

4/3 proportional directional valves hydraulic pilot operated P4WEH 10 to 32

DESCRIPTION

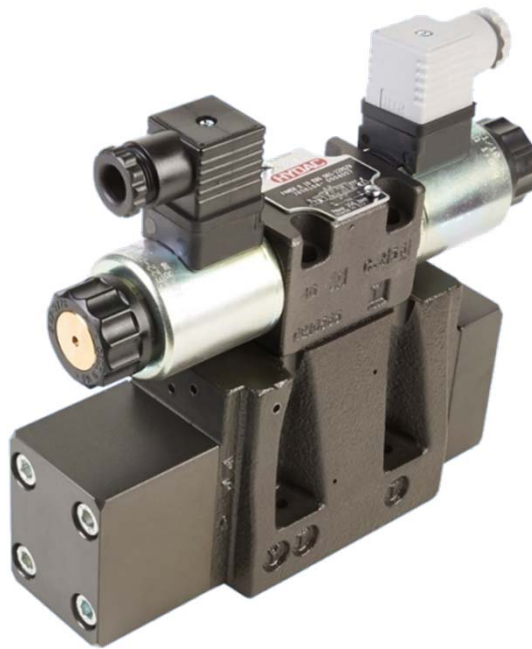
The P4WEH is a pilot operated proportional directional valve, which combines directional control with speed control of the consumer.

The controlled volume flow is proportional to the electrical input signal on valve electronics.

According to the input signal, the magnet generates a control pressure, which shifts hydraulically the main piston against a spring. In this process, cross-sections are released, which determine the size of the volume flow depending on the pressure difference.

FEATURES

- High nominal flow due to optimized, cast manifold
- Low hysteresis due to precision machining of moving parts
- Easy interchangeability due to internationally standardised interface ISO 4401



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MODEL CODE

P4WEH E 10 E80 D01-24PG/V/D

Type

Proportional 4 directional valve, electrical / hydraulic

Control type

E = external pilot supply and drain
 EI = external pilot supply, internal pilot drain
 IE = internal pilot supply, external pilot drain
 I = internal pilot supply and drain

Nominal size (NG)

10, 16, 25, 32

Symbols

See page 2

Nominal flow (at $\Delta p = 10 \text{ bar } P \rightarrow T$)

80 = 80 l/min

80/40 = 80 l/min ($P \rightarrow A$ or $A \rightarrow T$) / 40 l/min ($B \rightarrow T$ or $P \rightarrow B$)

further nominal flows see page 4 „Nominal flow ranges“ in chart „Hydraulic specifications“

Series

D01 = standard

D02 = ISO 4401-05-05-0-05 (NG10 only)

Rated voltage of the solenoid coil

12 = 12 V DC

24 = 24 V DC

Coil Type

PG = DIN connector to DIN 43563

Sealing material

V = FKM (standard)

N = NBR

Pressure reducing valve (30 bar fixed)

Necessary if control pressure at port X is higher than 210 bar

SPOOL TYPES / SYMBOLS

Type	Basic symbol	Type	Basic symbol
E		J	
EA		JA	
EB		JB	

FUNCTION

The P4WEH is a hydraulic pilot operated, proportional 4 directional valve. The volume flow is controlled continuously (proportionally) to the electrical input signal at the solenoid coil.

These valves essentially consist of the pilot stage (pressure regulating valve) and the main stage (directional valve). The pilot stage consists of the valve housing (1), a control piston with 2 pressure measuring pins (2) and two proportional solenoids (3).

The main stage consists of the housing (4), a main piston (5) and a centring spring (6) acting in both directions.

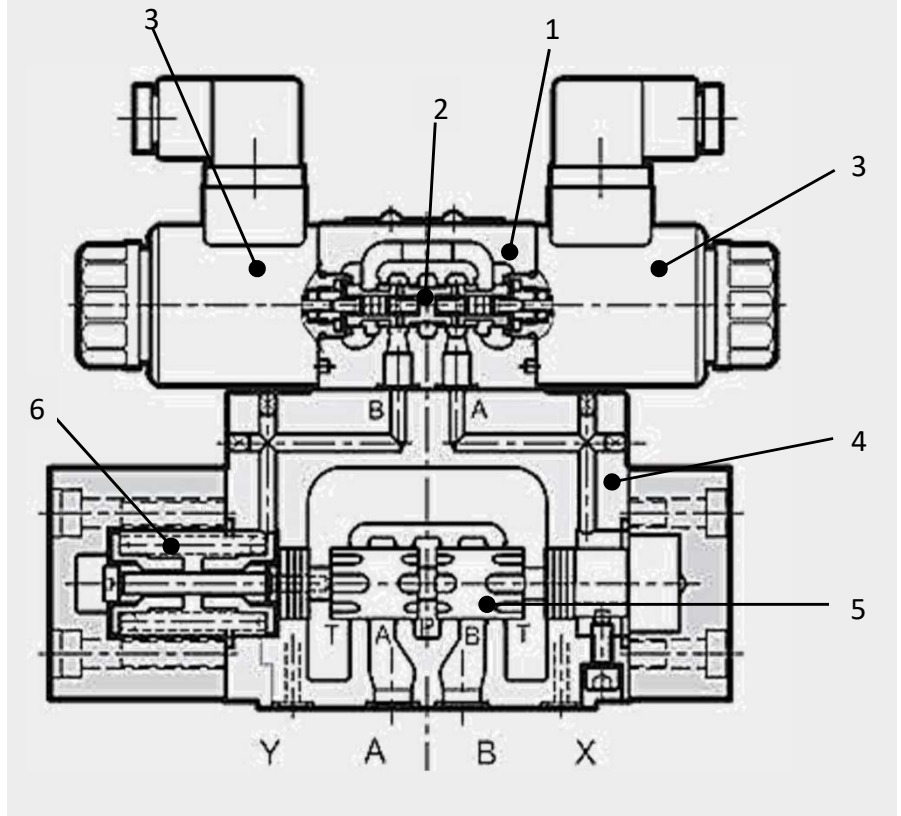
The pressure supply of the valve results from the interface according to ISO 4401. The external pilot supply and drain result from port X and Y to the pilot valve. The regulated control pressure is proportional to the stroke of the main stage. If one of the two solenoids is energized, the pilot releases the connection to control port A or B and regulates the control pressure according to the set solenoid current.

The main piston shifts until a balance of force is reached by pressurizing one of the two sides of the main piston via control pressure. The desired connection PABT or PBAT is released.

If the valve is subsequently relieved of pressure, the centring spring returns the main piston to neutral again.

P4WEH valves are available in two different versions, which differ in their interface. Due to this difference, the valve versions are not compatible with each other.

SECTION VIEW



ACCESSORIES

	Designation	Part no.
Seal kits (main stage)	P4WEH 10: 12,42 x 1,78 90 Sh (5 pcs) 9,25 x 1,78 90 Sh (2 pcs)	FKM: 3524523 NBR: 3524475
	P4WEH 16: 22,22 x 2,62 90 Sh (4 pcs) 10,82 x 1,78 90 Sh (2 pcs)	FKM: 3524634 NBR: 3524553
	P4WEH 25: 29,82 x 2,62 90 Sh (4 pcs) 20,24 x 2,62 90 Sh (2 pcs)	FKM: 3524660 NBR: 3524659
	P4WEH 32: 37,59 x 3,53 90 Sh (4 pcs) 20,24 x 2,62 90 Sh (2 pcs)	FKM: 3524690 NBR: 3524685
Mounting screws	P4WEH 10: ISO 4762 M6 x 35 (4 pcs)	3524691
	P4WEH 16: ISO 4762 M10 x 60 (4 pcs) ISO 4762 M6 x 60 (2 pcs)	4501973
	P4WEH 25: ISO 4762 M12 x 60 (6 pcs)	3524698
	P4WEH 32: ISO 4762 M20 x 70 (6 pcs)	3524700
Control module EHCD*	AM005XXXU	6158999

*For further information see brochure "Control modules for hydraulic drives -EHCD" catalogue-24000.2/10/14 or contact customer support EHCD@hydac.com.

TECHNICAL DATA ¹

General specifications

	Nominal size			
	10	16	25	32
MTTF _d :	According to EN ISO 13849-1:2015 chart C1 & C2			
Ambient temperature:	[°C] -20 to +60			
Installation position:	No orientation restrictions			
Weight:	[kg] 7,5	9,7	16,0	53,0
Material:	Valve casing: Name plate:			Cast iron Aluminium
Surface coating:	Valve casing:			Phosphate

Hydraulic specifications

	Nominal size				
	10	16	25	32	
Operating pressure:	[bar]	Port P: Port T, internal leak port: Port T, external leak port:			$p_{max} = 350$ $p_{max} = 10$ $p_{max} = 250$
Control pressure:	[bar]	$p_{min} = 30$ $p_{max} = 210$			
Max. nominal flow:	[l/min]	180	450	800	1600
Nominal flow ranges: (at $\Delta p = 10$ bar, $P \rightarrow T$)	[l/min]	80 80/40	100 150 150/75	200 300 300/150	350 500 500/250
Operating fluid:	Hydraulic oil to DIN 51524 part 1, 2 and 3				
Media operating temperature range:	[°C]	-20 to +80			
Viscosity range:	[mm ² /s]	10 – 400			
Permitted contamination level of operating fluid:	class 18/16/13 to ISO 4406				
Sealing material:	NBR, FKM (standard)				
Control flow: (Control 0 → 100 %)	[l/min]	3	5	9	13
Control volume: (Control 0 → 100 %)	[cm ³]	1,7	3,2	9,1	21,6

Electrical specifications

	Nominal size				
	10	16	25	32	
Switching time (0 → 100%):	[ms]	50	80	100	200
Switching time (100% → 0):	[ms]	40	50	70	120
Type of voltage:	DC				
Rated voltage:	[V]	12, 24			
Hysteresis:	[%]	< 4 of Q_{max}			
Repeatability:	[%]	< ±2 of Q_{max}			
Protection class to DIN EN 60529:	with electrical connection "G" IP65 ²				

Hint

If the system pressure exceeds the max. allowable control pressure, it is necessary to use the version with external control and control pressure within the specifications. Otherwise, the valve with internal pilot control and pressure reducing valve as 30 bar fixed sandwich plate can be ordered.

¹ see „Conditions and Instructions for Valves“ in brochure 53.000

PERFORMANCE

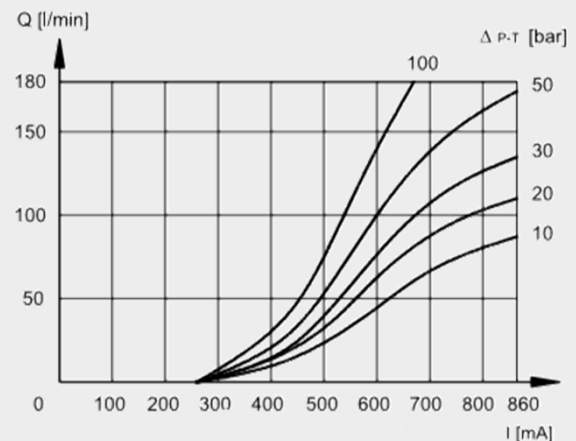
The performance represent typical curves for the various available valve pistons, at a constant Δp , depending on the current supplied by the solenoid coil.

(Note: The maximum current for the solenoid version D24 is 800 mA).

The total valve pressure drop (Δp) was measured between port P and T of the valve.

Q-I-performance NG10

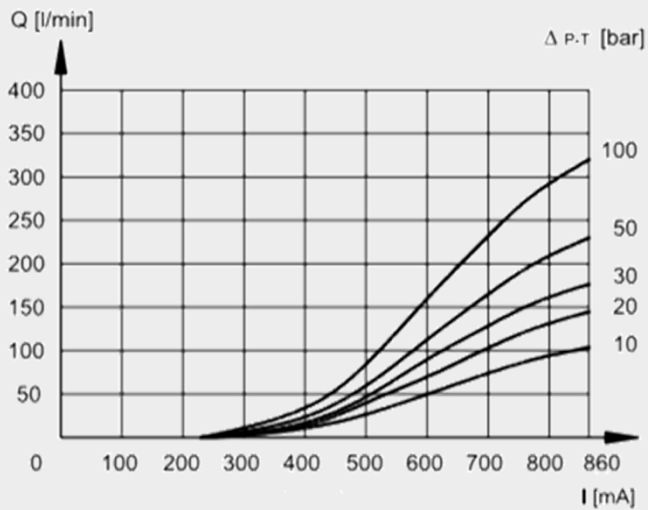
(measured at 36 cSt, 50°C), symbols E; EA; EB; J; JA; JB, nominal flow 80 l/min



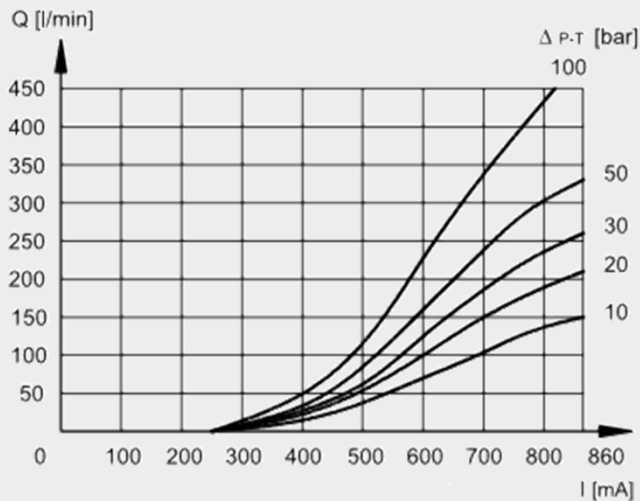
PERFORMANCE

Q-I-performance NG16

(measured at 36 cSt, 50°C), symbols E; EA; EB; J; JA; JB, nominal flow 100 l/min

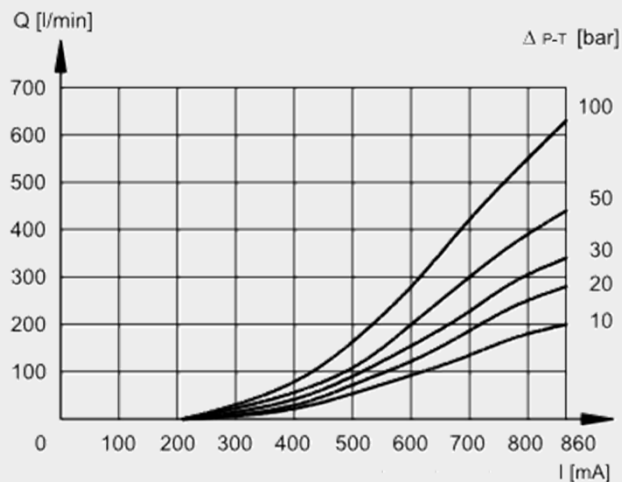


Nominal flow 150 l/min

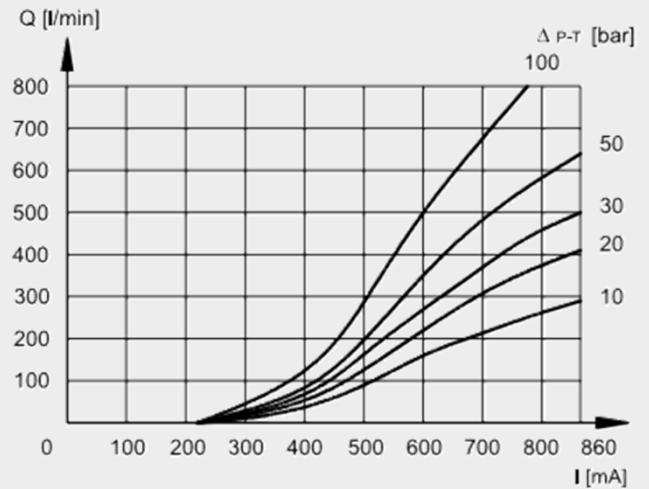


Q-I-performance NG25

(measured at 36 cSt, 50°C), symbols E; EA; EB; J; JA; JB, nominal flow 200 l/min,

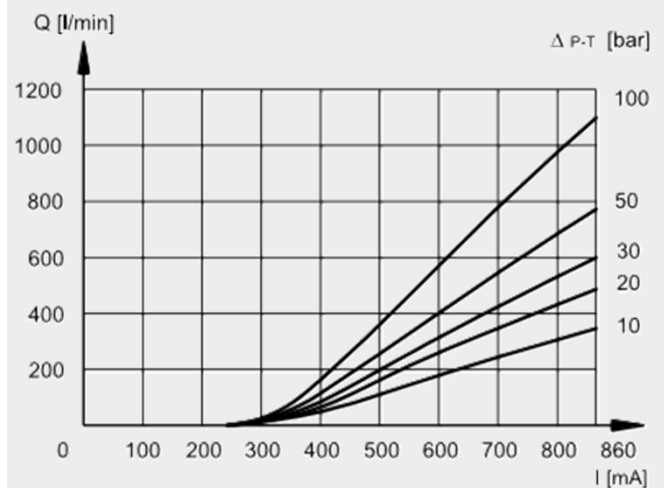


Nominal flow 300 l/min

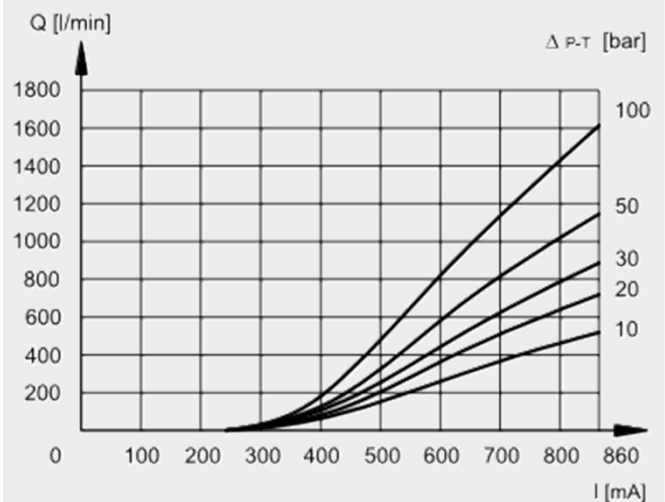


Q-I-performance NG32

(measured at 36 cSt, 50°C), symbols E; EA; EB; J; JA; JB, nominal flow 350 l/min



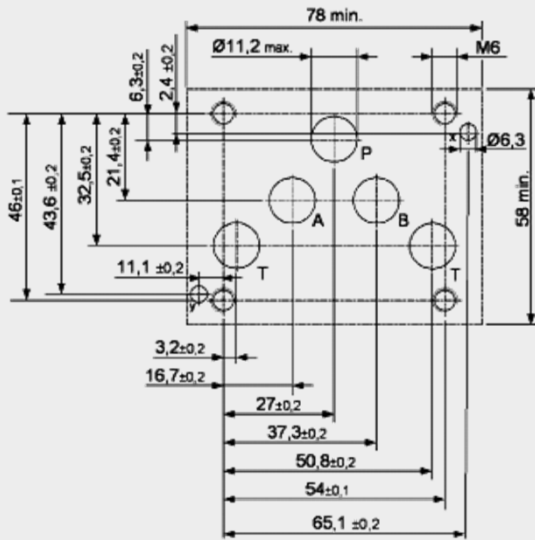
Nominal flow 500 l/min



DIMENSIONS NG10

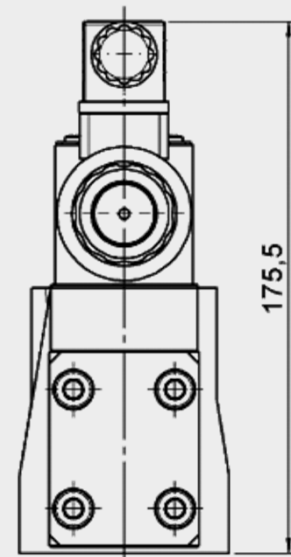
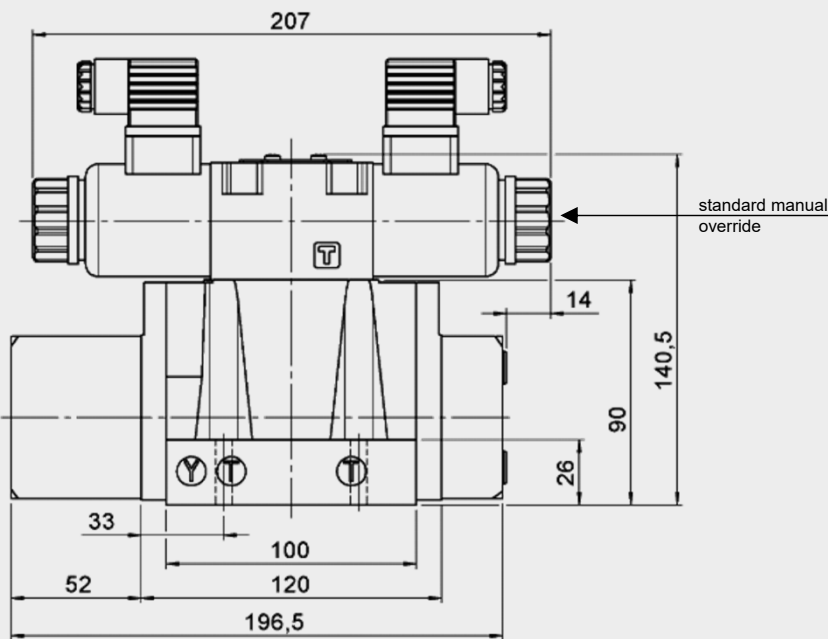
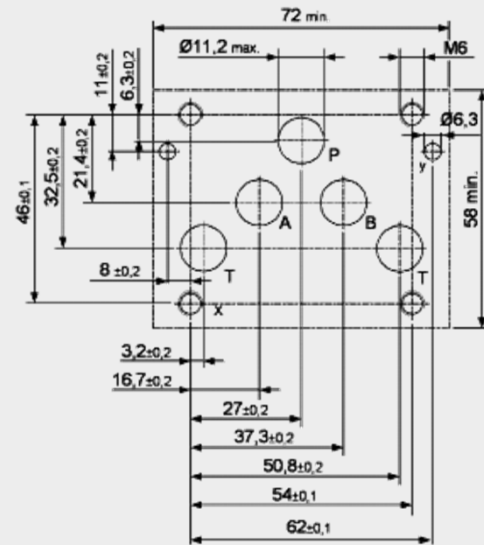
INTERFACE

CETOP 4.2-4 P05-350 (D01)



INTERFACE

ISO 4401-05-05-0-05 (D02)
(CETOP 4.2-4 R05-350)



Hint

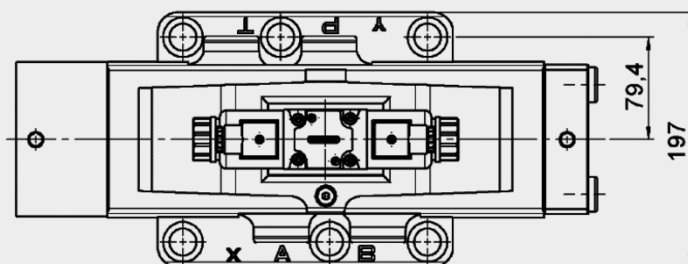
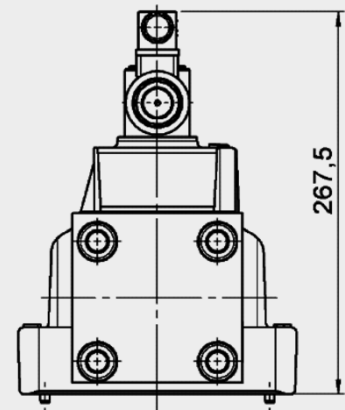
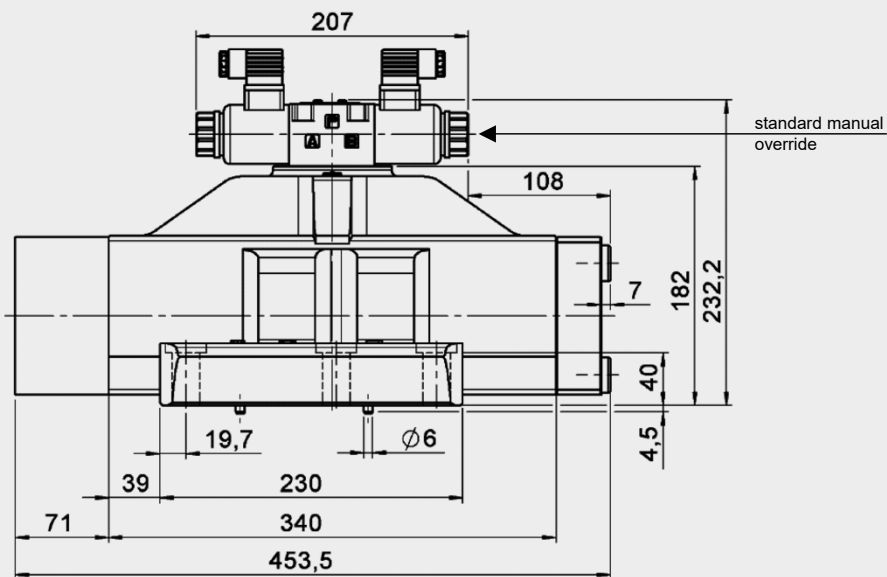
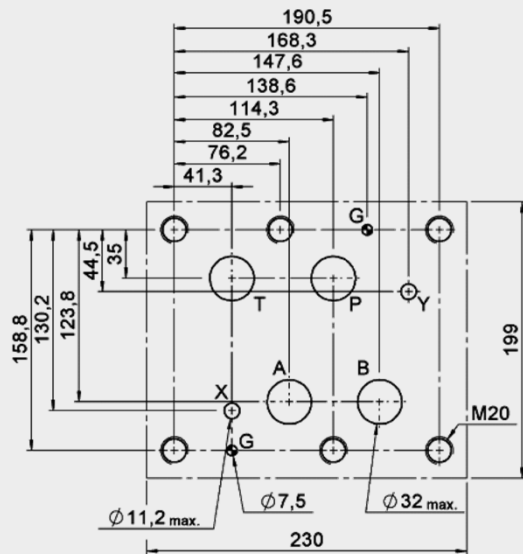
When using the pressure reducing as sandwich plate, the installation height changes by 40 mm to 180.5 mm.

Mounting screws (ISO 4762): 4 pcs M6 x 35 A8.8 (not included in delivery)
Torque: 8 Nm

DIMENSIONS NG32

INTERFACE

ISO 4401-10-09-0-05 (D01)
(CETOP 4.2-4-10-350)

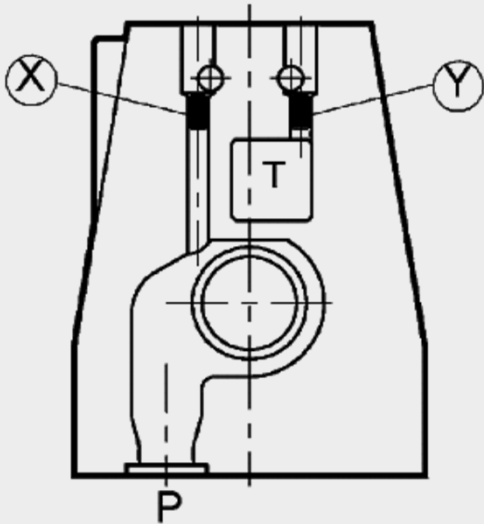


Hint

When using the pressure reducing as sandwich plate, the installation height changes by 40 mm to 272.2 mm.

Mounting screws (ISO4762): 6 pcs M12x70 A8.8 (not included in delivery)
Torque: 330 Nm

Plug



Control type		Installation	
		X	Y
E	external pilot supply and drain	●	●
EI	external pilot supply, internal pilot drain	●	-
IE	internal pilot supply, external pilot drain	-	●
I	internal pilot supply and drain	-	-

- **Version „E“ –**
Pilot oil supply is external from a separate fluid power supply via port X.
The pilot oil drain is also external via port Y.
- **Version „EI“ –**
Pilot oil supply is external from a separate fluid power supply via port X.
The pilot oil drain is internal via port T.
- **Version „IE“ –**
Pilot oil supply is internal via port P.
The pilot oil drain is external via port Y.
- **Version „I“ –**
Pilot oil supply is internal via port P.
The pilot oil drain is internal via port T.

The valve is configured and delivered as required.
The threaded plugs are glued in at delivery.
Subsequent modification is not possible.

Note

The information in this brochure relates to the operating conditions and applications described. For applications not described, please contact the relevant technical department. All technical details are subject to change without notice.

HYDAC Fluidtechnik GmbH
Justus-von-Liebig-Str.
D-66280 Sulzbach/Saar
Tel: 0 68 97 /509-01
Fax: 0 68 97 /509-598
E-Mail: valves@hydac.com