Presentation — A4/2

Power bases, control modules, connectors - TeSys U

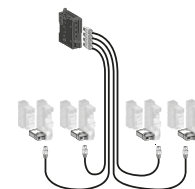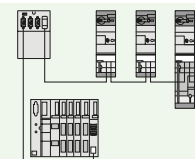| Type of product	Range		Page
Standard power base, basic control functionalities Direct and reversing	Up to 15 kW		A4/10
Advance power base, control, alarm and communication possibilities Direct and reversing	Up to 15 kW		A4/12

Communication components - TeSys U

		Page
Parallel type cabling system Principle and components		A4/18
Bus type cabling systems Principle, panorama and components		A4/23
LUFP communication gateway		A4/32

Accessories - TeSys U
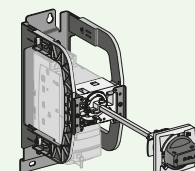
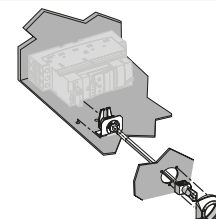|		Page
Short circuit current limiter		A4/33
Handles and accessories for rotary control		A4/34
Handles and accessories for integration into a MCC drawer		A4/35

Technical Data for Designers — A4/37

TeSys U

From traditional solution to ...

TeSys U

Motor circuit breaker: TeSys GV2 L

Magnetic protection
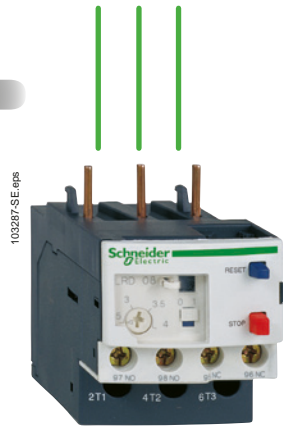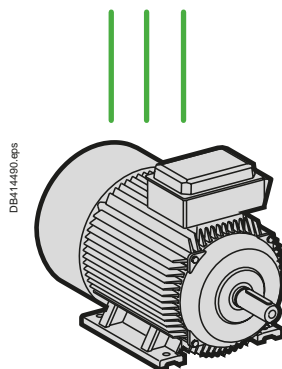> short-circuit protection

+

Contactor: TeSys D

Control
> Start /Stop

Status monitoring
> signaling
> alarm monitoring

+

Protection relay: TeSys LRD

Thermal protection
> overload

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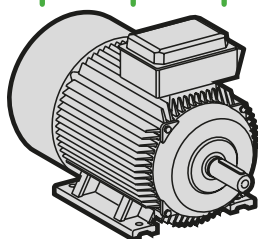
...TeSys U starter-controller

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DB414490.eps

TeSys U starter-controller

> All basic or advanced protection
  and control functions in one block

and more...

> Overload indication and alarm
> Status report, remote control via
  communication bus

TeSys U

☑ **TeSys U**
can be used in
80 %
of motor protection
and control
applications.

DB432795.eps

TeSys U

DB414490.eps

1 All in one

- Optimising space in enclosures.
- Total coordination (No contact welding on short circuit).
- Reduces installation times.

2 Simplicity of choice

- Controlled power.
- Protection functions ensured.
- Signaling functions, communication with PLC ensured.

3 Universal mounting

- On DIN rail or grid.

4 Conventional projet design

- Conventional control scheme with start , stop push buttons.

5 Electrically simple

Basic scheme of a TeSys U starter-controller

- Protection and power control functions acting on a single set of contact (QF1).
- The control unit (CU) monitors the voltage and current. In case of fault, it releases the coil, causing tripping.
- The coil is controlled by manual orders from an operator. Automatic control from a PLC is achieved with other diagrams.

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Power circuit

Control circuit

Presentation
Common characteristics
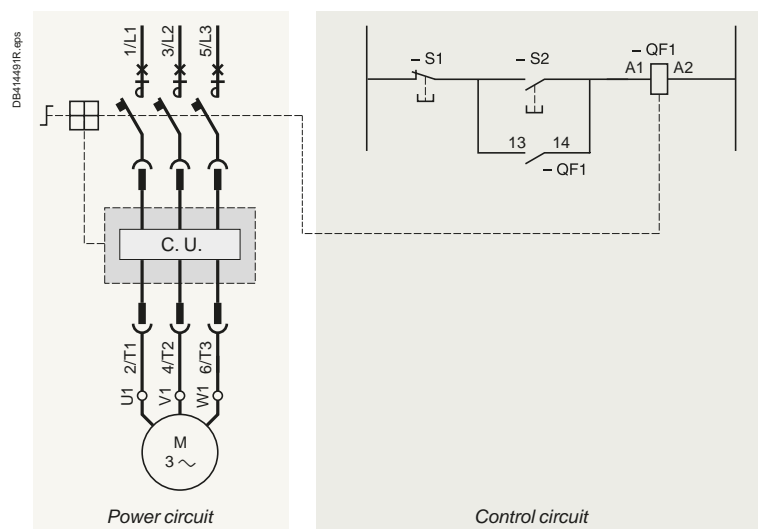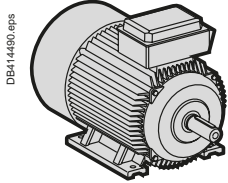
Motor up to

- 7.5 kW / 1-phase 230 V / 50-60 Hz.
- 15 kW / 3-phase 400-440 V / 50-60 Hz.
- 15 kW / 3-phase 500 V / 50-60 Hz.
- 18.5 kW / 3-phase 690 V / 50-60 Hz.
- Non-reversing or reversing.

Short-circuit protection
■ Isc:
□ 50 kA at ≤ 400 V
□ 10 kA at 500 V
□ 4 kA at 690 V.
■ Up to 690 V AC.

Overload protection
■ From 0.15 to 32 A, 6 setting ranges (tripping 14.2 x I setting).
■ Test button.
■ Adjustment lock.
■ Coil choice: 24 V, 48…72 V, 110...240 V DC/AC.

3 power contacts
■ For non-reversing (reversing with reverser block).
■ Imax, for 12 A power base (direct - reversing):
□ 12 A at up to 500 V / 50 Hz
□ 9 A > 500 V, up to 690 V.
■ Imax, for 32 A power base (direct - reversing):
□ 32 A at up to 500 V / 50 Hz
□ 21 A > 500 V, up to 690 V.

1 NO contact
1 NC contact
■ 5 A / max. 690 V AC or 250 V CC.
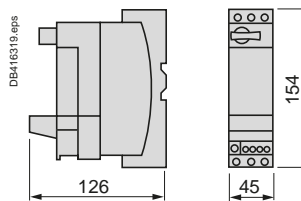
Other monitoring contacts
■ 5 A / max. 690 V AC or 250 V DC.
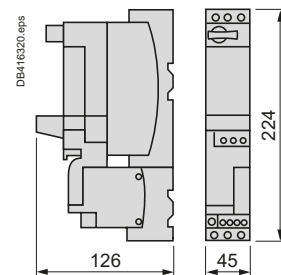
Communication modules
■ Modbus,
■ Ethernet,
■ CANopen,
■ DeviceNet,
■ Advantys stb,
■ Profibus DP,
■ Beckhoff,
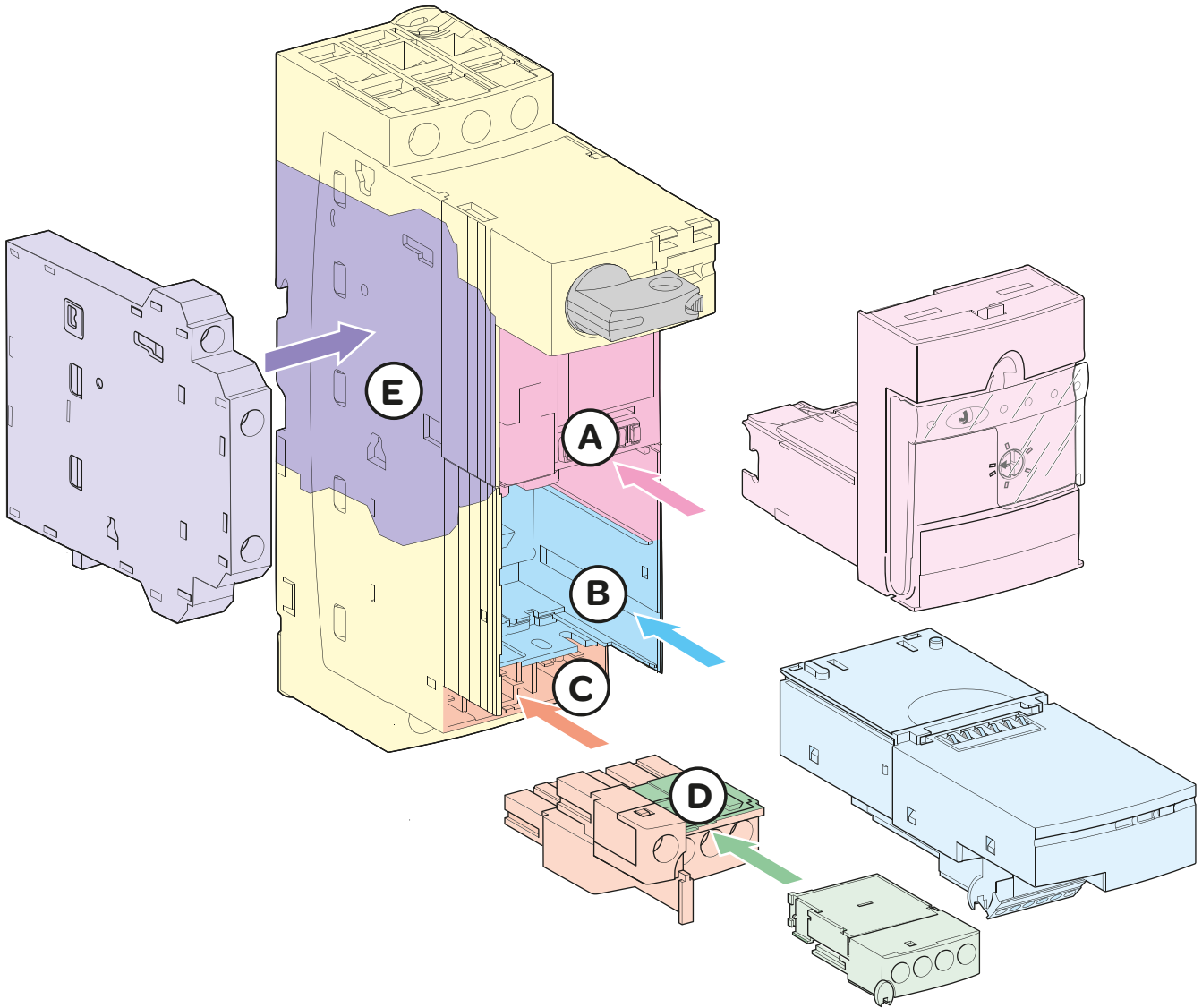■ AS-interface.

Dimensions
■ Base:

■ Base + reverser block:

Presentation
The modularity principle

▭	Power base		(C)	Cavity for control terminal block
(A)	Cavity for control unit		(D)	Cavity for additional contact block or shutter
(B)	Cavity for auxiliary module		(E)	Space for additional block fastening

Power Base

This is the basic constituent of the motor starter, it is composed of the power contacts, the control coil, the opening / closing mechanism of the protection device and the control pad.

Additional lateral block

Composed of the protection device signaling contacts.

Control unit

Composed of the power base management processor and setting knobs.

Auxiliary module

Depending on its type, it integrates load status contacts or a communication processor or an alarm processor.

Control terminal block

It is composed of two terminals "coil control", 1 NO auxiliary contact, 1 NC auxiliary contact. It can be eventually connected to an auxiliary communication module via a dedicated cable.

Additional block

It includes protection device additional signaling contacts. By default, this is a simple shutter.

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Components overview
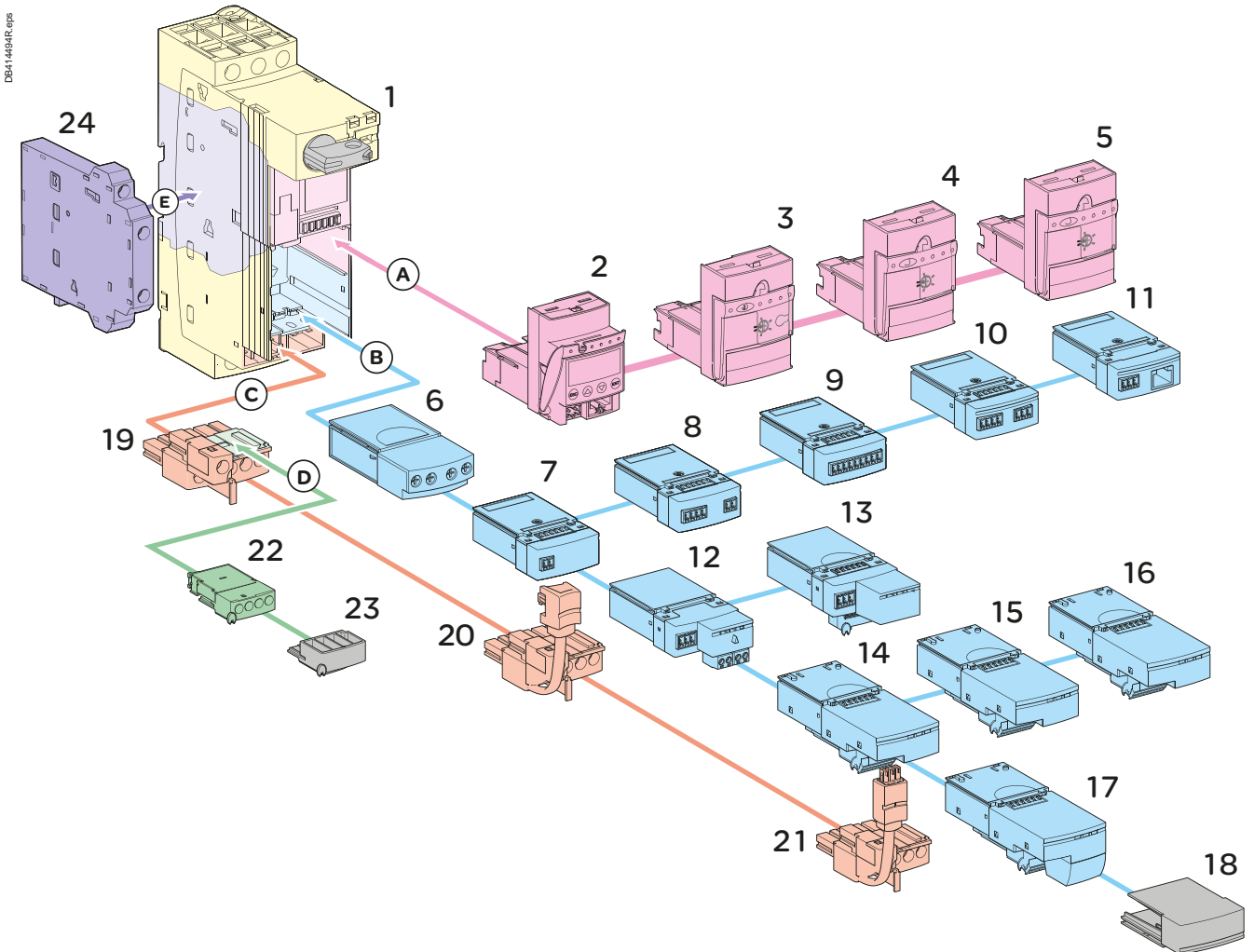
Power base
1- LUB
Non reversing power base -
1 rotation direction

Control units
2- LUCM
Multifunctional control unit

3- LUCB/LUCC/LUCD
Advanced control units

4- LUCA
Standard control unit

5- LUCL
Magnetic protection
control unit

Auxiliary module
6- LUFN
Auxiliary contacts module

Load monitoring auxiliary modules
7- LUFW10
Overload alarm module

8- LUFDH11
Overload alarm module with
manual reset

9- LUFDA01/LUFAD10
Overload alarm module with
automatic reset/remote reset

10- LUFV2
Motor load indication module

Communication auxiliary modules
11- LUFC00
Telefast parallel liaison
module, with RJ45 connector

12- ASILUFC5/ASILUFC51
AS-Interface c. m.

13- LULC031/LULC033
Modbus c. m

14- LULC07 Profibus DP c. m

15- LULC08 CANopen c. m.

16- LULC09 DeviceNET c. m.

17- LULC15 Advantys STB c. m.

Shutters
18- LU9C 1
Shutter for module cavity

23- Shutter for contacts
additional block cavity

Control terminal blocks
19- LU9BN11
Terminal block for imbedded
auxiliary contacts

20- LU9BN11C
Coil terminal block with its
connecting cable

21- LU9BN11L
Coil terminal block with its
connecting cable

Additional contacts blocks
22- LUA1
Additional contacts

24- LUA8
side-mounting additional
contacts

TeSys U

Additional components overview

TeSys U

Reverser block

1- LU2M B0●●
vertical-mounting reverser block

Control terminal blocks

2- LU9MR1C
Base/block assembling connector, with terminal block for imbedded auxiliary contacts

3- LU9M1
Coil terminal block for wired control

4- LU9MRC
Coil terminal block with its connecting cable for communicating control (only compatible with a selection of com. modules).

5-LU9MRL
Coil terminal block with its connecting cable for communicating control (only compatible with a selection of com. modules).

Evoluting reversing power base

6- Pre-assembled reversing power base **LU2B12**

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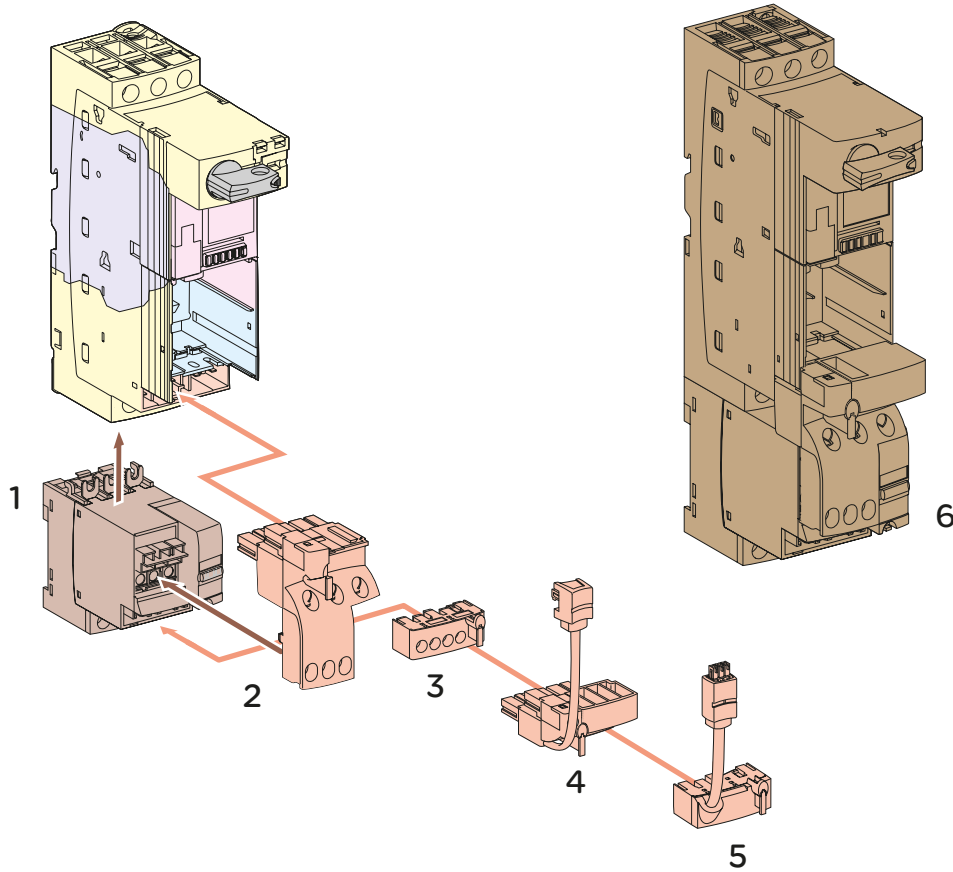Ihr Schweizer Industriepartner   info@digiparts.ch   www.digiparts.ch

Control units and modules

On/off control, 2 directions of rotation, side-mounting

Additional components overview

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Reverser block

1- LU6M B0●●
Side-mounting reverser block

Terminal blocks for electrical remote control

2- LU9MR1
Terminal block for 2 direction control (pulse or maintained control)

3- LU9M1
Terminal block for power base coil interlocking. With direction of rotation monitoring contacts

TeSys U

- Rotation control: 1 direction - 2 directions.
- Protection: overload + short circuits + main power fault.
- Monitoring: by dry contacts.

TeSys U

1- Selection of the standard power base

Rating / Ue AC	12 A / 400 V 12 A / 500 V 9A / 690 V		32 A / 400 V 23 A / 500 V 21 A / 690 V	
	1 direction	**2 directions**	**1 direction**	**2 directions**
Cial. ref.: replace dots by the coil code	Standard power base **LUB12**	Standard reversing power base **LU2B12●●**	Standard power base **LUB32**	Standard reversing power base **LU2B32●●**

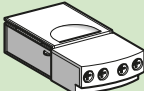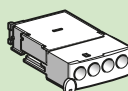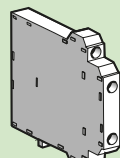## 2- Selection of the control unit

Maximum standardized power ratings of 3 phases motors 50/60 Hz

400/440 V	500 V	600 V	Setting range	Lip_in mounting on the power base - Rating	Protection type	
kW	**kW**	**kW**	**A**	**A**	**Thermal + magnetic**	**Magnetic**
					LUCA	**LUCL**
0.09	-	-	0.15...0,6	12 and 32	**LUCAX6●●**	**LUCLX6●●**
0.25	-	-	0.35...1,4	12 and 32	**LUCA1X●●**	**LUCL1X●●**
1.5	2.2	3	1.25...5	12 and 32	**LUCA05●●**	**LUCL05●●**
5.5	5.5	9	3...12	12 and 32	**LUCA12●●**	**LUCL12●●**
7.5	9	15	4.5...18	32	**LUCA18●●**	**LUCL18●●**
15	15	18.5	8...32	32	**LUCA32●●**	**LUCL32●●**

Cial. ref. of the control unit: dots to be replaced by the coil code (see below).

Coil voltage (V)	24 ⎓	24 ∼	48...72 ⎓ and 48∼	110...220 ⎓ and 110...240∼
Coil code	**BL**	**B**	**ES**	**FU**

3- Selection of the modules [1] and signaling blocks (optional)

Auxiliary signaling contacts module	Function	Indicates the ON/OFF running status of the motor, whatever the direction of rotation		
	Output	Change of the state of 2 contacts: 1NO + 1NC	Opening of 2 NC contacts	Closing of 2 NO contacts
	Cial. reference	**LUFN11**	**LUFN02**	**LUFN20**

Auxiliary signaling contacts block	Function	Indicates the open/ closed status of the protection: by NO/NC contact Protection standby/tripped: by SD contact To be inserted below the auxiliary module cavity (B)	
	Output	OF and SD contacts: NO type	OF contact: NC type SD contact: NO type
	Cial. reference	**LUA1C20**	**LUA1C11**

Auxiliary signaling contacts block	Function	Indicates the open/closed status of the protection To be clamped on the left side of the power base.
	Output	2 OF contacts: NO type
	Cial. reference	**LUA8E20**

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The power bases are delivered with the following items

> **LUB12**, **LUB32**
  12 or 32 A power base with imbedded control terminal
  block and 3 blanking shutters

> **LU2B12**, **LU2B32**
  12 A (LUB120) or 32 A (LUB320 [1] power base without
  imbedded control terminal block
  + 1 assembling connector **LU9MR1C**
  + 1 reverser block - vertical mounting **LU2MB0●●**
  + 1 control terminal block **LU9M1**

  (1) see description next page.

Control terminal blocks - Characteristics

> **LU9BN11**
  2 terminals ➡ for coil
  2 terminals ➡ NO contact (24 ... 250 V DC/AC, 5 A max)
  2 terminals ➡ NC contac (24 ... 250 V DC/AC, 5 A max)

> **LU9M1**
  1 terminal ➡ common
  1 terminal ➡ S1 coil
  1 terminal ➡ S2 coil
  2 terminals ➡ contact NF (24 ... 250 V DC/AC, 5 A max)
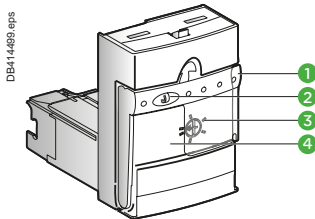
LUCA ●●●●

1 Extraction and locking handle.
2 Sealing of locking handle.
3 Ir adjustment dial.
4 Locking of settings by sealing the transparent cover.

They provide the electrical protection settings

LUCA - standard units

■ Protection against overload: 14.2 x lr (setting current).
■ Protection against short circuit: 13 x lr max (max setting current).
■ Protection against missing or unbalanced phases.
■ Protection against insulation fault (protection of equipment only).

■ Class 10 tripping.

■ Frequency 50...60 Hz.

LUCL - magnetic units

■ Protection against short circuits.

■ To be used when a standard power base is connected to a motor drive or a soft starter, as they provide the overload protection.

Note: both LUCA and LUCL units can be used in the advanced power bases LUB120 and LUB320.
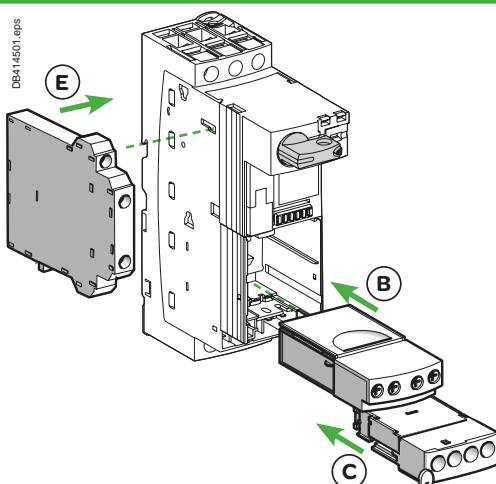
Modules and blocks are compatible with all standard and standard inverting power bases

Common electrical characteristics

■ Standard operating voltage: 24…250 V AC/DC.
■ Maximum current: 5 A.

Components for "advanced control"

- Rotation control: 1 direction - 2 directions.
- Protection: overload + short circuit + main power fault.
- Signaling: by dry contacts.
- Digital display of electrical values.
- Overload alarms.
- Network/bus communication.

TeSys U

1- Selection of the advanced power base and reverser block

	Advanced power base	Reverser block - vertical mounting	Reverser block - side mounting
Rating / Ue AC			
12 A / 400 et 500 V 9 A / 690 V	**LUB120**	① LU9MR1C ② LU2MB0●● (1) ③ LU9M1	① LU6MB0●● (1) ② LU9MR1 ③ LU9M1
32 A / 400 V 23 A / 500 V 21 A / 690 V	**LUB320**		

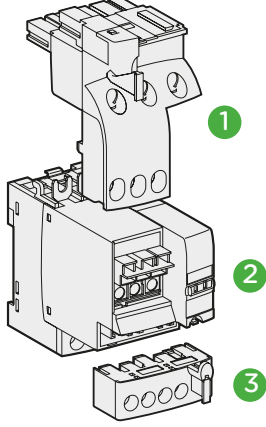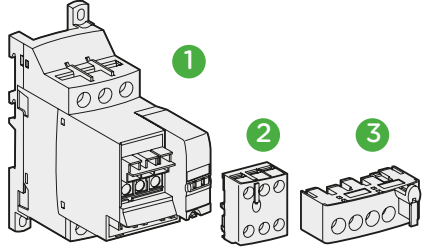*(1) Terminal coil control A1-A2 and aux. NO + NC.*

2- Selection of the control unit

Maximum standardized power ratings of 3 phases motors 50/60 Hz

Protection type:
- overload
- short-circuit
- Main power fault
- alarm

Multifunctional

400/440 V		500 V	600 V	Setting range	Lip_in mounting on the power base - Rating	Class 10	Class 10	Class 20	Class 5...30
kW		kW	kW	A	A	3P	1P	3P	1 - 3P
1P	3P	3P	3P						
-	0.09	-	-	0.15...0,6	12 and 32	LUCBX6●●	LUCCX6●●	LUCDX6●●	LUCMX6BL
0.09	0.25	-	-	0.35...1,4	12 and 32	LUCB1X●●	LUCC1X●●	LUCD1X●●	LUCM1XBL
0.55	1.5	2.2	3	1.25...5	12 and 32	LUCB05●●	LUCC05●●	LUCD05●●	LUCM05BL
2.2	5.5	5.5	9	3...12	12 and 32	LUCB12●●	LUCC12●●	LUCD12●●	LUCM12BL
4	7.5	9	15	4.5...18	32	LUCB18●●	LUCC18●●	LUCD18●●	LUCM18BL
7.5	15	15	18.5	8...32	32	LUCB32●●	LUCC32●●	LUCD32●●	LUCM32BL

Cial. ref. of the control unit: replace dots by the coil code.

Coil voltage (V)	24 ---	24 ∿	48...72 --- and 48∿	110...220 --- and 110...240∿
Coil code	**BL**	**B**	**ES**	**FU**

> Selection of the modules and signaling blocks: see page A4/14

Magelis XBT NU HMI terminal (optional)

SEMI-GRAPHIC DISPLAY
SMALL FONTS
BIG FONTS

XBT NU400

Provides display and modification of the LUCM multifunctional controller settings.
Ready to ensure dialogue with up to 8 TeSys U starter-controller (Modbus protocol - Pre-loaded application and alarm pages).

Main characteristics

- Multi-language: French, English, German, Spanish, Italian.
- Display: 4 lines of 20 characters.
- Width 132 mm, heigth 74mm, depth 43 mm.
- Supply voltage 24 V DC.

Designation	Reference
Magelis TeSys U terminal	**XBTNU400**
Connecting cable XBTNU400 to LUCM ●●BL, L = 2,50 m (1)	**XBTZ938**

(1) A Modbus hub or - junction must be used when connecting several TeSys U.

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LUB120, LUB320 - 12 or 32 A advanced power base equipped with:

One NO latching contact + one NC contact
Operation voltage 24 ... 250V AC/DC - I max 5 A

+ 2 blanking shutters

The cavity C is empty, ready for insertion of a terminal block:
> for local control **LU9BN11**
> for centralized control **LU9BN11C**, **LU9BN11L**
> or insertion of an assembling connector **LU9MR1C**, for reverser block - vertical mounting

Inverser block: its maximum controlled power might be limited by the power base capacity

Power base interlocking control:
> vertical mounting: by the assembling connector **LU9MR1C**
> side mounting: by a **LU9MR1** terminal block (to be linked to a **LU9B N11** terminal block in the advanced power base).

Reverse control:
> Local control, to be wired on a **LU9M1** terminal block
> centralized control, by a **LU9MRC** or **LU9MRL** terminal block; its connector must be plugged in a communication module, in the advanced power base.
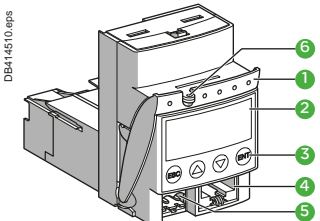

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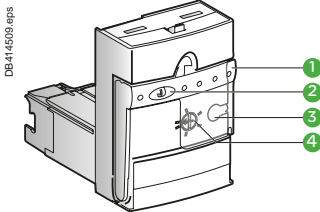
LUCB ●●●●, LUCC ●●●●, LUCD ●●●● control units

1 Extraction and locking handle.
2 Sealing of locking handle.
3 Ir adjustment dial.
4 Test push button.

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LUCM ●●BL control unit

1 Extraction and locking handle.
2 Built-in LCD display (2 lines, 12 characters).
3 4 button keyboard.
4 RS485 Modbus communication port, with RJ45 connector.
5 Connector for external 24 V DC power supply.
6 Sealing of locking handle.

LUCB, LUCC, LUCD control and diagnostic units

■ Motor protection, fault diagnostic.
■ Protection against
□ overload: 14.2 x lr (setting current).
Simulation of an overload by depressing the test push button.
□ short circuit: 13 x lr max (max setting current).
□ missing or unbalanced phases.
□ insulation fault (protection of equipment only).

■ Overload alarm management:
□ locally: with one of the LUF family module
□ Remotely: with LULC031, LULC033, LULC07, LULC08, LULC09 or LULC15 (thermal alarm only) communication module.

■ Reset:
□ manual
□ automatic, with a communication module.

LUCM multifunctional control unit

■ Motor protection, operational values display and diagnostic.
■ To be associated with 24 V DC coil only.
■ LUCM ●●BL: tripping class 5 to 30, single phase, three phase
■ Same functions as LUCB ●●●● with complementary functions:
□ in working mode: display of electrical values, setting parameters and events
□ in configuration mode: display of protection and alarm settings.
■ These functions are available for local display on a display panel, and for remote display via a RJ45 Modbus connector.
■ The Modbus - RS485 compatibility is ensured by the Magelis XBT display terminal or a PC with the PowerSuite software.
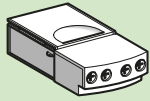
Note: a 24 V DC power supply is required during the configuration process.

- Rotation control: 1 direction - 2 directions.
- Protection: overload + short circuits + main power fault.
- Signaling: by dry contacts.
- Digital display of electrical values.
- Overload alarms.
- Network/bus communication.

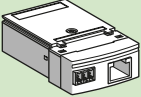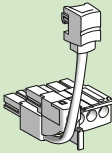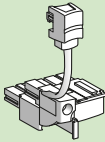### 3a- Selection of the modules and signaling blocks (optional)

Function	Indicates the ON/OFF running status of the motor, whatever the direction of rotation		
Output	Change of the state of 2 contacts: 1NO + 1NC 5 A/ 24 ... 250V AC/DC	Opening of 2 NC contacts 5 A/ 24 ... 250V AC/DC	Closing of 2 NO contacts 5 A/ 24 ... 250V AC/DC
Cial. reference	LUFN11	LUFN02	LUFN20

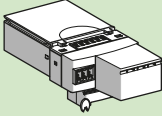### 3b - Selection of additional function module (optional)
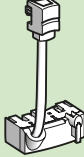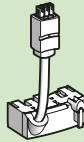
Function	Measure of average current in each phase	Alarm if average current in the phases = 105% of In	Indicates the overload tripping - manual reset	Indicates the overload tripping - reset with the power base control pad or remote reset	
Output	4-20 mA signal, image of the pourcentage of In	Closing of a NO contact	Change of state of 2 contacts: 1 NO + 1 NC	Opening of a NC contact	Closing of a NO contact
Référence	LUFV2	LUFW10	LUFDH11	LUFDA01	LUFDA10

4a- Selection of the auxiliary module and terminal block for Modicon Telefast system
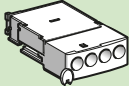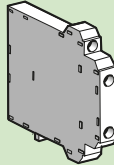
	Telefast system Module	Terminal block / control cable 1 direction of rotation	2 directions of rotation
Cial. reference	LUFC00	LU9BN11C use with LUB120 or LUB320	LU9MRC

4b- Selection of the communication auxiliary module

	Communication module	Terminal block / control cable for LUB●●● power base, 1 direction of rotation		Terminal blocks / control cables for LU2B●● ou LUB●●● + LU2MB0●● power base, 2 directions of rotation	
		LU9B N11C	*LU9B N11L*	*LU9M RC*	*LU9 MRL*
Modbus	LUL C033	LU9BN11C		LU9MRC	
Ethernet	LUL C033 + TeSys port TCSEQM113M13M				
AS-Interface	ASILUF C51				
Profibus DP	LUL C07	LU9BN11L		LU9MRL	
CANopen	LUL C08				
DeviceNet	LUL C09				
Advantys stb	LUL C15				
Beckhoff	LUL C14	contact us			

5- Selection of additional block signaling TeSys U status

	Auxiliary signaling contacts block		Auxiliary signaling contacts block
Function	Indicates the off/ready status of TeSys U: by NO/NC contact Protection on/tripped: by SD contact To be inserted below the auxiliary module cavity (B)		Indicates the off/ready status of the protection
Output	OF and SD contacts: NO type	OF contact: NC type SD contact: NO type	2 OF contacts: NO type
Cial. reference	LUA1C20	LUA1C11	LUA8E20

TeSys U

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■ The signaling modules with dry contacts are directly wired on indicators and electrical warning devices.
■ Contacts rating: 5 A / 24...250 V AC/DC.
■ The **LUF V2** module is connected to a datalogger or any other indication device providing a 4-20 mA analog input.

■ Module **LUF C00**:
☐ indicates the position of the control pad and the state of the poles,
☐ collects the FWD, REV commands from an automation process.

■ **Inputs**: P24 V power base coil control, from a 24 V DC PLC output
■ **Outputs**: OF / SD contacts from protection device, OF contact from the poles (to a 24 V PLC input)

■ RJ45 connector for Telefast PLC pre-wiring system:
☐ Modicon TM3 (map I/O controllers for RJ45 M221, M241, M25)
☐ Modicon STB modules (I/O for automation island)
☐ Modicon Telefast (interfaces RJ45/HE10).
■ Must be connected to a **LU9 G02** or **LU9 G03** Telefast distribution box

■ **Compatible exclusively with LUC●●● control unit with coil code B**

■ The terminal blocks + control cables provide the connection to the coil of the power base and the signal contacts.

■ Communication modules:
☐ indicates the position of the control pad and the state of the poles,
☐ collects the FWD, REV commands from an automation process.

■ The states and the control orders are coded according to the selected communication protocol.

■ Screw clamp terminals to the bus cable.

■ The terminal blocks + control cables provide the connection to the coil of the power base and the signal contacts.

■ Additional blocks:
☐ used for wiring indicator lights or controllers.

■ Advantage:
☐ the locations for these blocks are always available, regardless of the configuration of the power base.

■ Contact rating: 5 A / 24...250 V AC/DC.

Note: the indication the direction of rotation is available on the reverser block unit:
- On a LU9M R1C assembling connector
- On a LU9M R1 terminal block.

TeSys U

Standard or advanced power base

ON/OFF control (1 direction of rotation)

Push buttons wiring

OFF
ON

LU9B N11
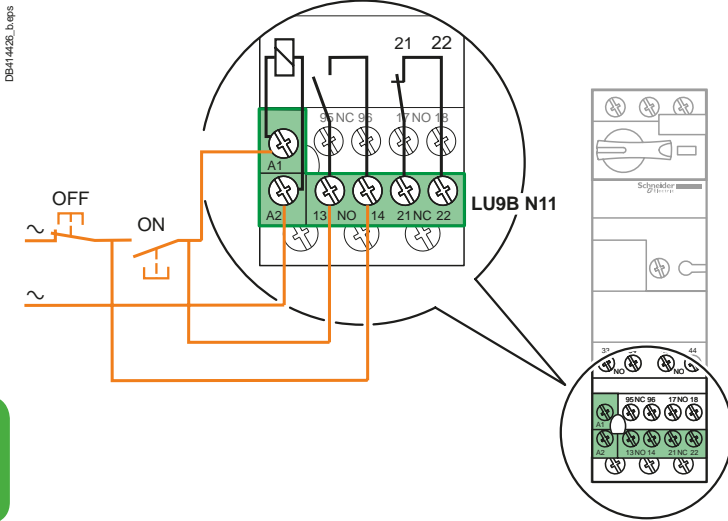
ON indication

"Motor RUN" indicator wiring | "Motor starter READY" indicator wiring
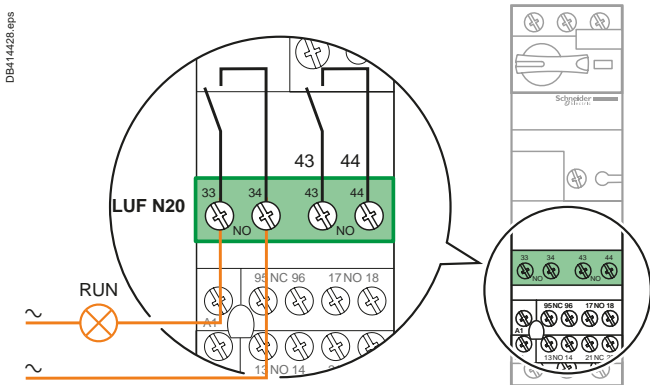
LUF N20

RUN

43 44

READY

LUA8 E20
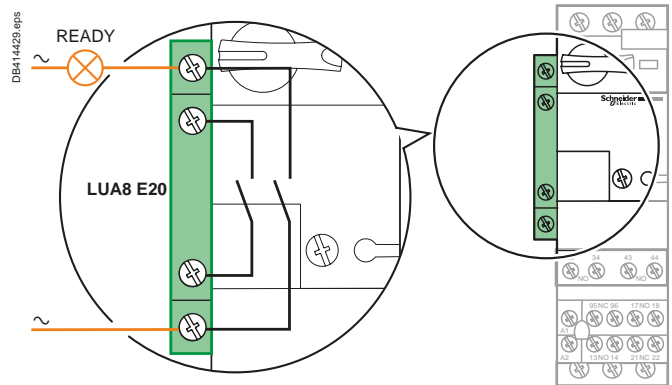
ALARM indication

Protection device status indicator wiring

95

33 34 43 44

97 NO 98 17 NO 18

LUA1 C20

ALARM

Protection OK

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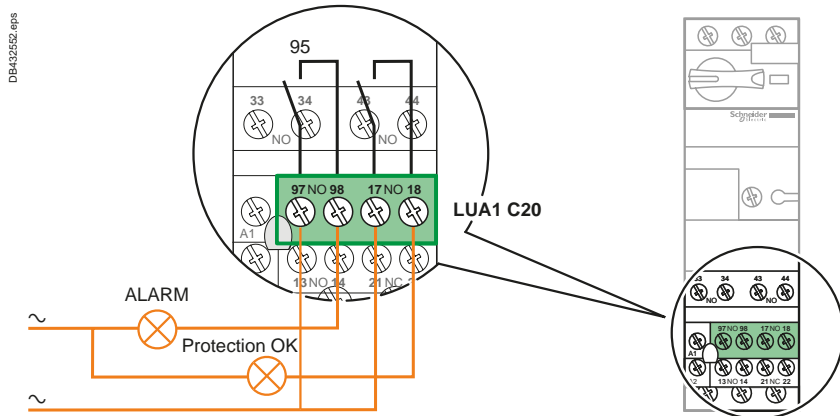
Power base with vertical mounting reverser block

FW/REV/OFF control (2 directions of rotation)	FW/REV control
Push buttons wiring	FW, REV indicators wiring

OFF   REV   FW

LUFN20

RUN FW
RUN REV

TeSys U
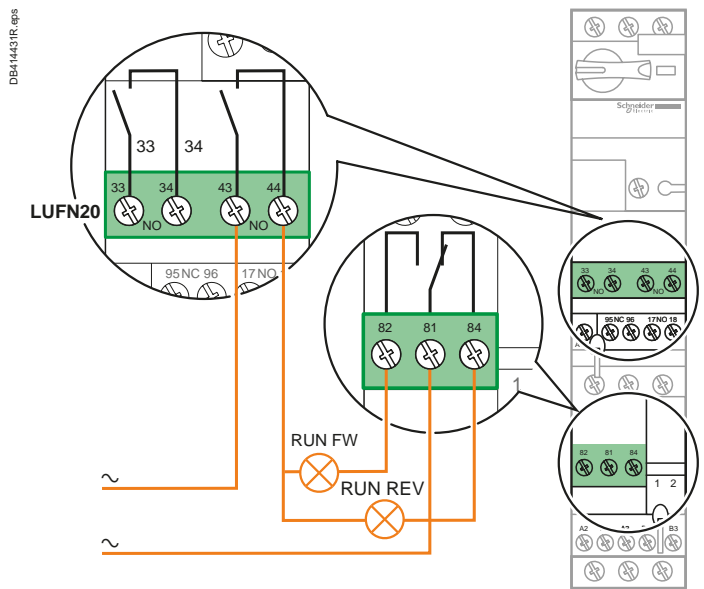
Contact states depending on the product status

			Position of rotary knob	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	N/C contact Rotary knob on OFF position
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	**LUA8 E20** 57/58 67/68
	or		–	–	**LUF N20** 33-34 43-44	**LUB9 N11** 21-22	–	–	**LUA1 C11** 17-18	–
	or		–	–	**LUF N11** 43-44	–	–	–	**LUA1 C110** No terminal block	–
	or		–	–	**LUB9 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/C contact ⎯⎯ in open position.

Parallel-type cabling systems
Principle

Point-to-point wiring
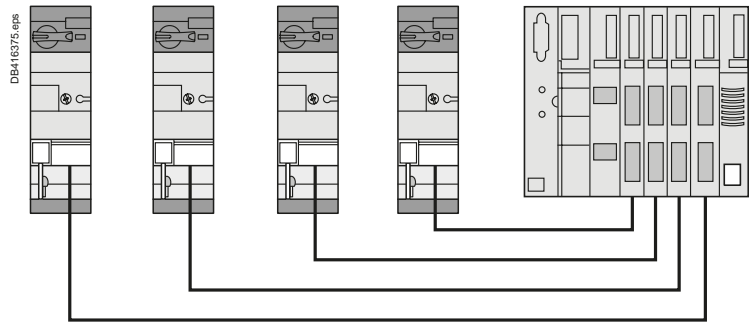
■ The control inputs and signaling outputs of the starter are grouped in a single socket, usually RJ45.
They are individually connected to PLC outputs and inputs.
■ The wires run in parallel in a multicore cable equipped with a multipin connectors, RJ45 in the case of Telefast type system.
■ 3 parallel wiring systems are available:
□ Modicon TM3, based on a RJ45 I/O module for M221, M241, M25 PLC
□ Modicon STB, based on I/O modules for automation island
□ Modicon Telefast: RJ45 / HE10 interfaces.
■ Simple way of proximity wiring. Quick cabling.
It is suitable for machine control panels when a large number of TeSys U starter-controller are installed.

---

informations

■ The control and signaling terminals of the starters are connected to the output and input terminals of a PLC. No specific connectors or cables are required.
■ Conventional wiring mode, without optimization of the cabling time.
May be suitable when a very small number of starters is used, with a very small number of links.

Parallel cabling systems

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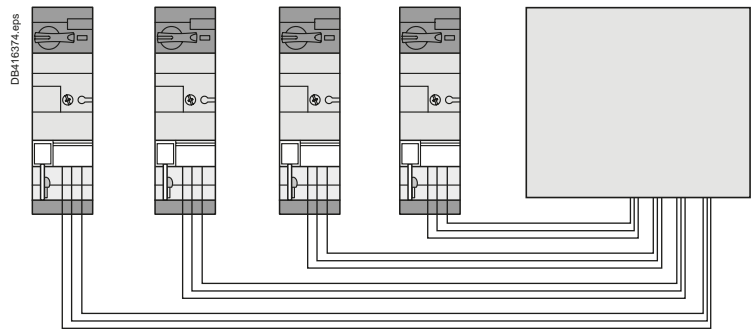
Integration in the Modicon TM3 wiring system

The TeSys U starter-controller are directly connected to a I/O module equipped with RJ45 connectors.

❶ Modicon M221, M241, M251 PLC's
❷ TM3XTY I/O module for 4 starters
❸ LU9R●● cables with RJ45 connectors,
❹ LUFC00 module for TeSys parallel connection (1 or 2 direction of rotation).
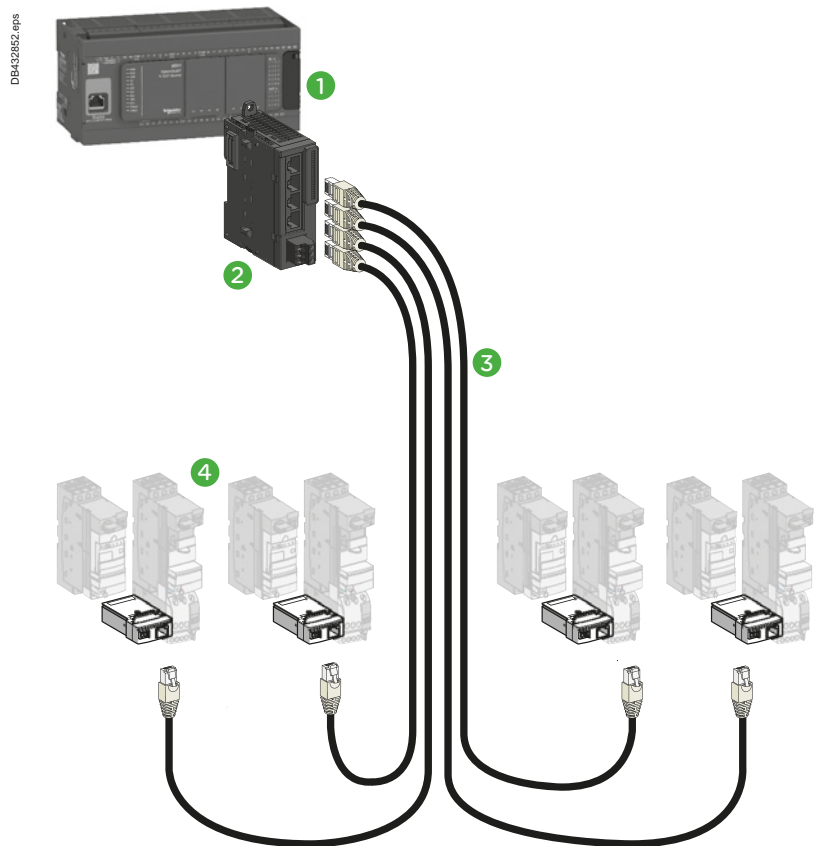
Integration in the Modicon Advantys STB system

Advantys STB is a solution for remote I/O modules.

These communicate with the Modicon PLCs range thanks to a serial liaison, using the Advantys STB protocol.

In this example an Advantys I/O module is used to facilitate wiring.

Each of its four terminals receives a preassembled RJ45 cable connected to a TeSys U starter-controller.

1 TeSys U starter-controller (equipped with 24 V DC LUC ●●●● BL control modules)

2 TeSys module for parallel RJ45 wiring: LUFC00 + LU9B N11C (one direction) or LU9MRC (2 directions)

3 RJ45 cables (2 connectors):
≤ 3 m: LU9 R●●
> 3 m: 490 NTW 000●● (5, 12, 40 or 80 m)

4 PLC: Modicon range

5 I/O Modicon Advantys module: STB EPI 2145K

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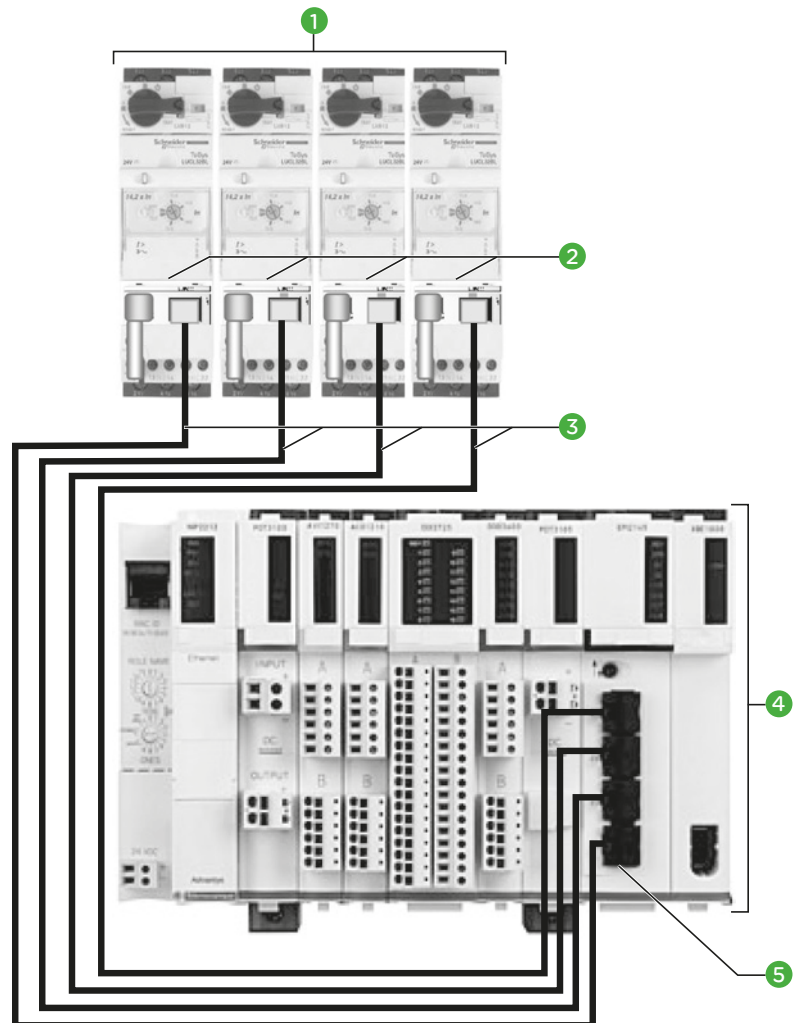
Integration in the Modicon Telefast system

The wiring hubb **LU9G0●** facilitates the connection to Modicon Premium PLCs.

It adapts RJ45 connectors to HE10 available on the Telefast I/O modules.

Connection: up to 8 TeSys U per hubb.

1 TeSys U starter-controllers (equipped with 24 V DC LUC ●●●●BL control units)

2 TeSys Module for parallel wiring RJ45: LUF C00 + LU9B N11C (one direction) or LU9MRC (2 directions)

3 RJ45 cables (2 connectors):
≤ 3 m: LU9R●●
> 3 m: 490 NTW 000●● (5, 12, 40 or 80 m)

4 Telefast RJ45 / HE10 splitter box: LU9G02 or LU9G03 (different TeSys U connection capacities)

5 HE10 cables (2 connectors): TSX CDP ●●●

6 PLC: Modicon Premium range

7 I/O module: TSX DMY 28FK
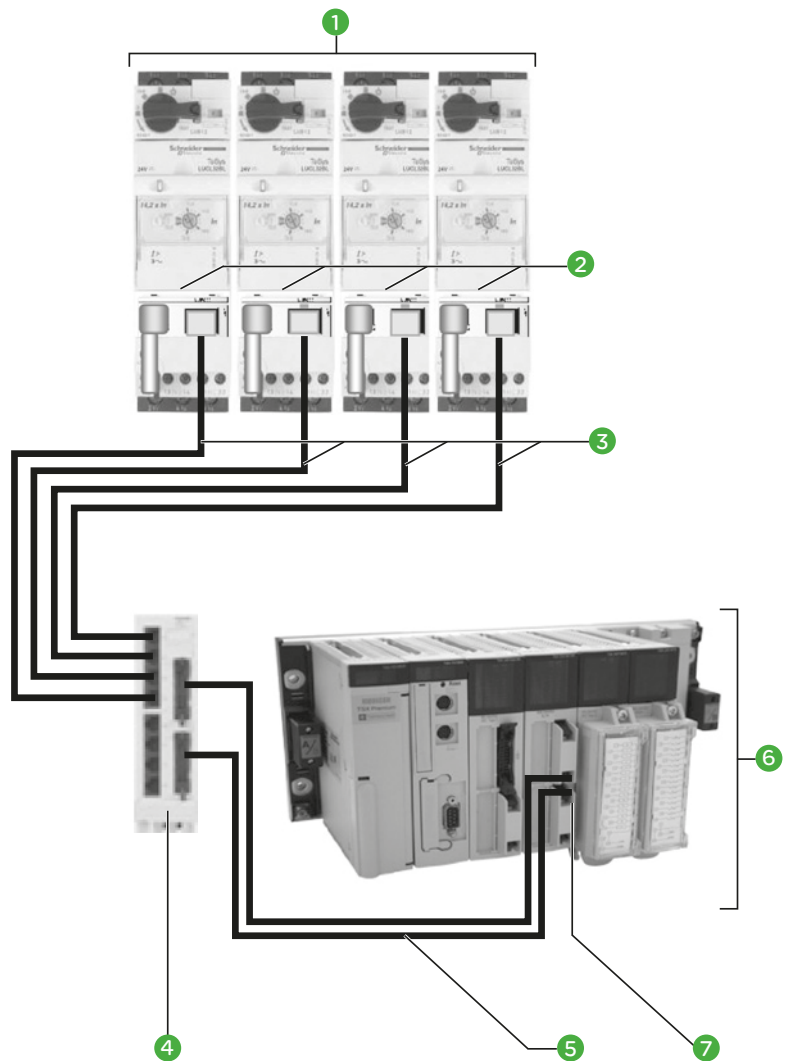
TeSys U

TeSys U

LU9 G02   *LU9 G03*
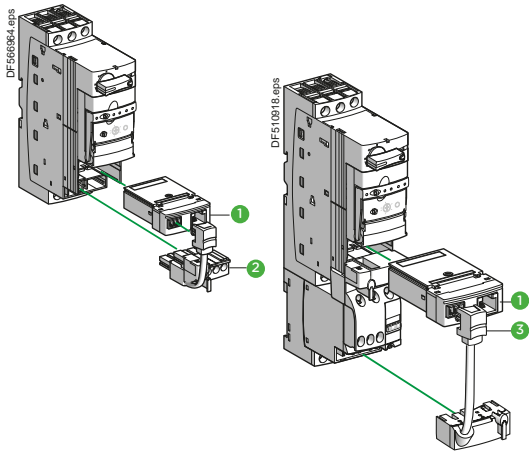
Components for connection of a starter - 1 direction of rotation	
Designation	**Reference**
❶ Parallel connection module, RJ45 output 2 coil control inputs, 3 signal outputs	**LUFC00**
❷ Pre wired connector, one direction of rotation, for coil connection and one contact for emergency stop	**LU9BN11C**

Components for connection of a starter - 2 directions of rotation	
Designation	**Reference**
❶ Parallel connection module, RJ45 output	**LUFC00**
❸ Pre wired connector, 2 directions of rotation, for coil connection and one contact for emergency stop	**LU9MRC**

Telefast RJ45/ HE10 splitter box	
Designation	**Reference**
Splitter box Connection to TeSys U: 4 RJ45 connectors: for 1 to 4 TeSys U, 1 or 2 directions 4 RJ45 connectors: for 1 to 4 TeSys U, 1 direction Connection to PLC: 1 x HE10 connector - 20 chanels, for pole status, alarms 1 x HE10 connector - 20 chanels, for control. 24 V DC auxiliary power supply required	**LU9G02**
Splitter box Connection to TeSys U: 8 RJ45 connectors: for 1 to 8 TeSys U, 1 or 2 directions Connection to PLC: 1 x HE10 connector - 20 chanels, for pole status, alarms 1 x HE10 connector - 20 chanels, for control. 24 V DC auxiliary power supply required.	**LU9G03**
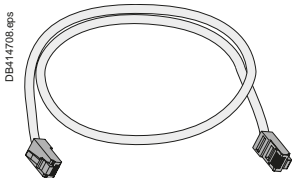
RJ45 cables.
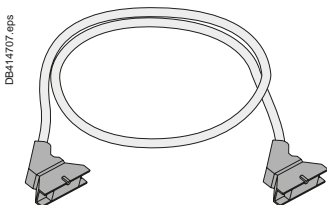
HE10 cables.

RJ45 connection cables, with 2 RJ45 connectors	
0.3 m	**LU9R03**
1 m	**LU9R10**
3 m	**LU9R30**

HE10 connection cables, with 2 HE10/20 way connectors	
Section: AWG 22 / 0.324 mm²	
0.5 m	**TSXCDP053**
1 m	**TSXCDP103**
2 m	**TSXCDP203**
3 m	**TSXCDP303**
5 m	**TSXCDP503**
Section: AWG 28 / 0.080 mm² (flat cable)	
1 m	**ABFH20H100**
2 m	**ABFH20H200**
3 m	**ABFH20H300**

HE10 connection cables, with 1 x HE10/40 way connector (PLC side) and 1x HE10/20 way connector (Splitter box side)	
Section: 0.324 mm²	
0,5 m	**BMXFCC053**
1 m	**BMXFCC103**
2 m	**BMXFCC203**
3 m	**BMXFCC303**
5 m	**BMXFCC503**
10 m	**BMXFCC1003**

Cable with stripped wires (PLC side) 1 x HE10/20 ways connector (Splitter box side)	
Section: AWG 22 / 0.324 mm²	
3 m	**TSXCDP301**
5 m	**TSXCDP501**

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Bus-type cabling systems
Principle

> ## Application functionality, topology

① Geographically expanded process

Many motors are scattered on the site, the process control requires individual control to ensure safety and proper operation.
TeSys U is a suitable communicating actuator. The integration of a bus communication module in the starter-controller saves space in the control board and simplifies wiring, compared to solutions based on conventional components (circuit breaker + contactor).

② Application: automatic motor control / monitoring

Thanks to a communication bus, starter-controllers are part of an automation system controlled by a PLC and (or) various communicating controllers.
These equipment can then share the status and alarm information related to each motor control and perform specific treatments.

③ Bus- type connection

This type of connection allows different topologies (star, ring ...) and supports various protocols dialogue. It is therefore recommended for geographically expanded process, in order to to simplify wiring and ensure multiple-controller management.

■ The bus wiring interconnects TeSys U starters controllers and components of the installation via a single the cable.
■ Commands and status are coded according to the selected protocol and transmitted on the communication bus.
■ This wiring is simple, usually a shielded (or not) pair of wires, suitable for monitored automation, regardless of the number of TeSys U and their locations.
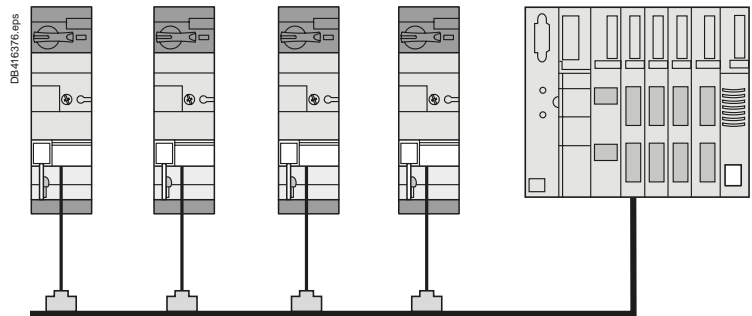
Available TeSys U status and controls via a communication module

Control unit	LUCA	LUCB LUCC LUCD	LUCM
Starter status (ready, running, fault)	■	■	■
Start and Stop commands	■	■	■
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			■
Alarms (overcurrent, ...)			■

Network	Architecture	Component references
AS Interface		
Cabling system for rapidly connecting sensors and actuators to the controller. A single cable provides both data transmission and power to sensors.		**1** ASI LUF C5 or ASI LUF C51 **2** LU9B N11C **3** LU9M RC **4** XZ CG0142 **5** TC SAT V01 N2
Details page **A4/26**		
CANopen		
Etoile		**1** LUL C08 **2** LU9B N11L **3** LU9M RL **4** TSX CAN C●●● **5** TSX CAN TDM4 **6** TSX CPP 110
Bus		
Details page **A4/27**		
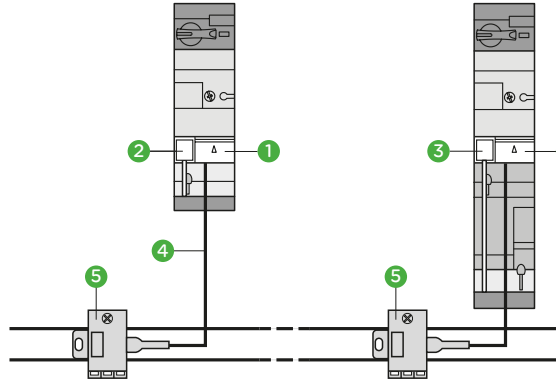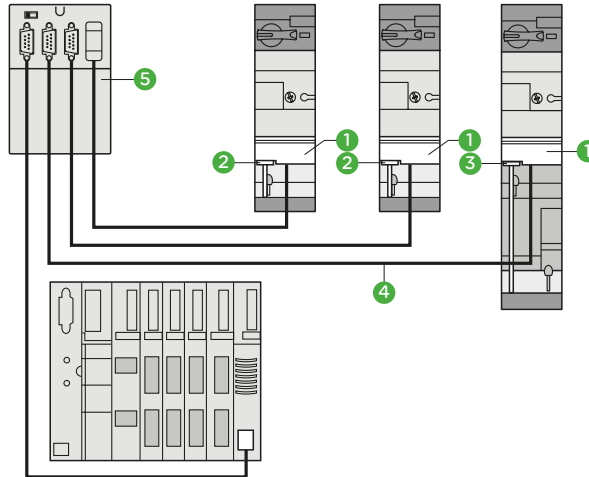
TeSys U
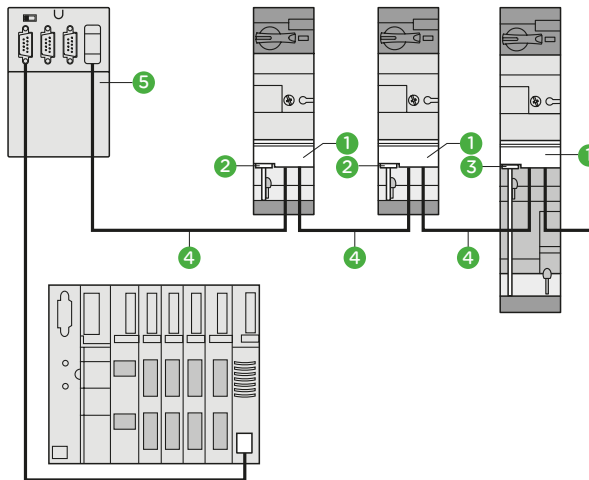
Network	Architecture	Component references
Modbus		
	Etoile Bus	① LUL C031 or LUL C033
		② LU9B N11C
		③ LU9M RC
		④ VW3 A8 306R●●●
		⑤ LU9 GC3
Details page **A4/28**		⑥ VW3 A8 306TF
Advantys STB		
Starter-controllers communicate using ADVANTYS STB protocol to fit into a remote I/O architecture.		① LUL C15
		② LU9B N11L
		③ LU9M RL
		④ LU9 RDD●●●
		⑤ LU9 RCD
Details page **A4/29**		⑥ STB XBE1100
Profibus-DP (Decentralized Peripherals)		
is used for connecting actuators and sensors to a central controller for applications in industrial production. The standard bus provides a number of diagnostic means	24 V	① LUL C07
		② LU9B N11L
		③ LU9M RL
		④ LU9 RPB010 LU9 RPB100 LU9 RPB400
		⑤ LU9 AD7
Details page **A4/30**		⑥ LU9 GC7
DeviceNet		
	24 V	① LUL C09
		② LU9B N11L
Details page **A4/31**		③ LU9M RL
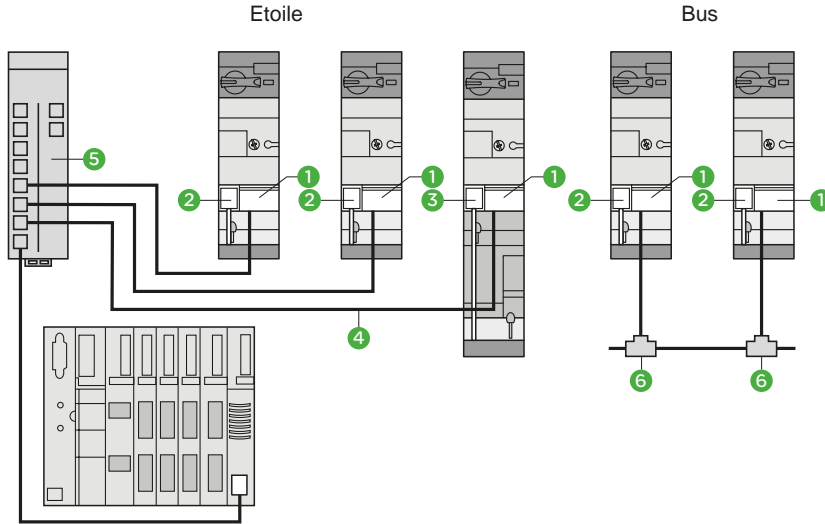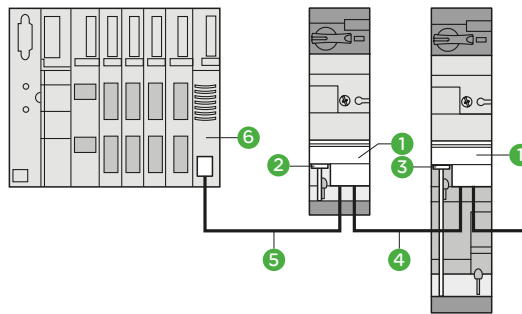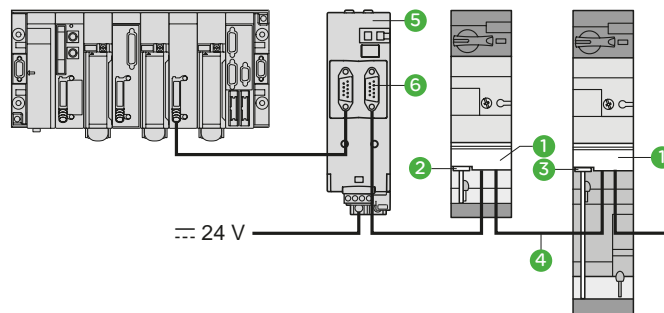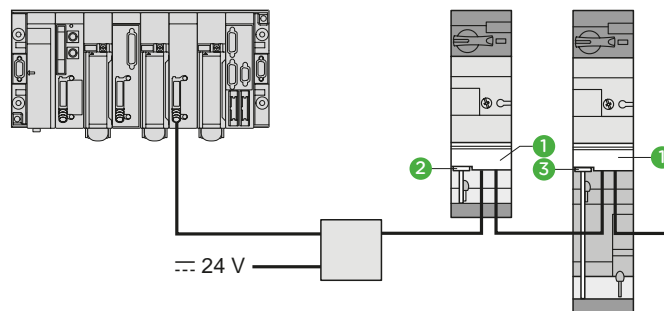
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Bus-type cabling systems
TeSys U components for AS-Interface bus

ASILUFC5

POWER   FAULT

0207

COM OA1 OA3   24 V ⎓   ASi
                  +   −   +   −
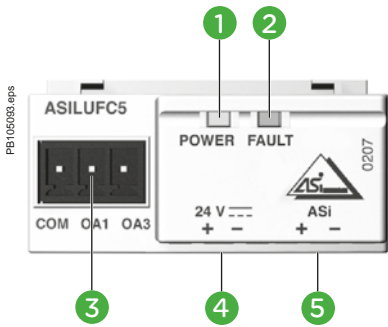
1. Green LED: AS-Interface voltage present
2. Red LED: AS-Interface or module fault
3. Outputs for starter commands
4. Black connector for connection to ⎓ 24 V auxiliary power supply
5. Yellow connector for connection to the AS-Interface system

The LULC09 communication module, combined with the power base and control unit is used to control TeSys U starters-controllers via DeviceNet bus.
The LULC09 communication module is slave type.

Module Specifications

I/O terminal block

■ Powered by external 24 V DC (power supply not included):
□ 2 x configurable inputs for binary sensors
□ 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

■ For TeSys U 24 V DC coil (common, direction 1, direction 2).
■ For AS-Interface bus.

Signaling

■ Module Status - Error - 24 V, by LED.

Tesys components			
Description	**Mark**	**Max number of slaves**	**References**
AS-Interface communication module	❶	31	**ASILUFC5**
		62	**ASILUFC51**
Pre-wired connector: coil - LUB powerbase	❷	-	**LU9BN11C**
Pre-wired connector: coil - LUB2B powerbase	❸	-	**LU9MRC**

Connection of the communication module

By a "Y" cable with:
■ TeSys U side, 2 connectors (bus + power),
■ Bus side, one connector to be connected to the AS-Interface TCSATV01N2 tap-off.

Description	**References**
AS-Interface / TeSys U branch cable, L = 2 m	**XZCG0142**
AS-Interface Tap-off	**TCSATV01N2**
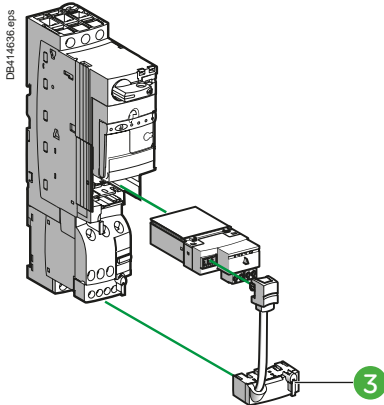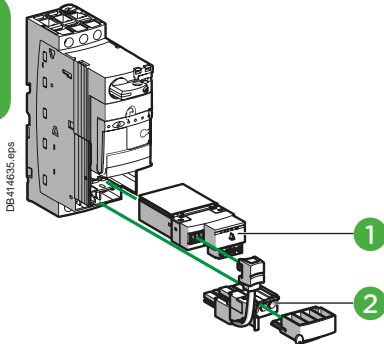
Life Is On   Schneider Electric
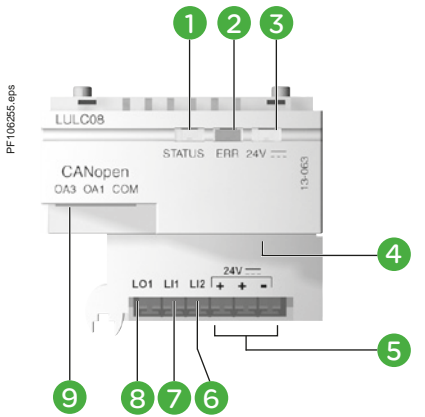
1 LED indicating module status
2 Fault signalling LED
3 LED indicating ⎓ 24 V supply ON for outputs
   OA1, OA3 and LO1
4 SUB-D connector for bus link
5 ⎓ 24 V supply connection
6 Discrete input
7 Discrete input
8 Discrete output
9 Outputs for starter commands
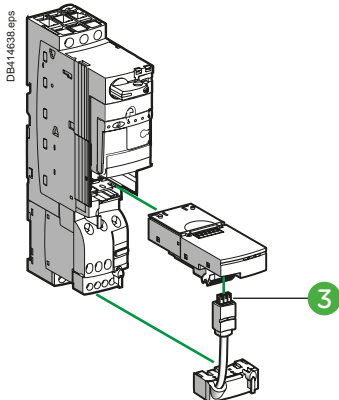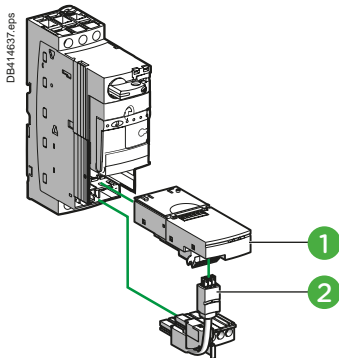
The LUL C08 communication module, combined with the power base and control unit is used to control TeSys U starters-controllers via CANopen bus.
The LULC08 communication module is slave type.

Module Specifications

I/O terminal block

■ Powered by external 24 V DC (power supply not included):
□ 2 x configurable inputs for binary sensors
□ 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

■ For TeSys U 24 V DC coil (common, direction 1, direction 2).
■ For CANopen bus.

Signaling

■ Module Status - Error - 24 V, by LED.

Tesys components		
Description	**Item**	**References**
CANopen communication module	1	**LULC08**
Pre-wired connector: coil - LUB powerbase	2	**LU9BN11L**
Pre-wired connector: coil - LUB2B powerbase	3	**LU9MRL**

Compatibility of CANopen communication module with control units	
LUCA ●●BL / B ●●BL / C ●●BL / D ●●BL	All versions marketed after **2T0481** [1]
LUC M●●BL	All versions ⩾ V3.2
LUC MT1BL	All versions ⩾ V3.2

(1) This "date code" is made up as follows:
  2T or 2C: factory code.
  04, 05, 06 and so on: year of manufacture.
  08: week.
  1: 1st day of the week.

How to get information on the design of a CANopen architecture and the choice of network accessories

Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

Bus-type cabling systems
TeSys U components for Modbus bus

LUL C031
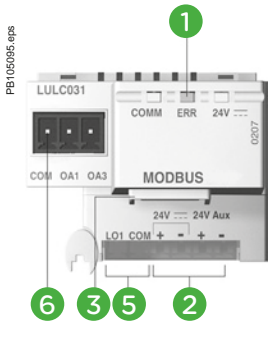
LUL C033
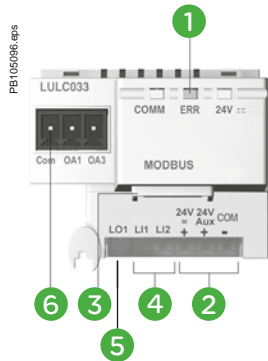
1. Module status signalling LED
2. 24 V supply connection
3. RJ45 connector for RS485 Modbus link
4. 2 discrete inputs
5. 1 discrete output
6. Outputs for starter commands

The LULC031 and LULC032 communication modules, combined with the power base and control unit is used to control TeSys U starters-controllers via Modbus.

Module Specifications

I/O terminal block

■ Powered by external 24 V DC (power supply not included):
  □ 2 x configurable inputs for binary sensors (on LULC033 only)
  □ 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

■ For TeSys U 24 V DC coil (common, direction 1, direction 2).
■ RJ45, For Modbus line.

Signaling

■ Module Status - Error - 24 V, by LED.
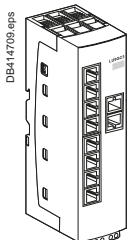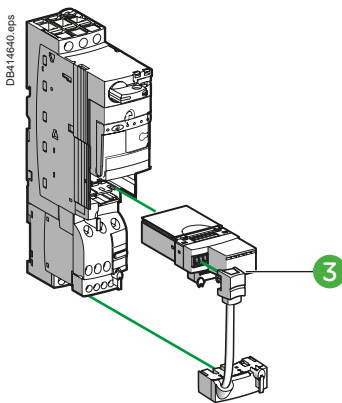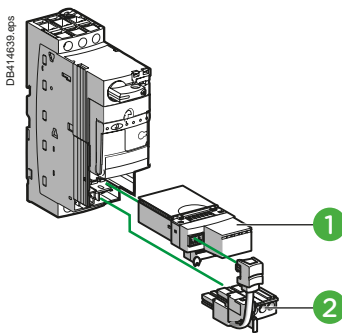
Tesys components			
Description	**Item**	**Bin. input**	**References**
Modbus communication module	1	0	**LULC031**
		2	**LULC033**
Pre-wired connector: coil - LUB powerbase	2	-	**LU9BN11C**
Pre-wired connector: coil - LUB2B powerbase	3	-	**LU9MRC**

Modbus hub		
Description	**Length (m)**	**References**
Modbus communication distributor	-	**LU9GC3**
Cables fitted with 2 x RJ45 connectors	0.3	**VW3A8306R03**
	1	**VW3A8306R10**
	3	**VW3A8306R30**
Tees derivations	0.3	**VW3A8306TF03**
	1	**VW3A8306TF10**
Description		**References**
RS 485 line terminator		**VW3A8306R**

Compatibility of Modbus communication modules				
Communication modules (software version)		**LUCL C031 from V2.3**	**LUCL C033 from V2.1**	**LUCL C033 from V2.2**
Power base	LUB ●● / LU2B ●2	■	■	■
	LUTM ●●BL		■	■
Control unit	LUCA ●●BL	■		■
	LUCB ●●BL LUCC ●●BL LUCD ●●BL	■		■
	LUCM ●●BL	■		■ [1]
	LUCBT ●●BL LUCDT ●●BL		■	
	LUCMT ●●BL		■	

(1) Except LUCM ●●BL V1.04 and V1.06.

How to get information on the design of a Modbus architecture and the choice of network accessories

Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

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TeSys U
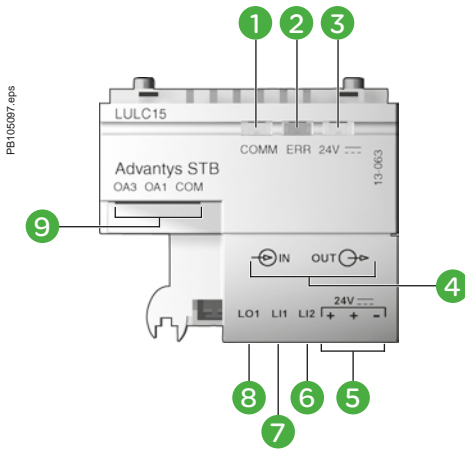
1. Two-colour LED indicating module status
2. Fault signalling LED
3. LED indicating that ⎓ 24 V supply is ON
4. Bus connectors
5. ⎓ 24 V supply connection
6. Discrete input
7. Discrete input
8. Discrete output
9. Outputs for starter commands

Communication module LUL C15 allows direct connection of TeSys U starter-controllers and controllers on an Advantys STB island, between two segments or at the end of a segment. The starter-controller will then be able to make use of the services provided by Advantys STB: self-addressing, autobaud, fallback positions.

Module Specifications

I/O terminal block
■ Powered by external 24 V DC (power supply not included):
□ 2 x configurable inputs for binary sensors (on LULC033 only)
□ 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors
■ For TeSys U 24 V DC coil (common, direction 1, direction 2).
■ For Advantys STB bus.

Signaling
■ Com - Error - 24 V, by LED.

LUB + LUL C15 + LU9B N11L
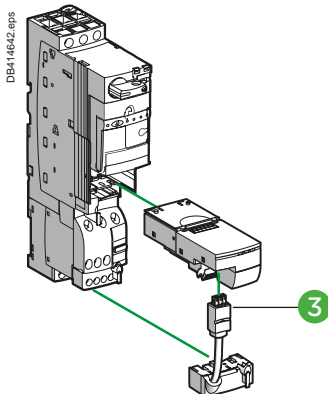
LU2B + LUL C15 + LU9M RL

Tesys components

Description	Item	References
Advantys STB communication module	1	**LULC15**
Pre-wired connector: coil - LUB powerbase	2	**LU9BN11L**
Pre-wired connector: coil - LUB2B powerbase	3	**LU9MRL**

Cables

Description	Length (m)	References
Cables fitted with connectors, one straight and one elbowed	0.3	**LU9RCD03**
	1	**LU9RCD10**
	3	**LU9RCD30**
	5	**LU9RCD50**
Cables fitted with two straight connectors	0.3	**LU9RDD03**
	1	**LU9RDD10**
	3	**LU9RDD30**

Compatibility of Advantys STB communication module with control units

LUCA ●●BL / B ●●BL / C ●●BL / D ●●BL	All versions marketed after **2T0481** [1]
LUCM ●●BL	All versions ≥ V3.2
LUCM T1BL	All versions ≥ V3.2

(1) This "date code" is made up as follows:
  2T or 2C: factory code.
  04, 05, 06 and so on: year of manufacture.
  08: week.
  1: 1st day of the week.

How to get information on the design of a Advantys STB architecture and the choice of network accessories

Consulter la librairie des documents téléchargeables sur le site schneider-electric.com en faisant une recherche sur le nom du protocole de transmission.

TeSys U

Bus-type cabling systems
TeSys U components for Profidus DP bus
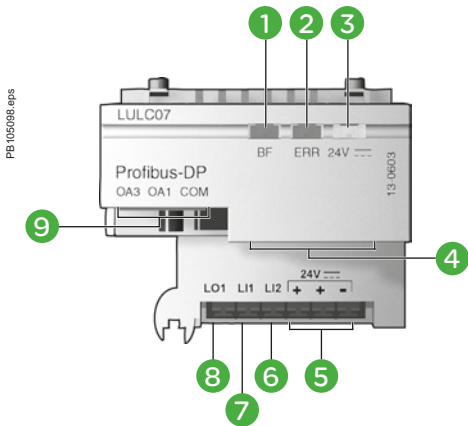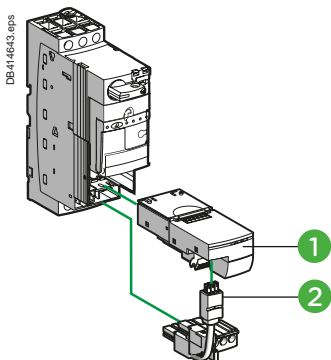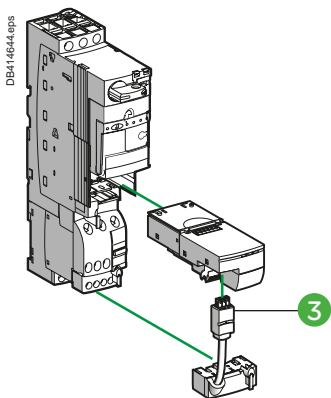
When used in conjunction with the power base and control unit, communication module LULC07 allows TeSys U starter-controllers to be controlled via Profibus DP (Deported Periphery) bus.
Communication module LULC07 is of the slave type.

Module Specifications

I/O terminal block

■ Powered by external 24 V DC (power supply not included):
□ 2 x configurable inputs for binary sensors
□ 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

■ For TeSys U 24 V DC coil (common, direction 1, direction 2).
■ For Profibus DP bus.

Signaling

■ Com - Error - 24 V, by LED.

1 Two-colour LED indicating module status
2 Fault signalling LED
3 LED indicating 24 V supply ON for outputs OA1, OA3 and LO1
4 SUB-D connector for bus link
5 24 V supply connection
6 Discrete input
7 Discrete input
8 Discrete output
9 Outputs for starter-controller commands (non-reversing and reversing)

LUB + LUC ●●●BL + LUL C07 + LU9B N11L

LU2B + LUC ●●●BL + LUL C07 + LU9 MRL

Tesys components		
Description	**Item**	**References**
Profibus DP communication module	1	**LULC07**
Pre-wired connector: coil - LUB powerbase	2	**LU9BN11L**
Pre-wired connector: coil - LUB2B powerbase	3	**LU9MRL**

Components for connection to the bus and to the installation

The 24 V DC -Aux supply to Profibus DP modules LUL C07 must pass through power supply module LU9 GC7.
LUL C07 modules must be connected to the LU9 GC7 splitter box in order to be powered.
The number of TeSys U starter-controllers that can be powered by an LU9 GC7 module is limited by the maximum current (1.5 A) which it can deliver.
The 24 V supply for the inputs/outputs must be provided separately..

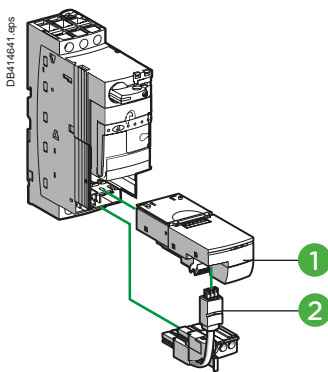| Description	Length (m)	References
Profibus DP power supply module	-	**LU9GC7**
Profibus DP connector	-	**LU9AD7**
Profibus DP cables 2-wire	100	**TSXPBSCA100**
	400	**TSXPBSCA400**
Profibus DP cables 4-wire	10	**LU9RPB010**
	100	**LU9RPB100**
	400	**LU9RPB400**

How to get information on the design of a Profibus DP architecture and the choice of network accessories

Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

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References
Bus-type cabling systems
TeSys U components for DeviceNet bus

When used in conjunction with the power base and control unit, communication module LULC09 allows TeSys U starter-controllers to be controlled via DeviceNet bus. Communication module LUL C09 is of the slave type.

Module Specifications

I/O terminal block

■ Powered by external 24 V DC (power supply not included):
□ 2 x configurable inputs for binary sensors
□ 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

■ For TeSys U 24 V DC coil (common, direction 1, direction 2).
■ For DeviceNet bus.

Signaling

■ Com - Error - 24 V , by LED.

1 LED indicating module status
2 Fault signalling LED
3 LED indicating --- 24 V supply ON for outputs OA1, OA3 and LO1 and 24 V bus
4 DeviceNet connector for bus link
5 --- 24 V supply connection
6 Discrete input
7 Discrete input
8 Discrete output
9 Outputs for starter-controller commands (non-reversing and reversing)

LUB + LUC ●●●BL + LUL C07 + LU9B N11L

LU2B + LUC ●●●BL + LUL C07 + LU9 MRL

Tesys components		
Description	Item	References
DeviceNet communication module	1	LULC09
Pre-wired connector: coil - LUB powerbase	2	LU9BN11L
Pre-wired connector: coil - LUB2B powerbase	3	LU9MRL

How to get information on the design of a DeviceNet architecture and the choice of network accessories

Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

Presentation

Communication gateways LUF P allow connection between the Modbus serial link and Fipio, Profibus DP or DeviceNet field buses.

After configuration, these gateways manage information which can be accessed by the Modbus serial link 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 serial link.

Example of architecture

Fipio
Profibus DP
DeviceNet

Configuration of gateway by PC

LUF P

TeSys U starter-controllers

Modbus

ATS 48   ATV 312
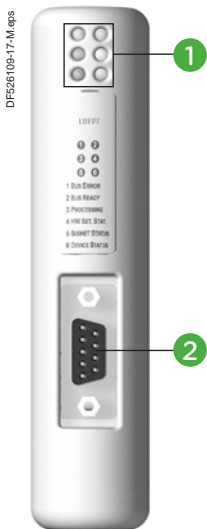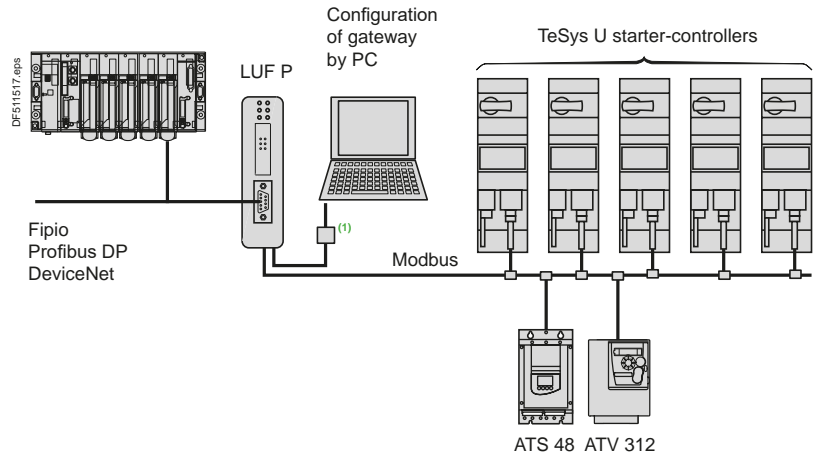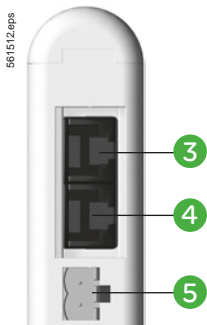
Communication gateway LUFP

Description	Reference
Fipio / Modbus gateway	**LUFP1**
Profidus DP / Modbus gateway	**LUFP7**
DeviceNet / Modbus gateway	**LUFP9**

Description

Front panel of the product

1 LED indicating :
- communication status of the Modbus serial links,
- 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 of the Modbus serial link
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 TeSys U user's manual.

(1) Connection kit for PowerSuite software workshop.

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DB414652.eps

PB113846.eps

LUA LF1

DB414653.eps

LUA LB1

LA9LB920

DB414654.eps
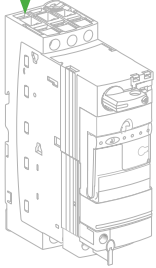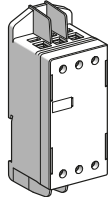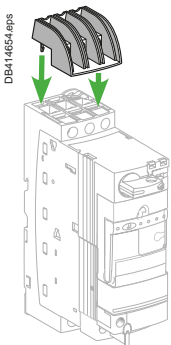
LU9SP0

PB113928.eps

LU9ET1S

Short-circuit current limiter block

To be connected in series and upstream of a TeSys U starter-controller . It increases its ability to withstand the short circuit current from 50 kA to 100 or 130 kA under 400 V.

Principle: under the action of a short-circuit, the opening of two contacts of each phase of the limiter creates a resistive arc. The current then decreases to a value tolerable by a TeSys U power base.

Limiter blocks and accessories

Description	Breaking capacity Iq (kA)		Mounting	Unit reference
	≤ 440 V	690 V		
Limiter-disconnector (1 x LUAFL1 cartridge supplied)	130	70	Direct on power base	**LUALB1** [1]
Limiter	100	35	Separate	**LA9LB920** [2]
limiter cartridge for LUALB1	130	70	Limiter-disconnector	**LUALF1**

(1) Must be connected to one power base only.
(2) Can be connected to multiple TeSys U power bases in parallel with limitation :
■ *Total Ith max 63 A*
■ *Total nominal current 32 A from motor with simultaneous start (LA9LB920 could not withstand higher inrush peak current)*

Phase barrier

Ensures a complementary electrical insulation between phases.
690 V AC network: compulsory.
440 V AC network: compulsory when assembling a UL508 type E compliant motor starter (Self Protected Starter).

Description	Use	Mounting	Reference
Phase separator	LUB or LU2B 12 or 120 LUB or LUB2B 32 or 320 LUA LB1	Live terminals L1, L2, L3	**LU9SP0**

Clip-in labels

Can be clipped on any TeSys U power base, on LU6M B0●● inverser block, and Linergy HK busbar system.

Marking accessory

Description	Sold by lot of	Reference per unit
Clip-in label 8 x 18 mm	100	**LAD90**

Safety-chain identification - Red label

The red sticker is dedicated to TeSys U LUCA, LUCB, LUCC, LUCD and LUCL control units.

Description	Reference per unit
Retrofit safety-chain identification sticker	**LU9ET1S**

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TeSys U

LU9APN21 mounting kit

GVA PA1 long shaft

GVA PK12 shaft support plate for deep enclosure

GVAPP1 spacer base (retrofit accessory)

GVA PR54 red handle, IP 54

GVAPL01 "Laser square" plotting tool
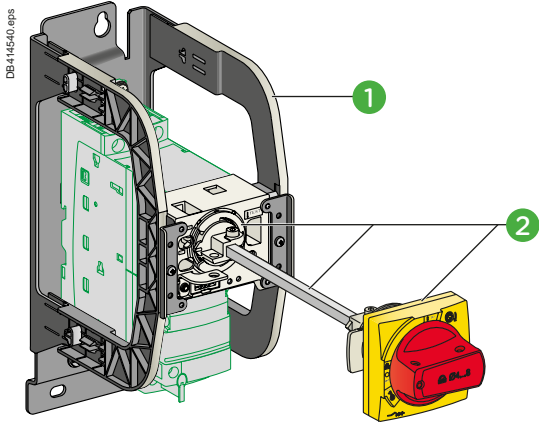
Extended rotary handle

Allows a circuit breaker or a TeSys U starter-controller installed in back of an enclosure to be operated from the front panel.

The rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (OFF) or | (ON) position (depending on the type of rotary handle) by means of up to 3 padlocks with a shank diameter of 4 to 8 mm.

The extension shaft must be adjusted to the depth of the enclosure.

The IP54 rotary handle is fixed with a nut (Ø22) to make it easier to assemble.

Mounting kit

❶ TeSys U Power base bracket; its horseshoe shaped sides hold the rotary mechanism facing the original handle.
❷ Mechanism, shaft and handle; the shaft enters the handle attached to the door during closing.

Long shaft

■ to be cut to the required length. Equipped with a connection endpiece.

Shaft support plate for deep enclosure

■ Provides horizontal guiding of the shaft, when the door is open.

Spacer base (retrofit accessory)

■ Fixed on a side of the box, for heightening an GVA P●●● handle.

Handle

■ Delivered as a single unit, to be fitted on a side of the enclosure.
Note: references below are suitable for TeSys U power bases after 2004.

"Laser Square" Tool

■ On the principle of an angle extended with a laser beam, the "Laser Square" facilitates tracing the piercing marks on the door or the sides of an enclosure.

"Safety" stickers

■ Marking: Electrical hazard, etc.

Description		Tripping indication	Reference
Mounting kit	Black handle, with error status, IP54	●	**LU9APN21**
	Red handle, with error status, IP54	●	**LU9APN22**
	Red handle, without error status, IP65	-	**LU9APN24**
Separate elements	Long shaft = 315 mm	-	**GVAPA1**
	Shaft (≥ 300 mm) support plate for deep enclosure	-	**GVAPK12**
	Spacer base	-	**GVAPP1**
	Black handle, IP54	●	**GVAPB54**
	Red handle, IP54	●	**GVAPR54**
	Black handle, IP65		**GVAPB65**
	Red handle, IP65		**GVAPR65**
Tool	"Laser square" plotting tool		**GVAPL01**
"Safety" stickers	French (x10)		**GVAPSFR**
	English (x10)		**GVAPSEN**
	German (x10)		**GVAPSDE**
	Spanish (x10)		**GVAPSES**
	Chinese (x10)		**GVAPSCN**
	Portuguese (x10)		**GVAPSPT**
	Russian (x10)		**GVAPSRU**
	Italian (x10)		**GVAPSIT**
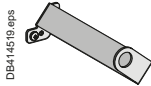
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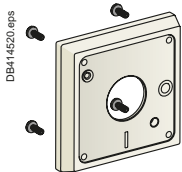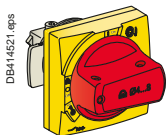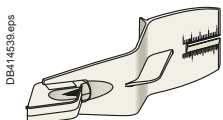
MCC drawers (Motor Control Center)

The drawers are composed of:
- a fixed part, in the frame of the panel,
- a fully withdrawable part, integrating the protection, control and automation components.

With a height of 3/4/6/8/12/18/24/36 modules, they allow the assembling of motor protection/control feeders:
- Direct, one direction of rotation
- Direct, 2 directions of rotation
- Star-delta
- Dahlander (2 speeds)
- 2-speed, separate winding
- Motor drives from 0 to 500 kW
- Soft starters of 0 to 75 kW.
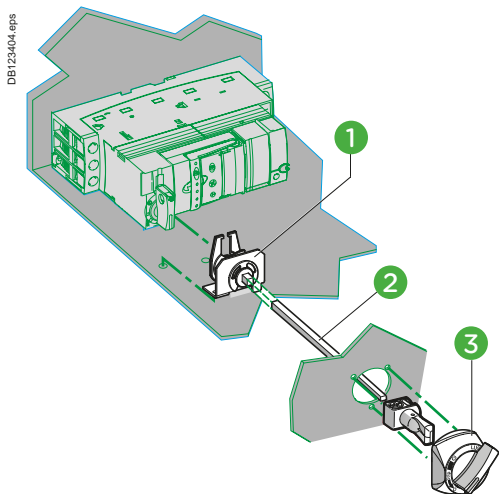
Mounting kit and handle for MCC drawer

Together, this provides manual control of a TeSys U starter-controller from the front face of the drawer.
As the clamping part on top of TeSys U control pad is open, the kit may be used on TeSys U power bases before 2005.

Mounting kit + small handle		
Description	**Item**	**Reference**
Handle with mounting kit for MCC drawer	❶ + ❷ + ❸	**LU9AP20**

TeSys U

Technical Data for Designers

A4/37

Contents

TeSys motor starters open version
TeSys U starter-controllers

Environment			
Product certifications			UL, CSA, CCC, GOST, ASEFA.
			ABS, BV, DNV, GL, LROS.
			ATEX.
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
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 starter-controller LUB32, 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 and 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 [2]
Resistance 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		Common mode	Serial mode
	Uc ∿ 24…240 V, Uc ⎓ 48…220 V	kV	2	1
	Uc = 24 V ⎓		Not applicable	
Immunity to conducted high-frequency disturbance	Conforming to IEC/EN 61000-4-6	V	10
Radiated emission and conducted	Conforming to CISPR 11 and EN 55011		Class A

(1) Without modifying the contact states, in the most unfavourable direction.
(2) 2 gn with Advantys STB or CANopen communication modules.

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TeSys motor starters open version

TeSys U starter-controllers
Power bases and control units

Power circuit connection characteristics

Connection to Ø4 mm screw clamp terminals

Power base, control unit or reverser block 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	LU2B LU2M LU6M
Flexible cable without cable end	1 conductor	mm²	2.5…10	2.5…10	2.5…10	2.5…10	2.5…10
	2 conductors	mm²	1.5…6	1.5…6	1.5…6	1.5…6	1.5…6
Flexible cable with cable end	1 conductor	mm²	1…6	1…6	1…6	1…6	1…6
	2 conductors	mm²	1…6	1…6	1…6	1…6	1…6
Solid cable without cable end	1 conductor	mm²	1…10	1…10	1…10	1…10	1…10
	2 conductors	mm²	1…6	1…6	1…6	1…6	1…6
Screwdriver			Philips n° 2 or flat screwdriver: Ø6 mm				
Tightening torque		N.m	1.9…2.5	1.9…2.5	1.9…2.5	1.9…2.5	1.9…2.5

Control circuit connection characteristics

Connection to Ø3 mm screw clamp terminals

Flexible cable without cable end	1 conductor	mm²	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
	2 conductors	mm²	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	mm²	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5
	2 conductors	mm²	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	mm²	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
	2 conductors	mm²	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: Ø5 mm				
Tightening torque		N.m	0.8…1.2	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	⎓ 24 V [1]	V	20…27	20…27	20…28	20…28	–
Operation	∼ 24 V	V	20…26.5	20…26.5	–	–	–
	∼ 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	–	–	–
Drop-out	⎓ 24 V	V	14.5	14.5	14.5	14.5	–
	∼ 24 V	V	14.5	14.5	–	–	–
	∼ or ⎓ 48…72 V	V	29	29	–	–	–
	∼ 110…240 V, ⎓ 110…220 V	V	55	55	–	–	–
Typical consumption	⎓ 24 V	mA	130	220	150	200	120
I max while closing	∼ 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 dips	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 conforming to IEC/EN 60947-1	Possible		Yes	Yes	Yes	Yes	–
	Padlocking		1 padlock with Ø6.9 mm shank				–
Rated thermal current		A	12	32	12	32	–
Rated operational current (Ue ≤ 440V)	To IEC/EN 60947-6-2 Category AC-41		θ ≤ 70°C: 12 A	θ ≤ 70°C: 32 A	θ ≤ 55°C: 12 A	θ ≤ 55°C: 32 A	–
	Category AC-43		θ ≤ 70°C: 12 A	θ ≤ 70°C: 32 A	θ ≤ 55°C: 12 A	θ ≤ 55°C: 32 A	–
Rated operational voltage		V	690 [3]	690 [3]	690 [3]	690 [3]	–
Frequency limits	Of the operating current	Hz	40…60	40…60	40…60	40…60	–
Power dissipated in the power circuits	Operational 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 limit	With Isc max on 440 V	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.

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TeSys U starter-controllers
Reversing power bases and auxiliary contacts

TeSys U

Specific characteristics of power bases LU2B and reverser blocks LU2M or LU6M				
Duration of inrush phase		$\sim$ 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 (Ith)	For ambient temperature θ < 70 °C		A	5
Frequency of the operational current			Hz	Up to 400
Minimum switching capacity λ = 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			mΩ	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 IEC/EN 60947-1		The N/C contact fitted in each power base reliably represents the state of the power contacts (safety scheme)
Rated operational voltage (Ue)		V	Up to $\sim$ 690; $---$ 250
Rated insulation voltage (Ui)	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 operational voltage (Ue)		V	Up to $\sim$ 250; $---$ 250
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-5-1	V	250
	Conforming to UL, CSA	V	250

Rated 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 φ 0.7) = 10 times the power broken (cos φ = 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
1 million operating cycles	W	120	90	75	68
3 million operating cycles	W	70	50	38	33
10 million operating cycles	W	25	18	14	12

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Control units
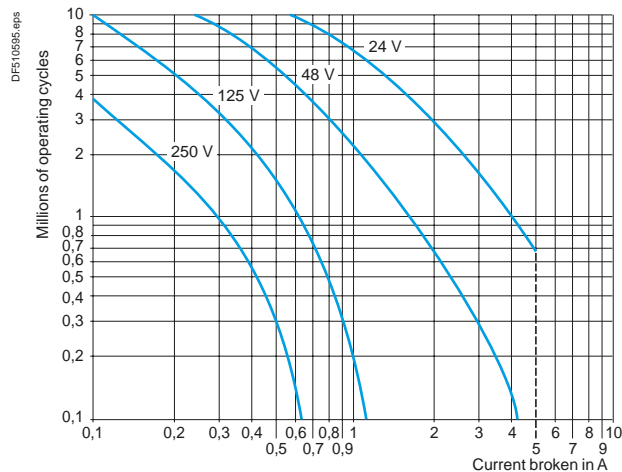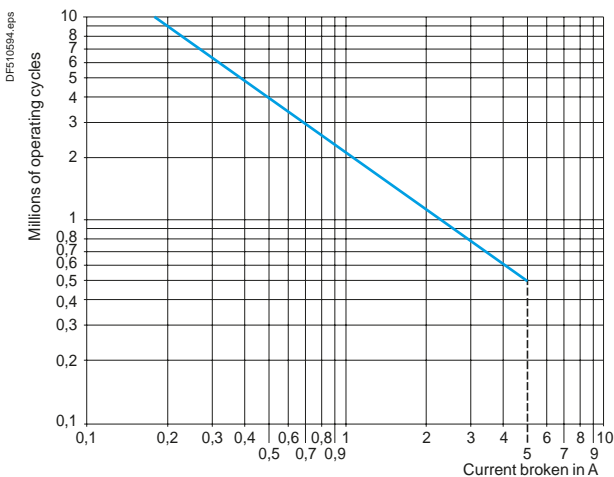
Characteristics of standard control units LUCA

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 operational current	**Hz**	40…60
	Temperature compensation	**°C**	- 25…+ 70
	Protection against phase imbalance		Yes
Short-circuit protection	Tripping threshold		13 x Ir max (max current setting)
	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 operational current	**Hz**	40…60	40…60	40…60
	Temperature compensation	**°C**	-25…+70	-25…+55	-25…+70
	Protection against phase imbalance		Yes	–	Yes
Short-circuit protection	Tripping threshold		13 x Ir max.	13 x Ir max.	13 x Ir max.
	Tripping tolerance		±20 %	±20 %	±20 %

Characteristics of multifunction control units LUCM

Protection	Motor type		Parameters can be set: 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 operational current	**Hz**	50…60
	Temperature compensation	**°C**	-25…+55
Communication interface for terminal on enclosure door	Physical interface		RS 485 multi-drop
	Connections		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)
	Precision		±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	0.5…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 time	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.

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TeSys motor starters - open version

TeSys U starter-controllers
Limiter-disconnector, current limiter, thermal overload alarm function module
and thermal overload fault signalling modules

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
Cabling			
Solid cable	1 conductor	**mm²**	1.5…10
	2 conductors	**mm²**	1.5...6
Flexible cable without cable end	1 conductor	**mm²**	1…10
	2 conductors	**mm²**	1…6
Flexible cable with cable end	1 conductor	**mm²**	1...6
	2 conductors	**mm²**	1...6
Screwdriver			Phillips n°2 or flat screwdriver Ø6 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
Cabling			
Solid cable	1 conductor	**mm²**	1.5…25
	2 conductors	**mm²**	1.5...10
Flexible cable without cable end	1 conductor	**mm²**	1.5…25
	2 conductors	**mm²**	2.5…10
Flexible cable with cable end	1 conductor	**mm²**	1.5…16
	2 conductors	**mm²**	1.5…4
Screwdriver			Phillips n°2 or flat screwdriver Ø6 mm
Tightening torque		**N.m**	2.2

Characteristics of thermal overload alarm function modules LUF W10

Activation threshold			Fixed at 88 % of the thermal tripping state
Hysteresis between activation and switching off			5 %
Display			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 θ < 70 °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**	$\sim$/$\overline{}$ 24… 240		
Module consumption		**mA**	7 at $\overline{}$ 24 1.1 at $\sim$ 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 θ < 70 °C	**A**	2		
Short-circuit protection	Conforming to IEC/EN 60947-5-1	**A**	gG fuse: 2		
Reset input	Conductor c.s.a.	**mm²**	0.2 min		
	Length	**m**	500 (R = 50 Ω , L = 52.8 mH, Cp = 93 pF)		

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TeSys U starter-controllers
Function modules and communication modules

Characteristics of motor load indication function module LUF V2

Analogue output			4 - 20 mA
Signal delivered			Value of I average/Ir ratio within the range of 0 to 2 for LUCB and LUCD
			Value of I average/Ir 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 Ir
Supply			External $\overline{---}$ 24 V

Characteristics of AS-Interface communication modules ASILUF C5 and ASILUF C51

Module type			ASILUF C5	ASILUF C51
Product certification			AS-Interface V2.1 n° 52901	AS-Interface V2.1 n° 52303
AS-Interface profile			7.D.F.0	7.A.7.E
Ambient air temperature		**°C**	Operation -25…+70	
Cycle time		**ms**	5	10
Addressing			31 slaves	62 slaves
AS-Interface supply		**V**	29.5...31.5	
Current consumption	On the AS-Interface bus	**mA**	Normal operation: 25	
		mA	Fault condition: 30	
	On 24 V supply for the outputs	**mA**	200	
Auxiliary supply		**V**	$\overline{---}$ 24 ±30 %	
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 module LUL C03●

Module type			LUL C031	LUL C033
Physical interface			RS 485 multi-drop	
Connections			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	
Discrete inputs	Number		–	2 (to be assigned according to the configuration)
	Supply	**V**	–	$\overline{---}$ 24
	Input current	**mA**	–	7
	Nominal input values	Voltage	**V**	$\overline{---}$ 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**	$\overline{---}$ 24	
	Max. current	**mA**	500	
	Protection	gI fuse	**A**	1
	Switching capacity		0.5 A/24 V	
Indication/diagnostics			By 3 LEDs on front panel	

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TeSys U starter-controllers
Function modules and communication modules

TeSys U

Characteristics of CANopen, Profibus DP and DeviceNet communication modules

Communication module			Profibus DP LUL C07	CANopen LUL C08	DeviceNet LUL C09
Services	Conformity class		NA	S 20 (Schneider Electric)	NA
	Standard		Profibus DP	CIADS-301 V4.02 DR 303-2	IEC 62026-1, overvoltage category III, degree of pollution: 3
	Profile		LVSG V1.0 MS (Motor Starter) and MMS (Motor Management Starter)	–	ODVA (Open DeviceNet Vendor Association) MS (Motor Starter)
	Protocol		Profibus DP	CAN 2.0A (2B passive)	CAN 2.0A (2B passive)
	Address		1…125	0…127 (by switches)	0…63
Structure	Physical interface		9-way SUB-D male	9-way SUB-D female	"Open Style" connector
	Binary rate		9600 Kbits/s…12 Mbits/s	10, 20, 50, 125, 250, 500 and 1000 Kbits/s (by switches)	125…500 kbaud
	Cables		2 shielded twisted pairs		
Supply for the discrete outputs and control	⎓ 24 V	V	20…28		
	Current consumption	A	1.5 (max)		
	Protection by gl fuse	A	2		
Ambient air temperature		°C	Operation -25…+55		
Logic inputs	Number		2 (to be assigned according to the configuration)		
	Supply	V	⎓ 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		
Discrete outputs	Number		3, of which 2 dedicated to starter-controller coil operation		
	Max. current	mA	500		
	Short-circuit protection		Yes		
	Switching capacity		0.5 A / ⎓ 24 V		
Indication/diagnostics			By 3 LEDs on front panel		

Characteristics of Advantys STB communication module LUL C15

Physical interface			CAN	
Connections			Fire Wire	
Protocol			CAN 2.0 and CAN 2.B (passive mode)	
Transmission speed		kbit/s	800	
Addressing			Self-addressing	
Supply for the discrete outputs and control	⎓ 24 V	V	20…28	
	Current consumption	A	1.5 (max)	
	Protection by gl fuse	A	2	
Ambient air temperature		°C	Operation -25…+55	
Discrete inputs	Number		2 (to be assigned according to configuration)	
	Supply	V	⎓ 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	
Discrete outputs	Number		3, of which 2 dedicated to starter-controller coil operation	
	Max. current	mA	500	
	Short-circuit protection		Yes	
	Switching capacity		0.5 A / ⎓ 24 V	
Indication/diagnostics			By 3 LEDs on front panel	

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# TeSys motor starters open version

TeSys U starter-controllers
Function modules and communication modules

Connection characteristics

Module type			LUF W10, LUF DH11, LUF DA01 and LUF DA10	LUF V2	ASILUF C5 and ASILUF C51	
					Inputs and 24 V auxiliary supply	Outputs
Connectors	Pitch		5.08	3.81	5.08	3.81
Flexible cable without cable end	1 conductor	mm²	0.2…1.5	0.14…1	0.2…1.5	0.14…1
	2 identical conductors	mm²	0.2…1	0.14…0.75	0.2…1	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
	Without insulated ferrule — 2 identical conductors	mm²	0.25…1	0.25…0.34	0.25…1	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
	With insulated ferrule — 2 identical conductors (Use a double cable end)	mm²	0.5…1	0.5	0.5…1	0.5
Solid cable without cable end	1 conductor	mm²	0.2…1.5	0.14…1	0.2…1.5	0.14…1
	2 identical conductors	mm²	0.2…1	0.14…0.5	0.2…1	0.14…0.5
Conductor size	1 conductor		AWG 24… AWG 16	AWG 26… AWG 16	AWG 24… AWG 16	AWG 26… AWG 16
Tightening torque		N.m	0.5…0.6	0.20…0.25	0.5…0.6	0.20…0.25
Flat screwdriver		mm	3.5	2.5	3.5	2.5

Module type			LUL C031, LUL C033, LUL C08 and LUL C15	LUFC 00	LUL C09	
					Inputs and 24 V auxiliary supply	Connection on the bus
Connectors	Pitch		3.81	3.81	3.81	5 (Open Style) DeviceNet
Flexible cable without cable end	1 conductor	mm²	0.14…1	0.14…1	0.14…1	0.2…2.5
	2 identical conductors	mm²	0.14…0.75	0.14…0.75	0.14…0.75	0.5…1.5
Flexible cable with cable end	Without insulated ferrule — 1 conductor	mm²	0.25…1	0.25…1	0.25…1	0.25…2.5
	Without insulated ferrule — 2 identical conductors	mm²	0.25…0.34	0.25…0.34	0.25…0.34	0.25…1
	With insulated ferrule — 1 conductor	mm²	0.25…0.5	0.25…0.5	0.25…0.5	0.25…2.5
	With insulated ferrule — 2 identical conductors (Use a double cable end)	mm²	0.5	0.5	0.75	0.5…1.5
Solid cable without cable end	1 conductor	mm²	0.14…1	0.14…1	0.14…1	0.2…2.5
	2 identical conductors	mm²	0.14…0.5	0.14…0.5	0.14…0.5	0.14…0.5
Conductor size	1 conductor		AWG 26… AWG 16	AWG 26… AWG 16	AWG 26… AWG 16	AWG 24… AWG 16
Tightening torque		N.m	0.20…0.25	0.20…0.25	0.20…0.25	0.5…0.6
Flat screwdriver		mm	2.5	2.5	2.5	3.5

TeSys U

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A4/45

TeSys U

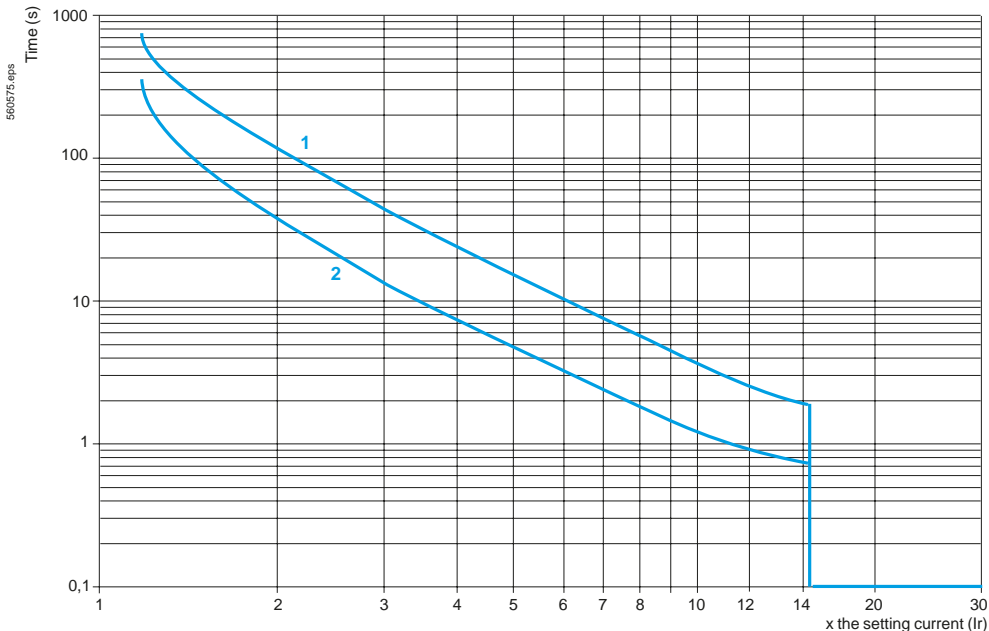**Tripping curves for control units LUCA, LUCB, LUCD**

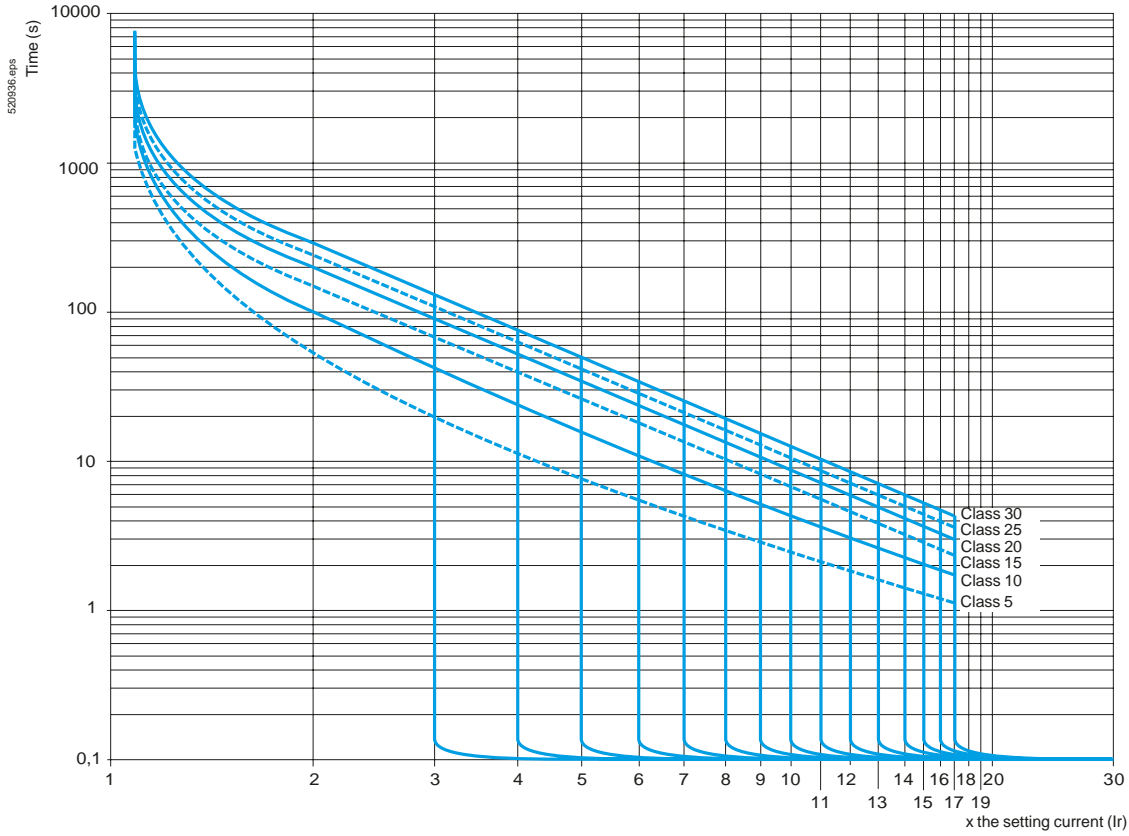Average operating times at 20 °C according to multiples of the setting current, tolerance : ± 20 %.
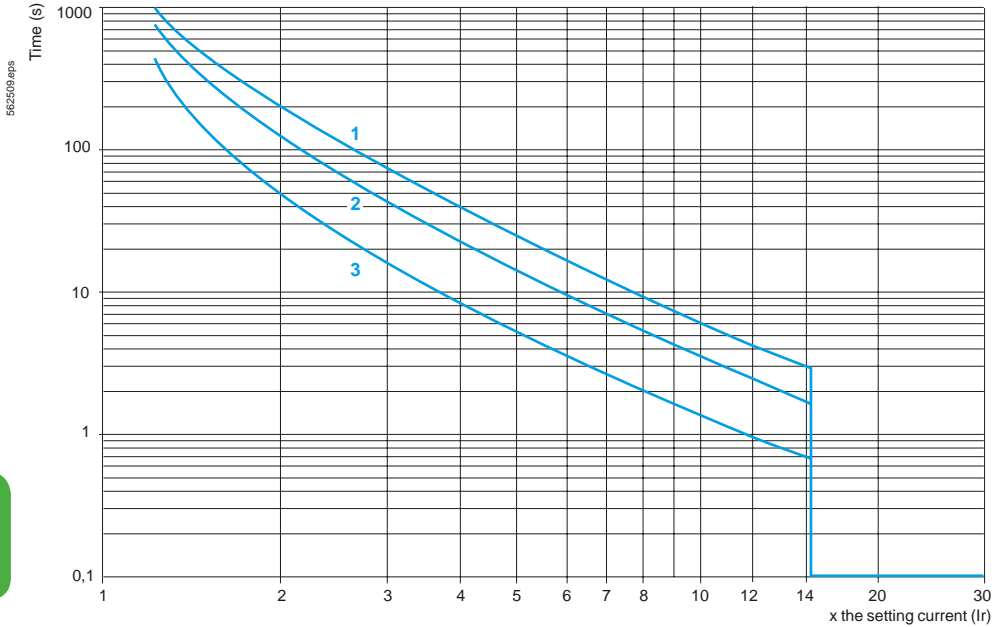
1 LUCD, 3 poles from cold state, class 20.
2 LUCA, LUCB, 3 poles from cold state, class 10.
3 LUCA, LUCB, LUCD, 3 poles from hot state.

Tripping curves for control units LUCC

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

Class 30
Class 25
Class 20
Class 15
Class 10
Class 5

x the setting current (Ir)

Tripping curves for control units LUCM

Hot state curves

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

Class 30
Class 25
Class 20
Class 15
Class 10
Class 5

x the setting current (Ir)

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Curves - TeSys U
TeSys motor starters - open version
TeSys U starter-controllers
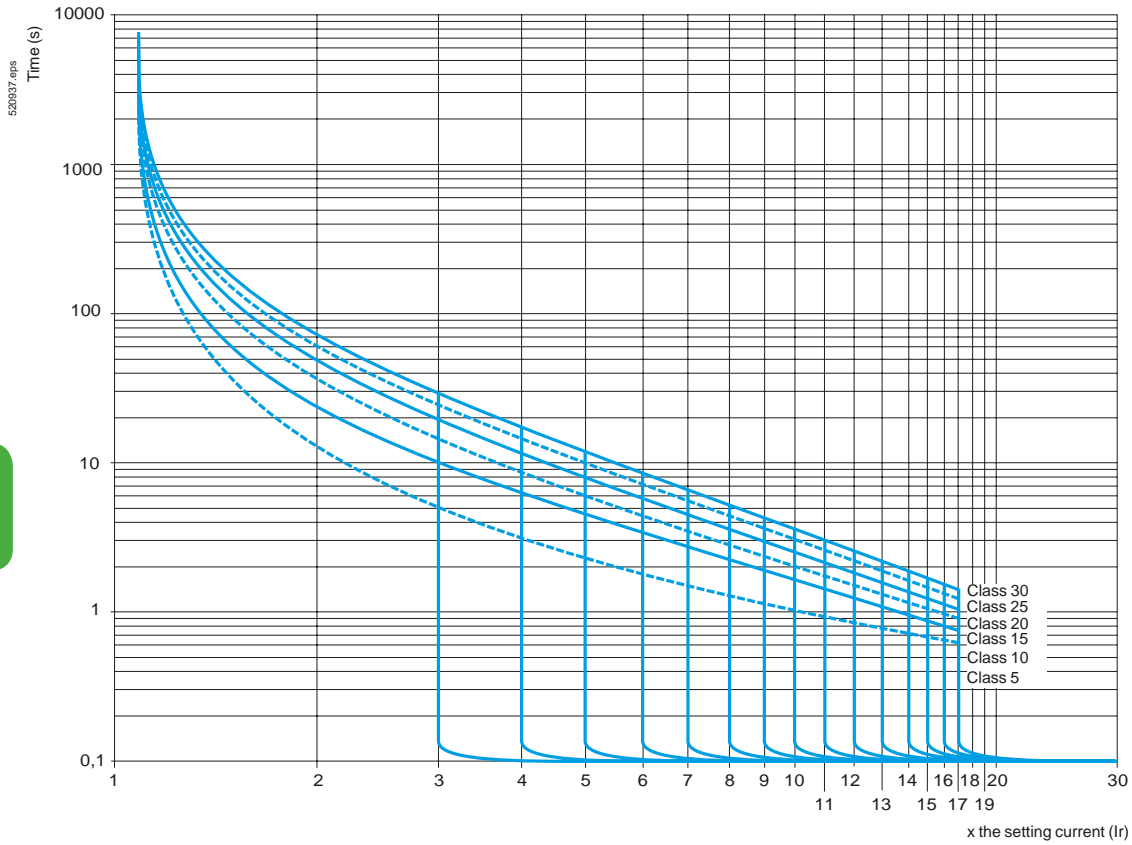
Current limitation on short-circuit

U_e = 460 V
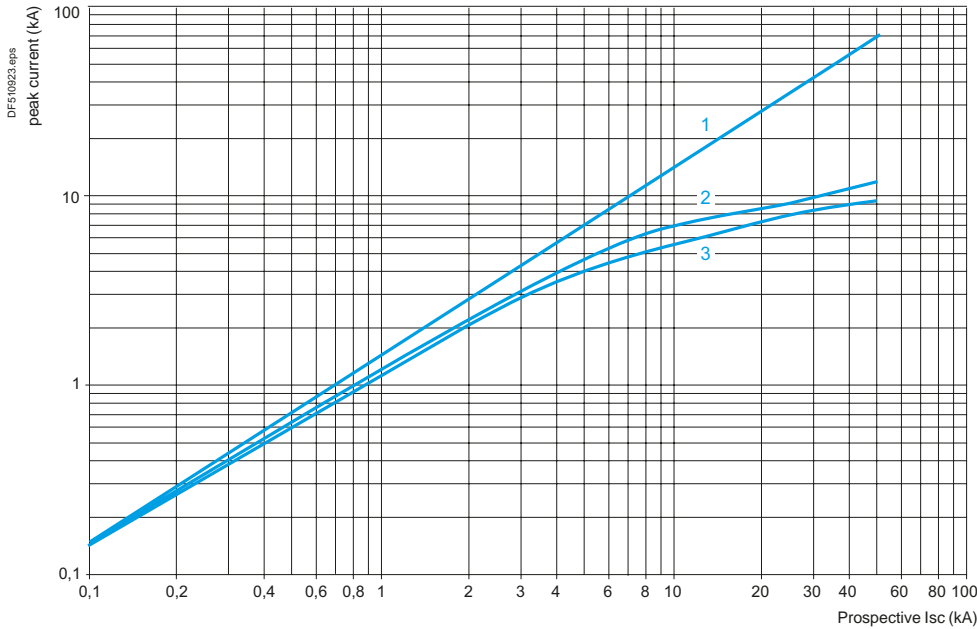
1 Maximum peak current
2 32 A power base
3 12 A power base

Thermal limit on short-circuit

U_e = 460 V
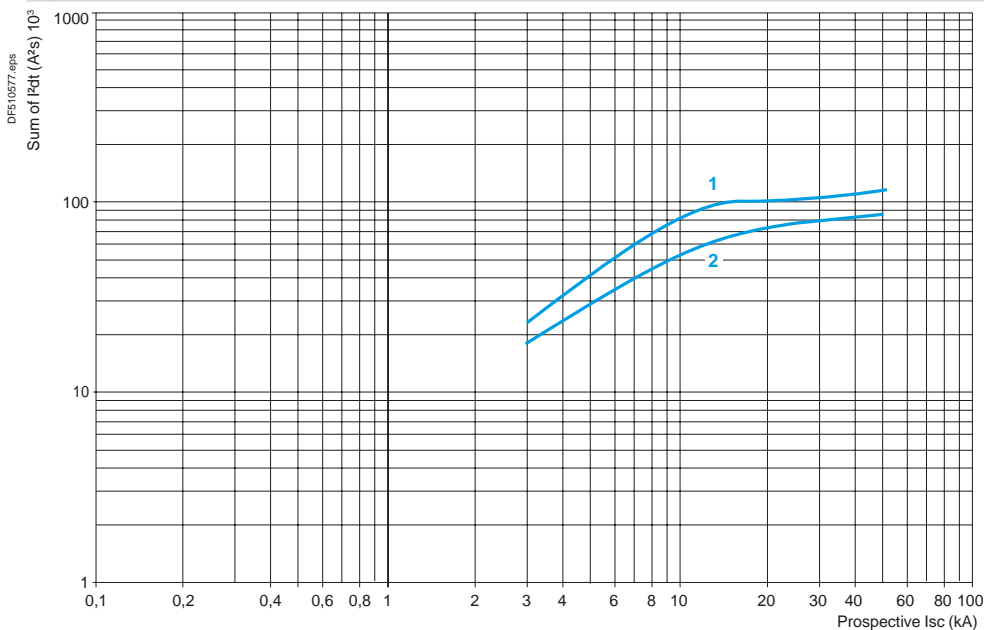
1 32 A power base
2 12 A power base

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A4/49

TeSys motor starters - open version
TeSys U starter-controllers

Use in category AC-41

LUB 12
LUB 32

Millions of operating cycles

520946.eps

Current broken in A
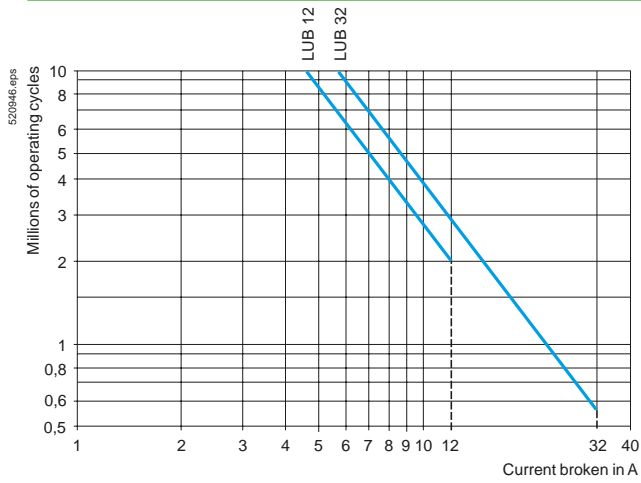
Use in category AC-43

Ue ⩽ 440 V | Ue = 690 V

LUB 12
LUB 32

Millions of operating cycles

520947.eps

Current broken in A

LUB 12
LUB 32

Millions of operating cycles

520948.eps

Current broken in A

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TeSys motor starters - open version
TeSys U starter-controllers
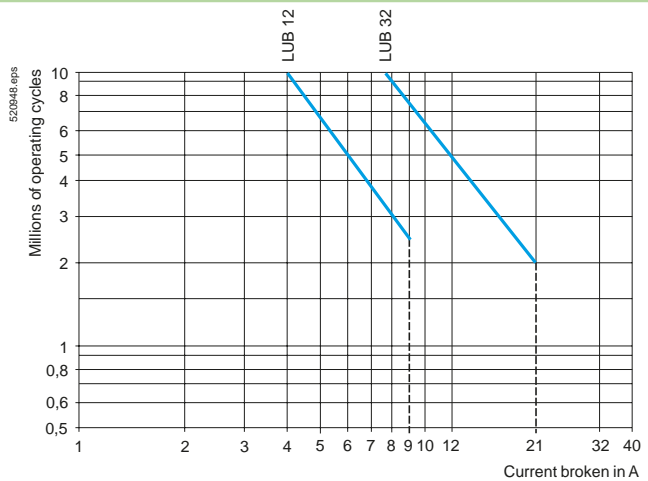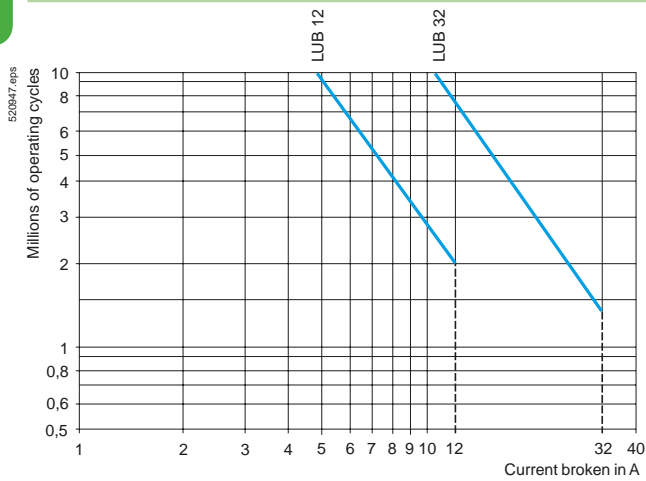
Use in category AC-44

Ue ⩽ 440 V	Ue = 690 V

Millions of operating cycles — Current broken in A

References :
pages A4/10 to A4/12

TeSys motor starters - open version
TeSys U starter-controllers
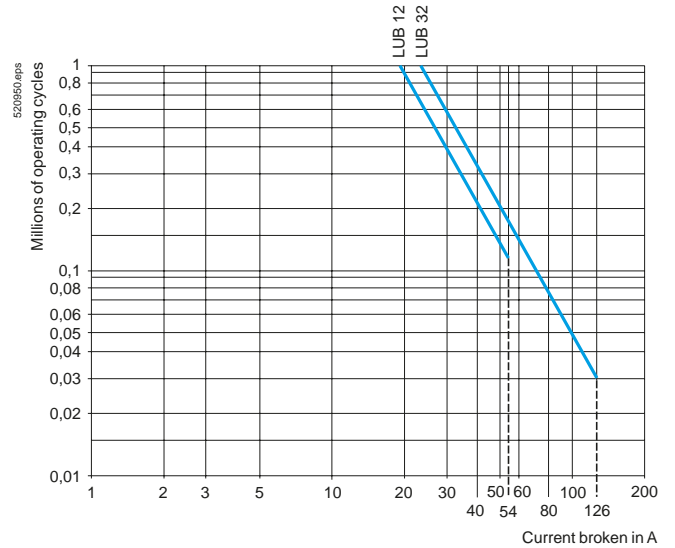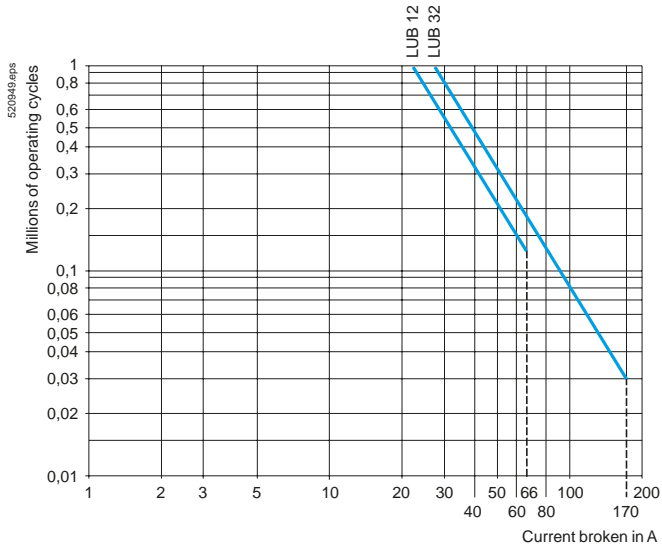
Dimensions

Starter-controllers

| LUB: non-reversing | | | | LU2B: reversing | | |

LUB: non-reversing

126 | Rail mounting 126 | Screw fixing 30 Ø4 (2)

X1, X2, 154, 73, 163…167

a (1), X1, 45, X2, 135 (1)

LU2B: reversing

Rail mounting | Screw fixing 29 Ø4 (2)

224, 120/125, 233…237, 45
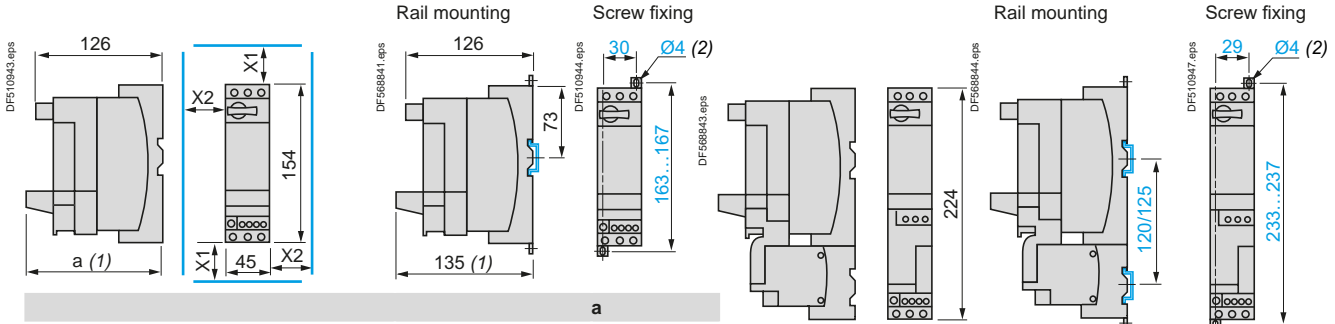
	a
With Modbus module	135
With Advantys STB, CANopen, Profibus DP or DeviceNet modules	147

Minimum electrical clearance:
X1 = 50 mm for Ue = 440 V and 70 mm for Ue = 500 and 690 V, X2 = 0

Reverser block for mounting separately from power base

Rail mounting | Screw fixing

115, 45, 113 | 113 | 104, 36 Ø4
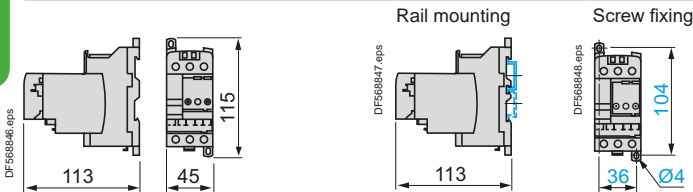
Sets of busbars and plug-in power sockets

| GV2 G445 and GV2 G454 | GV2 G••• with terminal block GV1 G09 | GV2 G245 and G254 |

GV2 G445 and GV2 G454

18, 95, a, l, p

	I
GV2 G245 (2 x 45)	89
GV2 G254 (2 x 54)	98
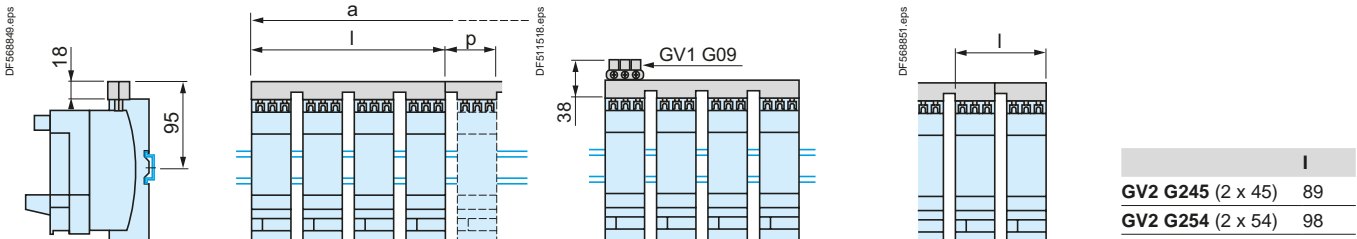
	I	P
GV2 G445 (2 x 45)	179	45
GV2 G454 (2 x 54)	206	54

GV2 G••• with terminal block GV1 G09

38, GV1 G09

GV2 G554

260

GV2 G345 et G354

l

	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

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

AK5 JB144

82, 30, 79

81, 438, 452, 45
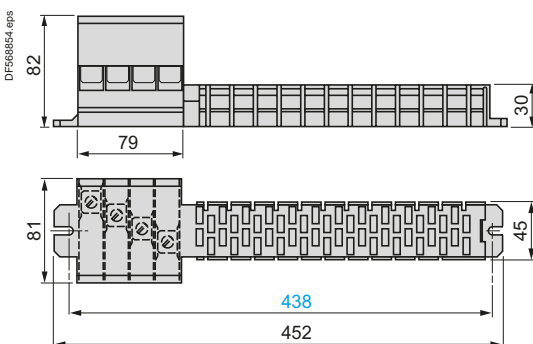
AK5 PC13, PC33, PC33L
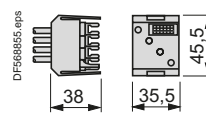
45,5, 38, 35,5

(1) Depth with communication module.
(2) Retractable fixing lugs.

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TeSys U starter-controllers

Dimensions, mounting

Limiter-disconnector LUA LB1
Disconnector LUA LB10
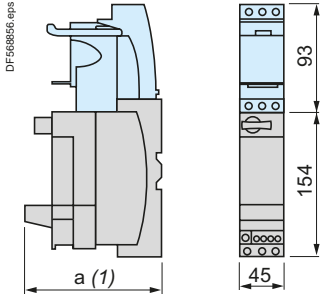
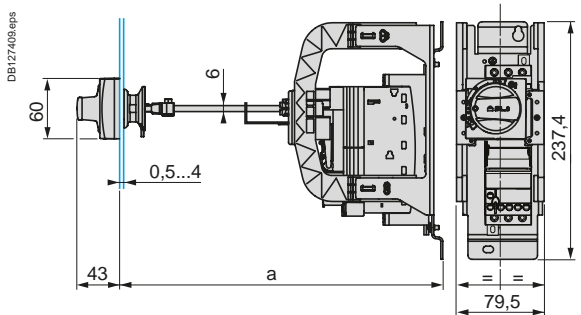|	a
With Modbus module	135
With Advantys STB, CANopen, Profibus DP or DeviceNet modules	147

Current limiter LA9 LB920
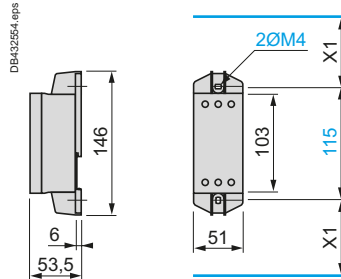
X1: Electrical clearance = 30 mm for Ue ⩽ 690 V

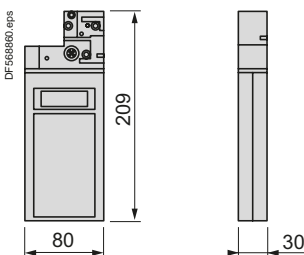## Door interlock mechanisms
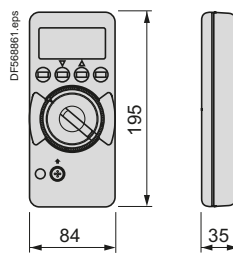
LU9 APN21, LU9 APN22, LU9 APN24

Door cut-out

(1) For IP65 only.

	a	
	Mini	Maxi
LU9 APN●●	191	300
LU9 APN●● + GV APK12	300	483

Addressing consoles

XZ MC11

ASI TERV2

Splitter boxes

LU9 GC3 (Modbus) LU9 G02 and LU9 G03
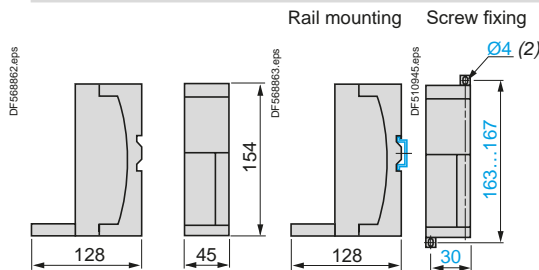
Rail mounting   Screw fixing

LU9 GC7 (Profibus DP)

Rail mounting   Screw fixing

(1) Depth with communication module.
(2) Retractable fixing lugs.

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TeSys U

TeSys motor starters - open version
TeSys U starter-controllers

TeSys U
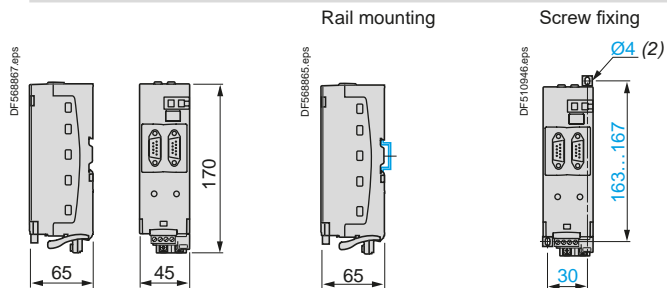
Starter-controllers, 12 or 32 A with standard, advanced or multifunction control unit

LUB
Non-reversing

1/L1 3/L2 5/L3

Control Unit

2/T1 4/T2 6/T3 A1 A2

13/NO 14/NO 21/NC 22/NC
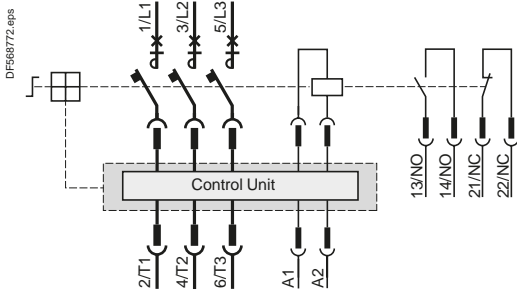
With control unit LUCC or LUCM
Connection of a single-phase motor
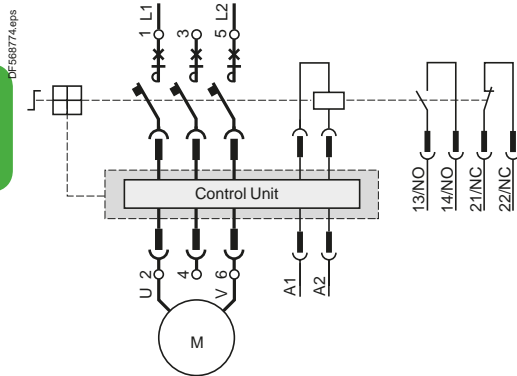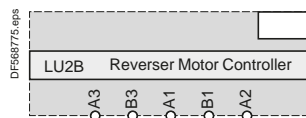
1 L1 3 5 L2

Control Unit

U 2 4 V 6 A1 A2

M

13/NO 14/NO 21/NC 22/NC

LU2B
Reversing

1/L1 3/L2 5/L3

Control Unit

Pre-wired

Reverser

2/T1 4/T2 6/T3

A3 B3 A1 B1 A2

81 84 82

Control terminal block

LU2B Reverser Motor Controller

A3 B3 A1 B1 A2

Reverser blocks

LU2M

1/L1 3/L2 5/L3

S1 S2 S3

Reverser

2/T1 4/T2 6/T3

A3 B3 A1 B1 A2

81 84 82

Control terminal block

LU2M Reverser Motor Controller

A3 B3 A1 B1 A2

LU6M
Control terminal blocks

S1 S2 S3

LU6M Reverser Block

A3 B3 A1 B1 A2
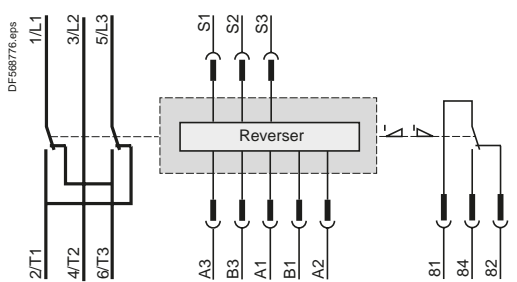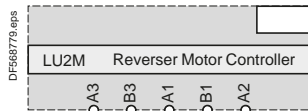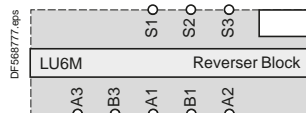
With pre-wired connector LU9 MRC

S1 S2 S3

LU6M Reverser Block

LU9M RC
Pre-wired coil

Basic scheme

13 A2 21

14 22

S2 S1 S3 LU6M

(1)

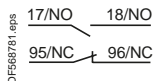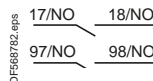B1 Forward B3 Reverse A1 Forward A3 Reverse A2
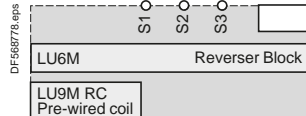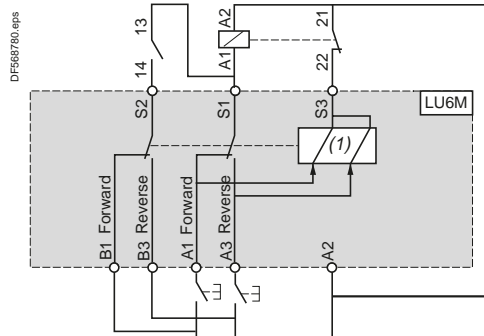
S1 *Start next stage*
S2 *Electrical interlocking*
S3 *Maintaining contact*
B1 *Maintain forward running*
B3 *Maintain reverse running*
A1 *Pulse forward running*
A2 *Common*
A3 *Pulse reverse running*
(1) Electronically operated bistable electromagnet.

Add-on contact blocks

LUA1 C11	LUA1 C20	LUA8 E20
17/NO 18/NO	17/NO 18/NO	I O 57 67
95/NC 96/NC	97/NO 98/NO	58 68
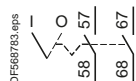
Add-on contact modules

LUFN 20	LUFN 11	LUFN 02
33/NO 34/NO	43/NO 44/NO	31/NC 32/NC
43/NO 44/NO	31/NC 32/NC	41/NC 42/NC

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TeSys motor starters - open version
TeSys U starter-controllers
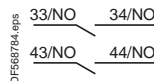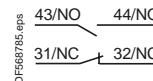
Control units

Standard control units LUCA

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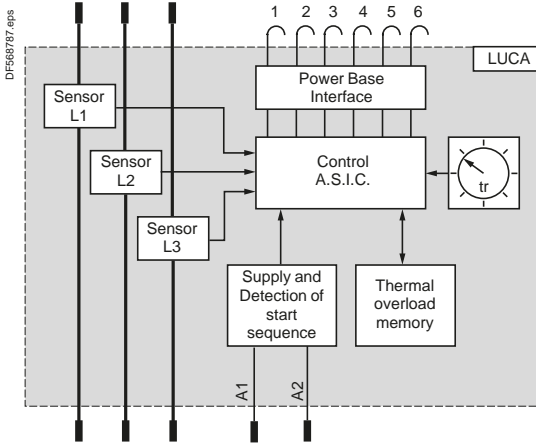
1 and 2 Trips
3 and 4 Electromagnet
5   Power base rating
6   N/C

Advanced control units LUCB, LUCC, LUCD

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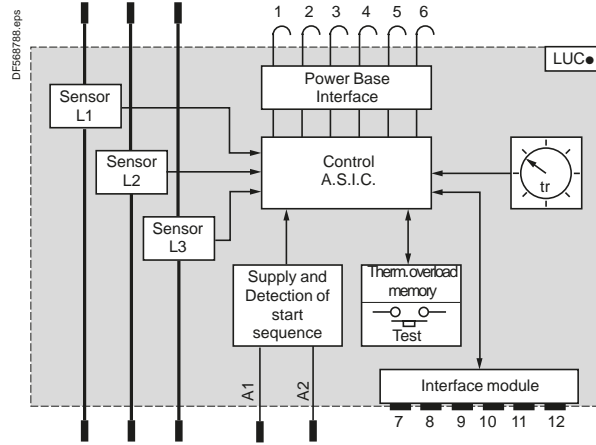
1 and 2 Trips
3 and 4 Electromagnet
5   Power base rating
6   N/C
7   Earth
8   Thermal status/Set
9   Reset mode/Reset
10   (Im/Ir)
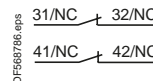11   Vc2
12   Vc1

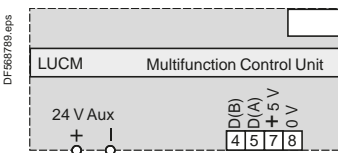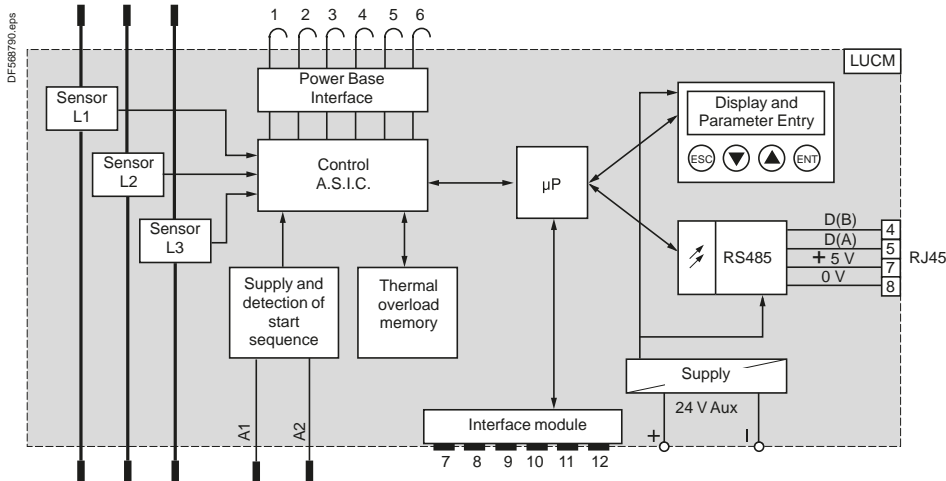#### Multifunction control units LUCM

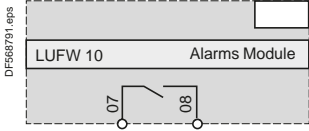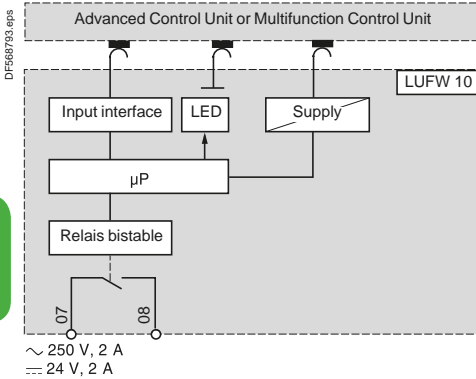Control terminal block

Basic scheme

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

Function modules

Alarm
LUF W10

LUFW 10 — Alarms Module

07   08

Basic scheme

Advanced Control Unit or Multifunction Control Unit

LUFW 10

Input interface   LED   Supply

µP

Relais bistable

07   08

∼ 250 V, 2 A
⎓ 24 V, 2 A

Indication of motor load
LUF V2

4-20 mA output

LUFV 2 — Analogue output Module

4...20 mA   24 V Aux   24 V Aux
+   −   +   −   +   NC

Basic scheme

Advanced Control Unit or Multifunction Control Unit

LUFV 2

Input interface   Supply

µP - Analogue/Digital converter

Isolation

Digital/Analogue converter

Voltage/Current converter

4...20 mA   ⎓ 24 V
+   −   +   −   +   −

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

Communication modules

Communication modules ASILUF C5 and ASILUF C51

Without pre-wired coil connection

ASILUF C5 or ASILUF C51 — AS-Interface Module

CCom   OA1   OA3   ⎓ 24 V   AS-i
+   −   +   −

With pre-wired coil connection LU9M RC

ASILUF C5 or ASILUF C51 — AS-Interface Module

⎓ 24 V   AS-i

LU9M RC Pre-wired coil

+   −   +   −

With pre-wired coil connection LU9B N11C

ASILUF C5 or ASILUF C51 — AS-Interface Module

⎓ 24 V   AS-i

LU9B N11C Pre-wired coil

+   −   +   −

Basic scheme

ASILUF C5 or ASILUF C51

DEL   Ready-Fault-Pole

µP

Output interface   A2SI

Com   OA1   OA3   +   ⎓ 24 V   −   +   AS-i   −

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Communication modules (continued)

Modbus communication module LUL C031	Modbus communication module LUL C033
Without pre-wired coil connection	**Without pre-wired coil connection**
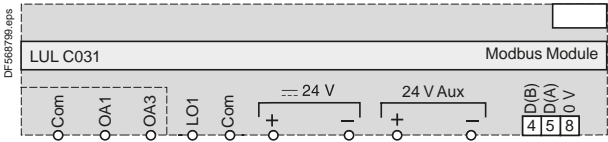
LUL C031 — Modbus Module

Com | OA1 | OA3 | LO1 | Com | ⎓ 24 V + − | 24 V Aux + − | D(B) 4 | D(A) 5 | 0 V 8

LUL C033 — Modbus Module

Com | OA1 | OA3 | LO1 | LI1 | LI2 | 24 V ⎓ + | 24 V Aux + | COM − | D(B) 4 | D(A) 5 | 0 V 8

With pre-wired coil connection LU9B N11C

LUL C031 — Modbus Module

LU9B N11C Pre-wired coil | LO1 | Com | ⎓ 24 V + − | 24 V Aux + − | D(B) 4 | D(A) 5 | 0 V 8

LUL C033 — Modbus Module

LU9B N11C Pre-wired coil | LO1 | LI1 | LI2 | 24 V ⎓ + | 24 V Aux + | COM − | D(B) 4 | D(A) 5 | 0 V 8

With pre-wired coil connection LU9M RC

LUL C031 — Modbus Module

LU9M RC Pre-wired coil | LO1 | Com | ⎓ 24 V + − | 24 V Aux + − | D(B) 4 | D(A) 5 | 0 V 8

LUL C033 — Modbus Module

LU9M RC Pre-wired coil | LO1 | LI1 | LI2 | 24 V ⎓ + | 24 V Aux + | COM − | D(B) 4 | D(A) 5 | 0 V 8

Basic scheme

Basic scheme

Schemes (continued) - TeSys U
TeSys motor starters - open version
TeSys U starter-controllers

TeSys U
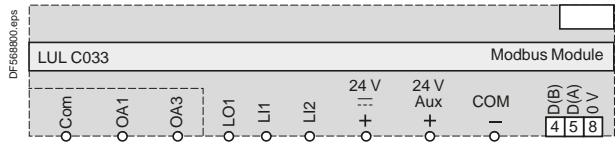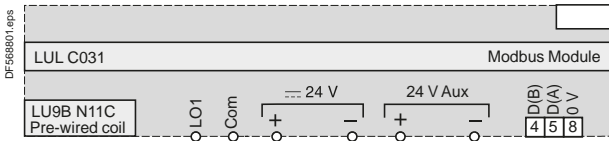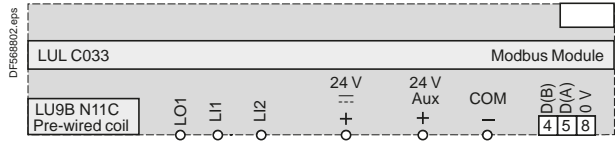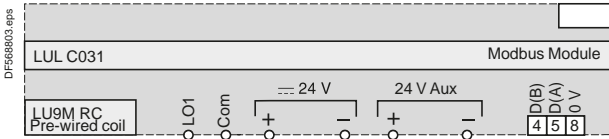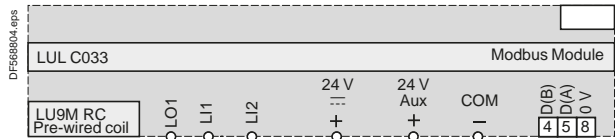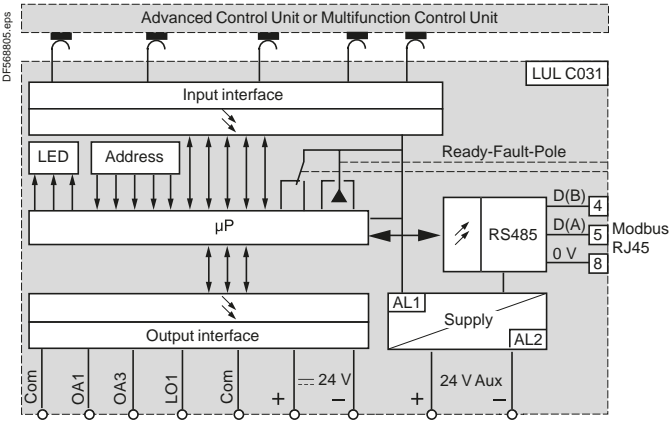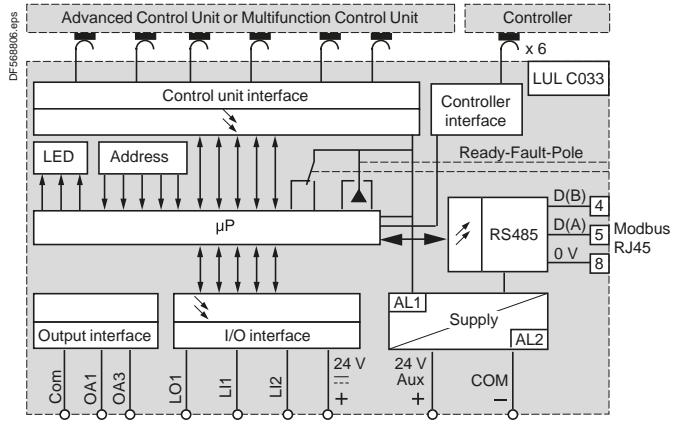
Communication modules (continued)

Profibus DP communication module LUL C07

Without pre-wired coil connection

DF568807.eps

LUL C07 — Profibus DP Module

OA3 · OA1 · Com · LO1 · LI1 · LI2 · ⎓ 24 V · + · + · − · Bus

With pre-wired coil connection LU9B N11LC

DF568809.eps

LUL C07 — Profibus DP Module

LU9B N11L Pre-wired coil · LO1 · LI1 · LI2 · ⎓ 24 V · + · + · − · Bus

With pre-wired coil connection LU9M RC

DF568811.eps

LUL C07 — Profibus DP Module

LU9M RL Pre-wired coil · LO1 · LI1 · LI2 · ⎓ 24 V · + · + · − · Bus

Basic scheme

DF568813.eps
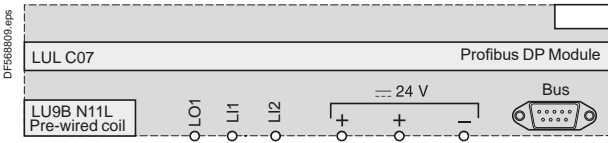
CANopen communication module LUL C08

Without pre-wired coil connection
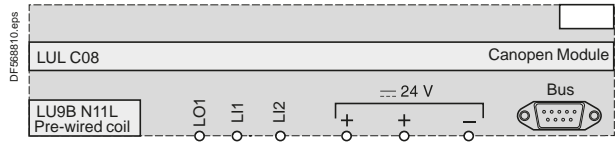
DF568808.eps

LUL C08 — Canopen Module

OA3 · OA1 · Com · LO1 · LI1 · LI2 · ⎓ 24 V · + · + · − · Bus

With pre-wired coil connection LU9B N11LC

DF568810.eps

LUL C08 — Canopen Module

LU9B N11L Pre-wired coil · LO1 · LI1 · LI2 · ⎓ 24 V · + · + · − · Bus

With pre-wired coil connection LU9M RC

DF568812.eps

LUL C08 — Canopen Module

LU9M RL Pre-wired coil · LO1 · LI1 · LI2 · ⎓ 24 V · + · + · − · Bus

Basic scheme

DF568814.eps

DeviceNet communication module LUL C09

Without pre-wired coil connection

DF568815.eps

LUL C09 — DeviceNet Module

OA3 · OA1 · Com · LO1 · LI1 · LI2 · ⎓ 24 V · + · + · − · Bus

With pre-wired coil connection LU9B N11LC

DF568817.eps

LUL C09 — DeviceNet Module

LU9B N11L Pre-wired coil · LO1 · LI1 · LI2 · ⎓ 24 V · + · + · − · Bus

With pre-wired coil connection LU9M RL

DF568818.eps

LUL C09 — DeviceNet Module

LU9M RL Pre-wired coil · LO1 · LI1 · LI2 · ⎓ 24 V · + · + · − · Bus

Basic scheme

DF510952.eps

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TeSys motor starters - open version
TeSys U starter-controllers
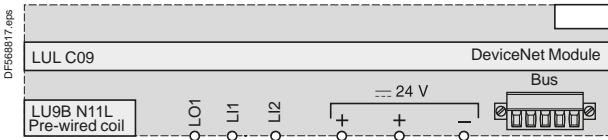
Communication modules (continued)
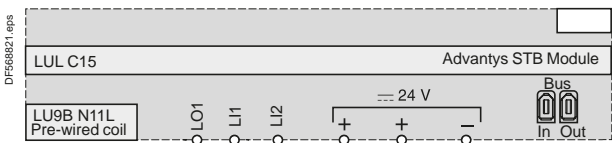
Advantys STB communication module LUL C15	Parallel wiring modules
Without pre-wired coil connection	**Without pre-wired coil connection**

LUL C15 — Advantys STB Module
OA3 OA1 Com LO1 LI1 LI2 ⎓ 24 V + + – Bus In Out

LUF C00 — Parallel bus Module
Com OA1 OA3 Link // RJ45 1 2 3 4 5 6 7 8

With pre-wired coil connection LU9B N11LC | **With pre-wired coil connection LU9B N11LC**

LUL C15 — Advantys STB Module
LU9B N11L Pre-wired coil LO1 LI1 LI2 ⎓ 24 V + + – Bus In Out

LUF C00 — Parallel bus Module
LU9B N11C Pre-wired coil Link // RJ45 1 2 3 4 5 6 7 8

With pre-wired coil connection LU9M RC | **With pre-wired coil connection LU9M RC**

LUL C15 — Advantys STB Module
LU9M RL Pre-wired coil LO1 LI1 LI2 ⎓ 24 V + + – Bus In Out

LUF C00 — Parallel bus Module
LU9M RC Pre-wired coil Link // RJ45 1 2 3 4 5 6 7 8

Basic scheme | Basic scheme

Advanced Control Unit or Multifunction Control Unit — Controller x 6
LUL C15
Control unit interface — Controller interface
LED — Address — Ready-Fault-Pole
µP — OUT — IN
I/O interface — AL1 Supply AL2
OA3 OA1 Com LO1 LI1 LI2 — 24 V ⎓

LUF C00
Reay-Fault-Pole
Com OA3 OA1 1 2 3 4 5 6 7 8 RJ45

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

Profibus DP power supply module LU9 GC7

LU9 GC7
IN OUT
Filter
24 V Aux.

TeSys motor starters - open version
TeSys U starter-controllers

TeSys U

Communication modules (continued)
Wiring hub and splitter boxes

Modbus hub LU9GC3	Parallel wiring splitter box LU9 G02	Parallel wiring splitter box LU9 G03

Modbus hub LU9GC3 (left column)

X1 — LU9 GC3
- N/C
- N/C
- N/C
- D (B) −
- D (A) +
- N/C
- N/C
- 0 V

RJ45 connectors: X1, X2, X3, X4, X5, X6, X7, X8

X9 — RJ45
- N/C
- N/C
- N/C
- D (B) −
- D (A) +
- N/C
- 24 V (1)
- 0 V

X10 — RJ45

Shielding

Bottom terminals: D (B) − , D (A) + , Shielding, 0 V, Shielding, 0 V

Parallel wiring splitter box LU9 G02 (middle column)

X1
- Forward running
- Reverse running
- Output common
- N/C
- Pole state
- N/C
- Fault
- +24 V Aux

RJ45: X2, X3, X4

X9 (2)
- 1 Fault X1
- 2 Fault X2
- 3 Fault X3
- 4 Fault X4
- 5 Fault X5
- 6 Fault X6
- 7 Fault X7
- 8 Fault X8
- 9 Pole state X1
- 10 Pole state X2
- 11 Pole state X3
- 12 Pole state X4
- 13 Pole state X5
- 14 Pole state X6
- 15 Pole state X7
- 16 Pole state X8
- 17 + 24 V Aux
- 18 Com
- 19 + 24 V Aux
- 20 Com

X5
- Forward running
- N/C
- Commun des sorties
- N/C
- Pole state
- N/C
- Fault
- + 24 V Aux

RJ45: X6, X7, X8

X10 (3)
- 1 Forward running X1
- 2 Forward running X2
- 3 Forward running X3
- 4 Forward running X4
- 5 Forward running X5
- 6 Forward running X6
- 7 Forward running X7
- 8 Forward running X8
- 9 Reverse running X1
- 10 Reverse running X2
- 11 Reverse running X3
- 12 Reverse running X4
- 13 N/C
- 14 N/C
- 15 N/C
- 16 N/C
- 17 + ⎓ 24 V
- 18 Com
- 19 + ⎓ 24 V
- 20 Com

Bottom: ⎓ 24 V — Outputs + − ; 24 V Aux — Inputs + −
Com / Com

Parallel wiring splitter box LU9 G03 (right column)

X1
- Forward running
- Reverse running
- Output common
- N/C
- Pole state
- + 24 V
- Fault
- + 24 V Aux

RJ45: X2, X3, X4

X9 (2)
- 1 Fault X1
- 2 Fault X2
- 3 Fault X3
- 4 Fault X4
- 5 Fault X5
- 6 Fault X6
- 7 Fault X7
- 8 Fault X8
- 9 Pole state X1
- 10 Pole state X2
- 11 Pole state X3
- 12 Pole state X4
- 13 Pole state X5
- 14 Pole state X6
- 15 Pole state X7
- 16 Pole state X8
- 17 + 24 V Aux
- 18 Com
- 19 + 24 V Aux
- 20 Com

RJ45: X5, X6, X7, X8

X10 (3)
- 1 Forward running X1
- 2 Forward running X2
- 3 Forward running X3
- 4 Forward running X4
- 5 Forward running X5
- 6 Forward running X6
- 7 Forward running X7
- 8 Forward running X8
- 9 Reverse running X1
- 10 Reverse running X2
- 11 Reverse running X3
- 12 Reverse running X4
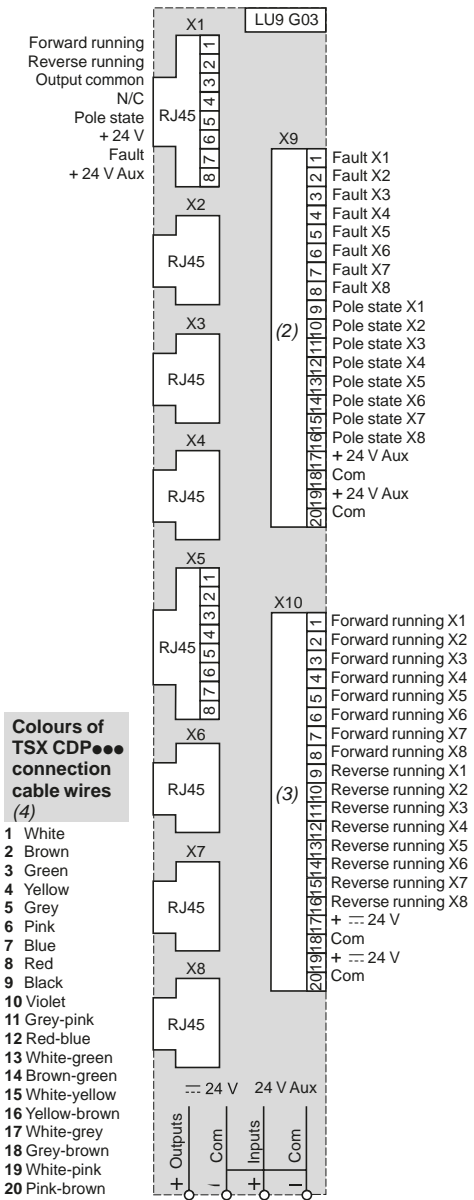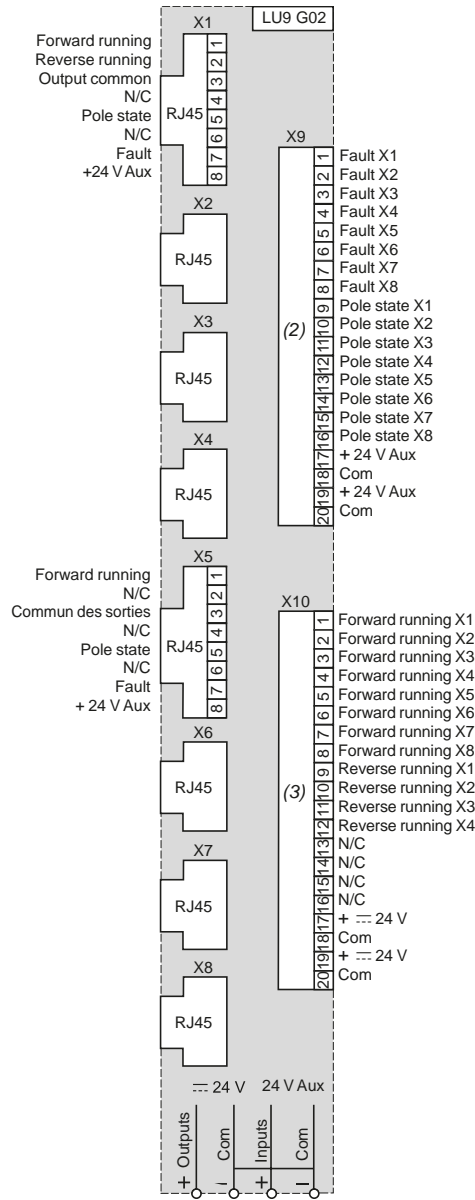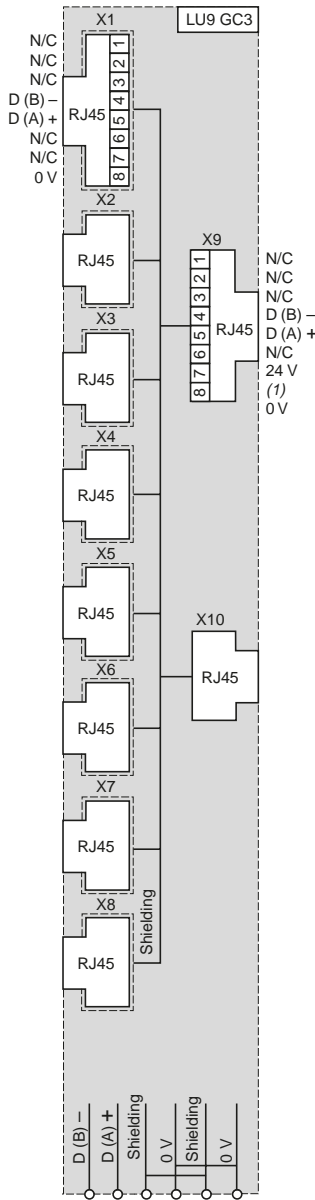- 13 Reverse running X5
- 14 Reverse running X6
- 15 Reverse running X7
- 16 Reverse running X8
- 17 + ⎓ 24 V
- 18 Com
- 19 + ⎓ 24 V
- 20 Com

Bottom: ⎓ 24 V — Outputs + − ; 24 V Aux — Inputs + −
Com / Com

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 HE10 input connector.
(3) 20-way HE10 output connector.
(4) Wire colours and corresponding HE10 connector pin numbers.

Gateways

LUF P1	LUF P7	LUF P9

LUF P1 — Fip I/O - Modbus Gateway
- 24 V Aux + −
- X2 Fip I/O: 1 2 3 4 5 6 7 8 9
- X1 D(B) D(A) 0 V: 4 5 8

LUF P7 — Profibus - Modbus Gateway
- 24 V Aux + −
- X2 Profibus: 1 2 3 4 5 6 7 8 9
- X1 D(B) D(A) 0 V: 4 5 8

LUF P9 — DeviceNet - Modbus Gateway
- 24 V Aux + −
- X2 DeviceNet: 1 2 3 4 5
- X1 D(B) D(A) 0 V: 4 5 8

DF568830.eps
DF568831.eps
DF568832.eps

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TeSys motor starters - open version
TeSys U starter-controllers

Data profile under AS-Interface				Standard LUCA	Advanced LUCB, CC, CD	Multifunction LUCM
Control unit present in the product						
Status		D0	Ready (available)	■	■	■
		D1	Poles closed (running)	■	■	■
Commands		D0	Start - forward running	■	■	■
		D1	Start - reverse running	■	■	■

Main registers accessible with Modbus, CANopen, Advantys STB, Profibus DP and DeviceNet communication modules.

For other registers and for further information, please consult the User's Manual *Communication variables* on the website www.schneider-electric.com

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		■	■

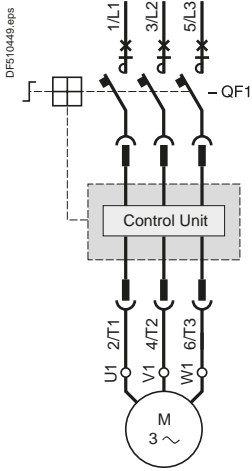| Commands	Register 700	Bit 0	LO1 output command	■	■	■
	Register 704	Bit 0	OA1 output command	■	■	■
		Bit 1	OA3 output command	■	■	■
		Bit 2	Reserved			
		Bit 3	Fault acknowledgement		■	■
		Bit 4	Reserved			
		Bit 5	Trip test			■
		Bit 6…15	Reserved			

■ *Data accessible*

TeSys motor starters - open version
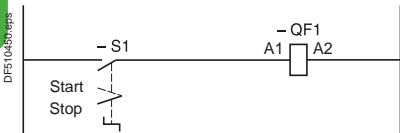## TeSys U starter-controllers
Non-reversing

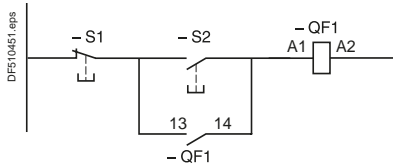## Non-reversing starter-controllers LUB
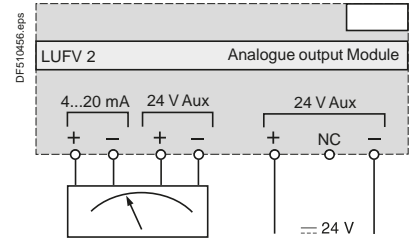

2-wire control via 2-position switch

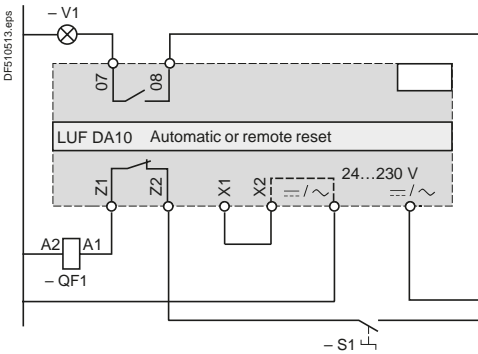
3-wire control, pulsed start with maintaining contact

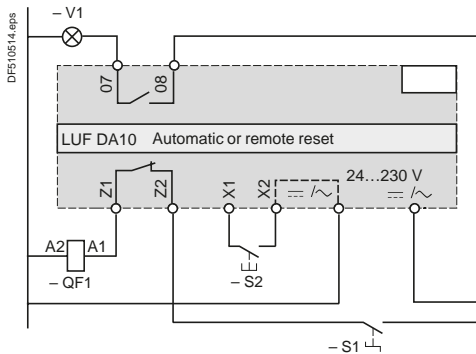

Connection of a motor load indicator module LUFV 2

Connection of thermal overload fault signalling modules LUF DA10
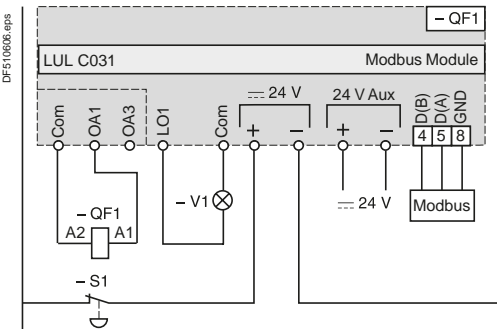
Automatic reset
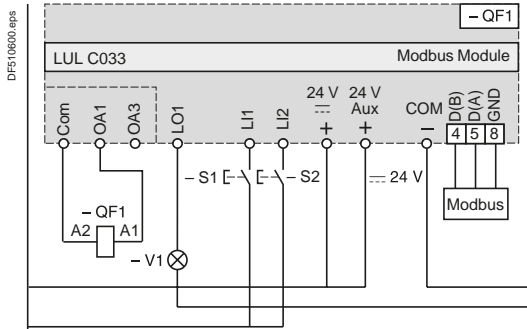

Remote reset

Control via Modbus communication module LUL C031

Without pre-wired coil connection

Control via Modbus communication module LUL C033

Without pre-wired coil connection

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TeSys motor starters - open version
TeSys U starter-controllers
Non-reversing

Non-reversing starter controllers LUB (continued)

Control by communication modules ASILUF C5 and ASILUF C51

Without pre-wired coil connection
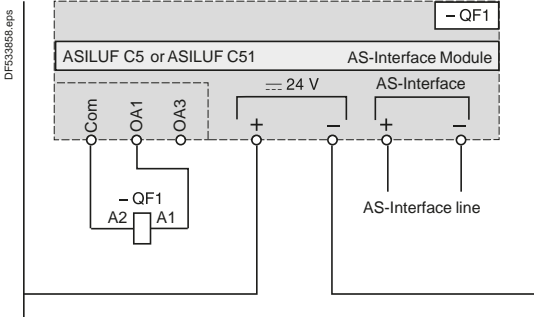
Without pre-wired coil connection
With local control
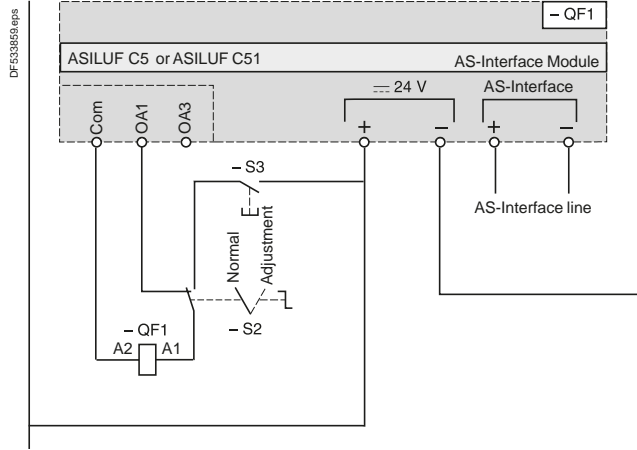
With pre-wired coil connection LU9B N11C
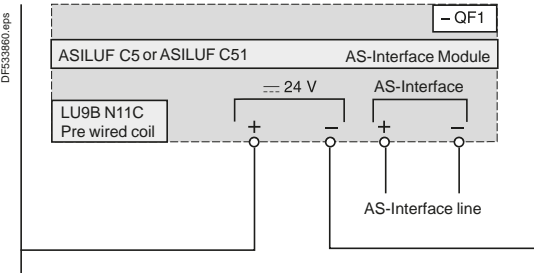
Without pre-wired coil connection
With local control
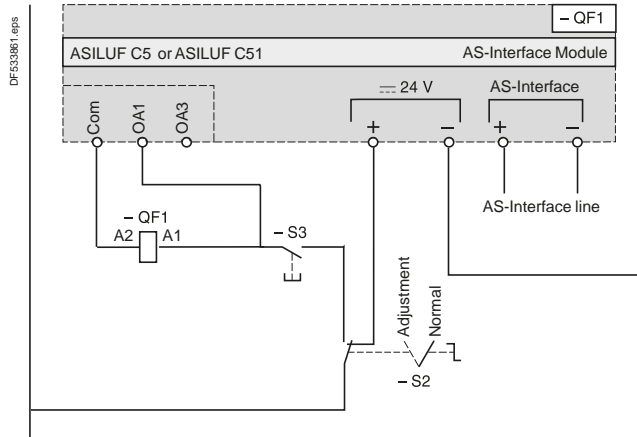
Without pre-wired coil connection
With multifunction control unit LUCM

TeSys U

TeSys motor starters - open version
TeSys U starter-controllers
Reversing
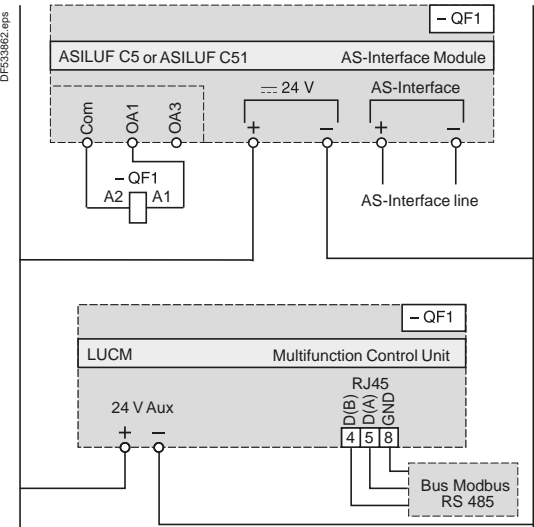
TeSys U

Reversing starter-controllers LUB

2-wire control via 3-position switch

3-wire control, pulsed start with maintaining contact
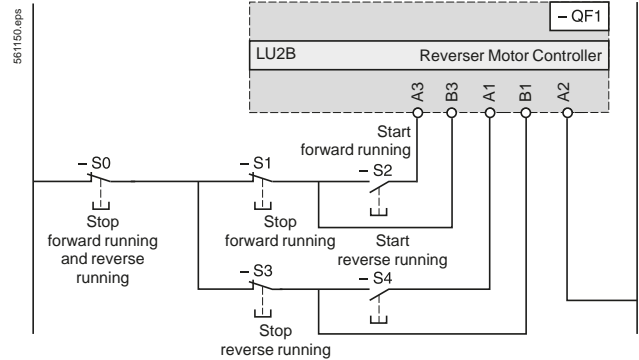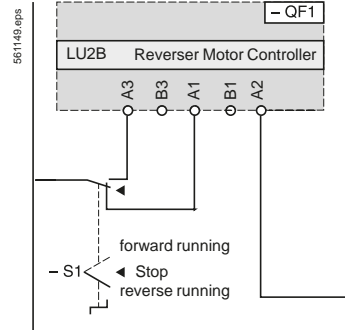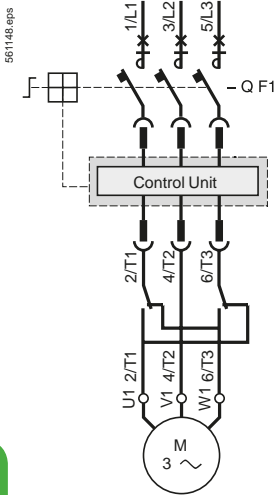
Control by communication modules ASILUF C5 and ASILUF C51

With pre-wired coil connection LU9M RC
With multifunction control unit LUCM

3-wire control, pulsed start with maintaining contact and limit switches
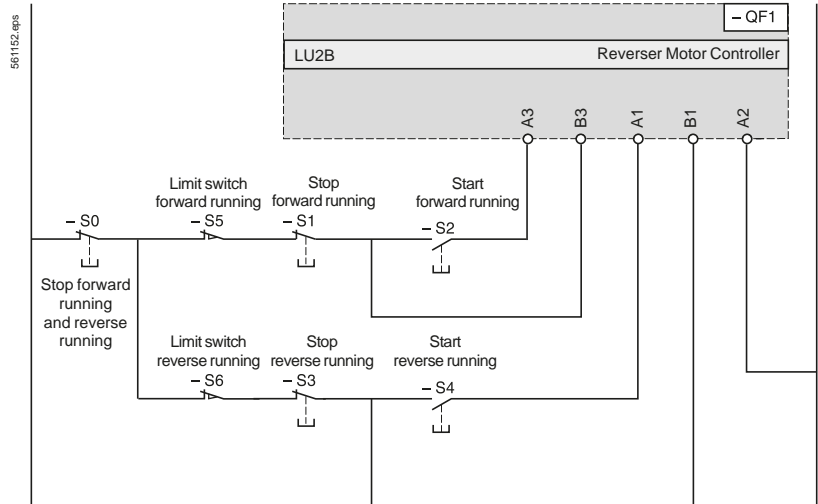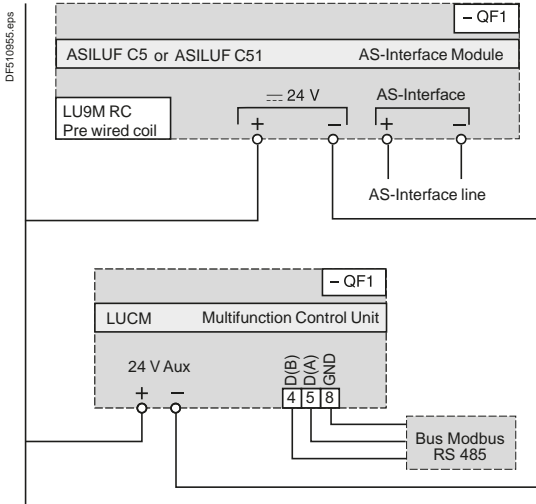
Control by communication modules ASILUF C5 and ASILUF C51

Without pre-wired coil connection
With running direction pilot lights and limit switches

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Basic schemes (continued) - TeSys U
TeSys motor starters - open version
TeSys U starter-controllers
Reversing
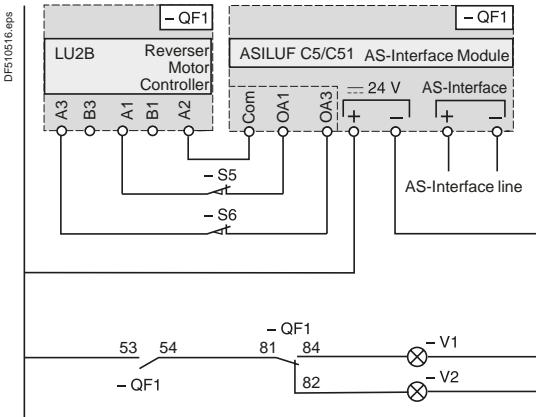
Reversing starter controllers LU2B (continued)

Control via Modbus communication module LUL C031

Without pre-wired coil connection. With local control
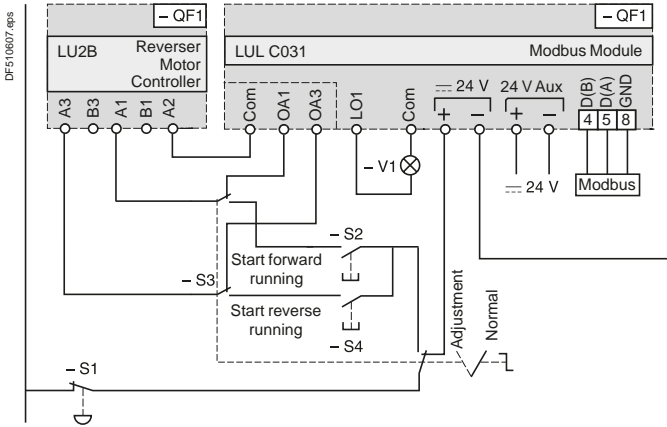
Control via Modbus communication module LUL C033

Without pre-wired coil connection. With local control
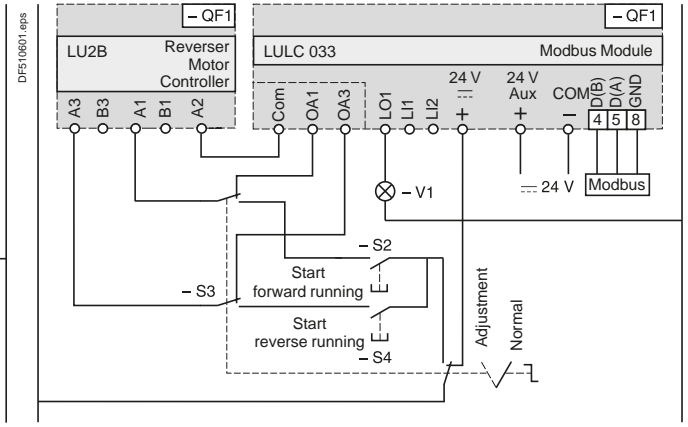
Reversing starter-controllers LUB + LU6M
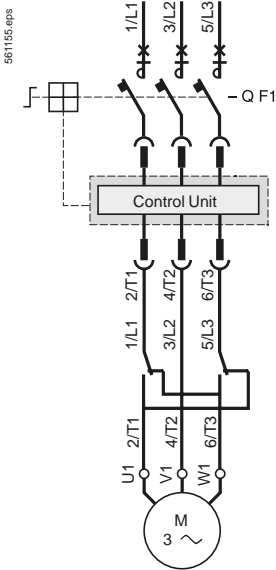
3-wire control, pulsed start with maintaining contact

2-wire control via 3-position switch

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TeSys U

Soft starters for asynchronous motors
Altistart U01 and TeSys U

DF536566.eps
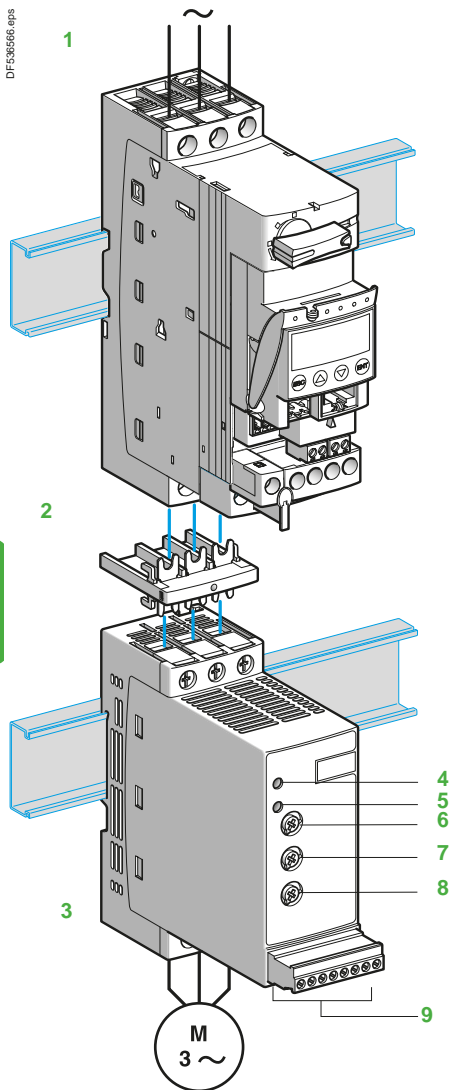
The Altistart U01 is a soft start/soft stop unit for asynchronous motors. It is designed primarily for combinations with **TeSys U** controller-starters.

When combined with a **TeSys U 1** controller by means of a connector **2**, the Altistart U01 **3** is a power option which provides the "Soft start/soft stop" function. The result is a unique, innovative motor starter.

Using the Altistart U01 starter enhances the starting performance of asynchronous motors by allowing them to start gradually, smoothly and in a controlled manner. It prevents mechanical shocks, which lead to wear and tear, and limits the amount of maintenance work and production downtime.
The Altistart U01 limits the starting torque and current peaks on starting, on machines which do not require a high starting torque.

The Altistart U01 is designed for the following simple applications:
■ Conveyors
■ Conveyor belts
■ Pumps
■ Fans
■ Compressors
■ Automatic doors and gates
■ Small cranes
■ Belt-driven machines, etc.

The Altistart U01 is compact and easy to install. It complies with standards IEC/EN 60947-4-2, carries UL, CSA, C-Tick, CCC certifications and CE marking.

■ **ATSU 01N2●●LT soft start/soft stop units**
□ Control two phases of the motor power supply to limit the starting current and for deceleration
□ Internal bypass relay
□ Motor power ratings ranging from 0.75 kW to 15 kW
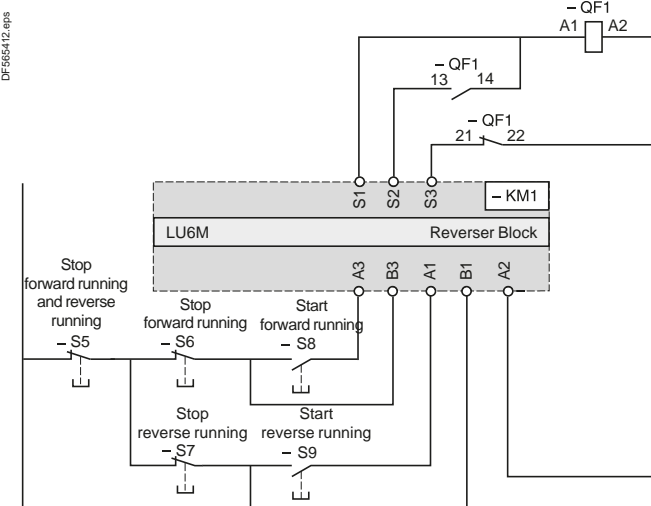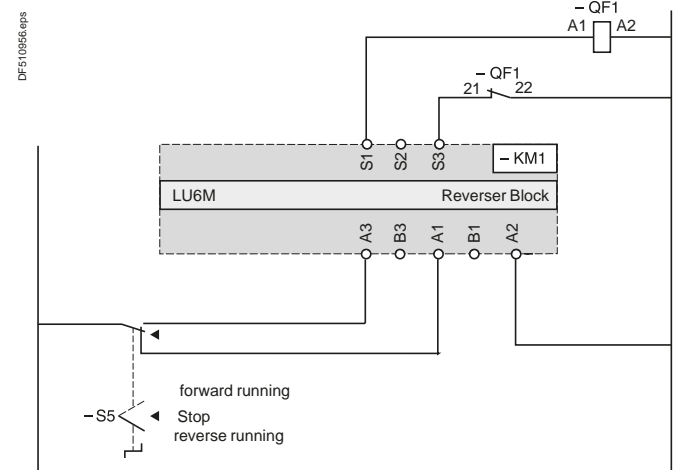□ Motor supply voltages ranging from 200 V to 480 V, 50/60 Hz.
An external power supply is required for controlling the starter.

Description

■ Altistart U01 soft start/soft stop units are equipped with:
□ A potentiometer for setting the starting time **6**
□ A potentiometer for setting the deceleration time **8**
□ A potentiometer for adjusting the start voltage threshold according to the motor load **7**
□ 1 green LED **4** to indicate that the unit is switched on
□ 1 yellow LED **5** **to indicate that the motor is powered at nominal voltage, if it is connected to the starter**
□ A connector **9**:
- 2 logic inputs for Run/Stop commands
- 1 logic input for the BOOST function
- 1 logic output to indicate the end of starting
- 1 relay output to indicate the starter has a power supply fault or the motor has reached a standstill at the end of the deceleration stage

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Soft starters for asynchronous motors
Altistart U01 and TeSys U

Please consult the "TeSys U starters - open version" catalogue.

■ 2-wire control
The run and stop commands are controlled by a single logic input. State 1 of logic input LI2 controls starting and state 0 controls stopping.
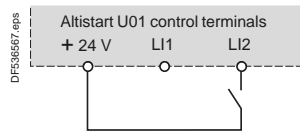
Wiring diagram for 2-wire control

■ 3-wire control
The run and stop commands are controlled by 2 different logic inputs.
Stopping is achieved when logic input LI1 opens (state 0).
The pulse on input LI2 is stored until input LI1 opens.
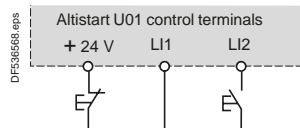
Wiring diagram for 3-wire control

■ Starting time
Controlling the starting time means that the time of the voltage ramp applied to the motor can be adjusted to obtain a gradual starting time, dependent on the motor load.

■ Voltage boost function via logic input
Activating the BOOST logic input enables the function for supplying a starting overtorque capable of overcoming any mechanical friction.
When the input is at state 1, the function is active (input connected to the + 24 V) and the starter applies a fixed voltage to the motor for a limited time before starting.
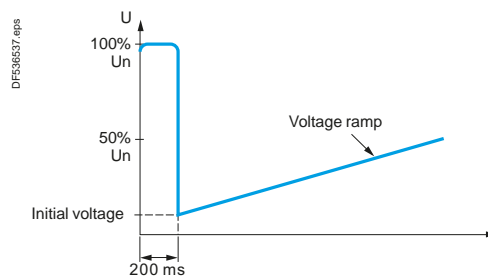
Application of a voltage boost equal to 100% of the nominal motor voltage

■ End of starting
□ application function for logic output LO1
ATSU 01N2●●LT soft start/soft stop units are equipped with an open collector logic output LO, which indicates the end of starting when the motor has reached nominal speed.

Characteristics:
pages A4/68 and A4/69

References:
page A4/70

Dimensions:
page A4/71

Schemes:
pages A4/72 to A4/75

Life Is On | Schneider Electric   A4/67

Soft starters for asynchronous motors
Altistart U01 and TeSys U

TeSys U

Environmental characteristics

Type of starter			ATSU 01N2••LT
Conformity to standards			Altistart U01 electronic starters have been developed to conform to the strictest international standards and the recommendations relating to electrical industrial control devices (IEC, EN), in particular standard IEC/EN 60947-4-2.
Electromagnetic compatibility EMC			
	Conducted and radiated emissions		CISPR 11 level B, IEC 60947-4-2, level B
	Harmonics		IEC 1000-3-2, IEC 1000-3-4
	EMC immunity		EN 50082-2, EN 50082-1
	Electrostatic discharge		IEC 61000-4-2 level 3
	Immunity to radiated radio-electrical interference		IEC 61000-4-3 level 3
	Immunity to electrical transients		IEC 61000-4-4 level 4
	Voltage/current impulse		IEC 61000-4-5 level 3
	Conducted and radiated emissions		IEC 61000-4-6 level 3
	Immunity to conducted interference caused by radio-electrical fields		IEC 61000-4-11
	Damped oscillating waves		IEC 61000-4-12 level 3
CE marking			The starters carry CE marking in accordance with the European low voltage directives IEC/EN 60947-4-2.
Product certifications			UL, CSA, C-Tick and CCC
Degree of protection			IP 20
Degree of pollution			2 conforming to IEC/EN 60947-4-2
Vibration resistance			1.5 mm peak to peak from 3 to 13 Hz, 1 gn from 13 to 150 Hz, conforming to IEC/EN 60068-2-6
Shock resistance			15 gn for 11 ms conforming to IEC/EN 60068-2-27
Relative humidity			5…95 % without condensation or dripping water conforming to IEC 60068-2-3
Ambient temperature around the unit	Storage	°C	-25…+70 conforming to IEC/EN 60947-4-2
	Operation	°C	-10…+40 without derating, up to 50°C with current derating of 2 % per °C above 40°C
Maximum operating altitude		m	1000 without derating (above this, derate the current by 2.2 % per additional 100 m)
Operating position Maximum permanent angle in relation to the normal vertical mounting position			10° 10°

Electrical characteristics

Type of starter			ATSU 01N2••LT
Category of use	Conforming to IEC 60947-4-2		Ac-53b
Rated operating voltage	3-phase ∼ voltage	V	200 - 10 % to 480 + 10 %
Frequency		Hz	50 - 5 % to 60 + 5 %
Output voltage			Maximum 3-phase voltage equal to line supply voltage
Control supply voltage			24 V ⎓, 100 mA ±10 %
Rated operating current		A	6...32
Adjustable starting time		s	1...10
Adjustable deceleration time		s	1...10
Starting torque		%	30.... 80 % of DOL motor starting torque

Type of starter	ATSU		01N206LT	01N209LT	01N212LT	01N222LT	01N232LT
Control power supply consumption			24 V ⎓, 65 mA			24 V ⎓, 100 mA	
Power dissipated	At full load at end of starting	W	1.5	1.5	1.5	2.5	2.5
	In transient state at 5 times the rated operating current	W	61.5	91.5	121.5	222.5	322.5

Type of starter			ATSU 01N206LT to ATSU 01N222LT			ATSU 01N232LT		
Use								
	Starting time	s	1	5	10	1	5	10
	Maximum number of cycles per hour		100	20	10	50	10	5

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Soft starters for asynchronous motors
Altistart U01 and TeSys U

Electrical characteristics (continued)

Logic input power supply (electrically isolated between power and control) + 24 V, COM		24 V ±10 % Isolated Max. current 100 mA
Logic inputs LI1, LI2, BOOST Stop, run and boost on start-up functions		Logic inputs with impedance 27 kΩ; 24 V power supply (U max 40 V) Max. current 8 mA State 0 if U < 5 V and I < 0.2 mA State 1 if U > 13 V and I > 0.5 mA
Logic output LO1 End of starting signal		Open collector logic output: External 24 V power supply (minimum 6 V, maximum 30 V) Max. current 200 mA
Relay output R1A R1C		Normally open (N/O) contact Minimum switching capacity: 10 mA for 6 V $\overline{\cdots}$ Maximum switching capacity on inductive load (cos φ = 0.5 and L/R = 20 ms): 2 A for 250 V $\sim$ or 30 V $\overline{\cdots}$ (AC-15) Maximum operating voltage 440 V
LED signalling	Green LED	Starter powered up
	Yellow LED	Nominal voltage reached

Connections (maximum connection capacity and tightening torque)

Power circuit			Connection to Ø4 mm screw clamps	
Flexible wire without cable end	1 conductor	mm²	1.5…10	8 AWG
	2 conductors	mm²	1.5…6	10 AWG
Flexible wire with cable end	1 conductor	mm²	1…6	10 AWG
	2 conductors	mm²	1…6	10 AWG
Rigid wire	1 conductor	mm²	1…10	8 AWG
	2 conductors	mm²	1…6	10 AWG
Tightening torque		N.m	1.9…2.5	

Control circuit			Screw connector	
Flexible wire without cable end	1 conductor	mm²	0.5…2.5	14 AWG
	2 conductors	mm²	0.5…1.5	16 AWG
Flexible wire with cable end	1 conductor	mm²	0.5…1.5	16 AWG
	2 conductors	mm²	0.5…1.5	16 AWG
Rigid wire	1 conductor	mm²	0.5…2.5	14 AWG
	2 conductors	mm²	0.5…1	17 AWG
Tightening torque		N.m	0.5	

Torque characteristics (typical curves)
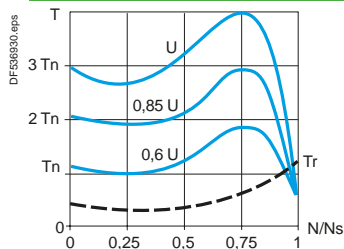
The diagram opposite shows the torque/speed characteristic of a cage motor in relation to the supply voltage.
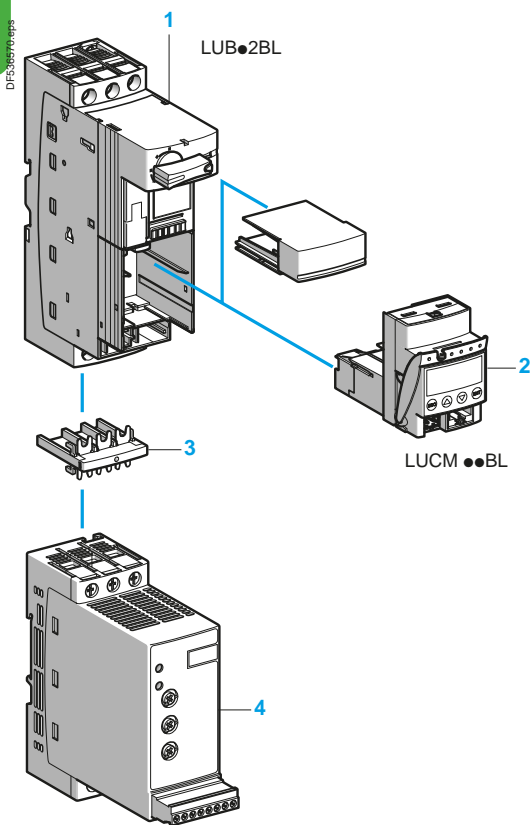The torque varies in line with the square of the voltage at a fixed frequency. The gradual increase in the voltage prevents the instantaneous current peak on power-up.

Soft starters for asynchronous motors
Altistart U01 and TeSys U

ATSU 01N222LT

1 LUB●2BL

2 LUCM ●●BL

3

4

ATSU 01N2●●LT

Soft start/soft stop units for 0.75 to 15 kW motors
(can be combined with the TeSys U starter)

Motor				Starter	
Motor power [1]				Nominal current	Reference
230 V	230 V	400 V	460 V		
kW	*HP*	kW	*HP*	A	
3-phase supply voltage: 200…480 V 50/60 Hz					
0.75	*1*	1.5	*2*	6	**ATSU01N206LT**
1.1	*1.5*	2.2	*3*		
		3			
1.5	*2*	–	*5*	9	**ATSU01N209LT**
–	*–*	4	*–*		
2.2	*3*	5.5	*7.5*	12	**ATSU01N212LT**
3	*–*	–	*–*		
4	*5*	7.5	*10*	22	**ATSU01N222LT**
5.5	*7.5*	11	*15*		
7.5	*10*	15	*20*	32	**ATSU01N232LT**

Accessorie

Description	Used for starter	Reference
Power connector between ATSU 01N2●●LT and TeSys U	ATSU 01N2●●LT	**VW3G4104**

TeSys U starter and soft start unit combinations

Numerous possibilities for combinations and options are offered.
Please consult the "TeSys U Starters-open version" specialist catalogue.

Motor power			Soft starter	TeSys U	
Voltage				Power base	Control unit [2]
230 V kW/*HP*	400 V kW	460 V *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 ●●BL)
3 power connector (VW3 G4104)
4 Altistart U01soft start/soft stop unit (ATSU 01N2●●LT)

(1) Standard motor power ratings, HP power ratings indicated according to standard UL 508.
(2) Depending on the configuration of the chosen TeSys U starter, replace the ● with A for standard, B for expandable, and M for multifunction.

Presentation: pages A4/66 and A4/67
Characteristics: pages A4/68 and A4/69
Dimensions: page A4/71
Schemes: pages A4/72 to A4/75

A4/70

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Soft starters for asynchronous motors
Altistart U01 and TeSys U

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

Mounting on ⌐⌐ (35 mm) rail with VW3 G4104 connector
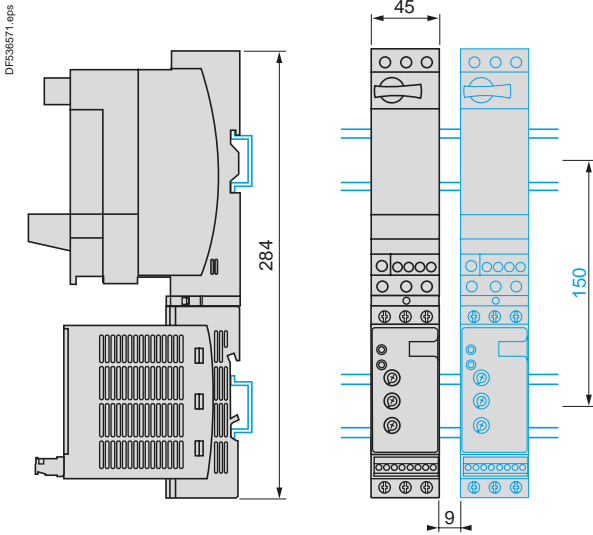
DF536571.eps

45 · 284 · 150 · 9

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

Side by side mounting

DF536572.eps

135 · 72,2 · 154 · 99 · 124 · 9
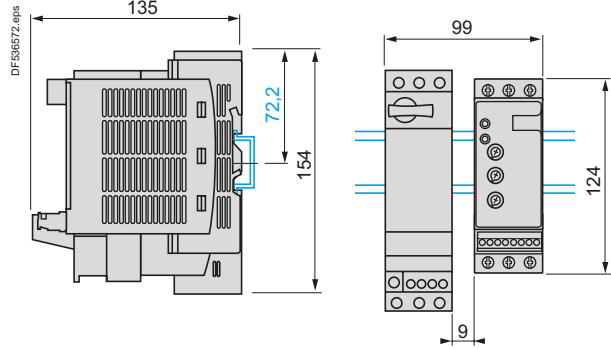
TeSys U combination (non-reversing power base) and ATSU 01N222LT to ATSU 01N232LT

Mounting on ⌐⌐ (35 mm) rail with VW3 G4104 connector
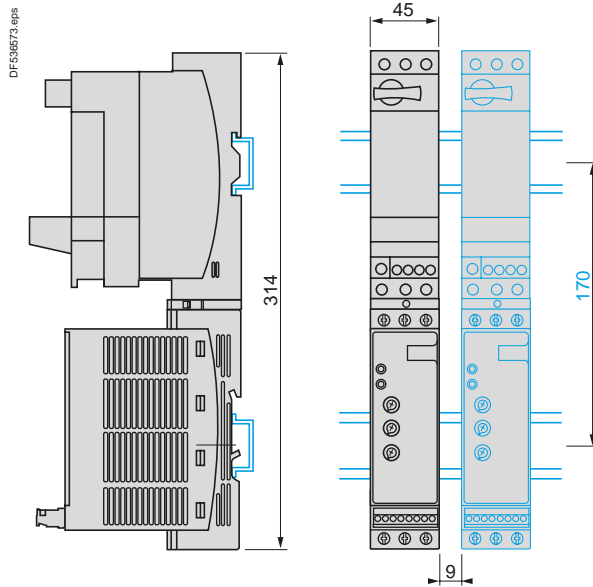
DF536573.eps

45 · 314 · 170 · 9

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

Side by side mounting

DF536574.eps

135 · 72,2 · 154 · 99 · 9

VW3 G4104 connector

DF536575.eps

20 · 44,8 · 46,6 · 28 · 6

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TeSys U

Soft starters for asynchronous motors
Altistart U01 and TeSys U
For 0.75 to 15 kW motors

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

Power wiring	Power wiring with reversing unit

TeSys U

TeSys U with reversing unit

ATSU 01N2●●LT

M1 3 ∼
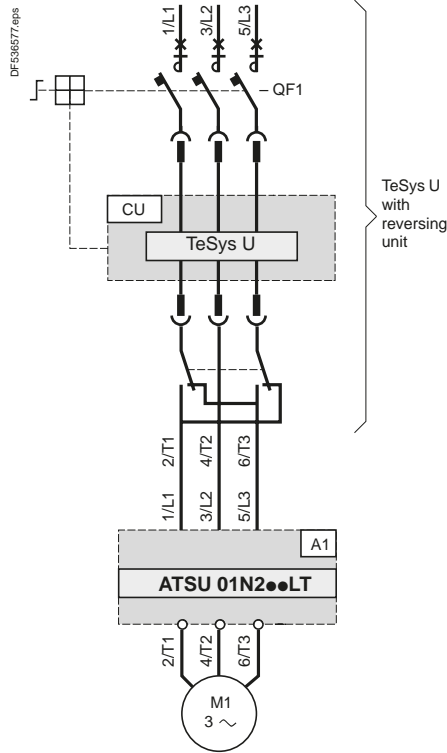
Compatible components

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

Presentation:	Characteristics:	References:	Dimensions:
pages A4/66 and A4/67	pages A4/68 and A4/69	page A4/70	page A4/71

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Schemes - TeSys U

Soft starters for asynchronous motors
Altistart U01 and TeSys 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
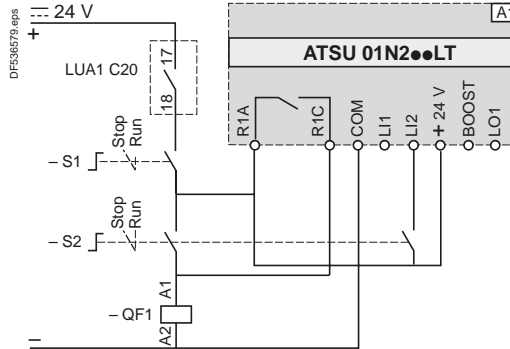
Functional diagrams
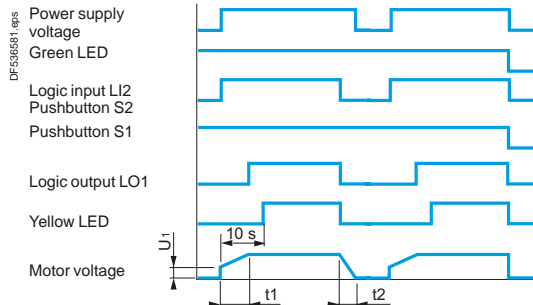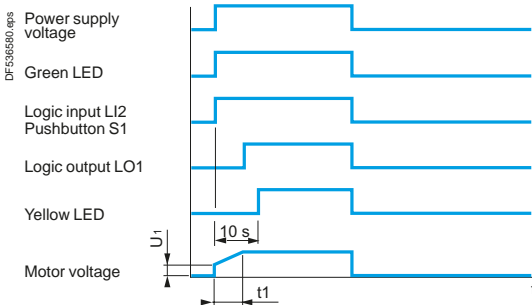
Automatic 3-wire control

Without deceleration
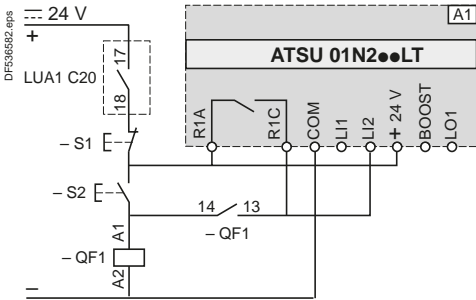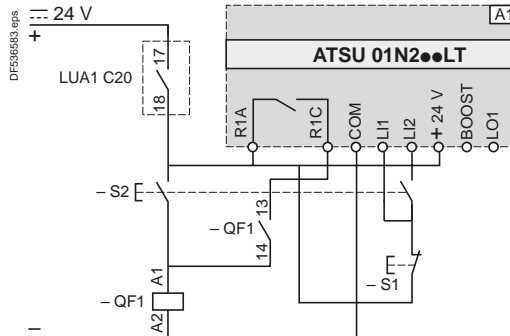
With deceleration

Functional diagrams
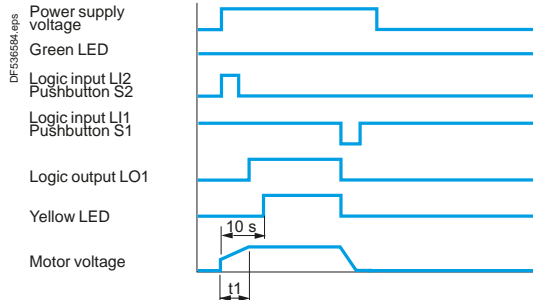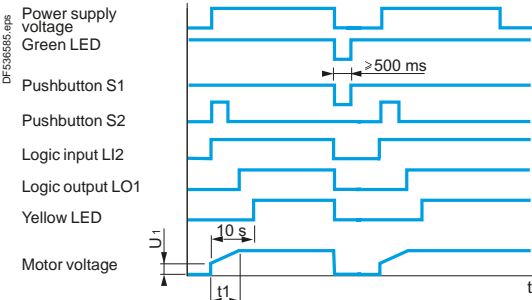
A1: Soft start/soft stop unit
S1, S2: XB4 B or XB5 B pushbuttons
QF1: TeSys U controller-starter
t1: Acceleration time can be controlled by a potentiometer
t2: Deceleration time can be controlled by a potentiometer
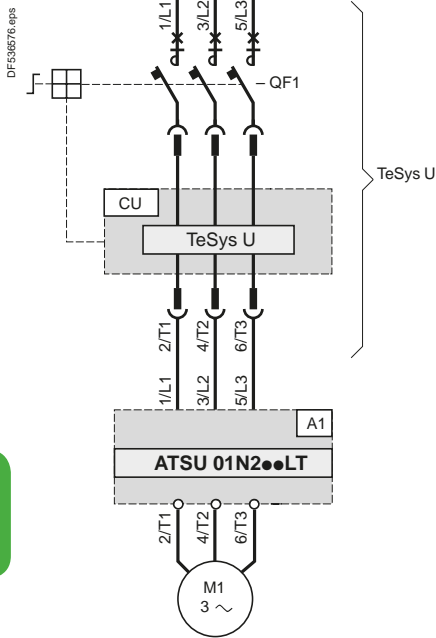U_s: Starting time can be controlled by a potentiometer

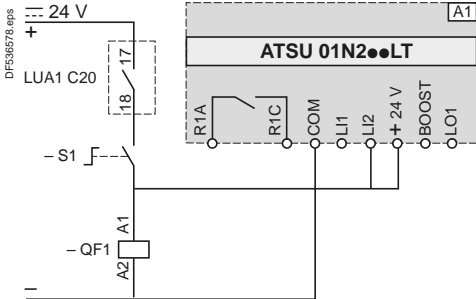# Soft starters for asynchronous motors

Altistart U01 and TeSys 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
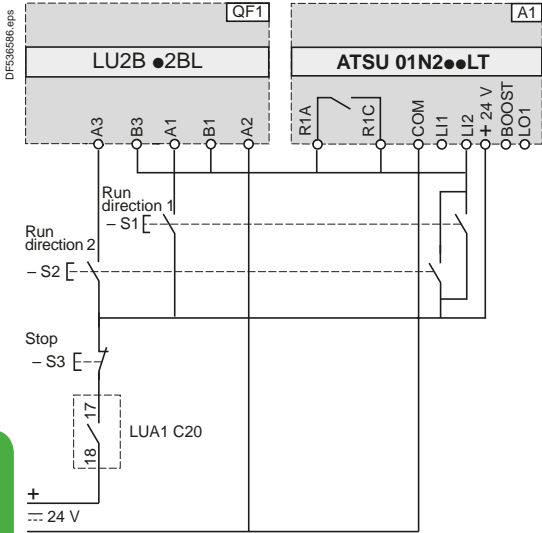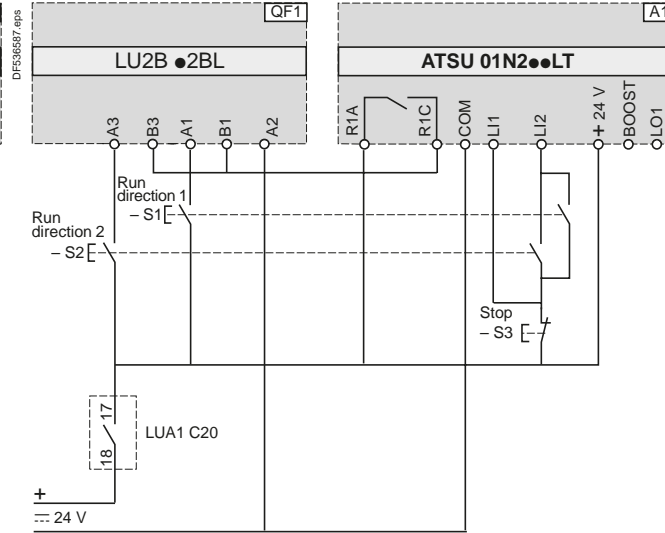
With deceleration

QF1: TeSys 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 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
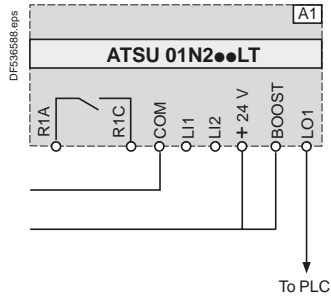
To PLC

A1: Soft start/soft stop unit

Presentation:
pages A4/66 and A4/67

Characteristics:
pages A4/68 and A4/69

References:
page A4/70

Dimensions:
page A4/71

A4/74

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

Automatic control with Modbus communication module, with and without deceleration
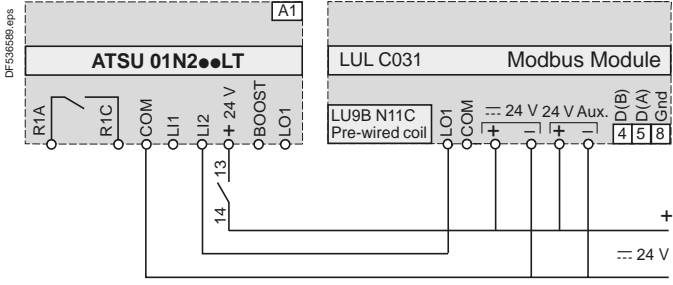
Without reversing unit   **With reversing unit**
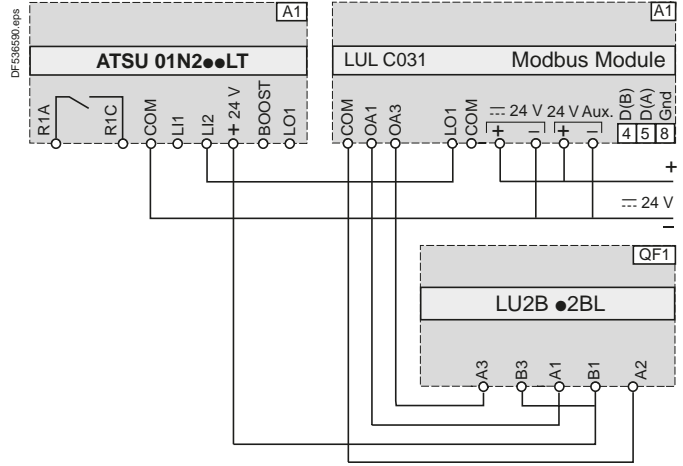
Function	Register	Bit	Value
Powering down TeSys U and ATSU			
–	704	0	0
Automatic control without deceleration			
Run	700	0	1
Stop	704	0	0
Automatic control with deceleration			
Run	700	0	1
Soft stop	700	0	0

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 U controller-starter with reversing unit

Automatic control with AS-Interface communication module, without deceleration
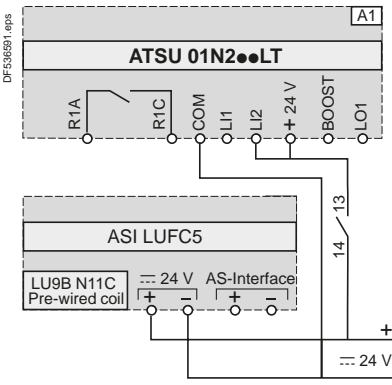
Without reversing unit   **With reversing unit**
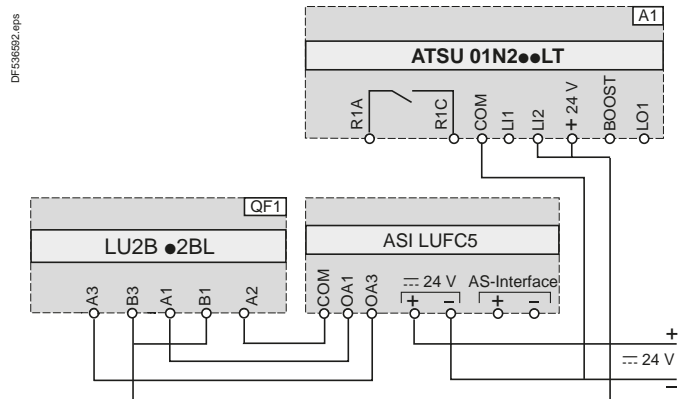
Function	Bit	Value
Power-up and automatic control without deceleration		
Run	D0	1
Stop	D0	0

A1: Soft start/soft stop 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 U controller-starter with reversing unit

TeSys motor starters - open version
Magnetic control unit for the protection of variable speed controllers and soft start units

S1 (mm² / AWG)

I >

S2 (mm² / AWG)   LUB ●●   LUCL●●

Altivar or Altistart

In
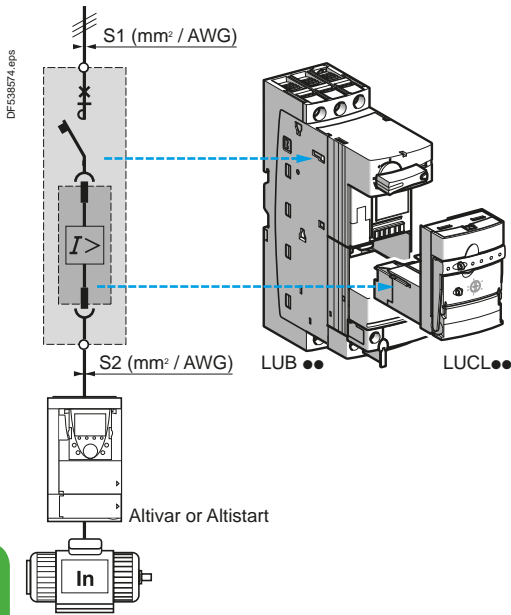
Presentation

When installed upstream of a variable speed controller or soft start unit,
control unit LUCL●●, used in conjunction with an LUB 12 or LUB 32 power base,
provides:
□ isolation,
□ short-circuit protection of the motor starter.
(variable speed controller-based or soft start unit-based motor starters).

Note: control unit LUCL, when used in conjunction with power base LUB 12 or LUB 32, conforms to standard IEC 60947-2.

Installation regulations

When the length of the cable between the TeSys U starter and the variable speed controller is more than 1.5 m, the c.s.a. of the cable between the variable speed controller and the TeSys U starter (S2) must be equal to the c.s.a. of the cable upstream of TeSys U (S1).

Description

1 Extraction and locking handle
2 Sealing of locking handle
3 Dial for magnetic adjustment of motor In
4 Locking of settings by sealing the transparent cover

References

Description	Line current of the variable speed controller or soft start unit	Reference (1)
	A	
Magnetic control unit	0.15…0.6	**LUCLX6●●**
	0.35…1.4	**LUCL1X●●**
	1.25…5	**LUCL05●●**
	3…12	**LUCL12●●**
	4.5…18	**LUCL18●●**
	8…32	**LUCL32●●**

(1) Standard control circuit voltage:

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 ±10 %.
(4) ---: 48…72 V, ∼: 48 V.
(5) ---: 110…220 V, ∼: 110…240 V.
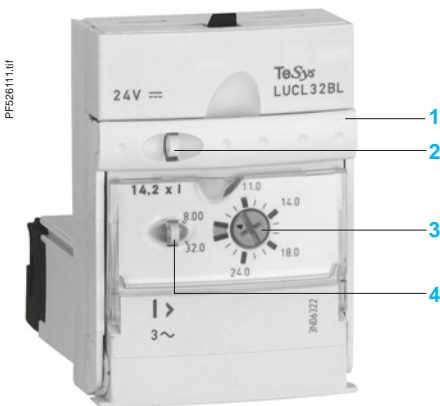
TeSys motor starters - open version
Magnetic control unit for the protection of variable speed controllers
and soft start stop units

Control unit and associated power base selection

Functions provided	Maximum motor power ratings 50/60 Hz			Power base reference	Control unit reference	Line current
	< 400/415 V	500 V	690 V			
	KW	KW	KW			A
■ Short-circuit protection ■ Manual reset	0.09	–	–	**LUB12 or LUB32**	**LUCLX6●●**	0.15…0.6
	0.25	–	–	**LUB12 or LUB32**	**LUCL1X●●**	0.35…1.4
	1.5	2.2	3	**LUB12 or LUB32**	**LUCL05●●**	1.25…5
	5.5	5.5	9	**LUB12 or LUB32**	**LUCL12●●**	3…12
	7.5	9	15	**LUB32**	**LUCL18●●**	4.5…18
	15	15	18.5	**LUB32**	**LUCL32●●**	8…32

Operating characteristics

| Control units		Standard	Advanced				Multifunction
		LUCA	LUCB	LUCC	LUCD	LUCL	LUCM
Thermal overload protection							
Over current protection		14.2 x the setting current					3 to 17 x the setting current
Short-circuit protection		13 x Ir max (max current setting)					
Protection against phase loss							
Protection against phase imbalance							
Earth fault protection (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 time							
Reset method	Manual						Parameters can be set
	Automatic or remote		With function module, or parameters can be set via the bus with a communication module (see page 24614/2).				Parameters can be set / Parameters can be set via the bus with a communication module (see page 24614/2).

Integrated function *Function provided with accessory*

Compatibility

Compatibility of control unit LUCL●● with		References	Functions
The starter-controller	Yes	LUB 12/LUB 32	Starter-controller (magnetic protection)
The starter	No	LUS 12/LUS 32	Starter without either magnetic or thermal overload protection)
The controller	No	LUT M	Controller (without thermal overload protection)
Add-on contact blocks with fault signalling and auxiliary contacts	Yes	LUA 1C11	Add-on contact blocks with fault signalling (1 N/O + 1 N/C)
		LUA 1C20	Add-on contact blocks with fault signalling (2 N/O)
		LUF N20	Auxiliary contacts (2 N/O)
		LUF N11	Auxiliary contacts (1 N/O + 1 N/C)
		LUF N02	Auxiliary contacts (2 N/C)
Communication modules	Yes	ASILUF C5 and ASILUF C51	AS-Interface communication modules
		LUF C00	Parallel wiring module
		LUL C07	Profibus DP communication module (1 output/2 inputs)
		LUL C08	CANopen communication module (1 output/2 inputs)
		LUL C09	DeviceNet communication module (1 output/2 inputs)
		LUL C15	Advantys STB communication module (1 output/2 inputs)
		LUL C031	Modbus communication module (1 output)
		LUL C033	Modbus communication module (1 output/2 inputs)
Function modules	No	LUF W10	Alarm function module
		LUF DH11	Thermal overload signalling module with manual reset
		LUF DA01	Thermal overload signalling module with automatic or remote reset (1 N/C)
		LUF DA10	Thermal overload signalling module with automatic or remote reset (1 N/O)
		LUF V2	Motor load indication module

TeSys U

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TeSys motor starters - open version
TeSys U starter-controllers

Characteristics of magnetic control unit LUCL			
Protection	Motor type		3-phase
	Conforming to standard		When used in conjunction with an LUB 12 or LUB 32 power base, magnetic control unit LUCL conforms to standard IEC 60947-2.
Short-circuit protection	Tripping threshold		14.2 x In (max. setting current)
	Tripping tolerance		±20 %
Environment			
Product certifications			CE
Conforming to standards			When used in conjunction an LUB power base, control unit LUCL conforms to standard 60947-2.
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3	V	690
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-2	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: 40
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/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/EN60068-2-27 [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 [2]
Resistance 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 60947-2		**Common mode**	**Serial mode**
	Uc ∼ 24…240 V, Uc ⎓ 48…220 V	kV	2	1
	Uc = 24 V ⎓		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.
(2) 2 gn with Advantys STB or CANopen communication modules.

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TeSys motor starters - open version
TeSys U starter-controllers
Power bases and LUCL magnetic control unit

Power circuit connection characteristics			LUB 12 + LUCL	LUB 32 + LUCL
Power base and control unit type			LUB 12 + LUCL	LUB 32 + LUCL
Connection to Ø4 mm screw clamp terminals				
Flexible cable without cable end	1 conductor	mm²	2.5…10	2.5…10
	2 conductors	mm²	1.5…6	1.5…6
Flexible cable with cable end	1 conductor	mm²	1…6	1…6
	2 conductors	mm²	1…6	1…6
Flexible cable without cable end	1 conductor	mm²	1…10	1…10
	2 conductors	mm²	1…6	1…6
Screwdriver			Philips n° 2 or flat screwdriver: Ø6 mm	
Tightening torque		N.m	1.9…2.5	1.9…2.5

Control circuit connection characteristics				
Connection to Ø3 mm screw clamp terminals				
Flexible cable without cable end	1 conductor	mm²	0.75…1.5	0.75…1.5
	2 conductors	mm²	0.75…1.5	0.75…1.5
Flexible cable with cable end	1 conductor	mm²	0.34…1.5	0.34…1.5
	2 conductors	mm²	0.34…1.5	0.34…1.5
Flexible cable without cable end	1 conductor	mm²	0.75…1.5	0.75…1.5
	2 conductors	mm²	0.75…1.5	0.75…1.5
Screwdriver			Philips n° 2 or flat screwdriver: Ø5 mm	
Tightening torque		N.m	0.8…1.2	0.8…1.2

Control circuit characteristics				
Rated control circuit voltage	∼ 50/60 Hz	V	24…240	24…240
	⎓	V	24…220	24…220
Voltage limits	⎓ 24 V (1)	V	20…27	20…27
Operation	∼ 24 V	V	20…26.5	20…26.5
	∼ or ⎓ 48…72 V	V	∼ 38.5…72. ⎓ 38.5…93	∼ 38.5…72. ⎓ 38.5…93
	∼ 110…240 V	V	∼ 88…264	∼ 88…264
	⎓ 110…240 V	V	⎓ 88…242	⎓ 88…242
Drop-out	⎓ 24 V	V	14.5	14.5
	∼ 24 V	V	14.5	14.5
	∼ or ⎓ 48…72 V	V	29	29
	∼ 110…240 V, ⎓ 110…220 V	V	55	55
Typical consumption	⎓ 24 V	mA	130	220
I max while closing	∼ 24 V	mA	140	220
	∼ or ⎓ 48…72 V	mA	280	280
	∼ 110…240 V, ⎓ 110…220 V	mA	280	280
I rms sealed	⎓ 24 V	mA	60	80
	∼ 24 V	mA	70	90
	∼ or ⎓ 48…72 V	mA	35	45
	∼ 110…240 V, ⎓ 110…220 V	mA	35	25
Heat dissipation		W	2	3
Operating time	Closing	ms	24 V: 70; 48 V: 60; ≥ 72 V: 50	24 V: 70; 48 V: 60; ≥ 72 V: 50
	Opening	ms	35	35
Resistance to micro-breaks		ms	3	3
Resistance to voltage dips	IEC/EN 61000-4-11		At least 70 % of Uc for 500 ms	
Mechanical durability	In millions of operating cycles		15	15
Maximum operating rate	In operating cycles per hour		3600	3600

Main pole characteristics										
Number of poles			3						3	
Isolation conforming to IEC/EN 60947-1	Possible		Yes						Yes	
	Padlocking		1 padlock with Ø6.9 mm shank						1 padlock with Ø6.9 mm shank	
Rated thermal current		A	12						32	
Rated operational current (Ue ≤ 440 V)	Conforming to IEC/EN 60947-2	Category AC-41	θ ≤ 70 °C: 12 A						θ ≤ 70 °C: 32 A	
		Category AC-43	θ ≤ 70 °C: 12 A						θ ≤ 70 °C: 32 A	
Rated operational voltage		V	690 (3)						690 (3)	
Frequency limits	Of the operating current	Hz	40…60						40…60	
Power dissipated in the power circuits	Operational 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		600	
		kA	50		50		10		4	
Total breaking time		ms	2		2		2			
Thermal limit	With Isc max on 440 V	kA²s	90						120	

(1) d.c. voltage with maximum ripple of ± 10 %.
(2) No consumption sealed.
(3) For 690 V, use phase barrier LU9SP0.

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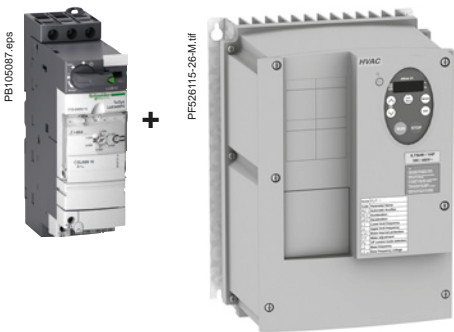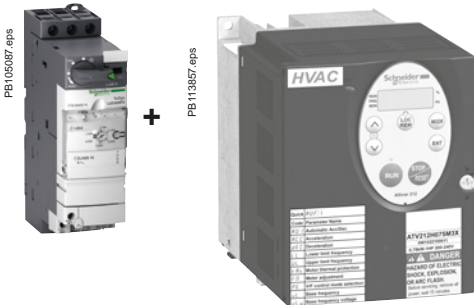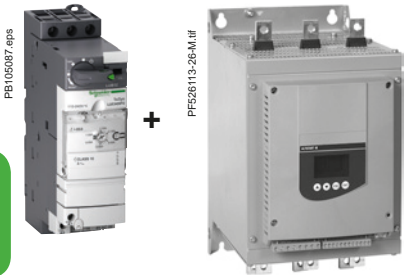
Coordination

The standard defines tests at different levels of current; the purpose of these tests is to place the equipment in extreme conditions.

The standard defines 2 types of coordination, according to the condition of the components after testing: type 1 and type 2.
Type 1 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must not be able to resume operation without repair or the replacement of parts.

The product combinations given below provide type 1 coordination

Soft start-soft stop unit/TeSys U starter controller combination with magnetic protection

TeSys U / Altistart 48: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Soft start unit reference	
		Class 10	Class 20
5.5	LUB32 + LUCL32 or LUCL18	–	ATS48D17
7.5	LUB32 + LUCL32	ATS48D17	ATS48D22
11	LUB32 + LUCL32	ATS48D22	ATS48D32
15	LUB32 + LUCL32	ATS48D32	ATS48D38

Variable speed controller/TeSys U starter controller combination with magnetic protection

TeSys U / Altivar 21 UL Type 1/IP 20: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	**ATV21H075N4**
		ATV21HU15N4
2.2	LUB12 + LUCL12	**ATV21HU22N4**
3	LUB12 + LUCL12	**ATV21HU30N4**
4	LUB12 + LUCL12	**ATV21HU40N4**
5.5	LUB32 + LUCL32 or LUCL18	**ATV21HU55N4**
7.5	LUB32 + LUCL32 or LUCL18	**ATV21HU75N4**
11	LUB32 + LUCL32	**ATV21HD11N4**
15	LUB32 + LUCL32	**ATV21HD15N4**

TeSys U / Altivar 21 IP 54: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	**ATV21W075N4/N4C**
1.5	LUB12 + LUCL12 or LUCL05	**ATV21WU15N4/N4C**
2.2	LUB12 + LUCL12	**ATV21WU22N4/N4C**
3	LUB12 + LUCL12	**ATV21WU30N4/N4C**
4	LUB12 + LUCL12	**ATV21WU40N4/N4C**
5.5	LUB32 + LUCL32 or LUCL18	**ATV21WU55N4/N4C**
7.5	LUB32 + LUCL32 or LUCL18	**ATV21WU75N4/N4C**
11	LUB32 + LUCL32	**ATV21WD11N4/N4C**
15	LUB32 + LUCL32	**ATV21WD15N4/N4C**

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Variable speed controller/TeSys U starter controller combination with magnetic protection (continued)
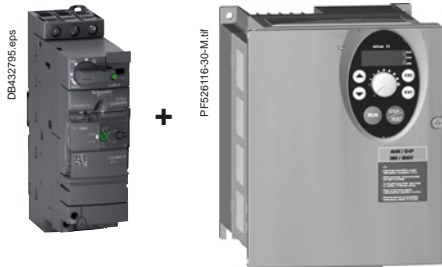
TeSys U / Altivar 31: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.37	LUB12 + LUCL05	ATV31H037N4
0.55	LUB12 + LUCL05	ATV31H055N4
0.75	LUB12 + LUCL05	ATV31H075N4
1.1	LUB12 + LUCL12	ATV31HU11N4
1.5	LUB12 + LUCL12	ATV31HU15N4
2.2	LUB12 + LUCL12	ATV31HU22N4
3	LUB32 + LUCL18	ATV31HU30N4
4	LUB32 + LUCL18	ATV31HU40N4
5.5	LUB32 + LUCL32	ATV31HU55N4
7.5	LUB32 + LUCL32	ATV31HU75N4

TeSys U / Altivar 61: type 1 coordination

Power 400V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	ATV61H075N4
1.5	LUB12 + LUCL12	ATV61HU15N4
2.2	LUB12 + LUCL12	ATV61HU22N4
3	LUB32 + LUCL18	ATV61HU30N4
4	LUB32 + LUCL18	ATV61HU40N4
5.5	LUB32 + LUCL32	ATV61HU55N4
7.5	LUB32 + LUCL32	ATV61HU75N4

TeSys U / Altivar 71: type 1 coordination

Power 400V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	ATV71H075N4
1.5	LUB12 + LUCL12	ATV71HU15N4
2.2	LUB12 + LUCL12	ATV71HU22N4
3	LUB32 + LUCL18	ATV71HU30N4
4	LUB32 + LUCL18	ATV71HU40N4
5.5	LUB32 + LUCL32	ATV71HU55N4

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