

# 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.

For level monitoring, model **NT-M** can be equipped with up to four adjustable, bistable level contacts or max. two level and two different temperature contacts, Pt100 or analogue output (4-20mA) for the temperature.

Model **NT-MD** features two level contacts fixed to specification and an LED display to indicate the temperature with up to four programmable switching outputs, or optionally one continuously analogue output and one switching output.

The configuration of the unit can be password protected.

### 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, highly dynamic float system

Brass or stainless steel housing

### NT-MD

Vessel connections G3/4, G1 or oval flange

Fixed fill level monitor switching outputs

Standardised VDMA-based menu structure

Up to four programmable temperature switching outputs

Alternatively, one continuous temperature output signal, plus one 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 (14.5 psi)*	max. 1 bar (14.5 psi)
Operating temperature:	-20 °C to +80 °C (-4 °F to 176 °F)	-20 °C to +80 °C (-4 °F to 176 °F)
Float:	SK 161	SK 161
Min. fluid density:	0.80 kg/dm <sup>3</sup> (0.029 lb/in <sup>3</sup> )	0.80 kg/dm <sup>3</sup> (0.029 lb/in <sup>3</sup> )
Lengths (all versions):	280, 370, 500 mm (standard) (11, 14.6, 19.7 in) variable to max. 1000 mm (39.4 in)	
Weight at L=500 mm (19.7 in):	approx. 300 g (0.7 lb)	approx. 350 g (0.8 lb)

\* 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 DC/V AC	48 V AC/V DC
Max. switching current:	0.5 A	0.5 A
Max. contact load:	10 VA	20 VA
Min. contact spacing:	40 mm (1.6 in)	40 mm (1.6 in)

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

Optional temperature

Temperature contact:	TM xx	
Max. voltage:	230 V DC	
Max. switching current:	2 A	
Max. contact load:	100 VA	
Function:	NC	NO
Switching point °C (°F):	50/60/70/80 (122/140/158/176)	50/60/70/80 (122/140/158/176)
Switching point tolerance:	± 5 K (± 9 Ra)	± 5 K (± 9 Ra)
Max. hysteresis:	18 K ± 5 K (32.4 Ra ± 9 Ra)	26/35/40/45 K ± 5 K (47/63/72/81 Ra ± 9 Ra)

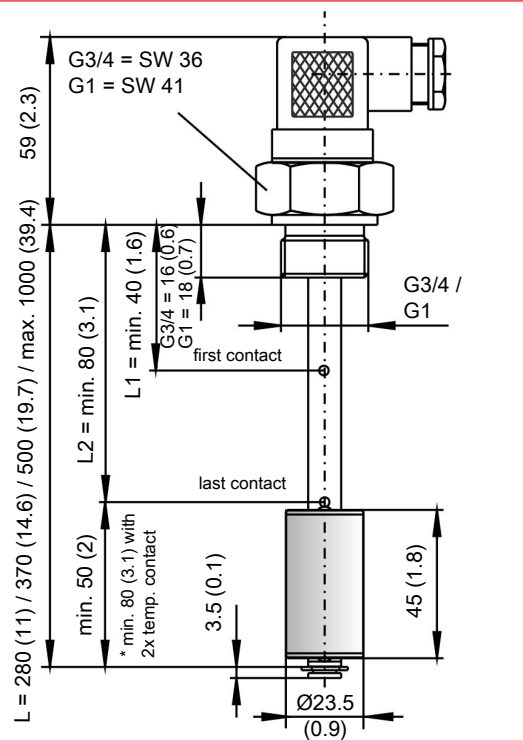
Temperature sensor

Pt100:	DIN EN 60 751 (tolerance ± 0.8 °C/1.4 °F)
Analogue output:	See "Technical Data NT-M with Analogue Output for Temperature"

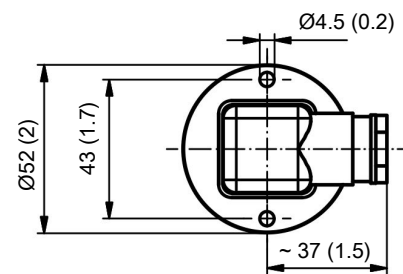
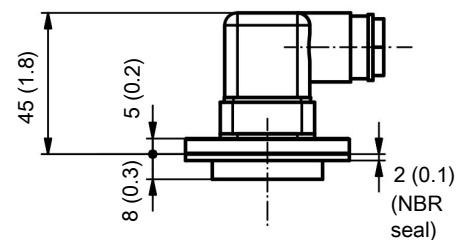
Adapter

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

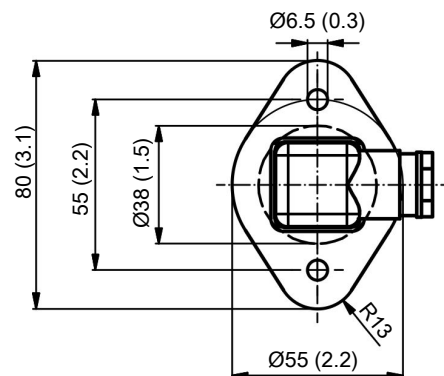
Dimensions



Flange style



Oval flange



## NT-M ordering instructions

### Model key

	NT M	XX	XX	XX	XX	XX	XX	A	B	XX	
Model designation											
<b>Version</b>											
MS = brass											
VA = stainless steel											
<b>Connection</b>											
G3/4											
G1*											
FL*											
OV*											
<b>Plug**</b>											
M3											
GS4***											
M12											
C7***											
<b>Length</b>											
280 (11 in)											
370 (14.6 in)											
500 (19.7 in)											
Variable (please specify)											
<b>Number of level contacts</b>											
1-4											
<b>Contact type</b>											
K8 NC/NO											
W9 change-over contact (max. 2)											
<b>Options</b>											
OV = oval flange (for G3/4)											
G1 = adapter G3/4 to G1											
<b>2nd Temperature contact</b> (double temperature contact only)											
<i>NC contact</i>											
TM50NC											
TM60NC											
TM70NC											
TM80NC											
<i>NO contact</i>											
TM50NO = 50 °C (122 °F)											
TM55NO = 55 °C (131 °F)											
TM60NO = 60 °C (140 °F)											
TM70NO = 70 °C (158 °F)											
TM80NO = 80 °C (176 °F)											
<b>1st temperature signal</b>											
Pt100**** = temperature sensor											
<b>Temperature contact</b>											
<i>NC contact</i>											
TM50NC											
TM60NC											
TM70NC											
TM80NC											
<i>NO contact</i>											
TM50NO = 50 °C (122 °F)											
TM55NO = 55 °C (131 °F)											
TM60NO = 60 °C (140 °F)											
TM70NO = 70 °C (158 °F)											
TM80NO = 80 °C (176 °F)											

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

### Ordering example

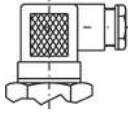
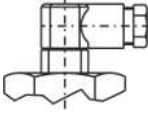
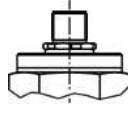

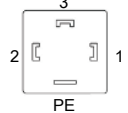
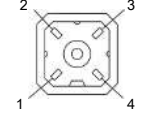
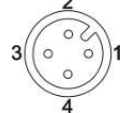
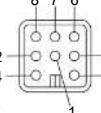
You require: Level switch with G3/4 connection, brass version, length L= 500 mm (19.7 in),  
2 level switches, 1st contact 100 mm (3.9 in) NC, 2nd contact 450 mm (17.7 in) NO

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

### NT-M Accessories

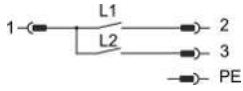
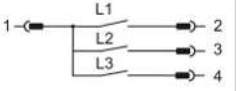
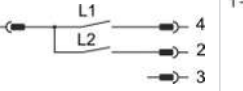
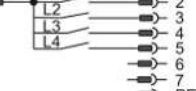
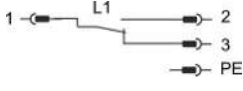
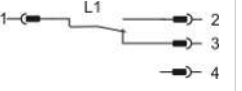
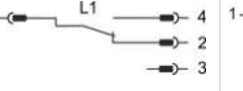
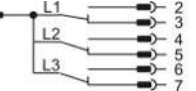
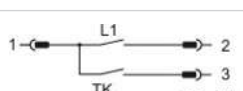
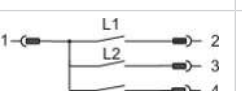


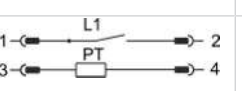

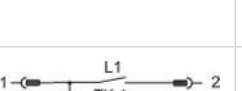

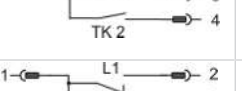
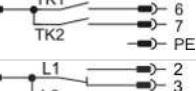
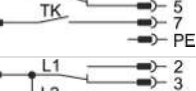
Item no.	Description
9144 05 0010	Connecting cable M12x1, 4-pin, 1.5 m (4.9 ft), angular coupling and straight plug
9144 05 0046	Connecting cable M12x1, 4-pin, 3.0 m (9.8 ft), angular coupling and straight plug
9144 05 0047	Connecting cable M12x1, 4-pin, 5.0 m (16.4 ft), angular coupling and strands

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

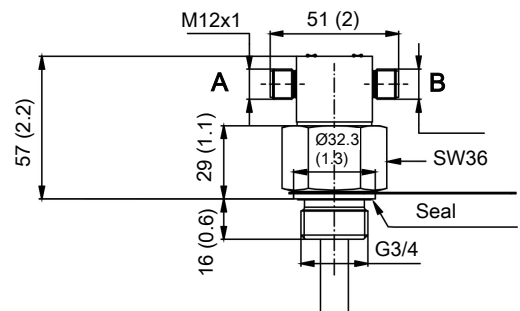
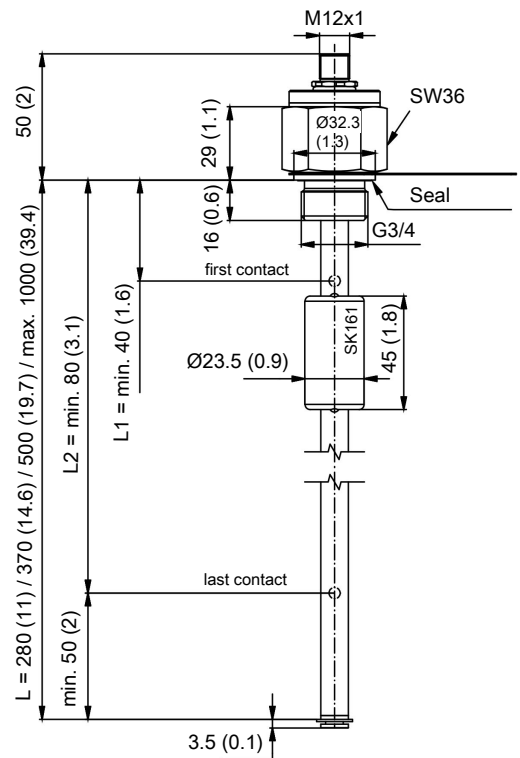
	M3	GS4	M12	C7
K8 Level contact(s)				
W9 Level contact(s)				
K8 Level contact(s) and temperature contact				
K8 / Pt100 Level- and temperature sensor				
K8 Level- and temperature contact(s)				
W9 Level contact(s) and temperature contact				
W9 / Pt100 Level- and temperature sensor				

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>Max. number:</b>	<b>2</b>
<b>Function:</b>	<b>NO/NC*</b>
<b>Max. voltage:</b>	<b>30 V DC</b>
<b>Max. switching current:</b>	<b>0.5 A</b>
<b>Max. contact load:</b>	<b>10 VA</b>
<b>Min. contact spacing:</b>	<b>40 mm (1.6 in)</b>
<i>*NO= falling NC contact / NC = falling NO contact</i>	
<b>Optional temperature</b>	
<b>Temperature</b>	<b>KT</b>
<b>Detector:</b>	<b>PT100 Class B, DIN EN 60 751</b>
<b>Measuring range*:</b>	<b>0 °C to 100 °C (32 °F to 212 °F)</b>
<b>Operating voltage (UB):</b>	<b>10-30 V DC</b>
<b>Outlet:</b>	<b>4-20 mA</b>
<b>Max. burden Ω:</b>	<b>= (UB-7.5 V)/0.02 A</b>
<i>*Other measuring ranges available upon request</i>	
<b>Adapter</b>	
<b>OV:</b>	Adapter to oval flange incl. seal and locking nut
<b>G1:</b>	Adapter G3/4 to G1

Dimensions

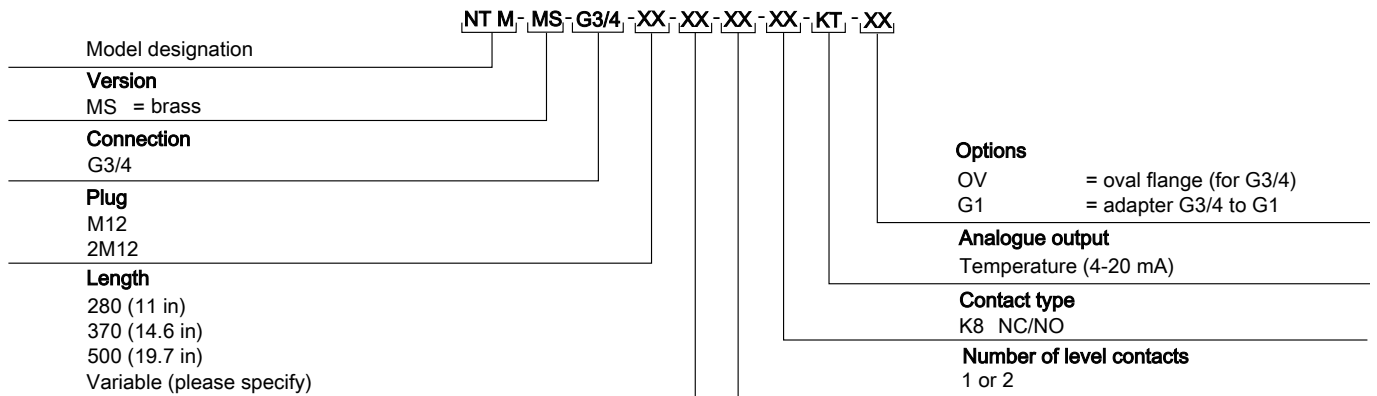


Connector NT-M with analogue output for temperature

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>Connector A: +1 to L1, Pin 2 to 4, Pin 3 to 2</p> <p>Connector B: +1 to KT, Pin 2 to 3, Pin 3 to 4</p>
	<p>2 x level contact and analogue output</p>	<p>Connector A: +1 to L1, Pin 2 to L2, Pin 3 to 3</p> <p>Connector B: +1 to KT, Pin 2 to 2, Pin 3 to 3, Pin 4 to 4</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 (19.7 in),  
                                   2 x level contact, 100 mm (3.9 in) NC, 450 mm (17.7 in) NO  
                                   Temperature output 0-100 °C (32-212 °F) = 4-20 mA and 2 x M12 connector

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



**Temperature outputs NT-MD**

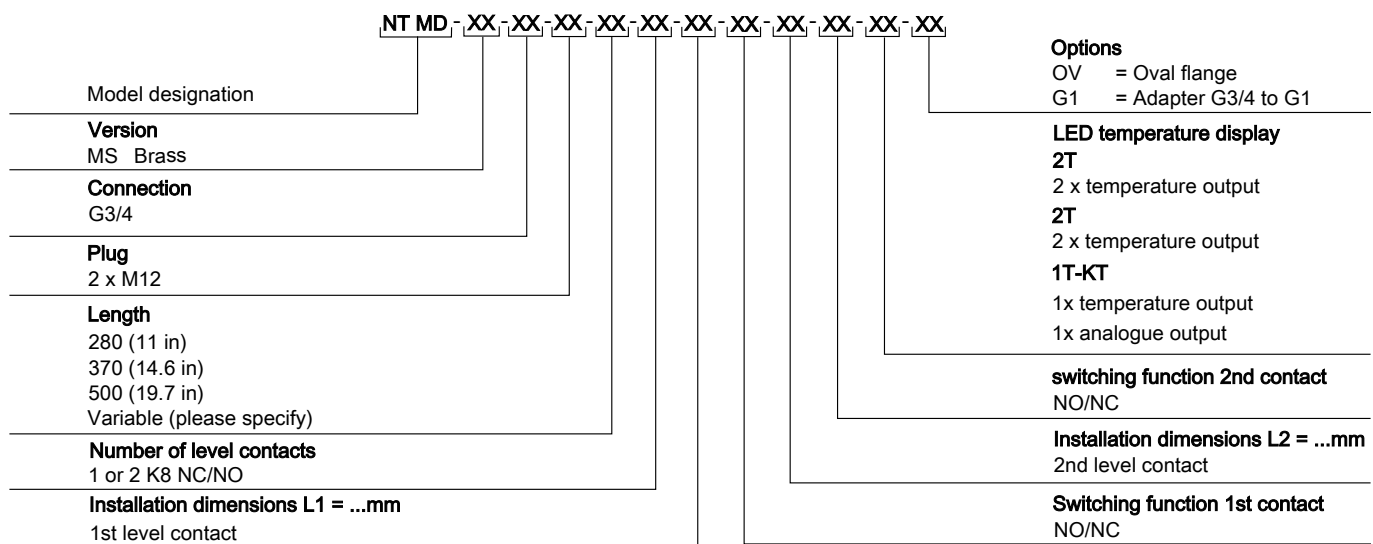
Choose from the following temperature outputs:

	<b>2T</b>	<b>4T</b>	<b>1T-KT</b>
Plug (base)	2 x M12 – 4-pin	1 x M12 – 4-pin 1 x M12 – 8-pin	2 x M12 – 4-pin
<b>Switching outputs</b>	2 x freely programmable*	4 x freely programmable	1 x freely programmable*
Alarm memory	1 switching output assignable to alarm logbook	1 switching output assignable to alarm logbook	with 1x 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
Analogue output	0 – 100 Hz	0 – 100 Hz	1 x 4 – 20 mA, 2-10 V DC, 0-10 V DC, 0-5 V DC
Max. burden $\Omega$ as current output			$= (U_b - 8 V) / 0.02 A$
Min. input load as voltage output			10 k $\Omega$

\*also programmable as frequency output

**NT-MD ordering instructions**

**Model key**



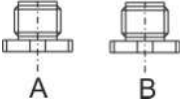
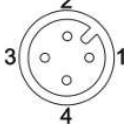
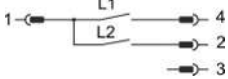
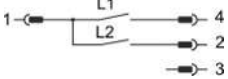
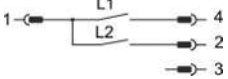
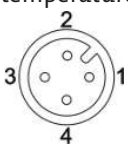
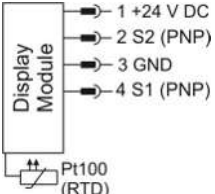
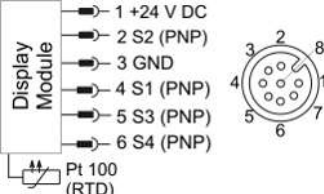
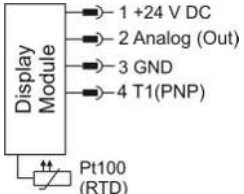
**Ordering example**

You require: Level switch with G3/4 connection, brass, length L= 500 mm (19.7 in), 2 level contacts, 1st contact 100 mm (3.9 in) NC, 2nd contact 450 mm (17.7 in) 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 layout of 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 is the center contact, Pin 2 is the top contact, Pin 3 is the left contact, and Pin 4 is the bottom contact.</p>	 <p>Wiring diagram for 2T: Pin 1 is connected to L1, Pin 2 to L2, Pin 3 to 3, and Pin 4 to 4.</p>	 <p>Wiring diagram for 4T: Pin 1 is connected to L1, Pin 2 to L2, Pin 3 to 3, and Pin 4 to 4.</p>	 <p>Wiring diagram for 1T-KT: Pin 1 is connected to L1, Pin 2 to L2, Pin 3 to 3, and Pin 4 to 4.</p>
<p>Plug B temperature</p>  <p>Diagram showing the pin assignment for Plug B temperature: Pin 1 is the center contact, Pin 2 is the top contact, Pin 3 is the left contact, and Pin 4 is the bottom contact.</p>	 <p>Wiring diagram for 2T with Display Module: Pin 1 is +24 V DC, Pin 2 is S2 (PNP), Pin 3 is GND, and Pin 4 is S1 (PNP). A Pt100 (RTD) is connected to the module.</p>	 <p>Wiring diagram for 4T with Display Module: Pin 1 is +24 V DC, Pin 2 is S2 (PNP), Pin 3 is GND, Pin 4 is S1 (PNP), Pin 5 is S3 (PNP), and Pin 6 is S4 (PNP). A Pt 100 (RTD) is connected to the module. An 8-pin connector diagram is also shown.</p>	 <p>Wiring diagram for 1T-KT with Display Module: Pin 1 is +24 V DC, Pin 2 is Analog (Out), Pin 3 is GND, and Pin 4 is T1 (PNP). A Pt100 (RTD) is connected to the module.</p>