

Level- and temperature switch

Nivovent NV 74, NV 74D

The oil tank is the key component of hydraulic and lubrication systems. The operating oil is removed from the tank and then returned to it. Depending on what the system is used for, the levels in the oil tank can fluctuate to varying degrees. In most applications, the level fluctuations result in an exchange of the vapour phase above the oil level with the ambient air. Therefore, virtually all oil tanks are equipped with a so-called air breather, to prevent contaminants in the ambient air from entering the system.

To reduce costs and space requirements, a number of other system-related functions such as liquid level and temperature monitoring are also combined in the air breather in the Nivovent series.

NV 74

Connecting flange as per DIN 24557 Part 2

Wireless, adjustable level contacts

Qualified vent filter with replaceable element

Visual air breather monitoring optional

Various plug options

Up to 4 switching outputs or 2 switching outputs for liquid level plus bi-metal, Pt 100 or analog output for temperature

Proven and tested highly dynamic float system

24 V DC standard, 230 V DC upon request

NV 74D

LED display with switching output status

Standard menu structure based on VDMA standard sheet 24574 ff.

Two wireless, adjustable level contacts

Up to 4 programmable temperature switching outputs

Alternatively, continuous temperature output signal (configurable to current or voltage) plus one freely programmable switching output

Characteristics of switching output configurable as window or hysteresis

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

Min/max memory, logbook function



Technical Data NV 74

Basic unit

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 610	SK 221
Min. fluid density	0.80 kg/dm³ with float (0.029 lb/in³)	0.85 kg/dm³ with float (0.031 lb/in³)
Lengths	280 mm (11.02 in), 370 mm(14.57 in), 500 mm(19.69 in) (standard)	
*Not available in conjunction with FCT option		

Material/Version

Float	rigid PU (SK 610)	1.4571 (SK 221)
Immersion tube	Brass	1.4571
Flange (DIN 24557)	PA	PA
Weight at L=280 mm	approx. 800 g (1.76 lb)	approx. 900 g (1.98 lb)
Each 100 mm add	approx. 30 g (0.06 lb)	approx. 50 g (0.11 lb)

Includes:

Mounting screws (quantity 6) and rubberised cork seal.

Options

Stillling tube (SSR)	Brass	VA
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Vent filter

All versions HY type Hydac BF 7

Filter fineness	3 µm
Additional equipment	Filler cap – n/a with filling adapter

Level switching output

K101-104

W101/102

Max. number	4	2
Function	NO / NC*	Change-over contact
Voltage max.	30 V DC	30 V DC
Switching current max.	0.5 A	0.5 A
Contact load max.	10 V AC	20 V AC
Min. contact spacing	40 mm (1.57 in)	40 mm (1.57 in)

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

Temperature contact

TK

Voltage max.	30 V DC
Switching current max.	2.5 A
Contact load max.	100 VA

Function

NC*

NO*

Switching point °C	50 / 60 / 70 / 80 (122/140/158/176 °F)	50 / 60 / 70 / 80 (122/140/158/176 °F)
Switching point tolerance	± 3 K (±5.4 °RA)	± 3 K (±5.4 °RA)
Max. hysteresis	10 K ± 3 K (18 °RA ±5.4 °RA)	10 K ± 3 K (18 °RA ±5.4 °RA)

*NC NC contact / NO NO contact. All data for rising temperature)

Temperature sensor

Pt 100 Class B, DIN EN 60 751

Tolerance	± 0.8 °C (1.44 °F)
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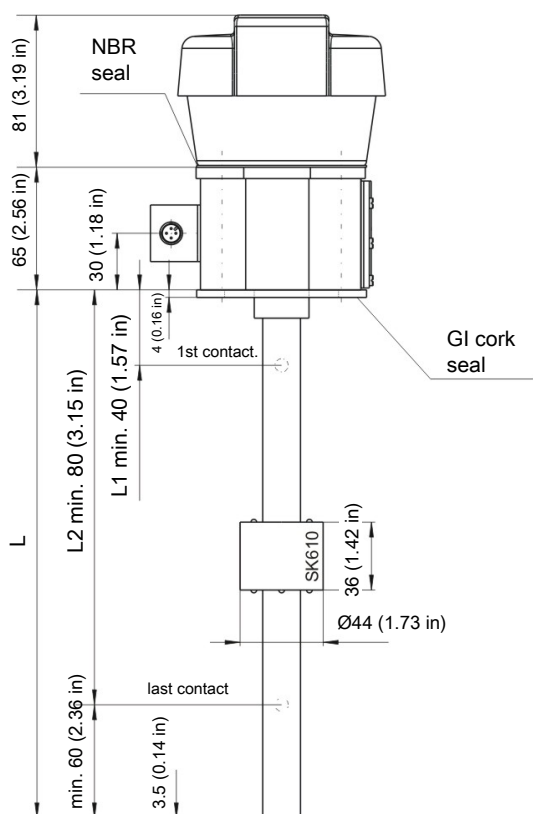
Temperature transmitter

KT

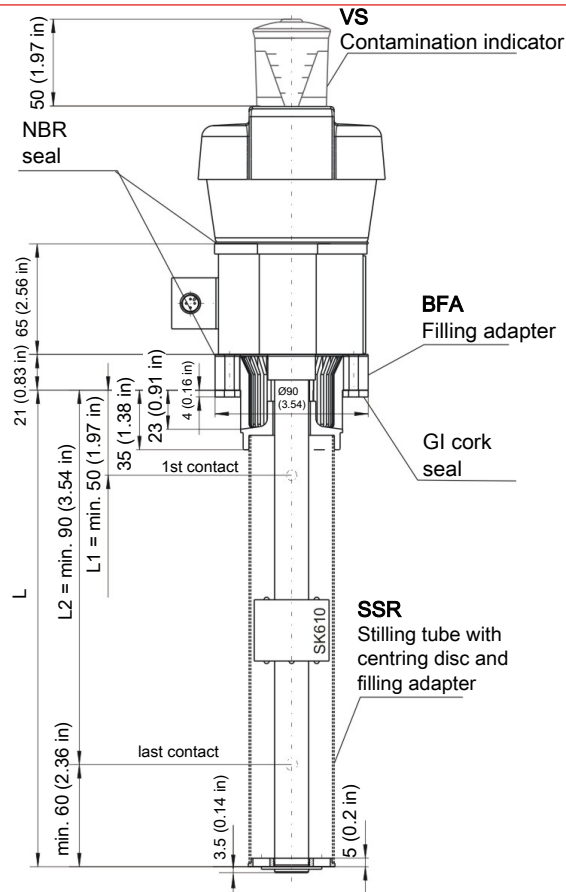
Temperature sensor	Pt 100 Class B, DIN EN 60 751
Measuring range	0 °C to +100 °C (32 °F to 212 °F)
Supply voltage (U _B)	10 - 30 V DC
Output	4 - 20 mA
Max. burden Ω	=(U _B -7.5 V) / 0.02 A
Accuracy	± 1 % from end value
Other measuring ranges available upon request	

Dimensions NV 74

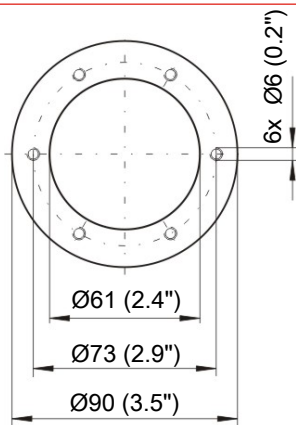
Basic version



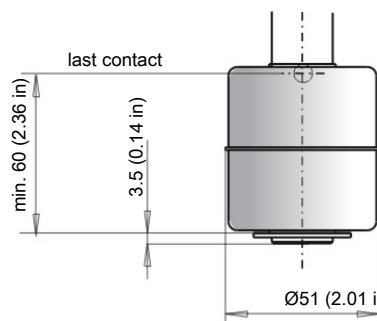
With options



Flange drawing



SK 221 float for NV 74-VA



Ordering instructions NV 74

Options / Accessories

- VS** Visual air breather **clogging indicator**: Analogue underpressure indicator, display range 0.35 bar (5.1 psi).
- BFA*** **Filling adapter** incl. ribbed flange with sieve insert: This option allows adding small oil quantities via the air breather housing. The corresponding housing is therefore equipped with that version.
- SSR*** **Stilling tube** with support ring and filling adapter: This includes the optional stilling tube as well as the same filling option as the BFA. The stilling tube is made of the same material as the requested immersion tube (MS/VS).
- MT** For integration in **Multiterminal**: The basic unit will be mounted to the Multiterminal (MT). For specification please refer to the Multiterminal data sheet.
- MTS** For integration in **Multiterminal including stilling tube**: In addition to the basic unit, a stilling tube with centring rod is installed in the Multiterminal.
- FCT** **Fluid control terminal**: Here the fluid control terminal (FCT) mounts directly onto the basic version. For details please refer to the fluid control terminal data sheet.

* not available in conjunction with FCT and MT/MTS option.

Model key

NV 74-HY-□□□□□□□□□□									
Type designation, HY filter									
Version									
MS Brass									
VA ¹⁾ float / VA immersion tube									
Plug connector									
M3									
S6									
M12									
2M12									
Length in mm (in)									
280 (11.02)									
370 (14.57)									
500 (19.69)									
Level measurement									
1-4 Number of contacts ²⁾									
Level contacts									
K NC/NO									
W change-over contact									
Options									
VS Contamination indicator									
BFA*** Filling adapter									
SSR*** Stilling tube incl. filling adapter									
MT for multiterminal									
MTS for multiterminal with stilling tube option									
FCT for Fluidcontrolterminal									
Temperature signal									
TK... NC contact NO contact									
TK50NC TK50NO = 50 °C (122 °F)									
TK60NC TK60NO = 60 °C (140 °F)									
TK70NC TK70NO = 70 °C (158 °F)									
TK80NC TK80NO = 80 °C (176 °F)									
Pt100 Temperature sensor									
KT Temperature transmitter									

¹⁾ Not in conjunction with option FCT

²⁾ Please specify position and switching function per model key, Example: L1 = nnn mm NC

³⁾ Not in conjunction with FCT, MT or MTS option

Accessories

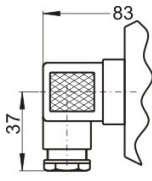
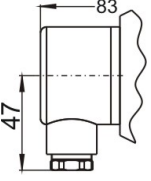
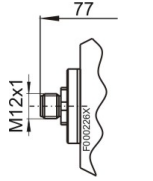
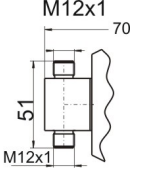
Item no.	Description
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9144 05 0046	Connecting cable M12x1, 4-pin, 3.0 m (9.8 ft), angular coupling and straight plug
9144 05 0047	Connecting cable M12x1, 4-pin, 5.0 m (16.4 ft), angular coupling and strands

Ordering example

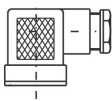
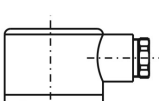

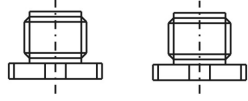
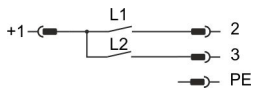
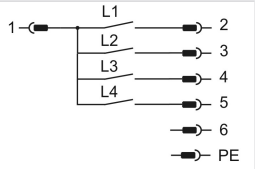
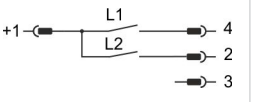
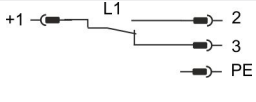
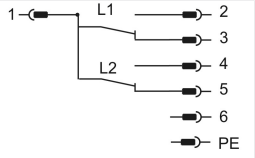
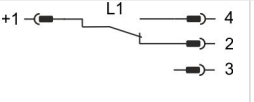
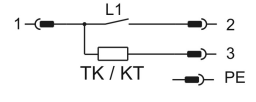
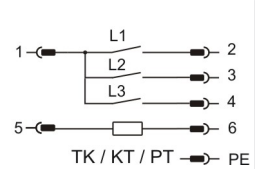
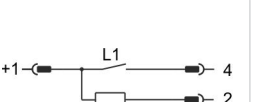
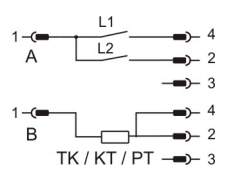
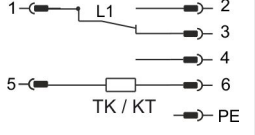
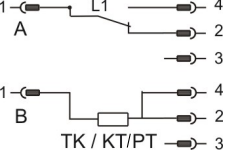
You require:	Level switch with vent filter, contamination indicator, length L = 500 mm (19.69 in), 2 level contacts and temperature contact TK 80 °C (TK176 °F) as NC contact, 1st contact 100 mm NC, 2nd contact 420 mm (16.54 in) NO
Order:	NV 74-HY-MS-S6 500-2-K-TK80NC-VS, 100 NC, 420 NO

Standard pin assignment NV 74

Plug connection

	M3	S6	M12 (base)	2M12 (base)
Dimensions				
Number of pins	3-pin + PE	6-pin + PE	4-pin	4-pin / 4-pin
DIN EN	175301-803	175201-804	61076-2-101	61076-2-101
Voltage max.	30 V AC / V DC	30 V AC / V DC	30 V DC	30 V DC
Contact load max.	0.5 A per output	0.5 A per output	0.5 A per output	0.5 A per output
Degree of protection	IP65	IP65	IP67*	IP67*
Cable fitting	PG11	M20x1.5		
Max. number of contacts				
Level/temp. contacts	1 x K101-104 / 1 x TK - / -	3 x K101-104 / 1 x TK 1 x W101/102 / 1 x TK	1 x K101-104 / 1 x TK - / -	3 x K101-102 / 1 x TK 1 x W101 / 1 x TK
Level contacts only	2 x K101-104 1 x W101/102	4 x K101-104 2 x W101/102	4 x K101-104 2 x W101/102	4 x K101-104 1 x W101/102

* with IP67 cable box attached. Other plug connections available upon request.

	M3	S6	M12 (base)	2 x M12 (base)
Connection schematic				
K101-104 Level contact(s)				
W101/102 Level contact(s)				
K101-104 Level contact(s) and Pt100				
W101/102 Level- and temperature contact(s)				

The standard assignment specified here applies to the max. number of contacts possible and contact function NO.

Technical Data NV 74D

Basic unit

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 610	SK 221
Min. fluid density	0.80 kg/dm ³ (0.029 lb/in ³)	0.85 kg/dm ³ (0.031 lb/in ³)
Lengths	280 mm (11.02 in), 370 mm (14.57 in), 500 mm (19.69 in)(standard)	

Material/Version

Display housing	PA	PA
Float	rigid PU (SK 610)	1.4571 (SK 221)
Immersion tube	Brass	1.4571
Flange (DIN 24557)	PA	PA
Weight at L=280 mm (11.02 in)	approx. 850 g (1.87 lb)	approx. 950 g (2.09 lb)
Each 100 mm (3.94 in) add	approx. 30 g (0.06 lb)	approx. 50 g (0.11 lb)

Includes:

Mounting screws (quantity 6) and rubberised cork seal.

Options

Stilling tube (SSR)	Brass	VA
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Vent filter

All versions HY type Hydac BF 7

Filter fineness	3 µm
Additional equipment	Filler cap – n/a with filling adapter

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 _B)	10 – 30 V DC (nominal voltage 24 V DC)
Ambient temperature	-20 °C to +70 °C (-4 °F to 158 °F)
Display units	Temperature °C / °F
Display range	-20 °C to +120 °C (-4 °F to 248 °F)
Alarm setting range	0 °C to +100 °C (32 °F to 212 °F)
Display accuracy	± 1 % from end value

Temperature sensor	Pt 100 Class B, DIN EN 60751 Resolution 0.5 °C (0.9 °F)
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Level switching output

K101-104

Max. number	2
Function	NC / NC*
Voltage max.	30 V DC
Switching current max.	0.5 A
Contact load max.	10 VA
Min. contact spacing	40 mm (1.57 in)

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

Temperature outputs

Choose from the following temperature outputs

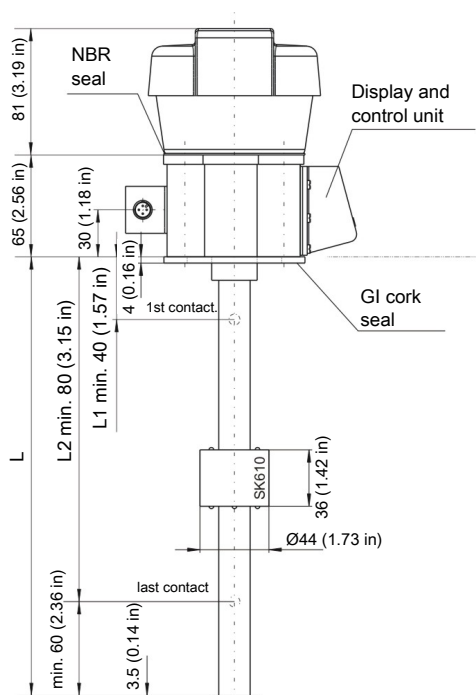
	-2T	-1T-KT	-4T
Plug (base)	2 x M12 – 4-pin	2 x M12 – 4-pin	1 x M12 – 4-pin 1 x M12 – 8-pin
Switching outputs	2 x freely programmable*	1 x freely programmable*	4 x freely programmable
max. switching current**	0.5 A per output continuous short-circuit protected	0.5 A per output continuous short-circuit 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 0-10 V, 0-5 V	
Max. burden Ω as current output		$= (U_B - 8 \text{ V}) / 0.02 \text{ A}$	
Min. input load as voltage output		10 k Ω	

*also programmable as frequency output

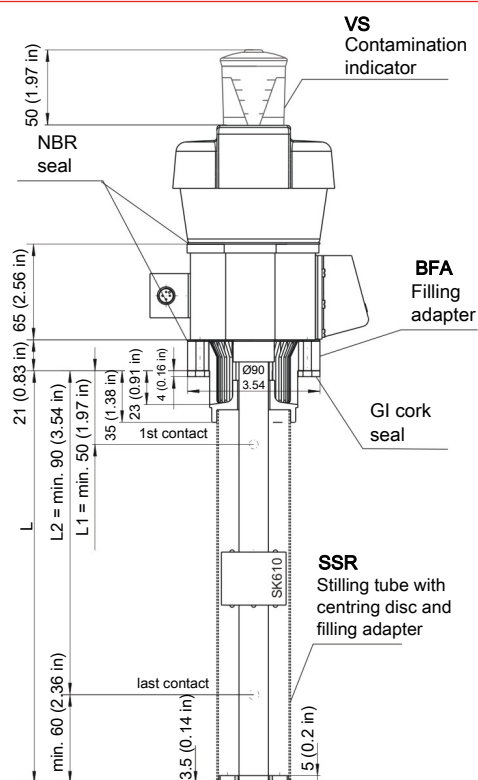
**Output 1 max. 0.2 A.

Dimensions NV 74D

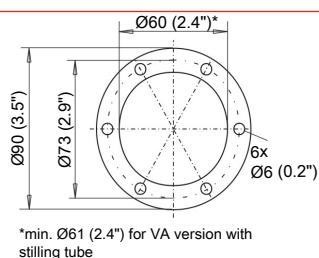
Basic version



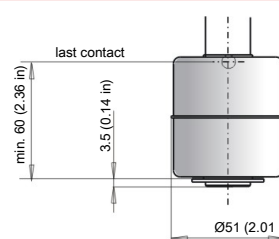
With options



Flange drawing



SK 221 float for
NV 74-VA



Ordering instructions NV 74D

Options / Accessories

- VS** Visual air breather **clogging indicator**: Analogue underpressure indicator, display range 0.35 bar (5.1 psi).
- BFA*** **Filling adapter** incl. ribbed flange with sieve insert: This option allows adding small oil quantities via the air breather housing. The corresponding housing is therefore equipped with that version.
- SSR*** **Stilling tube** with support ring and filling adapter: This includes the optional stilling tube as well as the same filling option as the BFA. The stilling tube is made of the same material as the requested immersion tube (MS/VS).
- MT** For integration in **Multiterminal**: The basic unit will be mounted to the Multiterminal (MT). For specification please refer to the Multiterminal data sheet.
- MTS** For integration in **Multiterminal including stilling tube**: In addition to the basic unit, a stilling tube with centring rod is installed in the Multiterminal.
- FCT** **Fluid control terminal**: Here the fluid control terminal (FCT) mounts directly onto the basic version. For details please refer to the fluid control terminal data sheet.

* not available in conjunction with FCT and MT/MTS option.

Model key

Model key with display, HY filter		Options	
Version		VS	Contamination indicator
MS Brass		BFA ²⁾	Filling adapter
VA ¹⁾ float and VA immersion tube		SSR ²⁾	Stilling tube incl. filling adapter
Plug connector		MT	for multiterminal
S6		MTS	for multiterminal with stilling tube option
2M12		FCT	for Fluidcontrolterminal
Length (mm/in, max. 1500/59.06)		Temperature measurement	
280 (11.02 in)		2T	2x PNP switching output
370 (14.57 in)		4T	4x PNP switching output
500 (19.69 in)		1T-KT	1x PNP switching output 1x analogue output 4-20 mA
Level measurement		Switching function 2nd contact	
1K 1x K10		NO	falling NC contact
2K 2x K10		NC	falling NO contact
1st level contact			
nn Please specify installation dimensions (L1 in mm)			
Switching function 1st contact			
NO falling NC contact			
NC falling NO contact			
2nd level contact (if applicable)			
nn Please specify installation dimensions (L2 in mm/in)			

¹⁾ Not in conjunction with FCT option

²⁾ Not in conjunction with FCT, MT and MTS option

Accessories

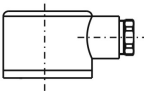
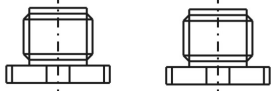
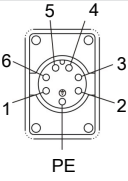
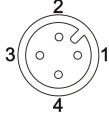
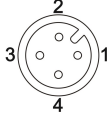
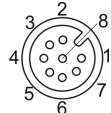
Item no. 4-pin	Item no. 8-pin	Description
9144 05 0010	9144 05 0048	Connecting cable M12x1, 1.5 m (4,92 ft), angular coupling and straight plug
9144 05 0046	9144 05 0049	Connecting cable M12x1, 3.0 m (9,84 ft), angular coupling and straight plug
9144 05 0047	9144 05 0033	Connecting cable M12x1, 5.0 m (16,40 ft), angular coupling and strands

Ordering example

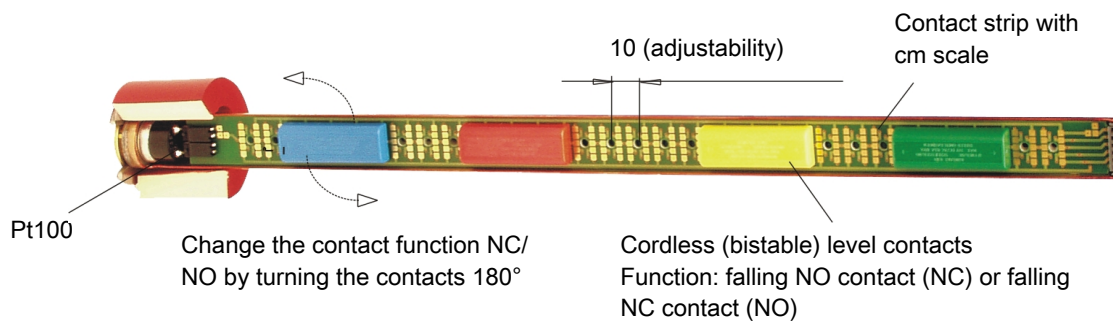
You require:	Level switch with vent filter, contamination indicator, length L=500 mm (19.69 in), 2 level contacts, 2 x programmable temperature switching output, 1st contact 100 mm NC, 2nd contact 420 mm (16.54 in) NO
Order:	NV 74D-HY-MS-S6 500-2K-2T-VS-100NC-420NO

Standard pin assignment NV 74D

Plug connection

	S6		2 x M12 (base)	
				
Connection schematic			Plug A (level)	Plug B (temperature)
				
2T	Pin		Pin	
2 x temperature output	1	+24 V DC	1	+24 V DC
	2	GND	2	S2 (PNP)
	3	T1 (PNP)	3	GND
	4	T2 (PNP)	4	S1 (PNP)
	5	L1		
	6	(L2)		
1T-KT	Pin		Pin	
1 x Temperature output, 1 x Analogue output	1	+24 V DC	1	+24 V DC
	2	GND	2	Analogue (out)
	3	T1 (PNP)	3	GND
	4	Temp 4-20 mA	4	S1 (PNP)
	5	L1		
	6	(L2)		
Connection schematic				
4T			Pin	
4 x Temperature output			1	+24 V DC
			2	S2 (PNP)
			3	GND
			4	S1 (PNP)
			5	S3 (PNP)
			6	S4 (PNP)

easyjust System



Using adjustable level contacts allows the use of standardised immersion tube lengths for different size and shape oil tanks. The switching points can always be configured to the specific system requirements without first having to purchase a specific level switch.

This aids original equipment manufacturers and operators with project planning and logistics.

Since the level contacts are electric components, they require a connection to the respective circuits. This is typically achieved using cables which however, particularly in the case of multiple contacts, makes adjustments more difficult.

The Easy Just System is based on a wireless contact arrangement.

These are enclosed by different coloured housings and are arranged on a carrier board with gold contact points.

The different colours aid with coding the various contacts and ensure the terminal configuration matches the connectors.

The switching function of the contacts (NO or NC) is determined by turning the contact sleeve 180° on the carrier board.

Depending on the option selected, a fixed temperature switch (bi-metal, NO or NC), Pt 100 or 4-20 mA transmitter will be fixed to the bottom end of the board for temperature monitoring.