

# Level and temperature switch

## Nivotemp NT M, NT MD

In hydraulics and lubrication technology the fill level of oil tanks needs to be monitored. Here, modern factory automation requires compatible signals. The Nivotemp M series features a group of devices for both monitoring the level as well as the level and temperature in hydraulic or lubrication units.

### NT M

Vessel connections G3/4, G1, flange or oval flange

Various plug options

Level and/or temperature control

Up to 4 switching outputs

Small, compact design

Proven and tested highly dynamic float system

Brass or stainless steel housing

### NT MD

Vessel connections G3/4, G1 or oval flange

Fixed switching outputs for liquid level monitoring

LED display with status of switching outputs, 270° swivel

Standardised VDMA-based menu structure

Up to four programmable temperature switching outputs

Alternatively, continuous temperature output signal plus freely programmable switching output

Switching output configurable as window or hysteresis

Switching output configurable as frequency output (1-100 Hz)

Min./max. value memory, logbook



## Technical Data NT M

Version	MS	VA
Operating pressure:	max. 1 bar *	max. 1 bar
Operating temperature:	-20 °C to +80 °C	-20 °C to +80 °C
Float:	SK 161	SK 161
Min. fluid density:	0.80 kg/dm <sup>3</sup>	0.80 kg/dm <sup>3</sup>
Lengths (all versions):	280, 370, 500 mm (standard) variable to max. 1000 mm	
Weight at L=500 mm:	approx. 300 g	approx. 350 g

\* max. atmospheric for PA oval flange

### Material

Float:	NBR	NBR
Immersion tube:	Brass	1.4571
G3/4 connection:	Brass	1.4571
G1 connection:	Brass	Brass via adapter
Flange connection:	Aluminium	--
Oval flange:	PA	VA/brass via adapter

Level switching output	K8	W9
Max. number	4	2
Function:	NO/NC*	Change-over contact
Max. voltage:	230 V AC/DC	48 V AC/DC
Max. switching current:	0.5 A	0.5 A
Max. contact load:	10 VA	20 VA
Min. contact spacing:	40 mm	40 mm

\*NO= falling NC contact / NC = falling NO contact

### Optional temperature

Temperature contact:	TM xx
Max. voltage:	230 V AC/DC
Max. switching current:	2 A
Max. contact load:	100 VA
Function:	NC NO
Switching point °C:	50/60/70/80 50/60/70/80
Switching point tolerance:	± 5 K ± 5 K
Max. hysteresis:	18 K ± 5 K 26/35/40/45 K ± 5 K

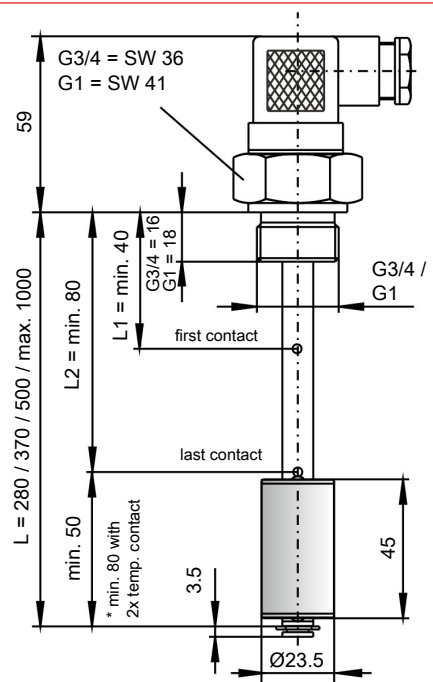
### Temperature sensor

Pt100:	DIN EN 60 751 (tolerance ± 0.8 °C)
Analogue output:	See "Technical Data NT M with Analogue Output for Temperature"

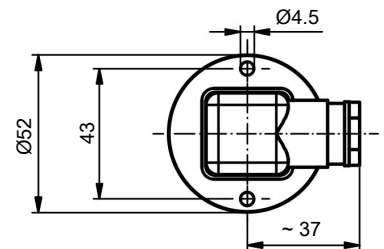
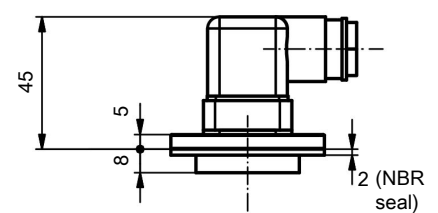
### Adapter

OV:	Adapter to oval flange incl. seal and locking nut
G1:	Adapter G3/4 to G1

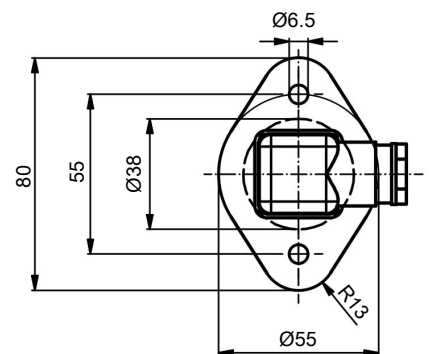
### Dimensions



### Flange style

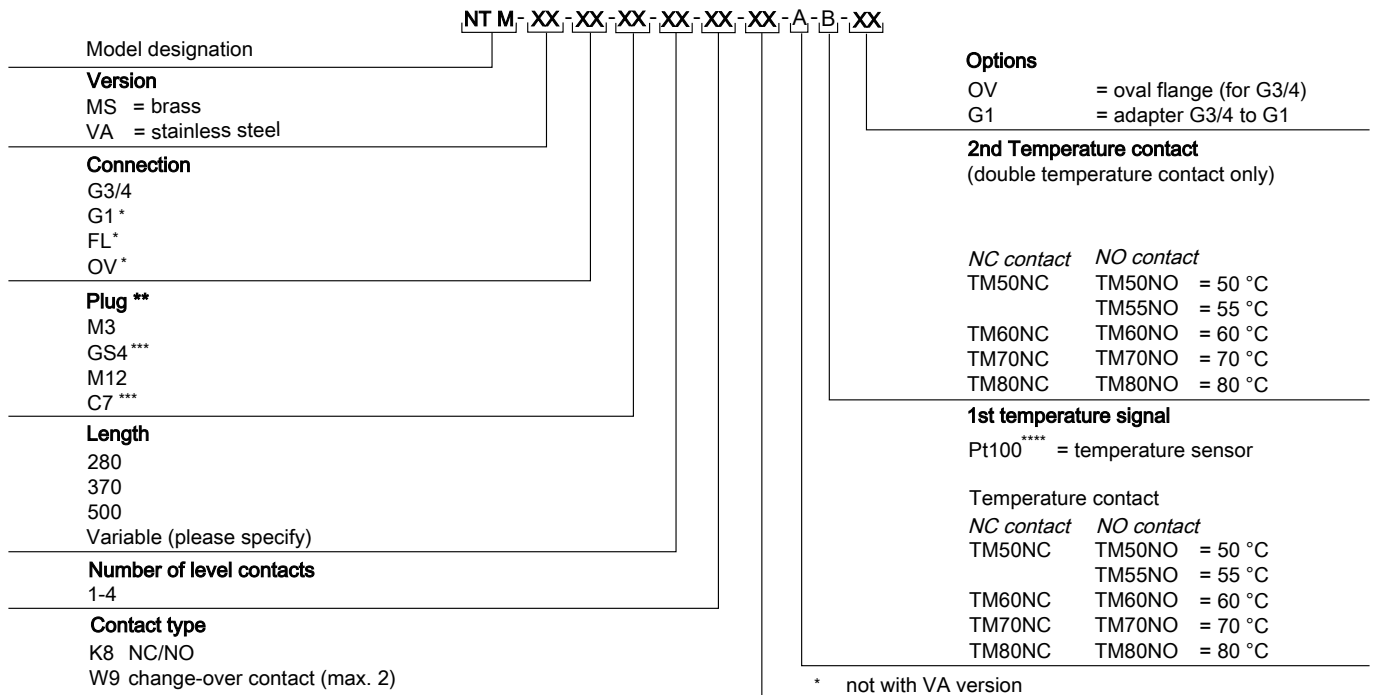


### Oval flange



## NT M ordering instructions

### Model key



- \* not with VA version
- \*\* see "Connector"
- \*\*\* only available with G3/4 connector
- \*\*\*\* Cannot be combined with temperature contact

### Ordering example

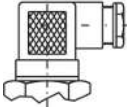
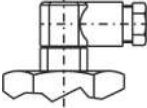


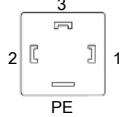
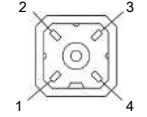
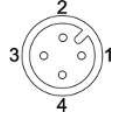
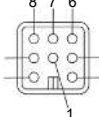
You require: Level switch with G3/4 connection, brass version, length L= 500 mm, 2 level switches, 1st contact 100 mm NC, 2nd contact 450 mm NO

Order NT M-MS-G3/4-M3/500-2K-100NC-450NO

### NT M Accessories

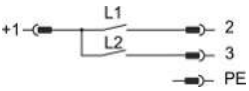
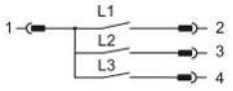
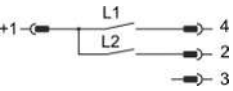

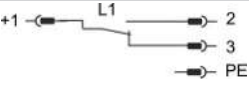
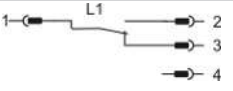
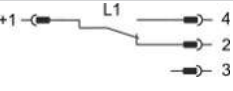
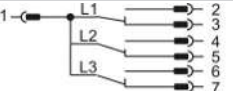
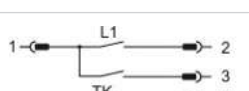
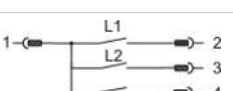
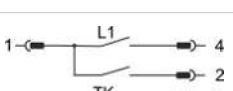
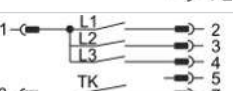
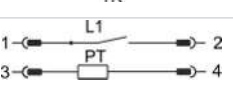
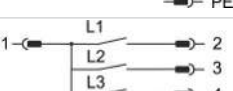

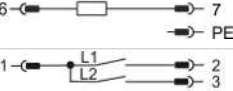

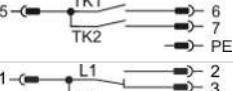

Item no.	Description
9144 05 0010	Connecting cable M12x1, 4-pin, 1.5 m, angular coupling and straight plug
9144 05 0046	Connecting cable M12x1, 4-pin, 3.0 m, angular coupling and straight plug
9144 05 0047	Connecting cable M12x1, 4-pin, 5.0 m, angular coupling and strands

NT M connector

Connector	M3	GS4	M12	C7
G3/4	X	X	X	X
G1	X	-*	X	-*
Flange	X	-	X	-
OV	X	-*	X	-*
* G3/4 connection with respective adapter				
Dimensions				
Connection schematic				
Number of pins	3-pin + PE	4-pin	4-pin	7-pin + PE
DIN EN	175301-803		61076-2-101	175201-804
Max. voltage	230 V AC / DC*	30 V DC	30 V DC	230 V AC / DC*
Degree of protection	IP65	IP65	IP67**	IP65
Cable fitting	PG 11	PG 7		PG 11
Max. number of contacts				
Level/temp. contacts	1 x K8, 1 x TK	2 x K8, 1 x TK	1 x K8, 1 x TK	3 x K8, 1 x TK
Level contacts only	2 x K8 1 x W9	3 x K8 1 x W9	2 x K8 1 x W9	4 x K8 3 x W9

\*Max. 48 V AC / V DC for change-over contact. \*\* With moulded cable box.

Standard pin assignment NT M

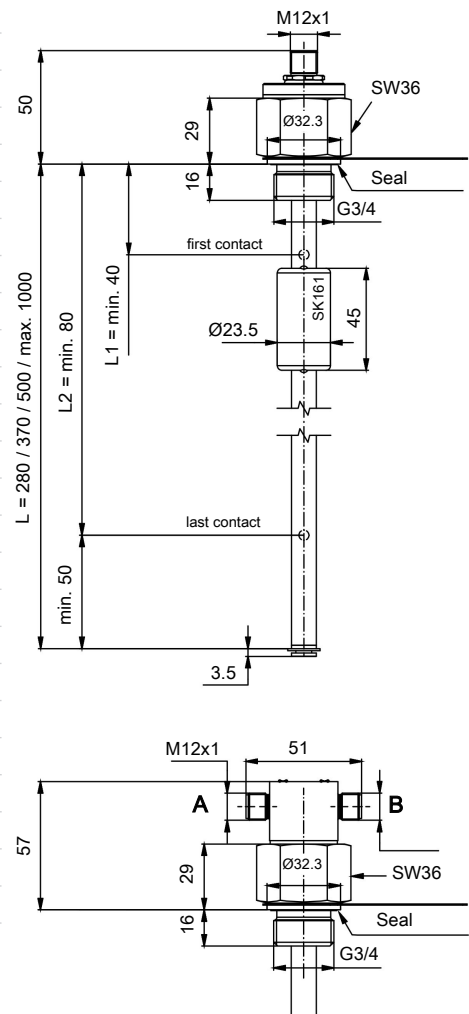
	M3	GS4	M12	C7
K8 Level contact(s)				
W9 Level contact(s)				
K8 Level contact(s) and temperature contact				
K8 / Pt100 Level- and temperature sensor				
K8 Level- and temperature contact(s)				
W9 Level contact(s) and temperature contact				
W9 / Pt100 Level- and temperature sensor				

The pin assignments shown always show the max. population possible for the respective plug connection.

Technical Data NT M with analogue output for temperature

<b>Version</b>	<b>MS</b>
<b>Material</b>	
Float:	NBR
Immersion tube:	Brass
G3/4 connection:	Brass
<b>Level switching output</b>	
<b>Level switching output</b>	<b>K8</b>
Max. number:	2
Function:	NO/NC*
Max. voltage:	30 V DC
Max. switching current:	0.5 A
Max. contact load:	10 VA
Min. contact spacing:	40 mm
*NO= falling NC contact / NC = falling NO contact	
<b>Optional temperature</b>	
<b>Temperature</b>	<b>KT</b>
Detector:	PT100 Class B, DIN EN 60 751
Measuring range*:	0 °C to 100 °C
Operating voltage (UB):	10-30 V DC
Outlet:	4-20 mA
Max. burden Ω:	= (UB-7.5 V)/0.02 A
*Other measuring ranges available upon request	
<b>Adapter</b>	
OV:	Adapter to oval flange incl. seal and locking nut
G1:	Adapter G3/4 to G1

Dimensions

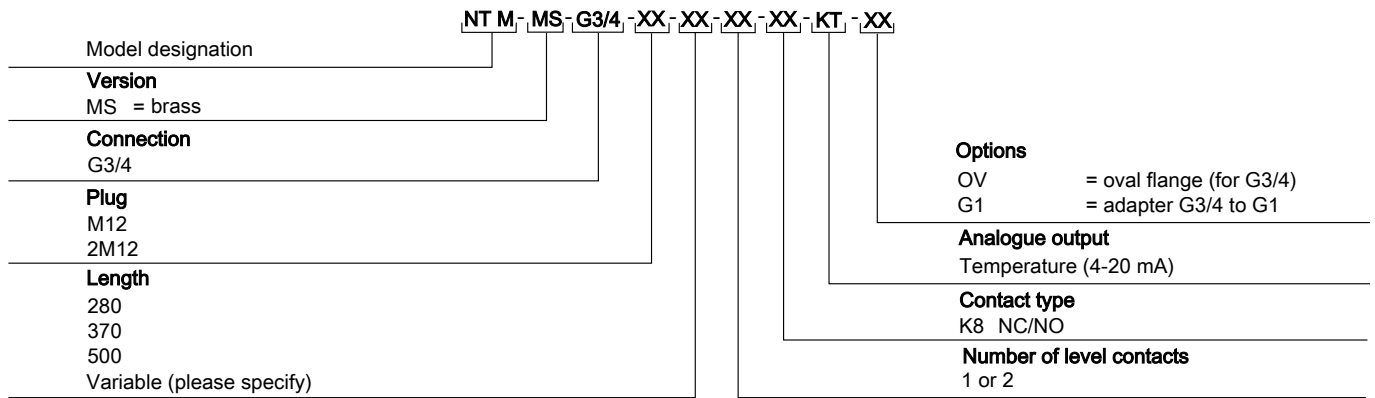


Connector NT M with analogue output for temperature

Connector	M12	2 x M12
Number of pins	4-pin	2 x 4-pin
DIN EN	61076-2-101	175201-804
Connection schematic	<p>1 x level contact and analogue output</p>	<p>2 x level contact and analogue output</p>
		<p>Connector A</p> <p>Connector B</p>

## Ordering instructions NT M with analogue output for temperature

### Model key



### Ordering example

You require:           Level switch with G3/4 connector, brass version, length 500 mm,  
                                   2 x level contact, 100 mm NC, 450 mm NO  
                                   Temperature output 0-100 °C = 4-20mA and 2 x M12 connector

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Order                       NT M-MS-G3/4-2M12/500-2K-KT-100NC-450NO

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## Technical Data NT MD

Version	MS
Operating pressure:	max. 1 bar
Operating temperature:	-20 °C to +80 °C
Float:	SK 161
Min. fluid density:	0.80 kg/dm <sup>3</sup>
Lengths:	280, 370, 500 mm (standard) variable to max. 1000 mm
Weight at L=280 mm:	approx. 500 g

### Material

Float:	NBR
Immersion tube:	brass
G3/4 connection:	brass

### Level switching output

	K8
Number max.:	2 (not adjustable)
Function:	NO/NC*
Max. voltage:	30 V DC
Max. switching current:	0.5 A
Max. contact load:	10 VA
Min. contact spacing:	40 mm
*NO= falling NC contact / NC = falling NO contact	

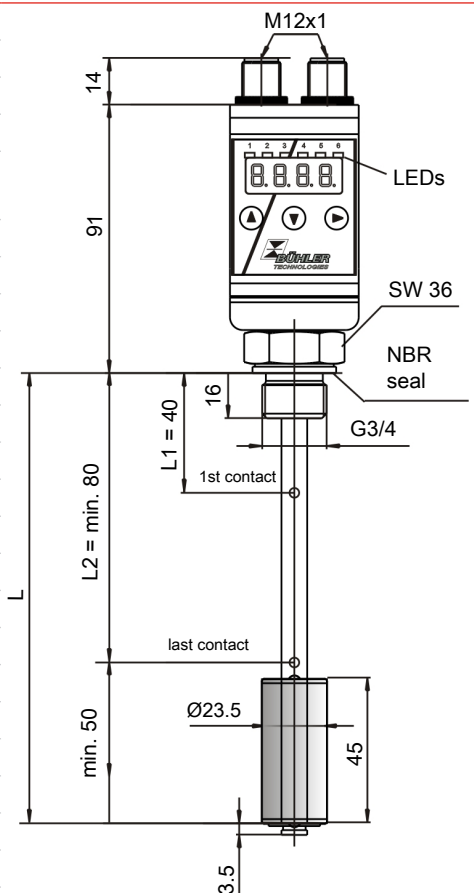
### Temperature display electronics

Display:	4 character 7 segment LED
Operation:	via 3 keys
Memory:	min./max. data memory
Starting current input:	approx. 100 mA for 100 ms
Current input during operation:	approx. 50 mA (without current- and switching outputs)
Supply voltage (U <sub>B</sub> ):	10–30 V DC (nominal voltage 24 V DC)
Ambient temperature:	-20 °C to +70 °C
Temperature display units:	°C/°F
Display range:	-20 °C to +120 °C
Alarm setting range:	0 °C to 100 °C
Display accuracy:	± 1 % from end value
Measuring principle:	Pt 100 Class B, DIN EN 60751, resolution 0.5 °C

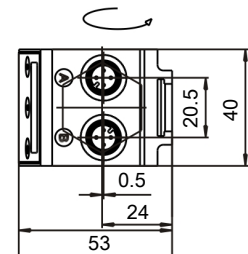
### Adapter

OV:	adapter to oval flange incl. seal and locking nut
G1:	adapter G3/4 to G1

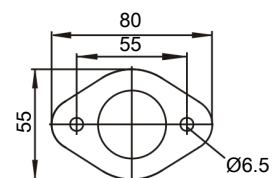
## Dimensions



Housing swivels 270°



### Oval flange



## Temperature outputs NT MD

Choose from the following temperature outputs:

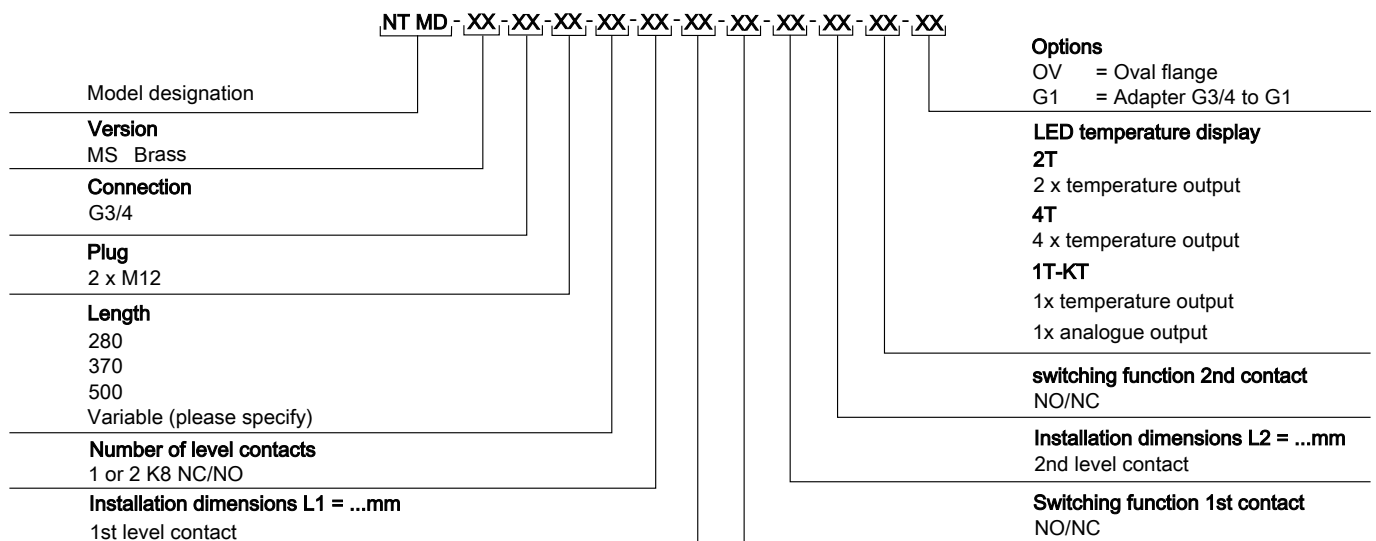
	2T	1T-KT	4T
Plug (base)	2 x M12 – 4-pin	2 x M12 – 4-pin	1 x M12 – 4-pin 1 x M12 – 8-pin
<b>Switching outputs</b>	2 x freely programmable*	1 x freely programmable*	4 x freely programmable*
Alarm memory	1 switching output assignable to alarm logbook	1 switching output assignable to alarm logbook	1 switching output assignable to alarm logbook
max. switching current**	0.5 A per output continuous short-circuit protected	0.5 A per output continuous short-circuit protected	0.5 A per output continuous short-circuit protected
Contact load	max. 1 A total	max. 1 A total	max. 1 A total
Analog output		1 x 4 – 20 mA, 2 - 10 V DC, 0 - 10 V DC, 0 - 5 V DC	
Max. burden $\Omega$ as current output		$= (U_b - 8 \text{ V})/0.02 \text{ A}$	
Min. input load as voltage output		10 k $\Omega$	

\*Switching output 1 + 2 also programmable as frequency output 1-100 Hz.

\*\*Output 1 max. 0.2 A.

## NT MD ordering instructions

### Model key



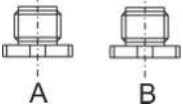
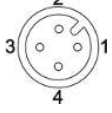
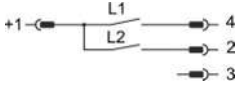
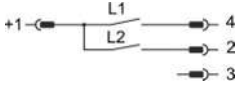
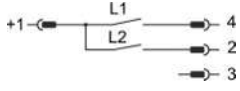
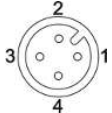
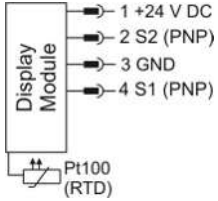
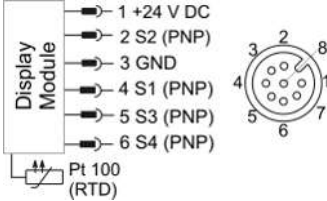
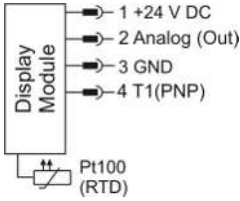
### Ordering example

You require: Level switch with G3/4 connection, brass, length L= 500 mm, 2 level contacts, 1st contact 100 mm NC, 2nd contact 450 mm NO, Temperature analysis with display and 2 programmable outputs.

Order NT MD-MS-G3/4-2M12 / 500-2K-100NC-450NO-2T



Standard pin assignment NT MD

Standard pin assignment	2T	4T	1T-KT
 <p>Diagrams showing the physical connectors for Plug A and Plug B.</p>	<p>Level contact(s) 2x temperature output</p>	<p>Level contact(s) 4x temperature output</p>	<p>Level contact(s) 1x temperature output 1x analogue output</p>
<p>Plug A level</p>  <p>Diagram showing the pin assignment for Plug A level: Pin 1, Pin 2, Pin 3, Pin 4.</p>	 <p>Circuit diagram for 2T level output showing L1 and L2 contacts connected to pins 4, 2, and 3.</p>	 <p>Circuit diagram for 4T level output showing L1 and L2 contacts connected to pins 4, 2, and 3.</p>	 <p>Circuit diagram for 1T-KT level output showing L1 and L2 contacts connected to pins 4, 2, and 3.</p>
<p>Plug B temperature</p>  <p>Diagram showing the pin assignment for Plug B temperature: Pin 1, Pin 2, Pin 3, Pin 4.</p>	 <p>Display Module pin assignment for 2T: 1 +24 V DC, 2 S2 (PNP), 3 GND, 4 S1 (PNP). Includes Pt100 (RTD) sensor.</p>	 <p>Display Module pin assignment for 4T: 1 +24 V DC, 2 S2 (PNP), 3 GND, 4 S1 (PNP), 5 S3 (PNP), 6 S4 (PNP). Includes Pt 100 (RTD) sensor and an 8-pin connector diagram.</p>	 <p>Display Module pin assignment for 1T-KT: 1 +24 V DC, 2 Analog (Out), 3 GND, 4 T1 (PNP). Includes Pt100 (RTD) sensor.</p>