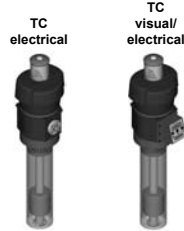




## TankConditioner® TC with Breather Filter, Float Switch and Temperature Monitoring System



### 1. TECHNICAL SPECIFICATIONS

#### 1.1 UNIT CONSTRUCTION

The TankConditioner® TC is a multi-functional unit consisting of a fluid level and temperature monitoring system, an optional temperature display and a breather filter BF7 or BF 72.

#### 1.2 FLUID LEVEL MONITORING

Values are measured using the float principle. For simple monitoring functions (e.g. pump protection or tank level monitoring) the fluid level monitoring device has two bi-stable switch contacts which can be turned through 180° for either N/O or N/C function.

A resolution of 10 mm makes it easy to set the switch points to suit the requirements of the system. The switch points can also be displayed via 3 LEDs (green, yellow, red), if specially requested by the customer.

Depending on the type of unit, the actual oil level can also be output as an analogue control signal for system control.

Oil level monitoring is maintenance-free for fluids which do not form a residue on the sensor tube during operation.

#### 1.3 FLUID TEMPERATURE MONITORING

The thermal contact required for this is fitted to the end of the contact strip and therefore monitors the oil temperature in the lower part of the tank.

The normally closed contact responds at 70 °C and acts as an emergency cut-out.

If switching functions are to be carried out in conjunction with temperature monitoring (to control an oil cooler, for example) then, depending on the model, up to 2 PNP switch outputs can either be programmed hysteresis-free from 0-100 °C, or can be output as an analogue control signal.

#### 1.4 TANK BREATHER FILTER

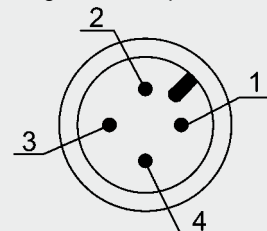
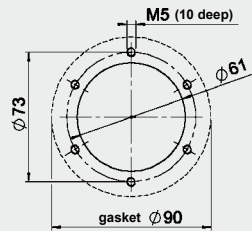
To meet the most likely customer requirements, the TankConditioner® TC is fitted with the BF 7 or BF 72 breather filter as standard.

The breather filter is designed in such a way that it is impossible to fill or top up the tank with hydraulic fluid via the filter housing (exception: version FABF).

The TankConditioner® TC can be supplied without a port for a clogging indicator or with a visual-analogue clogging indicator. To make the breather filter even more maintenance-friendly, we recommend fitting a UBM type clogging indicator, which is easily visible and includes a memory function. The yellow reset button is used to reset the indicator after changing the element.

### 1.5 GENERAL TECHNICAL SPECIFICATIONS

Flange connection	DIN 24557/ Part 2: mounting hole Ø61
Installation position	vertical ±30°
Operating voltage	12V ... 30V DC
Electrical connection	Male: Series M12x1 / 4 pole IP67 For type S44 screened cables must be provided by customer!
Filter element	3 µm
Air flow rate	BF 7: max. 900 l <sub>N</sub> /min BF 72: max. 1200 l <sub>N</sub> /min
Sensor tube / float / protective sleeve (option)	synthetic material / brass (optional stainless steel)
Nominal pressure	max. 1 bar
Temperature of fluid	max. 100 °C
Flange connection to DIN 24557 / Part 2	For pin assignment see point 3 Dimensions



For further information, please see point 3

#### 1.6 TANK FILLING OPTION

For simple applications the tank can be filled via the breather filter (see Supplementary Details code FABF). To protect the hydraulics a filler-strainer is built into the tank flange as a coarse filter. For high performance hydraulic systems we recommend the filling connection which allows the filling of filtered oil to be monitored (Supplementary Details FA34). The required quick release coupling is not supplied.

#### 1.7 FILTER ELEMENTS

##### Contamination retention capacities in g

	Paper
BF	3 µm
7	26.1
72	52.2

#### 1.8 SEALS

NBR (= Perbunan)  
NBR and cork for version FA34

#### 1.9 WAVE MOTION PROTECTION

Wave motion on the surface of the oil can affect the float and can therefore cause measurement errors, particularly in large tanks. A protective sleeve is therefore available in brass (type code 1.x) or stainless steel (type code 2.x) as an accessory for these applications.

#### 1.10 FLOAT

To ensure compatibility with many standard hydraulic fluids, the TankConditioner® TC sensor tube and float are made from synthetic material and brass, with stainless steel as an option.

#### 1.11 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

##### Brass version:

- Hydraulic oils H to HLPD DIN 51524
- Lubrication oils DIN 51517, API, ACEA, DIN 51515, ISO 6743

##### Stainless steel version:

- Hydraulic oils H to HLPD DIN 51524
- Lubrication oils DIN 51517, API, ACEA, DIN 51515, ISO 6743
- Biodegradable operating fluids VDMA 24568 HETG, HEES, HEPG
- Non-flam operating fluids HFA, HFB, HFC and HFD

## 2. MODEL CODE (also order example)

TC P 7 F 3 UBM + D 1 . X /-S12-V250 -SSR

### 2.1 COMPLETE FILTER

**Filter type** \_\_\_\_\_

TankConditioner® TC

**Filter material of element** \_\_\_\_\_

P Paper

**Size of breather filter** \_\_\_\_\_

7, 72

**Connection** \_\_\_\_\_

F flange (to DIN 24557 / part 2)

**Filtration rating in µm** \_\_\_\_\_

3

**Type of clogging indicator** \_\_\_\_\_

W without port for clogging indicator

UBM with visual vacuum indicator

**Type of temperature monitoring** \_\_\_\_\_

C electrical

D visual/electrical

**Type code** \_\_\_\_\_

1 material of float: polyurethane; material of sensor tube: brass

2 material of float and sensor tube: stainless steel

**Modification number** \_\_\_\_\_

X the latest version is always supplied

**Supplementary details**

**Required:** Switch assignment: \_\_\_\_\_

Switch	Fluid Level	Temperature
S	1	2
S	4	4

1 = fluid level contact; normal setting: L1 = rising N/O, L2 = rising N/C  
2 = N/C, 4 = measuring range 4-20 mA

V250 Length of the sensor tube = 250 mm

V370 Length of the sensor tube = 370 mm

V520 Length of the sensor tube = 520 mm

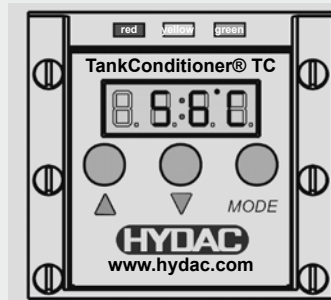
**Optional:**

SSR wave protection sleeve \_\_\_\_\_  
(the type of material (brass or stainless steel) is indicated by the type code 1 or 2;  
i.e. 1 = brass; 2 = stainless steel)

FA34 filling adaptor with G 3/4 connection (including wave protection sleeve)

FABF filling via breather filter (including wave protection sleeve)

LED optional LED display for fluid level  
(green = operating; yellow = warning; red = critical)  
(for this option, please contact HYDAC)



### 2.2 REPLACEMENT ELEMENT

**Size** \_\_\_\_\_

0007, 0072

**Type** \_\_\_\_\_

L

**Filtration rating in µm** \_\_\_\_\_

003

**Filter material** \_\_\_\_\_

P Paper

0007 L 003 P

### 2.3 STANDARD MODELS

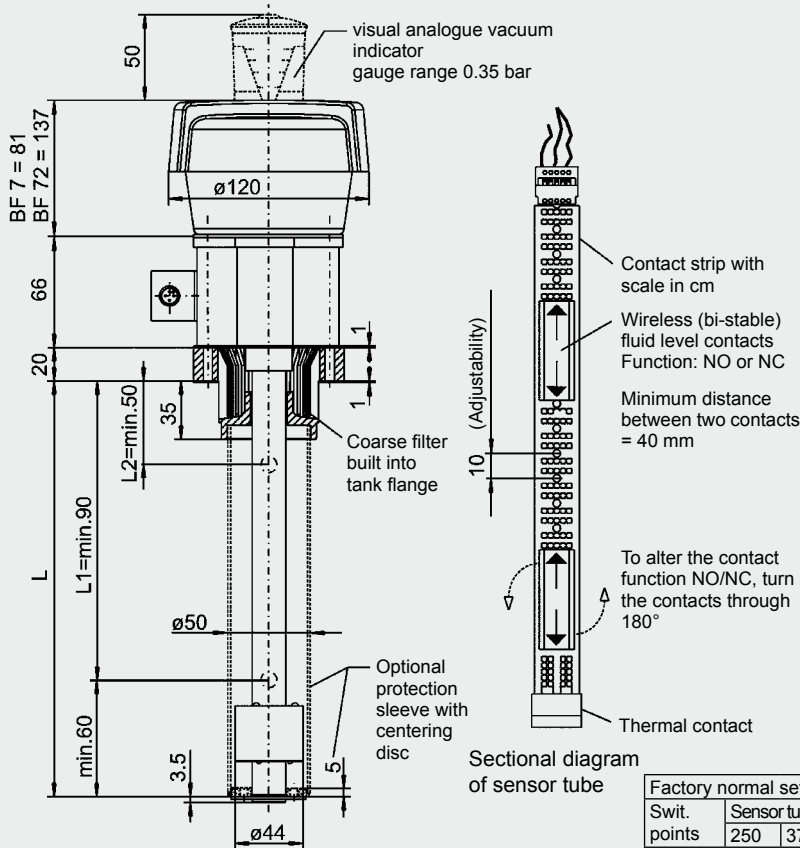
Out of the different models of TankConditioner® TC, with all the options available to the customer, the following are designated "Standard models":

- TC P 7 F 3 UBM+C 1.0 /-S12-Vxxx
- TC P 7 F 3 UBM+D 1.0 /-S12-Vxxx
- TC P 7 F 3 UBM+C 1.0 /-S12-Vxxx-FABF
- TC P 7 F 3 UBM+D 1.0 /-S12-Vxxx-FABF
- TC P 7 F 3 UBM+D 1.0 /-S12-Vxxx-FA34
- TC P 7 F 3 UBM+C 1.0 /-S44-Vxxx-FA34

### 3. DIMENSIONS AND TECHNICAL SPECIFICATIONS

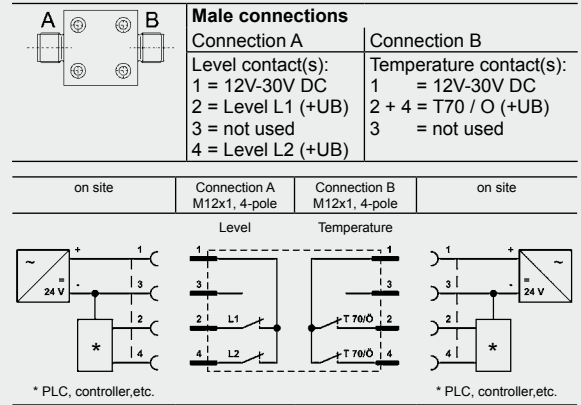
#### 3.1 TANKCONDITIONER® TC WITH SUPPLEMENTARY CODE "S12"

Version TC...C 1.x/-S12-Vxxx...(Brass/synthetic material)



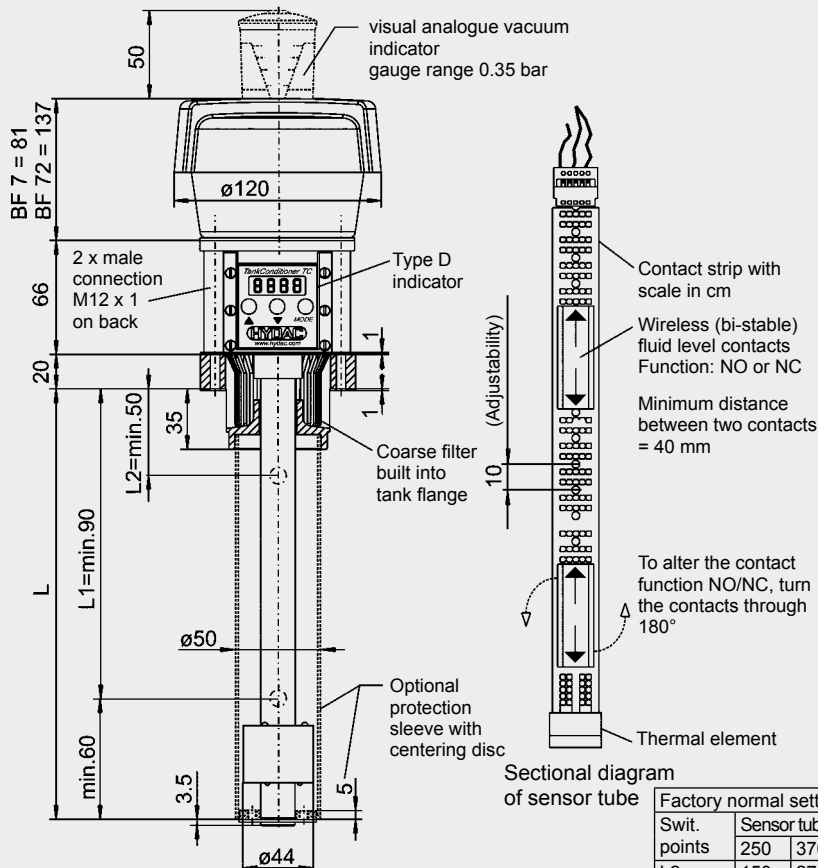
#### TECHNICAL SPECIFICATIONS

Fluid level switch points	bi-stable N/O / N/C Max. 2 can be set
Resolution	10 mm
Hysteresis	4 mm
Thermal contact	T70 °C / N/C
Switching capacity	10W / VA max 30 V / DC max.
Switching current	1 A max.



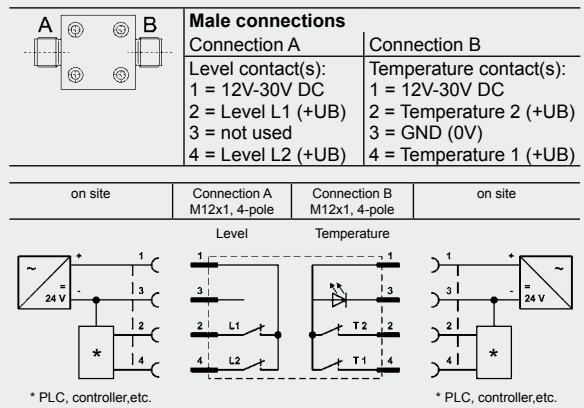
Swit. points	Sensor tube length L			Contact function of fluid level contacts	Possible application
	250	370	520		
L2	150	270	420	NC - rising NC	Warning "min. tank level"
L1	190	310	460	NO - rising NO	Cut-out "min. tank level"

Version TC...D 1.x /-S12-Vxxx... (Brass/synthetic material)



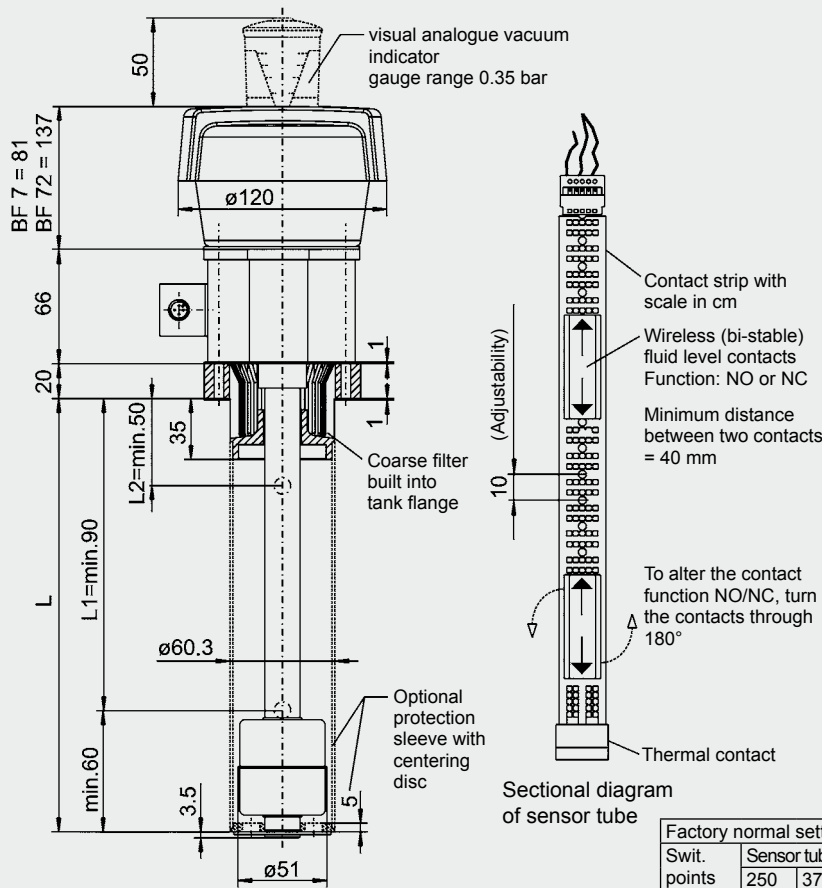
#### TECHNICAL SPECIFICATIONS

Fluid level switch points	bi-stable N/O / N/C Max. 2 can be set
Resolution	10 mm
Hysteresis	4 mm
Thermal element	Pt100
Temperature switch pt.	Max. 2 can be set
Hysteresis	1 - 99 K can be set
Switching capacity	10W / VA max 30 V / DC max.
Switching current	1 A max.
Display for temperature monitoring	LED 3-digit (4-digit w/o unit of meas.)
Indication range	-20 °C to +120 °C (-4 ° to +248 °F)



Swit. points	Sensor tube length L			Contact function of fluid level contacts	Possible application
	250	370	520		
L2	150	270	420	NC - rising NC	Warning "min. tank level"
L1	190	310	460	NO - rising NO	Cut-out "min. tank level"

Version TC...C 2.x /-S12-Vxxx... (Stainless steel)

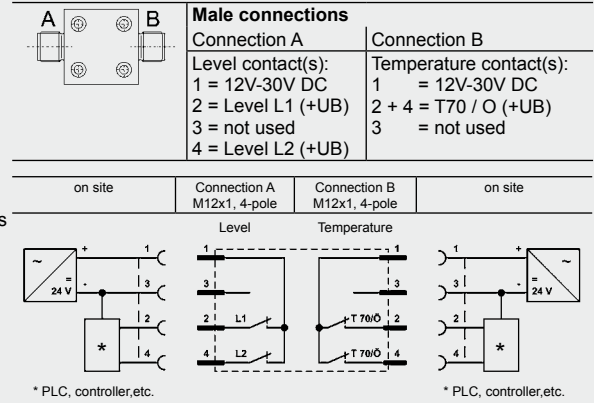


Sectional diagram of sensor tube

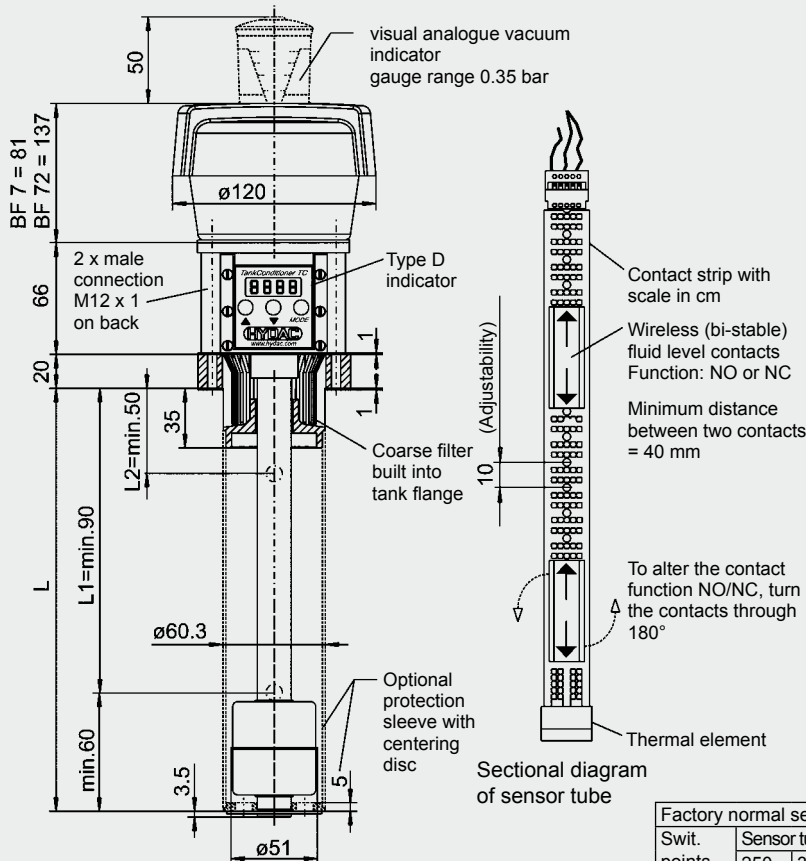
Factory normal setting for type S12: "pump protection monitoring"					
Swit. points	Sensor tube length L			Contact function of fluid level contacts	Possible application
	250	370	520		
L2	150	270	420	NC - rising NC	Warning "min. tank level"
L1	190	310	460	NO - rising NO	Cut-out "min. tank level"

TECHNICAL SPECIFICATIONS

Fluid level switch points	bi-stable N/O / N/C
	Max. 2 can be set
Resolution	10 mm
Hysteresis	4 mm
Thermal contact	T70 °C / N/C
Switching capacity	10W / VA max
	30 V / DC max.
Switching current	1 A max.



Version TC...D 1.x /-S12-Vxxx... (Stainless steel)

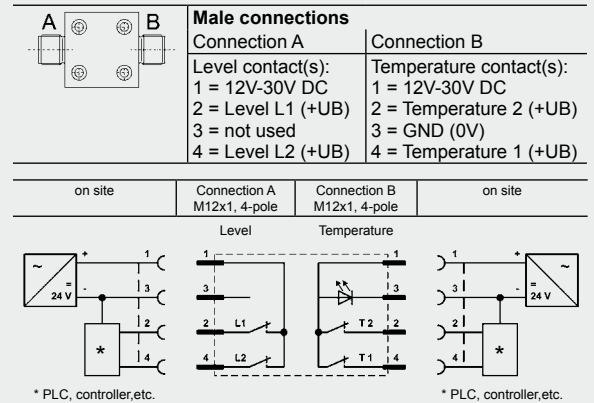


Sectional diagram of sensor tube

Factory normal setting for type S12: "pump protection monitoring"					
Swit. points	Sensor tube length L			Contact function of fluid level contacts	Possible application
	250	370	520		
L2	150	270	420	NC - rising NC	Warning "min. tank level"
L1	190	310	460	NO - rising NO	Cut-out "min. tank level"

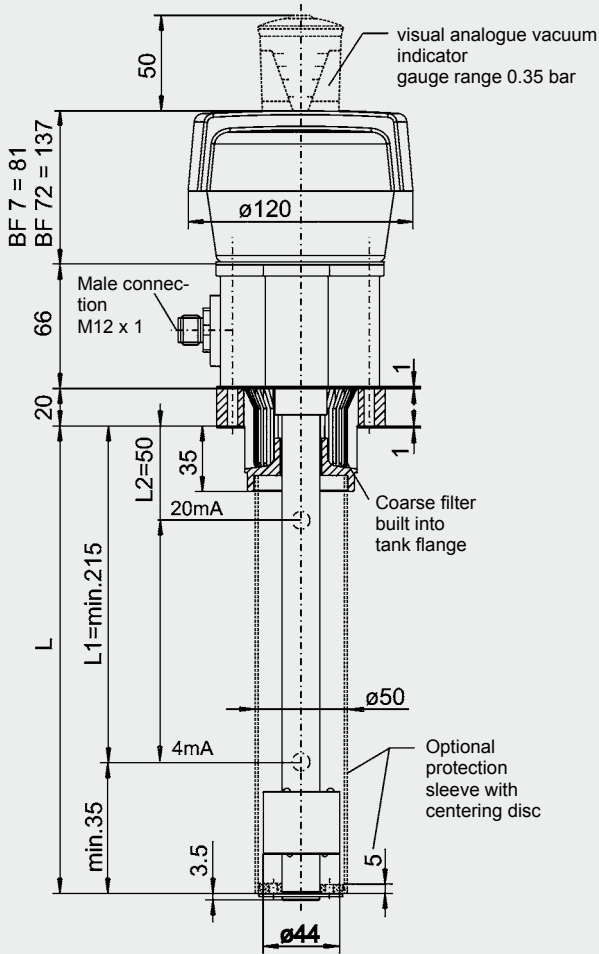
TECHNICAL SPECIFICATIONS

Fluid level switch points	bi-stable N/O / N/C
	Max. 2 can be set
Resolution	10 mm
Hysteresis	4 mm
Thermal element	Pt100
Temperature switch pt.	Max. 2 can be set
	Hysteresis 1 - 99 K can be set
Switching capacity	10W / VA max
	30 V / DC max.
Switching current	1 A max.
Display for	LED 3-digit
temperature monitoring	(4-digit w/o unit of meas.)
Indication range	-20 °C to +120 °C (-4 ° to +248 °F)

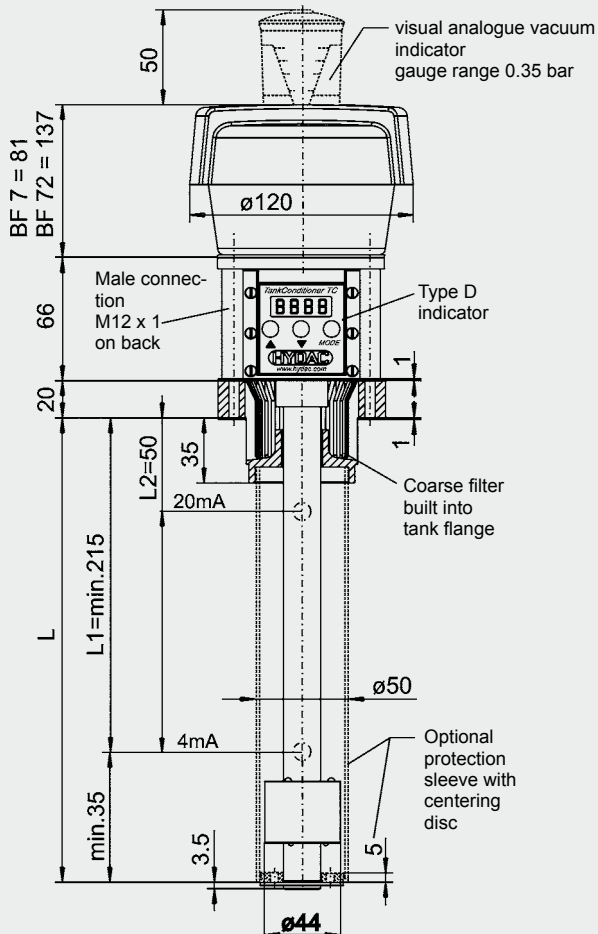


### 3.2 TANKCONDITIONER® TC MIT ERGÄNZENDER ANGABE „S44“

Version TC...C 1.x /-S44-Vxxx... (Brass/synthetic material)



Version TC...D 1.x /-S44-Vxxx... (Brass/synthetic material)



#### TECHNICAL SPECIFICATIONS

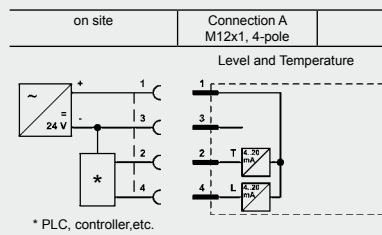
Fluid level monitoring	
Output signal	4 – 20 mA
Meas. range for V250	165 mm
Meas. range for V370	285 mm
Meas. range for V520	435 mm
Resolution	4 mm
Hysteresis	0 – 10%
Temperature monitoring	
Output signal	4 – 20 mA
Measuring range	0 – 100 °C
Hysteresis	0 – 1 K
Ohmic resistance	$RB = U - 8 V$ 20 mA
Data transfer	Screened cable must be provided!

#### Male connections

##### Connection

Fluid level/Temperature signals:

- 1 = 12V-30V DC
- 2 = Temperature 4 – 20 mA
- 3 = not used
- 4 = Fluid level 4 – 20 mA



#### TECHNICAL SPECIFICATIONS

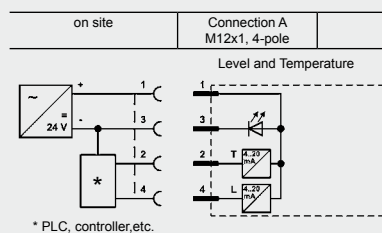
Fluid level monitoring	
Output signal	4 – 20 mA
Meas. range for V250	165 mm
Meas. range for V370	285 mm
Meas. range for V520	435 mm
Resolution	4 mm
Hysteresis	0 – 10%
Temperature monitoring	
Output signal	4 – 20 mA
Measuring range	0 – 100 °C
Hysteresis	0 – 1 K
Ohmic resistance	$RB = U - 8 V$ 20 mA
Data transfer	Screened cable must be provided!
Display for temperature monitoring	LED 3-digit (4-digit w/o unit of meas.)
Indication range -20 °C to +120 °C (-4 ° to +248 °F)	

#### Male connections

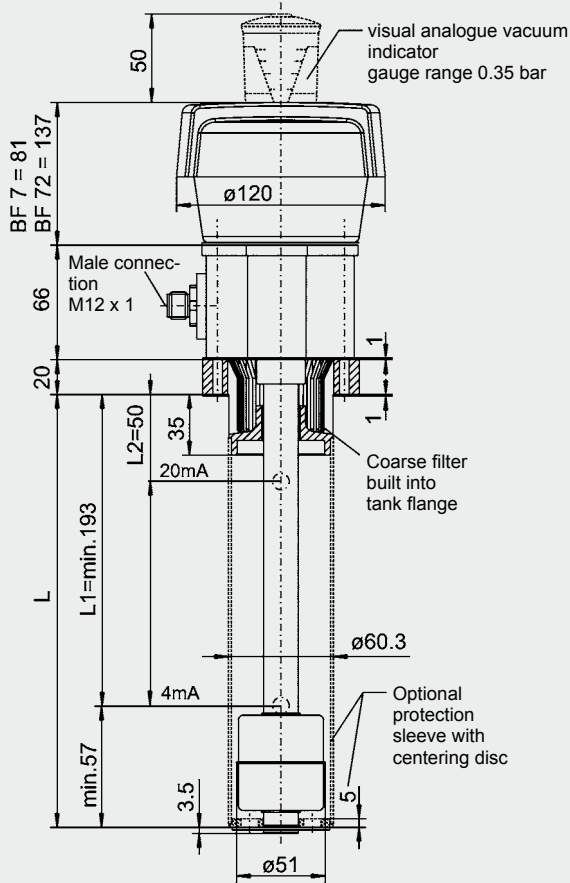
##### Connection

Fluid level/Temperature signals:

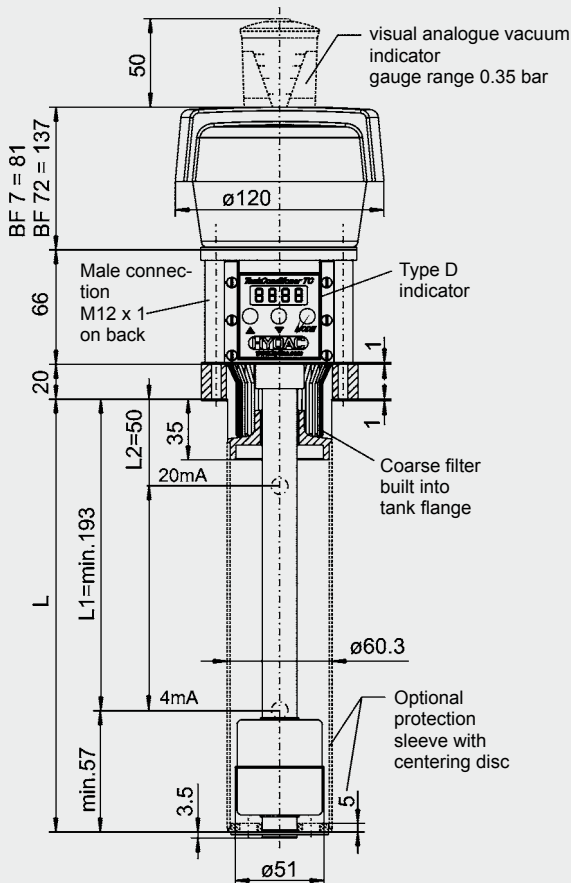
- 1 = 12V-30V DC
- 2 = Temperature 4 – 20 mA
- 3 = GND (0V)
- 4 = Fluid level 4 – 20 mA



Version TC...C 2.x /-S44-Vxxx... (Stainless steel)



Version TC...D 2.x /-S44-Vxxx... (Stainless steel)

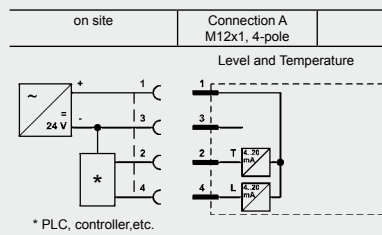


**TECHNICAL SPECIFICATIONS**

Fluid level monitoring	
Output signal	4 – 20 mA
Meas. range for V250	143 mm
Meas. range for V370	263 mm
Meas. range for V520	413 mm
Resolution	7.5 mm
Hysteresis	0 – 10%
Temperature monitoring	
Output signal	4 – 20 mA
Measuring range	0 – 100 °C
Hysteresis	0 – 1 K
Ohmic resistance	$RB = U - 8 V$ 20 mA
Data transfer	Screened cable must be provided!

**Male connections**

Connection  
 Fluid level/Temperature signals:  
 1 = 12V-30V DC  
 2 = Temperature 4 – 20 mA  
 3 = not used  
 4 = Fluid level 4 – 20 mA

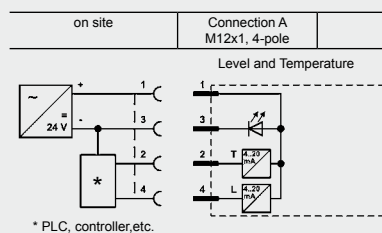


**TECHNICAL SPECIFICATIONS**

Fluid level monitoring	
Output signal	4 – 20 mA
Meas. range for V250	143 mm
Meas. range for V370	263 mm
Meas. range for V520	413 mm
Resolution	7.5 mm
Hysteresis	0 – 10%
Temperature monitoring	
Output signal	4 – 20 mA
Measuring range	0 – 100 °C
Hysteresis	0 – 1 K
Ohmic resistance	$RB = U - 8 V$ 20 mA
Data transfer	Screened cable must be provided!
Display for temperature monitoring	LED 3-digit (4-digit w/o unit of meas.)
Indication range	-20 °C to +120 °C (-4 ° to +248 °F)

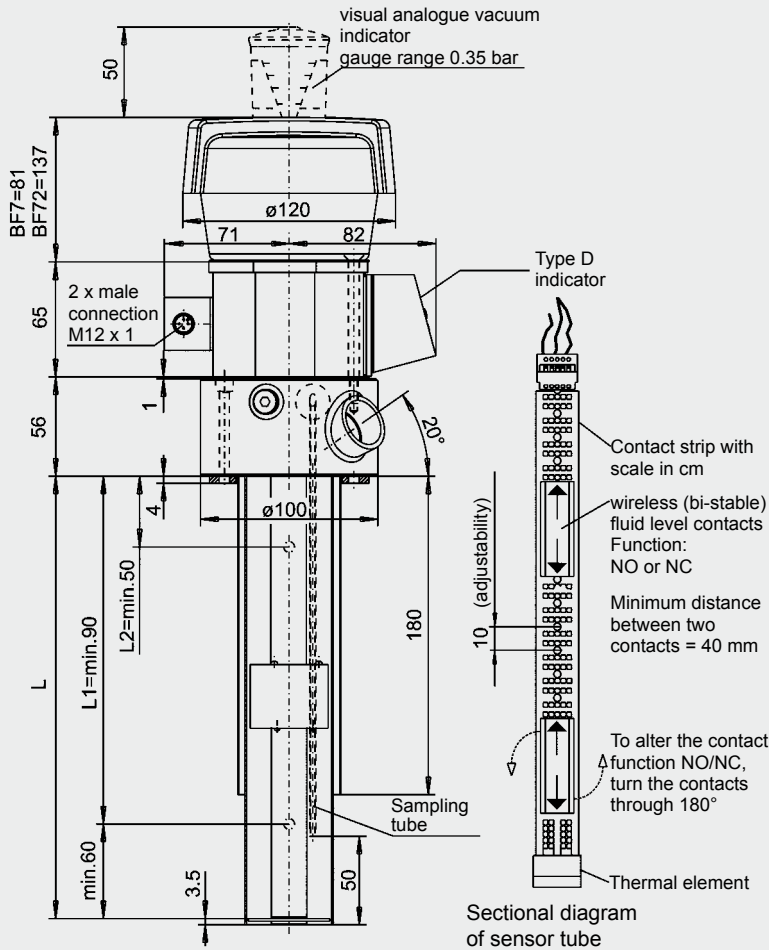
**Male connections**

Connection  
 Fluid level/Temperature signals:  
 1 = 12V-30V DC  
 2 = Temperature 4 – 20 mA  
 3 = GND (0V)  
 4 = Fluid level 4 – 20 mA

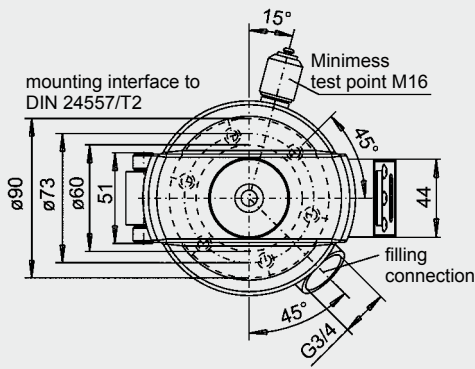


### 3.3 TANKCONDITIONER® TC WITH ADDITIONAL SUPPLEMENTARY DETAIL "FA34"

Version TC...D 1.x /-S12-Vxxx-FA34 (FA34 with filling adaptor)

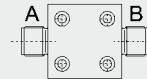


Sectional diagram of sensor tube

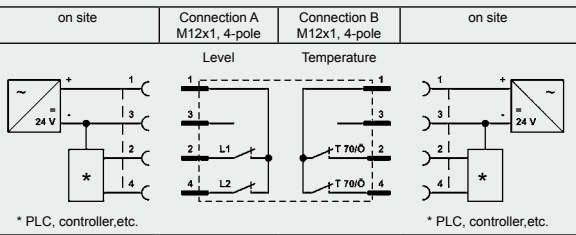


#### TECHNICAL SPECIFICATIONS

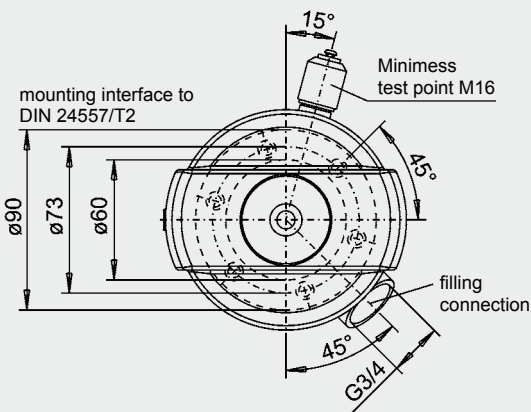
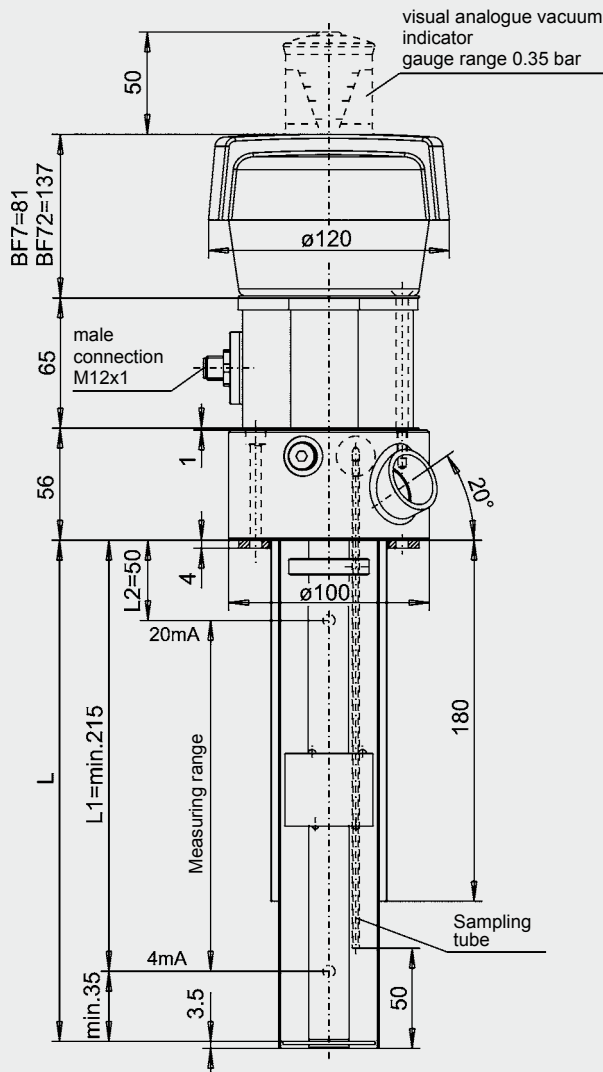
Fluid level switch points	bi-stable N/O / N/C Max. 2 can be set
Resolution	10 mm
Hysteresis	4 mm
Thermal element	Pt100
Temperature switch pt.	Max. 2 can be set
Hysteresis	1 – 99 K can be set
Switching capacity	10W / VA max 30 V / DC max.
Switching current	1 A max.
Display for temperature monitoring	LED 3-digit (4-digit w/o unit of meas.)
Indication range	-20 °C to +120 °C (-4 ° to +248 °F)



Male connections	
Connection A	Connection B
Level contact(s): 1 = 12V-30V DC 2 = Level L1 (+UB) 3 = not used 4 = Level L2 (+UB)	Temperature contact(s): 1 = 12V-30V DC 2 + 4 = T70 / O (+UB) 3 = not used



Factory normal setting for type S12: "pump protection monitoring"				
Swit. points	Sensor tube length L	Contact function of fluid level contacts	Possible application	
L2	150 270 420	NC - rising NC	Warning "min. tank level"	
L1	190 310 460	NO - rising NO	Cut-out "min. tank level"	



### TECHNICAL SPECIFICATIONS

#### Fluid level monitoring

Output signal	4 – 20 mA
Meas. range for V250	165 mm
Meas. range for V370	285 mm
Meas. range for V520	435 mm
Resolution	4 mm
Hysteresis	0 – 10%

#### Temperature monitoring

Output signal	4 – 20 mA
Measuring range	0 – 100°C
Hysteresis	0 – 1 K

Ohmic resistance  $RB = U - 8 V$   
20 mA

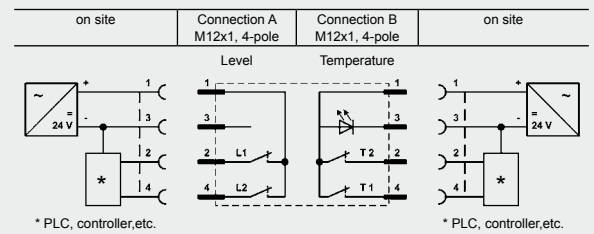
Data transfer Screened cable must be provided!

#### Male connections

##### Connection

Fluid level/Temperature signals:

- 1 = 12V-30V DC
- 2 = Temperature 4 – 20 mA
- 3 = not used
- 4 = Fluid level 4 – 20 mA



### NOTE

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

**HYDAC** Filtertechnik GmbH  
Industriegebiet  
**D-66280 Sulzbach/Saar**  
Tel.: 0 68 97 / 509-01  
Fax: 0 68 97 / 509-300  
Internet: www.hydac.com  
E-Mail: filter@hydac.com