

# Level- and temperature switch

## Nivotemp NT 61, NT 61D, NT 61-HT

In hydraulics and lubrication technology the fill level of oil tanks needs to be monitored continuously. Here, modern factory automation requires compatible signals. Despite central system control, visualising the current level on the actual tanks is often desired. To minimise production costs and the space required on containers, it makes sense to use one monitor for both e.g. the fill level and oil temperature. The Nivotemp series meets virtually all requirements arising in this area of application.

### NT 61

Connecting flange as per DIN 24557 Part 2

Various plug options

Up to 4 switching outputs for liquid level or 2 switching outputs for liquid level plus Pt100 or analog output for temperature

Proven and tested highly dynamic float system

Immersion tube length up to 1.5 m (longer upon request)

suitable for up to 230 V DC (varies by version)

NT 61-HT (used for HFC+HFA oils) for temperatures up to 150 °C

### NT 61D

LED display swivels 270°

Up to 4 programmable temperature switching outputs

Alternatively, continuous temperature signal plus one freely programmable switching output)

Characteristics of switching outputs configurable as frequency output (1-100 Hz)

Standard menu structure based on VDMA standard sheet 24574 ff.

Min/max memory, logbook function



**Technical Data NT 61**

**Basic Unit**

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 610	SK 221
Min. fluid density	0.80 kg/dm <sup>3</sup>	0.85 kg/dm <sup>3</sup>
Lengths (all versions)	280, 370, 500 mm (Standard) variable to max. 1500 mm	

Material/Version	MS	VA
Float	rigid PU	1.4571
Immersion tube	Brass	1.4571
Flange (DIN 24557)	PA	PA
Weight at L=280 mm	approx. 200 g	approx. 300 g
Each 100 mm add	approx. 30 g	approx. 50 g

**Includes:**

Mounting screws (quantity 6) and rubberised cork seal.

**Options**

Stilling tube (SSR)	Brass	VA
<b>Level switching output</b>	<b>K10</b>	<b>W11</b>
Function	NO / NC*	Change-over contact
Voltage max.	230 V DC	48 V DC
Switching current max.	0.5 A	0.5 A
Contact load max.	10 VA	20 VA
Min. contact spacing	40 mm	40 mm

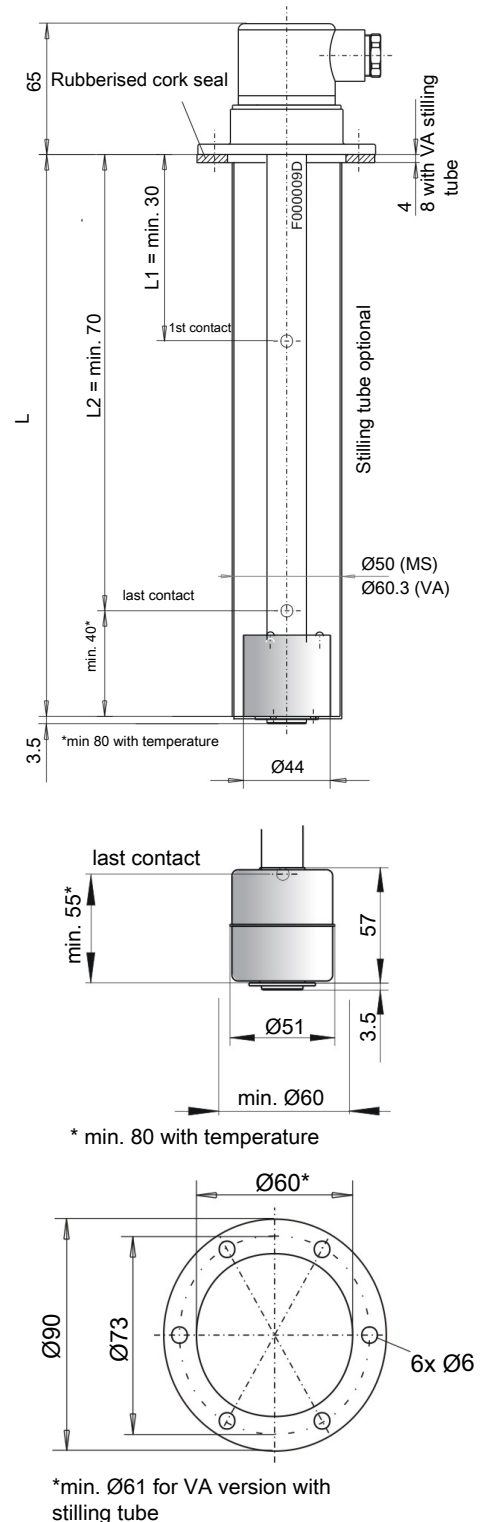
\*NO = falling NC contact / NC = falling NO contact

Temperature contact	TK	TM
Number of temp. contacts	1	2
Voltage max.	230 V DC	230 V DC
Switching current max.	2.5 A	2 A
Contact load max.	100 VA	100 VA

Function	NC*	NC*
Switching point °C	50 / 60 / 70 / 80	50 / 60 / 70 / 80
Switching point tolerance	± 3 K	± 5 K
Hysteresis max.	10 K ± 3 K	18 K ± 5 K
Function	NO*	NO*
Switching point °C	50 / 60 / 70 / 80	50/60/70/80
Switching point tolerance	± 3 K	± 5 K
Hysteresis max.	10 K ± 3 K	26/35/40/45 K ± 5 K

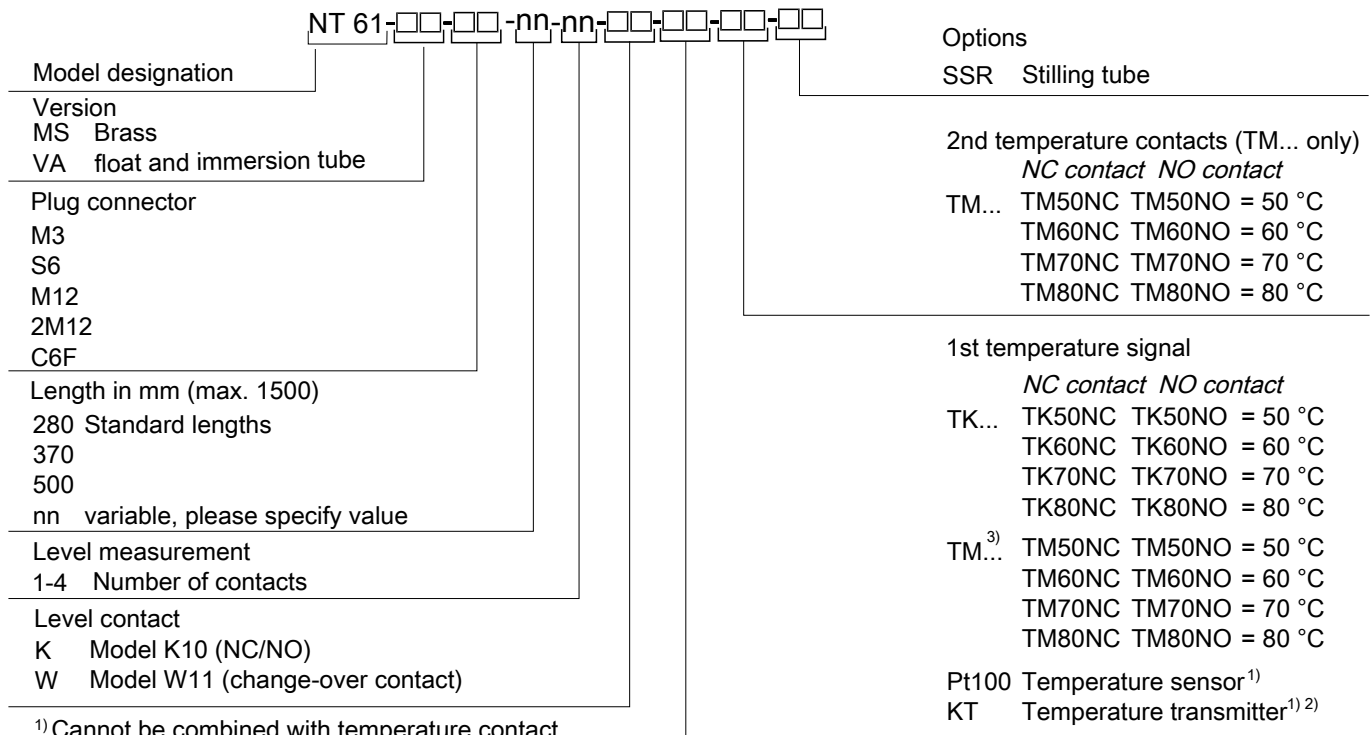
\*NO= NO contact / NC = NC contact Other temperatures and versions with 2 x TK contact available upon request

Temperature signal	
Temperature sensor	Pt 100 Class B, DIN EN 60 751 Tolerance ±0.8 °C
<b>Temperature transmitter</b>	<b>KT</b>
Temperature sensor	Pt100 Class B, DIN EN 60 751
Measuring range	0 °C to +100 °C
Operating voltage (U <sub>B</sub> )	10 - 30 V DC
Output	4 - 20 mA
Burden Ω max.	= (U <sub>B</sub> - 7.5 V) / 0.02 A
Accuracy	± 1 % from end value
Other measuring ranges available upon request	



Ordering instructions NT 61

Model key



<sup>1)</sup> Cannot be combined with temperature contact  
<sup>2)</sup> With KT only 10 - 30 V DC  
<sup>3)</sup> For version with 2 temperature contacts

Ordering example

You require: Level switch MS version, plug connector S6, length L= 550 mm, 2 level contacts (NO/NC) and temperature contact 80 °C as NC contact, 1st contact 100 mm NC, 2nd contact 470 mm NO

Order NT 61-MS-S6-550-2-K-T80NC, L1=100 NC L2=470 NO

Standard pin assignment NT 61

Plug connection

	M3	S6	C6F	M12	2xM12
Dimensions					
Number of pins	3-pin + PE	6-pin + PE	6-pin + PE	4-pin	4-pin / 4-pin
DIN EN	175301-803	175201-804	175301-804	61076-2-101	61076-2-101
Voltage max.	230 V AC / DC*	230 V AC / DC*	230 V AC / DC*	30 V DC	30 V DC
Degree of protection	IP65	IP65	IP65	IP67**	IP67**
Cable fitting	PG 11	M20 x 1.5	PG 11		
Max. number of contacts					
Level/temp. contacts	1 x K10 / 1 x TK - / - - / -	3 x K10 / 1 x TK 2 x K10 / 2 x TM 1 x W11 / 1 x TK 1 x W11 / 2 x TM	3 x K10 / 1 x TK 2 x K10 / 2 x TM 1 x W11 / 1 x TK 1 x W11 / 2 x TM	1 x K10 / 1 x TK - / - - / -	3 x K10 / 1 x TK 2 x K10 / 2 x TM 1 x W11 / 1 x TK 1 x W11 / 2 x TM
Level contacts only	2 x K10 1 x W11	4 x K10 2 x W11	4 x K10 2 x W11	2 x K10 1 x W11	4 x K10 2 x W11

\*Max. 48 V AC/ V DC with change-over contact. \*\* With moulded cable box. Other plug connections available upon request

	M3	S6	C6F	M12 (base)	2 x M12 (base)	
Connection schematic						
K10 Level contact(s)						
W11 Level contact(s)						
K10 Level- and tem- perature contact						
W11 Level- and tem- perature contact(s)						
K10 / Pt100 Level- and tem- perature contact(s)						
K10 Level and 2 x temperature con- tact(s)						
W11 Level and 2 x temperature con- tact(s)						

The standard assignment specified here refers to the max. number of contacts possible and contact function NO (contact type K10).

Technical Data NT 61D

Basic Unit

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 610	SK 221
Min. fluid density	0.80 kg/dm <sup>3</sup>	0.85 kg/dm <sup>3</sup>
Lengths (all versions)	280, 370, 500 mm (Standard) variable to max. 1500 mm	

Material/Version	MS	VA
Display housing	PA	PA
Float	rigid PU	1.4571
Immersion tube	Brass	1.4571
Flange (DIN 24557)	PA	PA
Weight at L=280 mm	approx. 200 g	approx. 300 g
Each 100 mm add	approx. 30 g	approx. 50 g

Level switching output	K10
Max. number	2
Function	NO / NC*
Voltage max.	30 V DC
Switching current max.	0.5 A
Contact load max.	10 VA
Min. contact spacing	40 mm

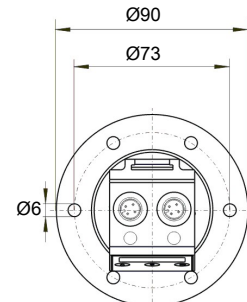
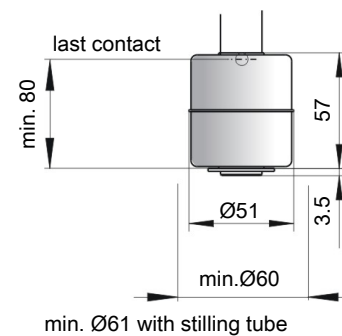
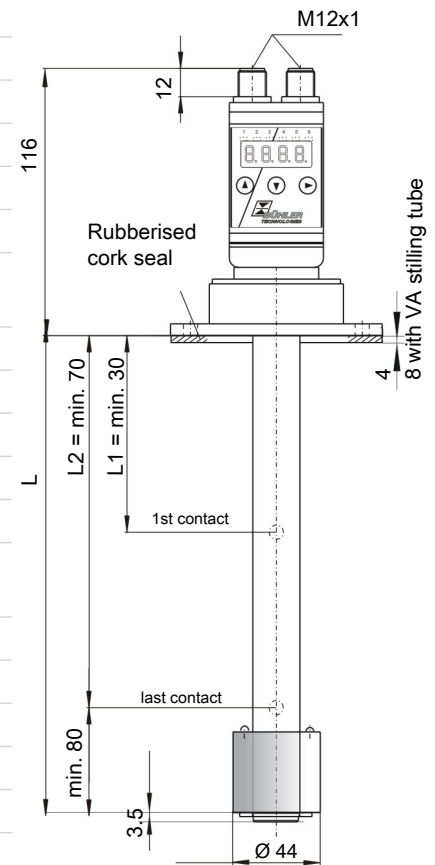
\*NO = falling NC contact / NC = falling NO contact

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
Display units	Temperature °C / °F
Display range	-20 °C to +120 °C
Alarm setting range	0 °C to 100 °C
Display accuracy	± 1 % from end value
Temperature sensor	Pt 100 Class B, DIN EN 60 751 Tolerance ±0.8 °C

Includes

Mounting screws (quantity 6), rubberised cork seal



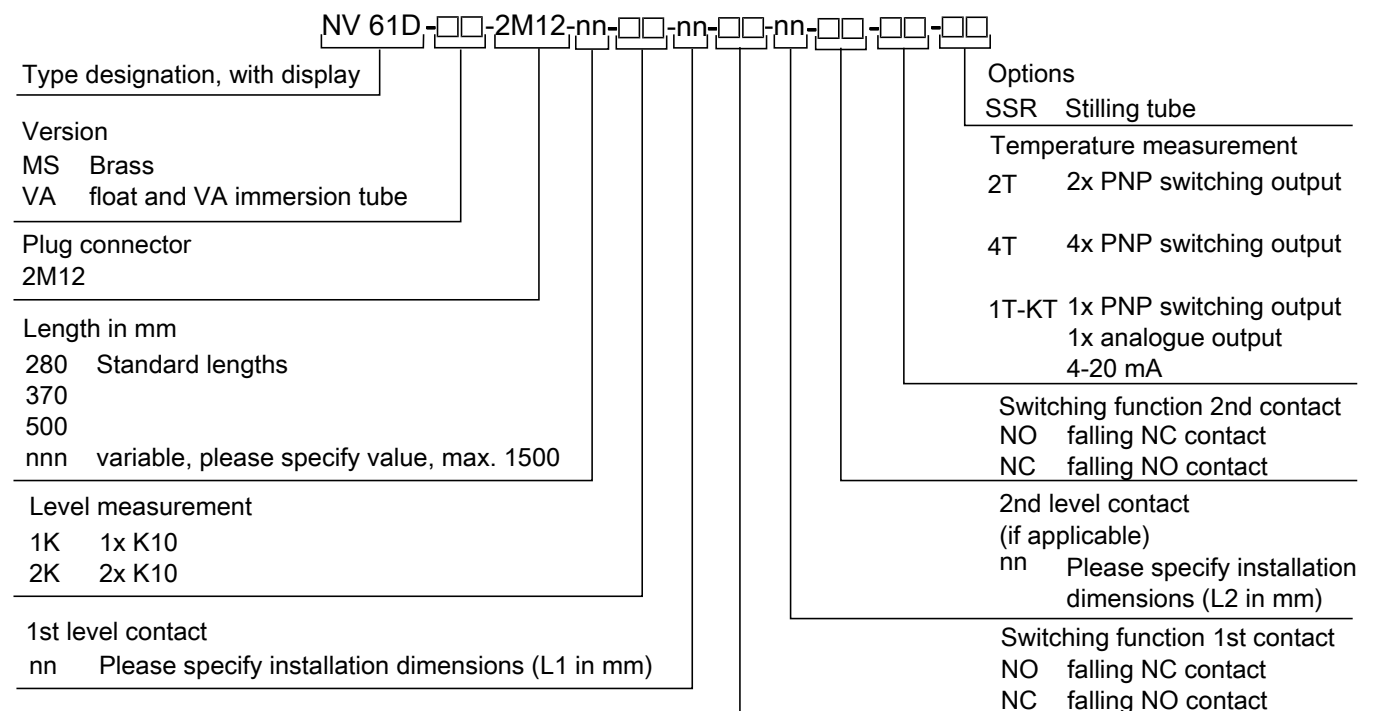
Alternative temperature outputs	-2T	-1T-KT	-4T
Plug (base)	2 x M12 – 4-pin	2 x M12 – 4-pin	1 x M12 – 4-pin 1 x M12 – 8-pin
Switching outputs	2 x freely programmable*	1 x freely programmable*	4 x freely programmable
Alarm memory		with 1 x assignable to alarm logbook	with 1 x assignable to alarm logbook
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		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 $\Omega$	
<b>Options:</b> Stilling tube SSR (same material as immersion tube)			

\*also programmable as frequency output

\*\*Output 1 max. 0.2 A.

## Ordering instructions NT 61D

### Model key



### Accessories

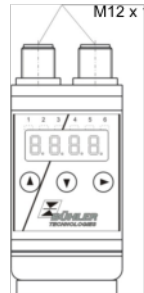
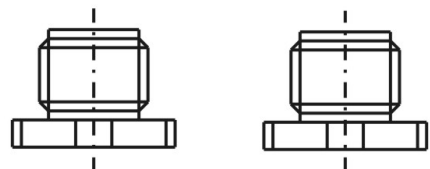
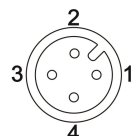
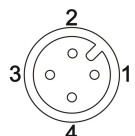
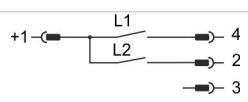
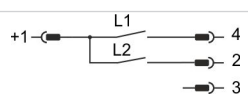
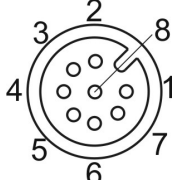
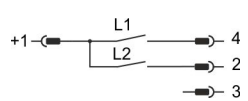
Item no. 4-pin	Item no. 8-pin	Description
9144 05 0010	9144 05 0048	Connecting cable M12x1, 1.5 m, angular coupling and straight plug
9144 05 0046	9144 05 0049	Connecting cable M12x1, 3.0 m, angular coupling and straight plug
9144 05 0047	9144 05 0033	Connecting cable M12x1, 5.0 m, angular coupling and strands

### Ordering example

You require:	Level switch VA version, length L= 550 mm, 2 level contacts: 1st contact 100 mm NC, 2nd contact 470 mm NO, 1 temperature output, 1 analog output, stilling tube
Order	NT 61D-VA-2M12-550-2K-100- NC-470-NO-1T-KT-SSR

Standard pin assignment NT 61D

Plug connection

Dimensions	<p>2 x M12 (base)</p> 															
Number of pins	4-pin / 4-pin															
DIN EN	61076-2-101															
Voltage max.	30 V DC															
																
Connection schematic	<p>Plug A (level)</p> 	<p>Plug B (temperature)</p> 														
<p><b>2T</b> 2 x temperature output</p>		<table border="1"> <thead> <tr> <th>Pin</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+24 V DC</td> </tr> <tr> <td>2</td> <td>S2 (PNP)</td> </tr> <tr> <td>3</td> <td>GND</td> </tr> <tr> <td>4</td> <td>S1 (PNP)</td> </tr> </tbody> </table>	Pin		1	+24 V DC	2	S2 (PNP)	3	GND	4	S1 (PNP)				
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Technical Data NT 61-HT

Basic Unit

Operating pressure	max. 1 bar
Operating temperature	-20 °C to +80 °C
Float	SK 221
Min. fluid density	0.85 kg/dm <sup>3</sup>
Lengths (all versions)	280, 370, 500 mm (Standard) variable to max. 1500 mm

Material/Version

Float	1.4571
Immersion tube	1.4571
Flange (DIN 24557)	1.4571
Weight at L=280 mm	approx. 950 g
Each 100 mm add	approx. 50 g

Includes:

Mounting screws (quantity 6) and rubberised cork seal.

Options

Stilling tube (SSR) Same material as immersion tube

Level switching contact

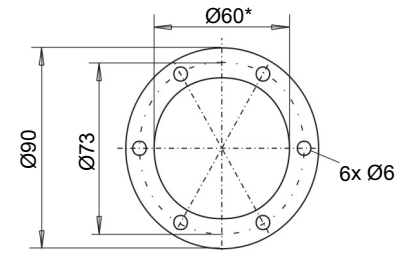
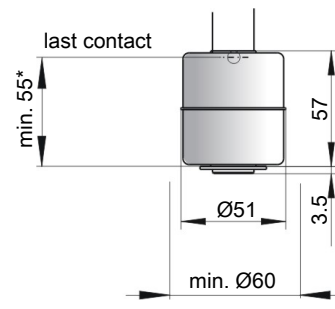
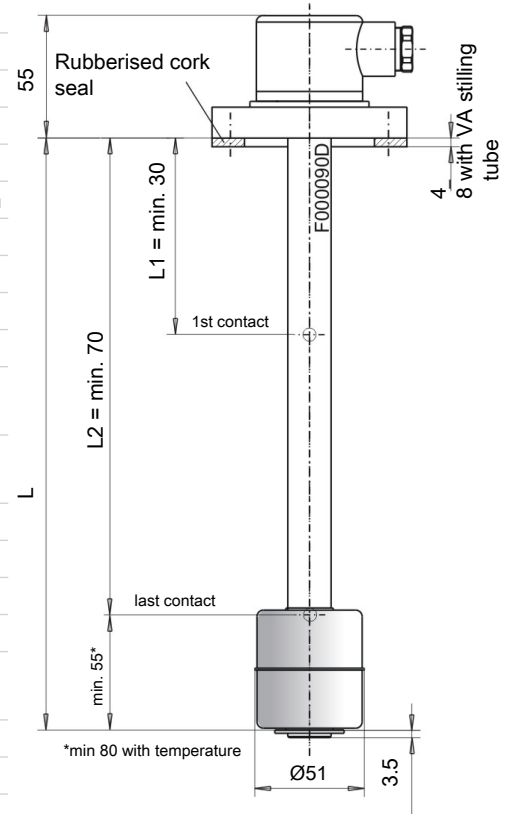
	K10	W11	K10HT**	W11HT**
Function	NO / NC*	Change-over contact	NO / NC*	Change-over contact
Voltage max.	230 V DC	48 V AC	230 V DC	48 V DC
Switching current max.	0.5 A	0.5 A	0.5 A	0.5 A
Contact load max.	10 VA	20 VA	10 VA	20 VA
Min. contact spacing	40 mm	40 mm	40 mm	40 mm
Operating temperature	105 °C	105 °C	150 °C	150 °C

\*NO= falling NC contact / NC = falling NO contact \*\*HT= not adjustable

Optional temperature switching outputs

Temperature contact	TK	TM
Number of temp. contacts	1	2
Voltage max.	230 V DC	230 V DC
Switching current max.	2.5 A	2 A
Contact load max.	100 VA	100 VA
Function	NC*	NC*
Switching point °C	50 / 60 / 70 / 80	50 / 60 / 70 / 80
Switching point tolerance	± 3 K	± 5 K
Hysteresis max.	10 K ± 3 K	18 K ± 5 K
Function	NO*	NO*
Switching point °C	50 / 60 / 70 / 80	50/60/70/80
Switching point tolerance	± 3 K	± 5 K
Hysteresis max.	10 K ± 3 K	26/35/40/45 K ± 5 K

\*NO = NO contact / NC = NC contact Data for rising temperature. Other temperatures and version with 2 x TK contact available upon request.



\*min. Ø61 for VA version with stilling tube



## Optional temperature signal

Temperature sensor Pt 100 Class B, DIN EN 60 751 Tolerance  $\pm 0.8\text{ }^{\circ}\text{C}$

## Temperature transmitter

Temperature sensor Pt100 Class B, DIN EN 60 751

Measuring range  $0\text{ }^{\circ}\text{C}$  to  $+100\text{ }^{\circ}\text{C}$

Operating voltage ( $U_B$ ) 10 - 30 V DC

Output 4 - 20 mA

Burden  $\Omega$  max. =  $(U_B - 7.5\text{ V}) / 0.02\text{ A}$

Accuracy  $\pm 1\%$  from end value

Other measuring ranges available upon request

## Ordering instructions NT 61-HT

### Model key

NT 61-□□-□□-nn-nn-□□-□□-□□-□□		Options
Model designation		SSR Stilling tube
Version		2nd temperature contacts (TM... only) NC contact NO contact
HT Stainless steel		TM... TM50NC TM50NO = $50\text{ }^{\circ}\text{C}$ TM60NC TM60NO = $60\text{ }^{\circ}\text{C}$ TM70NC TM70NO = $70\text{ }^{\circ}\text{C}$ TM80NC TM80NO = $80\text{ }^{\circ}\text{C}$
Plug connector		1st temperature signal NC contact NO contact
M3		TK... TK50NC TK50NO = $50\text{ }^{\circ}\text{C}$ TK60NC TK60NO = $60\text{ }^{\circ}\text{C}$ TK70NC TK70NO = $70\text{ }^{\circ}\text{C}$ TK80NC TK80NO = $80\text{ }^{\circ}\text{C}$
S6		TM <sup>5)</sup> TM50NC TM50NO = $50\text{ }^{\circ}\text{C}$ TM60NC TM60NO = $60\text{ }^{\circ}\text{C}$ TM70NC TM70NO = $70\text{ }^{\circ}\text{C}$ TM80NC TM80NO = $80\text{ }^{\circ}\text{C}$
M12		Pt100 Temperature sensor <sup>3)</sup>
2M12		KT Temperature transmitter <sup>3) 4)</sup>
C6F		
Length in mm (max. 1500)		
280 Standard lengths		
370		
500		
nnn variable, please specify value		
Level measurement		
1-4 Number of contacts <sup>1)</sup>		
<b>Level contact</b>		
K Model K10 (NC/NO)		
K-HT Model K10HT <sup>2)</sup> (NC/NO)		
W Model W11 (change-over contact)		
W-HT Model W11HT <sup>2)</sup> (change-over contact)		

1) Please specify position and switching function per model key

Example: L1 = nnn mm NC

2) Not adjustable

3) Cannot be combined with temperature contact

4) With KT only 10 - 30 V DC

5) For version with two temperature contacts

### 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

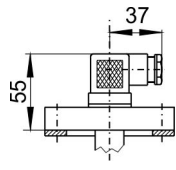
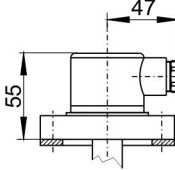
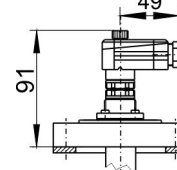
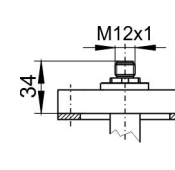
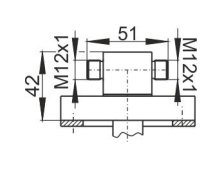
### Ordering example

You require: Level switch MS version, plug connector S6, length L= 550 mm, 2 level contacts (NO/NC) and temperature contact  $80\text{ }^{\circ}\text{C}$  as NC contact, 1st contact 100 mm NC, 2nd contact 470 mm NO

Order NT 61HT-M3-550-2-K-HAT-PT100-SSR, L1=100 NC L2=470 NO

**Standard pin assignment NT 61HT**

**Plug connection**

	<b>M3</b>	<b>S6</b>	<b>C6F</b>	<b>M12</b>	<b>2xM12</b>
Dimensions					
Number of pins	3-pin + PE	6-pin + PE	6-pin + PE	4-pin	4-pin / 4-pin
DIN EN	175301-803	175201-804	175301-804	61076-2-101	61076-2-101
Max. voltage	230 V AC / DC*	230 V AC / DC*	230 V AC / DC*	30 V DC	30 V DC
Degree of protection	IP65	IP65	IP65	IP67**	IP67**
Cable fitting	PG 11	M20 x 1.5	PG 11		
Max. Number of contacts					
Level/temp. contacts	1 x K10 / 1 x TK - / - - / -	3 x K10 / 1 x TK 2 x K10 / 2 x TM 1 x W11 / 1 x TK 1 x W11 / 2 x TM	3 x K10 / 1 x TK 2 x K10 / 2 x TM 1 x W11 / 1 x TK 1 x W11 / 2 x TM	1 x K10 / 1 x TK - / - - / -	3 x K10 / 1 x TK 2 x K10 / 2 x TM 1 x W11 / 1 x TK 1 x W11 / 2 x TM
Level contacts only	2 x K10 1 x W11	4 x K10 2 x W11	4 x K10 2 x W11	2 x K10 1 x W11	4 x K10 2 x W11

\*Max. 48 V AC/V DC for change-over contact. \*\* With moulded cable box. Other plug connections available upon request

	M3	S6	C6F	M12 (base)	2 x M12 (base)	
Connection schematic						
K10 Level contact(s)						
W11 Level contact(s)						
K10 Level- and tem- perature contact						
W11 Level- and tem- perature contact(s)						
K10 / Pt100 Level- and tem- perature contact(s)						
K10 Level and 2 x temperature con- tact(s)						
W11 Level and 2 x temperature con- tact(s)						

The standard assignment specified here refers to the max. number of contacts possible and contact function NO (contact type K10).