

JUMO GmbH & Co. KG

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JUMO Process Control, Inc.

6724 Joy Road
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Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com



JUMO ZELOS C01 LS

Capacitive level switch

Areas of application

- Food and beverage industry
- Railway applications, according to DIN EN 50155
- Shipbuilding
- Mechanical and plant engineering
- Water and wastewater engineering

Special features

- Suitable for CIP and SIP processes
- High pressure resistance and medium temperature
- Minimization of downtimes due to firmware update profile
- Standard torque wrench SW22 usable

Description

The capacitive level switch measures the point level of solid and liquid media in applications with requirements for overfill and dry run protection and can also be used for media detection, e.g. in separation and cleaning processes.

The device is suitable for installation in pressurized tanks, pipelines, containers, in hygienic areas and as part of overfill protection systems according to WHG and can be used in explosion-proof areas.



Type 408401



Type 408401



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Approval marks and certificates



Observe "Special conditions for safe use" in hazardous areas.

Certificates for approved device versions are available for download on the manufacturer's website.

EHEDG conformity only in conjunction with EHEDG-approved process connections, ⇒ page 8.

Submitted:



Technical data

Ex identification marking

ATEX, intrinsically safe, Ex i	II 1 G Ex ia IIC T4 Ga II 1 D Ex ta IIIC T ₂₀₀ 100 °C Da
IECEx, intrinsically safe, Ex i	Ex ia IIC T4 Ga Ex ta IIIC T ₂₀₀ 100 °C Da

Electrical safety

Requirements	DIN EN 61010-1:2023 The device must be equipped with an electrical circuit that meets the requirements for "Limited-energy circuits".
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Electrical data

Voltage supply PNP, NPN, push-pull IO-Link Explosion protection Ex i	DC 24 V SELV DC 9.6 to 36 V DC 18 to 30 V DC 9.6 to 30 V
Current consumption ^a Idle mode Switch operation with 2 outputs IO-Link operation Without switching output With one switching output Protection class Overvoltage category Pollution degree	0.45 W 15 W 0.6 W 7 W 3 II 2
Electrical connection Connection elements Device Connecting cable	M12 plug connector M12 plug connector
M12 plug connector Version	IEC 61076-2-101 4-pole

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Connecting cable	
Version	4-core, copper
Cable length	≤ 20 m
Temperature resistance	≥ 80 °C

^a The device labeling indicates a maximum power consumption in switching mode with 2 outputs including self-consumption. The actual power consumption depends on the connected load.

Inputs

Hysteresis	±1 mm
Repeatability	±1 mm
Switch-on delay	< 2 s, during this time the switching outputs are blocked
Switching delay	Adjustable 0.3 to 60 s
When the sensor is covered	0.5 s
When the sensor is uncovered	1 s
Filter time constant	Adjustable 0 to 100 s

Outputs

Number	
For IO-Link operation	1 (output signal according to IO-Link communication standard version 1.1)
For switching operation	2 (SIO mode; SIO = standard IO)
With PNP, NPN, push-pull	2
Configuration options	Hysteresis or window function, switching function, NC contact or NO contact, output p-switching (PNP) or n-switching (NPN), switch-on and switch-off delay, pulse-width modulation (PWM), wet test with medium
Pulse-width modulation (PWM)	
Period duration adjustable	50 to 1000 ms
Mark-to-space ratio	0 to 100 %
Switching current	≤ 200 mA per output
Voltage drop at switching transistor	≤ 1 V
Short-circuit resistance	Yes (clocked)
Reverse voltage protection	Yes
Current limiting	Yes

Interfaces

IO-Link

Function	Transfer of process data, diagnosis data, configuration data, and device information, displaying of process values
Communication	Via end device with IO-Link master and device description file (IODD)
Communication interface	IO-Link-Device V 1.1
Data transfer rate (baud rate)	COM 3 (230.4 kBaud)
Cycle time	≥ 0.7 ms
Profile	Common Profile, Smart Sensor Profile, Firmware Update Profile

Display

Color display	According to NE107, IO-Link, customer-specific
Brightness	4 levels (configurable)
Self-diagnosis/self-monitoring	According to NE107 and VDI/VDE 2650

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Environmental influences

Resistance to climatic conditions	
Operation	100 % relative humidity including condensation on the device outer case
Storage	90 % relative humidity without condensation
Ambient temperature	
M12 plug connector	-40 to +85 °C
Storage temperature	-40 to +80 °C
Process temperature	
Parts in contact with the medium	-40 to 115 °C (standard), <1 h/d to 135 °C and T _{amb} <50 °C -40 to +200 °C (for versions with sliding connection)
Process pressure	-1 to +60 bar
Protection type	DIN EN 60529
M12 plug connector	IP67
Max. site altitude	5,300 m above sea level
Electromagnetic compatibility (EMC)	DIN EN 61326-2-3:2022
Interference emission	Class B ^a
Interference immunity	Industrial requirement
Vibration resistance	IEC 60068-2-6, DIN EN 61373, DIN EN 50155, category 1 B
Endurance limit	4 g at 25 to 100 Hz
Shock resistance	3 g (vertical) or 5 g (transverse and longitudinal) for 30 ms
Operating location according to UL approval	Indoors

^a The product is suitable for industrial use as well as for households and small businesses.

Mechanical features

Materials	
Parts in contact with the medium	
Process connection	PEEK (depending on sealing concept stainless steel 316 L)
Sliding connection 360, 361	PEEK, FKM/FPM, stainless steel 316 L
Parts not in contact with the medium	
Housing	Stainless steel 304
Surface roughness	R _a ≤ 0.8 µm
Installation position	Any
Weight	60 g for G 1/2 with M12 plug connector

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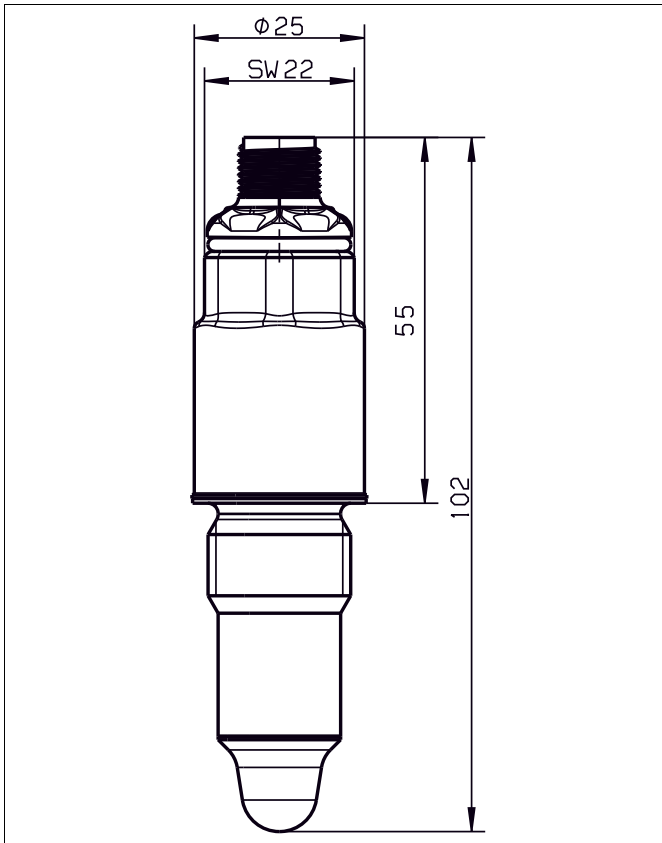
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Dimensions

Device

M12 plug connector



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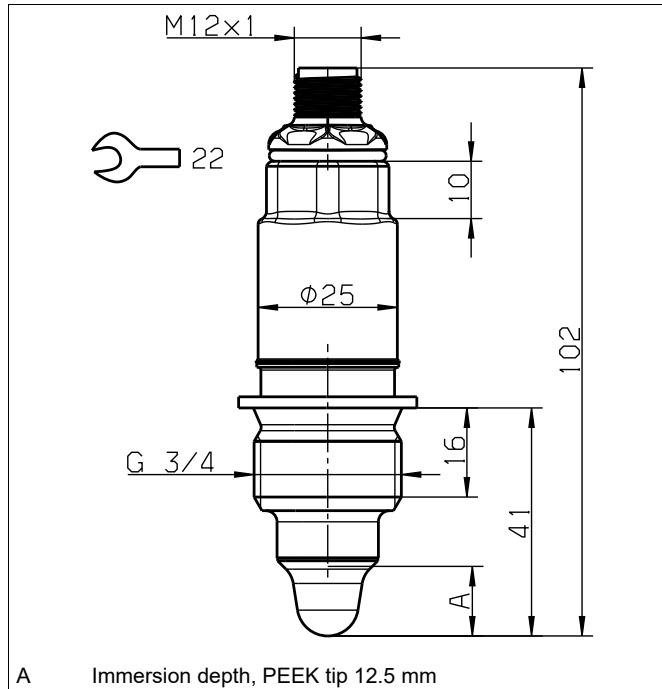
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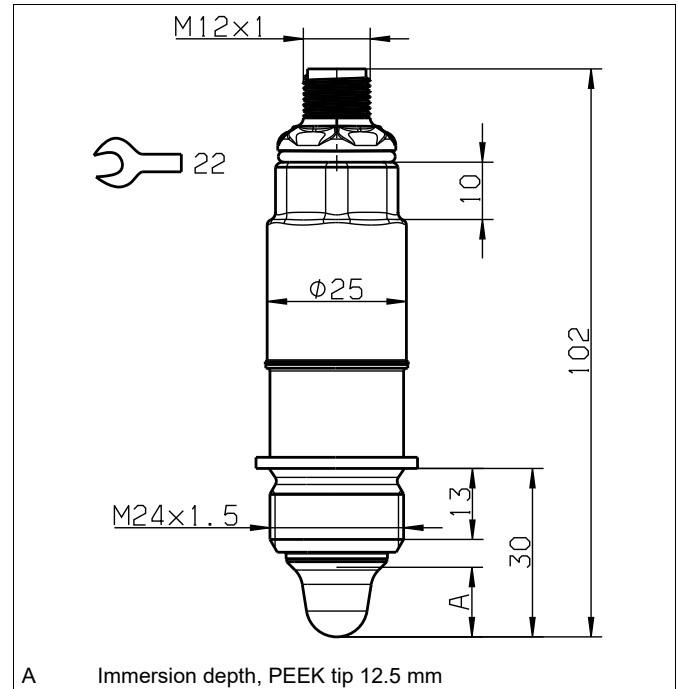
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**Process connections**

G 3/4



M24 × 1.5



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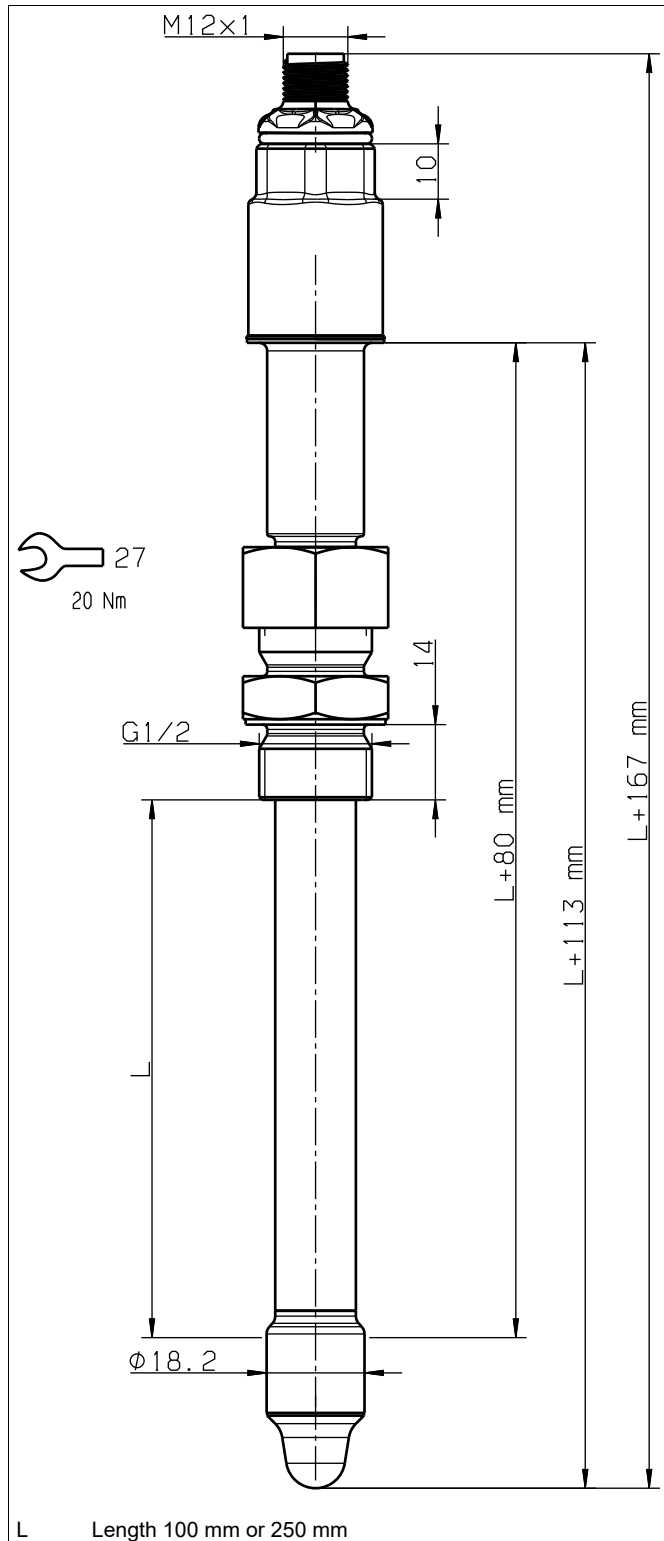
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Sliding connection



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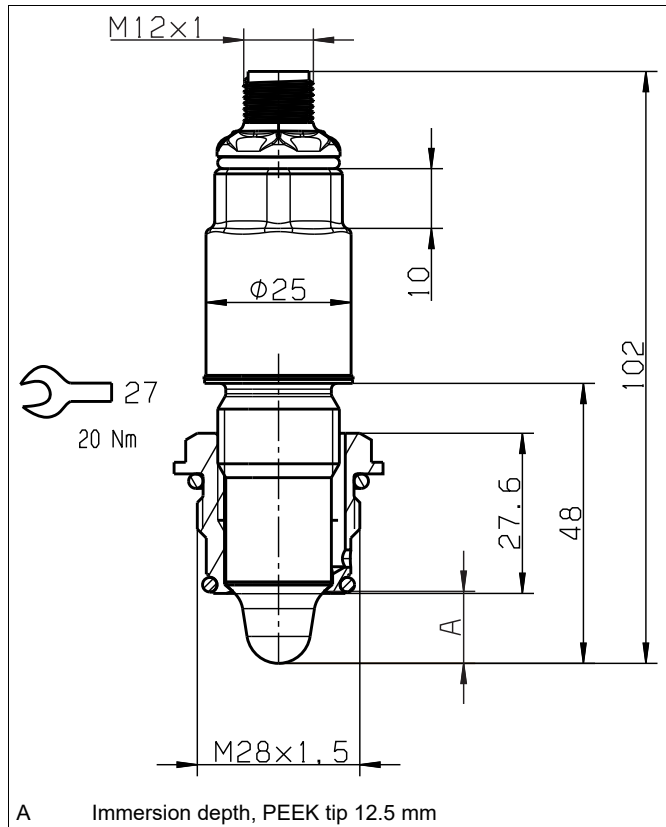
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**With EHEDG certification**

JUMO PEKA – Hygienic process connection



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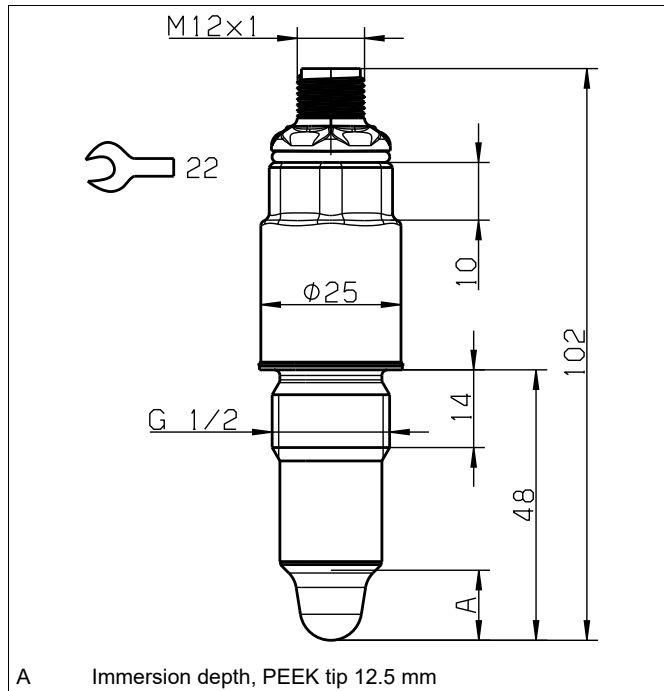
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**With EHEDG and 3A certification**

G 1/2



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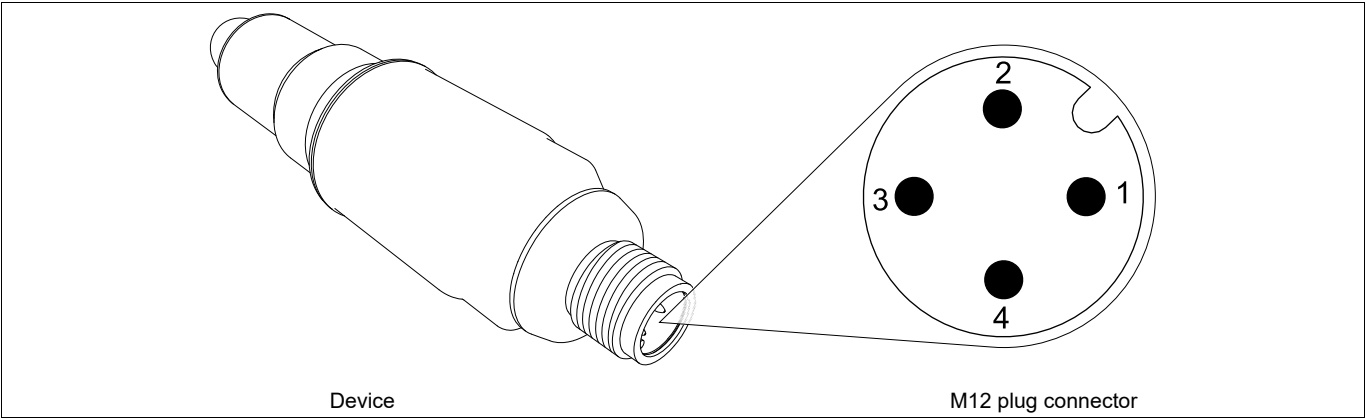
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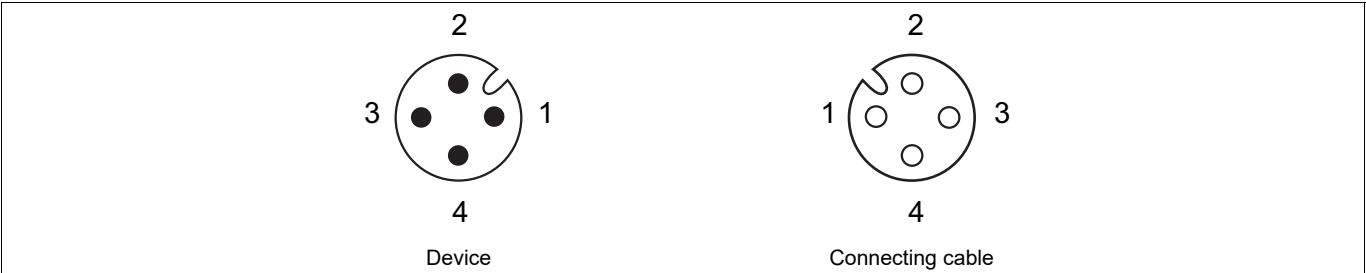
Connection elements

The connection diagram in the data sheet provides information on product selection.
For the electrical connection, only use the installation instructions or the operating manual.



Terminal assignment

M12 plug connector



Designation	Description	Assignment ^a
IO-Link	L+	1 BN (brown)
	L-	3 BU (blue)
	I/Q = OUT2	2 WH (white)
	C/Q = IO-Link/OUT1	4 BK (black)
PNP	L+	1 BN (brown)
	L-	3 BU (blue)
	OUT2	2 WH (white)
	OUT1	4 BK (black)
NPN	L+	1 BN (brown)
	L-	3 BU (blue)
	OUT2	2 WH (white)
	OUT1	4 BK (black)
push-pull	L+	1 BN (brown)
	L-	3 BU (blue)
	OUT2	2 WH (white)
	OUT1	4 BK (black)

^a The color coding is only valid for A-coded standard cables!

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If connected to a certified intrinsically safe electrical circuit [Ex i], the following values are given.

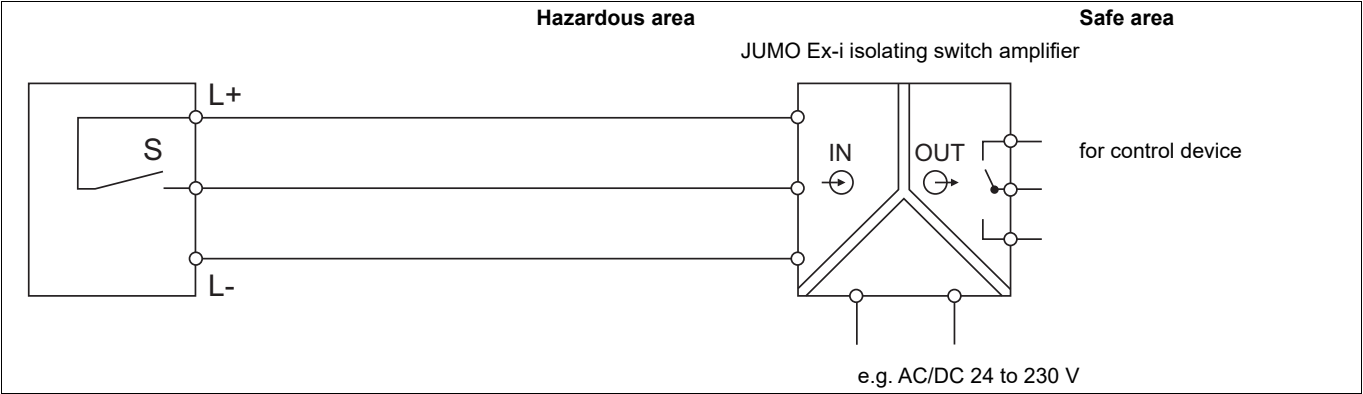
Output signal	Max. voltage U_i in V	Max. current I_i in mA	Max. power P_i in mW	Inner inductance in μ H	Inner capacitance in nF
PNP	≤ 30	≤ 100	≤ 750	57	35
NPN					
push-pull					

Connection examples

Standard

IO-Link operation with 1 switching output	Switch operation with 2 switching outputs
p-switching (PNP)	p-switching (PNP)
n-switching (NPN)	n-switching (NPN)

Ex i



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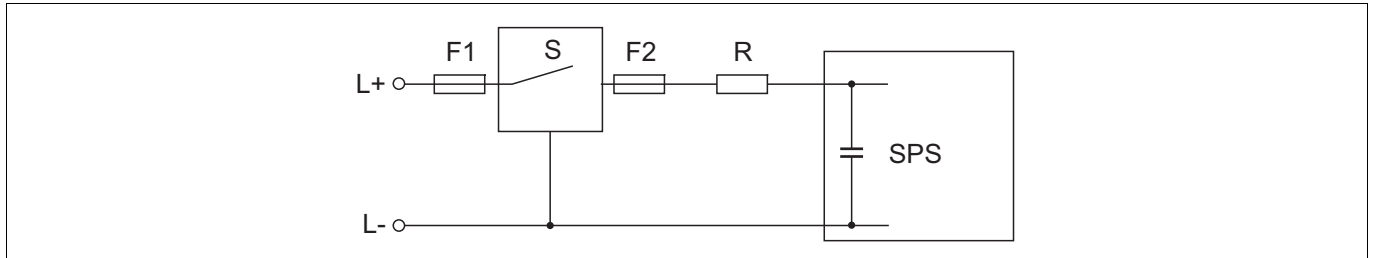
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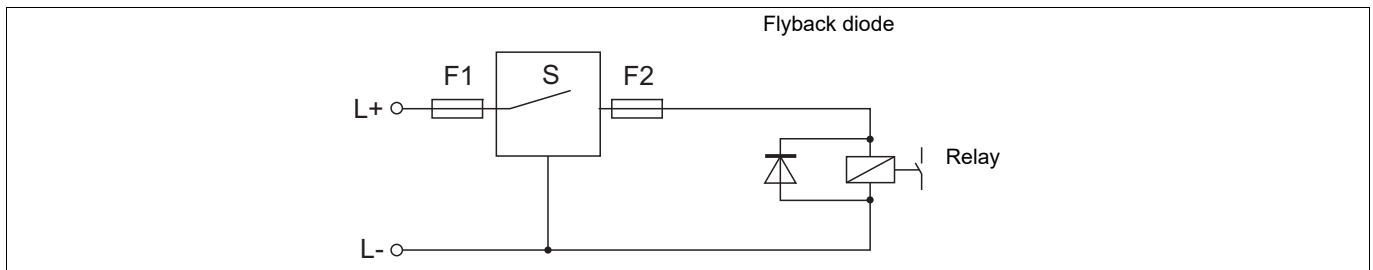
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**Current limiting for capacitive loads**

In the case of capacitive loads, the switching contact (S) must be protected with a resistor.

**Protective circuit for inductive loads for capacitive loads**

In the case of inductive loads, the switching contact (S) must be protected with a flyback diode.



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Order details

(1)	Basic type
408401	JUMO ZELOS C01 LS – Capacitive level switch
(2)	Basic type extension
000	None
062	Shipbuilding approval
065	Hygienic design
262	WHG approval
263	WHG approval, explosion protection, intrinsically safe, Ex i
265	WHG approval, explosion protection, intrinsically safe, Ex i, and hygienic design
362	Explosion protection, intrinsically safe, Ex i
365	Explosion protection, intrinsically safe, Ex i, and hygienic design
662	Shipbuilding approval and explosion protection, intrinsically safe, Ex i
(3)	Electrical connection
036	M12 plug connector
170	Cable, PUR
(4)	Cable length
0	None
2000	2,000 mm
5000	5,000 mm
10000	10,000 mm
(5)	Process connection
105	Fitting G 3/4
133	Fitting M24 × 1.5
360	Sliding connection, G 1/2, 100 mm adjustable
361	Sliding connection, G 1/2, 250 mm adjustable
387	Fitting G 1/2 with PEEK seal
997	JUMO PEKA – Hygienic process connection
(6)	Output
447	Digital (push-pull)
458	IO-Link measured value transmission, including digital output
469	NPN switching output
470	PNP switching output
(7)	Medium temperature
487	-40 to +200 °C
500	-40 to +115 °C
(8)	Extra codes
061	UL approval
374	acceptance test certificate 3.1 Material DIN EN 10204 ^a
634	TAG number
950	Railway application

^a Not in connection with process connection 360 or 631.

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)
Order code	<input type="text"/>	/	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	/	<input type="text"/>
Order example	408401	/	000	-	036	-	0	-	387	-	470	-	500	/	061

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Stock versions

Order code	Part no.
408401/000-036-0-387-458-500/061	00771685
408401/065-036-0-387-458-500/061	00771693
408401/065-036-0-387-470-500/061	00771694
408401/362-036-0-387-470-500/061	00771696
408401/062-036-0-387-470-500/061	00771699

Accessories

Without UL approval

Designation	Part no.
IO-Link master, 1-channel (TMG Device Tool), including mini USB cable for use with Windows® PC	00694070
Magnetic pen for teach function	00736330
Welding socket G 1/2, 3A and EHEDG for process connection 380 and 387	30056714
Adapter G 1/2 VARIVENT Type N DN 50/40, EHEDG	30054461
T-piece with PEKA connection DN 100, EHEDG	00643582
T-piece with PEKA connection DN 80, EHEDG	00643581
T-piece with PEKA connection DN 65, EHEDG	00643580
T-piece with PEKA connection DN 50, EHEDG	00643579
T-piece with PEKA connection DN 40, EHEDG	00643576
T-piece with PEKA connection DN 32, EHEDG	00643574
T-piece with PEKA connection DN 25, EHEDG	00643555
T-piece with screw connection G 1/2 DN 100, 3A and EHEDG	00772334
T-piece with screw connection G 1/2 DN 80, 3A and EHEDG	00772333
T-piece with screw connection G 1/2 DN 65, 3A and EHEDG	00772332
T-piece with screw connection G 1/2 DN 50, 3A and EHEDG	00772331
T-piece with screw connection G 1/2 DN 40, 3A and EHEDG	00772330
T-piece with screw connection G 1/2 DN 32, 3A and EHEDG	00772321
T-piece with screw connection G 1/2 DN 25, 3A and EHEDG	00772316
Configuration cable for Ex devices	30048990
Connection line M12, M12, black, PUR, length 2 m (straight coupling/straight connector; 5 pole; A-coded)	00777804
Line socket, 4-pole, M12 × 1, straight, length 2 m	00404585
Line socket, 4-pole, M12 × 1, angled, length 2 m	00409334
Sealing ring A24 × 2 - Vf for process connection 133	00704485
Sealing ring A26 × 2 - Vf for process connection 105	30049315
Service deployment	00427970
Preconfiguration (Service)	00427968

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**With UL approval**

Designation	Part no.
Connection line M8/voltage supply, length 2 m, IO-Link master, 4 channel	00767913
Connection line M8/Ethernet, length 2 m, IO-Link master, 4 channel	00767923
Connection line M12/voltage supply, length 2 m, IO-Link master, 8 channel	00767914
Connection line M12/Ethernet, length 2 m, IO-Link master, 8 channel	00767927
IO-Link master, 4-channel – TURCK TBEN-S2-4IOL	00759867
IO-Link master, 8-channel – TURCK TBEN-LL-8IOL	00759875
Cable PUR, 4 × 0.34, black, length 2 m	00776248
Cable PUR, 4 × 0.34, black, length 5 m	00776250
Cable PUR, 4 × 0.34, black, length 10 m	00776252
Connecting cable, M12 plug connection, straight, white, PVC, 10 m, IP68	30059200