Соединительный шлюз P-Connect для устройств безопасности

Технические характеристики

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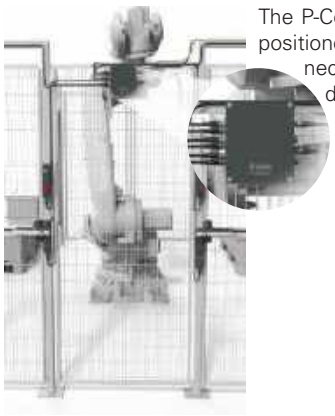
P-Connect connection gateway for safety devices

Description

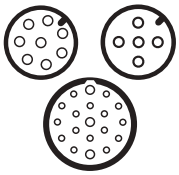
The P-Connect connection gateway is a system that allows up to six (6) devices to be connected to a data network. Safety information is exchanged via PROFIsafe extensions. Depending on its configurations, the gateway can transmit signals from two NG or NS series RFID safety switches with lock. The connection is performed safely using PROFIsafe standards. Furthermore, the P-Connect gateway can be connected to a number of devices available in the Pizzato Elettrica catalogue. These include the BN series modular control device units, and AN series handles with integrated signalling LED.

Positioning in safe areas



The P-Connect connection gateway can be positioned in safe areas, away from the connected devices, to limit the risk of accidental damage or tampering.

Various configurations available



The P-Connect connection gateway is available in various configurations for every kind of application. Depending on the configuration in fact it comes with various types of connectors to connect the devices to be monitored.

Field diagnostics

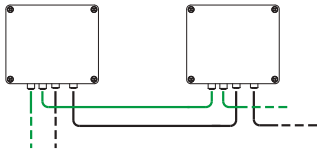
The P-Connect connection gateway has 3 integrated signalling LEDs to give the user a quick diagnostic overview:

- "System status" LED: multicolour signalling LED, which by lighting, flashing and using different colours, indicates the various device operating states, as well as any warnings or errors affecting internal electronic components;
- "Network status" LED: state monitoring of the connected Ethernet network;
- "Module status" LED: diagnostic events' signalling LED.

Connection to the PROFINET/PROFIsafe network

The P-Connect connection gateway is designed to connect safety devices to PROFINET and PROFIsafe networks.
It can in fact convert the communication protocols used by the safety devices into PROFINET compatible protocols, so the devices can be integrated in the industrial network. Furthermore, the PROFIsafe function guarantees a high gateway safety level when transmitting safety data between the devices and the control system.

Series connection



P-Connect connection gateways have two connectors. One supplies electrical power to the device and the other is used for the connection to the fieldbus network. This means several P-Connect gateways can be connected in series by simply connecting together the input and output connectors. This notably reduces the time required for installing, uninstalling and replacing components during maintenance.

Plug&Play device

With connectors on both the power side and the device side, the P-Connect connection gateway is a Plug&Play solution that saves installation time compared to traditional solutions that must be wired into a cabinet. What's more, it can quickly be replaced if there's a malfunction or if it gets damaged.

Diagnostic data

The P-Connect connection gateway allows quick access to diagnostic data such as internal temperature, gateway supply voltage, or current consumption of the connected devices. This makes it easy to monitor the gateway and the connected devices, quickly detecting any malfunctions.

Selection diagram

DEVICE CONFIGURATIONS

BP A1PL2001

BP A1PL2002

BP A1PL2003

Code structure

BP A1PL2001

Communication protocol	
P	PROFINET / PROFIsafe

Power supply connector	
2	1 x M12 5-pole male connector + 1 x M12 5-pole female connector

Input configuration	
001	Configuration 001
002	Configuration 002
003	Configuration 003
...	Other configurations on request

P-Connect connection gateway for safety devices

Main features

- Aluminium housing
- Protection degree IP65
- Operating temperature -15 °C … +50 °C
- 3 LEDs integrated in the device for status indication
- Devices can be connected in series

Quality marks:

EC-type examination certificate: M6A 075157 0034
TÜV SÜD approval: Z10 075157 0033
UL approval: E530502
PROFINET approval: Z13641
PROFIsafe approval: Z20348

Technical data

Aluminium housing, baked powder coating.

Protection degree:	IP65 acc. to EN 60529 with connectors of equal or higher protection degree

General data

Operating temperature:	-15°C … +50°C
Storage temperature:	-30°C … +70°C
Pollution degree:	2
Overvoltage category:	III

Power supply electrical data

Rated voltage (U_e):	24 Vdc SELV/PELV
Supply voltage tolerance:	±15%
Operating current at U_e voltage	
- no devices connected:	0.1 A
- maximum current supported:	3.1 A
Insulation voltage U_i:	32 V
Shock and vibration resistance:	acc. to EN 60947-1
EMC protection:	acc. to EN 61000-4 e EN 61326-3-1

Input and output circuits

Number of safety inputs:	3 dual-channel
Number of safety outputs:	1 dual channel (or 2 single channel)
Number of unsafe inputs:	14
Number of unsafe outputs:	24
Number of test outputs:	2
Maximum voltage at unsafe inputs:	24 Vdc
Voltage at unsafe outputs:	24 Vdc
Maximum control current at unsafe outputs:	50 mA
Maximum current at test outputs:	100 mA
Maximum current at unsafe outputs:	250 mA

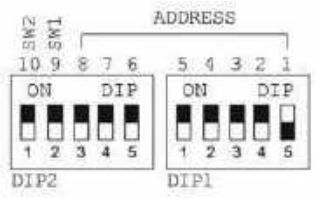
In compliance with standards:

EN 60947-1, EN 61326-1, EN 61326-3-1, UL 508, CSA C22.2 No. 14, EN IEC 63000, EN 60529, IEC 61784-3-3, EN 61508, EN 62061, EN ISO 13849-1, EN 61131-2.

Compliance with the requirements of:

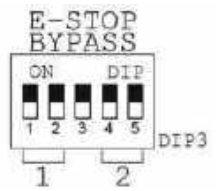
Machinery Directive 2006/42/EC, EMC Directive 2014/30/EU, RoHS Directive 2011/65/EU.

F - Address



The PROFIsafe F - Address identifies the device on the PROFIsafe network with an unique ID, protecting standard address mechanisms such as IP addresses. The safety address (F - Address) must be set using two "ADDRESS" DIP switches located under the cover of the P-Connect gateway. This value can be set from 1 to 255 and must be unique for every device connected to the network. Restart the device after setting the F - Address.

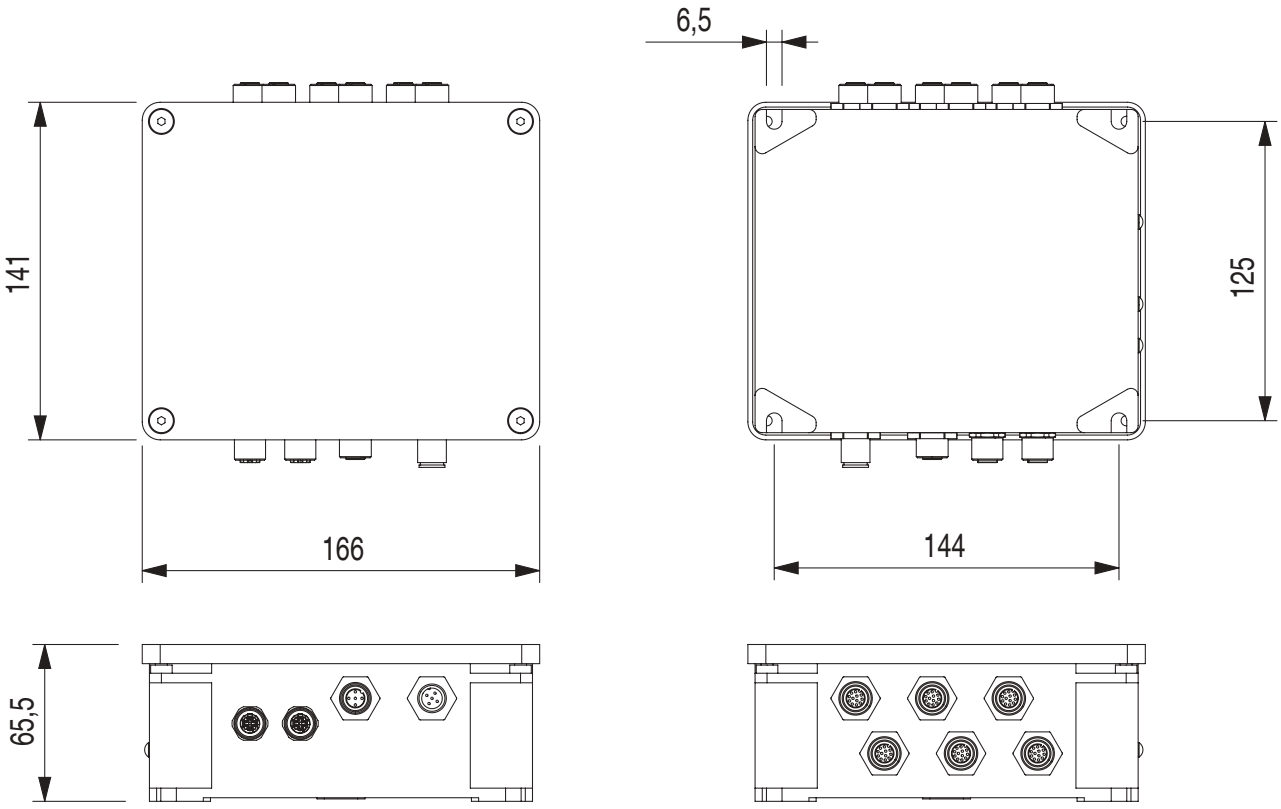
Emergency stop buttons



Some of the P-Connect gateway configurations can be used to manage up to two emergency stop buttons connected internally in series to the gateway. If you are not going to use both emergency stop buttons, bypass one of them using the "DIP3" switch (called "E-STOP BYPASS") located under the cover of the P-Connect gateway.

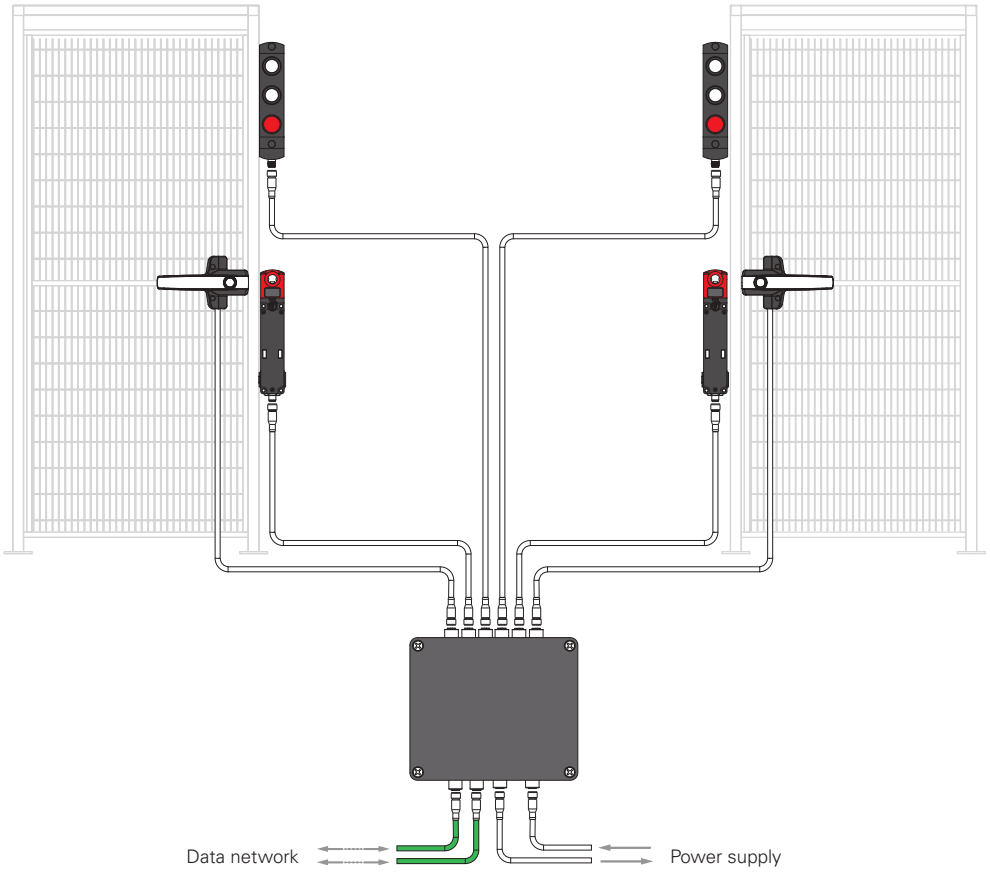
If switches "1" and "2" are switched "ON" this bypasses the first emergency stop button connected. Switches "4" and "5" bypass the second emergency stop button connected. The switches must only be switched when the P-Connect gateway is OFF, to prevent incoherent input test signal readings.

Dimensional drawings

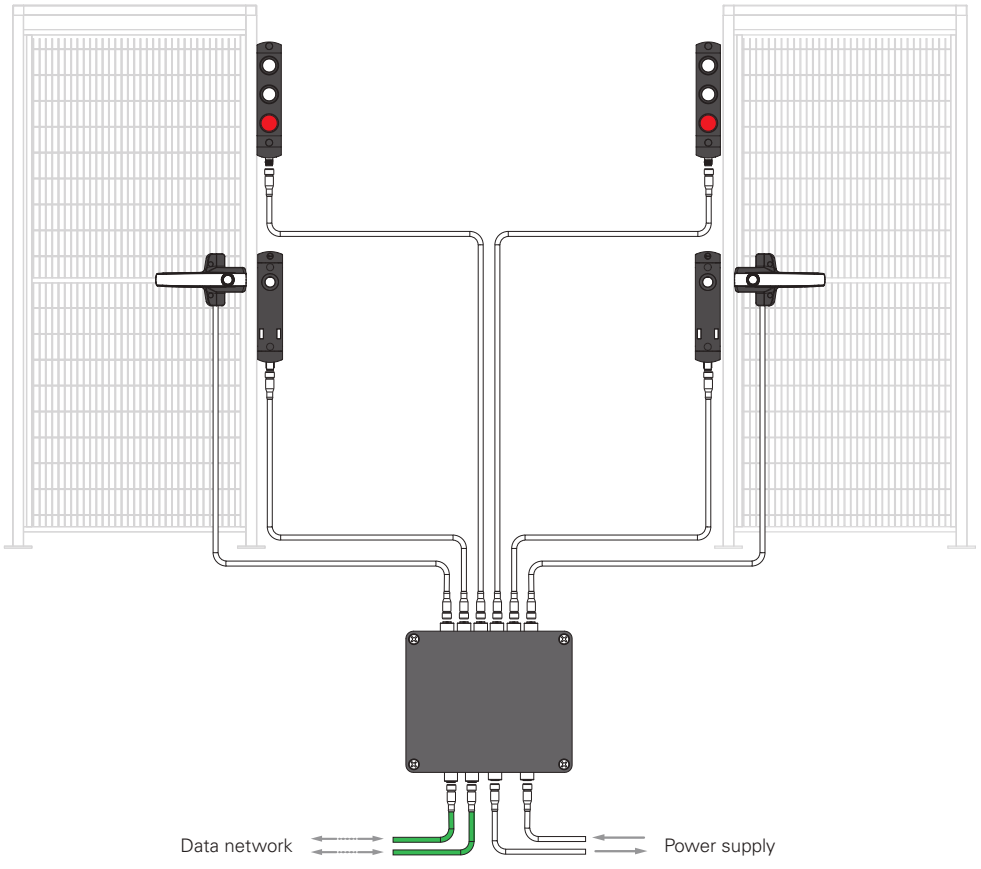


BP A1PL2001

Solution with NG series switches, P-KUBE Krome safety handle and BN series control device units



Solution with NS series switches, P-KUBE Krome safety handle and BN series control device units

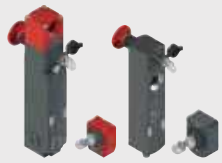
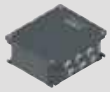


Note: the position of the connectors in the diagram is for illustrative purposes only.

Functional safety

Safety parameters	SIL	PL	Cat.
Monitoring function for the safety outputs	3	e	4
Locking function of the single channel actuator	1	c	1

Selection table for BP A1PL2001 devices

	Description	Quantity	Article number	
	RFID safety switch with lock, with separate actuator, NG/NS series	2	NG ••••311A-F3•K958 (1) NG ••••321A-F3•K958 (1) NG ••••411A-F3•K958 (1) NG ••••421A-F3•K958 (1) NS •3••••P•-F4• (1)	NG ••••311B-F3•K958 (1) NG ••••321B-F3•K958 (1) NG ••••411B-F3•K958 (1) NG ••••421B-F3•K958 (1) NS •4••••P•-F4• (1)
	P-Connect connection box	1	BP A1PL2001	BP A1PL2001
	P-KUBE Krome safety handle with illuminated white grip with control device	2	AN G1B00••-PM• (1) (2)	AN S1B00••-PM• (1) (2)
	Signalling device chosen by installer, to be used as an alternative to the P-KUBE Krome safety handle (for example: indicator light tower)	1	Check that the electrical connections of the chosen device are compatible with the diagrams shown in the paragraph "Pin assignments of usable devices"	
	BN series control device unit with 3 control devices	2	BN AC3Z••• (1) (3)	BN AC3Z••• (1) (3)

Notes:
(1) For the configurations, refer to pages 169 and 229, or contact technical assistance.
(2) Only configurations with M12 8-pole connector.
(3) Only configurations with two non-illuminated devices with 1NO or 1NC, an emergency stop button 2NC, with M12 8-pole connector.

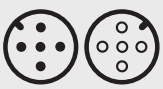
⚠ **Attention:** The articles listed above correspond to the maximum configuration that can be realised with the P-Connect connection gateway. Solutions with fewer devices can be implemented. If devices with emergency stop buttons are removed, the internal dip switches must be set accordingly to correctly configure the internal electronics of the connection system.

Cables with compatible connectors

Article	Description
VF CA5•••M	M12 female connectors with cable, 5-pole
VF CA5•••M-MD	M12 extension cables, 5-pole
VF CA8•••M-MD	M12 extension cables, 8-pole

Note: For the article codes of available cables with connectors refer to the chapter "Accessories".

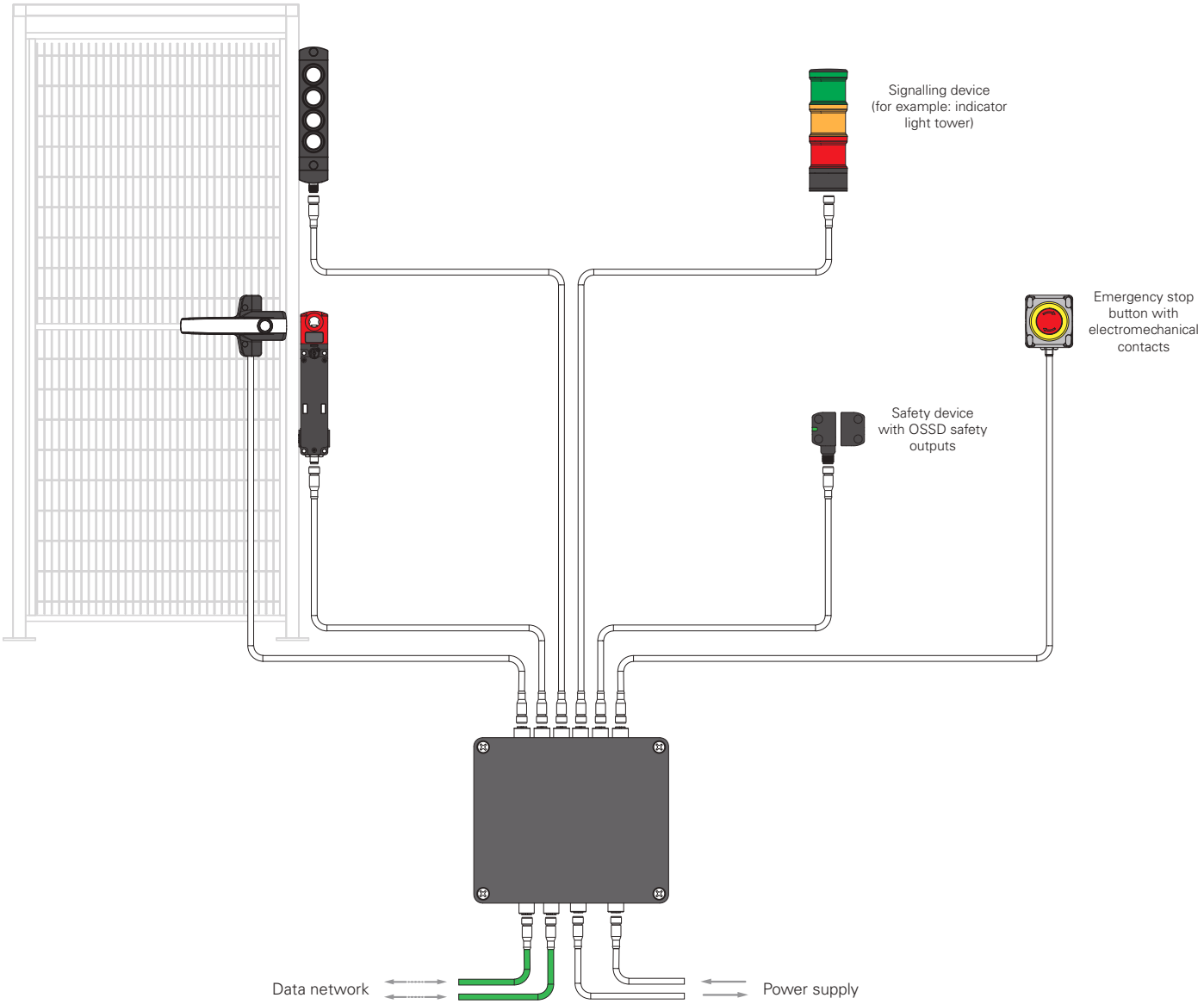
Connections

Article	Power supply ports	Network ports	Device inputs					
			1	2	3	4	5	6
BP A1PL2001	 1 x M12, 5-pole, male 1 x M12, 5-pole, female	 2 x M12, 4-pole, female, D-coded	 M12, 8-pole, female	 M12, 8-pole, female	 M12, 8-pole, female	 M12, 8-pole, female	 M12, 8-pole, female	 M12, 8-pole, female

Note: For the internal connections of usable devices, refer to pages 299-301.

BP A1PL2002

Solutions with NG/NS series switch, P-KUBE Krome safety handle, BN series control device unit, signalling device, safety device with OSSD safety outputs and control device unit including emergency stop

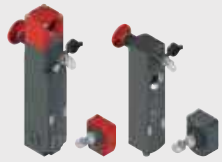
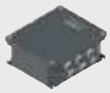


Note: the position of the connectors in the diagram is for illustrative purposes only.

Functional safety

Safety parameters	SIL	PL	Cat.
Monitoring function for the safety outputs	3	e	4
Locking function of the dual channel actuator	3	e	4

Selection table for BP A1PL2002 devices

	Description	Quantity	Article number	
	RFID safety switch with lock, with separate actuator, NG/NS series	1	NG ••••311A-F3•K958 (1) NG ••••321A-F3•K958 (1) NG ••••411A-F3•K958 (1) NG ••••421A-F3•K958 (1) NS •3••••P•-F4• (1)	NG ••••311B-F3•K958 (1) NG ••••321B-F3•K958 (1) NG ••••411B-F3•K958 (1) NG ••••421B-F3•K958 (1) NS •4••••P•-F4• (1)
	Safety device with OSSD safety outputs, at the user's discretion	1	Check that the electrical connections of the chosen device are compatible with the diagrams shown in the paragraph "Pin assignments of usable devices"	
	P-Connect connection box	1	BP A1PL2002	
	BN series control device unit with 4 control devices	1	BN AC4Z••• (1) (2)	
	Signalling device chosen by the user (for example: indicator light tower)	1	Check that the electrical connections of the chosen device are compatible with the diagrams shown in the paragraph "Pin assignments of usable devices"	
	P-KUBE Krome safety handle with illuminated white grip with control device	1	AN G1B00••-PM• (1) (3) AN S1B00••-PM• (1) (3)	
	Control device unit including emergency stop and luminous disc for signalling	1	ES AC31••• (1) (3)	

Notes:
(1) For the configurations, refer to pages 229 and 275, or contact technical assistance.
(2) Only configurations with four buttons 1NO + LED, M12 12-pole connector.
(3) Only configurations with M12 8-pole connector.

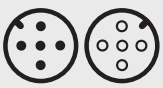
⚠ **Attention:** The articles listed above correspond to the maximum configuration that can be realised with the P-Connect connection gateway. Solutions with fewer devices can be implemented. If devices with emergency stop buttons are removed, the internal dip switches must be set accordingly to correctly configure the internal electronics of the connection system.

Cables with compatible connectors

Article	Description
VF CF••••M	M12 male connectors with cable, 5-pole
VF CA5•••M	M12 female connectors with cable, 5-pole
VF CA5•••M-MD	M12 extension cable, 5-pole
VF CA8•••M-MD	M12 extension cable, 8-pole
VF CA12•••M-MD	M12 extension cable, 12-pole

Note: For the article codes of available cables with connectors refer to the chapter "Accessories".

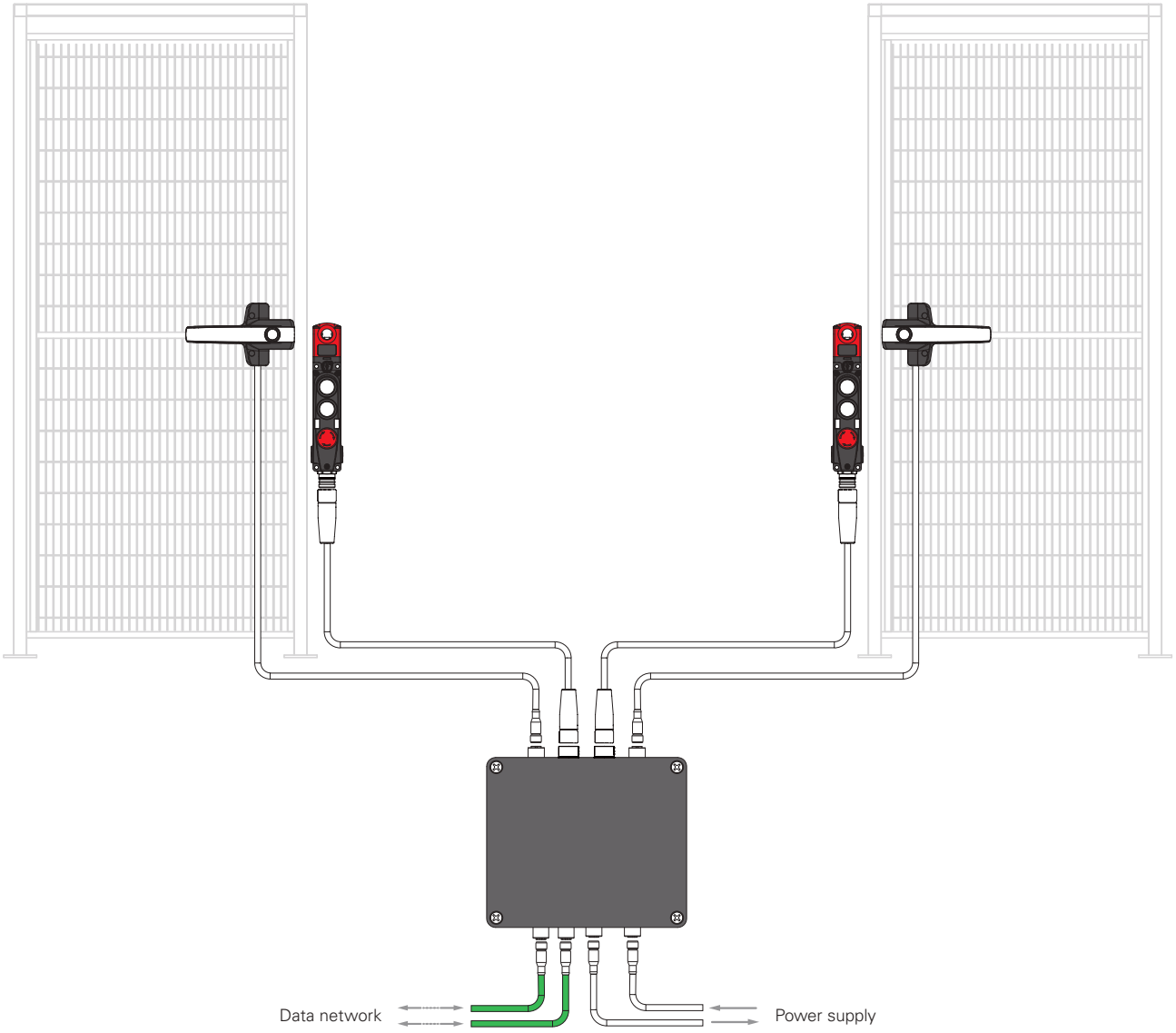
Connections

Article	Power supply ports	Network ports	Device inputs					
			1	2	3	4	5	6
BP A1PL2002	 1 x M12, 5-pole, male 1 x M12, 5-pole, female	 2 x M12, 4-pole, female, D-coded	 M12, 8-pole, female	 M12, 5-pole, female	 M12, 12-pole, female	 M12, 8-pole, female	 M12, 8-pole, female	 M12, 8-pole, female

Note: For the internal connections of usable devices, refer to pages 299-301.

BP A1PL2003

Solution with NG/NS series switches and P-KUBE Krome safety handles

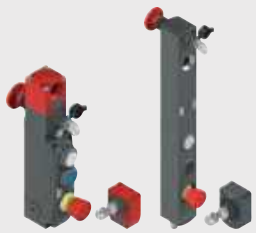
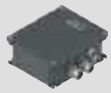


Note: the position of the connectors in the diagram is for illustrative purposes only.

Functional safety

Safety parameters	SIL	PL	Cat.
Monitoring function for the safety outputs	3	e	4
Locking function of the single channel actuator	1	c	1

Selection table for BP A1PL2003 devices

	Description	Quantity	Article number	
	RFID safety switch with lock, with integrated control devices, with separate actuator, NG/NS series	2	NG ••••311C-F3•K60• (1) NG ••••321C-F3•K60• (1) NG ••••411C-F3•K60• (1) NG ••••421C-F3•K60• (1) NG ••••311D-F3•K60• (1) NG ••••321D-F3•K60• (1) NG ••••411D-F3•K60• (1) NG ••••421D-F3•K60• (1) NS •3•••STK-F4•N••• (1)	NG ••••312V-F3•K60• (1) NG ••••322V-F3•K60• (1) NG ••••412V-F3•K60• (1) NG ••••422V-F3•K60• (1) NG ••••315R-F3•K60• (1) NG ••••325R-F3•K60• (1) NG ••••415R-F3•K60• (1) NG ••••425R-F3•K60• (1) NS •4•••STK-F4•N••• (1)
	P-Connect connection box	1	BP A1PL2003	
	P-KUBE Krome safety handle with illuminated white grip with control device	2	AN G1B00••-PM• (1) (2) AN S1B00••-PM• (1) (2)	

Notes:
(1) only codes with with 19-pole M23 connector. For the configurations, refer to pages 169 and 229, or contact technical assistance.
(2) Only configurations with M12 8-pole connector.

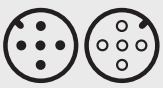
⚠ **Attention:** The articles listed above correspond to the maximum configuration that can be realised with the P-Connect connection gateway. Solutions with fewer devices can be implemented. If devices with emergency stop buttons are removed, the internal dip switches must be set accordingly to correctly configure the internal electronics of the connection system.

Cables with compatible connectors

Article	Description
VF CA5•••M	M12 female connectors with cable, 5-pole
VF CA5•••M-MD	M12 extension cable, 5-pole
VF CA8•••M-MD	M12 extension cable, 8-pole
VF CA19•••S-SD	M23 extension cable, 19-pole

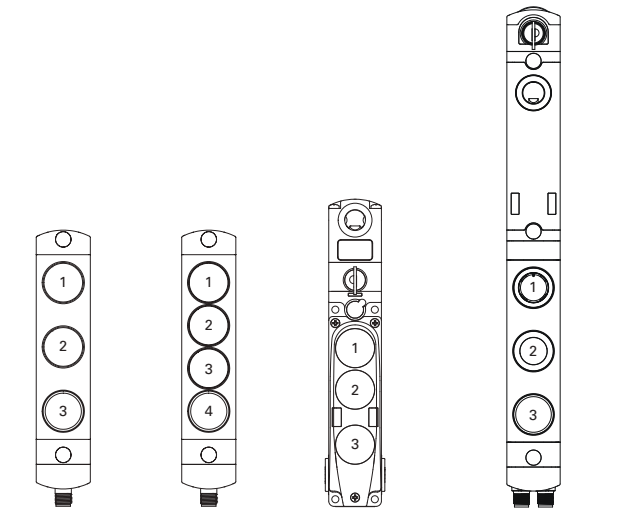
Note: For the article codes of available cables with connectors refer to the chapter "Accessories".

Connections

Article	Power supply ports	Network ports	Device inputs			
			1	2	3	4
BP A1PL2003	 1 x M12, 5-pole, male 1 x M12, 5-pole, female	 2 x M12, 4-pole, female, D-coded	 M23, 19-pole, female	 M23, 19-pole, female	 M12, 8-pole, female	 M12, 8-pole, female

Note: For the internal connections of usable devices, refer to pages 299-301.

Numbering of control devices



BN AC3•••• BN AC4•••• NG •••••••• NS ••••••••-N•••

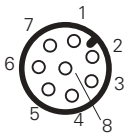
Legend:
A1 = Supply input +24 Vdc
A2 = Supply input 0 V
IE1, IE2 = Solenoid activation inputs
O3 = Signalling output, actuator inserted
O4 = Signalling output, actuator inserted and locked
ISx = Safety inputs
OSx = Safety outputs
I3 = Actuator programming input/reset
I5 = EDM input (cannot be used on BP series)

I = Device input
O = Device output

Pin assignments of usable devices

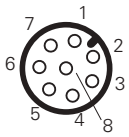
BP A1PL2001

Connectors no. 1 & 2:
NG - NS series safety switches



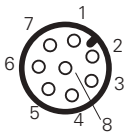
Pin	Type	P-Connect side	NG - NS side
1	O	+24 Vdc power supply	A1
2	I	Actuator enabled signal input	O3
3	O	0 Vdc power supply	A2
4	I	Safety input IS1/IS3	OS1
5	O	Solenoid activation command OS1	IE2
6	O	Actuator programming / reset	I3
7	I	Safety input IS2/IS4	OS2
8	O	Solenoid activation command OS2	IE1

Connectors no. 3 & 4:
BN AC3•••• series control device units



Pin	Type	P-Connect side	BN side
1	O	+24 Vdc power supply	Power supply +24 V
2	I	Button 1 contact non-safety input	Button 1 contact
3	-	Disconnected	Disconnected
4	I	Button 2 contact non-safety input	Button 2 contact
5	O	Test output TO1	Emergency stop button test input
6	I	Safety input for emergency stop button NC contact	Emergency stop button NC safety contact
7	O	Test output TO2	Emergency stop button test input
8	I	Safety input for emergency stop button NC contact	Emergency stop button NC safety contact

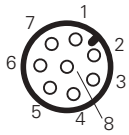
Connectors no. 5 & 6:
AN series safety handles



Pin	Type	P-Connect side	AN side
1	I	0 Vdc power supply	Power supply 0 V
2	O	+24 Vdc power supply	Power supply +24 V
3	O	Control output LED 1	Control input green LED (G)
4	O	Control output LED 4	Button LED control input
5	O	+24 V output for button contact	Button NO voltage-free contact input
6	I	Input for button contact	Button NO voltage-free contact output
7	O	Control output LED 2	Control input blue LED (B)
8	O	Control output LED 3	Control input red LED (R)

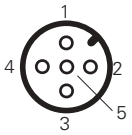
BP A1PL2002

Connector no. 1:
NG - NS series safety switches



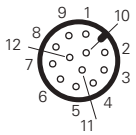
Pin	Type	P-Connect side	NG - NS side
1	O	+24 Vdc power supply	A1
2	I	Actuator enabled signal input	O3
3	O	0 Vdc power supply	A2
4	I	Safety input IS1	OS1
5	O	Solenoid activation command OS1	IE2
6	O	Actuator programming / reset	I3
7	I	Safety input IS2	OS2
8	O	Solenoid activation command OS2	IE1

Connector no. 2:
ST series safety sensors



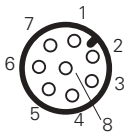
Pin	Type	P-Connect side	ST side
1	O	+24 Vdc power supply	A1
2	I	Safety input IS3	OS1
3	O	0 Vdc power supply	A2
4	I	Safety input IS4	OS2
5	I	Signalling input	O3

Connector no. 3:
BN AC4•••• series control device units



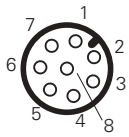
Pin	Type	P-Connect side	BN side
1	O	+24 Vdc power supply	+24 Vdc power supply
2	O	Position 1 LED control output	Position 1 LED control input
3	I	0 Vdc power supply	0 Vdc power supply
4	I	Input for button contact 1	Button 1 contact
5	I	Input for button contact 2	Button 2 contact
6	O	Position 2 LED control output	Position 2 LED control input
7	I	Input for button contact 3	Button 3 contact
8	O	Position 3 LED control output	Position 3 LED control input
9	I	Input for button contact 4	Button 4 contact
10	-	Disconnected	Disconnected
11	-	Disconnected	Disconnected
12	O	Position 4 LED control output	Position 4 LED control input

Connector no. 4:
Control unit with emergency stop and luminous disc



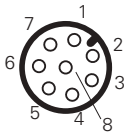
Pin	Type	P-Connect side	Control unit side
1	-	Disconnected	Disconnected
2	O	Control output luminous disc +24 Vdc	Control input luminous disc +24 V
3	O	Luminous disc power supply 0 Vdc	Power supply 0 V
4	-	Disconnected	Disconnected
5	O	Test output TO1	Emergency stop button test input
6	I	Safety input for emergency stop button NC contact	Emergency stop button NC safety contact
7	O	Test output TO2	Emergency stop button test input
8	I	Safety input for emergency stop button NC contact	Emergency stop button NC safety contact

Connector no. 5:
AN series safety handles



Pin	Type	P-Connect side	AN side
1	I	0 Vdc power supply	Power supply 0 V
2	O	+24 Vdc power supply	Power supply +24 V
3	O	Control output LED 1	Control input green LED (G)
4	O	Control output LED 4	Button LED control input
5	O	+24 V output for button contact	Button NO voltage-free contact input
6	I	Input for button contact	Button NO voltage-free contact output
7	O	Control output LED 2	Control input blue LED (B)
8	O	Control output LED 3	Control input red LED (R)

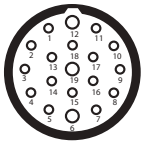
Connector no. 6:
Indicator light tower (reference wiring diagram)



Pin	Type	P-Connect side	Indicator light tower side
1	I	0 Vdc power supply	Power supply 0 V
2	O	+24 Vdc power supply	Power supply +24 V
3	O	Control output LED 1	Control input LED 1
4	O	Control output LED 4	Control input LED 4
5	O	Buzzer control output	Buzzer control input
6	I	Signalling input	Signalling output
7	O	Control output LED 2	Control input LED 2
8	O	Control output LED 3	Control input LED 3

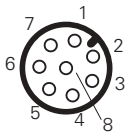
BP A1PL2003

Connectors no. 1 & 2:
NG - NS series safety switches



Pin	Type	P-Connect side	NG - NS side
1	O	Single-channel solenoid activation output	I4
2	O	Short circuit +24 VDC	IS1
3	O	Short circuit +24 VDC	IS2
4	I	Safety input IS1/IS3	OS1
5	I	Safety input IS2/IS4	OS2
6	O	+24 Vdc power supply	A1
7	O	Actuator programming / reset	I3
8	I	Actuator enabled signal input	O3
9	I	Locked guard signal input	O4
10	O	Test output TO1	Emergency stop button test input
11	I	Safety input for emergency stop button NC contact	Emergency stop button NC safety contact
12	-	Not connected	I5
13	O	Test output TO1	Emergency stop button test input
14	I	Safety input for emergency stop button NC contact	Emergency stop button NC safety contact
15	I	Input for position 2 contact	Position 2 contact
16	O	Position 2 LED control output	Position 2 LED control input
17	I	Input for position 1 contact	Position 1 contact
18	O	Position 1 LED control output	Position 1 LED control input
19	I	0 Vdc power supply	A2

Connectors no. 3 & 4:
AN series safety handles



Pin	Type	P-Connect side	AN side
1	I	0 Vdc power supply	Power supply 0 V
2	O	+24 Vdc power supply	Power supply +24 V
3	O	Control output LED 1	Control input green LED (G)
4	O	Control output LED 4	Button LED control input
5	O	+24 V output for button contact	Button NO voltage-free contact input
6	I	Input for button contact	Button NO voltage-free contact output
7	O	Control output LED 2	Control input blue LED (B)
8	O	Control output LED 3	Control input red LED (R)

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