Level- and temperature switch
Nivovent NV 74, NV 74D

Fluidcontrol

easyjust

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

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

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Tel. +49 (0) 21 02 / 49 89-0, Fax: +49 (0) 21 02 / 49 89-20
E-Mail: fluidcontrol@buehler-technologies.com
Internet: www.buehler-technologies.com

Technical Data NV 74

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/dm³ with float	0.85 kg/dm³ with float
Lengths	280, 370, 500 mm (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 Each 100 mm add	approx. 800 g approx. 30 g	approx. 900 g approx. 50 g

Includes:
Mounting screws (quantity 6) and rubberised cork seal.

Options		
Stilling tube (SSR)	Brass	VA

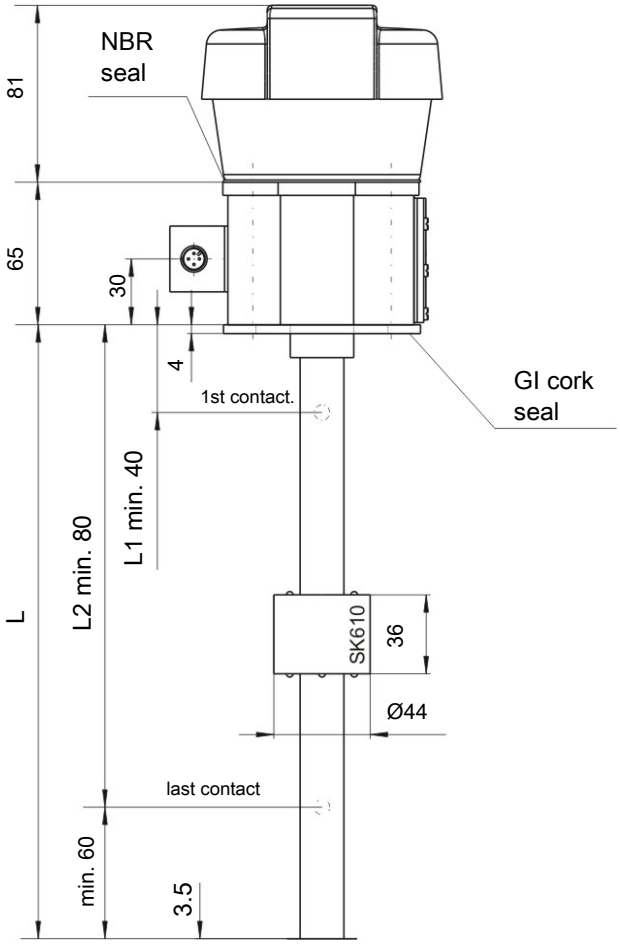
Vent filter	All versions HY type Hydac BF 7
Filter fineness	3 µm
Additional equipment	Filler cap – n/a with filling adapter

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	40 mm
*NO= falling NC contact / NC = falling NO contact		

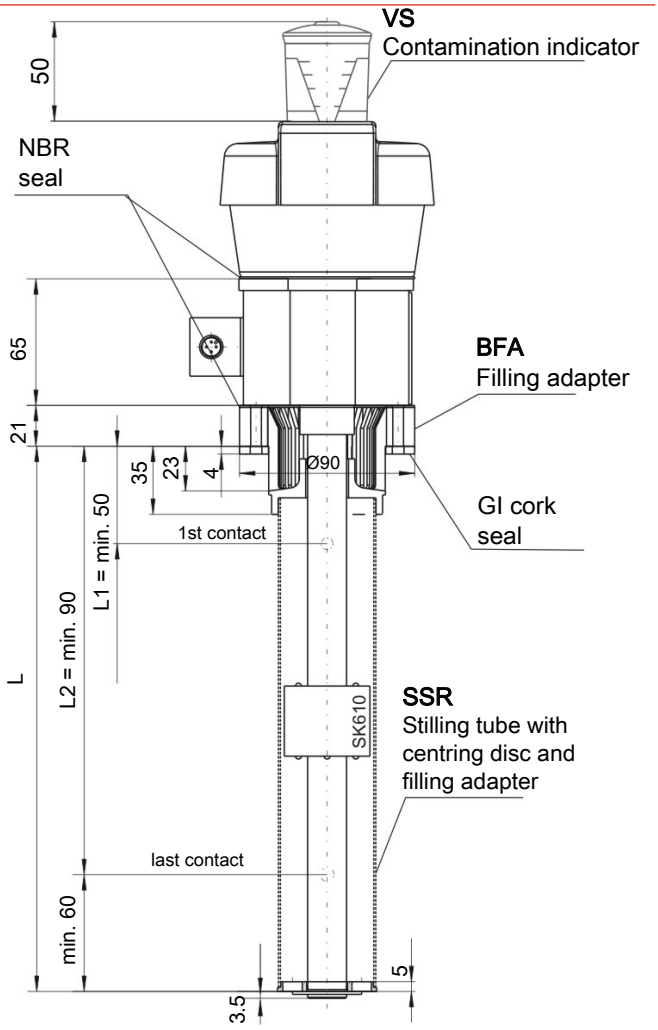
Temperature contact	TK	
Voltage max.	30 V DC	
Switching current max.	2.5 A	
Contact load max.	100 VA	
Function	**NC***	**NO***
Switching point °C	50 / 60 / 70 / 80	50 / 60 / 70 / 80
Switching point tolerance	± 3 K	± 3 K
Max. hysteresis	10 K ± 3 K	10 K ± 3 K
*NC NC contact / NO NO contact. All data for rising temperature)		
Temperature sensor	Pt 100 Class B, DIN EN 60 751	
Tolerance	± 0.8 °C	
Temperature transmitter	**KT**	
Temperature sensor	Pt 100 Class B, DIN EN 60 751	
Measuring range	0 °C to +100 °C	
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 (in the medium)	
Other measuring ranges available upon request		

Dimensions NV 74

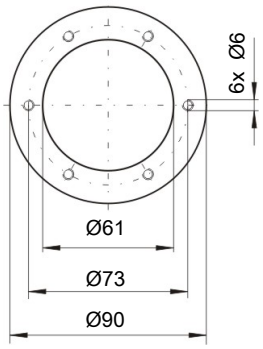
Basic version



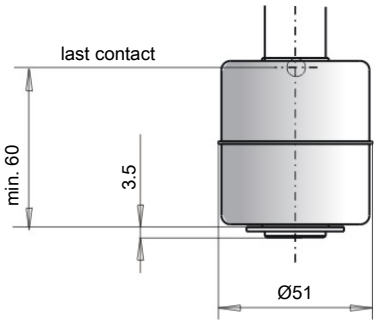
With options



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.

BFA* **Filling adapter** incl. ribbed flange 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
280
370
500

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
	TK60NC	TK60NO = 60 °C
	TK70NC	TK70NO = 70 °C
	TK80NC	TK80NO = 80 °C

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

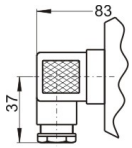
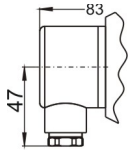
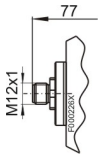
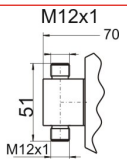
Item no.	Description
9144050010	Connecting cable M12x1, 4-pin, 1.5 m, angular coupling and straight plug
9144050046	Connecting cable M12x1, 4-pin, 3.0 m, angular coupling and straight plug
9144050047	Connecting cable M12x1, 4-pin, 5.0 m, angular coupling and strands

Ordering example

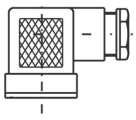
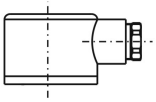
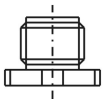
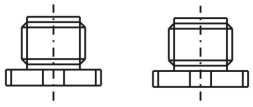
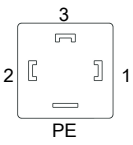
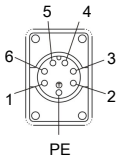
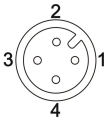
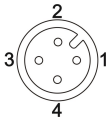
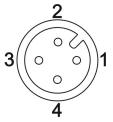
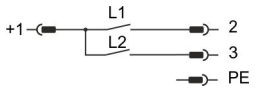
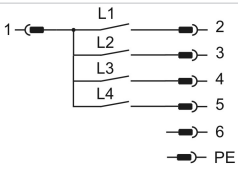
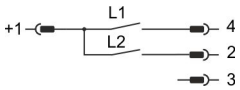
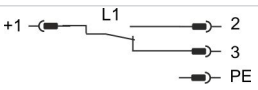
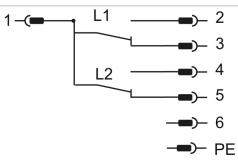
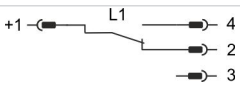
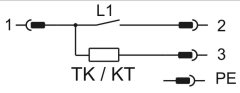
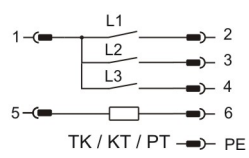
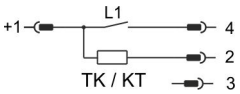
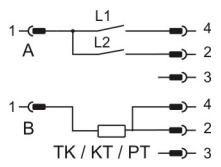
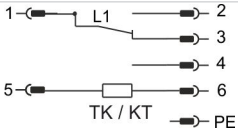
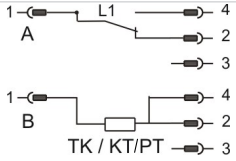
You require:	Level switch with vent filter, contamination indicator, length L = 500 mm, 2 level contacts and temperature contact TK 80 °C as NC contact, 1st contact 100 mm NC, 2nd contact 420 mm NO
Order:	NV 74-HY-MS-S6 500-2-K-TK80NC-VS, 100 NC, 420 NO

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		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 / 1 x TK - / -	3 x K101-103 / 1 x TK 1 x W101 / 1 x TK	1 x K101 / 1 x TK - / -	2 x K101-102 / 1 x TK 1 x W101 / 1 x TK
Level contacts only	2 x K101-102 1 x W101	4 x K101-104 2 x W101/102	2 x K101-102 1 x W101	

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

	M3	S6	M12 (base)	2 x M12 (base)
				
Connection schematic				Plug A  Plug B 
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	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/dm³	0.85 kg/dm³
Lengths	280, 370, 500 mm (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 Each 100 mm add	approx. 850 g approx. 30 g	approx. 950 g approx. 50 g

Includes:
Mounting screws (quantity 6) and rubberised cork seal.

Options		
Stilling tube (SSR)	Brass	VA

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
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 60751 Resolution 0.5 °C

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

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

Temperature outputs

Choose from the following temperature outputs

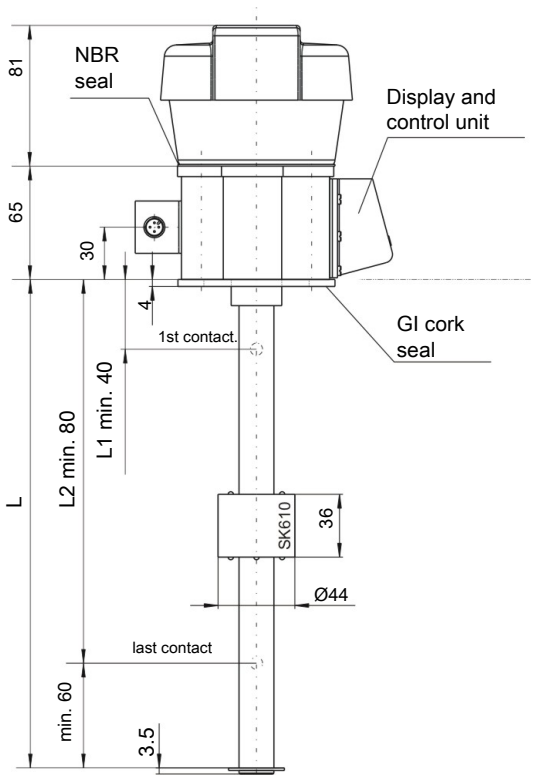
	-2T	-1T-KT	-4T
Plug (base)	2 x M12 – 4-pin	2 x M12 – 4-pin	1 x M12 – 4-pin 1 x M12 – 8-pin
Switching outputs	2 x freely programmable*	1 x freely programmable*	4 x freely programmable
max. switching current**	0.5 A per output continuous short-circuit protected	0.5 A per output continuous short-circuit 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 V) / 0.02 A	
Min. input load as voltage output		10 kΩ	

*also programmable as frequency output

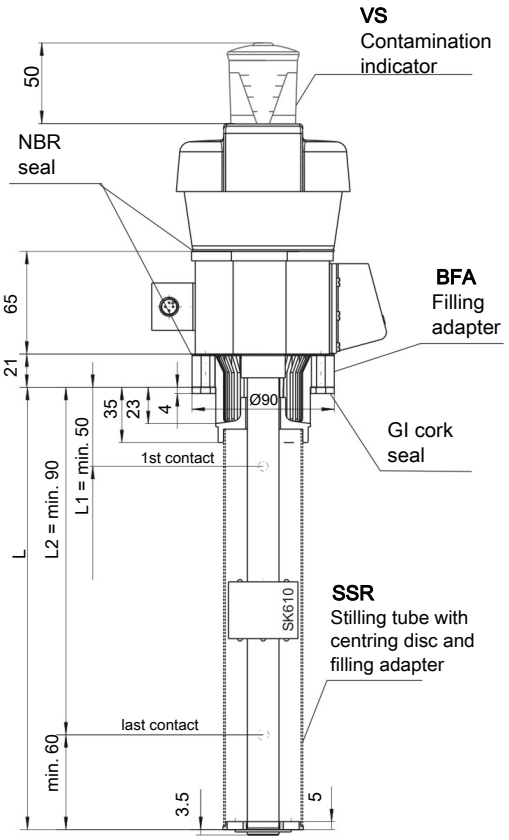
**Output 1 max. 0.2 A.

Dimensions NV 74D

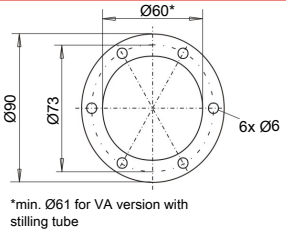
Basic version



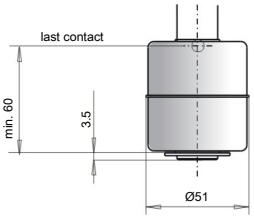
With options



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.

BFA* **Filling adapter** incl. ribbed flange 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 74D-HY-□□-□□-□□-□□-nn-□□-nn-□□-□□-□□-□□

Model key
with display, HY filter

Version
MS Brass
VA[1] float and VA immersion tube

Plug connector
S6
2M12

Length (mm, max. 1500)
280
370
500

Level measurement
1K 1x K10
2K 2x K10

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)

Options
VS Contamination indicator

BFA[2] Filling adapter
SSR[2] Stilling tube incl. filling adapter
MT for multiterminal
MTS for multiterminal with stilling tube option
FCT for Fluidcontrolterminal

Temperature measurement
2T 2x PNP switching output
4T 4x PNP switching output
1T-KT 1x PNP switching output 1x analogue output 4-20 mA

Switching function 2nd contact
NO falling NC contact
NC falling NO contact

[1] Not in conjunction with FCT option
[2] Not in conjunction with FCT, MT and MTS option

Accessories

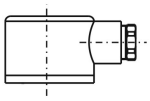
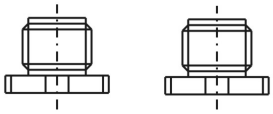
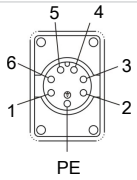
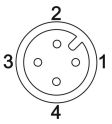
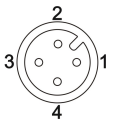
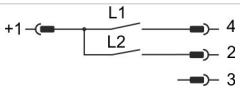
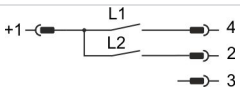
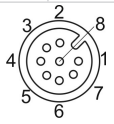
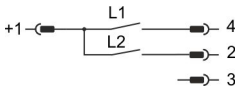
Item no. 4-pin	Item no. 8-pin	Description
9144050010	9144050048	Connecting cable M12x1, 1.5 m, angular coupling and straight plug
9144050046	9144050049	Connecting cable M12x1, 3.0 m, angular coupling and straight plug
9144050047	9144050033	Connecting cable M12x1, 5.0 m, angular coupling and strands

Ordering example

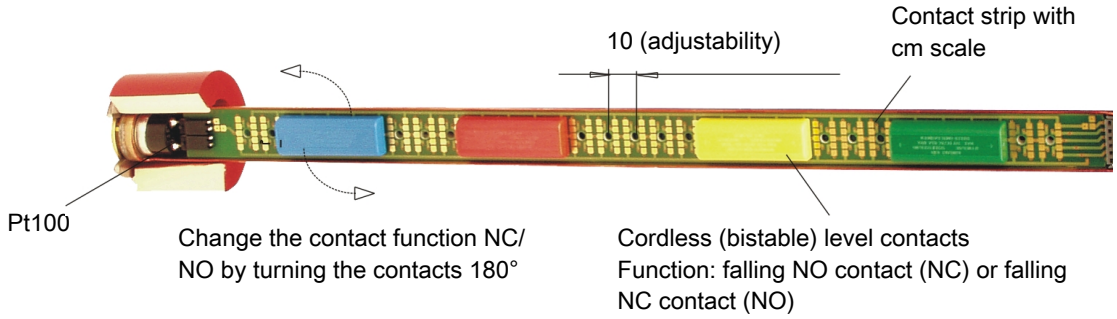
You require:	Level switch with vent filter, contamination indicator, length L=500 mm, 2 level contacts, 2 x programmable temperature switching output, 1st contact 100 mm NC, 2nd contact 420 mm NO
Order:	NV 74D-HY-MS-S6 500-2K-2T-VS-100NC-420NO

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 2 3 4 5 6	+24 V DC GND T1 (PNP) T2 (PNP) L1 (L2)		1 2 3 4	+24 V DC S2 (PNP) GND S1 (PNP)
1T-KT	**Pin**			**Pin**	
1 x Temperature output, 1 x Analogue output	1 2 3 4 5 6	+24 V DC GND T1 (PNP) Temp 4-20 mA L1 (L2)		1 2 3 4	+24 V DC Analogue (out) GND S1 (PNP)
Connection schematic					
4T				**Pin**	
4 x Temperature output				1 2 3 4 5 6	+24 V DC S2 (PNP) GND S1 (PNP) S3 (PNP) 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.