Safety module **CS AR-91**, according to EN 81

Safety modules for the lift automatic floor levelling operation according to EN 81

Main functions
- For safety applications up to SIL 3 / PL e
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Small 22.5 mm housing
- Output contacts: 2 safety NO contacts, 1 auxiliary NO opto-isolated
- Supply voltages: 24 Vac/dc
- Brief power failure insensitiveness

Utilization categories
Alternate current: AC15 (50...60 Hz)
Ue (V) 230
Ie (A) 3
Direct current: DC13
Ue (V) 24
Ie (A) 4

Markings, quality marks and certificates:
Approval IMQ:
Certificate Of Compliance IMQ n. 340 (*Norms: EN 81-1:1998 + A3:2009, EN 81-2:1998 + A3:2009*)
IMQ-type Examination Certificate n.236 (Machinery Directive)
Approval UL: E131787
Approval EAC: RU C-IT ДМ94.В.01024

Complying with the requirements requested by:
Low Voltage Directive 2006/95/EC,
Machinery Directive 2006/42/EC,
EMC Directive 2004/108/EC

Technical data

Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)	
Protection degree:	IP40 (housing), IP20 (terminals)
Dimensions:	see page 108

General data

SIL level (SIL CL):	up to SIL 3 according to EN IEC 62061
Performance Level (PL):	up to PL e according to EN ISO 13849-1
Safety category:	up to category 4 according to EN ISO 13849-1
MTTFd:	227 years
DC:	High
PFHd:	1.18×10^{-10}
Ambient temperature:	-25°C...+55°C
Mechanical endurance:	>10 millions of operations
Electrical endurance:	>100.000 operations
Pollution degree:	outside 3, inside 2
Rated impulse with stand voltage (Uimp):	4 kV
Rated insulation voltage (Ui):	250 V
Over-voltage category:	II
Weight:	0.2 kg

Power supply

Rated operating voltage (Un):	24 Vac/dc; ±15%; 50...60 Hz
Max residual ripple in DC:	10%
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2.5W

Control circuit

Protection against short circuits:	resistance PTC, Ih=0.5 A
Operating time of PTC:	intervention > 100 ms, reset > 3 s
Max input resistance:	≤ 50 Ω
Current for each input:	< 40 mA
Min. period of start impulse t_{MIN}:	> 50 ms
Operating time t_A:	< 120 ms
Releasing time t_{R1}:	< 15 ms
Releasing time in absence of power supply t_R:	< 65 ms
Simultaneity time t_C:	infinite
Operating time on energisation	< 300 ms

Auxiliary signalling circuit

Auxiliary Output (Y43-Y44):	1NO opto-isolated
Rated operational voltage (Ue):	24 Vdc
Rated operational current (Ie):	25 mA
Rated impulse withstand voltage (Uimp):	4 kV
Reaction time t_{R2}:	< 1 ms

In conformity with standards:
EN 60204-1, EN 999, EN 1037, EN ISO 12100-1, EN ISO 12100-2, EN 81-1, EN 81-2, EN ISO 13850, EN 60529, EN 61000-6-2, EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60947-1, EN ISO 13849-1, EN ISO 13849-2, EN 62061, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:	2 safety NO contacts,
Contacts type:	forced guided contacts
Contacts material:	silver alloy, gold plated
Max switching voltage:	230/240 Vac; 300 Vdc
Max switching current per contact:	6 A
Conventional free air thermal current Ith:	6 A
Max currents sum Σ Ith^2:	36 A^2
Min. current:	10 mA
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	4 A, F type

Code structure

CS AR-91V024

Kind of connection	
V	screw terminals
M	connector with screw terminals
X	connector with spring terminals

Supply voltage	
024	24 Vac/dc

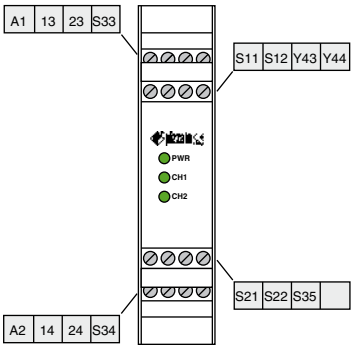
Data type approved by UL

Rated operating voltage (Un):	24 Vac/dc; 50...60 Hz
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2.5 W
Max switching voltage:	230 Vac
Max switching current per contact:	6 A
Utilization category	C300

Notes:
- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.
- Terminal tightening torque of 5-7 Lb-In.
- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.

Safety module CS AR-91

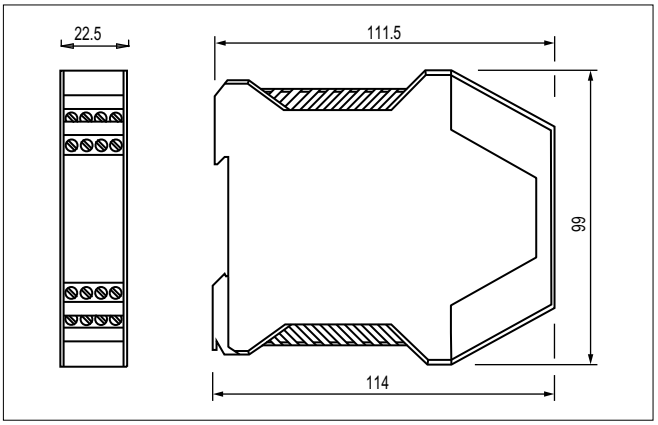
Terminals layout



Brief power failure and supply voltage variation

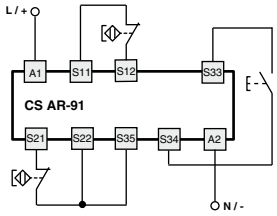
The CS AR-91 safety module has a voltage drop sensor inside which provides the protection and safety of the safety relays internal state in case of brief power failure, in order to avoid unwanted switching state as to the inputs state. Once the input voltage is reset the equipment always restarts correctly and coherently with the inputs state. When a brief power failure occurs the safety module keeps its standard performance. If the power failure lasts longer the safety outputs open and they will reset with the automatic start after the voltage is back while in case of manual or monitored start the system must be reset by the operator.

Dimensions



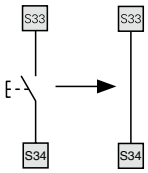
Inputs configuration

Emergency stop
Input configuration with magnetic sensors
2 channels



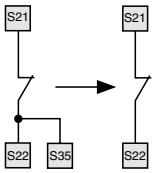
Automatic start

As regards the indicated diagrams, in order to activate the module with the automatic start, you have to bypass the start button between S33 and S34 terminals.



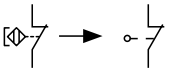
Monitored start

As regards the indicated diagrams, in order to activate the module with the monitored start, you have to remove the connection between S22 and S35 terminals.

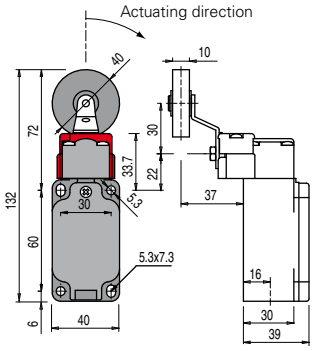


Electromechanical switches

The safety module can control both magnetic sensors and electromechanical switches, replacing the sensors contacts with switches contacts.



Safety position switches FP 945-S6

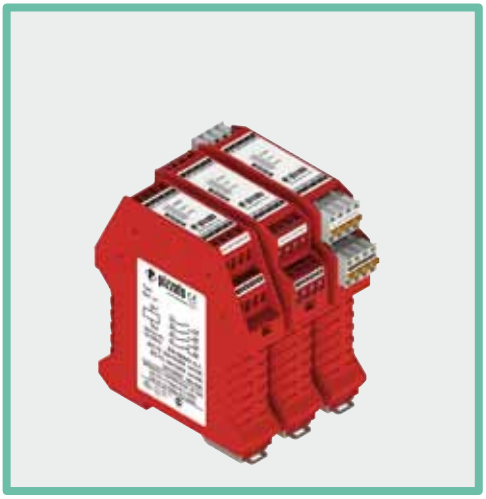


Article	Description
FP 945-S6	Safety switch with rotating lever and rubber roller for unidirectional actuating towards right. Actuated by a suitable cam, it can be used for automatic floor levelling operations. For further information please contact the technical office. Technical data on page 25.

Contacts

2NO

Safety module **CS AR-93**, according to EN 81



Safety modules for the lift automatic floor levelling operation according to EN 81

Main functions
- For safety applications up to SIL 3 / PL e
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Small 22.5 mm housing
- Output contacts: 3 NO safety contacts.1 NC auxiliary contact.
- Supply voltages: 24 Vac/dc
- Brief power failure insensitiveness

Utilization categories
Alternate current: AC15 (50...60 Hz)
Ue (V) 230
Ie (A) 3
Direct current: DC13
Ue (V) 24
Ie (A) 4

Markings, quality marks and certificates:

Approval IMQ:
Certificate Of Compliance IMQ n. 340 (*Norms: EN 81-1:1998 + A3:2009, EN 81-2:1998 + A3:2009*)
IMQ-type Examination Certificate n.236 (Machinery Directive)
Approval UL: E131787
Approval EAC: RU C-IT ДМ94.B.01024

Complying with the requirements requested by:
Low Voltage Directive 2006/95/EC,
Machinery Directive 2006/42/EC,
EMC Directive 2004/108/EC

Technical data

Housing
Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)

Protection degree:	IP40 (housing), IP20 (terminals)
Dimensions:	see page 110

General data

SIL level (SIL CL):	up to SIL 3 according to EN IEC 62061
Performance Level (PL):	up to PL e according to EN ISO 13849-1
Safety category:	up to category 4 according to EN ISO 13849-1
MTTFd:	227 years
DC:	High
PFHd:	1.34x 10^{-10}
Ambient temperature:	-25°C...+55°C
Mechanical endurance:	>10 millions of operations
Electrical endurance:	>100.000 operations
Pollution degree:	outside 3, inside 2
Rated impulse with stand voltage (Uimp):	4 kV
Rated insulation voltage (Ui):	250 V
Over-voltage category:	II
Weight:	0.2 kg

Power supply

Rated operating voltage (Un):	24 Vac/dc; ±15%; 50...60 Hz
Max residual ripple in DC:	10%
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2.5 W

Control circuit

Protection against short circuits:	resistance PTC, Ih=0.5 A
Operating time of PTC:	intervention > 100 ms, reset > 3 s
Max input resistance:	≤ 50 Ω
Current for each input:	< 35 mA
Min. period of start impulse t_{MIN}:	> 50 ms
Operating time t_A:	<130 ms
Releasing time t_{R1}:	< 20 ms
Releasing time in absence of power supply t_R:	< 60 ms
Simultaneity time t_C:	infinite
Operating time on energisation	< 300 ms

In conformity with standards:
EN 60204-1, EN 999, EN 1037, EN ISO 12100-1, EN ISO 12100-2, EN 81-1, EN 81-2, EN ISO 13850, EN 60529, EN 61000-6-2, EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60947-1, EN ISO 13849-1, EN ISO 13849-2, EN 62061, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:	3 NO safety contacts 1 NC auxiliary contact.
Contacts type:	forced guided contacts
Contacts material:	silver alloy, gold plated
Max switching voltage:	230/240 Vac; 300 Vdc
Max switching current per contact:	6 A
Conventional free air thermal current Ith:	6 A
Max currents sum Σ Ith^2:	36 A^2
Min. current:	10 mA
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	4 A, F type

Code structure

CS AR-93V024

Kind of connection	
V	screw terminals
M	connector with screw terminals
X	connector with spring terminals

Supply voltage	
024	24 Vac/dc

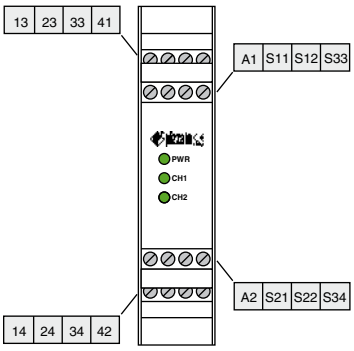
Data type approved by UL

Rated operating voltage (Un):	24 Vac/dc; 50...60 Hz
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2 W
Max switching voltage:	230 Vac
Max switching current per contact:	6 A
Utilization category	C300

Notes:
- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.
- Terminal tightening torque of 5-7 Lb-In.
- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.

Safety module CS AR-93

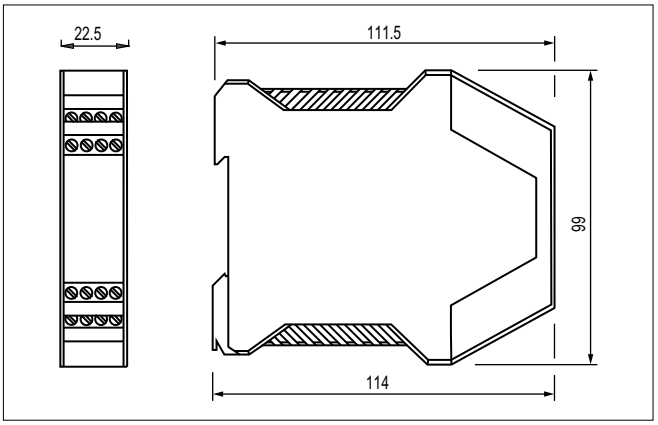
Terminals layout



Brief power failure and supply voltage variation

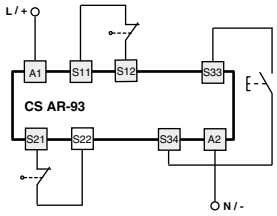
The CS AR-93 safety module has a voltage drop sensor inside which provides the protection and safety of the safety relays internal state in case of brief power failure, in order to avoid unwanted switching state as to the inputs state. Once the input voltage is reset the equipment always restarts correctly and coherently with the inputs state. When a brief power failure occurs the safety module keeps its standard performance. If the power failure lasts longer the safety outputs open and they will reset with the automatic start after the voltage is back while in case of manual or monitored start the system must be reset by the operator.

Dimensions



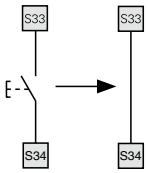
Inputs configuration

Emergency stop
Input configuration with magnetic sensors
2 channels



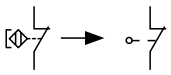
Automatic start

As regards the indicated diagrams, in order to activate the module with the automatic start, you have to bypass the start button between S33 and S34 terminals.

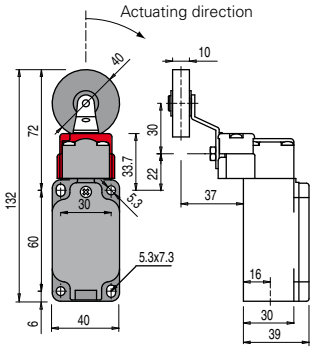


Electromechanical switches

The safety module can control both magnetic sensors and electromechanical switches, replacing the sensors contacts with switches contacts.



Safety position switches FP 945-S6



Article	Description
FP 945-S6	Safety switch with rotating lever and rubber roller for unidirectional actuating towards right. Actuated by a suitable cam, it can be used for automatic floor levelling operations. For further information please contact the technical office. Technical data on page 25.
Contacts	
2NO	

Safety module **CS AR-94**, according to EN 81

Safety modules for the lift automatic floor levelling operation according to EN 81

Main functions
- For safety applications up to SIL 3 / PL e
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Small 22.5 mm housing
- Output contacts: 2 safety NO contacts
- Supply voltages: 24 Vac/dc, 12 Vdc
- Brief power failure insensitiveness

Utilization categories
Alternate current: AC15 (50...60 Hz)
Ue (V) 230
Ie (A) 3
Direct current: DC13
Ue (V) 24
Ie (A) 4

Markings, quality marks and certificates:

Approval IMQ:
Certificate Of Compliance IMQ n. 340 (*Norms: EN 81-1:1998 + A3:2009, EN 81-2:1998 + A3:2009*)
IMQ-type Examination Certificate n.236 (Machinery Directive)
Approval UL: E131787
Approval EAC: RU C-IT ДМ94.В.01024

Complying with the requirements requested by:
Low Voltage Directive 2006/95/EC,
Machinery Directive 2006/42/EC,
EMC Directive 2004/108/EC

Technical data

Housing
Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)

Protection degree:	IP40 (housing), IP20 (terminals)
Dimensions:	see page 112

General data

SIL level (SIL CL):	up to SIL 3 according to EN IEC 62061
Performance Level (PL):	up to PL e according to EN ISO 13849-1
Safety category:	up to category 4 according to EN ISO 13849-1
MTTFd:	213 years (24 Vac/dc) 227 years (12 Vdc)
DC:	High
PFHd:	5.62×10^{-9} (24 Vac/dc) 1.13×10^{-10} (12 Vdc)
Ambient temperature:	-25°C...+55°C
Mechanical endurance:	>10 millions of operations
Electrical endurance:	>100.000 operations
Pollution degree:	outside 3, inside 2
Rated impulse with stand voltage (Uimp):	4 kV
Rated insulation voltage (Ui):	250 V
Over-voltage category:	II
Weight:	0.2 kg

Power supply

Rated operating voltage (Un):	24 Vac/dc; ±15%; 50...60 Hz 12 Vdc; -10% ... +15%
Max residual ripple in DC:	10%
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2 W

Control circuit

Protection against short circuits:	resistance PTC, Ih=0.5 A
Operating time of PTC:	intervention > 100 ms, reset > 3 s
Max input resistance:	≤ 25 Ω (24 Vac/dc), ≤ 15 Ω (12 Vdc)
Current for each input:	< 35 mA (24 Vac/dc), 65 mA (12 Vdc)
Min. period of start impulse t_{MIN}:	> 300 ms
Operating time t_A:	< 60 ms
Releasing time t_{R1}:	< 20 ms
Releasing time in absence of power supply t_R:	< 120 ms (24 Vac/dc), 70 ms (12 Vdc)
Simultaneity time t_C:	infinite
Operating time on energisation	< 200 ms (24 Vac/dc), 400 ms (12 Vdc)

In conformity with standards:
EN 60204-1, EN 999, EN 1037, EN ISO 12100-1, EN ISO 12100-2, EN 81-1, EN 81-2, EN ISO 13850, EN 60529, EN 61000-6-2, EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60947-1, EN ISO 13849-1, EN ISO 13849-2, EN 62061, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:	2 safety NO contacts,
Contacts type:	forced guided contacts
Contacts material:	silver alloy, gold plated
Max switching voltage:	230/240 Vac; 300 Vdc
Max switching current per contact:	6 A
Conventional free air thermal current Ith:	6 A
Max currents sum Σ Ith^2:	36 A^2
Min. current:	10 mA
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	4 A, F type

Code structure

CS AR-94V024

Kind of connection	
V	screw terminals
M	connector with screw terminals
X	connector with spring terminals

Supply voltage	
024	24 Vac/dc
U12	12 Vdc

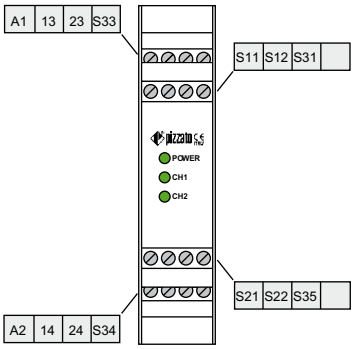
Data type approved by UL

Rated operating voltage (Un):	24 Vac/dc; 50...60 Hz
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2 W
Max switching voltage:	230 Vac
Max switching current per contact:	6 A
Utilization category	C300

Notes:
- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.
- Terminal tightening torque of 5-7 Lb-In.
- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.

Safety module CS AR-94

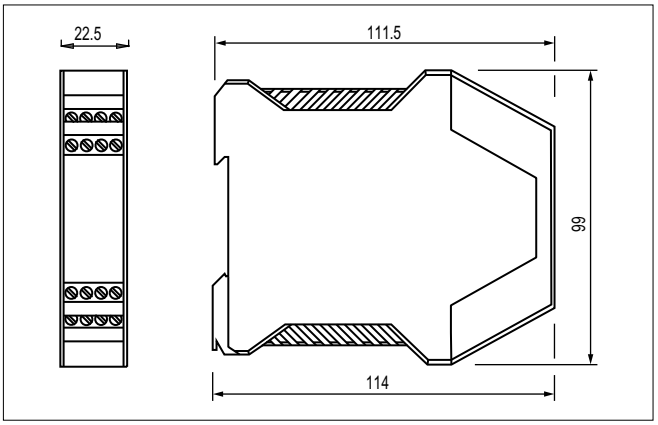
Terminals layout



Brief power failure and supply voltage variation

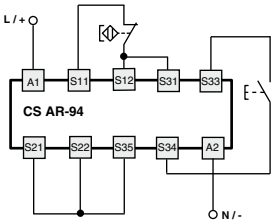
The CS AR-94 safety module has a voltage drop sensor inside which provides the protection and safety of the safety relays internal state in case of brief power failure, in order to avoid unwanted switching state as to the inputs state. Once the input voltage is reset the equipment always restarts correctly and coherently with the inputs state. When a brief power failure occurs the safety module keeps its standard performance. If the power failure lasts longer the safety outputs open and they will reset with the automatic start after the voltage is back while in case of manual or monitored start the system must be reset by the operator.

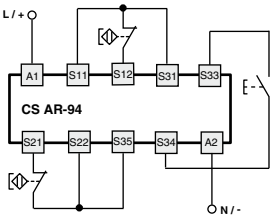
Dimensions



Inputs configuration

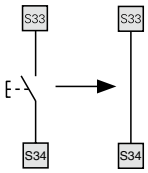
Emergency stop	
Input configuration with magnetic sensors	
1 channel	2 channels





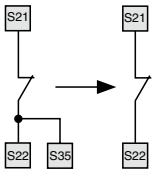
Automatic start

As regards the indicated diagrams, in order to activate the module with the automatic start, you have to bypass the start button between S33 and S34 terminals.



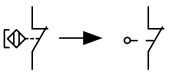
Monitored start

As regards the indicated diagrams, in order to activate the module with the monitored start, you have to remove the connection between S22 and S35 terminals.

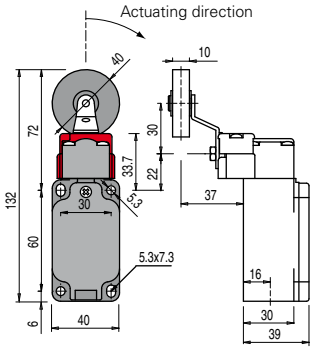


Electromechanical switches

The safety module can control both magnetic sensors and electromechanical switches, replacing the sensors contacts with switches contacts.

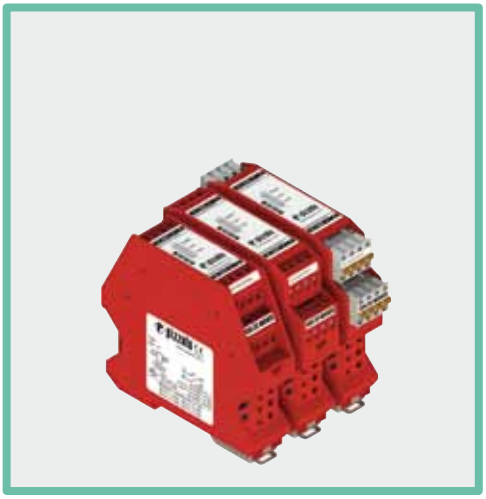


Safety position switches FP 945-S6



Article	Description
FP 945-S6	Safety switch with rotating lever and rubber roller for unidirectional actuating towards right. Actuated by a suitable cam, it can be used for automatic floor levelling operations. For further information please contact the technical office. Technical data on page 25.
Contacts	
⊖ 2NO	

Safety module **CS AR-95**, according to EN 81



Safety modules for the lift automatic floor levelling operation according to EN 81

Main functions
- For safety applications up to SIL 3 / PL e
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Small 22.5 x 88.5h mm housing
- Output contacts: 2 safety NO contacts
- Supply voltages: 24 Vac/dc
- Brief power failure insensitiveness

Utilization categories
Alternate current: AC15 (50...60 Hz)
Ue (V) 230
Ie (A) 3
Direct current: DC13
Ue (V) 24
Ie (A) 4

Markings, quality marks and certificates:

Approval IMQ:
Certificate Of Compliance IMQ n. 340 (*Norms: EN 81-1:1998 + A3:2009, EN 81-2:1998 + A3:2009*)
IMQ-type Examination Certificate n.236 (Machinery Directive)
Approval UL: E131787
Approval EAC: RU C-IT ДМ94.В.01024

Complying with the requirements requested by:
Low Voltage Directive 2006/95/EC,
Machinery Directive 2006/42/EC,
EMC Directive 2004/108/EC

Technical data

Housing
Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)

Protection degree:	IP40 (housing), IP20 (terminals)
Dimensions:	see page 114

General data

SIL level (SIL CL):	up to SIL 3 according to EN IEC 62061
Performance Level (PL):	up to PL e according to EN ISO 13849-1
Safety category:	up to category 4 according to EN ISO 13849-1
MTTFd:	213 years
DC:	High
PFHd:	5.42 x 10^{-9}
Ambient temperature:	-25°C...+55°C
Mechanical endurance:	>10 millions of operations
Electrical endurance:	>100.000 operations
Pollution degree:	outside 3, inside 2
Rated impulse with stand voltage (Uimp):	4 kV
Rated insulation voltage (Ui):	250 V
Over-voltage category:	II
Weight:	0.2 kg

Power supply

Rated operating voltage (Un):	24 Vac/dc; ±15%; 50...60 Hz
Max residual ripple in DC:	10%
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2 W

Control circuit

Protection against short circuits:	resistance PTC, Ih=0.5 A
Operating time of PTC:	intervention > 100 ms, reset > 3 s
Max input resistance:	≤ 25 Ω
Current for each input:	< 35 mA
Min. period of start impulse t_{MIN}:	> 300 ms
Operating time t_A:	< 60 ms
Releasing time t_{R1}:	< 20 ms
Releasing time in absence of power supply t_R:	< 100 ms
Simultaneity time t_C:	infinite
Operating time on energisation	< 200 ms

In conformity with standards:
EN 60204-1, EN 999, EN 1037, EN ISO 12100-1, EN ISO 12100-2, EN 81-1, EN 81-2, EN ISO 13850, EN 60529, EN 61000-6-2, EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60947-1, EN ISO 13849-1, EN ISO 13849-2, EN 62061, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:	2 safety NO contacts,
Contacts type:	forced guided contacts
Contacts material:	silver alloy, gold plated
Max switching voltage:	230/240 Vac; 300 Vdc
Max switching current per contact:	6 A
Conventional free air thermal current Ith:	6 A
Max currents sum Σ Ith^2:	36 A^2
Min. current:	10 mA
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	4 A, F type

Code structure

CS AR-95V024

Kind of connection	
V	screw terminals
M	connector with screw terminals
X	connector with spring terminals

Supply voltage	
024	24 Vac/dc

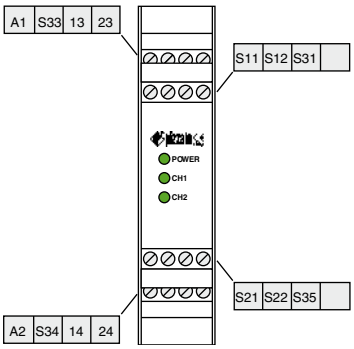
Data type approved by UL

Rated operating voltage (Un):	24 Vac/dc; 50...60 Hz
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2 W
Max switching voltage:	230 Vac
Max switching current per contact:	6 A
Utilization category	C300

Notes:
- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.
- Terminal tightening torque of 5-7 Lb-In.
- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.

Safety module CS AR-95

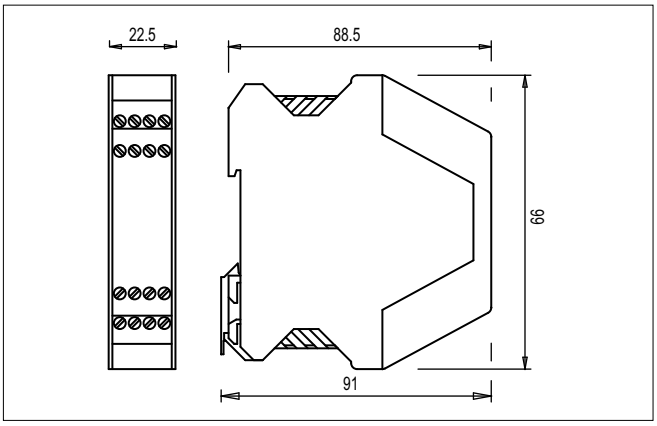
Terminals layout



Brief power failure and supply voltage variation

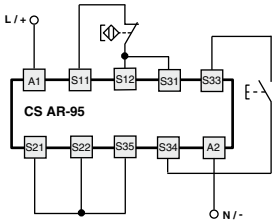
The CS AR-95 safety module has a voltage drop sensor inside which provides the protection and safety of the safety relays internal state in case of brief power failure, in order to avoid unwanted switching state as to the inputs state. Once the input voltage is reset the equipment always restarts correctly and coherently with the inputs state. When a brief power failure occurs the safety module keeps its standard performance. If the power failure lasts longer the safety outputs open and they will reset with the automatic start after the voltage is back while in case of manual or monitored start the system must be reset by the operator.

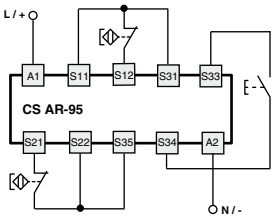
Dimensions



Inputs configuration

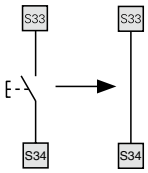
Emergency stop	
Input configuration with magnetic sensors	
1 channel	2 channels





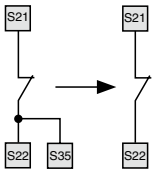
Automatic start

As regards the indicated diagrams, in order to activate the module with the automatic start, you have to bypass the start button between S33 and S34 terminals.



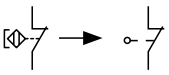
Monitored start

As regards the indicated diagrams, in order to activate the module with the monitored start, you have to remove the connection between S22 and S35 terminals.

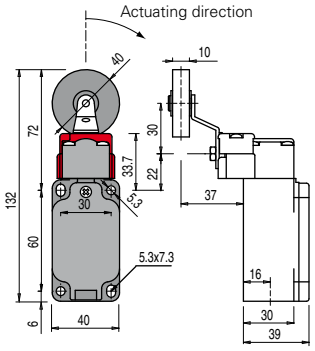


Electromechanical switches

The safety module can control both magnetic sensors and electromechanical switches, replacing the sensors contacts with switches contacts.



Safety position switches FP 945-S6



Article	Description
FP 945-S6	Safety switch with rotating lever and rubber roller for unidirectional actuating towards right. Actuated by a suitable cam, it can be used for automatic floor levelling operations. For further information please contact the technical office. Technical data on page 25.
Contacts	
⊖ 2NO	

Main data

- Polymer housing, with one or two conduit entries
- Protection degree IP67
- M12 assembled connector versions
- In conformity with EN 81

Markings and quality marks:

Approval IMQ: EG610
Approval IMQ-UNI: in progress
Approval UL: E131787
Approval EAC: RU C-IT ДМ94.B.01024

Technical data

Housing

Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation ⧈
FR series one threaded conduit entry M20x1.5 (standard)
FX series two threaded conduit entries M20x1.5 (standard)
Protection degree: IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data

Ambient temperature:	from -25°C to +80°C
Version for operation in ambient temperature from -40°C to +80° C on request	
Max operating frequency:	3600 operations cycles1/hour
Mechanical endurance:	1 million operations cycles1
Assembling position:	any
Driving torque for installation:	see page 123

(1) One operation cycle means two movements, one to close and one to open contacts, as foreseen by EN 60947-5-1 standard.

Cross section of the conductors (flexible copper wire)

Contact blocks 5:	min.	1 x 0.5 mm²	(1 x AWG 20)
	max.	2 x 2.5 mm²	(2 x AWG 14)

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, EN 50047, IEC 60204-1, EN 60204-1, EN 1088, EN 81-20, EN 81-50, EN ISO 12100-1, EN ISO 12100-2, IEC 529, EN 60529, NFC 63-140, VDE 0660-200, VDE 0113.
Approvals:
UL 508

Electrical endurance

Type of load:	20 single tube neon lamp 36 W / 230 V (connected in parallel)
Frequency:	10 s ON / 10 s OFF
Max number of cycles:	100.000

In conformity with requirements requested by:
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and EMC Directive 2004/108/EC.

Electrical data

Thermal current (Ith):	10 A
Rated insulation voltage (Ui):	500 Vac 600 Vdc 400 Vac 500 Vdc for contacts block 11, 12
Rated impulse withstand voltage (U_{imp}):	6 kV
Conditional shot circuit current:	1000 A according to EN 60947-5-1
Protection against short circuits:	fuse 10 A 500 V type aM
Pollution degree:	3

Utilization categories

Alternate current: AC15 (50...60 Hz)

Ue (V)	250	400	500
Ie (A)	6	4	1

Direct current: DC13

Ue (V)	24	125	250
Ie (A)	6	1.1	0.4

Data type approved by IMQ, CCC and EZU

Rated insulation voltage (Ui): 500 Vac
400 Vac for contacts block 11, 12
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (Uimp): 6 kV
Protection degree: IP67
MV terminals (screw clamps)
Pollution degree 3
Utilization category: AC15
Operation voltage (Ue): 400 Vac (50 Hz)
Operation current (Ie): 3 A
Forms of the contact element: Zb, Y+Y, X+X

In conformity with standards: EN 60947-1, EN 60947-5-1, fundamental requirements of the Low Voltage Directive 2006/95/CE.

Please contact our technical service for the list of type approved products.

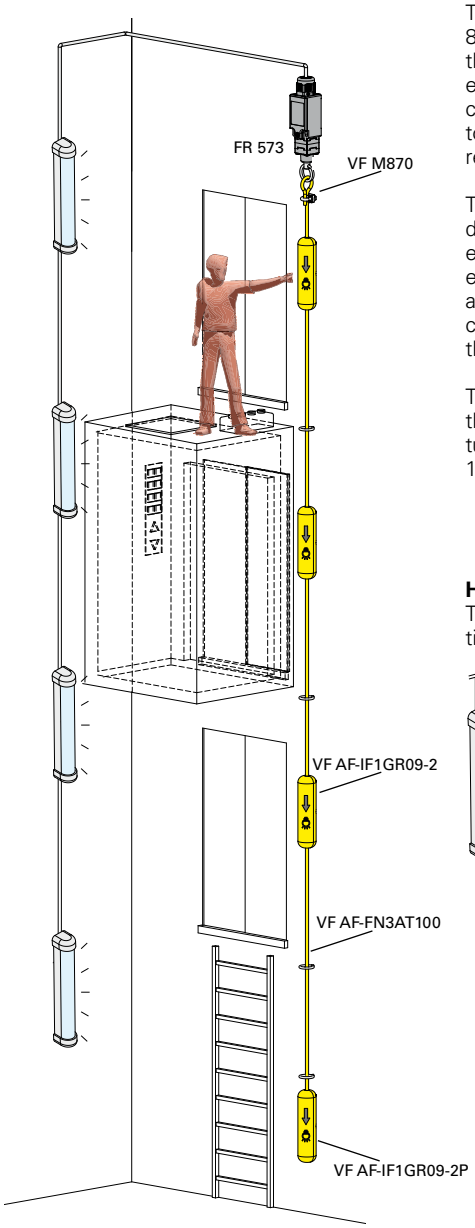
Data type approved by UL

Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7.1 lb in (0.8 Nm).

In conformity with standard: UL 508

Please contact our technical service for the list of approved products.

Introduction

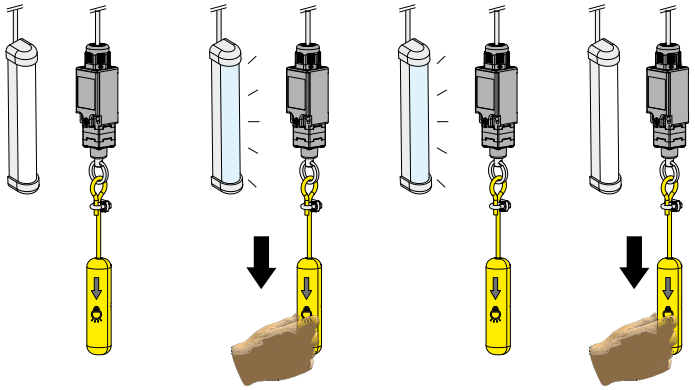


The FR 573 switch has been specifically studied to control the lift shaft lights. The norm EN 81 paragraphs 6.4.9, 13.6.3.2, 6.3.7 state the necessity to have a light switching point next to the working area access and in the machines room. To comply with this prescription usually at every floor there are installed lightning points which control a step relay with its considerable costs due to the number of the control points and their wiring. The switch FR 573 itself allows to control the shaft lights through its own wiring, without any need of different lightning points, relays or wiring.

The switch is fixed to the superior part of the lift shaft and it's connected to a rope which goes down in the shaft next to the cabin. The rope has to be guided through rings in order to avoid the excessive oscillation caused by the cabin windage. At regular intervals along the rope, usually at every floor, an indicator is fixed to make the rope and its function clearly visible. The last indicator at the end of the rope has a weight inside to keep the rope tight. This way the operator on the cabin roof or in any position along the shaft has the possibility to operate the switch by pulling the practical indicator or the rope itself.

The switch FR 573 has a stable position function, which means that the first operation closes the contacts; the following one opens them and so on. This way the switch can totally substitute also the step relay. The switch has been tested with twenty 36 W neon lamps exceeding 100.000 operations.

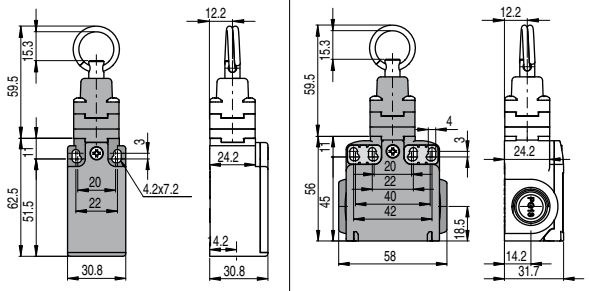
How it functions:
To switch the shaft light on it is sufficient to pull the rope; to switch it off just repeat the operation.



Dimensional drawings

Contacts type:

R = snap action



Contact blocks

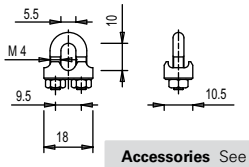
5	R	FR 573-M2 1NO+1NC	FX 573-M2 1NO+1NC
11	R	FR 1173-M2 2NC	FX 1173-M2 2NC
12	R	FR 1273-M2 2NO	FX 1273-M2 2NO
Max speed		0.5 m/s	0.5 m/s
Min. force		initial 20 N - final 40 N	initial 20 N - final 40 N

Accessories

Article	Description
VF AF-IF1GR09-2P	End clamp for rope fixing
VF AF-IF1GR09-2	Intermediate rope function indicators
	Rope function indicators.

Article	Description
VF AF-FN3AT100	100 m rope
	Yellow/transparent rope roll, Ø 3 mm, with a brass-plated steel core and a transparent PVC coating.

Article	Description
VF M870	Rope extremity clamp



Accessories See page 119

➔ 2D and 3D files available on **www.pizzato.com**

Main data

- Polymer housing, with one or two conduit entries
- Protection degree IP67
- M12 assembled connector versions
- Silver contacts gold plated versions

Markings and quality marks:

Approval IMQ: EG610
Approval IMQ-UNI: in progress
Approval UL: E131787
Approval CCC: 2007010305230013
Approval EZU: 1010151
Approval EAC: RU C-IT ДМ94.B.01024

Technical data

Housing

Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation ⧈

FR series one threaded conduit entry:	M20x1.5 (standard)
FX series two threaded conduit entries:	M20x1.5 (standard)
Protection degree:	IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data

Ambient temperature:	from -25°C to +80°C

Version for operation in ambient temperature from -40°C to +80° C on request

Max operating frequency:	3600 operations cycles[1]/hour
Mechanical endurance:	20 million operations cycles[1]
Assembling position:	any
Driving torque for installation:	see page 123

(1) One operation cycle means two movements, one to close and one to open contacts, as foreseen by EN 60947-5-1 standard.

Cross section of the conductors (flexible copper wire)

Contact blocks 5, 9:	min.	1 x 0.5 mm²	(1 x AWG 20)
	max.	2 x 2.5 mm²	(2 x AWG 14)

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, EN 50047, IEC 60204-1, EN 60204-1, EN 1088, EN 81-20, EN 81-50, EN ISO 12100-1, EN ISO 12100-2, EN 60529, EN 60529, NFC 63-140, VDE 0660-200, VDE 0113.
Approvals:
IEC 60947-5-1, UL 508, GB14048.5-2001

In conformity with requirements requested by:
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and EMC Directive 2004/108/EC.

Electrical data

Thermal current (Ith):	10 A
Rated insulation voltage (Ui):	500 Vac 600 Vdc
Rated impulse withstand voltage (U_{imp}):	6 kV
Conditional shot circuit current:	1000 A according to EN 60947-5-1
Protection against short circuits:	fuse 10 A 500 V type aM
Pollution degree:	3

Utilization categories

Alternate current: AC15 (50...60 Hz)

Ue (V)	250	400	500
Ie (A)	6	4	1

Direct current: DC13

Ue (V)	24	125	250
Ie (A)	6	1.1	0.4

Data type approved by IMQ, CCC and EZU

Rated insulation voltage (Ui): 500 Vac
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (Uimp): 6 kV
Protection degree: IP67
MV terminals (screw clamps)
Pollution degree 3
Utilization category: AC15
Operation voltage (Ue): 400 Vac (50 Hz)
Operation current (Ie): 3 A
Forms of the contact element: Zb, Y+Y

In conformity with standards: EN 60947-1, EN 60947-5-1, fundamental requirements of the Low Voltage Directive 2006/95/CE.

Please contact our technical service for the list of type approved products.

Data type approved by UL

Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7.1 lb in (0.8 Nm).

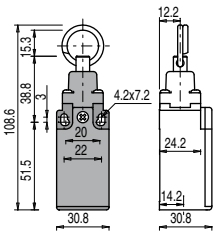
In conformity with standard: UL 508

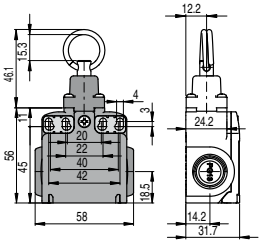
Please contact our technical service for the list of approved products.

Dimensional drawings

Contacts type:

R = snap action
L = slow action





Contact blocks			
5 R	FR 576-M2 1NO+1NC	FX 576-M2 1NO+1NC
		
9 L	FR 976-M2 2NO	FX 976-M2 2NO
		
Max speed	0.5 m/s	0.5 m/s
Min. force	initial 20 N - final 40 N	initial 20 N - final 40 N

Accessories

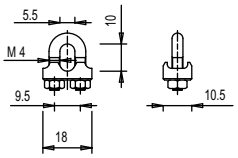
Article	Description
VF AF-IF1GR09-2P	End clamp for rope fixing
VF AF-IF1GR09-2	Intermediate rope function indicators

Rope function indicators.

Article	Description
VF AF-FN3AT100	100 m rope

Yellow/transparent rope roll, Ø 3 mm, with a brass-plated steel core and a transparent PVC coating.

Article	Description
VF M870	Rope extremity clamp



Accessories See page 119

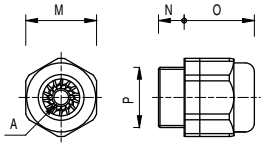
Wiretrap cable glands

10 pcs packs

The design of this cable gland improves the retention forces of the wires. Each type of cable gland accepts a wider range of cable diameters. Only fit for circular cables.

Technical data:

Body and nut material:	halogen free polymer
Protection degree:	IP67
Driving torque:	from 3 ... 4 Nm (PG 13.5/M20) from 2 ... 2.5 Nm (PG 11/M16)



	Article	Description	A	⬡M	N	O	P
Metric threading	VF PAM25C7N	Cable glands M25x1.5 for 1 Ø 10 to Ø 17 mm cable	○	30	10	28	M25x1.5
	VF PAM20C6N	Cable glands M20x1.5 for 1 Ø 6 to Ø 12 mm cable	○	24	9	24	M20x1.5
	VF PAM20C5N	Cable glands M20x1.5 for 1 Ø 5 to Ø 10 mm cable	◎	24	9	24	M20x1.5
	VF PAM20C3N	Cable glands M20x1.5 for 1 Ø 3 to Ø 7 mm cable	●	24	9	24	M20x1.5
	VF PAM16C5N	Cable glands M16x1.5 for 1 Ø 5 to Ø 10 mm cable	○	22	7.5	23	M16x1.5
	VF PAM16C4N	Cable glands M16x1.5 for 1 Ø 4 to Ø 8 mm cable	◎	22	7.5	23	M16x1.5
	VF PAM16C3N	Cable glands M16x1.5 for 1 Ø 3 to Ø 7 mm cable	●	22	7.5	23	M16x1.5
	VF PAM20CBN	Multi-hole cable gland M20x1.5 for 2 cables, Ø 3 to Ø 5 mm	◉	24	9	23	M20x1.5
	VF PAM20CDN	Multi-hole cable gland M20x1.5 for 3 cables, Ø 1 to Ø 4 mm	◉	24	9	23	M20x1.5
	VF PAM20CEN	Multi-hole cable gland M20x1.5 for 3 cables, Ø 3 to Ø 5 mm	◉	24	9	23	M20x1.5
	VF PAM20CFN	Multi-hole cable gland M20x1.5 for 4 cables, Ø 1 to Ø 4 mm	◉	24	9	23	M20x1.5
PG threading	VF PAP13C6N	Cable glands PG 13.5 for 1 Ø 6 to Ø 12 mm cable	○	24	9	24	PG 13.5
	VF PAP13C5N	Cable glands PG 13.5 for 1 Ø 5 to Ø 10 mm cable	◎	24	9	24	PG 13.5
	VF PAP13C3N	Cable glands PG 13.5 for 1 Ø 3 to Ø 7 mm cable	●	24	9	24	PG 13.5
	VF PAP11C5N	Cable glands PG 11 for 1 Ø 5 to Ø 10 mm cable	○	22	7.5	23	PG 11
	VF PAP11C4N	Cable glands PG 11 for 1 Ø 4 to Ø 8 mm cable	◎	22	7.5	23	PG 11
	VF PAP11C3N	Cable glands PG 11 for 1 Ø 3 to Ø 7 mm cable	●	22	7.5	23	PG 11

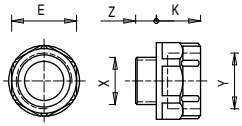
Thread adapters

100 pcs packs

With these adapters it is possible to offer to the customers the same product with different threaded cable entries, while only having to stock a single product and many kinds of adapters.

Technical data:

Body material:	glass-reinforced polymer resin
Driving torque:	from 3 ... 4 Nm



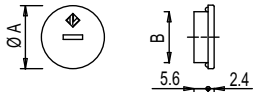
Article	Description	X	Y	Z	K	⬡E
VF ADPG13-PG11	Adapter from PG 13.5 to PG 11	PG 13.5	PG 11	9	12	22
VF ADPG13-M20	Adapter from PG 13.5 to M20x1.5	PG 13.5	M20x1.5	9	14	24
VF ADPG13-1/2NPT	Adapter from PG 13.5 to 1/2 NPT	PG 13.5	1/2 NPT	9	14	24
VF ADPG11-1/2NPT	Adapter from PG 11 to 1/2 NPT	PG 11	1/2 NPT	7	14	24
VF ADPG11-PG13	Adapter from PG 11 to PG 13.5	PG 11	PG 13.5	7	14	24
VF ADM20-1/2NPT	Adapter from M20 x 1.5 to 1/2 NPT	M20 x 1.5	1/2 NPT	9	14	24

Protection plugs

100 pcs packs

Technical data:

Body material:	halogen free polymer
Protection degree:	IP67
Driving torque:	from 1.2 ... 1.6 Nm (PG13.5 / M20) from 1 ... 1.4 Nm (PG11 / M16)



Article	Description	A	B
VF PTM20	Protection plug M20x1.5	25	M20x1.5
VF PTM16	Protection plug M16x1.5	23	M16x1.5
VF PTG13.5	Protection plug PG13.5	25	PG 13.5
VF PTG11	Protection plug PG11	23	PG 11

Items with code on the **green** background are available in stock

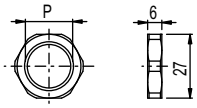
All measures in the drawings are in mm

Plastic threaded nuts

100 pcs packs

Technical data:

Body material:	glass-reinforced polymer resin
Driving torque:	from 1.2 ... 2 Nm



Article	Description	S	CH	P
VF DFPM25	Plastic threaded nut M25x1.5	6	32	M25x1.5
VF DFPM20	Plastic threaded nut M20x1.5	6	27	M20x1.5
VF DFPM16	Plastic threaded nut M16x1.5	5	22	M16x1.5
VF DFPP13	Plastic threaded nut PG13.5	6	27	PG 13.5

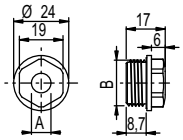
Chock plugs

100 pcs packs

Technical data:

Body material:	halogen free polymer
Protection degree:	IP54
Driving torque:	from 0.8 ... 1 Nm

Note: use a socket wrench for tightening.



Article	Description	A	B
VF PFM20C8N	Chock plug for cable from Ø 8 to Ø 12 mm, threaded M20	7.5	M20x1.5
VF PFM20C4N	Chock plug for cable from Ø 4 to Ø 8 mm, threaded M20	3.5	M20x1.5

Metal fixing plates

Metal fixing plate, designed to fix rope switches on ceiling. The plate is provided with many fixing holes suitable for all switches series. It is supplied without screws.

Article	Description
VF SFP2	Fixing plates for ceiling installations

Plastic fixing plates

Fixing plate (complete with fastening screws) provided with long slots for the adjustment of the actuating point.
Every plate has a double couple of fixing holes, one for standard switches and the other one for switches with reset device. In this way the actuator will always have the same actuating point.

Article	Description
VF SFP1	Fixing plate (FR series)
VF SFP3	Fixing plate (FX-FT series)

Items with code on the **green** background are available in stock

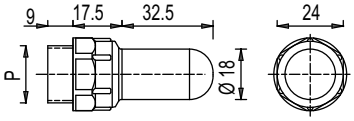
Light indicators

5 pcs packs

These light indicators are used for visualizing a change of the state of an electric contact inside the switch. They can be installed only on series FL, FX, FZ, FW, FG or FS by screwing them on one of the conduit entries not used for electric cables, and they can have many different functions: for example, combined with a rope switch (e.g. FL 1878) they can indicate (also in the distance) if the switch has been actuated. Otherwise, combined with safety switches with separate actuator (e.g. FL 693), they can indicate if the protection is closed correctly or not.
Combined with a safety switch with solenoid (FS or FG series), they can indicate if the protection is locked or unlocked. Combined with any switch of FL, FX, or FZ series they can be used to calibrate the actuator.
The light indicators are decomposable in two parts for bulb replacement without removing the lamp holder from the switch, and their inner part can rotate in such a way that it can be wired and screwed on the switch without any risk of kinking the wires.

Technical data:

Max operating voltage Ui:	250 Vac/dc
Rated impulse withstand voltage (U_{imp}):	4 kV
Max lamp power:	3 W
Protection degree:	IP67
Lamp coupling:	BA9
Cable cross section:	min. 0.5 mm²
	max 1.5 mm²
Ambient temperature:	from -25°C to +40°C
Driving torque:	from 3 ... 4 Nm



Items available in stock

VF ILI024GP
VF ILI024RP
VF ILI024VP
VF ILX000GP
VF ILX000RP
VF ILX000VP

How to order

VF ILI024GP

Kind of lamp	
I	incandescence
X	without lamp

Threaded coupling (P)	
P	PG 13.5
M	M20 x 1.5

Supply voltage	
024	24 Vac/dc ±10%
110	110 Vac/dc ±10%
220	220 Vac/dc ±10%
000	without lamp

Lamp cover colour	
G	Yellow
R	Red
V	Green
W	White

Items with code on the **green** background are available in stock

All measures in the drawings are in mm