


Railway applications, Rolling stock functions

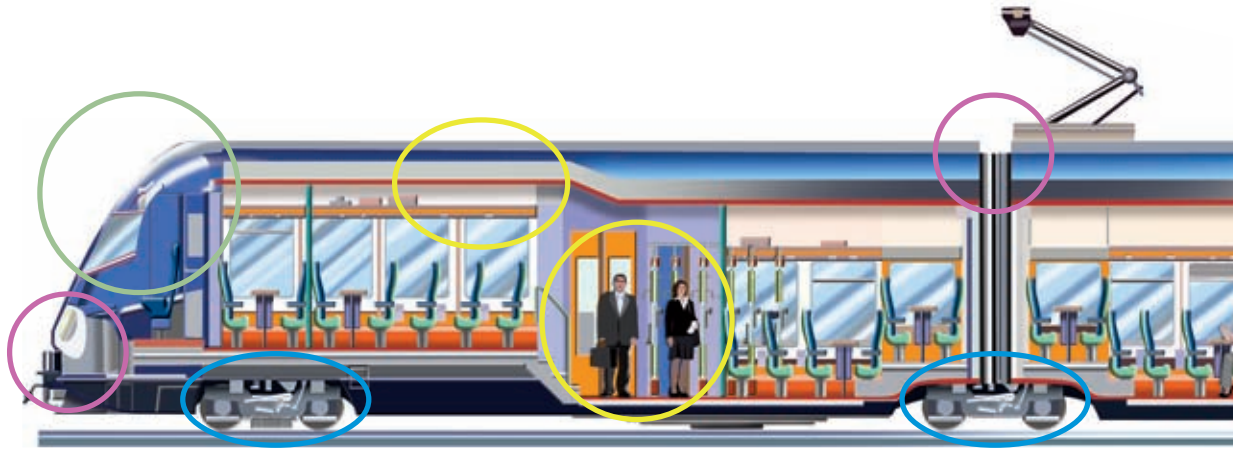
The **essential** guide



Merlin Gerin
Square D
Telemecanique

Schneider
 **Electric**

Schneider Electric offers you a selection of products for the main functions found on board rolling stock



Functions

Supply and control

- Multi 9 circuit-breakers
- TeSys contactors
- Harmony pushbuttons, switches and pilot lights
- Selectron PLCs



GPS



Data memory



Diagnostics



Driver's cab



Speed control

Access and comfort

- Multi 9 circuit-breakers
- Osi sensors
- TeSys contactors
- Harmony pushbuttons, switches and pilot lights
- Selectron PLCs



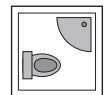
Doors



Ventilation



Lighting



WC



Heating

Propulsion

- Osi sensors
- Selectron PLCs
- TeSys contactors



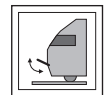
Propulsion



Brakes



Sander



Flaps



Gear control



Slip/skid control

Communication

- Selectron PLCs



Communication

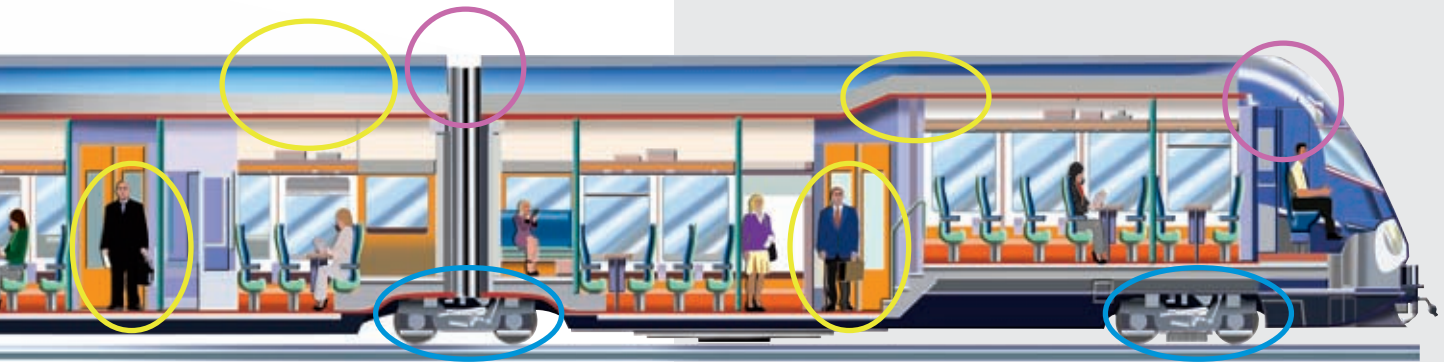


Networking

The essential guide

A selection of products that conform to the standards relating to railway applications.

Contents



Product advantages:

Standards:

Standard: **IEC 60077-2, IEC 50-155**

Fire/smoke/
toxicity: **NF F 16-101 - F 16-102**

Shock/vibration: **IEC 61 373 - Category 1,
Class B**

Certifications:

SNCF:

Circuit-breakers - Multi 9

- Modular circuit-breakers 4
- Differential circuit-breakers 5 to 6

Sensors - Osiris, Osiprox, Osisonic, Osiswitch, Nautilus

- Photo-electric sensors 7
- Proximity sensors 8 to 11
- Limit switches 12 to 19
- Pressure sensors 20 to 23

Contactors and circuit-breakers - TeSys

- Contactors 24 to 29
- Motor circuit-breakers 30 to 31

Pushbuttons, switches and pilot lights - Harmony

- Ø22 metal bezel pushbuttons, switches and pilot lights 32 to 35
- Cam switches K1/K2 36

Relays - Zelio control

- Monitoring relays 37

PLCs - Selectron

- Processor module 38 to 41

Multi 9

C32HDC/C60N

Severity
1

Modular circuit-breakers

C curve 1...63 A



Lighting



Ventilation



Driver's cab



WC



Heating



Circuit-breaker type		C curve		C60N			
		C32HDC					
Conformity to standards		IEC 60947-2		IEC 60898, IEC 60947-2			
Certifications		SNCF					
Number of poles		1-pole	2-pole	1-pole	2-pole	3-pole	4-pole
Supply voltage		125 VDC	250 VDC	230 VAC/60VDC	400 VAC	400 VAC	400 VAC
Number of 9 mm pitches		2	4	2	4	6	8
References	1 A	TM DC1P1AC10kA	TM DC2P1AC10kA	TM 1P1AC10kA	TM 2P1AC10kA	–	–
	2 A	TM DC1P2AC10kA	TM DC2P2AC10kA	TM 1P2AC10kA	TM 2P2AC10kA	–	–
	4 A	TM DC1P4AC10kA	TM DC2P4AC10kA	TM 1P4AC10kA	TM 2P4AC10kA	TM 3P4AC10kA	TM 4P4AC10kA
	6 A	TM DC1P6AC10kA	TM DC2P6AC10kA	TM 1P6AC10kA	TM 2P6AC10kA	TM 3P6AC10kA	TM 4P6AC10kA
	10 A	TM DC1P10AC10kA	TM DC2P10AC10kA	TM 1P10AC10kA	TM 2P10AC10kA	TM 3P10AC10kA	TM 4P10AC10kA
	16 A	TM DC1P16AC10kA	TM DC2P16AC10kA	TM 1P16AC10kA	TM 2P16AC10kA	TM 3P16AC10kA	TM 4P16AC10kA
	20 A	TM DC1P20AC10kA	TM DC2P20AC10kA	TM 1P20AC10kA	TM 2P20AC10kA	TM 3P20AC10kA	TM 4P20AC10kA
	25 A	TM DC1P25AC10kA	TM DC2P25AC10kA	TM 1P25AC10kA	TM 2P25AC10kA	TM 3P25AC10kA	TM 4P25AC10kA
	32 A	TM DC1P32AC10kA	TM DC2P32AC10kA	TM 1P32AC10kA	TM 2P32AC10kA	TM 3P32AC10kA	TM 4P32AC10kA
	40 A	TM DC1P40AC10kA	TM DC2P40AC10kA	TM 1P40AC10kA	TM 2P40AC10kA	TM 3P40AC10kA	TM 4P40AC10kA
	50 A	TM DC1P50AC10kA	TM DC2P50AC10kA	TM 1P50AC10kA	TM 2P50AC10kA	TM 3P50AC10kA	TM 4P50AC10kA
	63 A	TM DC1P63AC10kA	TM DC2P63AC10kA	TM 1P63AC10kA	TM 2P63AC10kA	TM 3P63AC10kA	TM 4P63AC10kA

D curve 4...63 A



Circuit-breaker type		D curve			
		C60N			
Conformity to standards		IEC 60898, IEC 60947-2			
Certifications		SNCF			
Number of poles		1-pole	2-pole	3-pole	4-pole
Supply voltage		230 VAC	400 VAC	400 VAC	400 VAC
Number of 9 mm pitches		2	4	6	8
References	1 A	TM 1P1AD10kA	TM 2P1AD10kA	–	–
	2 A	TM 1P2AD10kA	TM 2P2AD10kA	–	–
	4 A	TM 1P4AD10kA	TM 2P4AD10kA	TM 3P4AD10kA	TM 4P4AD10kA
	6 A	TM 1P6AD10kA	TM 2P6AD10kA	TM 3P6AD10kA	TM 4P6AD10kA
	10 A	TM 1P10AD10kA	TM 2P10AD10kA	TM 3P10AD10kA	TM 4P10AD10kA
	16 A	TM 1P16AD10kA	TM 2P16AD10kA	TM 3P16AD10kA	TM 4P16AD10kA
	20 A	TM 1P20AD10kA	TM 2P20AD10kA	TM 3P20AD10kA	TM 4P20AD10kA
	25 A	TM 1P25AD10kA	TM 2P25AD10kA	TM 3P25AD10kA	TM 4P25AD10kA
	32 A	TM 1P32AD10kA	TM 2P32AD10kA	TM 3P32AD10kA	TM 4P32AD10kA
	40 A	TM 1P40AD10kA	TM 2P40AD10kA	TM 3P40AD10kA	TM 4P40AD10kA
	50 A	TM 1P50AD10kA	TM 2P50AD10kA	TM 3P50AD10kA	TM 4P50AD10kA
	63 A	TM 1P63AD10kA	TM 2P63AD10kA	TM 3P63AD10kA	TM 4P63AD10kA

Accessories

Type	Spring terminals kit
Reference	17400

Other versions, refer to www.merlengerin.com

Multi 9

DPN N Vigi

Severity
1

Differential circuit-breakers

Instantaneous 6...32 A - Class A



Lighting



Ventilation



Driver's cab



WC



Heating



Circuit-breaker type		C curve - Class A DPN N Vigi	
Conformity to standards		EN 60898, EN 61009	
Certifications		SNCF	
Number of poles		1-pole + neutral	1-pole + neutral
Sensitivity		30 mA	300 mA
Supply voltage		230 VAC	230 VAC
Number of 9 mm pitches		4	4
References	6 A	DPNV1N630mA A	DPNV1N6300mA A
	10 A	DPNV1N1030mA A	DPNV1N10300mA A
	16 A	DPNV1N1630mA A	DPNV1N16300mA A
	20 A	DPNV1N2030mA A	DPNV1N20300mA A
	25 A	DPNV1N2530mA A	DPNV1N25300mA A
	32 A	DPNV1N3230mA A	DPNV1N32300mA A

Vigi C60 blocks ≤25...≤63 A - Class A



Circuit-breaker type		Vigi C60 blocks - Class A For use with circuit-breaker C60N			
Conformity to standards		EN 60898, EN 61009			
Certifications		SNCF			
Number of poles		2-pole		4-pole	
Sensitivity		30 mA	300 mA	30 mA	300 mA
Supply voltage		230...400 VAC			
Number of 9 mm pitches		3 (≤ 25 A) 4 (≤ 40/63 A)		6 (≤ 25 A) 7 (≤ 40/63 A)	
References	≤ 25 A	VC252P23040030mA A	VC252P230400300mA A	VC254P23040030mA A	VC254P230400300mA A
	≤ 40 A	VC402P23040030mA A	VC402P230400300mA A	VC404P23040030mA A	VC404P230400300mA A
	≤ 63 A	VC632P23040030mA A	VC632P230400300mA A	VC634P23040030mA A	VC634P230400300mA A

Accessories

Type	Screw cover	Replacement bolt
References	26982	26487

Other versions, refer to www.merlengerin.com

Multi 9

RCCB-ID

Severity
1

Differential circuit-breakers

Class A



Lighting



Ventilation



Driver's cab



WC



Heating



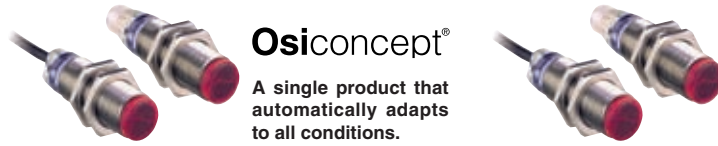
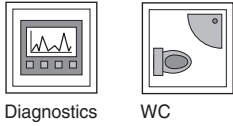
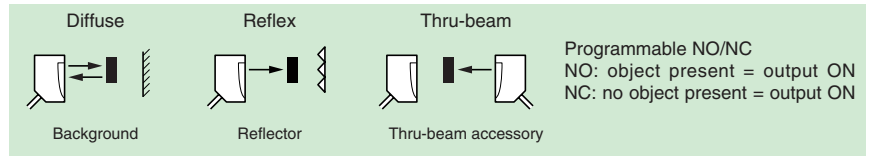
Circuit-breaker type		RCCB-ID - Class A			
Conformity to standards		IEC 61008, IEC 60947-1, IEC 60947-3			
Certifications		SNCF			
Number of poles		2-pole		4-pole	
Sensitivity		30 mA		300 mA	
Supply voltage		230...400 VAC			
Number of 9 mm pitches		4		8	
References	25 A	ID2P2530mAA	ID4P2530mAA	ID4P25300mAA	
	40 A	ID2P4030mAA	ID4P4030mAA	ID4P40300mAA	
	63 A	ID2P6330mAA	ID4P6330mAA	ID4P63300mAA	

Type "si" - Class A



Circuit-breaker type		Type "si" RCCB-ID - Class A			
Conformity to standards		IEC 61008, IEC 60947-1, IEC 60947-3			
Certifications		SNCF			
Number of poles		2-pole		4-pole	
Sensitivity		30 mA	300 mA	30 mA	300 mA
Supply voltage		230...400 VAC			
Number of 9 mm pitches		4		8	
References	40 A	ID2P4030mAA Si	–	–	–
	63 A	ID2P6330mAA Si	ID2P63300mAA Si S	ID4P6330mAA Si	ID4P63300mAA Si S

Photo-electric sensors Design 18 metal

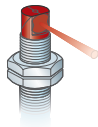


	Universal	Optimum	
Conformity to standards	IEC 60077-2		
Certifications	SNCF		
Max. / usable sensing distance	without accessory	0.4 / 0.3 m	—
	w/o accessory, with b/grnd suppress.	0.12 / 0.12 m	—
	with reflector (polarised)	3 / 2 m	—
	with thru-beam accessory	20 / 15 m	—
	Diffuse	—	0.8 / 0.6 m
	Polarised reflex	—	3 / 2 m
	Reflex	—	5.5 / 4 m
	Thru-beam	—	20 / 15 m
Fixing (mm)	M18 x 1	M18 x 1	
Case M (metal) P (plastic) / Dimensions (mm) Ø x L	M / M18 x 64	M / M18 x 46	
Sensing distance adjustment	Using teach mode	—	
Switching frequency (Hz)	250	500	
Setting-up assistance LEDs (⊗)	yes	—	
Product certification	CE - UL - CSA - C-TICK		
Common characteristics	Temperature range (°C): - 25...+ 55 / Degree of protection (conforming to IEC 60529): IP65, IP67 Output status LED (⊗): yes / Power on LED (⊗): yes Supply voltage limits, min./max. (V) including ripple: 10...36 Overload and short-circuit protection (★): yes / Switching capacity (mA), main output: 100		

Sensors for DC circuit applications (solid-state output: transistor)

Connection	Pre-cabled, PvR (L = 2 m)		
T/R 3-wire	PNP programmable NO/NC	XUB0BPSNL2	—
	NPN programmable NO/NC	XUB0BNSNL2	—
Thru-beam transmitter	—		XUB2BKSNL2T
Receiver or T/R, 3-wire PNP (1)	Diffuse, adjustable	NO	XUB5BPANL2
		NC	XUB5BPBNL2
	Polarised reflex	NO	XUB9BPANL2
		NC	XUB9BPBNL2
Reflex	NO	XUB1BPANL2	
	NC	XUB1BPBNL2	
Thru-beam	NO	XUB2BPANL2R	
	NC	XUB2BPBNL2R	
Thru-beam transmitter accessory	pre-cabled (L = 2 m)	XUB0BKSNL2T	—
	connector	XUB0BKSNM12T	—

90° head



All the above Osiris Design 18 sensors are available with an integral 90° head. To order, replace the letter "N" in the reference by "W".
Example: For pre-cabled versions: XUB0APSNL2 becomes XUB0APSWL2.
For connector versions: XUB0APSNM12 becomes XUB0APSWM12.
Sensing distances: refer to www.Telemechanique.com

Accessories

Reflectors		Suitable female connectors, including pre-wired versions			Simple bracket
<p>XUZC24 XUZC80 XUZC50</p>	Reflectors (mm)		<p>length 5 m without LED</p> <p>M8 XZCP1041L5 XZCP0941L5 XZCC8FCM40S</p> <p>M12 XZCP1241L5 XZCP1141L5 XZCC12FCM40B</p>	<p>for XUB...</p> <p>standard XUZA118 (stainless steel)</p>	
	Ø 21	XUZC21			
	24 x 21	XUZC24			
	Ø 31	XUZC31			
	Ø 39	XUZC39			
	Ø 80	XUZC80			
50 x 50	XUZC50				
100 x 100	XUZC100				



Doors



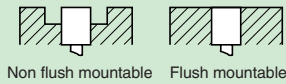
WC



Propulsion



Brakes



Non flush mountable Flush mountable



Sander



Flaps



Gear control



	Ø 4	M5	Ø 6.5
Conformity to standards	IEC 60077-2		
Certifications	SNCF		
Nominal sensing distance Sn	1 mm	1 mm	1.5 mm
Operating zone (mm)	0...0.8	0...0.8	0...1.2
Suitability for flush mounting (metal environment)	Flush mountable		
Case M (metal) P (plastic)	M		
Temperature range (°C)	- 25...+ 70		
Product certification	CE - UL - CSA - CCC - C-TICK		
Degree of protection (conforming to IEC 60529)	IP67		

Sensors for DC circuit applications

Connection			Pre-cabled, PvR (2 m)		
Dimensions (mm) Ø x L			Ø 4 x 29	M5 x 29	M6.5 x 33
3-wire	PNP	NO function	XS1L04PA310	XS1N05PA310	XS1L06PA340
		NC function	–	–	–
	NPN	NO function	XS1L04NA310	XS1N05NA310	XS1L06NA340
		NC function	–	–	–
Connection			M8 connector		
3-wire	PNP	NO function	XS1L04PA310S	XS1N05PA311S (2)	XS1L06PA340S
		NC function	–	–	–
	NPN	NO function	XS1L04NA310S	XS1N05NA311S (2)	XS1L06NA340S
		NC function	–	–	–
Supply voltage limits, min./max. (V) including ripple			5...30	5...30	10...38
Switching capacity, max. (mA)			100	100	200
Short-circuit protection (★) / Output status LED (⊗) / Power on LED (⊙)			★ / ⊗ / –	★ / ⊗ / –	★ / ⊗ / –
Voltage drop, closed state (V) at I nominal			≤ 2	≤ 2	≤ 2
Switching frequency (Hz)			5000	5000	2500

Sensors for DC circuit applications

Connection					
Dimensions (mm) Ø x L			–	–	–
2-wire	non polarised	NO function	–	–	–
		NC function	–	–	–
Connection					
2-wire	non polarised	NO function	–	–	–
		NC function	–	–	–
Supply voltage limits, min./max. (V) including ripple			–	–	–
Switching capacity, max. (mA)			–	–	–
Overload and short-circuit protection (★) / Output status LED (⊗)			–	–	–
Residual current, open state (mA)			–	–	–
Voltage drop, closed state (V) at I nominal			–	–	–
Switching frequency (Hz)			–	–	–

(2) Stainless steel products, Sn = 0.8 mm

Accessories

Fixing clamps

With indexing pin for cylindrical sensors



M4	XSZB104	M12	XSZB112
M5	XSZB105	M18	XSZB118
M6.5	XSZB165	M30	XSZB130
M8	XSZB108		

Threaded case



Increased range				Standard range			
M8	M12	M18	M30	M8	M12	M18	M30
IEC 60077-2				IEC 60077-2			
SNCF				SNCF			
2.5 mm	4 mm	10 mm	20 mm	1.5 mm	2 mm	5 mm	10 mm
0...2	0...3.2	0...8	0...16	0...1.2	0...1.6	0...4	0...8
Flush mountable	Flush mountable	Flush mountable	Flush mountable	Flush mountable	Flush mountable	Flush mountable	Flush mountable
M	M	M	M	M	M	M	M
- 25...+ 50	- 25...+ 50	- 25...+ 50	- 25...+ 50	- 25...+ 70	- 25...+ 70	- 25...+ 70	- 25...+ 70
CE - UL - CSA - CCC - C-TICK				CE - UL - CSA - CCC - C-TICK			
IP67		Pre-cabled: IP68 (with connector: IP67)		IP67		Pre-cabled: IP68 (with connector: IP67)	

Short case

Pre-cabled, PvR (2 m)			
M8 x 33	M12 x 33	M18 x 36.5	M30 x 40.6
XS1N08PA349	XS1N12PA349	XS1N18PA349	XS1N30PA349
XS1N08PB349	XS1N12PB349	XS1N18PB349	XS1N30PB349
XS1N08NA349	XS1N12NA349	XS1N18NA349	XS1N30NA349
XS1N08NB349	XS1N12NB349	XS1N18NB349	XS1N30NB349
M8 connector	M12 connector		
XS1N08PA349S	XS1N12PA349D	XS1N18PA349D	XS1N30PA349D
XS1N08PB349S	XS1N12PB349D	XS1N18PB349D	XS1N30PB349D
XS1N08NA349S	XS1N12NA349D	XS1N18NA349D	XS1N30NA349D
XS1N08NB349S	XS1N12NB349D	XS1N18NB349D	XS1N30NB349D
10...36	10...36	10...36	10...36
200	200	200	200
★ / -	★ / -	★ / -	★ / -
≤ 2	≤ 2	≤ 2	≤ 2
2500	2500	1000	500

Short case

Pre-cabled, PvR (2 m)			
M8 x 33	M12 x 33	M18 x 36.5	M30 x 40.6
XS508B1PAL2	XS512B1PAL2	XS518B1PAL2	XS530B1PAL2
XS508B1PBL2	XS512B1PBL2	XS518B1PBL2	XS530B1PBL2
XS508B1NAL2	XS512B1NAL2	XS518B1NAL2	XS530B1NAL2
XS508B1NBL2	XS512B1NBL2	XS518B1NBL2	XS530B1NBL2
M8 connector	M12 connector		
XS508B1PAM8	XS512B1PAM12	XS518B1PAM12	XS530B1PAM12
XS508B1PBM8	XS512B1PBM12	XS518B1PBM12	XS530B1PBM12
XS508B1NAM8	XS512B1NAM12	XS518B1NAM12	XS530B1NAM12
XS508B1NBM8	XS512B1NBM12	XS518B1NBM12	XS530B1NBM12
10...36	10...36	10...36	10...36
200	200	200	200
★ / ⊗	★ / ⊗	★ / ⊗	★ / ⊗
≤ 2	≤ 2	≤ 2	≤ 2
5000	5000	2000	1000

Long case

Pre-cabled, PvR (2 m)			
M8 x 50	M12 x 50	M18 x 52.5	M30 x 50
XS508B1DAL2	XS512B1DAL2	XS518B1DAL2	XS530B1DAL2
XS508B1DBL2	XS512B1DBL2	XS518B1DBL2	XS530B1DBL2
M12 connector			
XS508B1DAM12	XS512B1DAM12	XS518B1DAM12	XS530B1DAM12
XS508B1DBM12	XS512B1DBM12	XS518B1DBM12	XS530B1DBM12
10...58	10...58	10...58	10...58
100	100	100	100
★ / ⊗	★ / ⊗	★ / ⊗	★ / ⊗
≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5
≤ 4	≤ 4	≤ 4	≤ 4
4000	4000	3000	2000

Suitable female connectors, including pre-wired versions

length 5 m without LED	pre-wired, elbowed	pre-wired, straight	screw terminal
M8 (or S)	XZCP0666L5	XZCP0566L5	XZCC8FCM30S
M12 (or D)	XZCP1241L5	XZCP1141L5	XZCC12FCM40B
U20 (or K)	XZCP1965L5	XZCP1865L5	XZCC20FCM30B

Inductive proximity sensors Multivoltage with short-circuit protection



Doors



WC



Propulsion



Brakes



Sander



Flaps



Gear control



Non flush mountable Flush mountable



	M12	M18	M30
Conformity to standards	IEC 60077-2		
Certifications	SNCF		
Nominal sensing distance Sn	Flush mountable	2 mm	5 mm
	Non flush mountable	4 mm	8 mm
Operating zone (mm)	Flush mountable	0...1.6	0...4
	Non flush mountable	0...3.2	0...6.4
Suitability for flush mounting (metal environment)	Flush or non flush mountable depending on model		
Case M (metal) P (plastic)	M		
Temperature range (°C)	- 25...+ 70		
Degree of protection (conforming to IEC 60529)	IP68 (with connector: IP67)		
Product certification	CE - UL - CSA - CCC - C-TICK		
Dimensions (mm) Ø x L	M12 x 55	M18 x 60	M30 x 60

Multicurrent/multivoltage sensors for AC/DC circuit applications

Connection			Pre-cabled, PvR (2 m)		
2-wire AC/DC	NO function	Flush mountable	XS1M12MA250	XS1M18MA250	XS1M30MA250
		Non flush mountable	XS2M12MA250	XS2M18MA250	XS2M30MA250
	NC function	Flush mountable	XS1M12MB250	XS1M18MB250	XS1M30MB250
		Non flush mountable	XS2M12MB250	XS2M18MB250	XS2M30MB250
Connection			1/2"-20UNF connector		
2-wire AC/DC	NO function	Flush mountable	XS1M12MA250K	XS1M18MA250K	XS1M30MA250K
		Non flush mountable	XS2M12MA250K	XS2M18MA250K	XS2M30MA250K
	NC function	Flush mountable	XS1M12MB250K	XS1M18MB250K	XS1M30MB250K
		Non flush mountable	XS2M12MB250K	XS2M18MB250K	XS2M30MB250K
Supply voltage limits, min./max. (V) 50-60 Hz			20...264		
Switching capacity, max. (mA)			5...200	5...200 AC, 5...300 DC	
Output status LED (⊗) / Power on LED (⊗)			⊗ / ⊗		
Residual current, open state (mA)			≤ 1.5		
Voltage drop, closed state (V) at I nominal			≤ 5.5		
Switching frequency (Hz)			25 AC, 4000 DC	25 AC, 2000 DC	25 AC, 2000 DC (1)

(1) 25 AC, 1000 DC for non flush mountable Ø 30 mm

Inductive proximity sensors Rotation control Fixed sensing distance Factor 1 (Fe/Nfe)



Propulsion



Brakes



Sander



Gear control



	M30	M18	M30
Conformity to standards	IEC 60077-2		
Certifications	SNCF		
Nominal sensing distance Sn	10 mm	5 mm	10 mm
Operating zone (mm)	0...8	0...4	0...8
Suitability for flush mounting (metal environment)	Flush mountable	Flush mountable	
Case M (metal) P (plastic)	M	M	M
Temperature range (°C)	- 25...+ 70	0...+ 50	
Degree of protection (conforming to IEC 60529)	IP67	Pre-cabled: IP68 (with connector: IP67)	
Product certification	CE - UL - CSA - CCC - C-TICK		
Dimensions (mm) Ø x L	M30 x 81	M18 x 70	M30 x 60
Maximum speed of passing object (impulses/min)	6000...48000 (1)	–	–
Adjustable frequency range (impulses/min)	6...150 / 120...3000 (1)	–	–

Sensors for DC circuit applications

Connection	Pre-cabled, PvR (2 m)		
4-wire PNP/NPN NO/NC programmable	–	XS1M18KPM40	XS1M30KPM40
3-wire PNP NC function	slow version	XSAV11373	–
	fast version	XSAV12373	–
Connection	M8 or M12 connector		
4-wire PNP/NPN NO/NC programmable	–	XS1M18KPM40D	Flying lead (L = 0.8 m) with M12 XS1M30KPM40LD
Supply voltage limits, min./max. (V) including ripple	10...58	10...38	
Switching capacity, max. (mA)	200	200	
Short-circuit protection (★) / Output status LED (⊗) / Power on LED (⊗)	★ / ⊗ / –	★ / ⊗ / –	
Voltage drop, closed state (V) at I nominal	≤ 2	≤ 2.6	
Switching frequency (Hz)	–	1000	

Multicurrent/multivoltage sensors for AC/DC circuit applications

Connection	Pre-cabled, PvR (2 m)		
2-wire AC/DC NC function	slow version	XSAV11801	–
not short-circuit protected (2)	fast version	XSAV12801	–
Supply voltage limits, min./max. (V) 50-60 Hz		20...264	–
Switching capacity, max. (mA)		300 AC / 200 DC	–
Output status LED (⊗) / Power on LED (⊗)		⊗ / –	–
Residual current, open state (mA)		≤ 1.5	–
Voltage drop, closed state (V) at I nominal		≤ 5.7	–

- (1) 6...150 and 6000 impulses/min for XSAV11373 and XSAV11801 (slow version)
120...3000 and 48000 impulses/min for XSAV12373 and XSAV12801 (fast version)

Accessories

Fixing clamps

With indexing pin for cylindrical sensors



M12	XSZB112
M18	XSZB118
M30	XSZB130

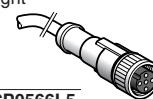
Suitable female connectors, including pre-wired versions

length 5 m
without LED

pre-wired,
elbowed



pre-wired,
straight



screw terminal



M8	XZCP0666L5
M12 (or D)	XZCP1241L5
U20	XZCP1965L5

XZCP0566L5
XZCP1141L5
XZCP1865L5

XZCC8FCM30S
XZCC12FCM40B
XZCC20FCM30B

Osiconcept®
Offering simplicity through innovation



Doors



Propulsion



Brakes



Flaps



Miniature XCMD metal, pre-cabled; fixing by the body or by the head

Conformity to standards	IEC 60077-2		
Certifications	SNCF		
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever
Mechanical durability (millions of operating cycles)	10	10	10
Actuation speed (in m/s)	0.5	0.5	1.5
Switches conforming to standard IEC 947-5-1 section 3 ⊕	⊕	⊕	⊕
Product certification	CE - UL - CSA - CCC		
Degree of protection conforming to IEC 60529	IP66 and IP67		
Rated operational characteristics	AC 15; B 300 (Ue = 240 V, Ie = 1.5 A) / DC 13; R 300 (Ue = 250 V, Ie = 0.1 A)		
Cable entry	Pre-cabled, adjustable direction, length = 1 m (other lengths available on request)		
Fixing centres (mm)	20		
Body dimensions (mm) W x D x H	30 x 16 x 50		
Complete switch (2-pole N/C + N/O snap action)	XCMD2110L1	XCMD2102L1	XCMD2115L1
(2-pole N/C + N/O break before make, slow break)	XCMD2510L1	XCMD2502L1	XCMD2515L1

⊕ Positive opening operation

Universal, complete switches



Compact XCKD metal and XCKP plastic conforming to standard EN 50047

Conformity to standards	IEC 60077-2			
Certifications	SNCF			
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	M18 head metal end plunger
Mechanical durability (millions of operating cycles)	15	10	15	10
Actuation speed (in m/s)	0.5	0.5	1	0.5
Switches conforming to standard IEC 947-5-1 section 3 ⊕	⊕	⊕	⊕	⊕
Product certification	CE - CSA - CCC - GOST			
Degree of protection conforming to IEC 60529	IP66 and IP67			
Rated operational characteristics	AC 15; A 300 (Ue = 240 V, Ie = 3 A) / DC 13; Q 300 (Ue = 250 V, Ie = 0.27 A)			
Cable entry	1 tapped entry for ISO M16 x 1.5 cable gland (2)			
Fixing centres (mm)	20	20	20	M18 x 1
Body dimensions (mm) W x D x H	31 x 30 x 65			
Metal switches				
Complete switch (2-pole N/C + N/O snap action)	XCKD2110P16	XCKD2102P16	XCKD2121P16	XCKD21H0P16
(2-pole N/C + N/O break before make, slow break)	XCKD2510P16	XCKD2502P16	XCKD2521P16	XCKD25H0P16
Plastic double insulated switches				
Complete switch (2-pole N/C + N/O snap action)	XCKP2110P16	XCKP2102P16	XCKP2121P16	XCKP21H0P16
(2-pole N/C + N/O break before make, slow break)	XCKP2510P16	XCKP2502P16	XCKP2521P16	XCKP25H0P16

⊕ Positive opening operation

(2) For Pg 11 cable entries, replace P16 by G11 in the reference. Example: XCKD2110**P16** becomes XCKD2110**G11**



IEC 60077-2			
SNCF			
Variable length thermoplastic roller lever	M12 head metal end plunger	M12 head steel roller plunger	"Cat's whisker"
10	10	10	5
1.5	0.5	0.1	1
⊖	⊕	⊕	-
CE - UL - CSA - CCC			
IP66 and IP67			
AC 15; B 300 (Ue = 240 V, Ie = 1.5 A) / DC 13; R 300 (Ue = 250 V, Ie = 0.1 A)			
Pre-cabled, adjustable direction, length = 1 m (other lengths available on request)			
20	M12 x 1	20	

XCMD2145L1	XCMD21F0L1	XCMD21F2L1	XCMD2106L1
XCMD2545L1	XCMD25F0L1	XCMD25F2L1	XCMD2506L1

⊖ Positive opening operation



IEC 60077-2				
SNCF				
M18 head steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever Ø 50 mm	"Cat's whisker"
10	10	10	10	5
0.5	1.5	1.5	1.5	1
⊖	⊖	⊕	⊕	-
CE - CSA - CCC - GOST				
IP66 and IP67				
AC 15; A 300 (Ue = 240 V, Ie = 3 A) / DC 13; Q 300 (Ue = 250 V, Ie = 0.27 A)				
1 tapped entry for ISO M16 x 1.5 cable gland (2)				
M18 x 1	20	20	20	20

XCKD21H2P16	XCKD2118P16	XCKD2145P16	XCKD2139P16	XCKD2106P16
XCKD25H2P16	XCKD2518P16	XCKD2545P16	XCKD2539P16	XCKD2506P16
XCKP21H2P16	XCKP2118P16	XCKP2145P16	XCKP2139P16	XCKP2106P16
XCKP25H2P16	XCKP2518P16	XCKP2545P16	XCKP2539P16	XCKP2506P16






⊖ Positive opening operation

Heads - common to miniature and compact bodies

Metal plunger and multidirectional heads

Description	Metal end plunger	Metal end plunger with protective elastomer boot	Steel roller plunger	Retractable steel roller lever plunger	Thermoplastic roller lever plunger, horizontal actuation
					
Reference	→ ZCE10	→ ZCE11	→ ZCE02	→ ZCE24 (2)	→ ZCE21


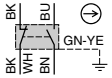
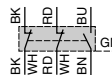
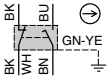
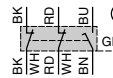
Metal rotary heads and levers

Description	Rotary head without lever, spring return, for actuation from LH AND RH side	Thermoplastic roller lever, track: 24/31 mm (ZCMD) 29/36 mm (ZCD/P/T)	Steel roller lever, track: 24/31 mm (ZCMD) 29/36 mm (ZCD/P/T)	Thermoplastic roller lever, track: 16/39 mm (ZCMD) 21/44 mm (ZCD/P/T)	Steel roller lever, track: 16/39 mm (ZCMD) 21/44 mm (ZCD/P/T)
					
Reference	→ ZCE01	→ ZCY15 (2)	→ ZCY16 (2)	→ ZCY25 (2)	→ ZCY26 (2)

(1) Use recommended with bodies: ZCD... / ZCP... / ZCT... (2) Use recommended with bodies ZCMD...

Bodies

Miniature


				
Type of contact				
	2-pole N/C + N/O Snap action	3-pole N/C + N/C + N/O Snap action	2-pole N/C + N/O Slow break	3-pole N/C + N/C + N/O Slow break
Reference of metal body	ZCMD21	ZCMD39	ZCMD25	ZCMD37
Reference of plastic body	-	-	-	-

Connection of miniature bodies

Specific pre-cabled connection components				
	for ZCMD21	for ZCMD39	for ZCMD25	for ZCMD37
L = 1 m	ZCMC21L1	ZCMC39L1	ZCMC25L1	ZCMC37L1
L = 2 m	ZCMC21L2	ZCMC39L2	ZCMC25L2	ZCMC37L2
L = 5 m	ZCMC21L5	ZCMC39L5	ZCMC25L5	ZCMC37L5

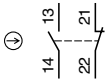
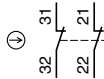
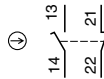
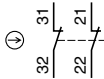
→ Positive opening operation

switches

Thermoplastic roller lever plunger, vertical actuation	M12 head metal end plunger	M18 head metal end plunger	M12 head steel roller plunger	M18 head steel roller plunger	Spring rod	Spring rod with plastic end	"Cat's whisker"
							
⊖ ZCE27	⊖ ZCEF0 (2)	⊖ ZCEH0 (1)	⊖ ZCEF2 (2)	⊖ ZCEH2 (1)	ZCE08	ZCE07	ZCE06
Thermoplastic roller lever, track: 20/36 mm (ZCMD) 24/40 mm (ZCD/P/T)	Steel roller lever, track: 20/36 mm (ZCMD) 24/40 mm (ZCD/P/T)	Ceramic roller lever	Variable length thermoplastic roller lever	Round, glass fibre rod lever Ø 3 mm L = 125 mm	Metal spring-rod lever	Thermoplastic roller lever Ø 50 mm	Adjustable thermo-plastic roller lever Ø 50 mm
							
⊖ ZCY18 (1)	⊖ ZCY19 (1)	⊖ ZCY22	⊖ ZCY45	ZCY55	ZCY91	⊖ ZCY39	⊖ ZCY49

Compact



Type of contact				
Ref. metal body	ZCD21	ZCD39	ZCD25	ZCD37
Ref. plastic body	ZCP21	ZCP39	ZCP25	ZCP37

Connection of compact bodies

Interchangeable outlet for cable gland						
Description	For ISO M16 cable gland	For ISO M20 cable gland	For Pg 11 cable gland	For Pg 13.5 cable gland	For 1/2" NPT cable gland	For PF 1/2 (G 1/2) cable gland
Metal	ZCDEP16	ZCDEP20	ZCDEG11	ZCDEG13	ZCDEN12	ZCDEF12
Plastic	ZCPEP16	ZCPEP20	ZCPEG11	ZCPEG13	ZCPEN12	ZCPEF12



Doors



Propulsion



Brakes



Flaps



Type XCKM metal, 3 cable entries

Type of operator	Metal end plunger	Steel roller plunger	Roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever	"Cat's whisker"
Mechanical durability (millions of operating cycles)	20	20	20	15	10
Actuation speed (in m/s)	0.5	0.5	1.5	1.5	0.5
Product certification	CE - UL - CSA - CCC - GOST - C-TICK - BV				
Degree of protection conforming to IEC 60529	IP665				
Rated operational characteristics	AC 15; A 300 (Ue = 240 V, Ie = 3 A) / DC 13; Q 300 (Ue = 250 V, Ie = 0.27 A)				
Cable entry (1)	3 tapped entries for ISO M20 x 1.5 cable gland (2 entries fitted with blanking plugs)				
Fixing centres (mm)	41				
Body dimensions (mm) W x D x H	63 x 30 x 64				

Complete switch (2-pole N/C + N/O snap action)	⊖ XCKM110H29	⊖ XCKM102H29	⊖ XCKM121H29	⊖ XCKM115H29	XCKM106H29
(2-pole N/C + N/O break before make, slow break)	⊖ XCKM510H29	⊖ XCKM502H29	⊖ XCKM521H29	⊖ XCKM515H29	-

(1) For Pg 13.5 cable entries, delete H29 from the end of the reference. Example: XCKM110H29 becomes XCKM110

⊖ Positive opening operation

Customised assembly of Classic XCKM switches Body/contact sub-assemblies



Type XCKM metal, 3 cable entries

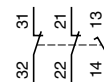
Type of contact



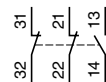
2-pole
N/C + N/O
snap action



2-pole
N/C + N/O make before
break, slow break



3-pole
N/C + N/C + N/O
snap action



3-pole
N/C + N/C + N/O
slow break

Reference of body with contact block	⊖ ZCKM1H29	ZCKM5H29	⊖ ZCKMD39H29	⊖ ZCKMD37H29
Reference of contact block only	⊖ XE2SP2151	⊖ XE2NP2151	⊖ XE3SP2141	⊖ XE3NP2141

Customised assembly of Classic XCKM switches

Operating heads, complete or for customer assembly



Complete switch

=



Body/contact assembly

+



Head

+



Lever

Rotary or multidirectional heads

with thermoplastic roller lever (2)

with steel roller lever (2)

with variable length thermoplastic roller lever (2)

with Ø 6 mm thermoplastic rod L = 200 mm (3)

with thermoplastic roller lever (3) for actuation from left **AND** right or left **OR** right

with "Cat's whisker"

with spring rod



Reference

⊖ ZCKD15

⊖ ZCKD16

ZCKD41

ZCKD59

⊖ ZCKD31

ZCKD06

ZCKD08

Plunger heads

with metal end plunger

with metal end plunger and protective boot

with steel roller plunger

with thermoplastic roller lever plunger, horizontal actuation in 1 direction

with steel roller lever plunger, horizontal actuation in 1 direction



Reference

⊖ ZCKD10

⊖ ZCKD109

⊖ ZCKD02

⊖ ZCKD21

⊖ ZCKD23

Rotary heads and separate levers

spring return for actuation from left **AND** right or left **OR** right

lever with thermoplastic roller (2)

lever with steel roller (2)

variable length lever with thermoplastic roller (2)

variable length lever with steel roller (2)

rod, Ø 6 mm thermoplastic L = 200 mm (3)



Reference

⊖ ZCKD05

⊖ ZCKY31

⊖ ZCKY33

ZCKY41

ZCKY43

ZCKY59

(2) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer

(3) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting



Doors



Propulsion



Brakes



Flaps



Type XCKJ metal, fixed body, conforming to standard EN 50041

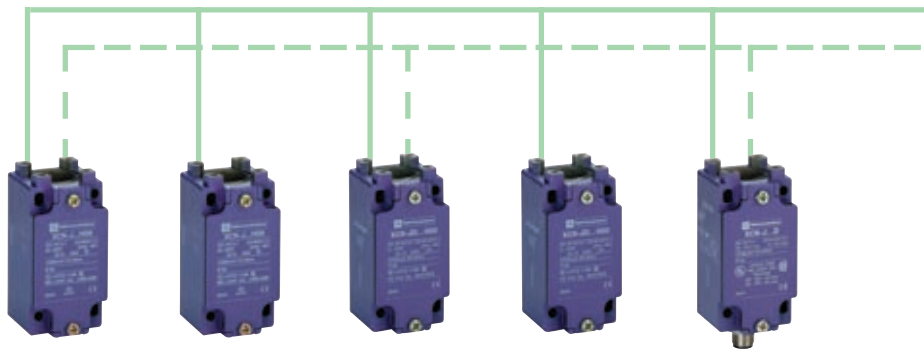
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Polyamide Ø 6 mm rod lever L = 200 mm
Mechanical durability (millions of operating cycles)	30	25	30	30	30
Actuation speed (in m/s)	0.5	1	1.5	1.5	1.5
Product certification	CE - UL - CSA - CCC - GOST - C-TICK - BV				
Degree of protection conforming to IEC 60529	IP667				
Rated operational characteristics	AC 15; A 300 (Ue = 240 V, Ie = 3 A) / DC 13; Q 300 (Ue = 250 V, Ie = 0.27 A)				
Cable entry (1)	1 tapped entry for ISO M20 x 1.5 cable gland				
Fixing centres (mm)	30 x 60				
Body dimensions (mm) W x D x H	40 x 44 x 77				

Complete switch (2-pole N/C + N/O snap action)	⊕ XCKJ161H29	⊕ XCKJ167H29	⊕ XCKJ10511H29	⊕ XCKJ10541H29	⊕ XCKJ10559H29
(2-pole N/C + N/O break before make, slow break)	⊕ XCKJ561H29	⊕ XCKJ567H29	⊕ XCKJ50511H29	⊕ XCKJ50541H29	⊕ XCKJ50559H29

(1) For Pg 13.5 cable entry, delete H29 from the end of the reference. Example: XCKJ161H29 becomes XCKJ161

⊕ Positive opening operation

Customised assembly of Classic XCKJ switches Body/contact sub-assemblies



Type XCKJ metal, 1 cable entry

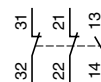
Type of contact



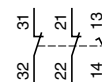
2-pole
N/C + N/O
snap action



2-pole N/C + N/O
break before make
slow break



3-pole
N/C + N/C + N/O
snap action



3-pole
N/C + N/C + N/O
slow break



2-pole
N/C + N/O
snap action

Cable entry (1)	1 tapped entry for ISO M20 x 1.5 cable gland				M12 connector
Reference of body with contact block	⊕ ZCKJ1H29	⊕ ZCKJ5H29	⊕ ZCKJD39H29	⊕ ZCKJD37H29	⊕ ZCKJ1D
Reference of contact block only	⊕ XE2SP2151	⊕ XE2NP2151	⊕ XE3SP2141	⊕ XE3NP2141	⊕ XE2SP2151

Customised assembly of Classic XCKJ switches

Operating heads,
complete or for customer assembly



Complete switch

=



Body/contact assembly

+



Head

+



Lever

Plunger or multidirectional heads

with reinforced steel roller end plunger

with metal end plunger

with thermoplastic roller lever plunger, 1 dir. of actuation

with steel roller lever plunger, 1 dir. of actuation

with steel roller end plunger

with steel ball bearing end plunger



Reference

⊖ ZCKE67



⊖ ZCKE61



⊖ ZCKE21



⊖ ZCKE23



⊖ ZCKE62



⊖ ZCKE66

with metal side plunger

with horizontal steel roller side plunger

with spring rod

with "Cat's whisker"



Reference

⊖ ZCKE63



⊖ ZCKE64



ZCKE08



ZCKE06

Rotary heads and separate levers

spring return for actuation from left AND right or left OR right

lever with thermoplastic roller (2)

lever with steel roller (2)

variable length lever with thermoplastic roller (2)

variable length lever with steel roller (2)

rod, Ø 6 mm thermoplastic L = 200 mm (2)

spring-metal rod lever (3)



Reference

⊖ ZCKE05



⊖ ZCKY11



⊖ ZCKY13



ZCKY41



ZCKY43



ZCKY59



ZCKY91

stay put for actuation from left AND right

forked arm lever with thermoplastic rollers, 1 track (2)

forked arm lever with thermoplastic rollers, 2 track (2)



Reference

ZCKE09



ZCKY71



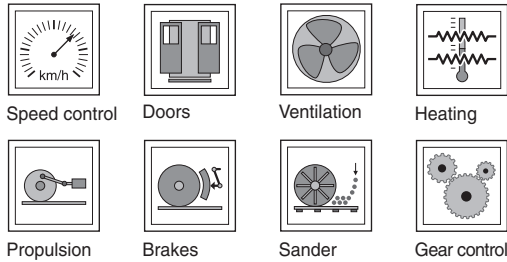
ZCKY61

(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting
 (3) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer

Sensors for pressure control

Electronic sensors XMLE

Electrical connection by DIN 43650 connector



Setting range (bar) (1)	-1...0	0...1	0...10	0...25	0...100	0...250	0...600
Fluids controlled	Hydraulic oils, air, fresh water, sea water, corrosive fluids from -15...+80°C						
Ambient air temperature	-15...+80°C						
Degree of protection (conforming to IEC 60529)	IP65						
Product certification	CE - UL - CSA						
Voltage limits	24 VDC, 11...33 VDC						
Dimensions (mm) Ø x L	Ø40 x 90 (not including connector)						
Fluid connection (2)	1/4" BSP male						
Electrical connection (3)	DIN 43650 connector						
Type of output (4)	Transmitter		4...20 mA, 2-wire technique				
	Pressure switch		PNP or NPN, normally closed (NC)				
Analogue output 4...20 mA	XMLEM01U1C21	XMLE001U1C21	XMLE010U1C21	XMLE025U1C21	XMLE100U1C21	XMLE250U1C21	XMLE600U1C21
NPN output	XMLEM01U1C31	XMLE001U1C31	XMLE010U1C31	XMLE025U1C31	XMLE100U1C31	XMLE250U1C31	XMLE600U1C31
PNP output	XMLEM01U1C41	XMLE001U1C41	XMLE010U1C14	XMLE025U1C41	XMLE100U1C41	XMLE250U1C41	XMLE600U1C41

(1) Other sizes, please consult us

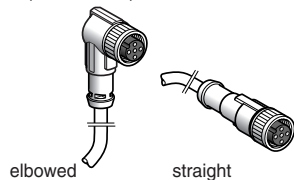
(2) Other fluid connections, please consult us

(3) Other types of connection, please consult us

(4) Other types of output; 0...5 V, 0...10 V, etc., please consult us

Suitable female connectors, including pre-wired versions

Pre-wired connectors, L = 5 m (without LED)



elbowed

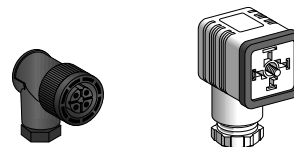
straight

M12

XZCP1241L5

XZCP1141L5

Connectors



screw terminal

DIN 43650A

XZCC12FCM40B

XZCC43FCP40B



Speed control



Doors



Ventilation



Heating



Propulsion



Brakes



Sander



Gear control



Setting range of lower limit (PB): vacuum switches (bar)		-0.08...-1	0.08...1	0.2...2.5	0.8...10	3.2...40
Fluids controlled		Hydraulic oils, air, fresh water, sea water, corrosive fluids from -15...+80°C				
Ambient air temperature		-25...+80°C				
Degree of protection (conforming to IEC 60529)		IP67				
Product certification		CE - UL - CSA - VIT-SEPRO				
Voltage limits (V)		24 VDC (17...33 VDC)				
Dimensions (mm) H x W x D		113 x 46 x 58				
Fluid connection		1/4" BSP female (1)				
Electrical connection		M12 connector (2)				
Configurable with digital display, connection by M12 connector (3)						
Universal sensors	4...20 mA	XMLFM01D2025	XMLF001D2025	XMLF002D2025	XMLF010D2025	XMLF040D2025
solid-state output, 200 mA	0...10 V	XMLFM01D2125	XMLF001D2125	XMLF002D2125	XMLF010D2125	XMLF040D2125
Dual stage pressure switches, solid-state output, 200 mA		XMLFM01D2035	XMLF001D2035	XMLF002D2035	XMLF010D2035	XMLF040D2035
Analogue sensors	4...20 mA	XMLFM01D2015	XMLF001D2015	XMLF002D2015	XMLF010D2015	XMLF040D2015
	0...10 V	XMLFM01D2115	XMLF001D2115	XMLF002D2115	XMLF010D2115	XMLF040D2115
Possible differential (bar) (pressure switches)	Min. at low setting	0.03	0.03	0.08	0.3	1.2
	Min. at high setting	0.03	0.03	0.08	0.3	1.2
	Max. at high setting	0.95	0.95	2.38	9.5	38



Setting range of upper limit (PH): pressure switches (bar)		8...100	12.8...160	20...250	32...400	48...600
Fluids controlled		Hydraulic oils, air, fresh water, sea water, corrosive fluids from -15...+80°C				
Ambient air temperature		-25...+80°C				
Degree of protection (conforming to IEC 60529)		IP67				
Product certification		CE - UL - CSA - VIT-SEPRO				
Voltage limits		24 VDC (17...33 VDC)				
Dimensions (mm) H x W x D		113 x 46 x 58				
Fluid connection		1/4" BSP female (1)				
Electrical connection		M12 connector (2)				
Configurable with digital display, connection by M12 connector (3)						
Universal sensors	4...20 mA	XMLF100D2025	XMLF160D2025	XMLF250D2025	XMLF400D2025	XMLF600D2025
solid-state output, 200 mA	0...10 V	XMLF100D2125	XMLF160D2125	XMLF250D2125	XMLF400D2125	XMLF600D2125
Dual stage pressure switches, solid-state output, 200 mA		XMLF100D2035	XMLF160D2035	XMLF250D2035	XMLF400D2035	XMLF600D2035
Analogue sensors	4...20 mA	XMLF100D2015	XMLF160D2015	XMLF250D2015	XMLF400D2015	XMLF600D2015
	0...10 V	XMLF100D2115	XMLF160D2115	XMLF250D2115	XMLF400D2115	XMLF600D2115
Possible differential (bar) (pressure switches)	Min. at low setting	3	4.8	7.5	12	18
	Min. at high setting	3	4.8	7.5	12	18
	Max. at high setting	95	152	237.5	380	570

(1) Available with other fluid connections: 1/4" NPT female and SAE 7/16-20 UNF

(2) For M12 connection accessories, see page 20

(3) AC 120 V version with 2.5 A relay output and SAE 7/8-16 UN connector also available

Sensors for pressure control Electromechanical pressure and vacuum switches XMLA and B



Speed control



Doors



Ventilation



Heating



Propulsion



Brakes



Sander



Gear control



Size (bar)	-1	5	1	2.5
Conformity to standards	IEC 60077-2			
Certifications	SNCF			
Environment characteristics	Ambient air temperature (°C): -25...+70 Degree of protection (conforming to IEC 60529): IP66			
Rated operational characteristics	AC-15; B300 (Ue = 240 V, Ie = 1.5 A - Ue = 120 V, Ie = 3 A) / DC-13; R300 (Ue = 250 V, Ie = 0.1 A)			
Product certification	CE - UL - CSA - CCC - BV - LROS - RINA - GL - DNV - VIT-SEPRO - GOST			
Fluid connection	1/4" BSP female (other connections possible, please consult us)			
Electrical connection	Screw terminals (1), tapped entry for ISO M20 x 1.5 cable gland. For n° 13 (DIN Pg 13.5) cable gland			

Fluids controlled	-1	5	1	2.5
	Hydraulic oils, fresh water, sea water, air up to 70°C		Hydraulic oils, air up to 160°C	Hydraulic oils, fresh water, sea water, air up to 70°C

Type XMLA fixed differential, single threshold detection

Setting range (bar) of upper limit (PH): pressure switches	-1	5	1	2.5
	-0.28...-1 (4)	-	0.03...1	0.15...2.5
Dimensions (mm) H x W x D	113 x 35 x 75	113 x 35 x 75	162 x 110 x 110	158 x 55 x 77.5
With setting scale 1 C/O single-pole, snap action contact	XMLAM01V2S12	-	XMLA001R2S12	XMLA002A2S12
Without setting scale 1 C/O single-pole, snap action contact	XMLAM01V1S12	-	XMLA001R1S12	XMLA002A1S12
Natural differential (bar) at low setting	0.24 (2)	-	0.02	0.13
subtract from PH to give PB at high setting	0.24 (2)	-	0.04	0.13

Type XMLB adjustable differential, regulation between 2 thresholds

Setting range (bar) of upper limit (PH): pressure switches	-1	5	1	2.5
	-0.14...-1 (4)	-0.5...5	0.05...1	0.3...2.5
With setting scale 1 C/O single-pole, snap action contact	XMLBM02V2S12	XMLBM05A2S12	XMLB001R2S12	XMLB002A2S12
Possible differential (bar) Min. at low setting	0.13 (3)	0.5	0.04	0.16
subtract from PH to give PB Min. at high setting	0.13 (3)	0.5	0.06	0.21
Max. at high setting	0.8 (3)	6	0.75	1.75



4	10	20	35	70	160	300	500
---	----	----	----	----	-----	-----	-----

conforming to IEC 947-5-1 Appendix A, EN 60 947-5-1

tapped entry, replace the last number of the reference (2) by 1 (example: XMLA010A2S12 becomes XMLA010A2S11)

Hydraulic oils, fresh water,
sea water, air up to 70°C

Hydraulic oils up to 160°C

0.4...4	0.6...10	0.7...20	1.5...35	5...70	10...160	20...300	30...500
113 x 35 x 75	113 x 35 x 75	113 x 35 x 75	113 x 35 x 75	113 x 35 x 75	113 x 35 x 75	113 x 35 x 75	113 x 35 x 75
XMLA004A2S12	XMLA010A2S12	XMLA020A2S12	XMLA035A2S12	XMLA070D2S12	XMLA160D2S12	XMLA300D2S12	XMLA500D2S12
XMLA004A1S12	XMLA010A1S12	XMLA020A1S12	XMLA035A1S12	XML-A070D1S12	XMLA160D1S12	XMLA300D1S12	XMLA500D1S12
0.35	0.5	0.4	1.25	3	5.5	16.5	20
0.35	0.5	1	1.25	7.5	18	35	45

0.25...4	0.7...10	1.3...20	3.5...35	7...70	10...160	22...300	30...500
XMLB004A2S12	XMLB010A2S12	XMLB020A2S12	XMLB035A2S12	XMLB070D2S12	XMLB160D2S12	XMLB300D2S12	XMLB500D2S12
0.02	0.57	1	1.7	4.7	9.3	19.4	23
0.25	0.85	1.6	2.55	8.8	20.8	37	52.6
2.4	7.5	11	20	50	100	200	300

(1) For electrical connection by DIN 43650A connector (IP65), replace the letter "S" in the reference by "C". Example: XMLB010A2S12 becomes XMLB010A2C12

(2) For vacuum switch: natural differential to be added to PB to give PH

(3) For vacuum switch: possible differential to be added to PB to give PH

(4) Setting range (bar) of lower limit (PB): vacuum switch



Doors



Speed control



Driver's cab



Ventilation



Heating



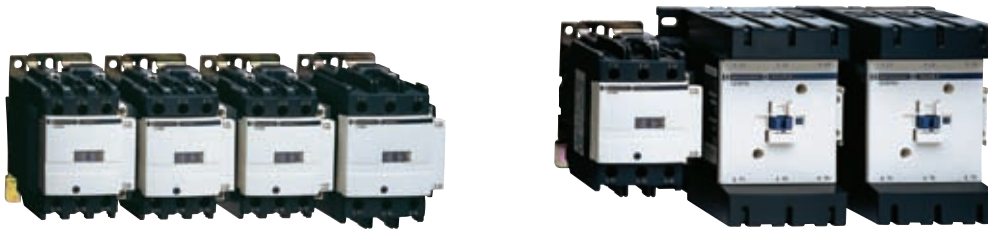
Connections		Lugs (ring)					
Conformity to standards	Standard (1)	IEC 947-4-1, EN 60 077					
Certifications		SNCF					
Rated operational voltage		690 V					
Rated operational current	le max. AC-3 ($U_e \leq 440$ V) le AC-1 ($\theta \leq 60^\circ\text{C}$)	9 A	12 A	18 A	25 A	32 A	38 A
Rated operational power in AC3	220/240 V	2.2 kW	3 kW	4 kW	5.5 kW	7.5 kW	9 kW
	380/400 V	4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW
	415/440 V	4 kW	5.5 kW	9 kW	11 kW	15 kW	18.5 kW
	500 V	5.5 kW	7.5 kW	10 kW	15 kW	18.5 kW	18.5 kW
	660/690 V	5.5 kW	7.5 kW	10 kW	15 kW	18.5 kW	18.5 kW
Contactor type*	1000 V	–	–	–	–	–	–
	3-pole	LC1-D096●●S207	LC1-D126●●S207	LC1-D186●●S207	LC1-D256●●S207	LC1-D326●●S207	LC1-D386●●S207
	4-pole	LC1-DT206●●S207	LC1-DT256●●S207	LC1-DT326●●S207	LC1-DT406●●S207	–	–
	2 N/O poles + 2 N/C poles	LC1-D0986●●S207	LC1-D1286●●S207	LC1-D1886●●S207	LC1-D2586●●S207	–	–

*Basic reference, to be completed with code indicating control circuit voltage (example: LC1-D096●●S207 becomes LC1-D096BLS207)

Standard control circuit voltages			
Low consumption ---			
Volts	24	72	110
Contactors LC1-D096...D386●●S207 (coils with integral suppression device fitted as standard)			
U 0.7...1.25 Uc	BL	SL	FL
Standard ---			
Volts	24	72	110
Contactors LC1-D096...D386●●S207 (coils with integral suppression device fitted as standard)			
U 0.7...1.1 Uc (or 1.25 Uc depending on temperature)		BD	SD FD
Contactors LC1-D406...D956●●			
U 0.85...1.1 Uc	BD	SD	FD
U 0.75...1.2 Uc	BW	SW	FW
Contactors LC1-D1156 and D1506●● (coils with integral suppression device fitted as standard)			
U 0.75...1.2 Uc	BD	SD	FD

(1) Rolling stock specific standards table

Type of S207 contactors	Low consumption VDC LC1-D●●●●LS207	Standard VDC LC1-D●●●●DS207
Fire/smoke/toxicity	Conforming to NF F 16-101 - F 16-102 - Severity 3	
Mechanical shock/Vibration	Conforming to IEC 61 373-Category 1, Class B	
Consumption	4 W (3-pole), 4.7 W (4-pole)	5.4 W
Number of auxiliary contacts	2 maximum	4 maximum
Operating temperature (°C)	-25...70°C, without installation restrictions	-25...70°C, with installation restrictions

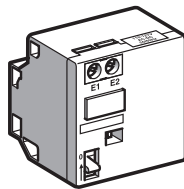


IEC 947-4-1, EN 60 077						
SNCF						
1000 V on ~, 690 V on ===						
40 A	50 A	65 A	80 A	95 A	115 A	150 A
60 A	80 A		125 A		200 A	
11 kW	15 kW	18.5 kW	22 kW	25 kW	30 kW	40 kW
18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW	75 kW
22 kW	25/30 kW	37 kW	45 kW	45 kW	59 kW	80 kW
22 kW	30 kW	37 kW	55 kW	55 kW	75 kW	90 kW
30 kW	33 kW	37 kW	45 kW	45 kW	80 kW	100 kW
22 kW	30 kW	37 kW	45 kW	45 kW	75 kW	90 kW
LC1-D406●●	LC1-D506●●	LC1-D656●●	LC1-D806●●	LC1-D956●●	LC1-D1156●●	LC1-D1506●●

Mounting accessories for 3-pole reversing contactors

2 identical contactors with screw clamp terminals or connectors, horizontally mounted

Mechanical interlock with electrical interlocking kit for contactors	Set of connections	Mechanical interlock
LC1-D096...D386	LAD-9R1V	included
with integral electrical interlocking		
LC1-D406...D656	LA9-D6569	LA9-D4002
LC1-D806 and D956 (~)	LA9-D8069	LA9-D4002
LC1-D806 and D956 (==)	LA9-D8069	LA9-D8002
LC1-D1156 and D1506	LA9-D11569	LA9-D11502
without electrical interlocking		
LC1-D096...D386	LA9-9R1	included
LC1-D406...D656	LA9-D6569	LA9-D50978
LC1-D806 and D956 (~)	LA9-D8069	LA9-D50978
LC1-D806 and D956 (==)	LA9-D8069	LA9-D80978



Mechanical latch blocks

Clip-on front mounting, manual or electrical unlatching control

For use on contactor	Reference	Standard control circuit voltages
LC1-D406...D656 3P ~ or ===, LC1-D656 4P ~, LC1-D656 4P ===	LA6-DK10●	B E F M Q
LC1-D806...D1506 3P ~, LC1-D806 & D1156 3P ~, LC1-D1156 4P ===	LA6-DK20●	B E F M Q
LC1-D096...D386 ~ or ===, LC1-DT206...DT406 ~ or ===	LAD6K10●	B E F M Q



Auxiliary contact blocks

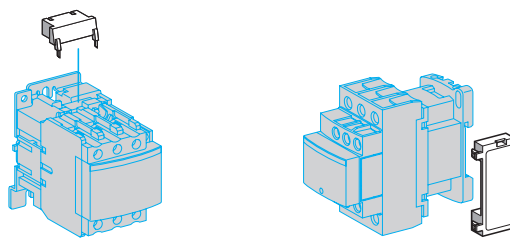
Instantaneous, lug (ring) connection

Front mounting						Side mounting		Time delay		
Composition	Reference	Composition	Reference	Composition	Reference	Composition	Reference	Type	Range	Reference
N/O	N/C	N/O	N/C	N/O	N/C	N/O	N/C			
1	–	1	1	2	2	1	1	On-delay	0.1...3 s	LAD-T06
–	1	2	–	1	3	2	–			
		–	2	4	–	–	2	Off-delay	10...180 s	LAD-T46
				–	4					
				3	1				0.1...30 s	LAD-R26
									10...180 s	LAD-R46

Maximum number of auxiliary contacts that can be fitted

Contactors

Type	Instantaneous auxiliary contact blocks					Time delay	
	Number of poles and size		Side mounting	Front mounting			
				1 contact	2 contacts	4 contacts	Front mounting
~	3P	LC1-D0966...D386	1 on LH side and	–	1	or 1	or 1
		LC1-D406...D956 (50/60 Hz)	1 on each side or	2	and 1	or 1	or 1
		LC1-D406...D956 (50 or 60 Hz)	1 on each side and	2	and 1	or 1	or 1
		LC1-D1156 and D1506	1 on LH side	–	and 1	or 1	or 1
	4P	LC1-DT206...DT406	1 on LH side and	–	1	or 1	or 1
		LC1-D656 and D806	1 on each side or	1	or 1	or 1	or 1
LC1-D1156		1 on each side and	1	or 1	or 1	or 1	
≡	3P	LC1-D096...D386	–	–	1	or 1	or 1
		LC1-D406...D956	–	1	or 1	or 1	or 1
		LC1-D1156 and D1506	1 on LH side and	–	1	or 1	or 1
	4P	LC1-DT206...DT406	–	–	1	or 1	or 1
		LP1-D656 and D806	–	2	and 1	or 1	or 1
		LC1-D1156	1 on each side	–	and 1	or 1	or 1
Low consumption	3P	LC1-D096...D386	–	–	1	–	–
	4P	LC1-DT206...DT406	–	–	1	–	–



Suppressor modules

Varistors (peak limiting)

Protection provided by limiting the transient voltage to 2 Uc max.

Maximum reduction of transient voltage peaks

Slight increase in drop-out time (1.1 to 1.5 times the normal time)

Mounting	For use with contactor Rating	Type V ~	V ---	Reference
Clip-on	D096...D386 (3P)	12...24 V	–	LAD-4VE
	DT206...DT406	50...127 V	–	LAD-4VG
		110...240 V	–	LAD-4VU
Screw fixing	D406...D1156 (3P) and	24...48 V	–	LA4-DE2E
		50...127 V	–	LA4-DE2G
	D656...D1156 (4P) and	110...250 V	–	LA4-DE2U
		–	24...48 V	LA4-DE3E
	D406...D1156 (3P) and	–	50...127 V	LA4-DE3G
		D656...D1156 (4P)	–	110...250 V

Diodes

No overload voltage or oscillating frequency

Increase in drop-out time (6 to 10 times the normal time)

Polarised component

Screw fixing	D406...D956 (3P)	–	24...250 V	LA4-DC3U
	D656 and D806 (4P)	–	–	

Bidirectional peak limiting diodes

Protection provided by limiting the transient voltage to 2 Uc max.

Maximum reduction of transient voltage peaks

Clip-on	D096...D386 (3P)	24 V	–	LAD-4TB
	DT206...DT406	72 V	–	LAD-4TS
Screw fixing	D406...D956 (3P)	24 V	–	LA4-DB2B
		72 V	–	LA4-DB2S
	D406...D956 (3P) and D665 and D806 (4P)	–	24 V	LA4-DB3B
		–	72 V	LA4-DB3S

RC circuits (Resistor-Capacitor)

Effective protection for circuits highly sensitive to "high frequency" interference

For use only in cases where the voltage is virtually sinusoidal, i.e. less than 5% total harmonic distortion

Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max.

Slight increase in drop-out time (1.2 to 2 times the normal value)

Clip-on	D096...D386 (3P)	12...24 V	–	LAD-4RCE
	DT206...DT406	110...240 V	–	LAD-4RCU
Screw fixing	D406...D1506 (3P) and	24...48 V	–	LA4-DA2E
		50...127 V	–	LA4-DA2G
	D656...D1156 (4P)	110...240 V	–	LA4-DA2U
		380...415 V	–	LA4-DA2N



Doors



Speed control



Driver's cab



Ventilation



Heating



Conformity to standards		IEC 947-4-1, EN 60 077, NF F 16-101 - F 16-102 - SIL 3, IEC 61 373-Cat 1, class B			
Certifications		SNCF			
Rated operational voltage		1000 V			
Rated operational current	le max. AC-3 (Ue ≤ 440 V)	185 A	225 A	265 A	330 A
	le AC-1 (θ ≤ 40°C)	275 A	315 V	350 A	400 A
Number of poles		3 or 4	3 or 4	3 or 4	3 or 4
Rated operational power in AC3	220/240 V	55 kW	63 kW	75 kW	100 kW
	380/400 V	90 kW	110 kW	132 kW	160 kW
	415 V	100 kW	110 kW	140 kW	180 kW
	440 V	100 kW	110 kW	140 kW	200 kW
	500 V	110 kW	129 kW	160 kW	200 kW
	660/690 V	110 kW	129 kW	160 kW	220 kW
	1000 V	100 kW	100 kW	147 kW	160 kW
Contactor type*		LC1-F185●●	LC1-F225●●	LC1-F265●●	LC1-F330●●
Reversing contactor type*		LC2-F185●●	LC2-F225●●	LC2-F265●●	

*Basic reference, to be completed with code indicating control circuit voltage

Standard control circuit voltages										
DC	24	48	110	125	220	230	250	400	440	
Volts										
Contactors LC1-F115...F330 (0.85...1.1 Uc) (coil LX4-F)	BD	ED	FD	GD	MD	MD	UD	–	RD	
Contactors LC1-F400...F630 (0.85...1.1 Uc) (coil LX4-F)	–	ED	FD	GD	MD	–	UD	–	RD	
Contactor LC1-F780 (0.85...1.1 Uc) (coil LX4-F)	–	–	FD	GD	MD	–	UD	–	RD	
Contactor LC1-F800 (0.85...1.1 Uc) (coil LX4-F)	–	–	FW	FW	MW	MW	–	QW	–	



IEC 947-4-1, EN 60 077, NF F 16-101 - F 16-102 - SIL 3, IEC 61 373-Cat 1, class B				
SNCF				
1000 V				
400 A	500 A	630 A	780 A	800 A
500 A	700 A	1000 A	1600 A	1000 A
2, 3 or 4	2, 3 or 4	2, 3 or 4	3 or 4	3
110 kW	147 kW	200 kW	220 kW	250 kW
200 kW	250 kW	335 kW	400 kW	450 kW
220 kW	280 kW	375 kW	425 kW	450 kW
250 kW	295 kW	400 kW	425 kW	450 kW
257 kW	355 kW	400 kW	450 kW	450 kW
280 kW	335 kW	450 kW	475 kW	475 kW
185 kW	335 kW	450 kW	450 kW	450 kW
LC1-F400●●	LC1-F500●●	LC1-F630●●	LC1-F780●●	LC1-F800●●

Assembly by customer



Auxiliary contact blocks											
Instantaneous				Dust/damp protected contacts			Time delay 1 N/O + 1 N/C				
Composition	Reference	Composition	Reference	Composition	Reference	Composition	Reference	Type	Range	Reference	
N/C	N/O	N/C	N/O	N/C	N/O	N/C	N/O				
1	-	LAD-N106	1 1	LAD-N116	2 2	LAD-N226	2 - - -	LA1-DX206	On-delay	0.1...3 s	LAD-T06
-	1	LAD-N016	2 -	LAD-N206	1 3	LAD-N136	2 2 - -	LA1-DY206		0.1...30 s	LAD-T26
			- 2	LAD-N026	4 -	LAD-N406	2 - 2 -	LA1-DZ406		10...180 s	LAD-T46
					- 4	LAD-N046	2 - 1 1	LA1-DZ316		1...30 s	LAD-S26
					3 1	LAD-N316			Off-delay	0.1...3 s	LAD-R06
					2 2	LAD-C226				0.1...30 s	LAD-R26
										10...180 s	LAD-R46

Mounting accessories for 3-pole reversing contactors for motor control

2 identical contactors, horizontally mounted		
Mechanical interlock with electrical interlocking kit for connectors		
Contactor type	Set of connections	Mechanical interlock
LC1-F115	LA9-FF976	LA9-FF970
LC1-F150	LA9-F15076	LA9-FF970
LC1-F185	LA9-FG976	LA9-FG970
LC1-F225	LA9-F22576	LA9-FG970
LC1-F265	LA9-FH976	LA9-FJ970
LC1-F330	LA9-FJ976	LA9-FJ970
LC1-F400	LA9-FJ976	LA9-FJ970
LC1-F500	LA9-FK976	LA9-FJ970
LC1-F630 or LC1-F800	LA9-FL976	LA9-FL970



Doors



Speed control



Driver's cab



Ventilation



Heating



Thermal-magnetic circuit-breakers GV2-ME and GV2-P. Lug (ring) connections for GV2-ME, screw clamp connections for GV2-P
GV2-ME with pushbutton control, GV2-P with rotary knob control

Conformity to standards: IEC 60077-2, IEC 947-4-2

Certifications: SNCF

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range	Magnetic	Reference	
400/415 V			500 V			690 V			of thermal	tripping		
P	I _{cu}	I _{cs} ⁽¹⁾	P	I _{cu}	I _{cs} ⁽¹⁾	P	I _{cu}	I _{cs} ⁽¹⁾	trips	current		
kW	kA		kW	kA		kW	kA		A	A (d ± 20%)		
—	—	—	—	—	—	—	—	—	0.1...0.16	1.5	GV2-ME016	GV2-P016
0.06	★	★	—	—	—	—	—	—	0.16...0.25	2.4	GV2-ME026	GV2-P026
0.09	★	★	—	—	—	—	—	—	0.25...0.40	5	GV2-ME036	GV2-P036
0.12	★	★	—	—	—	0.37	★	★	0.40...0.63	8	GV2-ME046	GV2-P046
0.18	★	★	—	—	—	—	—	—	0.40...0.63	8	GV2-ME046	GV2-P046
0.25	★	★	—	—	—	0.55	★	★	0.63...1	13	GV2-ME056	GV2-P056
0.37	★	★	0.37	★	★	—	—	—	1...1.6	22.5	GV2-ME066	GV2-P066
0.55	★	★	0.55	★	★	0.75	★	★	1...1.6	22.5	GV2-ME066	GV2-P066
—	—	—	0.75	★	★	1.1	★	★	1...1.6	22.5	GV2-ME066	GV2-P066
0.75	★	★	1.1	★	★	1.5	3	75	1.6...2.5	33.5	GV2-ME076	
0.75	★	★	1.1	★	★	1.5	8	100	1.6...2.5	33.5		GV2-P076
1.1	★	★	1.5	★	★	2.2	3	75	2.5...4	51	GV2-ME086	
1.1	★	★	1.5	★	★	2.2	8	100	2.5...4	51		GV2-P086
1.5	★	★	2.2	★	★	3	3	75	2.5...4	51	GV2-ME086	
1.5	★	★	2.2	★	★	3	3	100	2.5...4	51		GV2-P086
2.2	★	★	3	50	100	4	3	75	4...6.3	78	GV2-ME106	
2.2	★	★	3	★	★	4	6	100	4...6.3	78		GV2-P106
3	★	★	4	10	100	5.5	3	75	6...10	138	GV2-ME146	
3	★	★	4	50	100	5.5	6	100	6...10	138		GV2-P146
4	★	★	5.5	10	100	7.5	3	75	6...10	138	GV2-ME146	
4	★	★	5.5	50	100	7.5	6	100	6...10	138		GV2-P146
5.5	15	50	7.5	6	75	9	3	75	9...14	170	GV2-ME166	
5.5	★	★	7.5	42	75	9	6	100	9...14	170		GV2-P166
—	—	—	—	—	—	11	3	75	9...14	170	GV2-ME166	
—	—	—	—	—	—	11	6	100	9...14	170		GV2-P166
7.5	15	50	9	6	75	15	3	75	13...18	223	GV2-ME206	
7.5	50	50	9	10	75	15	4	100	13...18	223		GV2-P206
9	15	40	11	4	75	18.5	3	75	17...23	327	GV2-ME216	
9	50	50	11	10	75	18.5	4	100	17...23	327		GV2-P216
11	15	40	15	4	75	—	—	—	20...25	327	GV2-ME226 ⁽²⁾	
11	50	50	15	10	75	—	—	—	20...25	327		GV2-P226
15	10	50	18.5	4	75	22	3	75	24...32	416	GV2-ME326	
15	50	50	18.5	10	75	22	4	100	24...32	416		GV2-P326

★ > 100 kA

(1) As % of I_{cu}

(2) Combined with a recommended contactor



Doors



Speed control



Driver's cab



Ventilation



Heating



Thermal-magnetic circuit-breakers GV3-P, lug (ring) connections

Rotary knob control

Conformity to standards: IEC 60077-2, IEC 947-4-2

Certifications: SNCF

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range	Reference
400/415 V			500 V			660/690 V			of thermal	
P	I _{cu}	I _{cs} ⁽¹⁾	P	I _{cu}	I _{cs} ⁽¹⁾	P	I _{cu}	I _{cs} ⁽¹⁾	trips	
kW	kA		kW	kA		kW	kA		A	
5.5	100	50	7.5	12	50	11	6	50	9...13	GV3-P136
7.5	100	50	11	12	50	15	6	50	12...18	GV3-P186
11	100	50	15	12	50	18.5	6	50	17...25	GV3-P256
15	100	50	18.5	12	50	22	6	50	23...32	GV3-P326
18.5	50	50	22	10	50	30	5	60	30...40	GV3-P406
22	50	50	30	10	50	37	5	60	37...50	GV3-P506
30	50	50	37	10	50	45	5	60	48...65	GV3-P656

(1) As % of I_{cu}

Thermal-magnetic circuit-breakers GV3-P with EverLink[®] terminal connections (2)

Delete the number **6** from the end of the reference. Example: **GV3-P136** becomes **GV3-P13**

(2) 4 mm BTR screw



Lighting



Ventilation



Driver's cab



WC

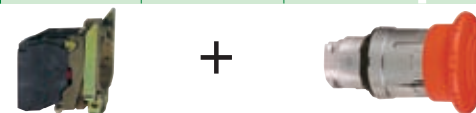


Heating



Pushbuttons, spring return

Conformity to standards		IEC 60947-1, IEC 60947-5-1, IEC 60947-5-4, IEC 60947-5-5							
Certifications		SNCF							
Type of head		Chromium plated circular bezel							
Degree of protection		IP66 / Nema 4X, 13 / Class I							
Mounting (mm)		panel-cut-out		Ø 22.5 (22.4 ^{+0.4} ₀ recommended)					
		mounting centres		30 (horizontal) x 40 (vertical)					
Depth (mm)		below head							
Connection		Faston lugs or lugs (ring), see below							
Type of push		Flush			Flush, booted				
Without marking		Assembly by customer (connection)			Assembly by customer (connection)				
				+				+	
References		black ● N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BA2	ZB4 BZ1013	ZB4 BZ1016	ZB4 BP2	
		green ● N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BA3	ZB4 BZ1013	ZB4 BZ1016	ZB4 BP3	
		red ● N/C	ZB4 BZ1023	ZB4 BZ1026	ZB4 BA4	ZB4 BZ1023	ZB4 BZ1026	ZB4 BP4	
		yellow ● N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BA5	ZB4 BZ1013	ZB4 BZ1016	ZB4 BP5	
		blue ● N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BA6	ZB4 BZ1013	ZB4 BZ1016	ZB4 BP6	
Type of push		Flush							
With international marking		Assembly by customer (connection)							
References		green ⓘ N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BA331	–	–	–	
		red ⓘ N/C	ZB4 BZ1023	ZB4 BZ1026	ZB4 BA432	–	–	–	
		white ⓘ N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BA334	–	–	–	
		black ⓘ N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BA335	–	–	–	
Type of push		Projecting			Mushroom head, Ø 40 mm				
Without marking		Assembly by customer (connection)			Assembly by customer (connection)				
				+				+	
References		black ● N/O	–	–	–	ZB4 BZ1013	ZB4 BZ1016	ZB4 BC2	
		red ● N/C	ZB4 BZ1023	ZB4 BZ1026	ZB4 BL4	–	–	–	
Type of push		Double-headed pushbuttons			Double-headed pushbuttons, booted				
Degree of protection		IP40			IP66				
With international marking		Assembly by customer (connection)			Assembly by customer (connection)				
				+				+	
References		green / red ⓘ N/O + N/C	ZB4 BZ1053	ZB4 BZ1056	ZB4 BL8434	ZB4 BZ1053	ZB4 BZ1056	ZB4 BL9434	



Ø 40 mm mushroom head Emergency stop pushbuttons (2)

		Trigger action (EN 418)							
Type of push		Push-pull (N/C + N/O)							
Without marking		Assembly by customer (connection)			Assembly by customer (connection)				
				OR		+			
References		red ● N/C + N/O	ZB4 BZ1053	ZB4 BZ1056	ZB4 BT84				
Type of push		Turn to release (N/C + N/O)							
References		red ● N/C + N/O	ZB4 BZ1053	ZB4 BZ1056	ZB4 BS844				
Type of push		Key release (N/C + N/O)							
References		red ● N/C + N/O	ZB4 BZ1053	ZB4 BZ1056	ZB4 BS944				

(2) The Emergency stop pushbuttons conform to standard IEC/EN 60947-5-5 and Machinery directive 98/37/EC
Trigger action Emergency stop pushbuttons conform to standard EN 418

Contact functions



Lighting



Ventilation



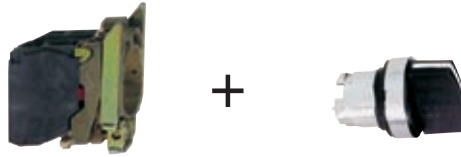
Driver's cab



WC



Heating



Selector switches and key switches

Conformity to standards		IEC 60947-1, IEC 60947-5-1, IEC 60947-5-4, IEC 60947-5-5					
Certifications		SNCF					
Type of head		Chromium plated circular bezel					
Degree of protection		IP66 / Nema 4X, 13 / Class I					
Mounting (mm)	panel cut-out	Ø 22.5 (22.4 ^{+0.4} ₀ recommended)					
	mounting centres	30 (horizontal) x 40 (vertical)					
Depth (mm)	below head	43					
Connection		Faston lugs or lugs (ring), see below					
Type of operator		Handle					
Assembly by customer (connection)		Faston lugs	Lugs (ring)	Head	Faston lugs	Lugs (ring)	Head
			OR	+		OR	+
Number and type of positions		2 positions stay put				2 positions spring return to left	
References	black ● N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BD2	ZB4 BZ1013	ZB4 BZ1016	ZB4 BD4
Number and type of positions		3 positions stay put				3 positions spring return to centre	
References	black ● N/O + N/O	ZB4 BZ1033	ZB4 BZ1036	ZB4 BD3	ZB4 BZ1033	ZB4 BZ1036	ZB4 BD5



Type of operator		Key, n° 455					
Assembly by customer (connection)		Faston lugs	Lugs (ring)	Head	Faston lugs	Lugs (ring)	Head
			OR	+		OR	+
Number and type of positions (2)		2 positions stay put				2 positions stay put	
References	black ● N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BG2	ZB4 BZ1013	ZB4 BZ1016	ZB4 BG4
Number and type of positions (2)		2 positions spring return to left				3 positions stay put	
References	black ● N/O	ZB4 BZ1013	ZB4 BZ1016	ZB4 BG6	–	–	–
	black ● N/O + N/O	–	–	–	ZB4 BZ1013	ZB4 BZ1036	ZB4 BG3

Separate components



Electrical blocks

Single contact blocks		Faston lugs (6.35 and 2 x 2.8)	Lugs (ring)
Rated operational characteristics		AC-15, 240 V - 3 A	
Positive operation of contacts conforming to IEC/EN 60947-5-1		All functions incorporating a N/C contact are positive opening operation	
References (5)*	N/O	ZBE 1016	ZBE 1013
	N/C	ZBE 1026	ZBE 1023

(2) The symbol indicates withdrawal position

*sold in lots

Pushbuttons, switches and pilot lights Ø 22 with metal bezel

Light functions



Lighting



Ventilation



Driver's cab



WC



Heating



Pilot lights

Conformity to standards		IEC 60947-1, IEC 60947-5-1, IEC 60947-5-4, IEC 60947-5-5						
Certifications		SNCF						
Type of head		Chromium plated circular bezel Smooth lens cap						
Degree of protection		IP66 / Nema 4X, 13 / Class I						
Mounting (mm)		panel cut-out Ø 22.5 (22.4 ^{+0.4} ₀ recommended)						
Depth		30 (horizontal) x 40 (vertical)						
Connection		Screw clamp terminals, Faston lugs or lugs (ring), see below						
Light source		Integral LED			Direct supply for BA 9s bulb (not included)			
Products		Complete			Assembly by customer			
Connection		Screw clamp terminals			Faston lugs	Lugs (ring)	Head	
						OR	+	
Supply voltage		24V AC/DC	48...120V AC	230...240V AC	250V max., 2.4W max.			
References		white	XB4 BVB1	XB4 BVG1	XB4 BVM1	ZB4 BV63	ZB4 BV66	ZB4 BV01
		green	XB4 BVB3	XB4 BVG3	XB4 BVM3	ZB4 BV63	ZB4 BV66	ZB4 BV03
		red	XB4 BVB4	XB4 BVG4	XB4 BVM4	ZB4 BV63	ZB4 BV66	ZB4 BV04
		yellow	XB4 BVB5	XB4 BVG5	XB4 BVM5	ZB4 BV63	ZB4 BV66	ZB4 BV05
		blue	XB4 BVB6	XB4 BVG6	XB4 BVM6	-	-	-



Illuminated pushbuttons and selector switches

Type		illuminated pushbuttons, flush push, spring return						
Light source		Integral LED			Direct supply for BA 9s bulb (not included)			
Products		Complete			Assembly by customer			
Connection		Screw clamp terminals			Faston lugs	Lugs (ring)	Head	
						OR	+	
Supply voltage		24V AC/DC	48...120V AC	230...240V AC	250V max., 2.4W max.			
References		white N/C + N/O	XB4 BW31B5	XB4 BW31G5	XB4 BW31M5	ZB4 BW0653	ZB4 BW0656	ZB4 BW31
		green N/C + N/O	XB4 BW33B5	XB4 BW33G5	XB4 BW33M5	ZB4 BW0653	ZB4 BW0656	ZB4 BW33
		red N/C + N/O	XB4 BW34B5	XB4 BW34G5	XB4 BW34M5	ZB4 BW0653	ZB4 BW0656	ZB4 BW34
		yellow N/C + N/O	XB4 BW35B5	XB4 BW35G5	XB4 BW35M5	ZB4 BW0653	ZB4 BW0656	ZB4 BW35
		blue N/C + N/O	XB4 BW36B5	XB4 BW36G5	XB4 BW36M5	-	-	-



Type		Double-headed pushbuttons with LED pilot light (1 flush green push, 1 projecting red push)			Illuminated selector switches (2 position stay put)			
Degree of protection		IP40			IP65			
Light source		Integral LED			Integral LED			
Products		Complete (screw clamp terminal connections)			Complete (screw clamp terminal connections)			
Supply voltage		24V AC/DC	48...120V AC	230...240V AC	24V AC/DC	48...120V AC	230...240V AC	
References		green N/C + N/O	-	-	XB4 BK123B5	XB4 BK123G5	XB4 BK123M5	
		red N/C + N/O	-	-	XB4 BK124B5	XB4 BK124G5	XB4 BK124M5	
		yellow N/C + N/O	XB4 BW84B5	XB4 BW84G5	XB4 BW84M5	XB4 BK125B5	XB4 BK125G5	XB4 BK125M5

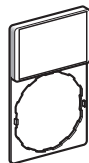
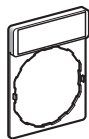
Separate components and accessories



Electrical blocks										
Conformity to standards					IEC 60947-1, IEC 60947-5-1, IEC 60947-5-4, IEC 60947-5-5					
Certifications					SNCF					
			Single contact blocks				Light blocks with integral LED			Light block, direct supply
Rated operational characteristics		AC-15, 240 V - 3 A			Consumption					
					18 mA			24 V AC/DC		
Positive operation of contacts conforming to IEC/EN 60947-5-1		N/C contacts with positive opening operation			14 mA			120 V AC		
					14 mA			240 V AC		
Connection		Faston lugs (6.35 & 2 x 2.8)		Lugs (ring)		Screw clamp				
						To combine with heads for integral LED				For BA 9s bulb (not included)
							24V AC/DC	48...120V AC	230...240V AC	250 V max., 2.4 W max.
References (5)*	N/O	ZBE 1013	ZBE 1016	white		ZBV B1	ZBV G1	ZBV M1	ZBV 6	
	N/C	ZBE 1023	ZBE 1026	green		ZBV B3	ZBV G3	ZBV M3	Colour provided by lens	
				red		ZBV B4	ZBV G4	ZBV M4		
				yellow		ZBV B5	ZBV G5	ZBV M5		
				blue		ZBV B6	ZBV G6	ZBV M6		



Diecast metal enclosures (Zinc alloy, usable depth 49 mm)		1 vertical row				2 vertical rows		
		1	2	3	4	2	4	6
Number of cut-outs	Front face dimensions							
References	80 x 80 mm	XAP M1201	–	–	–	XAP M1202	–	–
	80 x 130 mm	–	XAP M2202	XAP M2203	–	–	XAP M2204	–
	80 x 175 mm	–	–	XAP M3203	XAP M3204	–	–	XAP M3206



Accessories										
Legend holders, 30 x 40 mm, for 8 x 27 mm legends										
References (10)*		Background colour: black or red							white or yellow	
Blank		ZBY 2101							ZBY 4101	
International		0 (red background)	ZBY 2931	I	ZBY 2147	AUTO	ZBY 2115	STOP	ZBY 2304	–
English		OFF	ZBY 2312	ON	ZBY 2311	START	ZBY 2303	–	–	–
French		ARRET (red b/grnd)	ZBY 2104	ARRET-MARCHE	ZBY 2166	MARCHE	ZBY 2103	–	–	–
German		AUS	ZBY 2204	AUS-EIN	ZBY 2266	EIN	ZBY 2203	–	–	–
Spanish		PARADA (red b/grnd)	ZBY 2404	PARADA-MARCHA	ZBY 2466	MARCHA	ZBY 2403	–	–	–
Legend holders, 30 x 50 mm for 18 x 27 mm legends										
Background colour		black or red							white or yellow	
References (10)*		Blank							ZBY 6101	ZBY 6102
Ø 60 mm legend for mushroom head Emergency stop pushbutton										
Background colour		yellow								
References		Blank	EMERGENCY STOP	ARRET D'URGENCE	NOT-AUS	PARADA DE EMERGENCIA				
		ZBY 9101	ZBY 9330	ZBY 9130	ZBY 9230	ZBY 9430				

*sold in lots of



Heating



Ventilation



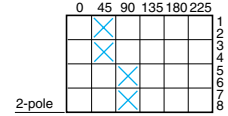
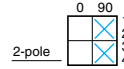
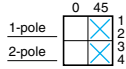
Lighting



Driver's cab



positions (°)

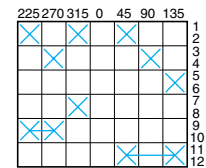
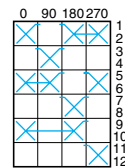
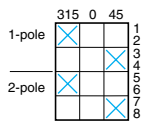


Cam switches, K1/K2 series

Conformity to standards	IEC 60947-5-1, IEC 60947-3						
Certifications	SNCF						
Function	Switches		ON-OFF switches		Stepping switches		
Degree of protection front face	45° switching angle		90° switching angle		with "0" position		
Conventional thermal current (Ith)	IP65 (1)		IP65 (1)		IP65 (1)		
Rated insulation voltage (Ui) conforming to IEC 60947-1	12 A	20 A	12 A	20 A	12 A	20 A	
Rated insulation voltage (Ui) conforming to IEC 60947-1	690 V		690 V		690 V		
Number of positions	2		2		2 + "0" position		
Number of poles	2		2		2		
Dimensions of front plate (mm)	45 x 45		45 x 45		45 x 45		
Front mounting method	Multifixing plate, 45 x 45 mm	K1B 002ALH	K2B 002ALH	K1B 1002HLH	K2B 1002HLH	K1D 012QLH	K2D 012QLH
	Plastic mounting plate for Ø 22 mm hole	K1B 002ACH	K2B 002ACH	K1B 1002HCH	K2B 1002HCH	K1D 012QCH	K2D 012QCH



positions (°)



Cam switches, K1/K2 series

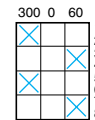
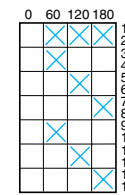
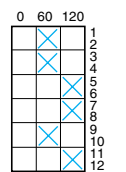
Conformity to standards	IEC 60947-5-1, IEC 60947-3						
Certifications	SNCF						
Function	Changeover switches		Ammeter switches		Voltmeter switches		
Degree of protection front face	IP65 (1)		IP65 (1)		IP65 (1)		
Conventional thermal current (Ith)	12 A	20 A	12 A	20 A	12 A	20 A	
Rated insulation voltage (Ui) conforming to IEC 60947-1	690 V		690 V		690 V		
Number of positions	2 + "0" position		3 + "0" position (3 circuits + "0" position)		6 + "0" position (measurements between 3 phases & N + "0" pos.)		
Number of poles	2		4		7		
Dimensions of front plate (mm)	45 x 45		45 x 45		45 x 45		
Front mounting method	Multifixing plate, 45 x 45 mm	K1D 002ULH	K2D 002ULH	K1F 003MLH	to be compiled*	K1F 027MLH	to be compiled*
	Plastic mounting plate for Ø 22 mm hole	K1D 002UCH	K2D 002UCH	K1F 003MCH	to be compiled*	K1F 027MCH	to be compiled*

(1) With seal KZ73 for switch with Multifixing plate, with seal KZ65 for Ø 22 mm hole mounting switches. Seal to be ordered separately

(*) Please consult your Schneider Electric agency



positions (°)



Cam switches with key operated lock, K1 series

Function	Stepping switches		Run switches		Changeover switches + "0" pos.	
Degree of protection front face	IP65		IP65		IP65	
Conventional thermal current (Ith)	12 A		12 A		12 A	
Rated insulation voltage (Ui) conforming to IEC 60947-1	690 V		690 V		690 V	
Number of positions	2 + "0" position		3 + "0" position		2 + "0" position	
Number of poles	3		2		2	
Dimensions of front plate (mm)	55 x 100		55 x 100		55 x 100	
Colour of handle	red	black	red	black	red	black
Front mounting method	Ø 22 mm hole + Ø 43.5 mm hole		K1G 043RZ2	K1G 043RZ4	K1D 002UZ2	K1D 002UZ4



Ventilation



Lighting



WC



Heating



Function	Presence of phase + phase sequence		+ phase sequence, + regeneration + phase imbalance, + under/over voltage	
Conformity to standards	NF EN 60255-6, IEC 60255-6			
Certifications	SNCF			
Supply voltage	208...480 VAC	208...440 VAC	208...480 VAC	220...440 VAC
Outputs	1 C/O	2 C/O	1 C/O	2 C/O
Reference	RM17TG00	RM17TG20	RM17TE00	RM35TF30



Function	Presence of phase + under/over voltage		+ presence of neutral + under/over voltage
Conformity to standards	NF EN 60255-6, IEC 60255-6		
Certifications	SNCF		
Supply voltage	208...480 VAC	220...480 VAC	120...277 VAC (phase-neutral)
Output(s)	1 C/O	2 C/O	2 C/O
Reference	RM17UB310	RM35UB330	RM35UB3N30

Liquid level and speed monitoring relays



Function	Conductive liquid level monitoring	Non conductive materials level monitoring	Under/over rate/speed monitoring
Conformity to standards	NF EN 60255-6, IEC 60255-6		
Certifications	SNCF		
Supply voltage	24...240 VAC/DC		
Monitoring range	0.25...5 kΩ 5...100 kΩ 0.05...1 MΩ	sensor input: Contact/PNP/NPN	Interval between pulses: 0.05...0.5 s, 0.1...1 s, 0.5...5 s 1...10 s, 0.1...1 mn, 0.5...5 mn 1...10 mn
Outputs	2 C/O	1 C/O	1 C/O
Reference	RM35LM33MW	RM35LV14MW	RM35S0MW



GPS



Data memory



Diagnostics



Driver's cab



Speed control



Communication



Networking



Processor type			CPU 854-T
Conformity to standards			EN 50155 Class T3 (ambient temperature -25...+70°C)
Number of digital I/O			RTC (1) interface
Bus	CAN/CANopen		2
	Ethernet		1
Serial link			2 x RS 232
RAM			64 MB
Flash-EPROM expansion			64 MB
Connection			UPS
Reference	Supply voltage	24 VDC	CPU 854-T

(1) Real Time Clock, buffered

Train bus coupler



Type			TBC
Conformity to standards			EN 50155 Class T3 (ambient temperature -25...+70°C)
Maximum number of stations			16
Bus			CAN Powerline
Maximum length of bus			500 m
Transfer rate			20, 50, 80 and 125 kbps
Reference	Supply voltage	24 VDC	TBC 702-T



GPS



Data memory



Diagnostics



Driver's cab



Speed control



Communication



Networking



Slip/skid control



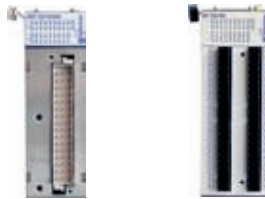
Processor type			CPU 73x-T					
Conformity to standards			EN 50155 Class TX (ambient temperature -40...+70°C)					
Number of I/O			RTC (1) interface		MVB (2) interface			
Bus			CAN/CANopen		1			
Serial link			1 x RS 232					
RAM			4 MB					
Flash-EPROM expansion			2 MB					
Connection			UPS		-			
Reference			Supply voltage	24/36 VDC	CPU 731-TG	CPU 733-TG/ESD	CPU 733-TG/EMD	CPU 733-TG/OGF

(1) Real Time Clock, buffered

(2) Multifunction Vehicle Bus

Coupler type			DDC 732-TG				
Bus			CAN/CANopen				
Reference			Supply voltage	24/36 VDC	DDC 732-TG		

I/O module



Module type			Inputs/Outputs								
			Digital								
Conformity to standards			EN 50155 Class TX (ambient temperature -40...+70°C)								
Number of I/O			32 I		16 I + 1 encoder or 2 counters (3)		16 I/O (1 A max.)		16 I/16 O (2 A max.)		16 I / 16 O (0.5 A max.)
Reference			Supply voltage	24 VDC	-	DIT 733-TF	-	DDT 732-TG/2A	DDT 732-TG/05A		
			24...110 VDC	DIT 732-TW	-	DDT 731-TW/1A	-	-			

(3) Frequency 25 kHz



Module type			Inputs/Outputs								
			Relay		Current regulation	Analogue	Encoder/counter				
Conformity to standards			EN 50155 Class TX (ambient temperature -40...+70°C)								
Number of I/O			8 O (2 A)		8 O (4 A)		4 O + 2 O PWM (2 A/300 mA)		4 I/4 O 16-bit		2 encoders or 4 counters (4)
Reference			Supply voltage	24 VDC	DOT 733-TR/S01	DOT 733-TR	-	AAT 732-TG/16B	-		
			24/36 VDC	-	-	PWT 731-TG	-	CDT 731-TG			

(4) Frequency 45 kHz, 4 x 1 A digital outputs conforming to SIL 2



Doors



Ventilation



WC



Lighting



Heating



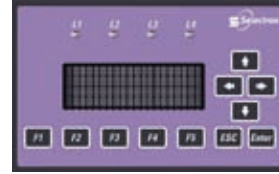
Diagnostics



Sander



Slip/skid control



Processor type			CPU 72x-T				
Conformity to standards			EN 50155 Class T3 (ambient temperature -25...+70°C)				
Number of digital I/O			RTC	8 I/8 O	8 I/8 O/RTC	4 counters/4 O/RTC	RTC (1)
Bus			CAN/CANopen				
			2	1	1	1	2
Serial link			1 x RS 232				
RAM			1 MB	256 kB	1 MB	1 MB	1 MB
Flash-EPROM expansion			1 MB	512 kB	1 MB	1 MB	1 MB
Reference	Supply voltage	24 VDC	–	CPU 725-LT	CPU 727-T	CPU 727-CT	–
		36 VDC	–	CPU 725-LTH	CPU 727-TH	CPU 727-CTH	–
		24/36 VDC	CPU 723-T	–	–	–	CPU 727-DT (2)

(1) Real Time Clock, buffered

(2) With VF display

CANopen bus coupler



Coupler type			DDC	
Number of digital I/O			8 I/8 O	
Bus			1 x SeleCAN	1 x CANopen
Reference	Supply voltage	24 VDC	DDC 701-T	DDC 712-T
		36 VDC	DDC 701-TH	DDC 712-TH

I/O module



Module type			Inputs/Outputs						
			Digital		Relay	Analogue			
Conformity to standards			EN 50155 Class T3 (ambient temperature -25...+70 °C)						
Number of I/O			8 I	8 O	8 O, relay	8 I, 10-bit	4 I, 12-bit	2 O, 10-bit	2 O, PWM 2 A
Reference	Supply voltage	24 VDC	DIT 701-T	–	DOT 703-T	AIT 701-T	AIT 702-T	AOT 701-T	–
		36 VDC	DIT 701-TH	–	–	–	–	AOT 701-TH	–
		24/36 VDC	–	–	–	–	–	–	PWT 701-T
		24 VDC/0.5 A	–	DOT 701-T	–	–	–	–	–
		24 VDC/2 A	–	DOT 702-T	–	–	–	–	–
		36 VDC/0.5 A	–	DOT 701-TH	–	–	–	–	–



Doors



Ventilation



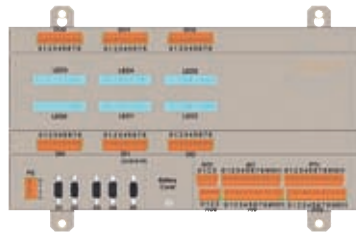
WC



Lighting

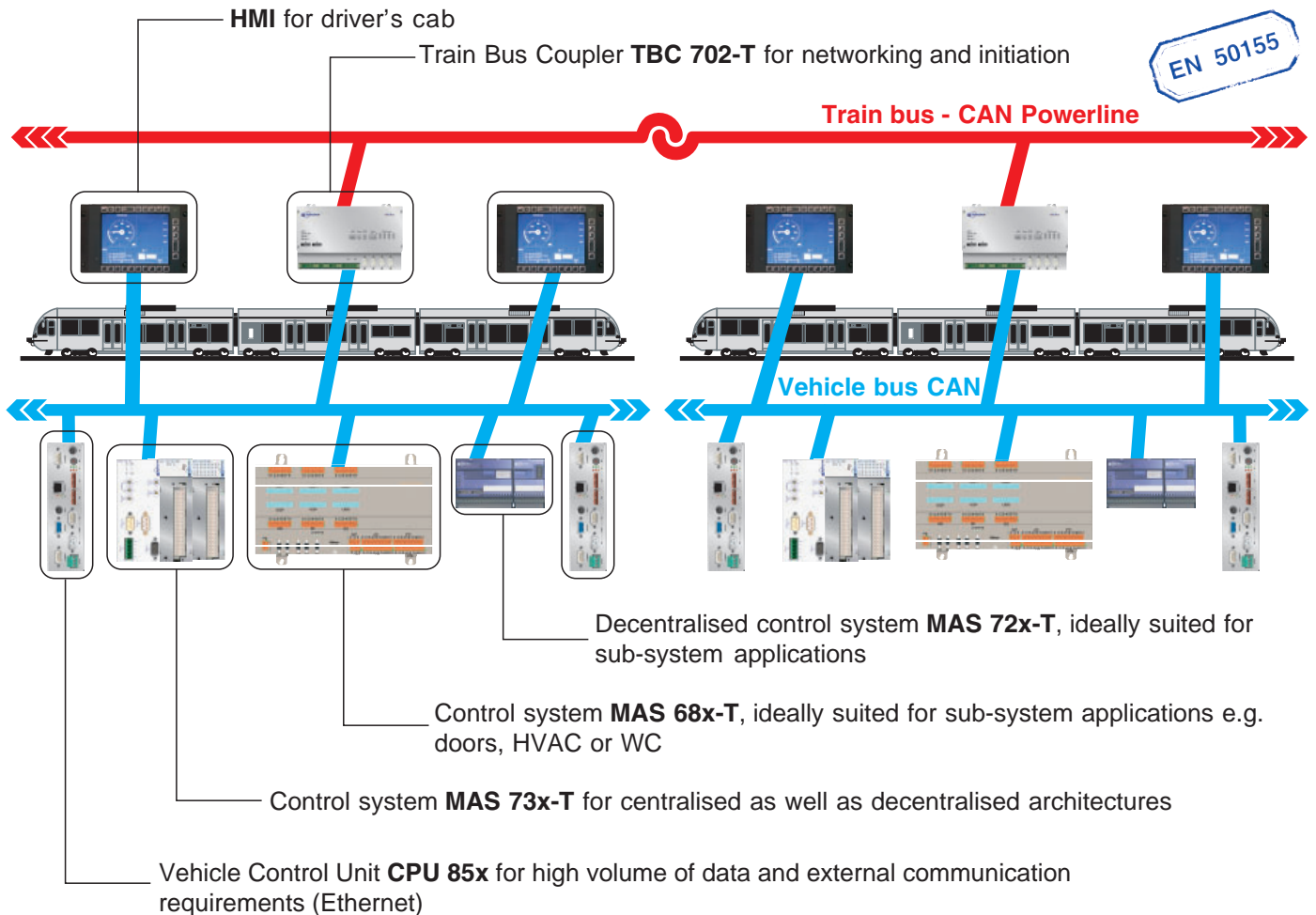


Heating



Processor type			CPU 68x-T		
Application			Door control	WC and air conditioning control	Air conditioning control
Conformity to standards			EN 50155 Class T1 (ambient temperature -25...+55°C)		
Number of I/O	Digital		24 I/24 O	24 I/24 O	40 I/40 O
	Analogue		2 I/22 O	8 I/4 O	8 I/4 O
	Counter		–	8 PT 100/PT1000/NTC	8 PT 100/PT1000/NTC
Bus	CANopen		1		
Serial link			1 x RS 232, 1 x RS 232/485/422		
RAM			4 MB		
Flash-EPROM expansion			2 MB		
Reference	Supply voltage	24 VDC	CPU 681-T	CPU 682-T	CPU 683-T

TCMS from Selectron,
tailored to your needs



Programming

Project management, programming and implementation using Symphony®, conforming to IEC 61131-3

www.schneider-electric.com



Schneider Electric Industries S.A.S.

Head office
89, bd Franklin Roosevelt
92500 Rueil-Malmaison Cedex
France
www.schneider-electric.com

Owing to changes in standards and equipment, the characteristics given in the text and images in this document are not binding until they have been confirmed with us.
Design: IGS-CP
Photos:
Printed by: