



Screw-in temperature threshold detector/transmitter with display

- Indication, monitoring, transmitting and On/Off control in one device
- Extra large display
- Menu-guided parametrisation
- Complete control loop with external setpoint

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

	Type 6213 Servo-assisted 2/2 way diaphragm valve	▶
	Type 8652 AirLINE - the valve island optimised for process automation	▶
	Type 8611 eCONTROL - Universal controller	▶
	Type 8619 multiCELL - Multi-channel and multi-function transmitter/controller	▶

Type description

This intelligent threshold detector/transmitter with an extra large display is specifically designed to monitor limit values or an ON/OFF or continuous control loop.

Two versions are available: the 8400 Compact and 8400 for wall mounting. The wall-mounted version must be inserted into a holder previously mounted on a wall, and it must be associated with a remote temperature sensor.

The switching points can be programmed with keys directly in the display or optionally with a 4...20 mA standard signal input from an external PLC. As an option, the process value can additionally be transmitted to the PLC (with a 4...20 mA signal).

The connection of the 8400 to the process in the piping is made using standard T-fittings with standard connections (G 1/2).

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1. General technical data

Product properties

Materials

Please make sure the device materials are compatible with the fluid you are using.

Detailed information can be found in chapter [“4.1. Chemical Resistance Chart – Bürkert resistApp” on page 7.](#)

Non wetted parts

Depending on the device version.

Detailed information can be found in chapter [“2. Product versions” on page 5](#) and in chapter [“4.2. Material specifications” on page 7.](#)

Housing, cover	PC, glass fibre reinforced
Front panel folio	Polyester
Screws	Stainless steel

Wetted parts

Depending on the device version.

Detailed information can be found in chapter [“2. Product versions” on page 5](#) and in chapter [“4.2. Material specifications” on page 7.](#)

Voltage supply cable	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
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Electrical data

Power supply	12...30 V DC $\pm 10\%$, filtered and regulated. Connection to main supply: permanent (through external SELV (Safety Extra Low Voltage) and LPS (Limited Power Source) power supply)
Power Source (not supplied)	Limited power source according to UL/EN 60950-1 standards or limited energy circuit according to UL/EN 61010-1 §9.4
Protection against DC polarity reversal	Yes
Current consumption	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.

Performance data

Measuring range	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
Measurement deviation	$\pm 0.5\text{ °C}$ (0.9 °F) ($0...+80\text{ °C}$ ($+32...+176\text{ °F}$)) $\pm 1.5\text{ °C}$ (2.7 °F) (outside of $0...+80\text{ °C}$ ($+32...+176\text{ °F}$))
Repeatability	$\leq \pm 0.4\%$
4...20 mA output uncertainty	$\pm 0.5\%$ of range

Medium data

Fluid temperature	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
Fluid pressure max.	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.

Approvals and Certificates

Standards

Protection class according to IEC/EN 60529	IP65 with device wired and with plugs mounted and tightened
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Directives

CE directives	The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable)
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Product connections

Process connection	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
Electrical connections	Cable plug acc. to EN 175301-803, free positionable 5 pin M12 male fixed plug, 8 pin M12 male fixed plug or 4 pin M12 female fixed plug

Environment and installation

Ambient temperature	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
Relative air humidity	$\leq 80\%$, without condensation
Height above sea level	Max. 2000 m
Operating condition	Continuous
Equipment mobility	Fixed

Use	Indoor and outdoor (Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions)
Installation category	Category I according to UL/EN 61010-1
Pollution degree	Degree 2 according to UL/EN 61010-1

2. Product versions

2.1. Compact version

Compact version, available in several variants.

- The 8400 Standard has a Pt100 with a 29.5 mm mounting length.
- The 8400 Extended has a Pt100 with a 100 or 200 mm mounting length. The adaptation of the 8400 will be done through the external thread or also with a compression fitting (not part of delivery).
This allows variable mounting in larger pipe diameters or tanks.



Product details	
Materials	• Non wetted parts: – Female cable plug/male fixed plug in PA with electrical contact in Zn – 5-pins M12 male fixed plug in PA with electrical contact in brass, gold-plated – 8-pins M12 male fixed plug in PA and CuZn, nickel-plated with electrical contact in CuZn, pre-nickel and gold-plated • Wetted parts: – Pt100 sensor element in stainless steel – Seal in FKM (EPDM on request) – Process connection in stainless steel 316L (1.4404)
Compatibility	Any pipe with DN ≥ 15
Voltage supply cable	Shielded • For female cable plug (supplied): external diameter of wire: 6...7 mm, cross section of wires: 0.14...0.5 mm² • For 5-pins M12 female plug (not supplied): external diameter of wire: 3...6.5 mm, cross section of wires: max. 0.75 mm² • For 8-pins M12 female plug (not supplied): external diameter of wire: 5.9 mm, cross section of wires: 0.25 mm²
Measuring range	• -40...+125 °C (-40...+257 °F) (with ambient temperature 0...+40 °C (-32...+104 °F)) • -40...+90 °C (-40...+194 °F) (with ambient temperature > +40 °C (104 °F))
Current consumption	Max. 80 mA (no load)
Input external setpoint	4...20 mA, galvanic insulation, max. input impedance: 250 Ω
Output signal	• Transistor (configurable): protection against short circuits – NPN and/or PNP, open collector, 700 mA max., 500 mA per transistor if both transistors outputs are wired – NPN-output: 0.2...30 V DC – PNP-output: power supply • Relay (configurable): – single relay output: 3 A/250 V AC or 3 A/30 V DC – relay output and 4...20 mA current output: 3 A/48 V AC or 3 A/30 V DC • Process value: – 4...20 mA, galvanic insulation – loop resistance max.: 1000 Ω at 30 V DC, 800 Ω at 24 V DC, 500 Ω at 18 V DC
Response time (10...90 %)	7 s (for one step increment from 0...+100 °C (+32...+212 °F))
Fluid temperature	-40...+125 °C (+40...+257 °F)
Fluid pressure max.	PN16
Pressure equipment directives	Complying with Article 4, Paragraph 1 of 2014/68/EU directive. Detailed information on the pressure equipment directive can be found in chapter “3.1. Pressure Equipment Directive” on page 6
Process connection	G, NPT, Rc ½ screw-in thread
Ambient temperature	• -20...+60 °C (-4...+140 °F) if T_{fluid} < 90 °C (+194 °F) • -20...+40 °C (-4...+104 °F) if T_{fluid} > 90 °C (+194 °F)

2.2. Wall-mounted version

The 8400 Wall has to be inserted into a holder previously mounted on a wall. It must be associated to a remote temperature sensor.



Product details	
Materials	Non wetted parts: • Wall-mounted holder in PVC • 5-pins M12 male fixed plug in PA with electrical contact in brass gold-plated • 4-pins M12 female fixed plug in PA and zinc die-cast, nickel-plated with electrical contact in CuSn, gold-plated
Compatibility	With remote 3-wire Pt100 temperature sensor
Voltage supply cable	• For 5-pins M12 female plug (not supplied): shielded, external diameter of wire: 3...6.5 mm, cross section of wires: max. 0.75 mm² • For 4-pins M12 male plug (not supplied): external diameter of wire: 3...6.5 mm, cross section of wires: max. 0.75 mm²
Measuring range	-40...+125 °C (-40...+257 °F)
Current consumption	Max. 50 mA (no load)
Input signal	From connected 3-wire Pt100 temperature sensor
Output signal	• Transistor (configurable): protection against short circuits – NPN and/or PNP, open collector, 700 mA max. 500 mA per transistor if both transistors outputs are wired – NPN-output: 0.2...30 V DC – PNP-output: power supply
Response time (10...90 %)	7 s (for one step increment from 0...+100 °C (+32...+212 °F))
Ambient temperature	-20...+60 °C (-4...+140 °F)

3. Approvals

3.1. Pressure Equipment Directive

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

Device used on a pipe

Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure; DN = nominal diameter of the pipe

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.c.i	DN ≤ 25
Fluid group 2, Article 4, Paragraph 1.c.i	DN ≤ 32 or PS*DN ≤ 1000
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PS*DN ≤ 2000
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PS*DN ≤ 5000

Device used on a vessel

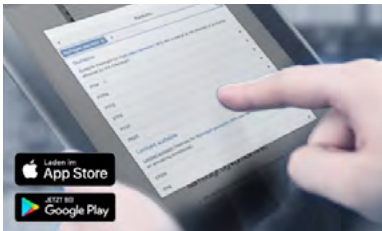
Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.a.i	PS ≤ 200 bar
Fluid group 2, Article 4, Paragraph 1.a.i	PS ≤ 1000 bar
Fluid group 1, Article 4, Paragraph 1.a.ii	PS ≤ 500 bar
Fluid group 2, Article 4, Paragraph 1.a.ii	PS ≤ 1000 bar

4. Materials

4.1. Chemical Resistance Chart – Bürkert resistApp



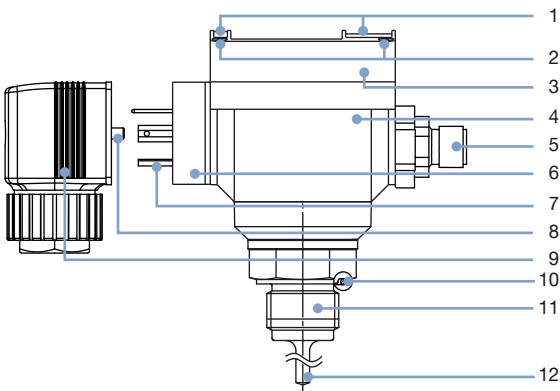
Bürkert resistApp – Chemical Resistance Chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

[Start Chemical Resistance Check](#)

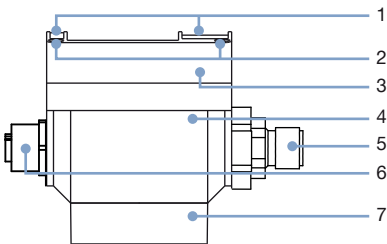
4.2. Material specifications

Compact version



No.	Element	Material
1	Front panel folio	Polyester
2	Screws	Stainless steel
3	Cover	PC, glass fibre reinforced
4	Housing	PC, glass fibre reinforced
5	M12 male fixed plug	PA (5 pin), PA and CuZn nickel-plated (8 pin)
6	Male fixed plug (EN 175301-803)	PA
7	Electrical contact	Sn
8	Screw	Stainless steel
9	Female cable plug (EN 175301-803)	PA
10	Seal	FKM (EPDM on request)
11	Process connection	Stainless steel 316L (1.4404)
12	Pt100 sensor element	Stainless steel

Wall-mounted version



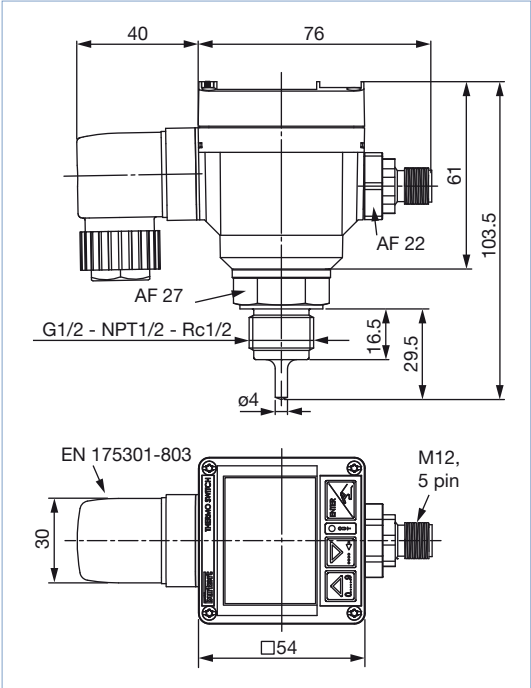
No.	Element	Material
1	Front panel folio	Polyester
2	Screws	Stainless steel
3	Cover	PC, glass fibre reinforced
4	Housing	PC, glass fibre reinforced
5	M12 male fixed plug	PA (5 pin)
6	M12 female plug	PA and zinc die-cast, nickel-plated (4 pin)
	Wall-mounted holder	PVC

5. Dimensions

5.1. Temperature threshold detector, compact version

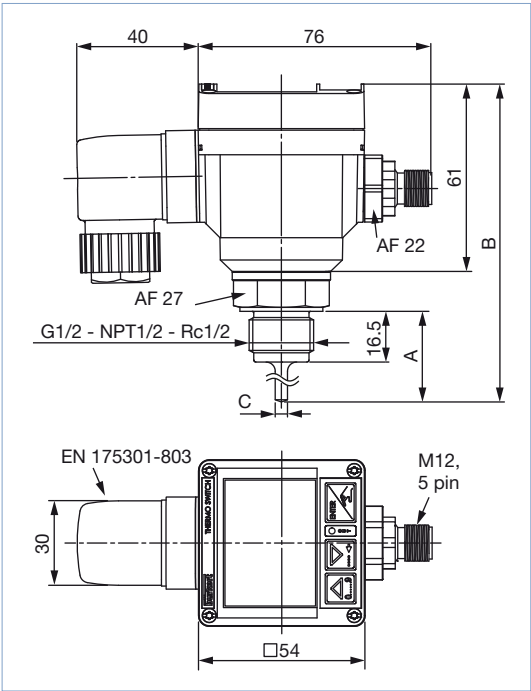
Standard mounting length

Note:
Specifications in mm



Extended mounting length

Note:
Specifications in mm

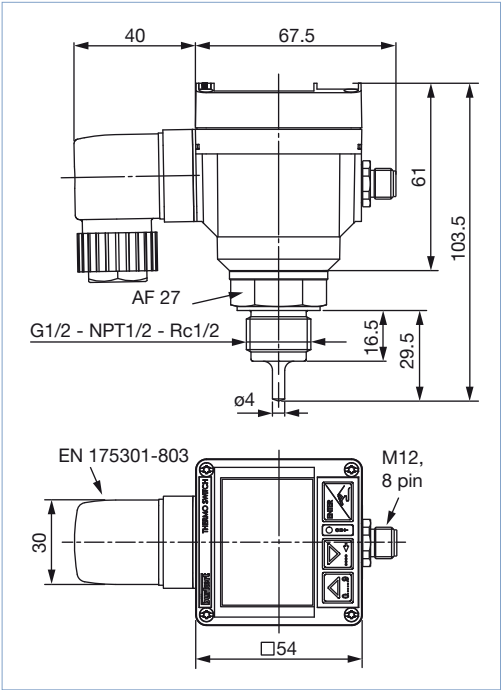


No.	Installation length 1	Installation length 2
A	100	200
B	174	274
C	Ø6	Ø6

5.2. Temperature transmitter, compact version

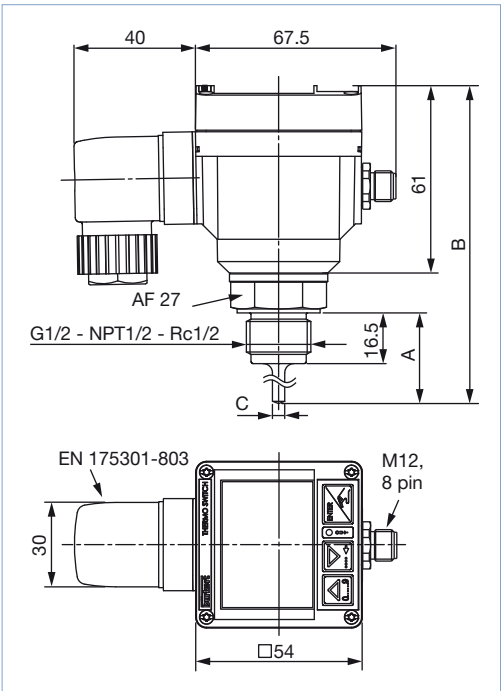
Standard mounting length

Note:
Specifications in mm



Extended mounting length

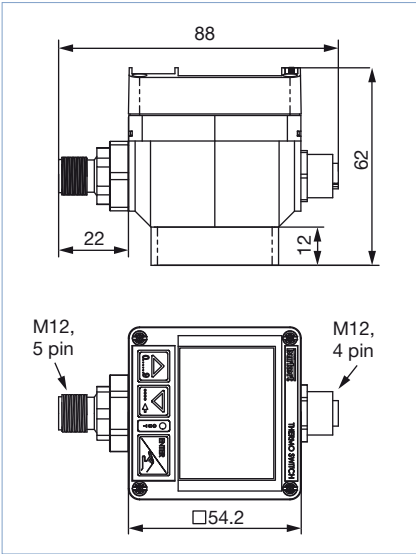
Note:
Specifications in mm



No.	Installation length 1	Installation length 2
A	100	200
B	174	274
C	Ø6	Ø6

5.3. Wall-Mounted version

Note:
Specifications in mm



6. Product operation

6.1. Functional overview

The display is used to:

- read the value of certain parameters such as the measured temperature
- parameterize the device by means of 3 keys
- read the configuration of the device.

Display and operating keys	No.	Description
	1	Bar graph running in each mode
	2	“Confirm” key: • to confirm the function displayed • to confirm the parameters set
	3	Shows the status of the on/off output (red LED)
	4	“Next” key: • to select the digit • to go to the next function
	5	“Back” key: • to change the value (0...9) of the selected digit • to go back to the previous function

User adjustments, such as engineering units, output, filter, bargraph are carried out on site.

The device has 2 operating levels:

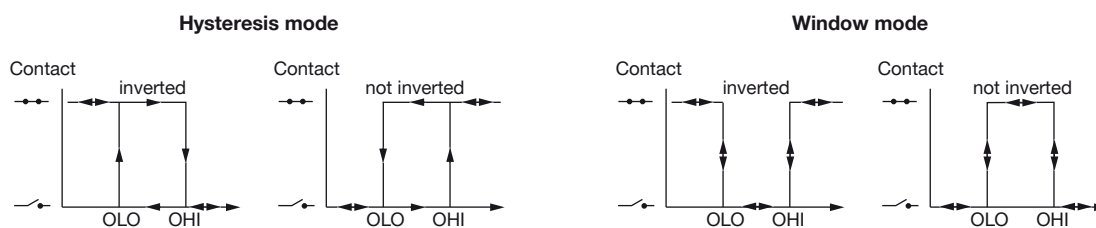
- the process level
- the configuration level, which comprises the parameters and the test menus

Level	Functions
Process	- To read out: - the measured temperature - the switching thresholds (high and low value) - the value of the 4...20 mA output (transmitter only) - To access the parameters and test menus of the configuration level
Configuration - parameters menu	- To make the settings needed for operation: - engineering units (international measuring units) - transistor or relay output - temperature adjustment 4...20 mA current output (transmitter only) 4...20 mA current input (transmitter only) - selection of switching mode: window, hysteresis (see chapter "6.2. Function modes" on page 11.) - selection of threshold value (see chapter "6.2. Function modes" on page 11.) - filter 10 segment bargraph
Configuration - test menu	- To test the configuration made in the parameters menu with input of a theoretical value - To calibrate the expansion board in a transmitter version (4...20 mA current output and input)

6.2. Function modes

Temperature threshold detector

- Standard On/Off output
 - 2 switching modes for the output, either hysteresis or window, inverted or not



- Configurable delay before switching
- Possible outputs depending on the version: relay, transistor NPN, transistor PNP.

Temperature transmitter

- External setpoint
 - The switching points are automatically adjusted by the 4...20 mA input signal originating from a PLC.
 - On/Off relay output
- External setpoint
 - This version delivers a 4...20 mA electric signal whose value is the image of the measured temperature
 - On/Off relay output
 - 4...20 mA output
 - External setpoint (4...20 mA input).

7. Ordering information

7.1. Bürkert eShop – Easy ordering and quick delivery



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7.2. Bürkert product filter



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7.3. Ordering chart

Temperature threshold detector, compact version

Note:

The adaptation of the 8400 Extended will be done through the external thread or also with a compression fitting (not part of delivery). This allows variable mounting in larger pipe diameters or tanks.

Version	Voltage supply	Sensor element	Screw-in thread	Output	Electrical connection	Article no.
Standard mounting length	12...30 V DC	29.5 mm - Ø 4 mm	G ½	NPN and PNP	Free positionable 5 pin M12 male fixed plug	436501
				Relay	Free positionable 5 pin M12 male fixed plug and cable plug EN 175301-803	436503
			NPT ½	NPN and PNP	Free positionable 5 pin M12 male fixed plug	436507
				Relay	Free positionable 5 pin M12 male fixed plug and cable plug EN 175301-803	436509
			Rc ½	NPN and PNP	Free positionable 5 pin M12 male fixed plug	436504
				Relay	Free positionable 5 pin M12 male fixed plug and cable plug EN 175301-803	436506
Extended mounting length	12...30 V DC	100 mm - Ø 6 mm	G ½	Relay	Free positionable 5 pin M12 male fixed plug and cable plug EN 175301-803	550053
		200 mm - Ø 6 mm	G ½	Relay	Free positionable 5 pin M12 male fixed plug and cable plug EN 175301-803	550054

Temperature transmitter, compact version

Note:

The adaptation of the 8400 Extended will be done through the external thread or also with a compression fitting (not part of delivery). This allows variable mounting in larger pipe diameters or tanks.

Version	Voltage supply	Sensor element	Screw-in thread	Input	Output	Electrical connection	Article no.
Standard mounting length	12...30 V DC	29.5 mm - Ø 4 mm	G ½	4...20 mA ^{1.)}	4...20 mA ^{2.)} + Relay	8 pin M12 male fixed plug and cable plug EN 175301-803	444696 
			NPT ½	4...20 mA ^{1.)}	4...20 mA ^{2.)} + Relay	8 pin M12 male fixed plug and cable plug EN 175301-803	444698 
			Rc ½	4...20 mA ^{1.)}	4...20 mA ^{2.)} + Relay	8 pin M12 male fixed plug and cable plug EN 175301-803	444697 
Extended mounting length	12...30 V DC	100 mm - Ø 6 mm	G ½	4...20 mA ^{1.)}	4...20 mA ^{2.)} + Relay	8 pin M12 male fixed plug and cable plug EN 175301-803	550055 
		200 mm - Ø 6 mm	G ½	4...20 mA ^{1.)}	4...20 mA ^{2.)} + +Relay	8 pin M12 male fixed plug and cable plug EN 175301-803	550056 

1.) Ext. Setpoint

2.) Process value

Wall-mounted version

Voltage supply	Input	Output	Electrical connection	Article no.
12...30 V DC	3-wired Pt100	NPN and PNP	Free positionable 5 pin M12 male fixed plug and 4 pin M12 female fixed plug	448862 

7.4. Ordering chart accessories

Description	Article no.
5 pin M12 female straight cable plug with plastic threaded locking ring, to be wired	917116 
5 pin M12 female straight cable plug moulded on cable (2 m, shielded)	438680 
4 pin M12 male straight cable plug with plastic threaded locking ring, to be wired	448856 
4 pin M12 male straight cable plug moulded on cable (2 m, shielded)	448857 
8 pin M12 female straight cable plug with plastic threaded locking ring, to be wired	444799 
8 pin M12 female straight cable plug moulded on cable (2 m, shielded)	444800 
Female cable plug EN 175301-803 with cable gland - see Type 2508 ▶	438811 
Female cable plug EN 175301-803 with NPT ½ reduction without cable gland - see Type 2509 ▶	162673 

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