The essential guide Preventa

Machine safety

2013

Schneider Electric

Why safety?

Human life is the most important value in a company!

Schneider Electric helps protect people and improve your productivity

Functional safety

Simplifing your work to reach your required performance level and SIL

Thanks to directives and standards as guidelines and our certified safety chain solutions

Certified safety chain solutions, designed by Schneider Electric, for you!

The concept:

Provides you certified safety architectures based upon the most common safety functions required on and around a machine. The safety chain solutions enable you to save time and costs when designing and manufacturing your machine in accordance with the European Machinery Directive.

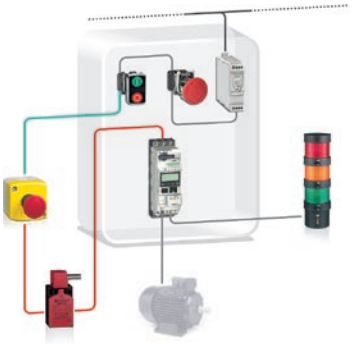
Each solution comes with:

> Bill of materials and the system description file
> Safety conceptual principle diagram
> Layout of solution indicating performance level (PL) and safety integrity level (SIL)
> Example description of the PL and SIL calculation for the safety function
> Sistema Library file with corresponding solution
> TÜV certification

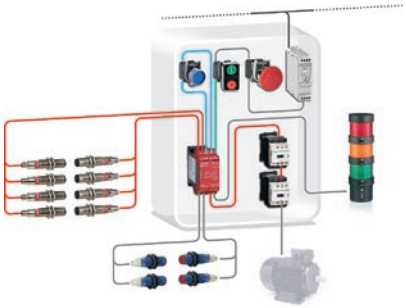
Approved

> TÜV approval certified solutions

Motor starter (PL c, SIL 1)



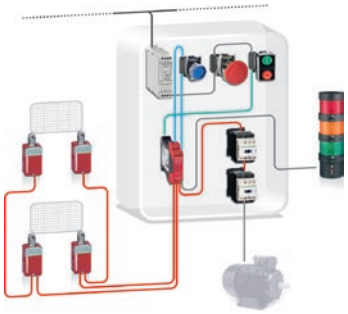
Light curtain (PL c, SIL 1)



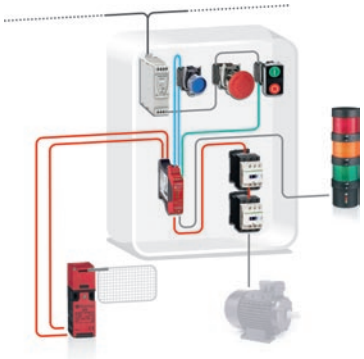
Machine Safety Expertise and Co-design

> Worldwide support and assistance with a local engineers to help you implement machine safety solutions that meet or exceed the latest legislation and compliance with new functional machine safety standards

Safe stop 0 (PL d, SIL 2)



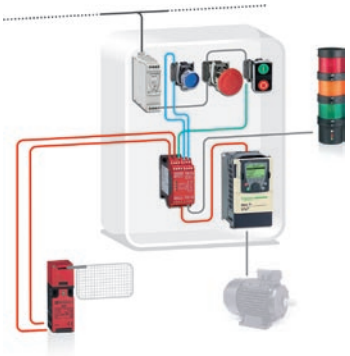
Safe stop 0 (PL e, SIL 3) High performance



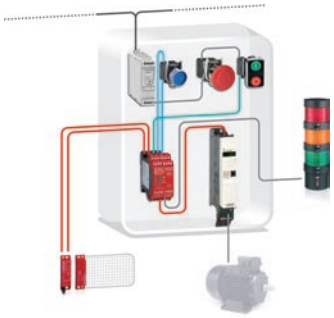
Be confident by using certified safety chain solutions

- Save cost by reducing external safety expert engineering
- Reduce machine design time by using our calculations to meet your safety function requirements

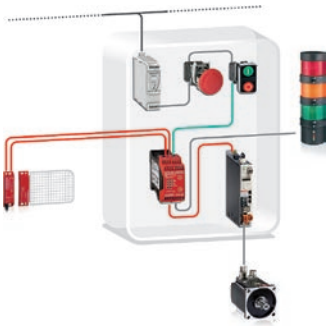
Safe stop 1 (PL d, SIL 2)
Variable speed drive



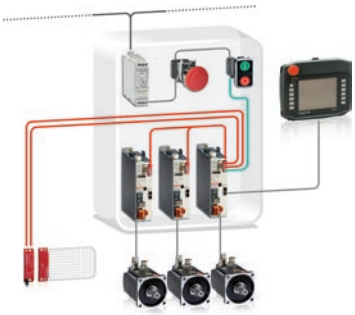
Safe stop 1 (PL e, SIL 3)
High performance



Safe stop 1 (PL e, SIL 3)
Servo drive



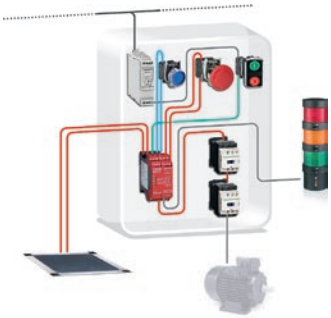
Safe stop 2 (PL e, SIL 3)
Servo-enhanced safety



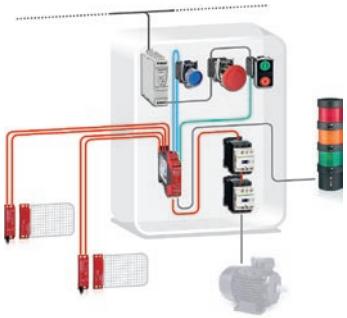
No reason to delay your implementation of the functional standards

- We guide you step by step on http://www.schneider-electric.com
- Download our Machine Safety guide
- Select the right safety chain to solve each function
- Evaluate if your architecture meets the risk reduction requirements by use of the Sistema software tool and Preventa library all downloadable via www.schneider-electric.com.

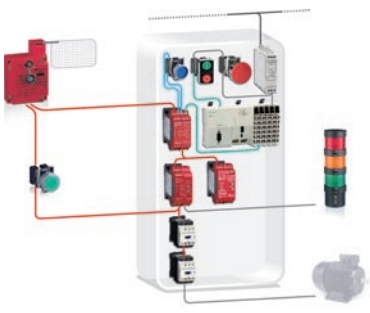
Safety Mat (PL d, SIL 2)



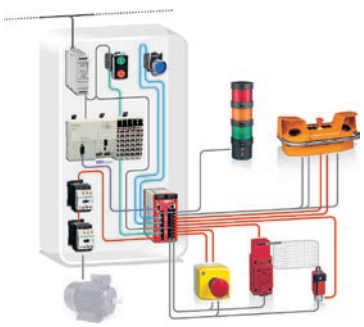
Magnetic switches (PL e, SIL 3)



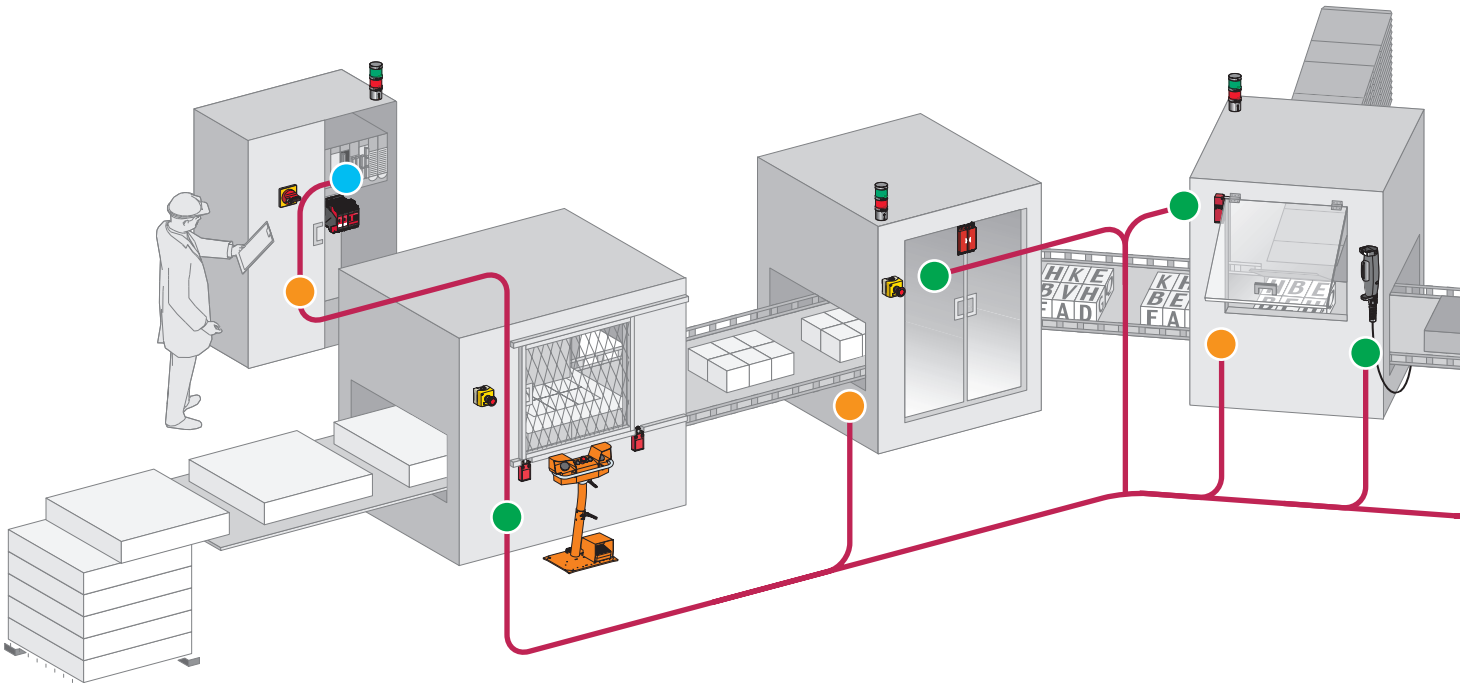
Zero speed detection (PL e, SIL 3)



Multifunction (PL e, SIL 3)



Save cost and time with our Preventa offer



Safe signal transmission

Acquire the information*:

> Protective guard devices used as part of safeguarding systems to control the access under specific conditions of reduced risk.

> Light curtains to detect approach to dangerous and limited areas.

> Two hand control stations and enabling switches for starting and enabling of dangerous movements.

> Generic protective measures - Emergency stop.

Protective guard devices

Light curtains

Two hand control stations and enabling switches

Monitor and processing:

> Safety modules manage one safety function, monitoring inputs from safety devices and manages the outputs to contactors and drives.

> Safety controllers: configurable safety device capable of managing multiple safety functions simutaneously

> Safety PLCs: programmable electronic systems to carry out safety or non-safety related tasks for machinery and equipment.

Safety relays

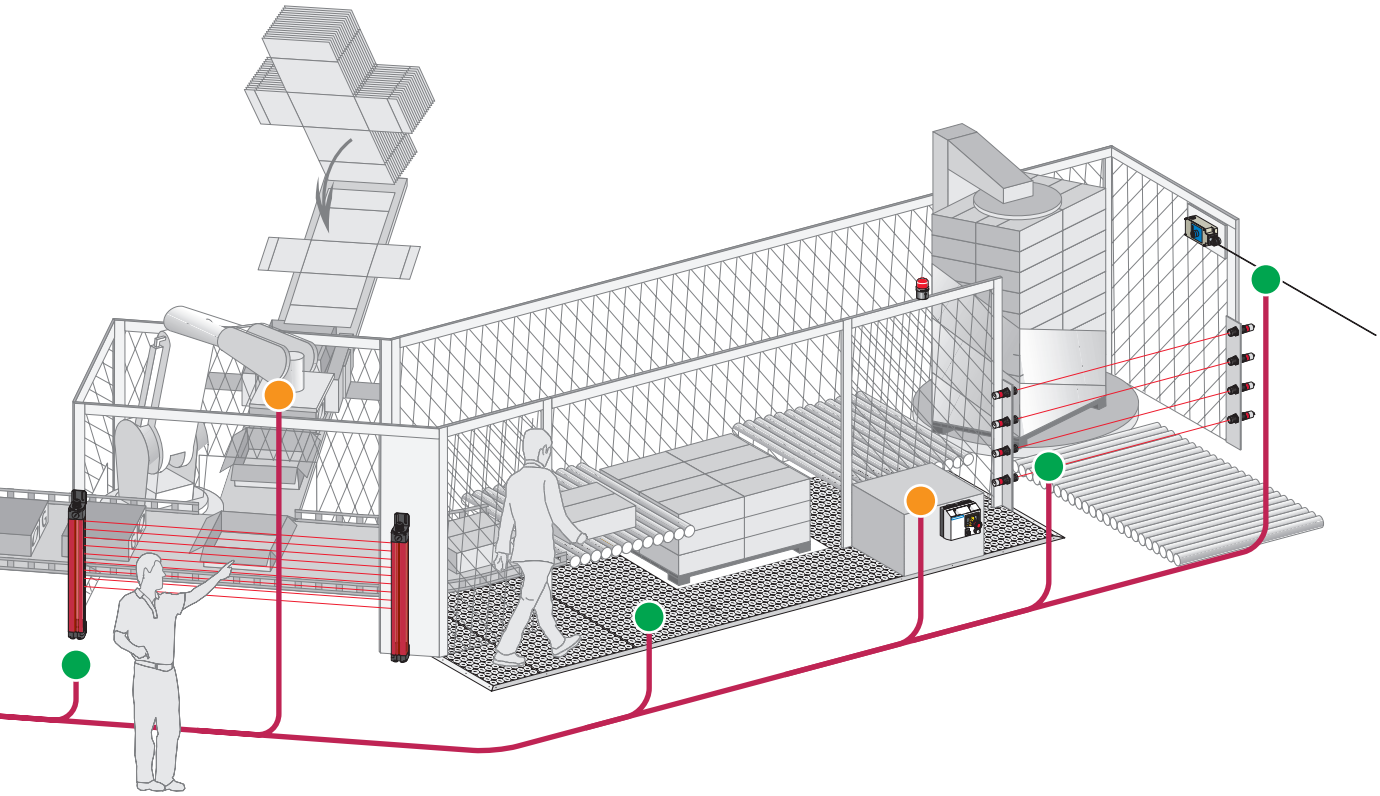
Safety Controller

Safety PLCs

*For detection products, please refer to the Telemecanique Sensors Essential guide of Detection

Emergency stop

Emergency stop rope pull switch



Stop the machine:

> Contactors to cut-off the electrical power supply to the motors with mechanically linked mirror auxiliary contacts integrated for the feedback loop diagnosis used by the safety modules, controller and PLCs.

> Variable speed drives and servo drives provide controlled stopping of the machine by using embedded safety functions.

> Rotary switch disconnectors: for equipment isolation from the electrical supply andfor emergency stop by direct interruption of the power supply.

Variable speed Drives

Servo drives

Contactors

Rotary switch disconnectors

1 Complete & upgraded safety offer:

Improved hardware features and expanded offer

Up to 50% of space optimization

Increase the compactness by reducing size.

Save up to 30% on installation time

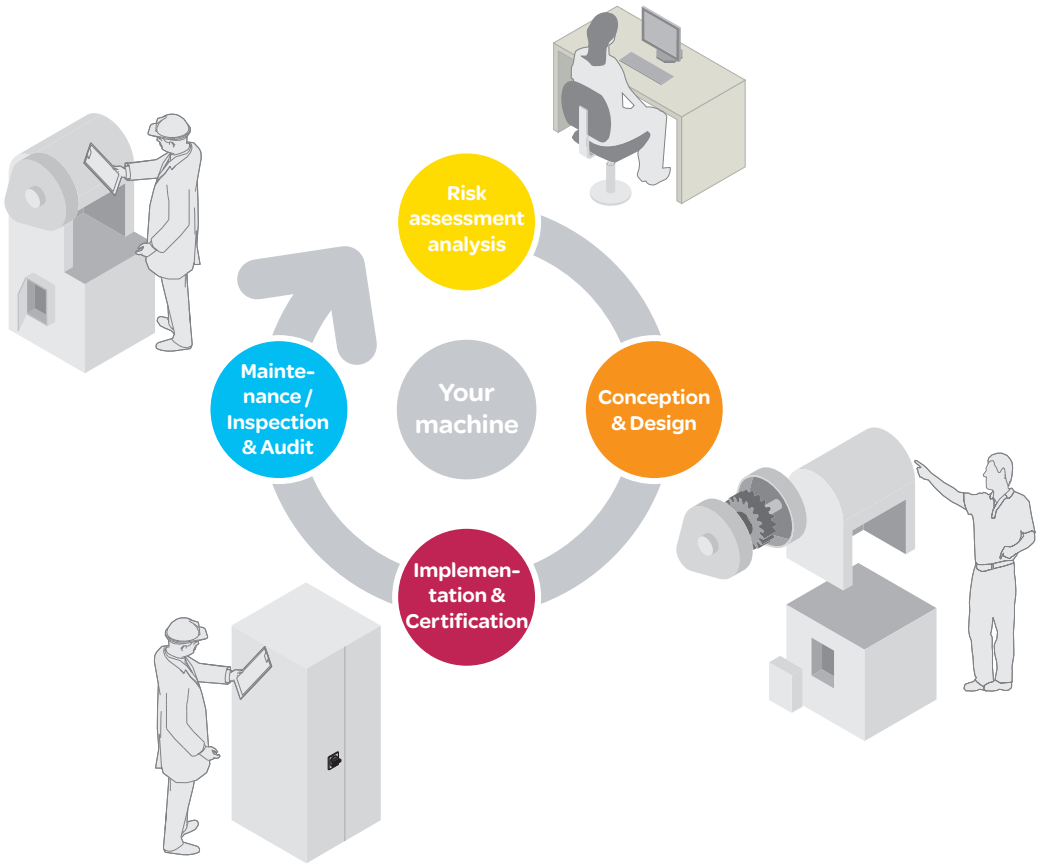
Reduce installation time by easy and quick wiring.

In addition to moral obligation and economic consequences, the law requires that machinery is safe in the interests of accident prevention. Preventa offers an extensive range of safety products, compliant with international standards, designed to provide the most comprehensive protection for personnel and equipment.

Preventa

The Preventa range enhances safety throughout a machine's entire life cycle from design, manufacture, installation, adjustment, operation and servicing right through to decommissioning.

Preventa, the safety attitude around your machine life cycle



Contents

This document is a selection of the top selling products.
For more information:
http://www.schneider-electric.com

Automation

Operator dialog

Motor control

> New machines - the Machinery Directive

From 29 December 2009, the new European Machinery Directive 2006/42/EC is effective. Machines have to comply with the Essential Health and Safety Requirements (EHSRs) listed in Annex I of the Directive, thus setting a common minimum level of protection across the EEA (European Economic Area).

Machine manufacturers, or their authorised representatives within the EU, must ensure that their machines are compliant, the Technical File is made available to the enforcing authorities on request, the CE marking is affixed, and a Declaration of Conformity has been signed, before the machine may be placed on the market within the EU.

For all XPSMF PLCs

- Maximum category of the solution ..... **Category 4** (EN 954-1)
- Max performance level for the solution ..... **PL e** (EN ISO 13849-1)
- Max safety integrity level for the solution ..... **SIL 3** (EN IEC 62061)



Safety PLC type		Compact					
Number of inputs/outputs	Digital (configurable with XPSMFWIN software)	**24**					
	Pulsed (1)	2x4					
Memory capacity	Application	250 Kb					
	Data	250 Kb					
Supply		External 24 VDC supply (with separate protection conforming to IEC 61131-2)					
Communication	On Ethernet network with safe Ethernet protocol	Integrated (2xRJ45)	Integrated (2xRJ45)	Integrated (2xRJ45)	Integrated (2xRJ45)	Integrated (2xRJ45)	Integrated (2xRJ45)
	On Modbus TCP/IP	–	Integrated (2xRJ45)	–	Integrated (2xRJ45)	–	Integrated (2xRJ45)
	On Modbus (Serial link)	–	–	Integrated (1xRJ45)	Integrated (1xRJ45)	–	–
	On Profibus DP	–	–	–	–	Integrated (SUB-D9)	Integrated (SUB-D9)
Input/output connections		Removable screw terminal blocks or removable cage clamp terminal blocks coded with locating device					
References		**XPSMF4000**	**XPSMF4002**	**XPSMF4020**	**XPSMF4022**	**XPSMF4040**	**XPSMF4042**

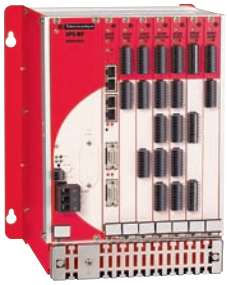
(1) They outputs are not safety outputs.

Compact

Safety PLC type		Compact				
Number of inputs	Digital	**20**	**20**	**24**	**24**	**24**
	Analogue	–	–	**8**	**8**	**8**
	Counting	–	–	**2**	**2**	**2**
Number of outputs	Digital	**8**	**8**	**8**	**8**	**8**
	Analogue	–	–	–	–	–
	Relay	–	–	–	–	–
Memory capacity	Application	250 Kb				
	Data	250 Kb				
Supply		External 24 VDC supply (with separate protection conforming to IEC 61131-2)				
Communication	On Ethernet network (Modbus TCP/IP)	Integrated (4xRJ45)	Integrated (4xRJ45)	Integrated (4xRJ45)	Integrated (4xRJ45)	Integrated (4xRJ45)
	On Modbus (Serial link)	Integrated (SUB-D9)	–	–	Integrated (SUB-D9)	–
	On Profibus DP	–	–	–	–	Integrated (SUB-D9)
Input/output connections		Removable screw terminal blocks, coded with locating device				
References (2)		**XPSMF3022**	**XPSMF31222**	**XPSMF3502**	**XPSMF3522**	**XPSMF3542**

(2) Products referenced **XPSMF30**/**MF31**/**MF35** are marked **Himatrix F30**, **F31** and **F35**.

Safety PLCs
Modular



For all XPSMF PLCs

- Maximum category of the solution ..... **Category 4** (EN 954-1)
- Max performance level for the solution ..... **PL e** (EN ISO 13849-1)
- Max safety integrity level for the solution ..... **SIL 3** (EN IEC 62061)

Type		CPU	Power supply module	Rack with 6 slots	Software
Memory capacity	Application	500 Kb	–	–	For XPSMF PLCs
	Data	500 Kb	–	–	
Supply		–	External 24 VDC, integrated	–	
Communication	On Ethernet network (Modbus TCP/IP)	Integrated (4xRJ45)	–	–	Complete version
	On Modbus bus (Serial link)	Integrated (SUB-D9)	–	–	**SSV1XPSMFWIN**
Power connections		Screw terminal blocks	Screw terminal blocks	–	(1)
Dimensions W x D x H		–	–	257 x 239 x 310 mm	Update version
References		**XPSMFCPU22**	**XPSMFPS01**	**XPSMFGEH01**	**SSVXPSMFWINUP**

I/O module type		For modular safety PLC						
		Analogue		Digital				Relay
Number of inputs	Digital	–	–	–	**24**	**32**	**24**	–
	Analogue	**8**	–	–	–	–	–	–
	Counting	–	–	**2**	–	–	–	–
Number of outputs	Digital	–	–	**4**	–	–	**16**	–
	Analogue	–	**8**	–	–	–	–	–
	Relay	–	–	–	–	–	–	**8**
Supply		Removable screw terminal blocks, coded with locating device						
References		**XPSMFAI801**	**XPSMFAO801**	**XPSMFCIO2401**	**XPSMFDI2401**	**XPSMFDI3201**	**XPSMFDIO241601**	**XPSMFDO801**

Decentralised safety I/O modules

Module type		Inputs/Ouputs Digital			
Number of inputs	Digital	16	8+2	16	20
Number of outputs	Digital	–	8	8	8
	Pulsed	4	2	2	–
Supply		External 24 VDC supply (with separate protection conforming to IEC 61131-2)			
Communication	On Safe Ethernet network (Modbus TCP/IP)	Integrated (2xRJ45)			
Input/output connections		Removable screw terminal blocks, coded with locating device			
References (2)		**XPSMF1DI1601**	**XPSMF3DIO8801**	**XPSMF3DIO16801**	**XPSMF3DIO20802**

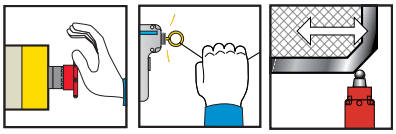
I/O module type		Inputs/Outputs Analogue	Outputs Digital		Relay	
Number of inputs	Analogue	8	–	–	–	–
Number of outputs	Digital	–	4	16	–	–
	Analogue (not safety)	4	–	–	–	–
	Relay	–	–	–	8	16
Supply		External 24 VDC supply (with separate protection conforming to IEC 61131-2)				
Communication	On Safe Ethernet network (Modbus TCP/IP)	Integrated (2xRJ45)				
Input/output connections		Removable screw terminal blocks, coded with locating device				
References (2)		**XPSMF3AIO8401**	**XPSMF2DO401**	**XPSMF2DO1601**	**XPSMF2DO801**	**XPSMF2DO1602**

(1) To be ordered only if the previous version of have been already installed.

(2) Products referenced **XPSMF1/MF2/MF3** are marked **Himatrix F1**, **F2** and **F3**.

Safety controllers for monitoring

Emergency stops and limit switches



Universal

Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061)		PL e / Cat. 4, SILCL 3			
Number of circuits	Safety	2 x 2N/O + 6 solid-state			2 x 3N/O per function
	Additional	–			3 solid-state
Display (number of LEDs)		30			12
Width of housing		74 mm			45 mm
Communication interface		Modbus	Modbus, CANopen	Modbus, Profibus DP	–

Universal solutions: safety controllers (for monitoring several safety functions simultaneously)

Supply voltage	24 VDC	**XPSMC32Z** (1) (2)	**XPSMC32ZC** (1) (2)	**XPSMC32ZP** (1) (2)	**XPSMP11123P** (3)

Coded magnetic switches
Enabling switch

Universal

Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061)		PL e / Cat. 4, SILCL 3			
For monitoring		magnetic switches and enabling switch			
Number of circuits	Safety	2 x 2N/O + 6 solid-state			2 x 3N/O per function
	Additional	–			3 solid-state
Display (number of LEDs)		30			12
Width of housing		74 mm			45 mm
Communication interface		Modbus	Modbus, CANopen	Modbus, Profibus DP	–

Universal solutions: safety controllers (for monitoring several safety functions simultaneously)

Supply voltage	24 VDC	**XPSMC32Z** (1)(2)	**XPSMC32ZC** (1)(2)	**XPSMC32ZP** (1)(2)	**XPSMP11123P** (3)

Safety mats and edging

Universal

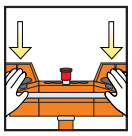
Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061)		PL d / Cat. 3, SILCL 2			
Number of circuits	Safety	2 x 2N/O + 6 solid-state			2 x 3N/O per function
	Additional	–			3 solid-state
Display (number of LEDs)		30			12
Width of housing		74 mm			45 mm
Communication interface		Modbus	Modbus, CANopen	Modbus, Profibus DP	–

Universal solutions: safety controllers (for monitoring several safety functions simultaneously)

Supply voltage	24 VDC	**XPSMC32Z** (1)(2)	**XPSMC32ZC** (1)(2)	**XPSMC32ZP** (1)(2)	**XPSMP11123P** (3)

(1) Version with 32 inputs. For version with 16 inputs, replace 32 in the reference by 16 (example: XPSMC32Z becomes XPSMC16Z).
(2) Configuration software XPSMCWIN (complete version), configuration cable, adaptor and set of screw or cage clamp terminal plug-in connectors XPSMCTS16 and XPSMCTS32 or set of spring clip terminal plug-in connectors XPSMCTC16 and XPSMCTC32 to be ordered separately.
(3) For fixed connector version, delete the letter P from the end of the reference (example: XPSMP11123P becomes XPSMP11123).

Safety controllers for monitoring
Two-hand control



Universal

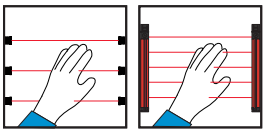


Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061)		PL e / Cat. 4, SILCL 3		
Number of circuits	Safety	2 x 2N/O + 6 solid-state		
	Additional	–		
Display (number of LEDs)		30		
Width of housing		74 mm		
Communication interface		Modbus	Modbus, CANopen	Modbus, Profibus DP

Universal solutions: safety controllers (for monitoring several safety functions simultaneously)

Supply voltage	24 VDC	**XPSMC32Z** (1)(2)	**XPSMC32ZC** (1)(2)	**XPSMC32ZP** (1)(2)

Light curtains



Universal





Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061)		PL e / Cat. 4, SILCL 3				2 light curtains monitoring max.
Number of circuits	Safety	2 x 2N/O + 6 solid-state			2x3N/O per function	6 PNP solid-state
	Additional	–			3 solid-state	1 PNP + 1 NPN
Display (number of LEDs)		30			12	14 + double display units
Width of housing		74 mm			45 mm	100 mm
Integral Muting function		Yes			No	Yes
Communication interface		Modbus	Modbus, CANopen	Modbus, Profibus DP	–	–

Universal solutions: safety controllers (for monitoring several safety functions simultaneously)

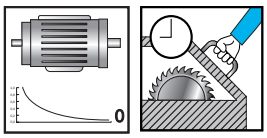
Supply voltage	24 VDC	**XPSMC32Z**(1)(2)	**XPSMC32ZC**(1)(2)	**XPSMC32ZP**(1)(2)	**XPSMP11123P** (3)	**XPSLCM1150** (4)

(1) Version with 32 inputs, for version with 16 inputs, replace 32 in the reference by 16 (example: XPSMC32Z becomes XPSMC16Z).

(3) For version with non removable terminal block, delete the letter P from the end of the reference (example: XPSMP11123P becomes XPSMP11123).

(4) Removable terminal blocks

Zero speed, time delay



Universal



Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061)		PL e / Cat. 4, SILCL 3		
For monitoring		Motor zero speed condition		
Number of circuits	Safety	2 x 2N/O + 6 solid-state		
	Additional	–		
Display (number of LEDs)		30		
Width of housing		74 mm		
Communication interface		Modbus	Modbus, CANopen	Modbus, Profibus DP

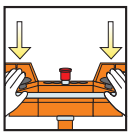
Universal solutions: safety controllers (for monitoring several safety functions simultaneously)

Supply voltage	24 VDC	**XPSMC32Z** (5) (2)	**XPSMC32ZC** (5) (2)	**XPSMC32ZP** (5) (2)

(2) Configuration software XPSMCWIN (complete version), configuration cable, adaptor and set of screw or cage clamp terminal plug-in connectors XPSMCTS16 and XPSMCTS32 or set of spring clip terminal plug-in connectors XPSMCTC16 and XPSMCTC32 to be ordered separately.

(5) Plug-in connector version only.

Safety modules for monitoring
Two-hand control



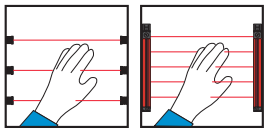
Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061)		PL c / Cat. 1 (type IIIA to EN 574/ISO 13851)	PL e / Cat. 4, SILCL 3 (type IIIC to EN 574/ISO 13851)	
Number of circuits	Safety	1N/O	2N/O	2N/O
	Additional	1N/C	1N/C	2 solid-state
Display (number of LEDs)		2	3	3
Width of housing		22.5 mm	22.5 mm	22.5 mm

Optimum solutions: safety modules (for monitoring 1 safety function)

Supply voltage	24 VDC	–	–	**XPSBF1132P** (1)
	24 VAC/DC	**XPSBA5120** (2)	**XPSBCE3110P** (2)	–

(1) For version with non removable terminal block, delete the letter P from the end of the reference (example: XPSBF1132P becomes XPSBF1132).
(2) For version with cage clamps removable terminal block, change the letter P for C from the end of the reference (example: XPSBCE3110P becomes XPSBCE3110C)

Light curtains



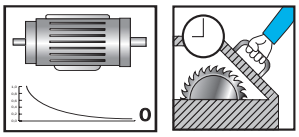
Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061)		PL c / Cat. 2, SILCL 1	PL e / Cat. 4, SILCL 3		
Number of circuits	Safety	2N/O	3N/O	3N/O	7N/O
	Additional	4 solid-state	–	1N/C + 4 solid-state	1N/C + 4 solid-state
Display (number of LEDs)		4	3	4	4
Width of housing		45 mm	22.5 mm	45 mm	90 mm
Integral Muting function		Yes	No	No	No

Optimum solutions: safety modules (for monitoring 1 safety function)

Supply voltage	24 VDC	**XPSCM1144P** (1)	–	–	–
	24 VAC/DC	–	**XPSAFL5130P** (1)	**XPSAK311144P** (1)	**XPSAR311144P** (1)

(1) For version with non removable terminal block, delete the letter P from the end of the reference (example: XPSCM1144P becomes XPSCM1144).

Zero speed, time delay and lifts



Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061)		PL d / Cat. 3, SILCL 2		
For monitoring		Motor zero speed condition	Safety time delay	
Number of circuits	Safety	1N/O + 1N/C	1N/O time delay	1N/O pulse
	Additional	2 solid-state	2N/C + 2 solid-state	2N/C + 2 solid-state
Display (number of LEDs)		4	4	4
Width of housing		45 mm	45 mm	45 mm

Optimum solutions: safety modules (for monitoring 1 safety function)

Supply voltage	24 VDC	**XPSVNE1142P** (1)	–	–
	24 VAC/DC	–	**XPSTSA5142P** (2)	**XPSTSW5142P** (2)

(1) Motor frequency ≤ 60 Hz.. For frequencies ≥ 60 Hz, please see: www.schneider-electric.com
(2) Removable terminal block version only.




Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061, EN/IEC 61058)		PL e/Cat. 4, SILCL 3		PL e/Cat. 4 (1) and PL d/Cat. 3 (2), SILCL 3 (1) and SILCL 2 (2)	PL e/Cat. 4, SILCL 3
Number of circuits	Safety	3 NO	3 NO	2 NO instantaneous + 3 NO time delay	3 NO instantaneous + 3 NO time delay
	Additional	1 solid-state output for signalling to PLC	1 relay output for signalling to PLC	4 solid-state outputs for signalling to PLC	1 NC
Display (number of LEDs)		2 LEDs	2 LEDs	4 LEDs	5 LEDs
Width of housing		22,5mm	22,5mm	45 mm	45 mm
Supply voltage	24 VDC	**XPSAC5121**	**XPSAXE5120P or XPSAXE5120C**	**XPSATE5110P**	**XPSATR1153P or XPSATR1153C**
Section Title		For Emergency stop and switch monitoring			For Emergency stop and protective guard applications



Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061, EN/IEC 61058)		PL e/Cat. 4, SILCL 3	PL e/Cat. 4 (1) and PLC d/Cat. 3 (2), SILCLC 3 (1) and SILCLC 2 (2)	PL e/Cat. 4, SILCL 3
Number of circuits	Safety	3 NO instantaneous + 3 NO time delay	2 NO instantaneous + 1 NO time delay	3 NO
	Additional	3 solid-state outputs for signalling to PLC		
Display (number of LEDs)		11 LEDs	3 LEDs	3 LEDs
Width of housing		45 mm	22,5 mm	22,5 mm
Supply voltage	24 VDC	**XPSAV11113P**	**XPSABV11330P or XPSABV11330C**	**XPSAF5130P**
Section Title		For Emergency stop and switch monitoring		




Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061, EN/IEC 61058)		PL e/Cat. 4, SILCL 3			
Number of circuits	Safety	3 NO	7 NO	3 NO instantaneous	2 NO
	Additional		2 NC + 4 solid-state outputs for signalling to PLC	1 NC + 4 solid-state outputs for signalling to PLC	2 solid-state outputs for signalling to PLC
Display (number of LEDs)		3 LEDs	4 LEDs	4 LEDs	3 LEDs
Width of housing		22,5 mm	90 mm	45 mm	22,5mm
Supply voltage	24 VDC	**XPSAFL5130P**	**XPSAR311144P**	**XPSAK311144P**	**XPSVC1132P**
Section Title		For Emergency stop, switch or solid-state output safety light curtain monitoring		For Emergency stop, switch, sensing mat/edges or solid-state output safety light curtain monitoring	For enabling switch monitoring

(1) Instantaneous safety outputs.
(2) Time-delay safety outputs.




Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061, EN/IEC 61058)		PL c/Cat. 1, SILCL 1	PL e/Cat. 4, SILCL 3		PL c/Cat. 2, SILCL 1
Number of circuits	Safety	1 NO	2 NO	2 NO	2 NO
	Additional	1 NC	1 NC	2 solid-state outputs for signalling to PLC	4 solid-state PNP NO outputs for signalling to PLC
Display (number of LEDs)		2 LEDs	3 LEDs	3 LEDs	4 LEDs
Width of housing		22,5mm	22,5mm	22,5mm	45 mm
Supply voltage	24 VDC	**XPSBAE5120P or XPSBAE5120C**	**XPSBCE3110P or XPSBCE3110C**	**XPSBF1132P**	**XPSCM1144P**
Section Title		For electrical monitoring of two-hand control stations			To monitor 1 to 4 XUS S single beam photo-electric sensors transmitter-receiver pairs



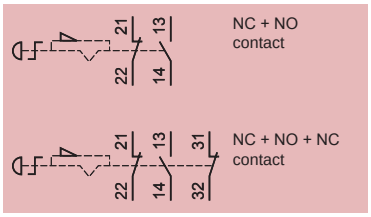

Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061, EN/IEC 61058)		PL e/Cat. 4, SILCL 3 (1)		PL d/Cat. 3, SILCL 2	
Number of circuits	Safety	4 NO	8 NO	1 NO time delayed	1 NO pulse type
	Additional	2 NC	1 NC	2 NC + 2 solid-state outputs for signalling to PLC	2 NC + 2 solid-state outputs for signalling to PLC
Display (number of LEDs)		2 LEDs	3 LEDs	4 LEDs	4 LEDs
Width of housing		22,5 mm	45 mm	45 mm	45 mm
Supply voltage	24 VDC	**XPSECME5131P or XPSECME5131C**	**XPSECPE5131P or XPSECPE5131C**	**XPSTSA5142P**	**XPSTSW5142P**
Section Title		For extending the number of safety contacts		For the monitoring of applications requiring safety time delays	

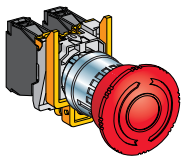


Maximum safety level of the solution attained (EN ISO 13849-1, EN/IEC 62061, EN/IEC 61058)		PL e/Cat. 4, SILCL 3		PL d/Cat. 3, SILCL 2
Number of circuits	Safety	2 NO	2 NO	1 NO + 1 NC
	Additional	2 solid-state outputs for signalling to PLC	2 solid-state outputs for signalling to PLC	2 solid-state outputs for signalling to PLC
Display (number of LEDs)		3 LEDs	15 LEDs	4 LEDs
Width of housing		22,5 mm	45 mm	45 mm
Supply voltage	24 VDC	**XPSDMB1132P**	**XPSDME1132P**	**XPSVNE1142P (>60 Hz) or XPSVNE1142HSP (<60 Hz)**
Section Title		For coded magnetic switch monitoring		For zero speed detection of AC or DC motors which produce a remanent voltage in their windings due to residual magnetism

(1) When connected to the appropriate module.

Emergency stops
Ø 22 trigger action latching pushbuttons

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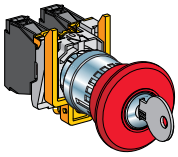
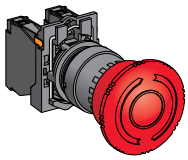

Key release
(key n° 455)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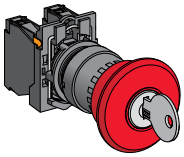
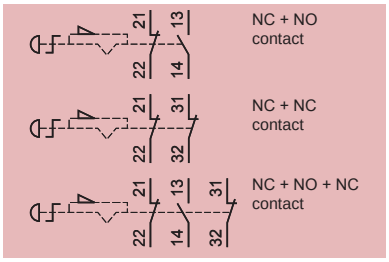
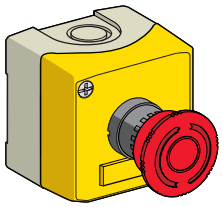

Key release
(key n° 455)

Pushbuttons		Metal		Plastic	
Mechanical life (millions of operating cycles)		0.3		0.3	
Shock / vibration resistance		10 gn / 5 gn		10 gn / 5 gn	
Degree of protection		IP 66		IP 66	
Rated operational characteristics		AC 15, A 600 / DC 13, Q 600 (conforming to EN IEC 60947-5-1)			
Dimensions Ø x Depth		Ø 40 x 82 mm	Ø 40 x 104 mm	Ø 40 x 81.5 mm	Ø 40 x 103 mm
Contact	NC + NO	**XB4BS8445**	**XB4BS9445**	**XB5AS8445**	**XB5AS9445**
	2 NC + 1 NO	**XB4BS84441**	**ZB4BS944+ZB4BZ141**	**ZB5AS844 + ZB5AZ141**	**ZB5AS944+ZB5AZ141**

ISO entry (to EN 50262)

Ø 22 trigger action latching pushbutton stations

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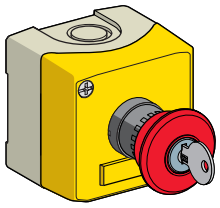
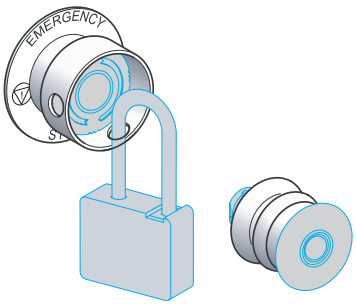

Key release (key n° 455)

Enclosure		Plastic 2 x ISO M20 cable entries or n° 13 (Pg 13.5) cable gland	
Mechanical life (millions of operating cycles)		0.1	0.1
Shock / vibration resistance		10 gn / 5 gn	10 gn / 5 gn
Degree of protection		IP 66	IP 66
Rated operational characteristics		AC 15, A 600 / DC 13, Q 600 (conforming to EN IEC 60947-5-1)	
Dimensions W x D x H		68 x 91 x 68 mm	68 x 113 x 68 mm
Contact	NC + NO	**XALK178E**	**XALK188E**
	NC + NC	**XALK178F**	**XALK188F**
	2 NC + 1 NO	–	**XALK188G**

Accessories

With legend holder



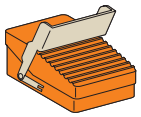
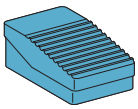
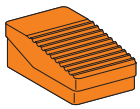
Type			Étiquettes		Padlocking kit	Bellows seals	
Colour			Red with white lettering	Yellow with black lettering	Yellow	Red Silicone	Black EPDM
Dimensions			30 x 40 mm (1)	Ø 60 mm			
Références	**Marking:**	“Arrêt d'urgence”	**ZBY2130**	**ZBY9130**	–	–	–
		“Emergency stop”	**ZBY2330**	**ZBY9330**	–	–	–
		“Not Halt”	**ZBY2230**	**ZBY9230**	–	–	–
			–	–	**ZBZ3605**	**ZBZ48**	**ZBZ28**

(1) circular appearance

Foot switches - metal

Single pedal switches

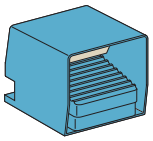
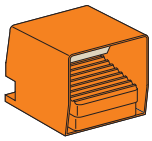
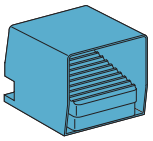
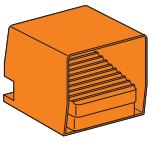
ISO entry (to EN 50262)

Type			Foot switches without protective cover 2 cable entries for n° 16 (Pg 16) cable gland (1)		
Trigger mechanism			With (positive operating action reqd.)	Without	
Colour			Orange	Blue	Orange
Mechanical life (millions of operating cycles)			15		
Degree of protection			IP 66		
Shock resistance			100 joules		
Rated operational characteristics			AC 15, A 300 / DC 13, Q 300 (conforming to EN IEC 60947-5-1)		
Dimensions W x D x H			104 x 172 x 59 mm		
Contact operation	**1 step**	1 NC + NO	**XPER810**	**XPEM110**	**XPER110**
		2 NC + NO	**XPER811**	**XPEM111**	**XPER111**
	2 step	2 NC + NO	**XPER911**	**XPEM211**	**XPER211**
	Analogue output	2 NC + NO	**XPER929**	–	**XPER229**

(1) For entry for ISO M20 cable gland, also order adaptor DE9RA1620 (sold in lots of 5).

ISO entry (to EN 50262)

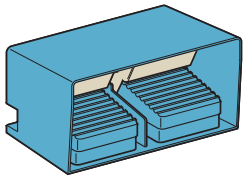
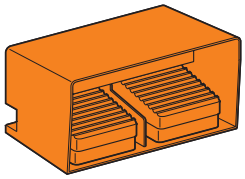





Type			Foot switches without protective cover 2 cable entries for n° 16 (Pg 16) cable gland (1)			
Trigger mechanism			With (positive operating action reqd.)		Without	
Colour			Blue	Orange	Blue	Orange
Mechanical life (millions of operating cycles)			15			
Degree of protection			IP 66			
Shock resistance			100 joules			
Rated operational characteristics			AC 15, A 300 / DC 13, Q 300 (conforming to EN IEC 60947-5-1)			
Dimensions W x D x H			160 x 186 x 152 mm			
Contact operation	**1 step**	1 NC + NO	**XPEM510**	**XPER510**	**XPEM310**	**XPER310**
		2 NC + NO	**XPEM511**	**XPER511**	**XPEM311**	**XPER311**
	1 step latching	1 NC + NO	–	–	**XPEM410**	**XPER410**
	2 step	2 NC + NO	**XPEM711**	**XPER711**	**XPEM611**	**XPER611**
	Analogue output	2 NC + NO	**XPEM529**	**XPER529**	**XPEM329**	–

(1) For entry for ISO M20 cable gland, also order adaptor DE9RA1620 (sold in lots of 5).

Double pedal switches

ISO entry (to EN 50262)

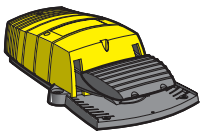
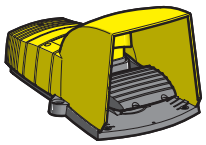
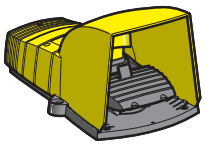



Type			Foot switches without protective cover 2 cable entries for n° 16 (Pg 16) cable gland (1)			
Trigger mechanism			With (positive operating action reqd.)		Without	
Colour			Blue	Orange	Blue	Orange
Mechanical life (millions of operating cycles)			15			
Degree of protection			IP 66			
Shock resistance			100 joules			
Rated operational characteristics			AC 15, A 300 / DC 13, Q 300 (conforming to EN IEC 60947-5-1)			
Dimensions W x D x H			295 x 190 x 155 mm			
Contact operation	**1 step**	2 x 1 NC + NO	**XPEM5100D**	**XPER510D**	**XPEM3100D**	**XPER3100D**
		2 x 2 NC + NO	**XPEM5110D**	**XPER5110D**	**XPEM3110D**	**XPER3110D**

(1) For entry for ISO M20 cable gland, also order adaptor DE9RA1620 (sold in lots of 5).

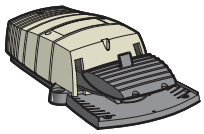
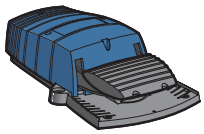
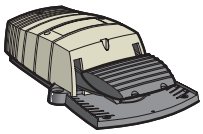
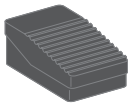
Foot switches - plastic
Single pedal switches

ISO entry (to EN 50262)

Type			Without protective cover 2 cable entries for **ISO M20 cable gland**	With protective cover	
Trigger mechanism			Without		With (positive operating action reqd.)
Colour			Yellow	Yellow	Yellow
Mechanical life (millions of operating cycles)			5		
Degree of protection			IP 55		
Shock resistance			30 joules		
Rated operational characteristics			AC 15, A 300 / DC 13, Q 300 (conforming to EN IEC 60947-5-1)		
Dimensions W x D x H			160 x 280 x 70 mm	160 x 280 x 162 mm	160 x 280 x 162 mm
Contact operation	**1 step**	1 NC + NO	**XPEY110**	**XPEY310**	**XPEY510**
		2 NC + NO	–	**XPEY311**	**XPEY511**
	2 step	2 NC + NO	**XPEY211**	**XPEY611**	**XPEY711**

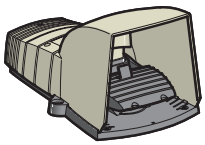
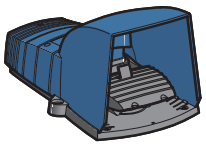
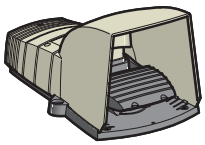
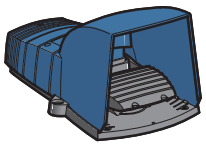
ISO entry (to EN 50262)

Type			Foot switches without protective cover 2 cable entries for ISO M20 cable gland			1 entry (1)
Trigger mechanism			With (positive operating action reqd.)	Without		Without
Colour			Grey+	Blue	Grey	Black
Mechanical life (millions of operating cycles)			10			2
Degree of protection			IP 66			IP 43
Shock resistance			100 joules			
Rated operational characteristics			AC 15, A 300 / DC 13, Q 300 (conforming to EN IEC 60947-5-1)			
Dimensions W x D x H			160 x 280 x 70 mm			94 x 161 x 54 mm
Contact operation	**1 step**	1 NC + NO	**XPEG810**	**XPEB110**	**XPEG110**	**XPEA110**
		2 NC + NO	–	**XPEB111**	**XPEG111**	**XPEA111**
	2 step	2 NC + NO	**XPEG911**	**XPEB211**	**XPEG211**	–

(1) Cable entry for ISO M16 or n° 9 (Pg 9) cable gland and for ISO M20 or n° 13 (Pg 13.5) cable gland.

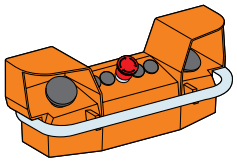
ISO entry (to EN 50262)

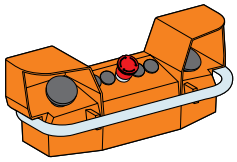
Type			Foot switches with protective cover 2 cable entries for ISO M20 cable gland			
Trigger mechanism			With (positive operating action reqd.)		Without	
Colour			Grey	Blue	Grey	Blue
Mechanical life (millions of operating cycles)			10			
Degree of protection			IP 66			
Shock resistance			100 joules			
Rated operational characteristics			AC 15, A 300 / DC 13, Q 300 (conforming to EN IEC 60947-5-1)			
Dimensions W x D x H			180 x 280 x 162 mm			
Contact operation	**1 step**	1 NC + NO	**XPEG510**	**XPEB510**	**XPEG310**	**XPEB310**
		2 NC + NO	**XPEG511**	**XPEB511**	**XPEG311**	**XPEB311**
	2 step	2 NC + NO	**XPEG711**	**XPEB711**	**XPEG611**	**XPEB611**

Control units
Two-hand control

ISO entry (to EN 50262)



2 control pushbuttons and 1 mushroom head Emergency stop or Lock out pushbutton



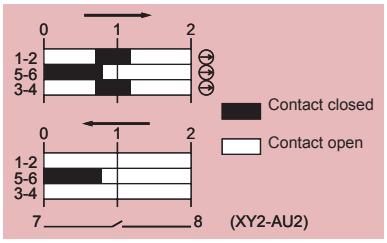
2 control pushbuttons and 1 mushroom head Emergency stop or Lock out pushbutton, with pre-wired terminal block

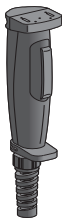
Type	Two-hand control stations 2 cable entries for ISO M20 or n° 13 (Pg 13.5) cable gland, 1 cable entry for n° 21 (Pg 21) cable gland (2)	
Mechanical life (millions of operating cycles)	1	1
Degree of protection	IP 65	IP 65
Rated operational characteristics	AC 15, A 600 / DC 13, Q 600 (conforming to EN IEC 60947-5-1)	
Dimensions W x D x H	455 x 170 x 188.5 mm	
Red emergency stop (NC + NC slow break)	**XY2SB71** (1)	**XY2SB72** (1)
Yellow lock out (NC + NO break before make)	**XY2SB75**	**XY2SB76**

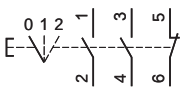
(1) To order a two-hand control station with pedestal XY2SB90, add 4 to the end of the reference (example: XY2SB71 becomes XY2SB714).
(2) For entry for ISO M25 cable gland, also order adaptor DE9RA2125 + fixing nut DE9EC21 (sold in lots of 5).

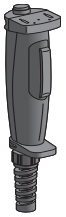
Enabling switch

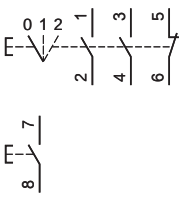
Contact states







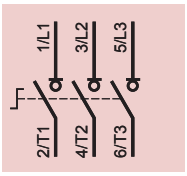


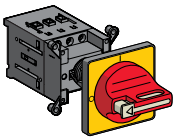


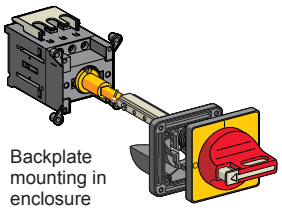
Type	Plastic grip Entry for Ø 7 to 13 mm cable	
Number of contacts	3	3
Type of contacts	2 NO + 1 NC	2 NO + 1 NC 1 NO auxiliary
Description	3 positions	3 positions with button for NO contact (auxiliary)
Shock / vibration resistance	10 gn / 6 gn	
Degree of protection	IP 66	IP 65
Rated operational characteristics	AC 15, C300 / DC 13, R300 (conforming to EN IEC 60947-5-1)	
Dimensions W x D x H	46 x 58 x 261 mm	46 x 58 x 269 mm
References	**XY2AU1**	**XY2AU2**

For fixing accessories, please refer to www.schneider-electric.com.

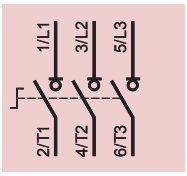
Switch disconnectors
Front mounting

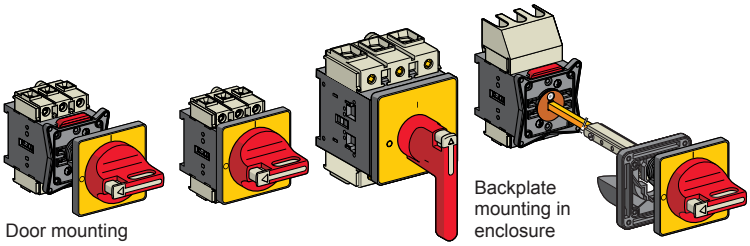



Door mounting


Backplate mounting in enclosure

Type		Mini-Vario for standard applications	
Front plate dimensions (mm)		60 x 60	60 x 60
Fixing		Ø 22.5 mm	Ø 22.5 mm
Degree of protection		IP 20	IP 20
Rated operational voltage (Ue)		690 V	690 V
Thermal current in open air (Ith)	12 A	**VCDN12**	**VCCDN12**
	20 A	**VCDN20**	**VCCDN20**

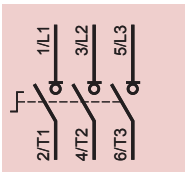


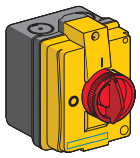

Door mounting

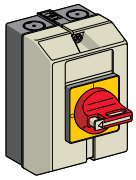
Backplate mounting in enclosure

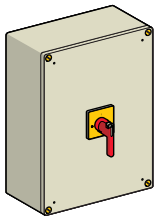
Type		Vario for high performance applications					
Front plate dimensions (mm)		60 x 60	60 x 60	90 x 90	60 x 60	60 x 60	90 x 90
Fixing		Ø 22.5 mm	4 screws	4 screws	Ø 22.5 mm	4 screws	4 screws
Degree of protection		IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Rated operational voltage (Ue)		690 V	690 V	690 V	690 V	690 V	690 V
Thermal current in open air (Ith)	12 A	**VCD02**	**VCF02**	–	**VCCD02**	**VCCF02**	–
	20 A	**VCD01**	**VCF01**	–	**VCCD01**	**VCCF01**	–
	25 A	**VCD0**	**VCF0**	–	**VCCD0**	**VCCF0**	–
	32 A	**VCD1**	**VCF1**	–	**VCCD1**	**VCCF1**	–
	40 A	**VCD2**	**VCF2**	–	**VCCD2**	**VCCF2**	–
	63 A	–	**VCF3**	–	–	**VCCF3**	–
	80 A	–	**VCF4**	–	–	**VCCF4**	–
	125 A	–	–	**VCF5**	–	–	**VCCF5**
	175 A	–	–	**VCF6**	–	–	**VCCF6**

Enclosed



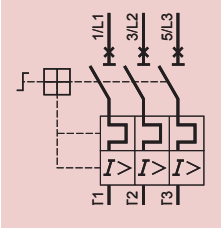




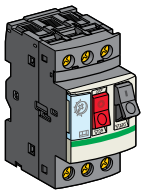


Type		Mini-Vario	Vario	
Front plate dimensions (mm)		60 x 60	60 x 60	90 x 90
Dimensions W x D x H		82.5 x 106 x 131 mm	90 x 131 x 146 mm	241 x 191 x 291 mm
Degree of protection		IP 55	IP 65	IP 65
Rated operational voltage (Ue)		690 V	690 V	690 V
Thermal current in enclosure (Ithe)	10 A	**VCFN12GE**	**VCF02GE**	–
	16 A	**VCFN20GE**	**VCF01GE**	–
	20 A	**VCFN25GE**	**VCF0GE**	–
	25 A	**VCFN32GE**	**VCF1GE**	–
	32 A	**VCFN40GE**	**VCF2GE**	–
	50 A	–	**VCF3GE** (1)	–
	63 A	–	**VCF4GE** (1)	–
	100 A	–	–	**VCF5GEN**
	140 A	–	–	**VCF6GEN**

(1) Dimensions W x D x H: 150 x 152 x 170 mm.

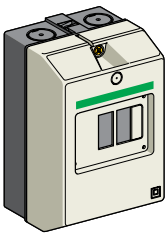


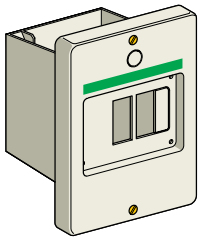
Complete circuit-breaker: circuit-breaker + enclosure + safety device.
Ex.: GV2ME01 + GV2MC02 + GV2K04.



Type		Thermal-magnetic motor circuit-breakers				
Motor power	kW (on 400 V)	–	0.06	0.09	0.12…0.18	0.25…0.37
Setting range	A	0.1…0.16	0.16…0.25	0.25…0.40	0.40…0.63	0.63…1
Current Id ± 20%	A	1.5	2.4	5	8	13
Current Ithe (in enclosure)	A	0.16	0.25	0.40	0.63	1
Reference		**GV2ME01**	**GV2ME02**	**GV2ME03**	**GV2ME04**	**GV2ME05**
Motor power	kW (on 400 V)	0.37…0.55	0.75	1.1…1.5	2.2	3…4
Setting range	A	1…1.6	1.6…2.5	2.5…4	4…6.3	6…10
Current Id ± 20%	A	22.5	33.5	51	78	138
Current Ithe (in enclosure)	A	1.6	2.5	4	6.3	9
Reference		**GV2ME06**	**GV2ME07**	**GV2ME08**	**GV2ME10**	**GV2ME14**
Motor power	kW (on 400 V)	5.5	7.5	9…11	11	15
Setting range	A	9…14	13…18	17…23	20…25	24…32
Current Id ± 20%	A	170	223	327	327	416
Current Ithe (in enclosure)	A	13	17	21	23	24
Reference		**GV2ME16**	**GV2ME20**	**GV2ME21**	**GV2ME22**	**GV2ME32**

Enclosure

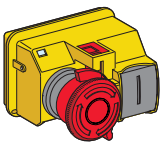


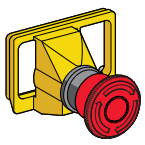


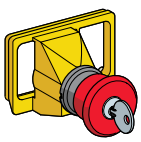
Type	Empty enclosure	
Mounting	Surface mounting	Flush mounting
Degree of protection	IP 55	IP 55 (front face)
Dimensions W x D x H (1)	93 x 145.5 x 147 mm	93 x 55 x 126 mm
References	**GV2MC02**	**GV2MP02**

(1) Dimensions with safety device GV2K04 fitted.

Safety device

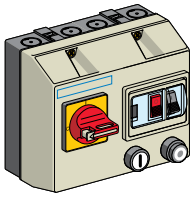
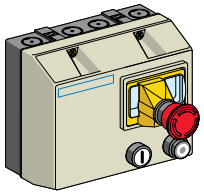
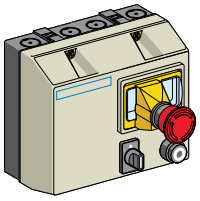




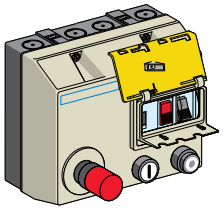


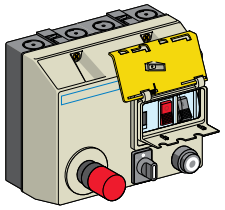
Type	Safety devices		
With red mushroom head	Turn to release Padlockable in “Off” position	Turn to release	Key release (key n° 455)
References	**GV2K04**	**GV2K031**	**GV2K021**

Enclosed motor starters
Enclosed DOL

Type				Non reversing		Reversing
Degree of protection				IP 657	IP 657	IP 657
Standard motor power ratings (kW), category AC3			Ith setting	Basic reference, to be completed by code indicating voltage (1)		
220/230 V	400/415 V	440 V	range (A)			
–	0.06	0.06	0.16…0.25	LG1K065••02	LG7K06••02	LG8K06••02
0.06	0.09	0.12	0.25…0.40	LG1K065••03	LG7K06••03	LG8K06••03
–	0.18	0.18	0.40…0.63	LG1K065••04	LG7K06••04	LG8K06••04
0.12	0.25	0.25	0.63…1	LG1K065••05	LG7K06••05	LG8K06••05
0.25	0.55	0.55	1…1.6	LG1K065••06	LG7K06••06	LG8K06••06
0.37	0.75	1.1	1.6…2.5	LG1K065••07	LG7K06••07	LG8K06••07
0.75	1.5	1.5	2.5…4	LG1K065••08	LG7K06••08	LG8K06••08
1.1	2.2	3	4…6.3	LG1K065••10	LG7K06••10	LG8K06••10
1.5	4	4	6…10	LG1K095••14	LG7K09••14	LG8K09••14
3	5.5	5.5	9…14	LG1D122••16	LG7D12••16	LG8K12••16
4	7.5	9	13…18	LG1D182••20	LG7D18••20	–
4	9	9	17…23	LG1D182••21	LG7D18••21	–


With integral control transformer, 400/24 V


With integral control transformer, 400/24 V

Type		Non reversing	Reversing
Degree of protection		IP 657	IP 657
Standard motor power ratings (kW), category AC3	Ith setting	Basic references	
380/400 V	range (A)	(The code **Q7** (380/400 V) designates the power supply voltage to which the starter will be connected)	
0.06	0.16…0.25	LJ7K06Q702	LJ8K06Q702
0.09	0.25…0.40	LJ7K06Q703	LJ8K06Q703
0.18	0.40…0.63	LJ7K06Q704	LJ8K06Q704
0.25	0.63…1	LJ7K06Q705	LJ8K06Q705
0.55	1…1.6	LJ7K06Q706	LJ8K06Q706
0.75	1.6…2.5	LJ7K06Q707	LJ8K06Q707
1.5	2.5…4	LJ7K06Q708	LJ8K06Q708
2.2	4…6.3	LJ7K06Q710	LJ8K06Q710
4	6…10	LJ7K09Q714	LJ8K09Q714

	Control circuit voltages available			
Volts 50/60 Hz	24 V	230 V	400 V	415 V
(1) Voltage code	B7	P7	V7	N7

The control circuit must be cabled by the user.

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