

Hydraulic pilot control unit of sandwich plate design for the remote control of directional valves, pumps, motors

RE 64 552/05.06 1/8

Replaces: 05.03

Type 2TH6

Series 1X



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Features

- Progressive, sensitive control
- Precise and play-free control characteristics
- Low actuation force at the lever
- Rust-free plunger

Further remote controls and pilot control units:

– Hydraulic remote control

- Pilot control unit type 2 TH 6 R, pedal version (see RE 64551)
- Pilot control unit types 4 TH 6, 4 TH 5, 4TH 6 N, for arm rest installation (see RE 64555)
- Pilot control device type TH 7, for instrument panel installation or in pedal design (see RE 64558)
- Pilot control device with end position locking type 4/5 THF 6 (see RE 64553) or type 4/6 THF 5 (see RE 64557)

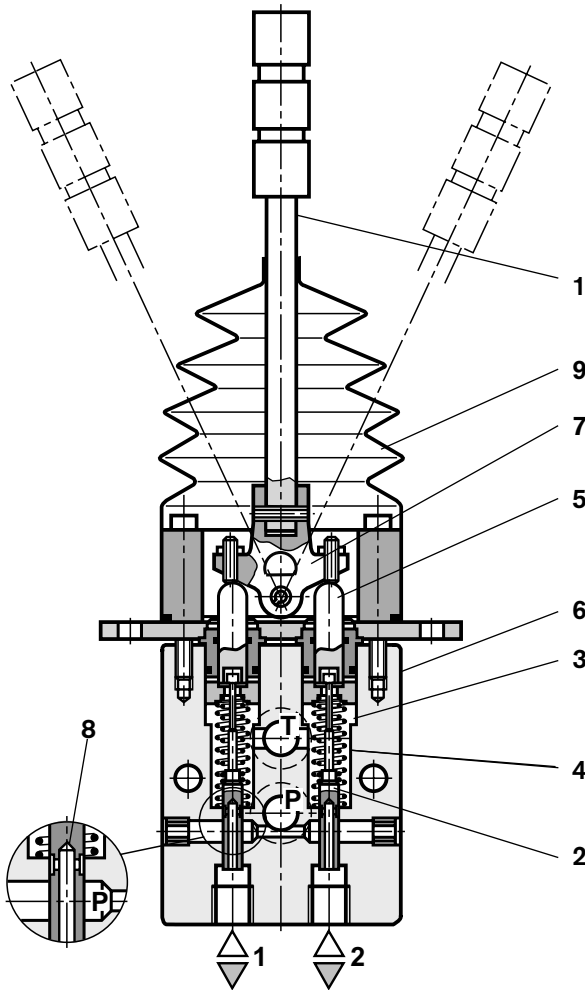
– Electronic pilot control device

- Electronic remote control device type THE6 for direct controlling of electrical or electro-hydraulic pilot operated actuators (see RE 29771)
- Electronic pilot control device type THE5 (see RE 29881)

– B2 TH 6 (see picture opposite)

- Recommended for use with a single 2 TH 6 control axis
- This pilot control unit cannot be flanged on

Functional description, section



Hydraulic operating principle

Hydraulic pilot control units of the type 2TH6 operate on the basis of direct operated pressure reducing valves.

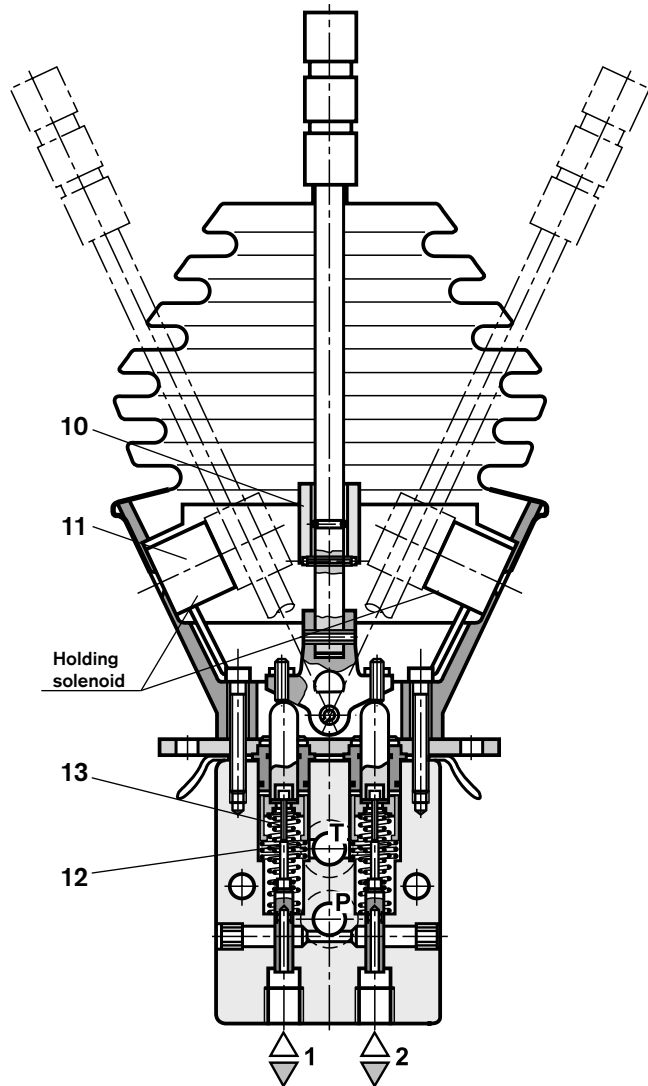
Pilot control units of the type 2TH6 basically comprise of a control lever (1), two pressure reducing valves and a housing (6).

Each pressure reducing valve consists of a control spool (2), a control spring (3), a return spring (4) and a plunger (5).

In the non-actuated condition, the control lever is held in the neutral position by the return spring (4). The control ports (1,2) are connected to tank port T via a drilling (8).

When the control lever (1) is deflected, the plunger (5) is pressed against the return spring (4) and the control spring (3). The control spring (3) initially moves the control spool (2) downwards and closes the connection between the relevant port and tank port T. At the same time, the relevant port is connected to port P via the drilling (8). The control phase starts as soon as the control spool (2) finds its balance between the force from the control spring (3) and the force resulting from the hydraulic pressure in the relevant ports (ports 1, 2).

As a result of the interaction of the control spool (2) and the control spring (3) the pressure in the relevant ports is proportional to the stroke of the plunger (5) and thus to the



position of the control lever (1).

This pressure control as a function of the control lever (1) position and the characteristics of the control spring (3) enables the proportional hydraulic control of directional valves and high response control valves for hydraulic pumps and motors.

A rubber gaiter (9) protects the mechanical parts in the housing against contamination and ensures that the 2TH6 pilot control units can also be used for the arduous applications.

Electro-magnetic lock

End position locking is only provided for the control connections which require that the control lever is held in the deflected position.

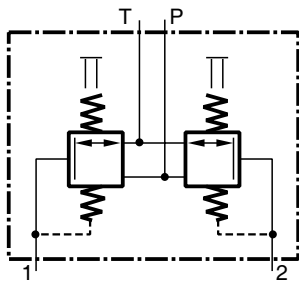
An additional spring (12), which is fitted below an additional plate (13) warns, by means of an increased force, which is required for compressing this spring, that the plunger (5) and the control lever (1) have almost reached the end position.

When this threshold is overcome, a ring (10) contacts the solenoid (11); if the solenoid is energised, then control lever (1) is held in its end position by magnetic force.

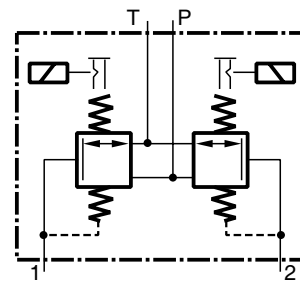
Unlocking can be performed automatically when the solenoid current is switched off.

Symbol, hydraulic

Variants without electrical detent: L, M, P, T, N



Variants with electrical detent: G, H, J



Technical data, mechanical (for applications outside these parameters, please consult us!)

Inlet pressure	bar	up to 50
Back pressure at port T	bar	up to 3
Control fluid flow (P to 1 - 2)	l/min	up to 16
Hysterises	bar	up to 1
Pressure fluid		
¹⁾ suitable for NBR seals		mineral oil (HL, HLP) to DIN 51524 ¹⁾
²⁾ suitable for FKM seals		phosphate ester (HFD-R) ²⁾
Pressure fluid temperature range	°C	- 20 to + 80
Viscosity range	mm ² /s	10 to 380
Degree of pressure fluid contamination		Maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 9. We, therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$
Max. permissible operating torque at lever	Nm	10 in operation
	Nm	80 for an exceptional, one time loading
Weight (dependent on the actuating element)	kg	1.2 to 1.8

Technical data, electrical (for applications outside these parameters, please consult us!)

E-contact technical data for actuator N

• Switching capacity			
	- DC	1 A - 30 V	250 000 cycles
	- AC	0.3 A - 250 V	250 000 cycles
		0.6 A - 125 V	250 000 cycles
• Max. start contact resistance	mW	50	
• Min. isolation resistance at 500 V DC	MW	1 000	
• Dielectric strength		1 000 V eff. 50 Hz min. between outputs	
		1 500 V eff. 50 Hz min. between outputs and mass	
Solenoid supply voltage	V	24 (20 to 27) / DC	
Power consumption of each solenoid		8.5 W at 24 V	

Application guidelines (this list is not intended to be considered as complete)

- Do not direct the jet of a pressure washing unit directly at the unit.
- The electrical cable must be kept free of any mechanical forces.
- During operation protection via the rubber boot must be ensured.

Safety guidelines (this list is not intended to be considered as complete)

- Only one function control must be allocated to an E-contact.
- The circuit functions are to be so designed that uncontrolled machine movements, caused by the application, are prevented and that it is possible to switch from one function to another.
- Take into account all of the application limits, particularly those application limits stated within this catalogue sheet.

Ordering details

Pilot control unit with N flangeable control axis

N = number of control axes 1 to 6

Pilot control unit with 1 control axis, not flangeable

Control axis, separate

Example

3-2 TH 6 L06-1X
M70
L06 M01

Further details in clear text

Example

B 2 TH 6 L06-1X/M01

Example

2 TH 6 L06-1X/M01

Actuator type

1 lever without detent	= L
1 lever with detent in 3 positions	= M
1 lever held in any position by a friction coupling	= P
1 lever with detent in 3 positions and held in any position by a friction coupling	= T
1 lever with E-contact	= N
1 lever with electrical detent in position 1	= G
1 lever with electrical detent in position 2	= H
1 lever with electrical detent in both positions	= J

Enter the identification number of the control curve that is required (see page 5)

Series 10 à 19 = 1X
(10 to 19 : unchanged installation and connection dimensions))

Connection threads

01 = G 1/4 pipe thread to standard ISO 228/1

05 = 9/16 UNF-2 B connections to standard ISO 11926

Seals

M = NBR seals

V = FKM seals

⚠ Attention!
The compatibility of the seals and pressure fluid has to be taken into account

Plug (voir page 8)

5 = DEUTSCH sealed plug IP 67 for wiring the solenoid on a 2 TH 6 G/H/J

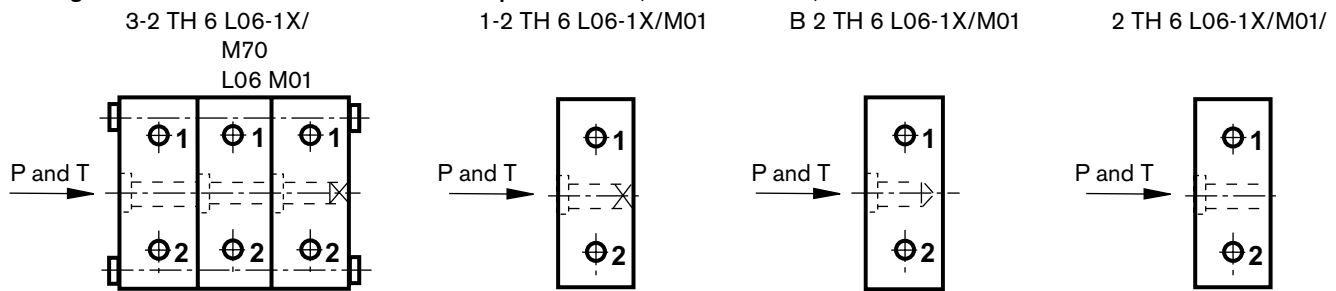
6 = Plug AMP MAT-N-LOK for wiring the solenoid on a 2 TH 6 G/H/J

7 = DEUTSCH sealed plug IP 67 for wiring the solenoids on a 2 TH 6 N

8 = Plug AMP MAT-N-LOK for wiring the solenoids on a 2 TH 6 N

No code = Without plug

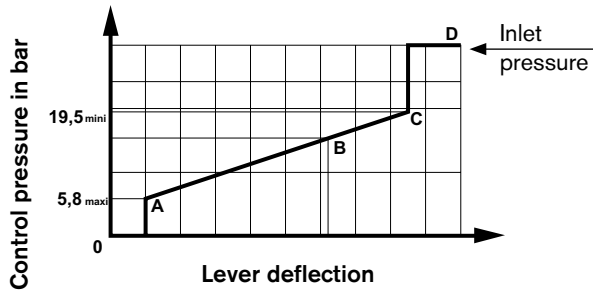
Drillings for connections P and T: connection possibilities (seen from above)



Characteristic curves: control ranges, actuation moments

06 Control curve, identification no. 06

This curve is used for the pilot control of the **SM12, SM18, M1** control blocks

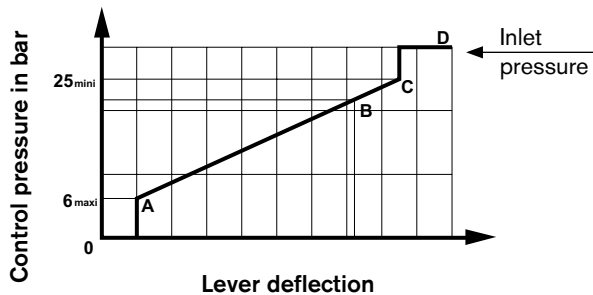


Inter-section point	A	B	C	D
Lever deflection	3°	18°	21°	25°
Actuation moment for actuator L in N.m	0.8	/	2.7	3.8 (p = 35 bar)
Actuation moment for actuators G, H, J in N.m	0.8	1.8	3.2	4.3 (p=35 bar)

B = resistance point before changeover to inlet pressure

70 Control curve, identification no. 70

This curve is used for the pilot control of the **SX14, SX18** control blocks

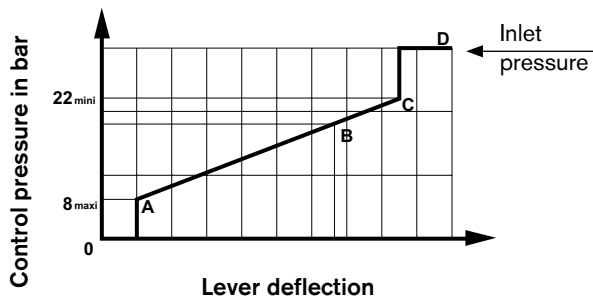


Inter-section point	A	B	C	D
Lever deflection	3°	18°	21°	25°
Actuation moment for actuator L in N.m	0.8	/	2.7	3.8 (p = 35 bar)
Actuation moment for actuators G, H, J in N.m	0.8	3.2	3.6	4.3 (p=35 bar)

B = resistance point before changeover to inlet pressure

20 Control curve, identification no. 20

This curve is used for the pilot control of the **SP12** control blocks

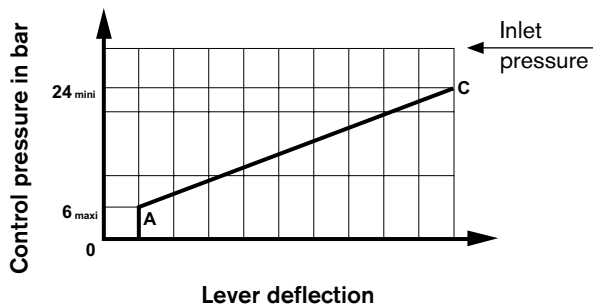


Inter-section point	A	B	C	D
Lever deflection	3°	18°	21°	25°
Actuation moment for actuator L in N.m	1	/	2.9	3.8 (p = 35 bar)
Actuation moment for actuators G, H, J in N.m	1	3.1	3.4	4.3 (p=35 bar)

B = resistance point before changeover to inlet pressure

97 Control curve, identification no. 97 (only for actuators L, M, P, N and T)

This curve is used for the pilot control of the **M7** control blocks



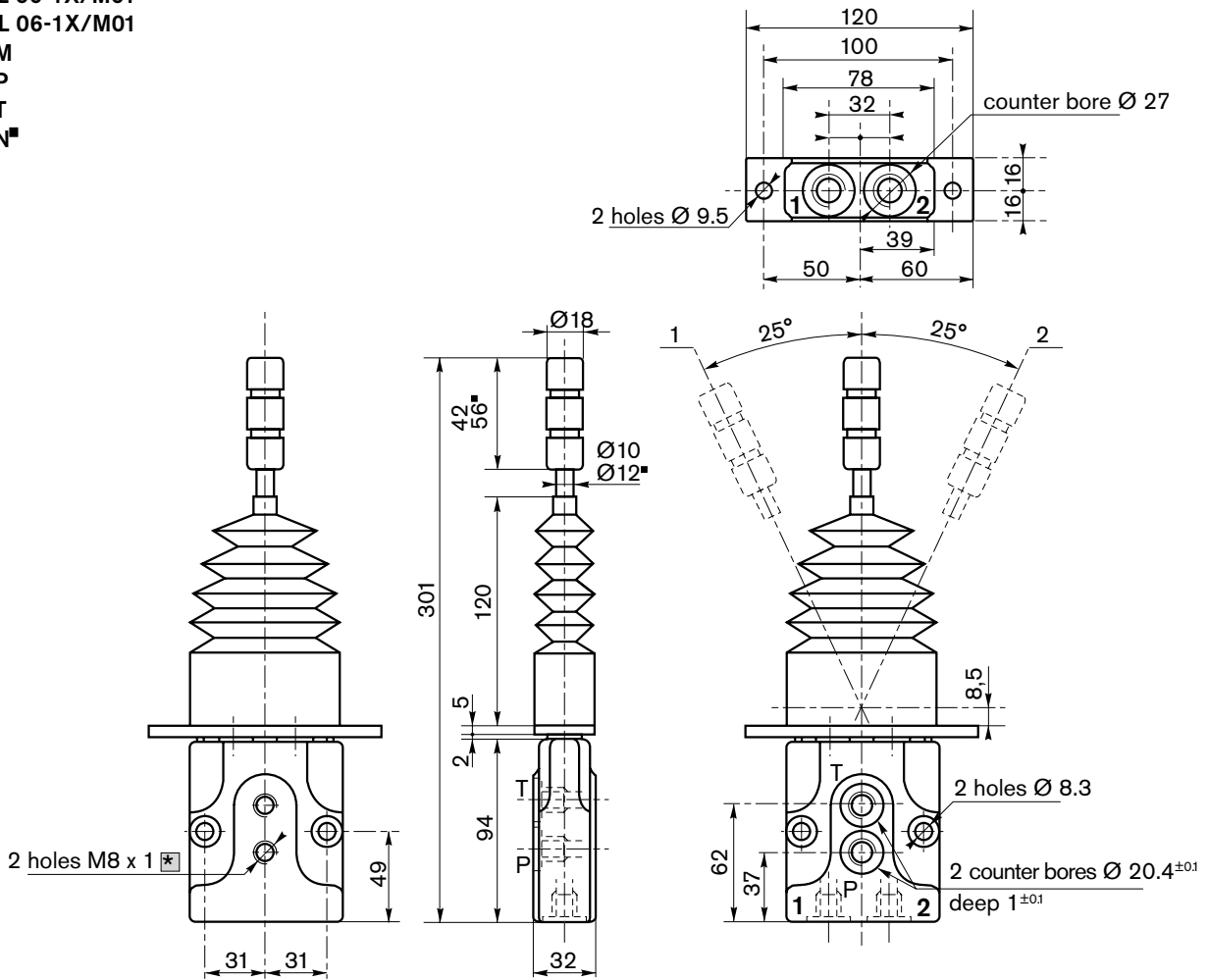
Inter-section point	A	C
Lever deflection	3°	25°
Actuation moment for actuator L in N.m	0.8	3.3

The actuation moments stated are theoretical values which do not take into account the rubber boot resistance.

Unit dimensions (Dimensions in mm)

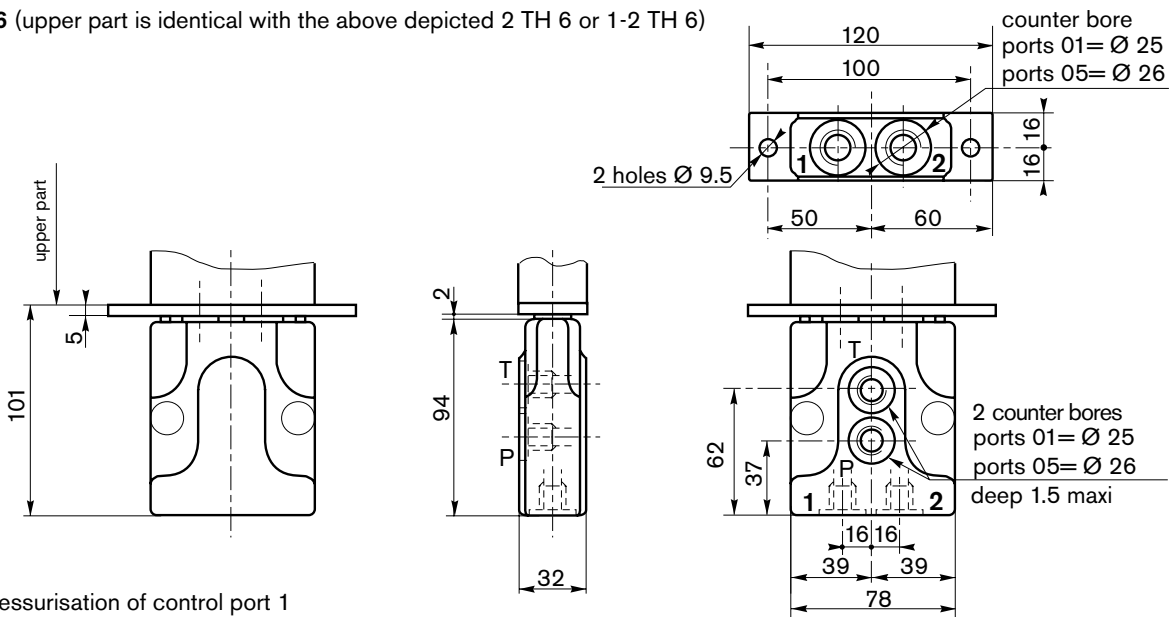
2 TH6 L 06-1X/M01
 1-2 TH6 L 06-1X/M01

M
 P
 T
 N[■]



- * for version 2 TH 6 the threads are open
- for version 1-2 TH 6 the threads are closed
- the version 2 TH6 N has other dimensions for the lever and bush

B2 TH6 (upper part is identical with the above depicted 2 TH 6 or 1-2 TH 6)

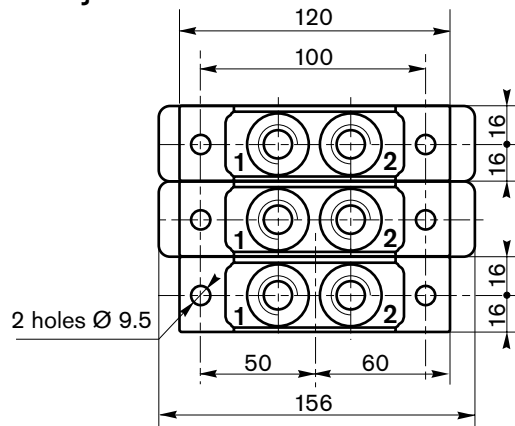


- 1 pressurisation of control port 1
- 2 pressurisation of control port 2

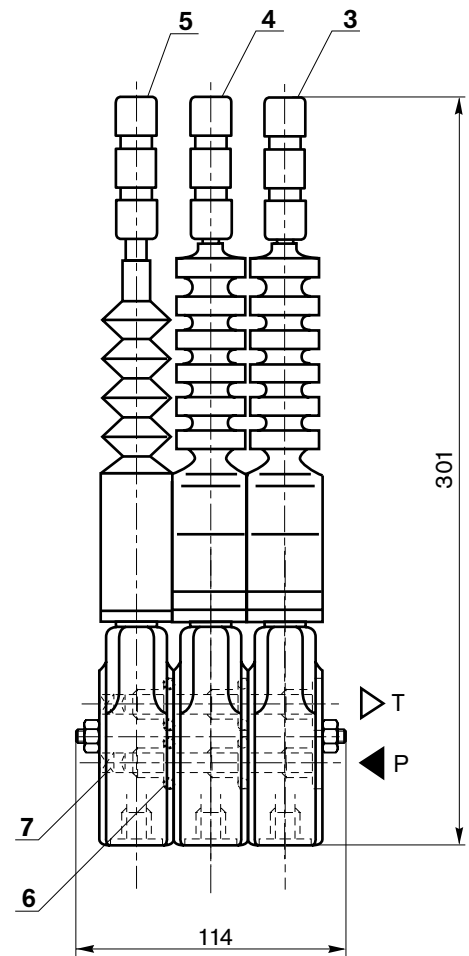
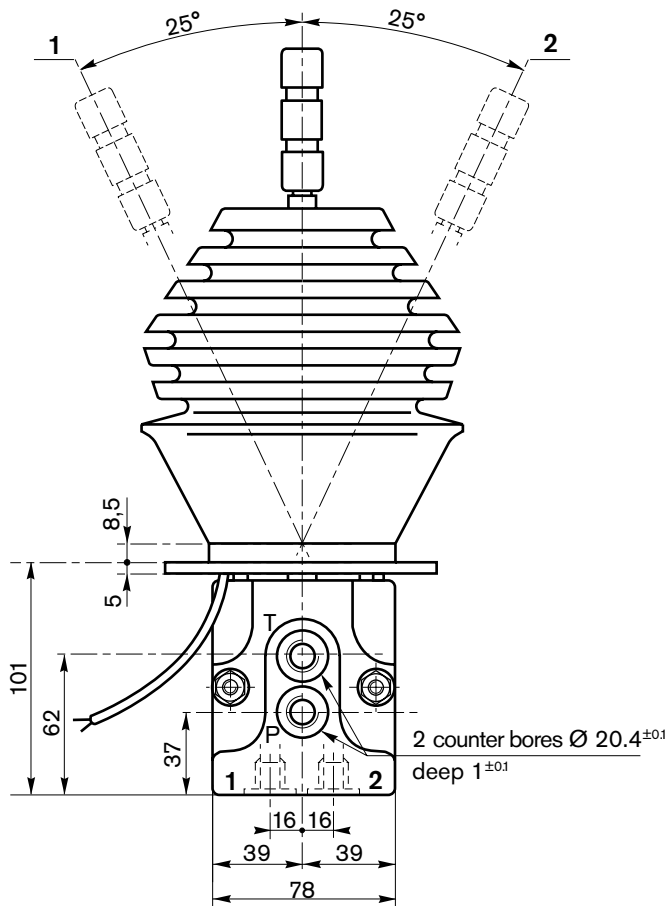
Unit dimensions (Dimensions in mm)

3-2 TH6 H06-1X/H06 L06 M01

G G
J J



- 1 pressurisation of control port 1
- 2 pressurisation of control port 2
- 3 1st control axis (H06)
- 4 2nd control axis (H06)
- 5 3rd control axis (L06)
- 6 O-rings: 17.5 x 1.5 (2 off per contact surface)
- 7 plug factory fitted



Installation guidelines

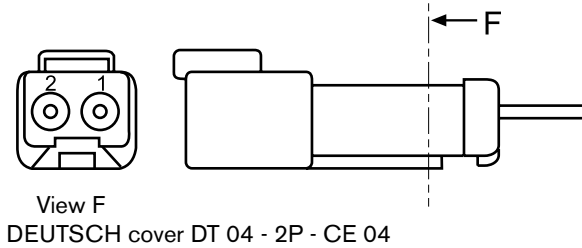
- Mounting flange area: Flatness = 0.5 mm
- Screw head imensions = $\varnothing 13$ mm
- Tightening torque for the flange fixing screws = Max. 10 Nm
- Tightening torque for the pipe connections = Max. 30 Nm

Electrical contact symbol for version 2 TH 6 N

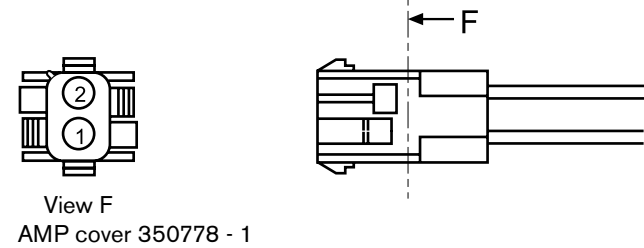


Contact location within the plugs for wiring the 2 TH 6 N

DEUTSCH sealed plug IP 67 (ordering code = 7)

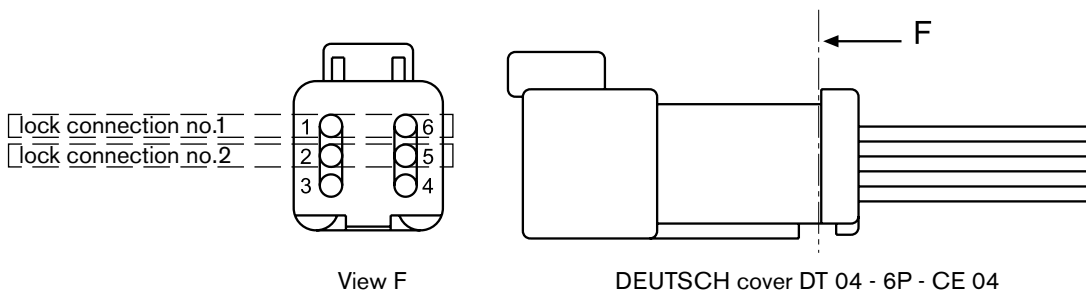


Plug AMP MAT-N-LOK (ordering code = 8)



Contact location within the plugs for wiring the solenoids of the electro-magnetic lock 2 TH 6 G / H / J

DEUTSCH sealed plug IP 67 (ordering code = 5)



Plug AMP MAT-N-LOK (ordering code = 6)

