

	Function performed	Function not performed	Function not performed	Function not performed
<b>Selectable overload class</b>				
<b>Detection of overtorque, no-load running, long starting times</b>				
<b>Earth fault protection (equipment protection only)</b>				
<b>Protection against phase imbalance</b>				
<b>Protection against phase loss</b>				
<b>Fault differentiation</b>				With contact block
<b>Reset on thermal overload</b>	Manual or automatic	Manual	Manual or automatic	Manual
<b>Alarms (thermal overload, overcurrent, ...)</b>				
<b>Indication of motor load</b>				
<b>Protection function parameter entry</b>				
<b>"Log" function, monitoring</b>				
<b>Remote motor starter status and commands via serial or parallel link</b>				
<b>Motor starter management via serial link (status, commands, selection and parameter entry for alarms, log, monitoring)</b>			Modbus port built-in	
<b>Isolation function</b>				
<b>Protection against overloads and short-circuits</b>				
<b>Power at 400 V</b>				
<i>With circuit-breaker</i>	0.06...75 kW	30...450 kW	0.06...450 kW	0.06...110 kW
<i>With fuses</i>	0.06...75 kW	30...450 kW	0.06...450 kW	

Magnetic circuit-breaker or fuses



Magnetic circuit-breaker or fuses



Magnetic circuit-breaker or fuses



Thermal magnetic circuit-breaker



Contactor



Contactor



Contactor



Contactor



Thermal overload relay



Electronic thermal overload relay

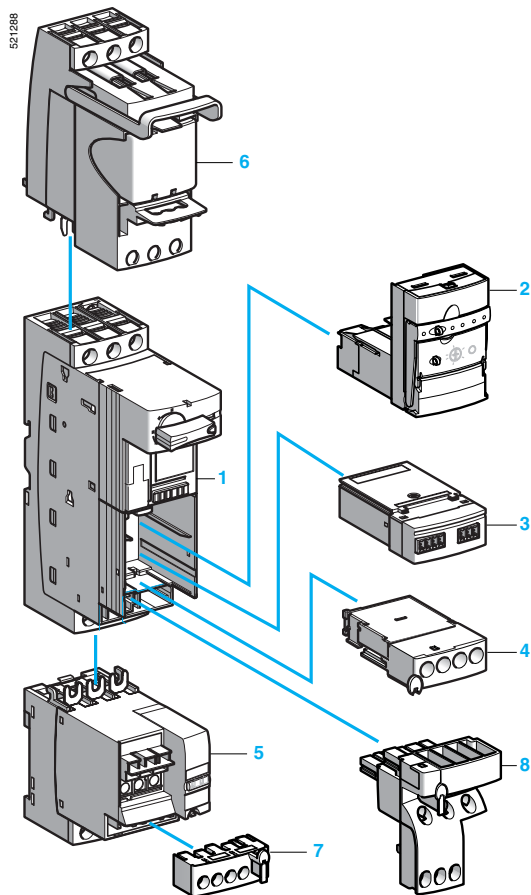


Multifunction protection relay





# TeSys Model U Starter-controllers



## Presentation

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

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

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

## Basic starter-controller

Consists of a power base and a control unit.

### Power base 1

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

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

### Control units 2

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

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

The control units are interchangeable without rewiring and without using tools. They have a wide range of adjustment (0.25 - 1.0 x In) and low heat dissipation.

## Control options

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

### Function modules 3

Must be used with advanced control units.

4 types are available:

- thermal overload alarm (LUF W10),
- fault differentiation and manual reset (LUF DH20),
- fault differentiation and automatic or remote reset (LUF DA10),
- indication of motor load (LUF V), which can also be used with the multifunction control unit.

All information processed by these modules is available on digital contacts.

### Communication modules 3

The information processed is exchanged:

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

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

### Auxiliary contact modules (LUFN) 3

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

### Add-on contact blocks 4

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

## Power options

### Reverser block 5

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

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

### Limiter-disconnector LUA LB 6

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

## Setting-up accessories

### Plug-in terminal blocks 7

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

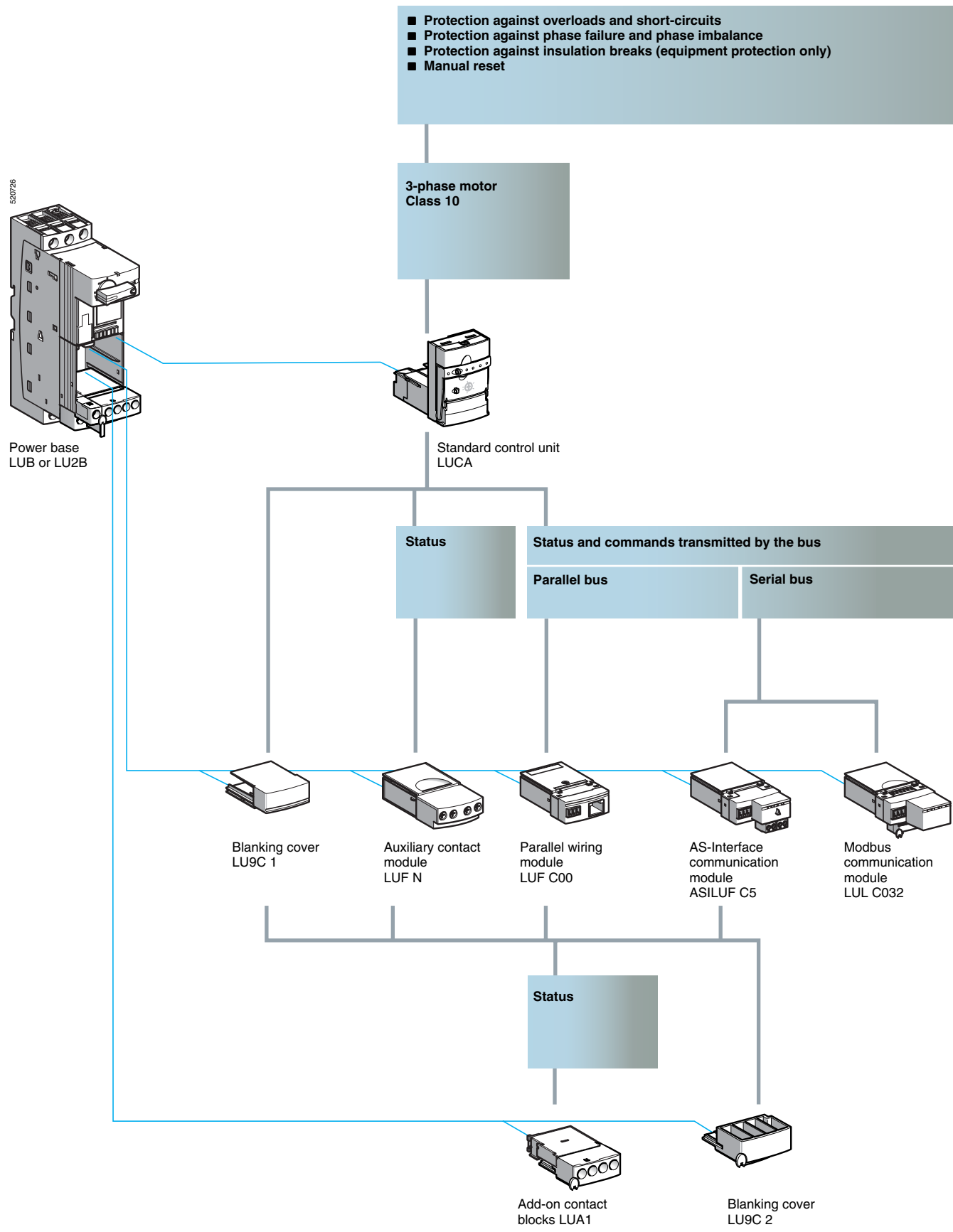
### Control circuit wiring system 8

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

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

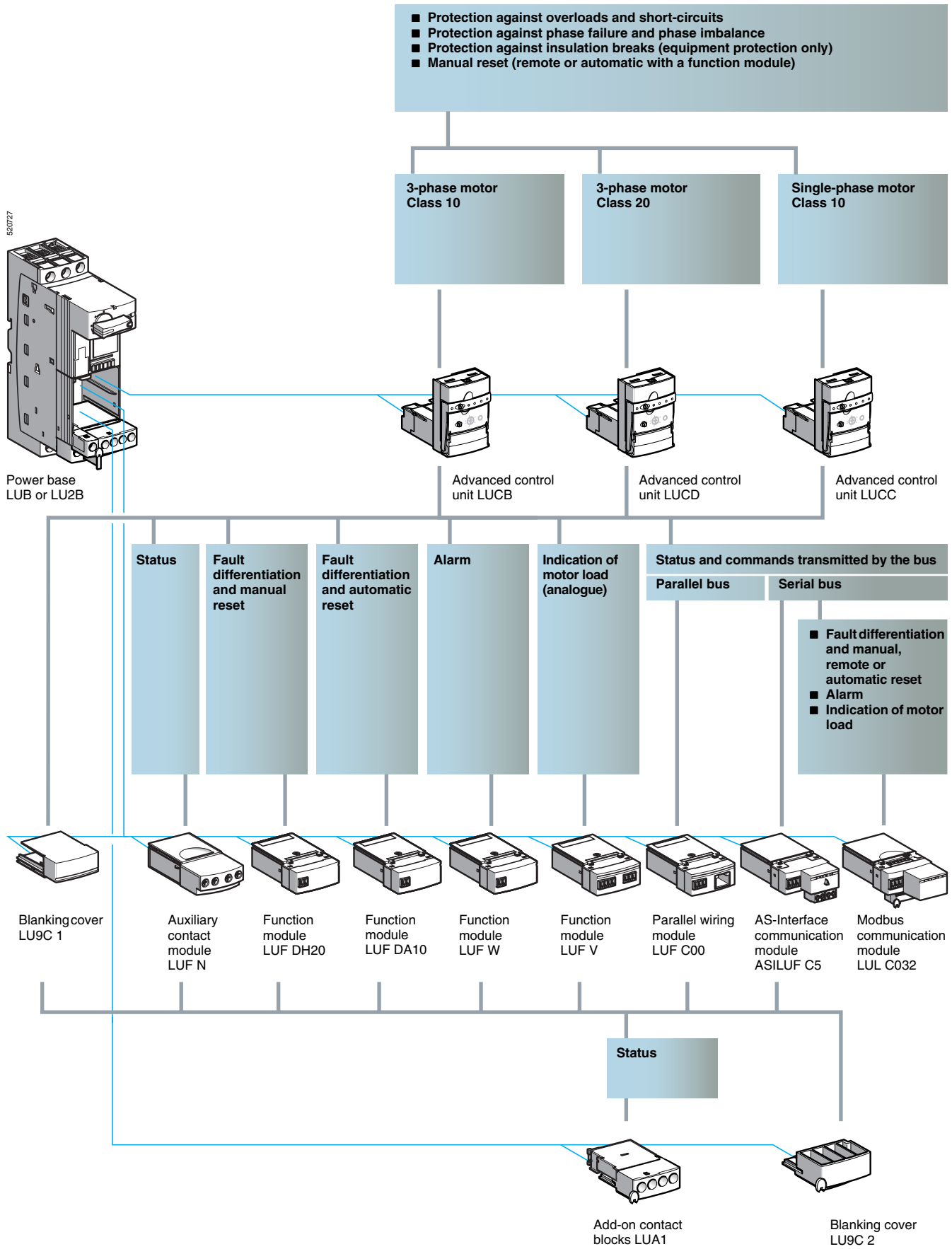
# TeSys Model U

## Starter-controllers with standard control unit



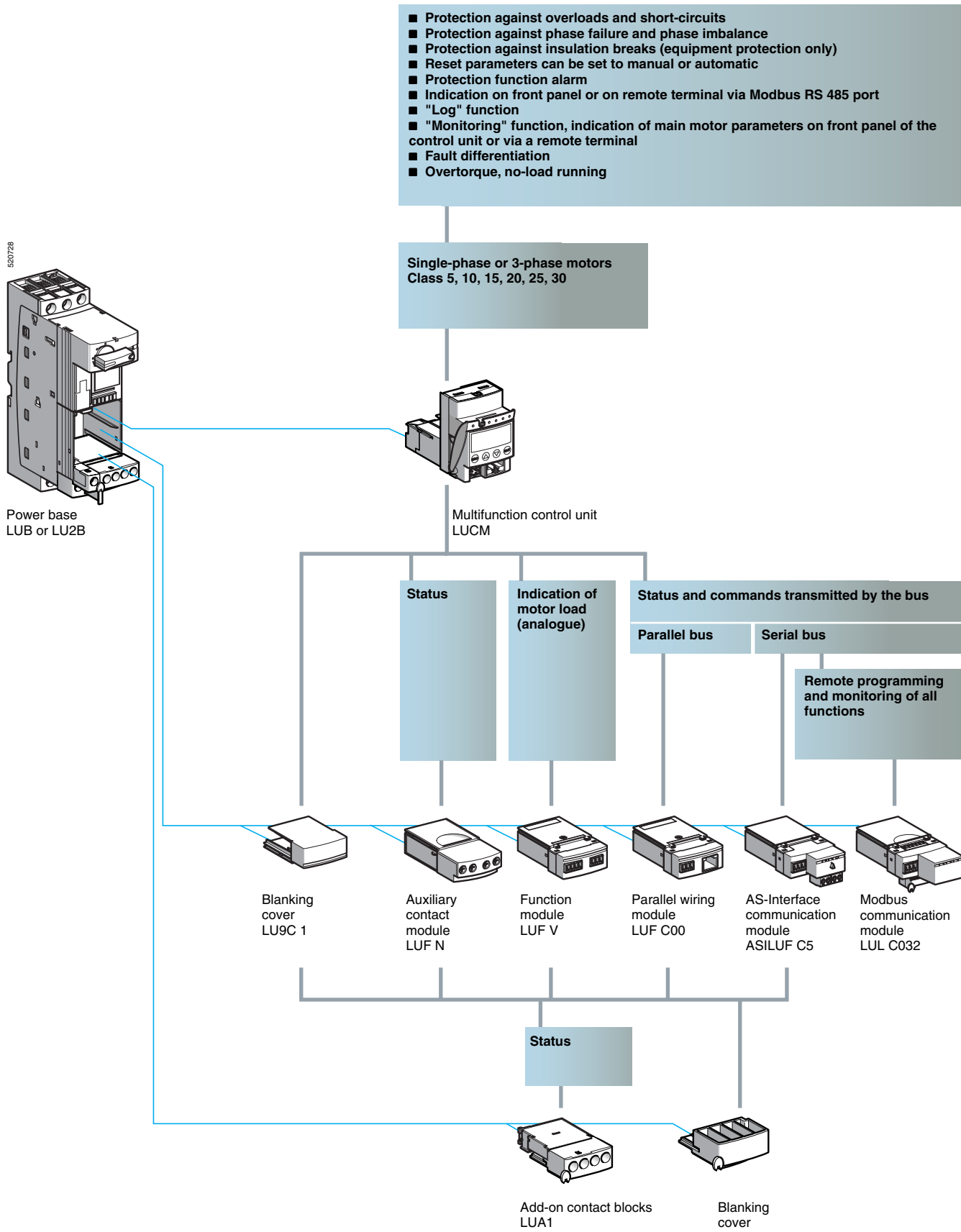
# TeSys Model U

## Starter-controllers with advanced control unit



# TeSys Model U

## Starter-controllers with multifunction control unit





### Application

Starting and protection of a pump.

### Operating conditions

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

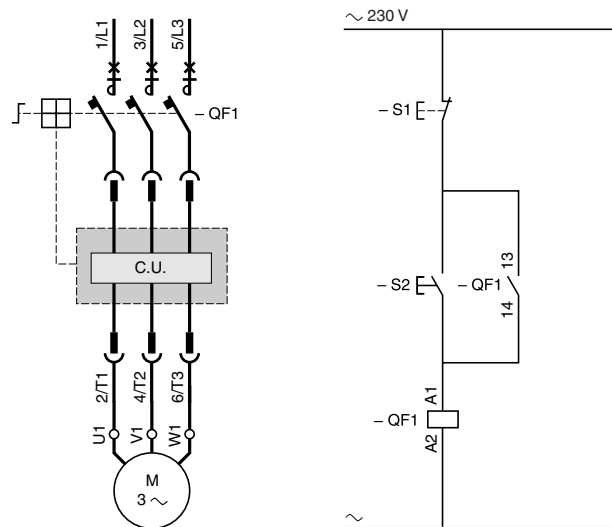
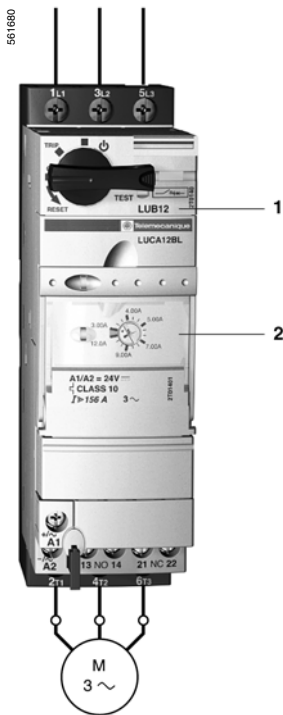
### Products used

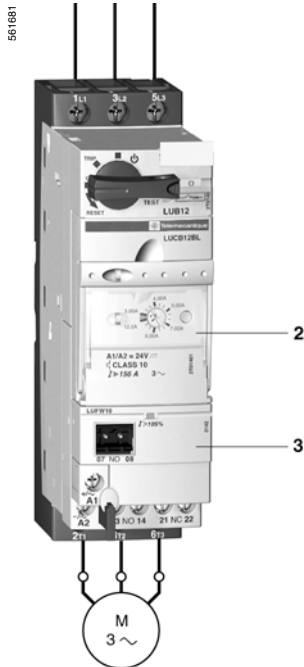
Products used	Item	Quantity	Reference	Page
Power base 12 A with screw clamp connections	1	1	LUB 12	14
Standard control unit	2	1	LUCA 12FU	19

### Functions performed

- Short-circuit protection with level of protection of 50 kA at 400 V.
- Total coordination of protection devices conforming to EN 60947-6-2 (continuity of service) in case of a short-circuit.
- Electronic protection against thermal overloads with an adjustment range of 0.25 - 1.0 x In.
- Load switching (2 million operating cycles in category AC-43 at In).
- Indication of motor status by N/C or N/O contact.
- Interlock between the motor starter control and the selector switch position; not possible to start the motor when the switch is in the OFF position.

### Scheme





### Application

**Expansion** of an existing installation to meet the operating conditions described below.

### Operating conditions

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

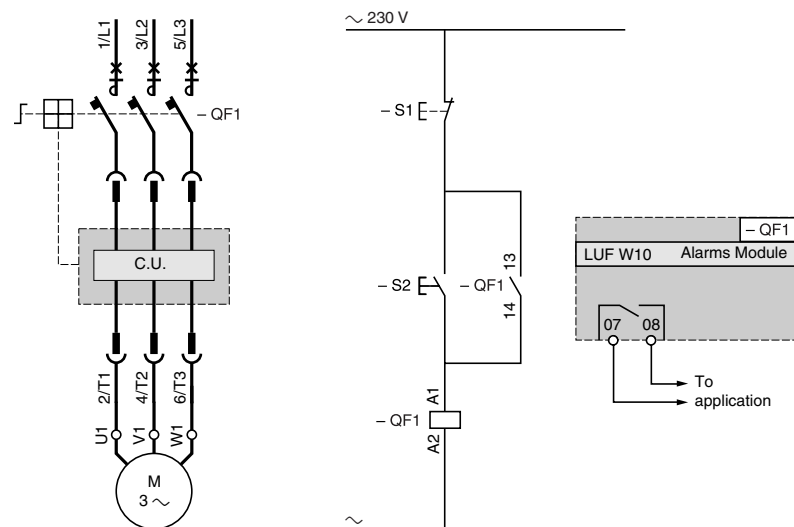
### Additional products used

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

### Functions performed

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

### Scheme



### Other versions

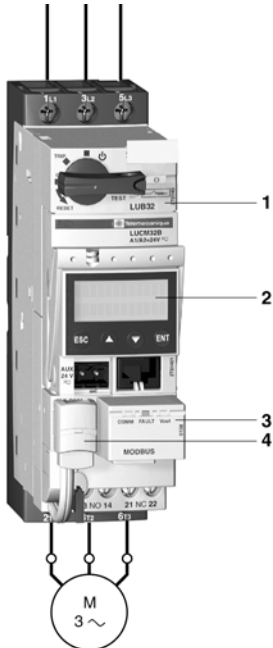
The advanced control unit can provide other functions, depending on the type of function modules used (instead of the LUF W module described above) :

- fault differentiation with function module LUF DA10 or LUF DH20,
- indication of motor load with function module LUF V2. This module delivers a 4-20 mA, analogue signal which is proportional to the average 3-phase current drawn by the motor. This allows the load current to be monitored and provides access to other application functions using this value, or to predictive or preventive maintenance possibilities (replacement of the motor before it breaks down).

▲ Available 1<sup>st</sup> quarter of 2004.



520609



510301

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

## Application

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

## Operating conditions

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

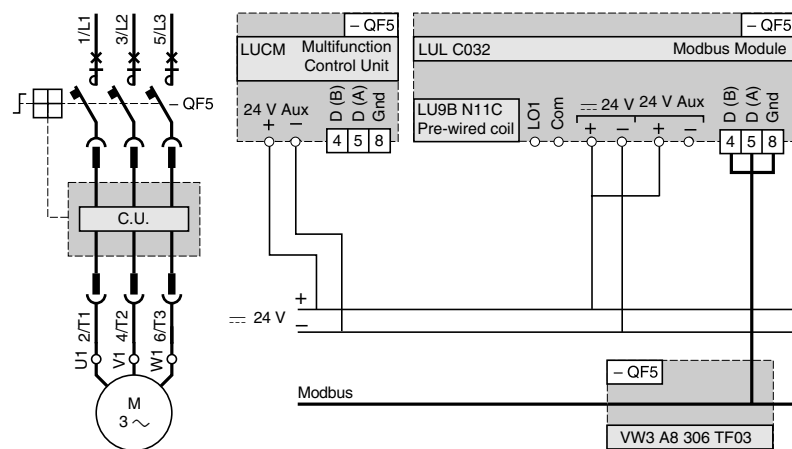
## Products used

Products used	Item	Quantity	Reference	Page
Power base 32 A without connections	1	1	LUB 320	14
Multifunction control unit	2	1	LUCM 32BL	20
Modbus communication module	3	1	LUL C032	30
Pre-wired coil connection	4	1	LU9B N11C	31
Connection of communication module output terminals to the coil terminals				
Connection cable for connecting the communication module to the serial bus	-	1	VW3 A8 306 R●●	31
T-junction	-	1	VW3 A8 306 TF03	31

## Functions performed

- Short-circuit protection with level of protection of 50 kA at 400V.
- Total coordination of protection devices conforming to EN 60947-6-2 (continuity of service) in case of a short-circuit.
- Electronic protection against thermal overloads with an adjustment range of 0.25 - 1.0 xIn.
- Load switching (1.5 million operating cycles in category AC-43 at In).
- Measurement of load current and detection of no-load running by the multifunction control unit.
- Interlock between the motor starter control and the selector switch position; not possible to start the motor when the switch is in the OFF position.
- No-load running or operation under load. To use this function, the following parameters must be entered :
  - trip : the answer yes/no enables or disables the function,
  - time before tripping : the time period during which the value of the current must be below the tripping threshold in order to cause tripping (adjustable from 1 to 200 s).
  - tripping threshold : value as a % of the load current ratio in relation to the setting current. If the ratio remains below this threshold for the time specified in the previous parameter, the product trips (adjustable from 30 to 100 %).
- Indication of the various motor starter status and currents.

## Schemes



## Other functions

The multifunction control unit incorporates other control and protection functions, such as : monitoring and control of phase current, alarm, ...  
Module LUL C032 also provides a programmable output.

520987



### Application

Starting and control of a packing machine conveyor belt.

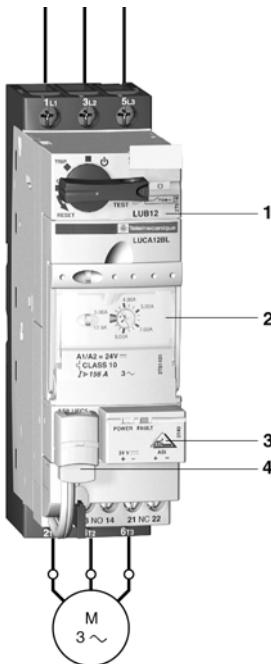
### Operating conditions

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

### Products used

Products used	Item	Quantity	Reference	Page
Power base 12 A without connections	1	1	LUB 120	14
Standard control unit	2	1	LUCA 1XBL	19
AS-Interface communication module	3	1	ASILUF C5	28
Tap-off for connecting the communication module to the serial bus	-	1	XZ CG0142	29
Pre-wired coil connection Connection of communication module output terminals to the coil terminals	4	1	LU9B N11C	29

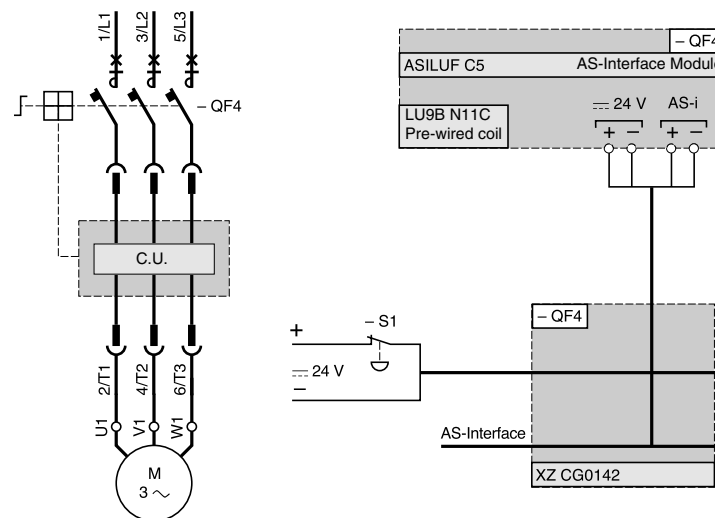
521489



### Functions performed

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

### Scheme



# TeSys U Starter-controllers



520971

### Application

Manual control of a 2-position turntable.

### Operating conditions

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

### Products used

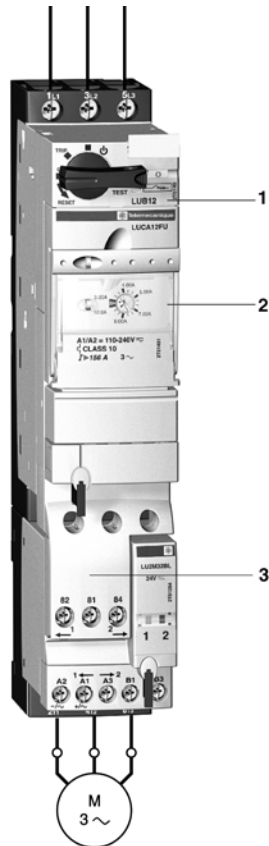
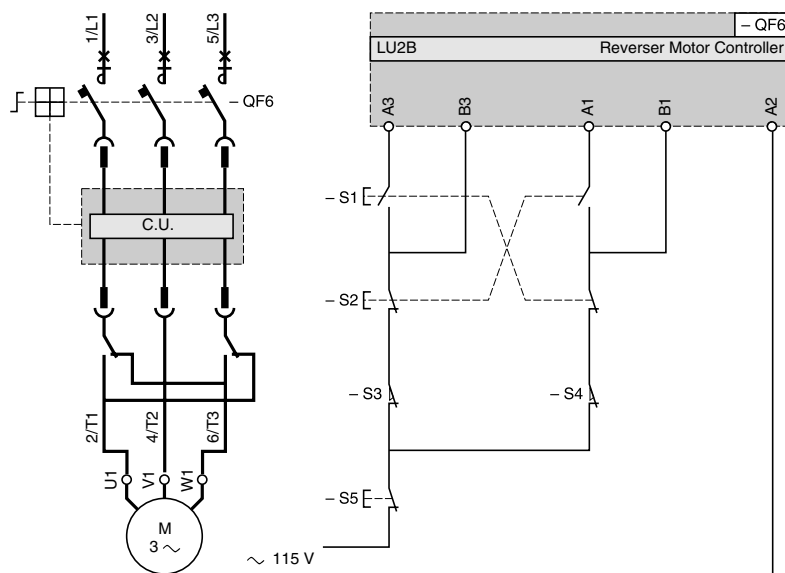
Products used	Item	Quantity	Reference	Page
Power base reversing, 12 A with screw clamp connections	1	1	LU2B 12FU	15
Standard control unit	2	1	LUCA 12FU	19

### Functions performed

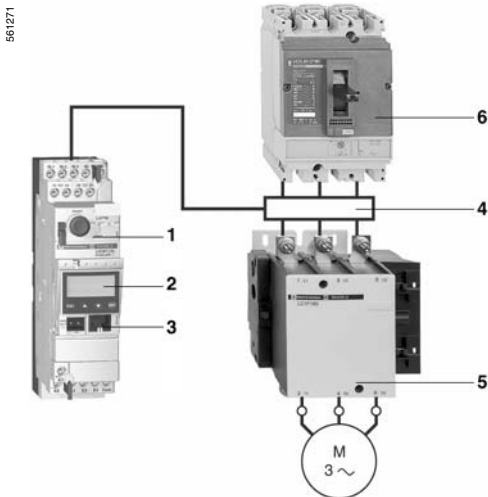
- Short-circuit protection with level of protection of 50 kA at 400V.
- Total coordination of protection devices conforming to EN 60947-6-2 (continuity of service) in case of a short-circuit.
- Electronic protection against thermal overloads with an adjustment range of 0.25 - 1.0 x In.
- Load switching (2 million operating cycles in category AC-43 at In).
- Interlock between the motor starter control and the selector switch position; not possible to start the motor when the switch is in the OFF position.

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

### Scheme (manual control)



561684



**Application**

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

**Operating conditions**

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

**Products used**

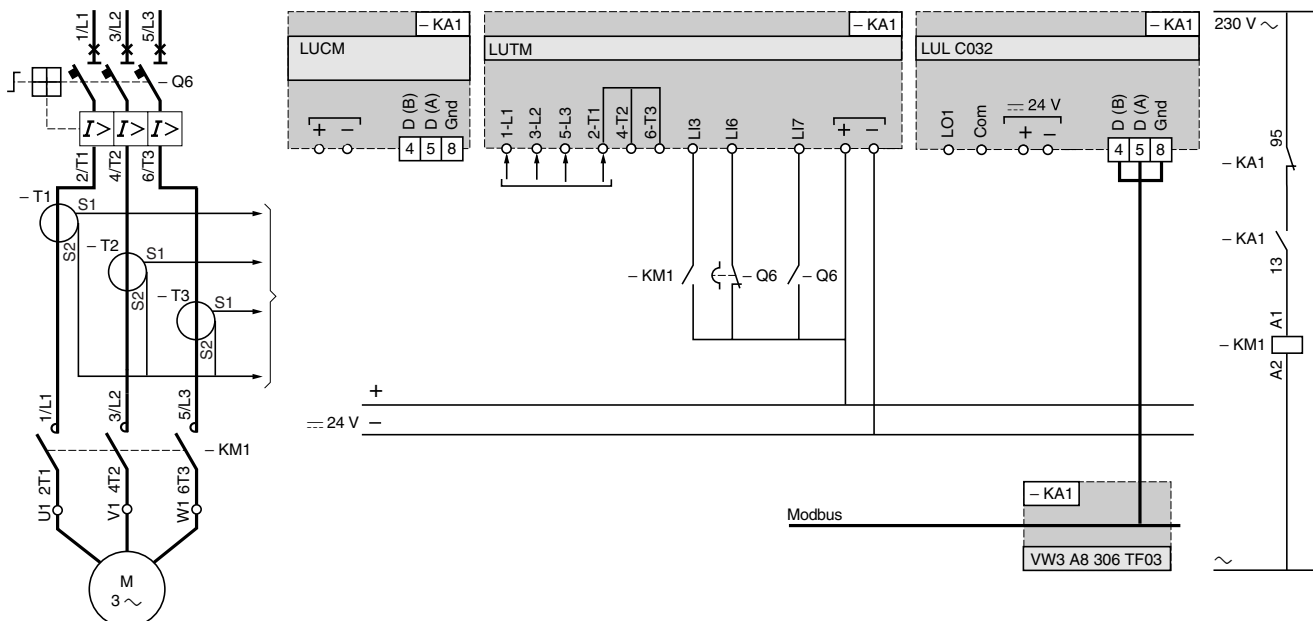
Products used	Item	Quantity	Reference	Page
Controller	1	1	LUT M	25
Multifunction control unit	2	1	LUCM T1BL	25
Modbus communication module	3	1	LUL C032 ▲	30
Current transformers	4	3	LUT C4001	25
Contacteur	5	1	LC1 F185P7	-
Circuit-breaker	6	1	NS 250HMA	-

**Functions performed**

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

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

**Scheme**



**Other functions**

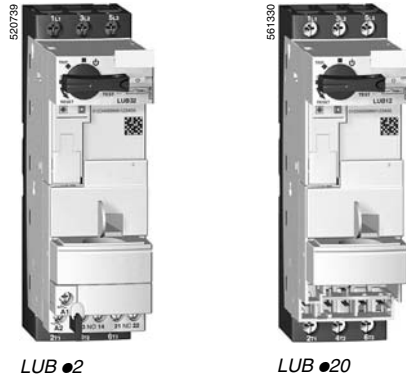
The multifunction control unit incorporates other control and protection functions, such as : monitoring and control of phase currents, alarm, ...

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

# TeSys Model U

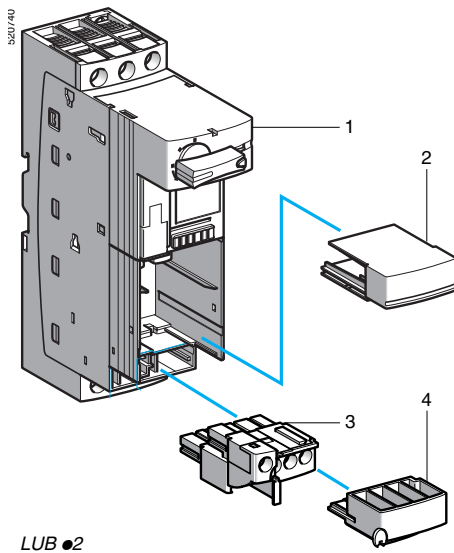
## Starter-controllers

### Non-reversing power bases



LUB 02

LUB 020



LUB 02

Two versions of control connection are available:

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

#### Power bases for non-reversing D.O.L. starting <sup>(1)</sup>

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

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

They must be used in conjunction with a control unit, see pages 18 to 20.

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

#### For use with high density PLC cards (100 mA)

Must be used with 24 V control units, LUC ● ●BL

Screw terminals	Screw terminals	Item	12	12	9	Reference	Weight
Screw terminals	Screw terminals	1 + 2 + 3 + 4	12	12	9	LUB 12BH ▲	0.900
			32	23	21	LUB 32BH ▲	0.900
Without connections	Without connections	1 + 2	12	12	9	LUB 120BH ▲	0.865
			32	23	21	LUB 320BH ▲	0.865

#### Terminal blocks for power bases without connections

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

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

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

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

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

**Other versions** Power bases without built-in short-circuit protection device (short-circuit protection by circuit-breaker or separate fuses).  
Please call our Customer Information Centre on 0870 608 8 608.

▲ Available Qtr 4 2004

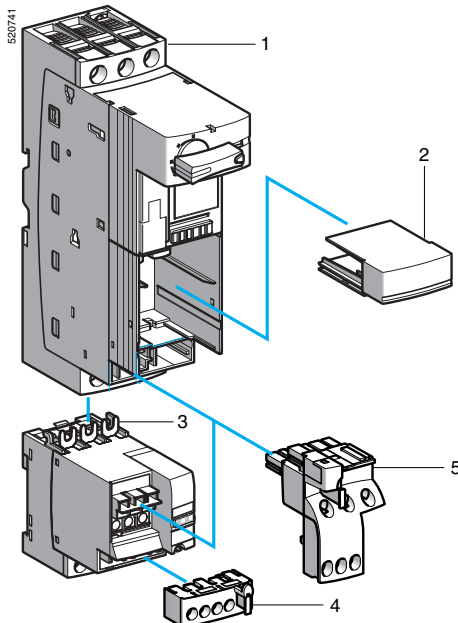
# TeSys Model U

## Starter-controllers

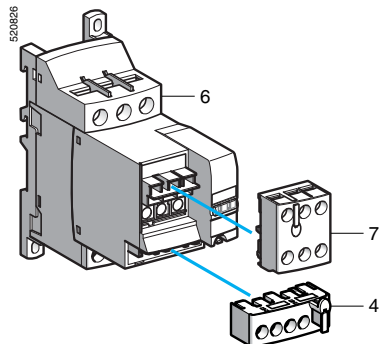
### Reversing power bases



LU2B ●2



LU2B ●2



LU6M + LU9 M1 + LU9M R1

Two versions of control connection are available:

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

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

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

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

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

#### For use with high density PLC cards (100 mA)

Must be used with 24 V control units, LUC● ●●BL

Screw terminals	Screw terminals	1 + 2 + 3	12	12	9	LU2B 12BH ▲	1.270
		+ 4 + 5	32	23	21	LU2B 32BH ▲	1.270
	Without connections	1 + 2 + 3	12	12	9	LU2B A0BH ▲	1.270
		+ 5	32	23	21	LU2B B0BH ▲	1.250

#### Power bases for reversing D.O.L. starting, mounted by the customer

A reverser block should preferably be combined with a non-reversing power base without connections to create a reversing starter-controller. The built-in N/O (13-14) and N/C (21-22) contacts are used for electrical interlocking between the reverser block and the base; they are therefore no longer available as output contacts.

The reverser block has a C/O common point contact (81-82-84) which indicates non-reversing and reversing operating status.

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

(screw or rail fixing)

#### Accessories

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

#### Control circuit pre-wiring components

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

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

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

Standard control circuit voltages :

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

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

(4) ≡ : 48...72 V, ~ : 48 V.

(5) ≡ : 110...220 V, ~ : 110...240 V.

**Other versions** Power bases without built-in short-circuit protection device (short-circuit protection by circuit-breaker or separate fuses). Please call our Customer Information Centre on 0870 608 8 608.

▲ Available Qtr 4 2004

Characteristics :  
pages 34 and 35

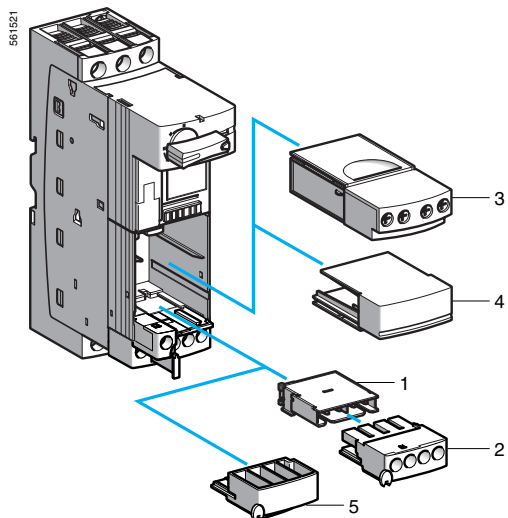
Dimensions :  
pages 48 and 49

Schemes :  
pages 50 to 54

Contact states							
Product status	Position of control handle	Indication on front panel	N/O pole contact	N/C pole contact	N/O contact any fault	N/C contact any fault	⊕ N/O contact product ready
References of add-on contact blocks and auxiliary contact modules Terminal referencing	–	–	LUA1 D11 53-54	LUF N11 31-32	LUA1 C20 97-98	LUA1 C11 95-96	LUA1 C20 17-18
	or	–	LUA1 D110 no terminal block	LUF N02 31-32 41-42	–	LUA1 C110 no terminal block	LUA1 C200 no terminal block
	or	–	LUF N20 33-34 43-44	LU9B N11 21-22	–	LUA1 D11 95-96	LUA1 C11 17-18
	or	–	LUF N11 43-44	–	–	LUA1 D110 no term. block	–
	or	–	LU9B N11 13-14	–	–	–	–
Off	OFF	0					
Ready to operate		0					
Running		1					
Tripped on short-circuit	TRIP	I >>					
Tripped on thermal overload	Manual reset mode	TRIP					
	Automatic reset on thermal overload mode						
	Remote reset mode						

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

## References



LUB + LUA1 + LUF N

Add-on contact blocks					
Signalling and composition	Connection	Item	Reference	Weight	kg
1 N/C fault signalling contact (95-96) and 1 N/O contact (53-54) indicating status of starter-controller power poles	Screw terminals	1 + 2	LUA1 D11 ▲	0.030	
1 N/O contact (53-54) indicating status of starter-controller power poles	Without connections	1	LUA1 D110 ▲	0.012	
1 N/C fault signalling contact (95-96) and 1 N/O contact (17-18) indicating control handle in "ready" position ⊕	Screw terminals	1 + 2	LUA1 C11 ▲	0.030	
1 N/O contact (17-18) indicating control handle in "ready" position ⊕	Without connections	1	LUA1 C110 ▲	0.012	
1 N/O fault signalling contact (97-98) and 1 N/O contact (17-18) indicating control handle in "ready" position ⊕	Screw terminals	1 + 2	LUA1 C20	0.030	
1 N/O contact (17-18) indicating control handle in "ready" position ⊕	Without connections	1	LUA1 C200	0.012	
Auxiliary contact modules for connection by screw clamp terminals					
Module with 2 contacts indicating the state of the starter-controller power poles					
Application : ~ or = 24...250 V, Ith : 5 A					
Composition	Item	Reference	Weight	kg	
2 NO contacts (33-34 and 43-44)	3	LUF N20	0.050		
1 NC contact (31-32) and 1 NO contact (43-44)	3	LUF N11	0.050		
2 NC contacts (31-32 and 41-42)	3	LUF N02	0.050		
Accessories					
Description	For use on	Item	Reference	Weight	kg
Screw clamp terminal blocks	LUA1 D110	2	LU9B D11 ▲	0.022	
	LUA1 C110	2	LU9B C11 ▲	0.022	
	LUA1 C200	2	LU9B C20	0.022	
Blanking covers	Location for auxiliary contact, communication or function module	4	LU9C 1	0.020	
	Location for add-on contact blocks	5	LU9C 2	0.010	

▲ Available Qtr 4 2004.

Characteristics :  
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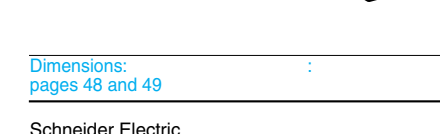
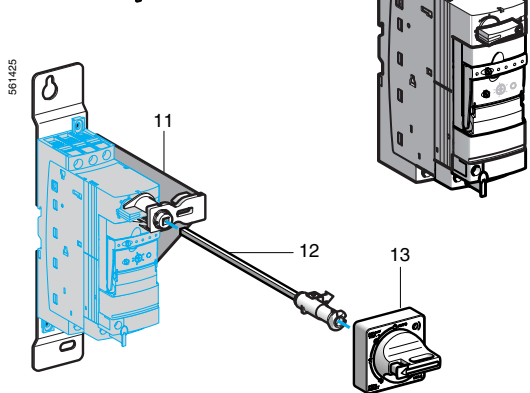
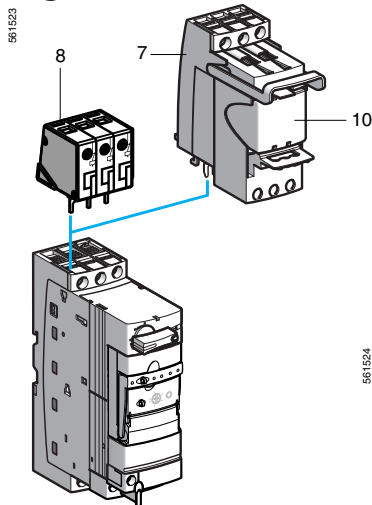
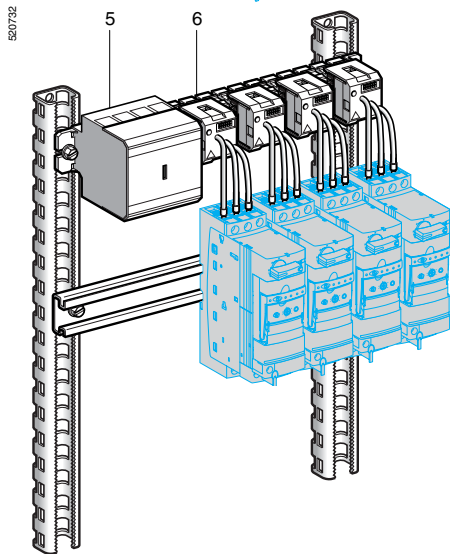
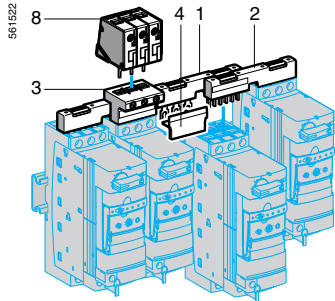
Schemes :  
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## References

# TeSys Model U

## Starter-controllers

Power connection pre-wired system, limiter blocks and accessories



### Pre-wired system for power connections up to 63 A

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

### Pre-wired system for power connections up to 160 A

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

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

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

#### Removable 3-phase power sockets

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

### Limiter blocks and accessories

Application	Item	Breaking capacity Iq		Mounting	Unit reference	Weight kg
		≤ 440 V	690 V			
Limiter-disconnector (2)	7 + 10	130	70	Direct on power base	LUA LB1 (1)▲	0.310
Current limiters (2)	-	100	35	Separate	LA9 LB920	0.320
Limiter cartridge	10	70	15	Direct on power base	GV1 L3 (3)	0.130
Limiter cartridge	10	130	70	Limiter-disconnector	LUA LF1▲	0.135
Clip-in marker holder	-	-	-	On power base, on reverser block, on parallel link splitter box	LAD 90 (4)	0.001

### Phase barriers

Phase barrier LU9 SP0 must be used:

■ To build a UL 508 type E certified starter (Self Protected Starter). Without the phase barrier, the starter-controller is certified UL 508.

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

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

### Door interlock mechanisms

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

(1) Supplied with limiter cartridge.

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

(3) Use a GV2 G05 terminal block for mounting on the busbar system.

(4) Sold in lots of 100.

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

▲ Available Qtr 3 2004

Dimensions:  
pages 48 and 49