TeSys Model U
Starter-controllers
Control units

Function characteristics

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

With function modules *(2)*

Thermal overload alarm		With module LUF W	
Fault differentiation and manual reset		With module LUF DH20	
Fault differentiation and automatic reset		With module LUF DA10	
Indication of motor load (analogue)		With module LUF V	

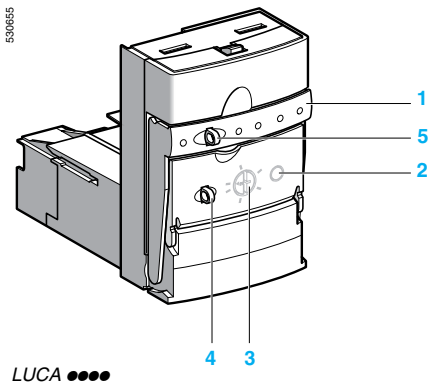
With communication module or via Modbus port on control unit LUCM *(2)*

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

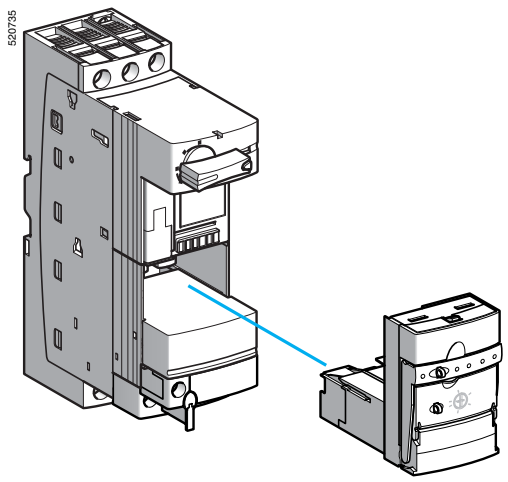
Built-in function *Function provided with accessory*

(1) PDA : Personal Digital Assistant.
*(2) Mounting possibilities: 1 function module **or** 1 communication module.*

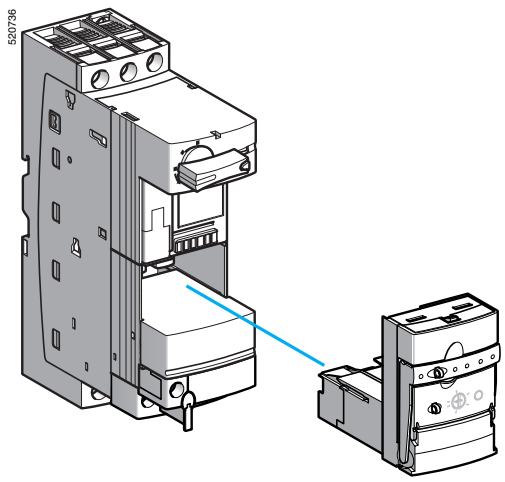
TeSys Model U
Starter-controllers
Standard and advanced control units



LUCA ●●●●
LUCB ●●●●



LUB ●2 + LUCA ●●●●



LUB ●2 + LUCB ●●●●

Description

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

Standard control units

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

Advanced control units

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

Class 10 for 3-phase motors

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

Class 10 for single-phase motors

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

Class 20 for 3-phase motors

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

(1) Standard control circuit voltages :

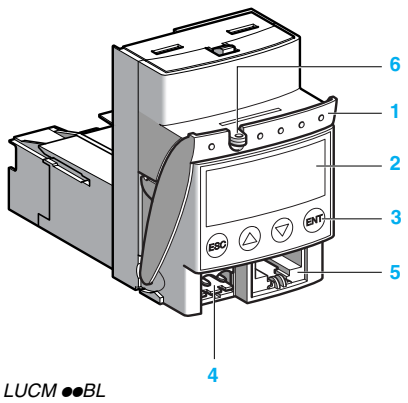
Volts	24	48…72	110…240
⎓	BL *(2), (3)*	–	–
∿	B	–	–
⎓ or ∿	–	ES *(4)*	FU *(5)*

(2) Voltage code to be used for a starter-controller with communication module.
(3) d.c. voltage with maximum ripple of ± 10 %.
(4) ⎓ : 48…72 V, ∿ : 48 V.
(5) ⎓ : 110…220 V, ∿ : 110...240 V.

Characteristics : pages 34 and 35
Schemes : pages 50 to 54

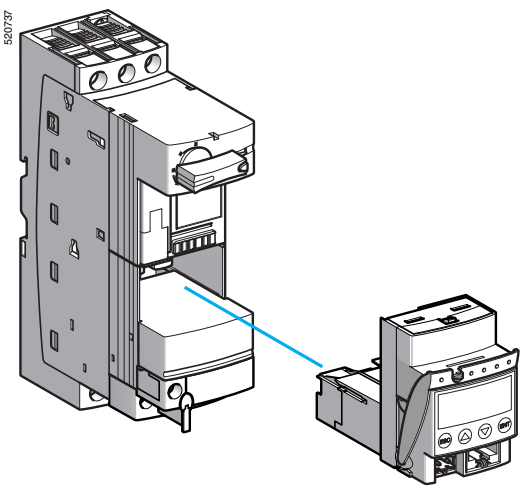
TeSys Model U
Starter-controllers
Multifunction control units

530656



LUCM ●●BL

520737



LUB ●2 + LUCM ●●BL

521335

XBT NU400

Description

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

The display window 2 and keypad 3 allow :
- in configuration mode: local configuration of protection functions and alarms,
- in run mode: display of parameter values and events.

The Modbus communication port 5 is used to connect :
- an operator terminal,
- a PC,
- a Personal Digital Assistant (PDA).

Multifunction control units

Parameter entry, monitoring of parameter values and consultation of logs are carried out :
- either on the front panel, using the built-in display window/keypad,
- or via an operator terminal,
- or via a PC or a PDA with PowerSuite software,
- or remotely, via a Modbus communication bus.

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

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

TeSys model U user's manual *(2)*

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

Operator terminal

This compact Magelis terminal enables the parameters of multifunction control unit LUCM to be read and modified.
It is supplied pre-configured to provide dialogue with 8 model U starter-controllers (Modbus protocol, application pages and alarm pages loaded).
Starter-controller alarm and fault management takes priority.

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

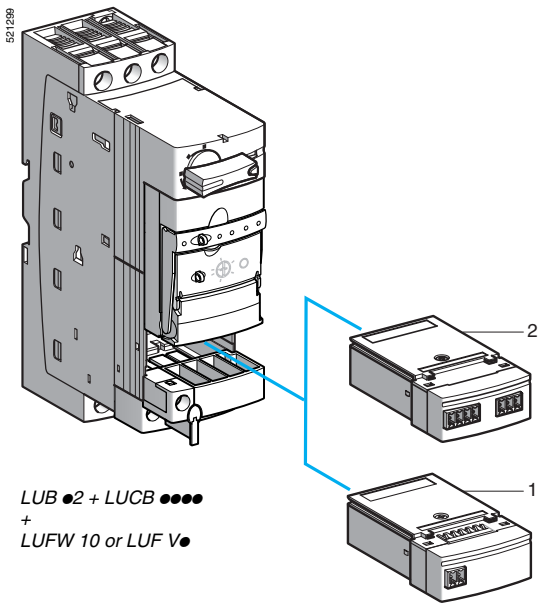
Connecting cable *(4)*

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

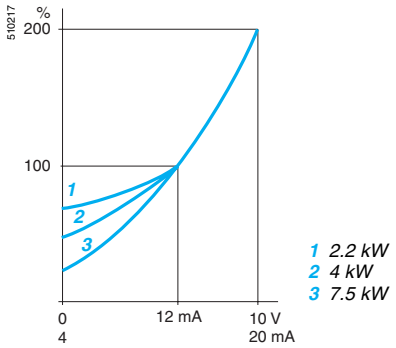
(1) Input voltage ⎓ 24 V with maximum ripple of ± 10 %.
(2) The CD-Rom contains user's manuals for the AS-Interface and Modbus communication modules, multifunction control units and gateway modules, as well as the gateway programming software.
(3) English, French, German, Italian, Spanish
(4) If a terminal is used with several control units, this cable can be connected to a Modbus hub or to T-junctions (see page 31).

Characteristics : pages 34 and 37
Schemes : pages 50 to 54

TeSys Model U
Starter-controllers
Function modules



LUB ●2 + LUCB ●●●●
+
LUFW 10 or LUF V●



Function modules

Output	Item	Application	Reference	Weight kg
Fault differentiation and manual reset				
This module differentiates short-circuit and thermal overload faults. It includes a contact for each of these types of fault. It can only be used with an advanced control unit, from which it takes its power.				
2 N/O with common point	–	∿ or ⎓ 24…250 V	**LUF DH20** ▲	0.060
Fault differentiation and automatic reset				
This module signals a thermal overload fault. It includes an overload fault contact. Short-circuit signalling can be obtained by using an add-on fault signalling contact LUA1 (see page 16). It can only be used with an advanced control unit, from which it takes its power. In the event of tripping on thermal overload, the control unit is forced to automatic reset mode. In the event of tripping on short-circuit, the control unit is forced to manual reset mode.				
1 N/O	–	∿ or ⎓ 24…250 V	**LUF DA10** ▲	0.055
Thermal overload alarm				
Through load shedding, this module makes it possible to avoid stoppages in operation due to overload tripping. Imminent thermal overload tripping is displayed as soon as the thermal state exceeds the threshold of 105 % (hysteresis = 5 %). Signalling is possible via an LED on the front panel of the module and externally by a N/O relay output. It can only be used with an advanced control unit, from which it takes its power.				
1 N/O	1	∿ or ⎓ 24…250 V	**LUF W10**	0.055
Indication of motor load				
This module provides a signal which is representative of the motor load status (I average/Ir). ■ I average = average value of the rms currents in the 3 phases, ■ Ir = value of the setting current. The value of the signal (4-20 mA) corresponds to a load status of 0 to 200 % (0 to 300 % for a single-phase load). It can be used with an advanced or multifunction control unit. The module LUF V2 requires a ⎓ 24 V external supply.				
4 - 20 mA	2	–	**LUF V2**	0.050

Other versions

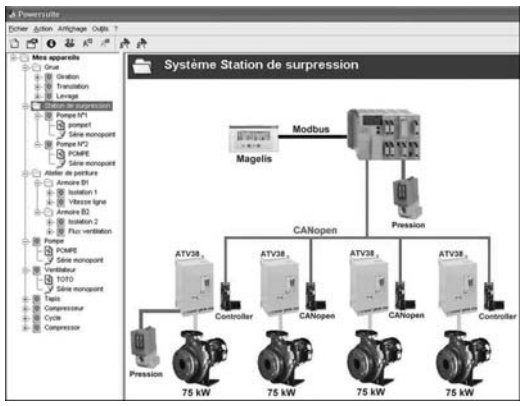
Application modules which allow the starter-controllers to provide preset logic functions and eliminate the need for additional auxiliary functions :
■ module dedicated to measuring,
■ module for non-reversing applications (e.g. : pumping, ventilation),
■ module for reversing applications (e.g. : mechanical handling).
Please call our Customer Information Centre on 0870 608 8 608.

▲ Available 2nd half of 2004.

Characteristics : pages 34 and 39
Schemes : pages 50 to 54

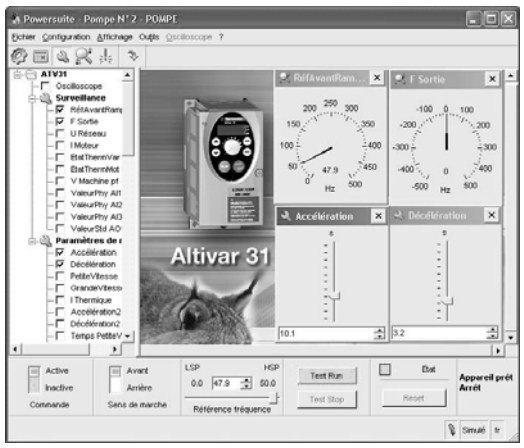
TeSys Model U
PowerSuite software workshop advanced dialogue solutions

531819



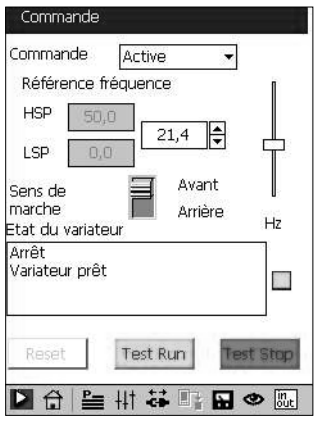
PowerSuite with PC screen
Installation management

531820



PowerSuite with PC screen
Monitoring screen

531440



PowerSuite with Pocket PC screen

Presentation

The PowerSuite software workshop, for PC or Pocket PC, is designed for setting up Telemecanique starters and variable speed drives.

This single program is an easy-to-use interface for configuring Altistart and Tesys model U starters as well as all Altivar drives in a Microsoft Windows® environment, in five languages (English, French, German, Italian and Spanish).

Functions

The PowerSuite software workshop can be used for preparing, programming, setting up and maintaining Telemecanique starters and variable speed drives.

The PowerSuite software workshop can be used:
- stand alone to prepare and store starter or drive configuration files,
- connected to the starter or drive to:
  - configure,
  - adjust,
  - monitor (except for Altivar 11 drives),
  - control (except for Altivar 11 drives),
  - transfer and compare configuration files between PowerSuite and the starter or drive.

The configuration files generated by the PowerSuite software workshop can be:
- saved to hard disk, CD-Rom, floppy disk, etc...
- printed,
- exported to office automation software applications,
- exchanged between a PC and a Pocket PC using standard synchronization software. PowerSuite PC and Pocket PC configuration files have the same format,
- they are password protected.

The software associated with the Altivar 31 has been enhanced to include: oscilloscope function, parameter name customisation, creation of a user menu, creation of monitoring screens, searching and sorting on different parameters. The PowerSuite software workshop has on-line contextual help.

Connections

- The PowerSuite software workshop can be connected directly to the terminal port on the starter or variable speed drives, via the serial port on the PC or Pocket PC. Two types of connection are possible:
  - either with a single starter or drive (point to point connection)
  - or with a group of starters or drives (multi-point connection).

- The PowerSuite software workshop for PC can be connected to an Ethernet network. In this case the starters and drives can be accessed using:
  - either an Ethernet-Modbus 174 bridge CEV 300 20,
  - or a communication option card VW3 A58310 (for Altivar 38, 58 and 58F drives only).

Hardware and software environment

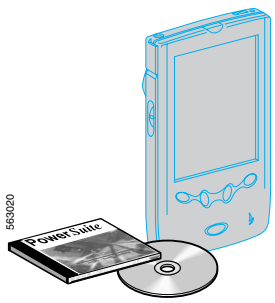
- The PowerSuite for PC software workshop can operate in the following PC environments and configurations:
  - Microsoft Windows® 95 OSR2, Microsoft Windows® 98 SE, Microsoft Windows® NT4 X SP5, Microsoft Windows® Me, Microsoft Windows® 2000, Microsoft Windows® XP,
  - Pentium III, 800 MHz, hard disk with 300 Mb available, 128 Mb RAM,
  - SVGA or higher definition monitor

- The PowerSuite for Pocket PC software workshop, version V2.0.0, is compatible with Pocket PCs equipped with Windows for Pocket PC 2002 or 2003 operating system and an ARM or XSCALE processor.
Performance tests for version V2.00 of the PowerSuite software workshop have been carried out on the following Pocket PCs:
  - Hewlett Packard® IPAQ 2210,
  - Compaq® IPAQ series 3800 and 3900,
  - Hewlett Packard® Jornada series 560.

TeSys Model U
PowerSuite software workshop advanced dialogue solutions

References

VW3 A8101



VW3 A8102

PowerSuite software workshop for PC or Pocket PC *(1)*

Description	Composition	Reference	Weight kg
PowerSuite for PC kit	■ 1 PowerSuite CD-Rom ■ 1 PC connection kit.	**VW3 A8101**	0.400
PowerSuite for Pocket PC kit *(2)*	■ 1 PowerSuite CD-Rom, ■ 1 Pocket PC connection kit.	**VW3 A8102**	0.400
PowerSuite CD-Rom	■ Software for PC and Pocket PC in English, French, German, Italian and Spanish, ■ technical documentation and ABC configurator program.	**VW3 A8104**	0.100
PowerSuite upgrade CD	■ Software for PC and Pocket PC in English, French, German, Italian and Spanish, ■ technical documentation and ABC configurator program.	**VW3 A8105**	0.100
PC connection kit	■ 2 x 3 m connection cables with 2 x RJ 45 connectors, ■ 1 RJ 45/9-way SUB-D adapter for connecting ATV 58/58F/38 drives, ■ 1 RJ 45/9-way SUB-D adapter for connecting ATV 68 drives, ■ 1 converter marked “RS 232/RS 485 PC” with one 9-way female SUB-D connector and one RJ 45 connector, ■ 1 converter for ATV 11 drives, with one 4-way male connector and one RJ 45 connector.	**VW3 A8106**	0.350
Pocket PC connection kit *(2)*	■ 2 x 0.6 m connection cables with 2 x RJ 45 connectors, ■ 1 RJ 45/9-way SUB-D adapter for connecting ATV 58/58F/38 drives, ■ 1 converter marked “RS 232/RS 485 PPC” with one 9-way male SUB-D connector and one RJ 45 connector, ■ 1 converter for ATV 11 drives, with one 4-way male connector and one RJ 45 connector.	**VW3 A8111**	0.300

(1) To find out about the latest available version, please call our Customer Information Centre on 0870 608 8 608.
(2) These kits connect to the synchronization cable, which must be ordered separately from your Pocket PC supplier.

Compatibility

Compatibility of the PowerSuite software workshop with starters and variable speed drives		Starter-controller	Soft start/ soft stop unit	Variable speed drives					
		TeSys model U	ATS 48	ATV 11	ATV 28	ATV 31	ATV 38	ATV 58 ATV 58F	ATV 68
PowerSuite software workshop with serial link for PC									
Kit and CD-Rom	**VW3 A8101** **VW3 A8104** **VW3 A8105**	**⩾ V 1.40**	**⩾ V 1.30**	**⩾ V 1.40**	**⩾ V 1.0**	**⩾ V 2.0.0**	**⩾ V 1.40**	**⩾ V 1.0**	**⩾ V 1.50**
PowerSuite software workshop with Ethernet link for PC									
Kit and CD-Rom	**VW3 A8101** **VW3 A8104** **VW3 A8105**	–	**⩾ V 1.50** and Ethernet-Modbus bridge	–	**⩾ V 1.50** and Ethernet-Modbus bridge	**⩾ V 2.0.0** and Ethernet-Modbus bridge	**⩾ V 1.50** and Ethernet V2 communication card or bridge		–
PowerSuite software workshop for Pocket PC									
Kit and CD-Rom	**VW3 A8102** **VW3 A8104** **VW3 A8105**	**⩾ V 1.50**	**⩾ V 1.30**	**⩾ V 1.40**	**⩾ V 1.20**	**⩾ V 2.0.0**	**⩾ V 1.40**	**⩾ V 1.20**	–

Compatible products and software versions.
Non compatible products.

Compatibility of the PowerSuite software workshops with Pocket PCs

Operating system	Performance tests carried out on models	PowerSuite software version			
		V 1.30	V 1.40	V 1.50	V 2.0.0
Windows for Pocket PC 2003	Hewlett Packard® IPAQ 2210	no	no	no	yes
Windows for Pocket PC 2002	Compaq® IPAQ series 3800, 3900	no	no	yes	yes
	Hewlett Packard® Jornada series 560	no	yes	yes	yes
Windows for Pocket PC 2000	Hewlett Packard® Jornada series 525	yes	yes	yes	no
Windows CE	Hewlett Packard® Jornada 420	yes	no	no	no

TeSys Model U
Controllers

Presentation

The TeSys model U starter-controller provides **Total Coordination** to IEC/EN 60947-6-2 under overcurrent conditions up to 50kA at 400V for motor loads up to 32A. This standard provides for continuity of service with no welding of the main poles being permitted under short circuit conditions.

Above 32 A, the model U controller provides a motor starter management solution identical to that provided by TeSys model U starter-controllers.
Used in conjunction with a short-circuit protection device and a contactor, it provides a motor starter whose functions are the same as those of a TeSys model U starter-controller and, in particular, provides motor starter overload protection and control functions.

The following starter combinations provide **Type 2 Coordination** to IEC/EN 60947-4-1 under overcurrent conditions up to 50kA at 400V. This standard provides for continuity of service where only light tack welding of the contactor poles (easily broken) is permitted under short circuit conditions..

Composition

A TeSys model U controller consists of a control unit whose adjustment range is compatible with the secondary of current transformers, plus a control base which also allows fitment of a function module or a communication module.
It requires a ⎓ 24 V external power supply.

Combinations providing Type 2 Coordination at 50kA

With circuit-breaker

Standard power ratings of 3-phase motors 50-60 Hz Category AC-3 400/415 V		Circuit-breaker *(1)*			Contactor	Model U controller	Current transformers
P kW	Ie A	Reference	Rating A	Irm *(2)* A	Reference *(3)*	Reference	Reference
18,5	35	**NS80H MA50**	50	500	**LC1 D40**	**LUTM + LUC●**	**3 x LUT C1005**
22	42	**NS80H MA50**	50	650	**LC1 D50**	**LUTM + LUC●**	**3 x LUT C1005**
30	57	**NS80H MA80**	80	880	**LC1 D65**	**LUTM + LUC●**	**3 x LUT C1005**
37	69	**NS80H MA80**	80	1040	**LC1 D80**	**LUTM + LUC●**	**3 x LUT C1005**
45	81	**NS100H MA100**	100	1300	**LC1 D115**	**LUTM + LUC●**	**3 x LUT C1005**
55	100	**NS160H MA150**	150	1350	**LC1 D115**	**LUTM + LUC●**	**3 x LUT C1005**
75	135	**NS160H MA150**	150	1800	**LC1 D150**	**LUTM + LUC●**	**3 x LUT C4005**
90	165	**NS250H MA220**	220	2200	**LC1 F185**	**LUTM + LUC●**	**3 x LUT C4005**
110	200	**NS250H MA220**	220	2640	**LC1 F225**	**LUTM + LUC●**	**3 x LUT C4005**
132	240	**NS400H MA320**	320	3200	**LC1 F265**	**LUTM + LUC●**	**3 x LUT C4005**
160	285	**NS400H MA320**	320	4160	**LC1 F330**	**LUTM + LUC●**	**3 x LUT C4005**
200	352	**NS630H MA500**	500	5000	**LC1 F400**	**LUTM + LUC●**	**3 x LUT C4005**
220	388	**NS630H MA500**	500	5500	**LC1 F400**	**LUTM + LUC●**	**3 x LUT C4005**
250	437	**NS630H MA500**	500	6000	**LC1 F500**	**LUTM + LUC●**	**3 x LUT C8005**

With fuses

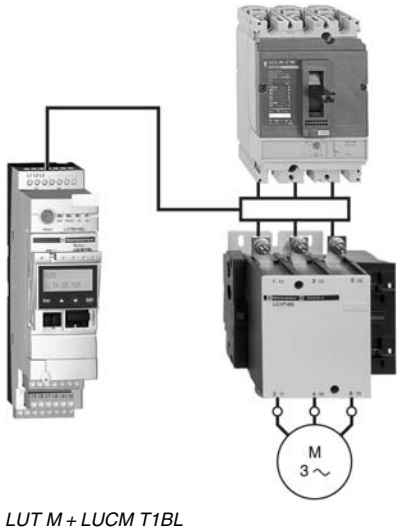
Standard power ratings of 3-phase motors 50-60 Hz Category AC-3 400/415 V		Switch disconnector-fuse	gG fuses GE Power Controls 'RED SPOT'		Contactor	Model U controller	Current transformers
P kW	Ie A	Reference	Size	Reference A	Reference *(3)*	Reference	Reference
18,5	35	**GS1 GB30**	A3	TIS63M80	**LC1 D40**	**LUTM + LUC●**	**3 x LUT C1001**
22	42	**GS1 GB30**	A3	TIS63M80	**LC1 D50**	**LUTM + LUC●**	**3 x LUT C1001**
30	57	**GS1 GB30**	A3	TIS63M100	**LC1 D65**	**LUTM + LUC●**	**3 x LUT C1001**
37	69	**GS1 LLB30**	A4	TCP100M125	**LC1 D80**	**LUTM + LUC●**	**3 x LUT C1001**
45	81	**GS1 LLB30**	A4	TCP100M125	**LC1 D95**	**LUTM + LUC●**	**3 x LUT C1001**
55	100	**GS1 LLB30**	A4	TCP100M160	**LC1 D115**	**LUTM + LUC●**	**3 x LUT C1001**
75	135	**GS1 LB30**	B2	TF200M250	**LC1 D150**	**LUTM + LUC●**	**3 x LUT C4001**
90	165	**GS1 MMB30**	B2	TF200M250	**LC1 F185**	**LUTM + LUC●**	**3 x LUT C4001**
110	200	**GS1 MMB30**	B2	TF200M315	**LC1 F225**	**LUTM + LUC●**	**3 x LUT C4001**
132	240	**GS1 NB30**	B3	TKF315M355	**LC1 F265**	**LUTM + LUC●**	**3 x LUT C4001**
160	285	**GS1 PPB30**	B3	TKF315M355	**LC1 F330**	**LUTM + LUC●**	**3 x LUT C4001**
200	352	**GS1 QQB30**	B4	TMF400M450	**LC1 F400**	**LUTM + LUC●**	**3 x LUT C4001**
220	388	**GS1 QQB30**	B4	TMF400M450	**LC1 F400**	**LUTM + LUC●**	**3 x LUT C4001**
250	437	**GS1 SB30**	C2	TTM500	**LC1 F500**	**LUTM + LUC●**	**3 x LUT C8001**
315	555	**GS1 SB30**	C2	TTM500	**LC1 F630**	**LUTM + LUC●**	**3 x LUT C8001**

(1) Product marketed under the Merlin Gerin brand.
(2) Irm : setting current of the magnetic trip
(3) For reversing operation, replace the prefix LC1 with LC2.

Characteristics : pages 40 and 41
Dimensions : page 25
Schemes : page 25

TeSys Model U
Controllers

532083



LUT M + LUCM T1BL

References

Control bases (control circuit voltage ⎓ 24 V)

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

Control units

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

Current transformers

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

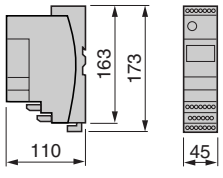
Function modules and communication modules

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

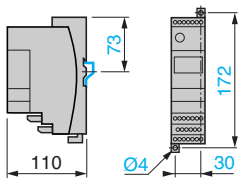
- Thermal overload alarm module LUF W10, see page 21.
- Motor load indication module LUF V2, see page 21.
- Modbus communication module LUL C032, see page 30.

Dimensions, mounting

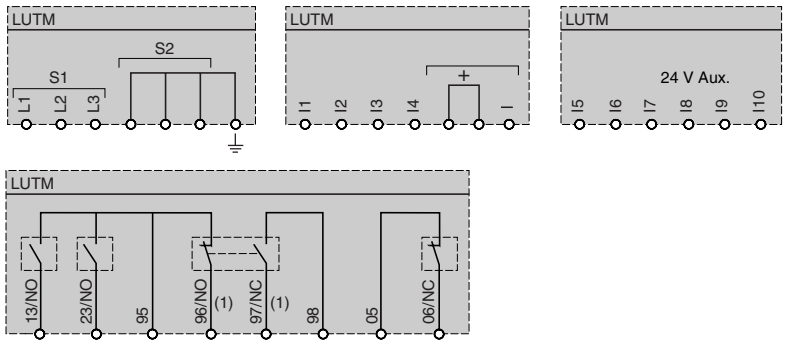
Dimensions



Mounting



Schemes

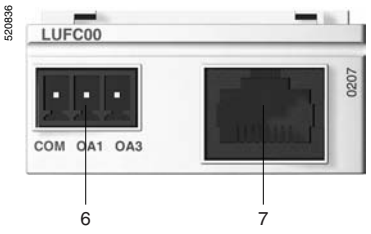


(1) The contacts are represented with controller powered up and not in a fault condition.

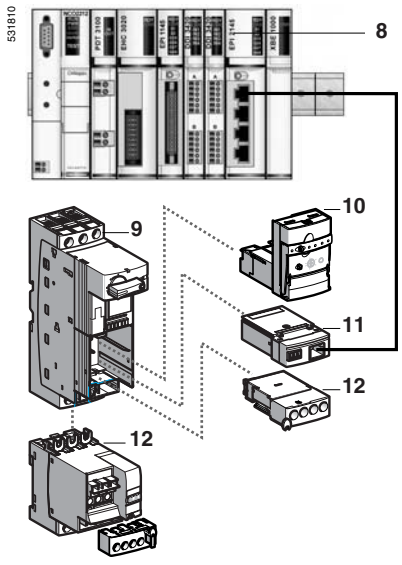
▲ Available Qtr 3 2004.

Characteristics :
pages 40 and 41

TeSys Model U
Starter-controllers
Parallel wiring module and pre-wired coil connection components

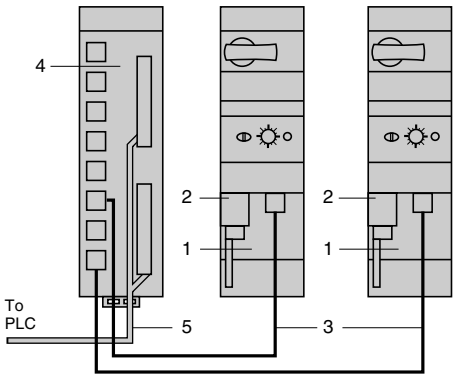


6 Outputs for starter commands
7 RJ45 connector for connecting to splitter box



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

Parallel type connection
Architecture



1 Parallel wiring module LUF C00
2 Pre-wired coil connection LU9B N11C
3 Connection cable LU9 R● with one RJ45 connector at each end
4 Splitter box LU9 G02 for 8 motor starters with channel connections on the PLC side by 2 HE 10 connectors and on the starter-controller side by 8 RJ45 connectors.
5 Connection cable TSX CDP●●● with one HE 10 connector at each end.

Parallel wiring module

The parallel wiring system makes it possible to connect starter-controllers to the PLC I/O modules quickly and without any need for tools. It replaces traditional screw terminal and single wire connections. It is used with the Telefast pre-wired system .
The parallel wiring module provides the status and command information for each starter-controller. It must be used with a ⎓ 24 V control unit, LUC● ●●BL.
Splitter box LUF GO2 distributes information from the PLC I/O modules to each of the starter-controllers connected to it.
This splitter box is optimised for use with card TSX DMZ28DTK.

When used in conjunction with the Advantys STB distributed I/O solution, the model U starter-controller is ideal in decentralised automation architecture *(1)*.
The use of dedicated parallel interface module STB EPI 2145 allows remote connection of 4 starter-controllers.

Each of the dedicated module's 4 channels has:
- 2 outputs: control of starter forward and reverse running,
- 3 inputs: position of the knob, fault indication and position of the poles.

Connection to the dedicated module is by means of the following cables:
- RJ45 LU9R●●, for lengths less than 3 metres,
- 490 NTW 000●●, for lengths greater than 3 metres

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

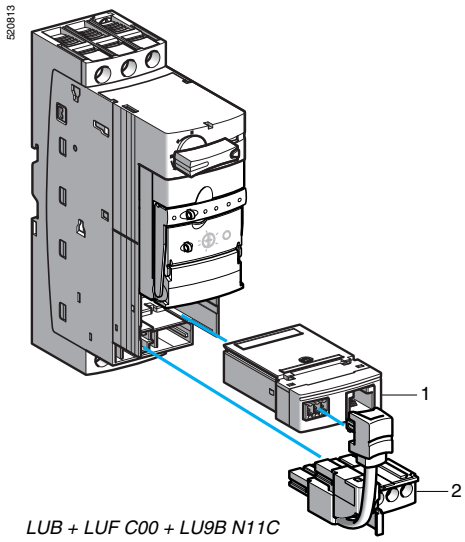
(1) Please consult our "Distributed I/O Advantys STB, the open device integration I/O system" catalogue

Characteristics : pages 34 and 39
Schemes : pages 50 to 54

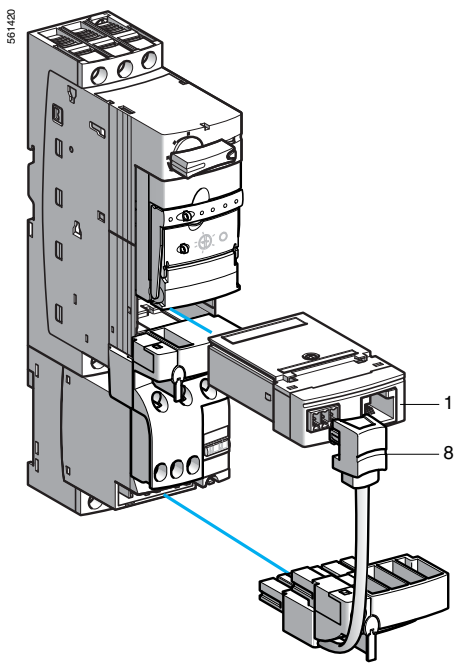
TeSys Model U

Starter-controllers

Parallel wiring module and pre-wired coil connection components



LUB + LUF C00 + LU9B N11C



LU2B + LUFC00 + LU9MRC

Pre-wired components simplify wiring and reduce wiring errors.

Connection of communication module output terminals to the coil terminals

By pre-wired connector or wire link.

■ **Pre-wired connector : pre-wired coil connection**

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

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

■ **Wire link :**

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

Connection of parallel wiring module to the PLC

No tools are required to connect the parallel wiring module to the PLC. Connection is via a splitter box which allows up to 8 starter-controllers to be connected; a maximum of 4 reversing starters per splitter box is allowed.
The splitter box requires a ⎓ 24 V power supply.

Splitter box

Connectors		Item	Reference	Weight
PLC side (16I/12O)	Starter-controller side			kg
2 x HE 10 20-way	**8 x RJ45**	4	**LU9 G02** *(1)*	0.260

Connection cables to the splitter box

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

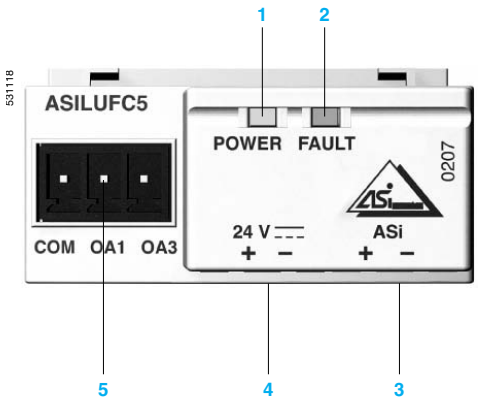
Connection cables from splitter box to PLC

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

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

Characteristics : pages 34 and 39
Schemes : pages 50 to 54

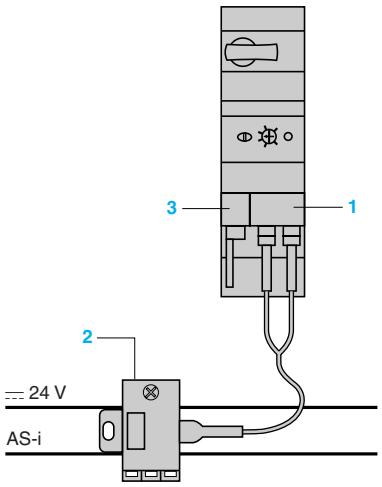
TeSys Model U
Starter-controllers
AS-Interface cabling system



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

Series type connection

Architecture



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

Information transmitted by the AS-Interface system

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

AS-Interface communication module

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

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

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

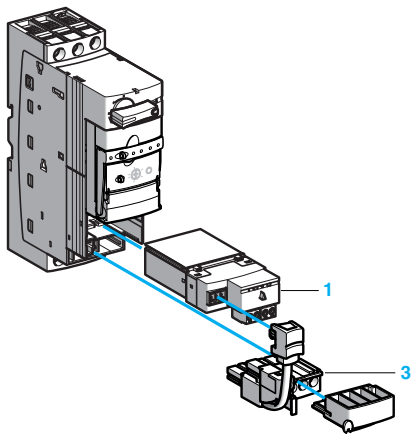
The incorporation of AS-Interface V.2.1 functions allows diagnostics to be performed on the module, either remotely via the bus or locally via the ASI TERV2 addressing terminal.

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

Description	Item	Reference	Weight kg
Communication module	1	**ASILUF C5**	0.065

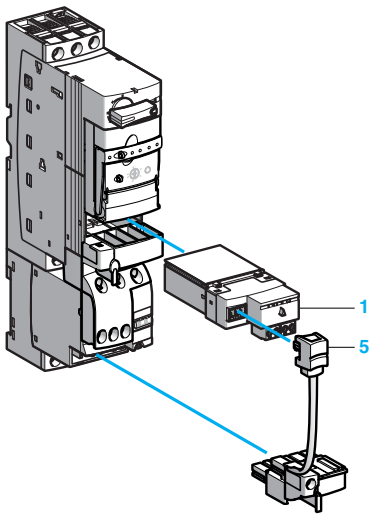
TeSys Model U
Starter-controllers
AS-Interface cabling system

510300



LUB + ASILUF C5 + LU9B

520799

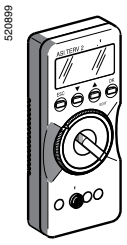


LU2B + ASILUF C5 + LU9M

520888

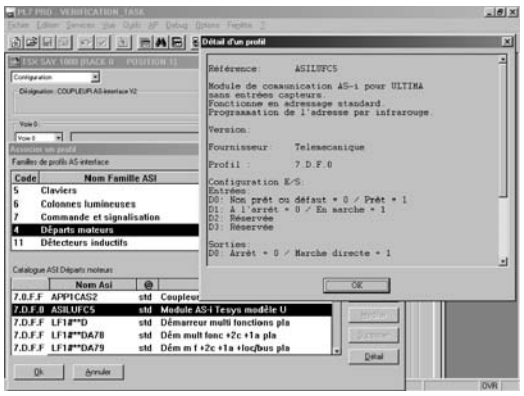
XZ MC11

520899



ASI TERV2

561421



Configuration example with Premium TSX SAY 100/1000 module

Pre-wired components simplify wiring and reduce wiring errors.

Connection of communication module output terminals to the coil terminals

By pre-wired connector or wire link.

■ **Pre-wired connector: pre-wired coil connection**

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

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

■ **Wire link**

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

Connection of the communication module on the serial bus *(1)*

Achieved by using a tap-off for connection to 2 ribbon cables:
- 1 for AS-Interface (yellow).
- 1 for separate ⎓ 24 V supply (black).

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

Consoles and cable adaptors

Description	Reference	Weight kg
Addressing console Battery operated. Battery charger supplied AS-Interface V.1 and V.2.1 compatible	**XZ MC11**	0.550
Adjustment and diagnostics console Runs on LR6 batteries Allows addressing of AS-Interface V.2.1interfaces and diagnostics	**ASI TERV2**	0.500
Cable adaptor For console XZ MC11	**XZ MG12**	0.070

Software set-up

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

TeSys model U user's manual *(2)*

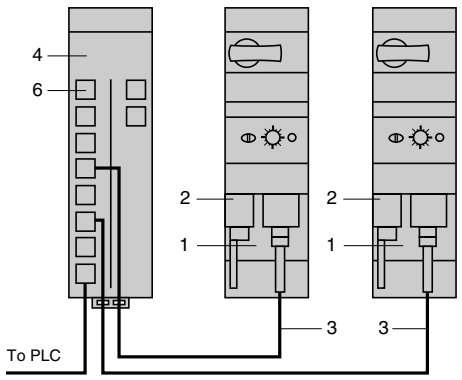
Application	Language	Reference	Weight kg
On CD-Rom	Multi-language *(3)*	**LU9 CD1**	0.022

(1) Degree of protection IP 54. Connection by 4 x 0.34 mm² wires.
Black wire: +24 V.
White wire: 0 V.
Blue wire: AS-Interface (–).
Brown wire: AS-Interface (+).
(2) The CD-Rom contains user's manuals for the AS-Interface and Modbus communication modules, multifunction control units and gateway modules, as well as the gateway programming software.
(3) English, French, German, Italian, Spanish

TeSys Model U
Starter-controllers
Modbus communication module and pre-wired coil connection components

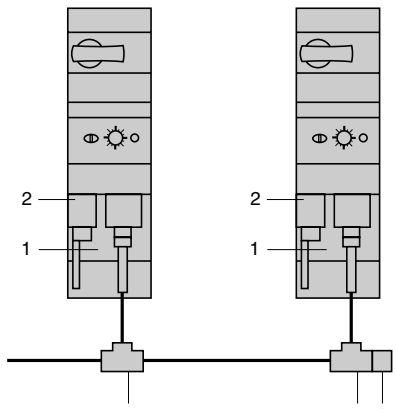
Series type connection
Architecture

■ **Star topology**



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

■ **Bus topology**



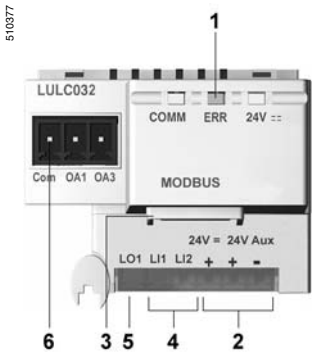
1 Communication module LUL C032
2 Pre-wired coil connection LU9B N11C
5 T-junction VW3 A8 306 TF●●
6 Line terminator VW3 A8 306 RC

Information carried by the bus
Depends on the type of control unit used.

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

Functions performed

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



1 Module status signalling LED
2 ⎓ 24 V supply connection
3 RJ45 connector RS485 for Modbus link
4 2 digital inputs
5 1 digital output
6 Outputs for starter commands

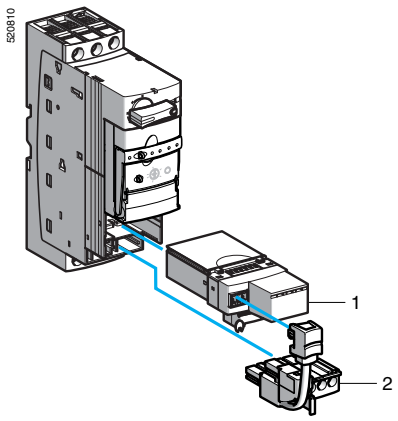
Modbus communication module
Communication module LUL C032 enables the model U starter-controller to be connected to the Modbus network.
It must have a ⎓ 24 V supply and must be used in conjunction with a ⎓ 24 V control unit, LUC● ●●BL.
It incorporates a 0.5 A, ⎓ 24 V digital output for local command requirements and two configurable digital inputs.

Description	Item	Reference	Weight kg
Communication module	1	**LUL C032 ▲**	0.080

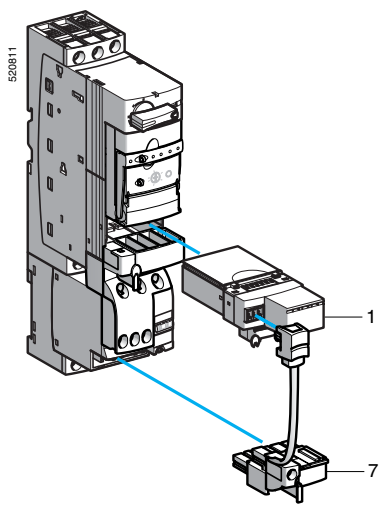
▲ Available June 2004.

Characteristics : pages 34 and 39
Schemes : pages 50 to 54

TeSys Model U
Starter-controllers
Modbus communication module and pre-wired coil connection components



LUB + LUL C032 + LU9B



LU2B + LUL C032 + LU9M

Pre-wired components simplify wiring and reduce wiring errors.

Connection of communication module output terminals to the coil terminals

By pre-wired connector or wire link.

■ **Pre-wired connector : pre-wired coil connection**

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

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

■ **Wire link :**

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

Connection of the communication module on the serial bus

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

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

TeSys model U user's manual *(2)*

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

(1) Fitted with 2 RJ45 female connectors (bus side) and a 0.3 m or 1 m length cable supplied with an RJ45 male connector (station side).
(2) The CD-Rom contains user's manuals for the AS-Interface and Modbus communication modules, multifunction control units and gateway modules, as well as the gateway programming software.
(3) English, French, German, Italian, Spanish.

Characteristics : pages 34 and 39
Schemes : pages 50 to 54

TeSys Model U

Starter-controllers

Starters, drives and communication
Communication gateways LUF P

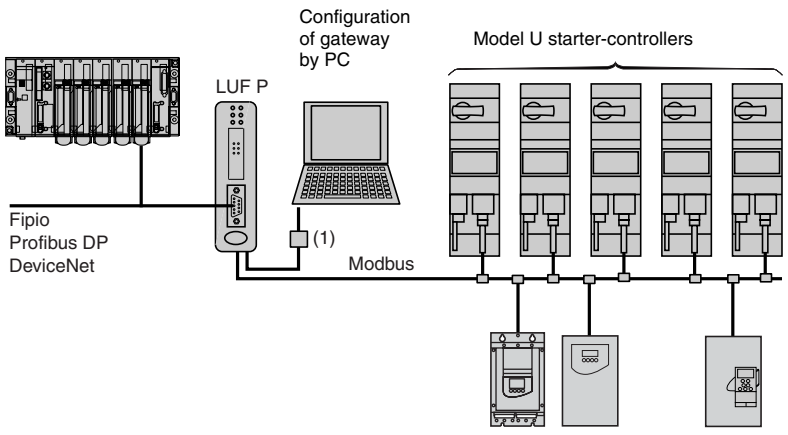
Presentation

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

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

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

Example of architecture

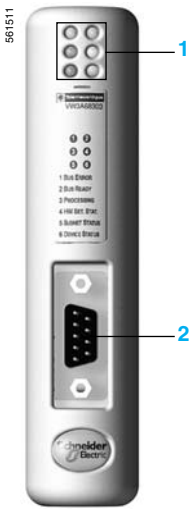


ATS 48	ATV 28	ATV 38 ATV 58 ATV 58F

(1) Connection kit for PowerSuite software workshop.

Description

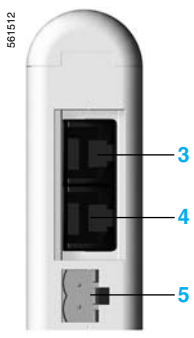
Front panel of the product



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

2 Connectors for connection to Fipio, Profibus DP or DeviceNet buses.

Underside of product



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

Software set-up

For the Fipio bus, software set-up of the gateway is performed using either PL7 Micro/Junior/Pro software or ABC Configurator software.
For the Profibus DP and DeviceNet buses, software set-up is performed using ABC Configurator.
This software is included:
- in the PowerSuite software workshop for PC (see page 23),
- in the TeSys model U user's manual

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Characteristics, references : page 33
Dimensions : page 33

TeSys Model U

Starter-controllers

Starters, drives and communication
Communication gateways LUF P

Characteristics

Bus type			Fipio	Profibus DP	DeviceNet
Environment	Conforming to IEC 664		Degree of pollution : 2		
Ambient air temperature	Around the device	**˚C**	+ 5…+ 50		
Degree of protection			IP 20		
Electromagnetic compatibility	Emission		Conforming to IEC 50081-2 : 1993		
	Immunity		Conforming to IEC 61000-6-2 : 1999		
Number of Modbus slaves which can be connected			⩽ 8		
Connection	Modbus		By RJ45 connector conforming to Schneider Electric RS485 standard		
	To a PC		By RJ45 connector, with PowerSuite connection kit		
	Field bus		By SUB D9 female connector	By SUB D9 female connector	By 5-way removable screw connector
Supply		**V**	External supply, ⎓ 24 ± 10 %		
Consumption	Max.	**mA**	280		
	Typical	**mA**	100		
Indication/diagnostics			By LED on front panel		
Services	Profile		FED C32 or FED C32P	–	–
	Command		26 configurable words *(1)*	122 configurable words	256 configurable words
	Monitoring		26 configurable words *(1)*	122 configurable words	256 configurable words
	Configuration and adjustment		By gateway mini messaging facility (PKW)		

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

References

	Description	For use with	With bus type	Reference	Weight kg
	Communication gateways	TeSys Model U starter-controllers, Altistart 48, Altivar 28, 38, 58 and 58F	Fipio/Modbus	**LUF P1**	0.245
			Profibus DP/Modbus	**LUF P7**	0.245
			DeviceNet/Modbus	**LUF P9**	0.245

Connection accessories

TSX FP ACC 12

490 NAD 911 03

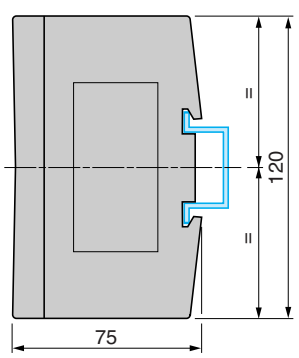
	Description	For use with	Length m	Connectors	Reference	Weight kg
	Connection cables	Modbus	3	1 RJ45 type connector and one end with stripped wires	**VW3 A8 306 D30**	0.150
			0.3	2 RJ45 type connectors	**VW3 A8 306 R03**	0.050
			1	2 RJ45 type connectors	**VW3 A8 306 R10**	0.050
			3	2 RJ45 type connectors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

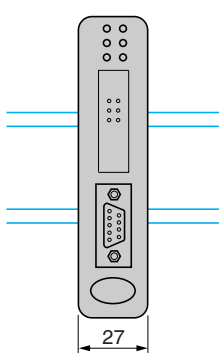
Documentation

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

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

Dimensions



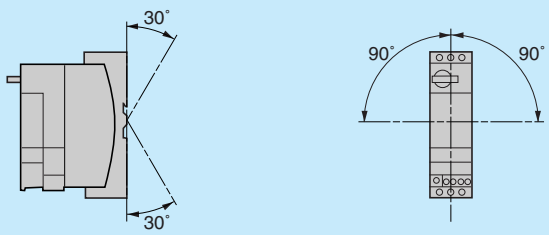


Presentation, description : page 32

Setting-up : page 32

TeSys Model U
Starter-controllers

Environment

Approvals			UL, CSA
			Pending : BV, GL, LROS, DNV, PTB
Conforming to standards			IEC/EN 60947-6-2, CSA C22-2 N˚14, Type E UL 508 type E : with phase barrier LU9 SP0
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution : 3	**V**	690
	To UL508, CSA C22-2 n˚14	**V**	600
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-6-2	**kV**	6
Safety separation of circuits SELV	Conforming to IEC/EN 60947-1 appendix N	**V**	Between the control or auxiliary circuit and the main circuit : 400
			Between the control and auxiliary circuits : 400
Degree of protection Conforming to IEC/EN 60947-1 (protection against direct finger contact)	Front panel outside connection zone		IP 40
	Front panel and wired terminals		IP 20
	Other faces		IP 20
Protective treatment	Conforming to IEC/EN 60068		"TH"
	Conforming to IEC/EN 60068-2-30	**Cycles**	12
	Conforming to IEC/EN 60068-2-11	**h**	48
Ambient air temperature around the device	Storage	**˚C**	- 40…+ 85
	Operation	**˚C**	Power bases and standard and advanced control units : - 25… + 70. (At temperatures above 60˚C and up to 70˚C, for Ie = 32 A, leave a minimum gap 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 = 11ms	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
Immunity to electrostatic discharge	Conforming to IEC/EN 61000-4-2	**kV**	In open air : 8 - Level 3
		kV	On contact : 8 - Level 4
Immunity to radiated high-frequency disturbance	Conforming to IEC/EN 61000-4-3	**V/m**	10 - Level 3
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	**kV**	All circuits except for serial link : 4 - Level 4
		kV	Serial link : 2 - Level 3
Immunity to dissipated shock waves	Conforming to 60947-6-2		**Common mode** / **Serial mode**
	Uc ∿ 110...240 V	**kV**	2 / 1
	⎓ 110...220 V		
	Uc < 100 V		Not applicable: for use on a protected supply
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.

References : pages 14 to 27
Dimensions : pages 48 and 49
Schemes : pages 50 to 54

TeSys Model U
Starter-controllers
Power bases and control units

Power base and control unit type				LUB 12 + LUCA or LUCB or LUCC or LUCD	LUB 32 + LUCA or LUCB or LUCC or LUCD	LUB 12 + LUCM	LUB 32 + LUCM	LU2M LU6M
Power circuit connection characteristics								
Connection to Ø 4 mm screw clamp terminals								
Flexible cable without cable end	1 conductor		mm^2	2.5…10	2.5…10	2.5…10	2.5…10	2.5…10
	2 conductors		mm^2	1.5…6	1.5…6	1.5…6	1.5…6	1.5…6
Flexible cable with cable end	1 conductor		mm^2	1…6	1…6	1…6	1…6	1…6
	2 conductors		mm^2	1…6	1…6	1…6	1…6	1…6
Solid cable without cable end	1 conductor		mm^2	1…10	1…10	1…10	1…10	1…10
	2 conductors		mm^2	1…6	1…6	1…6	1…6	1…6
Screwdriver				Philips n° 2 or flat screwdriver : Ø 6 mm				
Tightening torque			N.m	1.9…2.5	1.9…2.5	1.9…2.5	1.9…2.5	1.9…2.5
Control circuit connection characteristics								
Connection to Ø 3 mm screw clamp terminals								
Flexible cable without cable end	1 conductor		mm^2	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
	2 conductors		mm^2	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
Flexible cable with cable end	1 conductor		mm^2	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5
	2 conductors		mm^2	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5
Solid cable without cable end	1 conductor		mm^2	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
	2 conductors		mm^2	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
Screwdriver				Philips n° 1 or flat screwdriver : Ø 5 mm				
Tightening torque			N.m	0.8…1.2	0.8…1.2	0.8…1.2	0.8…1.2	0.8…1.2
Control circuit characteristics								
Rated voltage of control circuit	∿ 50/60 Hz		V	24…240	24…240	–	–	–
	⎓		V	24…240	24…240	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, ⎓ 110…220 V		V	∿ and ⎓ 88…264	∿ and ⎓ 88…264	–	–	–
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	–	–	2050
	∿ 110…240 V, ⎓ 110…220 V		mA	280	280	–	–	840
I rms sealed	⎓ 24 V		mA	55	70	70	75	120
	∿ 24 V		mA	70	90	–	–	*(2)*
	∿ or ⎓ 48…72 V		mA	35	45	–	–	*(2)*
	∿ 110…240 V, ⎓ 110…220 V		mA	30	20	–	–	*(2)*
Heat dissipation			W	2	3	1.7	1.8	–
Operating time	Closing		ms	24 V : 70/ 48 V 60; ≥ 72 V : 50		75	65	–
	Opening		ms	35	35	35	35	–
Resistance to micro-breaks			ms	3	3	3	3	–
Resistance to voltage drops	EC/EN 61000-4-11			At least 70 % of Uc for 500 ms				–
Mechanical durability	In millions of operating cycles			15	15	15	15	–
Maximum operating rate	In operating cycles per hour			3600	3600	3600	3600	–
Main pole characteristics								
Number of poles				3	3	3	3	–
Isolation function To IEC/EN 60947-1	Possible			Yes	Yes	Yes	Yes	–
	Padlocking			1 padlock with Ø 7 mm shank				–
Rated thermal current			A	12	32	12	32	–
Rated operating current (Ue ≤ 440V)	To IEC/ EN 60947-6-2	In cat. AC-41		θ ≤ 70°C : 12A	θ ≤ 70°C : 32A	θ ≤ 55°C : 12A	θ ≤ 55°C : 32A	–
		In cat. AC-43		θ ≤ 70°C : 12A	θ ≤ 70°C : 32A	θ ≤ 55°C : 12A	θ ≤ 55°C : 32A	–
Rated operating voltage			V	690 *(3)*	690 *(3)*	690 *(3)*	690 *(3)*	–
Frequency limits	Of the operating current		Hz	40…60	40…60	40…60	40…60	–
Power dissipated in the power circuits	Operating current		A	3 6 9 12 18 25 32				–
	Power dissipated in all three poles		W	0.1 0.3 0.6 1.1 2.4 4.6 7.5				–
Rated breaking capacity on short-circuit			V	230 440 500 690				–
			kA	50 50 10 4				–
Total breaking time			ms	2 2 2				–
Thermal stress limit	With Isc max on 440 V		kA^2s	90	120	90	120	–

(1) Voltage with maximum ripple of ± 10 %.
(2) No consumption sealed.
(3) For 690 V, use phase barrier LU9 SP0.

TeSys Model U
Starter-controllers
Reversing power bases and auxiliary contacts

Specific characteristics of power bases LU2B and reverser blocks LU2M or LU6M				
Duration of inrush phase		∿ 50/60 Hz	**ms**	25
		⎓	**ms**	15
Maximum operating time	Without change of direction		**ms**	75
	With change of direction		**ms**	150
General characteristics of auxiliary contacts				
Conventional rated thermal current (Ith)	For ambient temperature θ < 70 °C		**A**	5
Frequency of the operating current			**Hz**	Up to 400
Minimum switching capacity $\lambda = 10^{-8}$		U min	**V**	17
		I min	**mA**	5
Short-circuit protection	Conforming to IEC/EN 60947-5-1		**A**	gL 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 contact built-into the power base				
Linked contacts	Conforming to IEC/EN 60947-4-1			Each power base has 1 N/O contact and 1 N/C contact which are mechanically linked
Mirror contact	Conforming to draft standard IEC/EN 60947-1			The N/C contact fitted in each power base reliably represents the state of the power contacts (safety scheme)
Rated operating voltage	(Ue)		**V**	Up to ∿ 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 operating voltage	(Ue)		**V**	Up to ∿ 250; ⎓ 250
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-5-1		**V**	250
	Conforming to UL, CSA		**V**	250

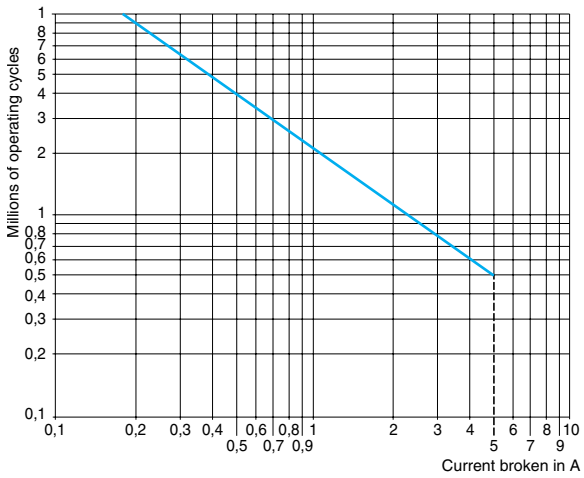
Operational power of contacts
Conforming to IEC/EN 60947-5-1

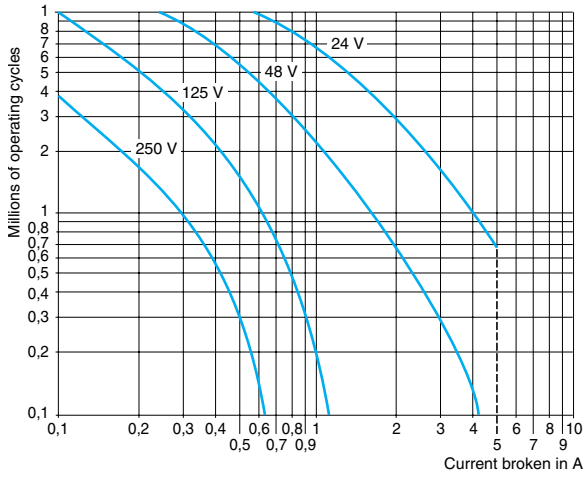
a.c. supply, categories AC-14 and AC-15
Electrical durability (up to 3600 operating cycles/hour on an inductive load such as the coil of an electromagnet : making power (cos φ 0.7) = 10 times the power broken (cos φ = 0.4)

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

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





References : page 14
Dimensions : pages 48 and 49
Schemes : pages 50 to 54

TeSys Model U
Starter-controllers
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 operating current	**Hz**	40…60
	Temperature compensation	**˚C**	- 25…+ 70
	Protection against phase imbalance		With
Short-circuit protection	Tripping threshold		14.2 x the setting current
	Tripping tolerance		± 20 %

Characteristics of advanced control units LUCB, LUCC and LUCD

Control unit type			**LUCB**	**LUCC**	**LUCD**
Protection	Motor type		3-phase	Single-phase	3-phase
	Conforming to standard		IEC/EN 60947-6-2, UL 508, CSA C22-2 n˚14	IEC/EN 60947-6-2, UL 508, CSA C22-2 n˚14	IEC/EN 60947-6-2, UL 508, CSA C22-2 n˚14
Overload protection	Tripping class conforming to UL 508, IEC/EN 60947-6-2		10	10	20
	Frequency limits of the operating current	**Hz**	40…60	40…60	40…60
	Temperature compensation	**˚C**	- 25…+ 70	- 25…+ 55	- 25…+ 70
	Protection against phase imbalance		With	–	With
Short-circuit protection	Tripping threshold		14.2 x the setting current	14.2 x the setting current	14.2 x the setting current
	Tripping tolerance		± 20 %	± 20 %	± 20 %

Characteristics of multifunction control units LUCM

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

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

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

Configuration of additional functions on multifunction control units LUCM

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

(1) This function cannot be deactivated.
(2) The setting range depends on the rating of the control unit used.

References : pages 19 to 21
Dimensions : pages 48 and 49
Schemes : pages 50 to 54

TeSys Model U
Starter-controllers
Limiter-disconnectors and current limiters

Characteristics of limiter-disconnector LUA LB1

Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1		**V**	690	
Conventional rated thermal current (Ith) conforming to standard IEC/EN 60947-1		**A**	32	
Operating threshold	I rms	**kA**	50	
Breaking capacity		**V**	440	690
		kA	130	70
Mounting			Directly on the upstream terminals of the starter-controller	
Connection				
Solid cable	1 conductor	**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 ø 6 mm	
Tightening torque		**N.m**	1.9…2.5	

Characteristics of current limiter LA9 LB920

Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1		**V**	690	
Conventional rated thermal current (Ith) conforming to standard IEC/EN 60947-1		**A**	63	
Operating threshold	I rms	**A**	1000	
Breaking capacity		**V**	440	690
		kA	100	35
Mounting			Separate	
Connection				
Solid cable	1 conductor	**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 ø 6 mm	
Tightening torque		**N.m**	2.2	

Characteristics of current limiter GV1 L3

Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1		**V**	690	
Conventional rated thermal current (Ith) conforming to standard IEC/EN 60947-1		**A**	63	
Operating threshold	I rms	**A**	1500	
Breaking capacity		**V**	440	690
		kA	70	15
Mounting			Directly on the upstream terminals of the starter-controller or separate, using terminal block GV2 G05	
Connection				
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 ø 6 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
Digital 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

References : pages 17 and 21
Dimensions : pages 48 and 49
Schemes : pages 50 to 54

TeSys Model U
Starter-controllers
Function modules and communication modules

Characteristics of motor load indication function module LUF V2

			LUF V2
Analogue output			4 - 20 mA
Signal delivered			Value of I average/Ir ratio within the range of 0 to 2
Load impedance	Minimum	**kΩ**	–
	Maximum	**Ω**	500
	Typical	**Ω**	100
Signal characteristics with advanced control unit	Accuracy		± 6 %
Signal characteristics with multifunction control unit	AccuracyP		± 10 %
	Resolution		1 % of Ir
Supply			External ⎓ 24 V

Characteristics of AS-Interface communication module ASILUF C5

Approval			AS-Interface V2.1 n° 52301
AS-Interface profile			7.D.F.0
Ambient air temperature		**°C**	Operation - 25…+ 70
AS-Interface supply		**V**	29.5...31.5
Current consumption By the AS-Interface system		**mA**	Normal operation : 25
		mA	Fault condition : 30
Auxiliary supply		**V**	⎓ 24 ± 30 %
Current consumption On 24 V supply for the outputs		**mA**	200
Number of outputs			2 dedicated to starter-controller coil operation
Switching capacity of the solid state outputs			0.5 A/24 V (outputs protected against short-circuits)
Indication/diagnostics			By 2 LEDs on front panel

Characteristics of Modbus communication module LUL C032

Physical interface			RS 485 multi-drop
Connector			RJ45 on front panel
Protocol			Modbus RTU
Maximum transmission speed		**bit/s**	19 200 (self-configuration up to this value)
Maximum return time		**ms**	30
Addressing			By switches : from 0...31
Ambient air temperature		**°C**	Operation - 25…+55
Number of inputs			2
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
Protection	gl fuse	**A**	1
Number of outputs			3, of which 2 dedicated to starter-controller coil operation
Supply for the outputs		**V**	⎓ 24
Current consumption On 24 V supply for the outputs		**mA**	200
Switching capacity of the solid state outputs			0.5 A/24 V
Indication/diagnostics			By 3 LEDs on front panel

Connection characteristics

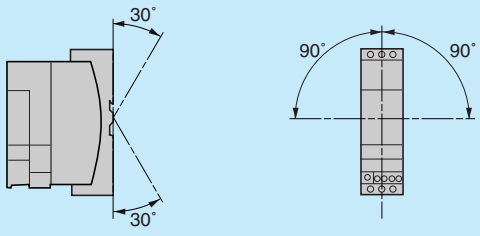
Module type				**LUF W10**	**LUF V2**	**ASILUF C5**		**LULC 032**	**LUFC 00**
						Inputs and 24 V auxiliary	**Outputs**		
Connectors		Pitch		5.08	3.81	5.08	3.81	3.81	3.81
Flexible cable without cable end		1 conductor	**mm²**	0.2…1.5	0.14…1	0.2…1.5	0.14…1	0.14…1	0.14…1
		2 identical conductors	**mm²**	0.2…1	0.14…0.75	0.2…1	0.14…0.75	0.14…0.75	0.14…0.75
Flexible cable with cable end	Without insulated ferrule	1 conductor	**mm²**	0.25…1.5	0.25…1	0.25…1.5	0.25…1	0.25…1	0.25…1
		2 identical conductors	**mm²**	0.25…1	0.25…0.34	0.25…1	0.25…0.34	0.25…0.34	0.25…0.34
	With insulated ferrule	1 conductor	**mm²**	0.25…1.5	0.25…0.5	0.25…1.5	0.25…0.5	0.25…0.5	0.25…0.5
		2 identical conductors *(1)*	**mm²**	0.5…1.5	0.5	0.5…1.5	0.5	0.5	0.5
Solid cable without cable end		1 conductor	**mm²**	0.2…1.5	0.14…1	0.2…1.5	0.14…1	0.14…1	0.14…1
		2 identical conductors	**mm²**	0.2…1	0.14…0.5	0.2…1	0.14…0.5	0.14…0.5	0.14…0.5
Conductor size		1 conductor		AWG 24 to AWG 16	AWG 26 to AWG 16	AWG 24 to AWG 16	AWG 26 to AWG 16	AWG 26 to AWG 16	AWG 26 to AWG 16
Tightening torque			**N.m**	0.5…0.6	0.22…0.25	0.5…0.6	0.22…0.25	0.22…0.25	0.22…0.25
Flat screwdriver			**mm**	3.5	2.5	3.5	2.5	2.5	2.5

(1) Use a double cable end.

References : pages 21 to 28
Dimensions : pages 48 and 49
Schemes : pages 50 to 54

TeSys Model U
Controllers
Control bases and control units

Environment

Control base and control unit type			LUT M + LUCB T5 or LUCD T5	LUT M + LUCM T5
Approvals			UL, CSA	
Conforming to standards			IEC/EN 60947-4-1, UL 508, CSA C22-2 N˚14	
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution : 3	**V**	690	
	To UL508, CSA C22-2 n˚14	**V**	600	
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-4-1	**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**	- 25…+ 70	- 25…+ 55
Maximum operating altitude		**m**	2000	
Operating positions Without derating	In relation to normal vertical mounting plane			
Flame resistance	Conforming to UL 94		V2	
	Conforming to IEC/EN 60695-2-1	**˚C**	960 (parts supporting live components)	
		˚C	650	
Shock resistance 1/2 sine wave = 11ms	Conforming to IEC/EN60068-2-27 *(1)*		15 gn	
Vibration resistance 5…300 Hz	Conforming to IEC/EN 60068-2-6 *(1)*		4 gn	
Immunity to electrostatic discharge	Conforming to IEC/EN 61000-4-2	**kV**	In open air : 8 - Level 3	
		kV	On contact : 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 serial link : 4 - Level 4	
		kV	Serial link : 2 - Level 3	
Immunity to transient overvoltage surges	Conforming to IEC/EN 61000-4-5		Common mode	Serial mode
	Control voltage > 200 V	**kV**	4	2
	Control voltage < 200 V	**kV**	2	1
	Control voltage = ⎓ 24 V	**kV**	2	0.5
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.

References : page 25 Dimensions : page 25 Schemes : page 25

Control supply characteristics

Operating voltage		**V**	⎓ 24
Power consumption		**W**	2
Connection			By plug-in terminal block
Solid cable	1 conductor	**mm²**	0.75…1.5
	2 conductors	**mm²**	0.75…1.5
Flexible cable without cable end	1 conductor	**mm²**	0.34…1.5
	2 conductors	**mm²**	0.34…1.5
Flexible cable with cable end	1 conductor	**mm²**	0.75…1.5
	2 conductors	**mm²**	0.75…1.5
Screwdriver			Philips n° 1 or flat screwdriver : Ø 5 mm
Tightening torque		**N.m**	0.8…1.2

Input characteristics

Operating voltage		**V**	⎓ 24
Logic inputs		**mA**	Logic state 1 : I ⩾ 10 mA Logic state 0 : I ⩽ 3 mA

Digital output characteristics

Type			Double break volt-free contacts
Load	a.c. current	**V**	250 max
	d.c. current	**V**	24 V
Permissible power in cat. AC-15		**VA**	500 for 100 000 operating cycles
Permissible power in cat. DC-13		**W**	50 for 100 000 operating cycles

Characteristics of external current transformers

Precision		Class 5P		
Precision limit factor		15		
Maximum operating temperature	**°C**	70		
Transformer ratio		100/5	400/5	800/5
Hole diameter	**mm**	35	35	10
Maximum connection c.s.a.	**mm²**	300	300	Built-in

References : page 25
Dimensions : page 25
Schemes : page 25