT**

Side by side mounting



VW3 G4104 connector

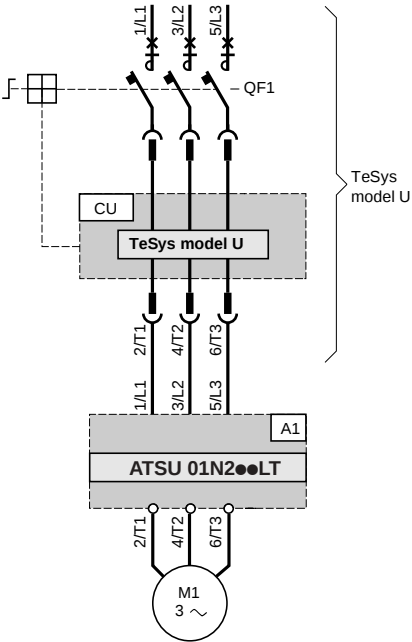


Soft starters for asynchronous motors

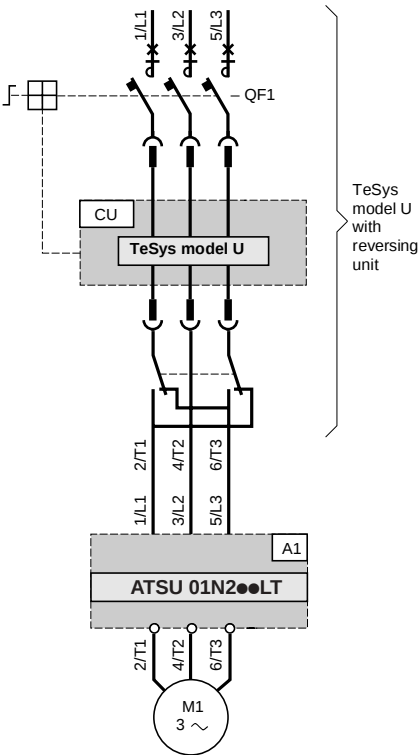
Altistart U01 and TeSys model U
For 0.75 to 15 kW motors

ATSU 01N2●●LT soft start/soft stop units

Power wiring



Power wiring with reversing unit



Compatible components (For full references, refer to our catalogue: "Motor starter solutions - Control and protection components")

Code	Description
A1	Soft start/soft stop unit
QF1	TeSys model U controller-starter
CU	TeSys model U control unit

Soft starters for asynchronous motors

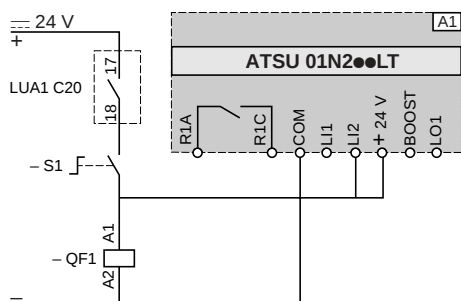
Altistart U01 and TeSys model U

For 0.75 to 15 kW motors

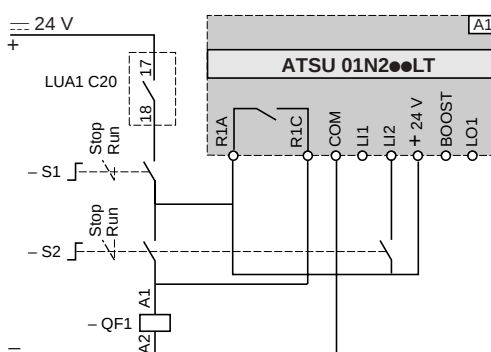
ATSU 01N2●●LT soft start/soft stop units (continued)

Automatic 2-wire control

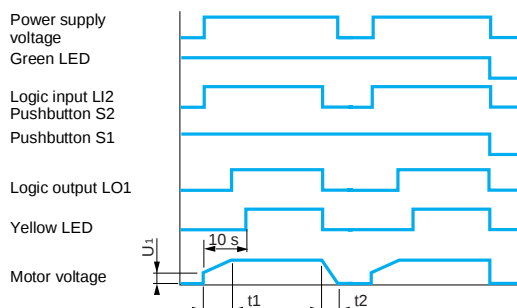
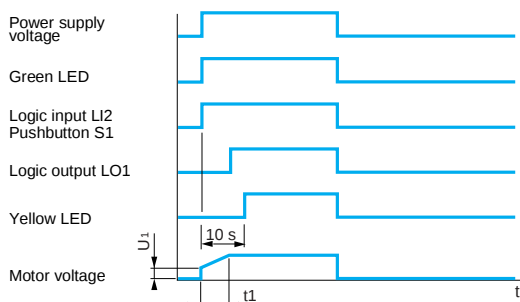
Without deceleration



With and without deceleration

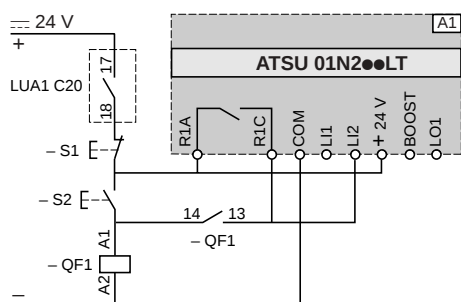


Functional diagrams

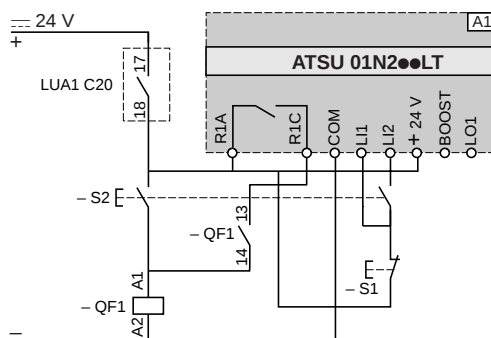


Automatic 3-wire control

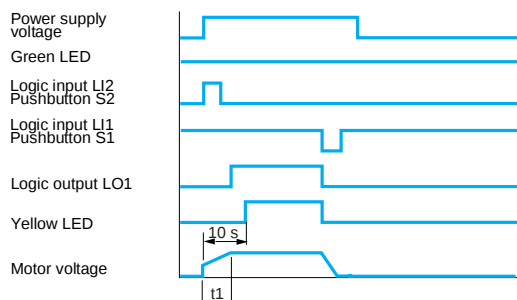
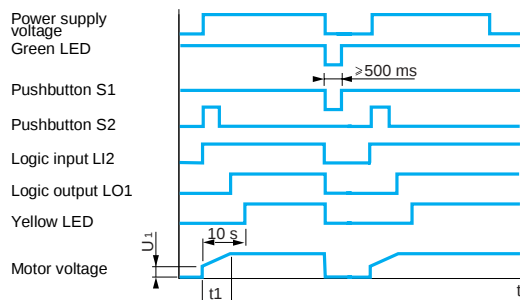
Without deceleration



With deceleration



Functional diagrams



A1: Soft start/soft stop unit

S1, S2: XB4 B or XB5 B pushbuttons

QF1: TeSys model U controller-starter

t1: Acceleration time can be controlled by a potentiometer

t2: Deceleration time can be controlled by a potentiometer

U1: Starting time can be controlled by a potentiometer

Soft starters for asynchronous motors

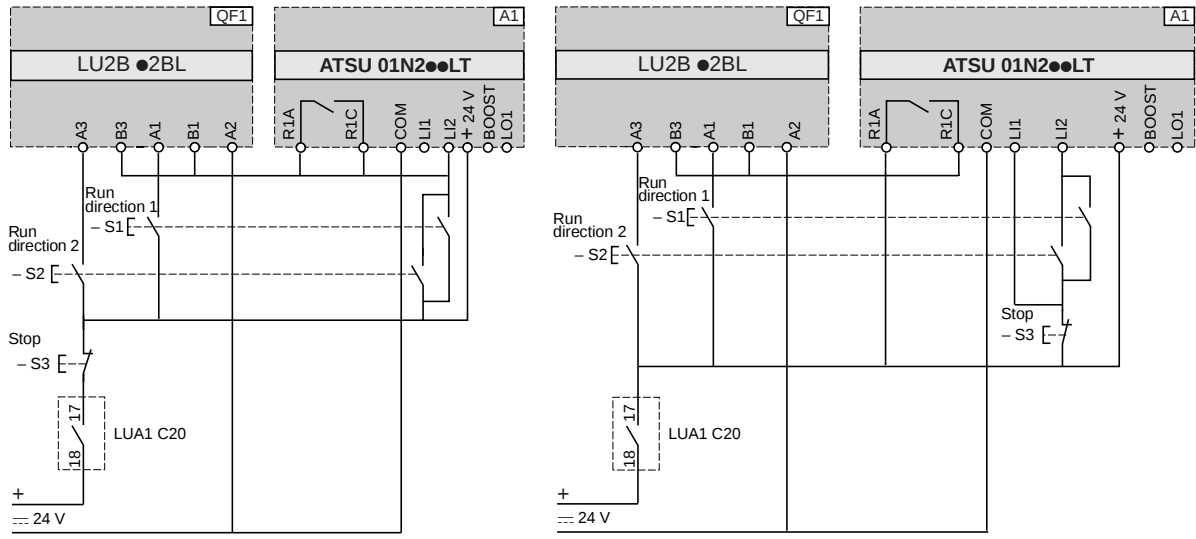
Altistart U01 and TeSys model U
For 0.75 to 15 kW motors

ATSU 01N2●●LT soft start/soft stop units (continued)

Automatic 3-wire control, with reversing unit

Without deceleration

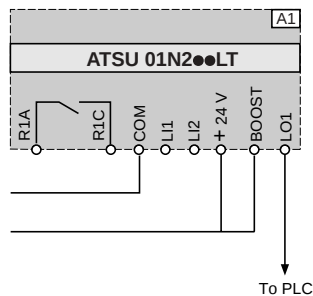
With deceleration



QF1: TeSys model U controller-starter with reversing unit
A1: Soft start/soft stop unit
S1, S2, S3: XB4 B or XB5 B pushbuttons
S3: minimum depression time 500 ms

QF1: TeSys model U controller-starter with reversing unit
A1: Soft start/soft stop unit
S1, S2, S3: XB4 B or XB5 B pushbuttons

Boost on starting and end of starting signal



A1: Soft start/soft stop unit

Soft starters for asynchronous motors

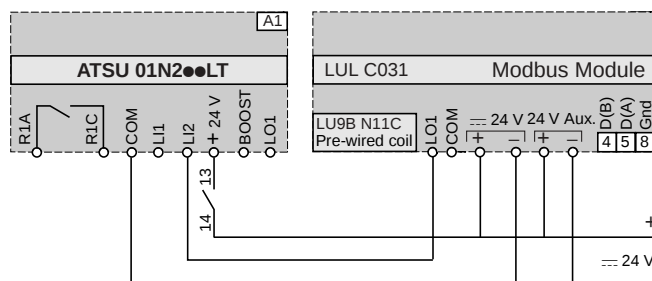
Altistart U01 and TeSys model U

For 0.75 to 15 kW motors

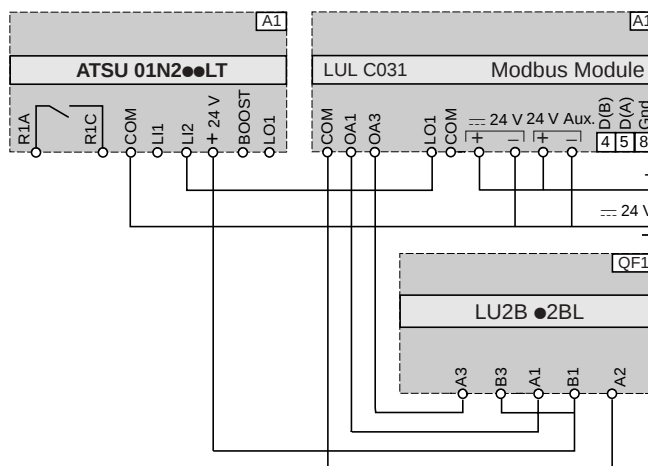
ATSU 01N2●●LT soft start/soft stop units (continued)

Automatic control with Modbus communication module, with and without deceleration

Without reversing unit



With reversing unit



Function	Register	Bit	Value
Powering down TeSys U and ATSU			
—	704	0	0
Automatic control without deceleration			
Run	700	0	1
Stop	704	0	0
Automatic control with deceleration			
Run	700	0	1
Soft stop	700	0	0

A1: Soft start/soft stop unit

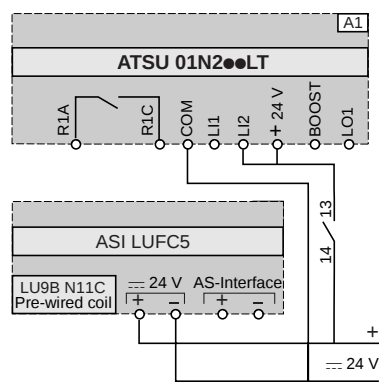
Function	Register	Bit	Value
Powering up TeSys U and ATSU			
Forward	704	0	1
Reverse	704	1	1
Powering down TeSys U and ATSU			
Forward	704	0	0
Reverse	704	1	0
Automatic control without deceleration			
Run	700	0	1
Stop forward	704	0	0
Stop reverse	704	1	0
Automatic control with deceleration (forward or reverse)			
Run	700	0	1
Soft stop	700	0	0

A1: Soft start/soft stop unit

QF1: TeSys model U controller-starter with reversing unit

Automatic control with AS-Interface communication module, without deceleration

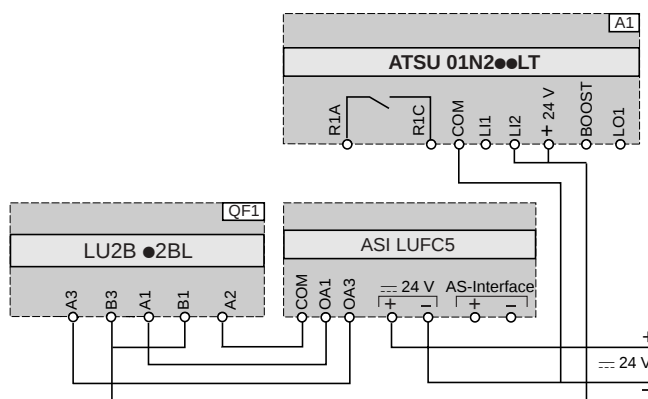
Without reversing unit



Function	Bit	Value
Power-up and automatic control without deceleration		
Run	D0	1
Stop	D0	0

A1: Soft start/soft stop unit

With reversing unit



Function	Bit	Value
Power-up and automatic control without deceleration		
Run forward	D0	1
Stop	D0	0
Run reverse	D1	1
Stop	D1	0

A1: Soft start/soft stop unit

QF1: TeSys model U controller-starter with reversing unit

The efficiency of Telemecanique branded *solutions*

Used in combination, Telemecanique products provide quality solutions, meeting all your **Automation & Control** applications requirements.



A worldwide presence

Constantly available

- More than 5 000 points of sale in 130 countries.
- You can be sure to find the range of products that are right for you and which complies fully with the standards in the country where they are used.

Technical assistance wherever you are

- Our technicians are at your disposal to assist you in finding the optimum solution for your particular needs.
- Schneider Electric provides you with all necessary technical assistance, throughout the world.



Schneider Electric Industries SAS

Head Office
89, bd Franklin Roosevelt
92506 Rueil-Malmaison Cedex
France

www.schneider-electric.com
www.telemecanique.com

Due to evolution of standards and equipment, the characteristics indicated in texts and images of this document do not constitute a commitment on our part without confirmation.

Design: Schneider Electric
Photos: Thierry Laroche, Schneider Electric
Printed by:

Simply Smart !

DIA1ED2050405EN