

4/2 and 4/3 Proportional directional valve direct-acting P4WE 10

DESCRIPTION

HYDAC 4/2 and 4/3 proportional directional valves of the P4WE series combines directional control with speed control of the consumer.

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

FEATURES

- High nominal flow due to optimized, cast casing
- Low hysteresis due to precision machining of moving parts
- Easy interchangeability due to internationally standardised interface ISO 4401
- Electronic control by EHCD (see brochure 2.429.2)



Nominal size 10
up to 90 l/min
up to 350 bar

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MODEL CODE

P4WE 10 EA30 A01 – 24 PG /V

Type

Proportional directional valve with 4 main ports, direct-acting

Nominal size

10

Symbol

see page 2

Nominal flow (at $\Delta p = 10$ bar, $P \rightarrow T$)

30 = 30 l/min

60 = 60 l/min

Series

A01 = specified by the manufacturer

Rated voltage of the solenoid coil

12 = 12 VDC

24 = 24 VDC

Coil type (Details see page 6)

PG = device connector to DIN EN175301-803

PN = Deutsch connector

Sealing material

V = FKM (standard)

N = NBR

SPOOL TYPES / SYMBOLS

4/2-DIRECTIONAL SPOOL VALVES

Type	Basic model
EA	
QA	

4/3-DIRECTIONAL SPOOL VALVES

Type	Basic model
E	
Q	

FUNCTION

The proportional valves of the P4WE series are direct-acting proportional valves.

The volume flow is controlled continuously (proportionally) to the electrical input signal at the solenoid coil.

The valve consists of a valve casing (1), a control piston (2) and two proportional solenoids (3).

According to the input signal, the solenoid generates a force and shifts the piston against a spring. This releases cross-sections, which define the size of the volume flow, depending on the pressure difference at the relevant control element.

For electrical control of the coil there are electronic controls available (see brochure 5.249.2).

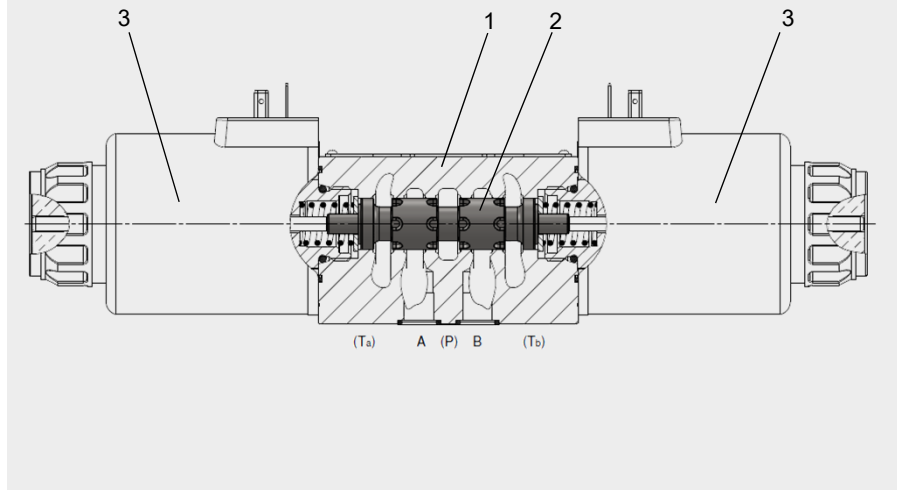
Hint:

Vent system and valve before setting in motion.

Caution:

The valves are available in 12V and 24V coil versions. A 24VDC supplied control electronics enables improved dynamic and hysteresis values for a valve with 12V coil. A control electronic supplied with 12VDC can only be used in combination with a 12V coil version. Then the dynamic advantage of the valve is lost.

SECTION VIEW



TECHNICAL DATA ¹

General specifications	
MTTFd	According to EN ISO 13849-1:2015 chart C1 & C2
Ambient temperature	[°C] -20 to +60
Installation position	No orientation restrictions
Weight	[kg] 4,0 one solenoid; 6,0 two solenoids
Material	Valve casing: Cast iron Name plate: Aluminium
Surface coating	Valve casing: Phosphate coated
Hydraulic specifications	
Operating pressure	[bar] Port P, A, B: $p_{max} = 350$ Port T: $p_{max} = 210$
Flow rate (at Δp A → B min. 10 bar)	[bar] see performance curves on page 5
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] 15 to 400
Permitted contamination level of operating fluid	class 18/16/13 according to ISO 4406
Max. switching frequency	[1/h] 7.000
Hysteresis	[%] 6 of Q_{max}
Repeatability	[%] $\pm 1,5$ of Q_{max}
Sealing material	FKM (standard), NBR
Electrical specifications	
Switching time	[ms] Switch-on: 80 bis 120 Switch-off: 70 bis 110 Switching times are highly dependent on pressure, flow rate and application of the valve.
Type of voltage	DC
Rated voltage	[V] 12 24
Max. current	[A] 2,5 1,9
Resistance at 20°C	[Ω] 3,2 5,5
Voltage tolerance	[%] ± 10
Duty cycle	[%] 100
Protection class to DIN EN 60529	with electrical connection "G" IP65 ² with electrical connection "N" IP65 ²

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

² if installed correctly

PERFORMANCE

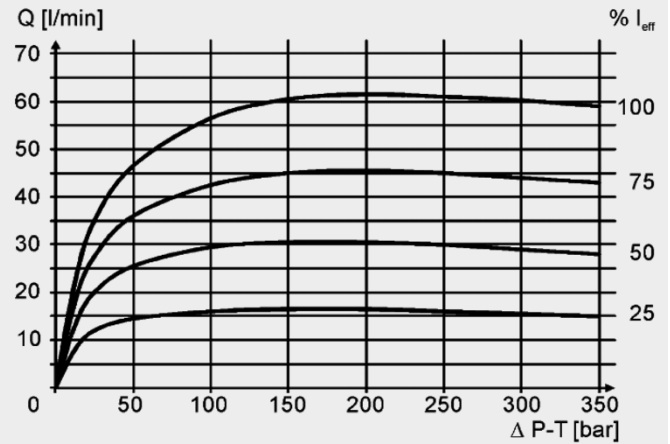
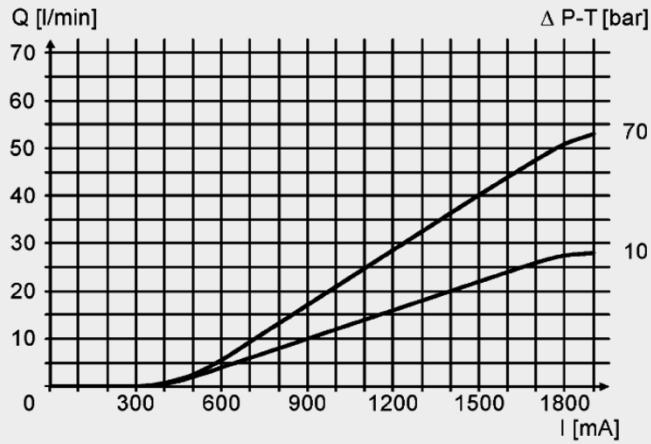
measured at $T_{oil} = 42^{\circ}\text{C}$ and $36 \text{ mm}^2/\text{s}$ and flow on both sides of the spool (z.B. $P \rightarrow A \rightarrow B \rightarrow T$)

The performance curves represent typical flow curves for different valve spools. The first curve shows the flow value at constant Δp , depending on the solenoid current. The second curve describes the dependency of flow value and Δp at constant solenoid current.

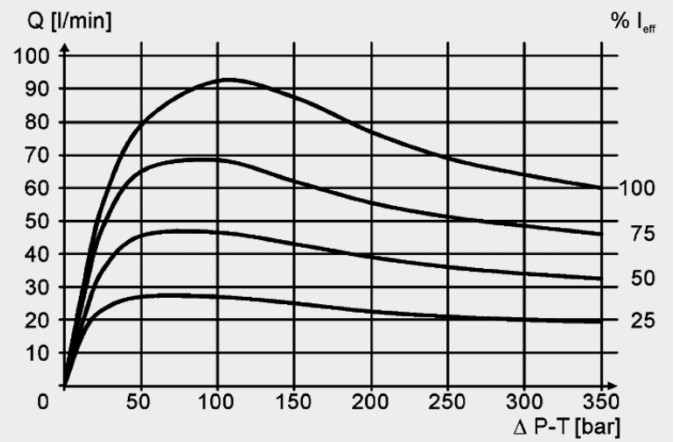
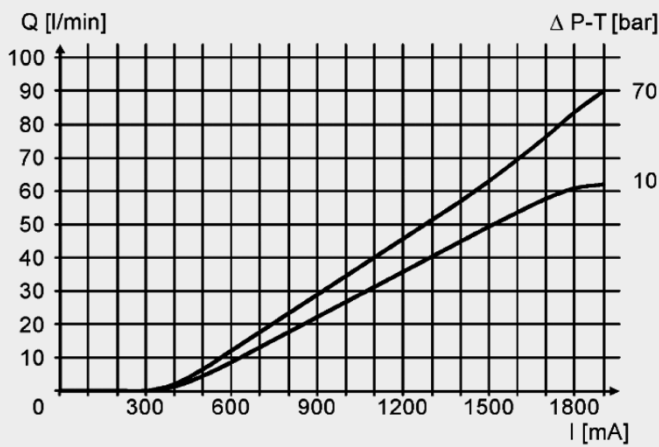
The total valve pressure drop (Δp) was measured between port P and T of the valve.

Hint: $I_{eff} = I_{efficient} = I_{max} - I_{empty}$

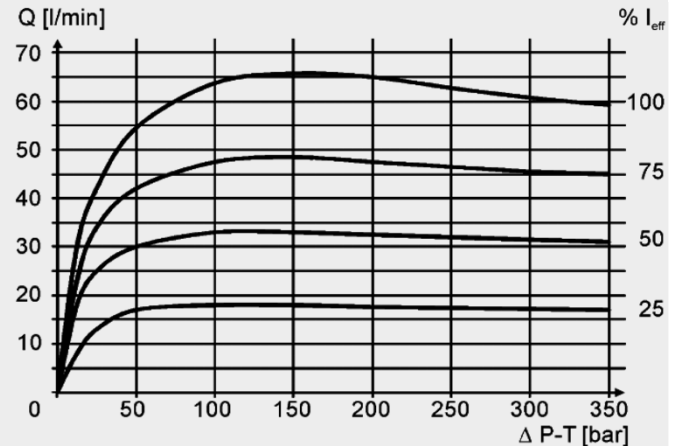
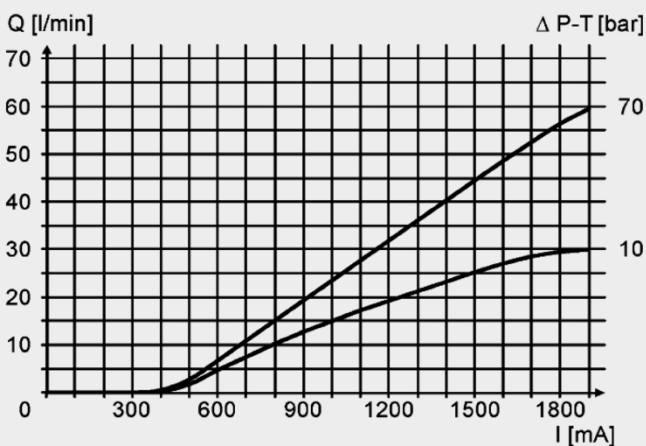
E 30 spool



E 60 spool

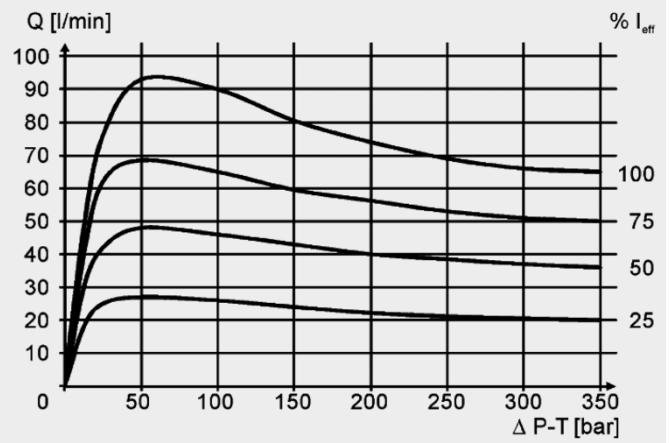
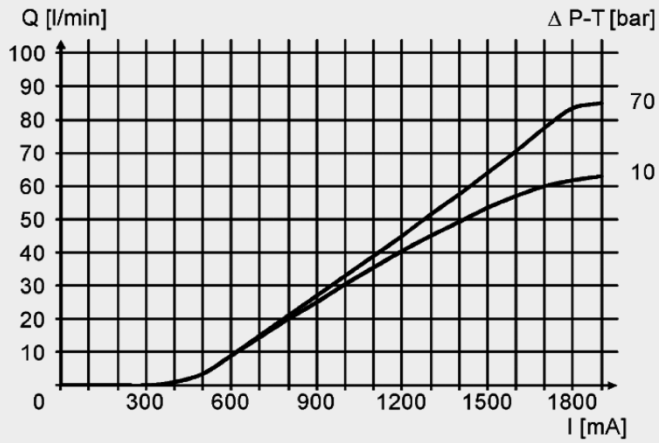


Q 30 spool



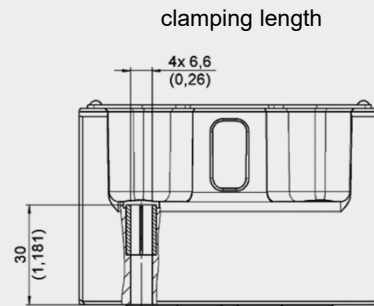
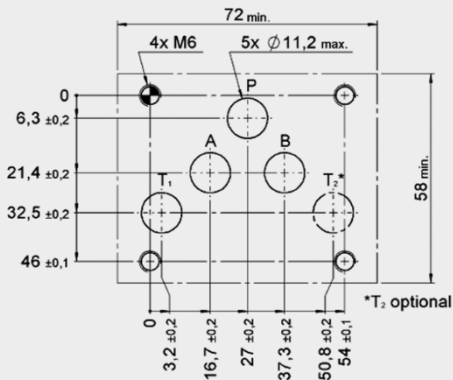
PERFORMANCE

Q 60 spool



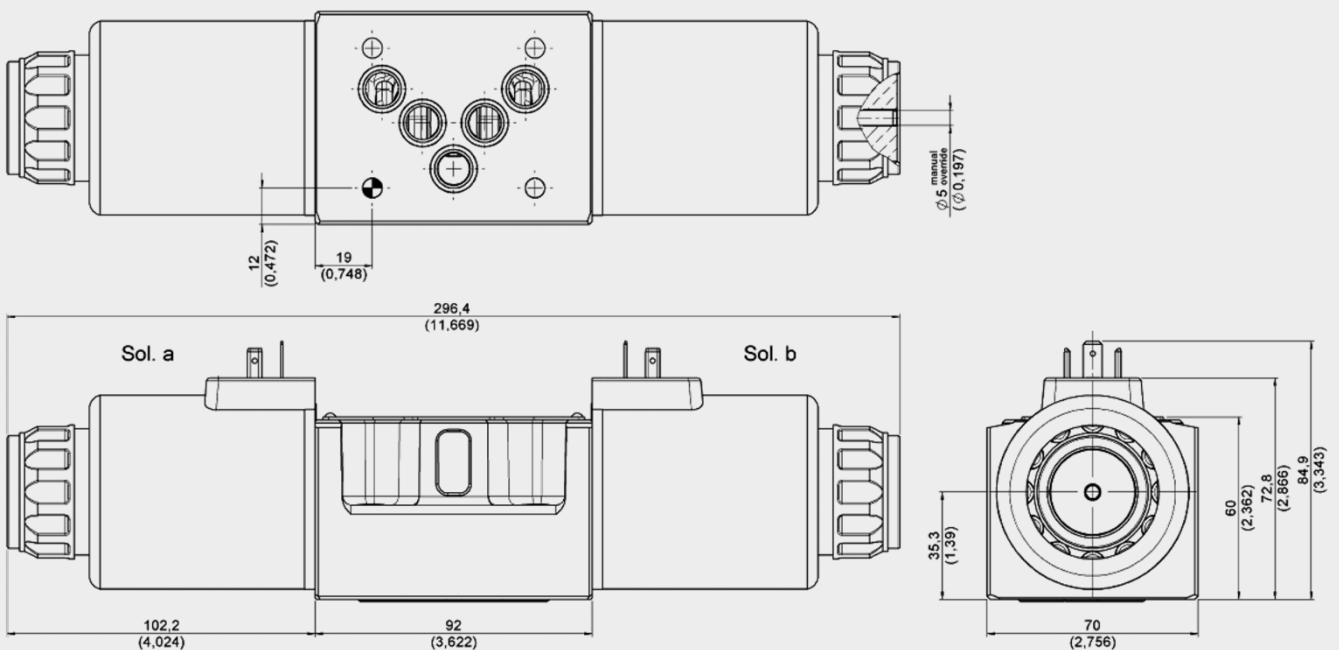
DIMENSIONS

Interface to ISO 4401-05-04-0-05 (Cetop 5)

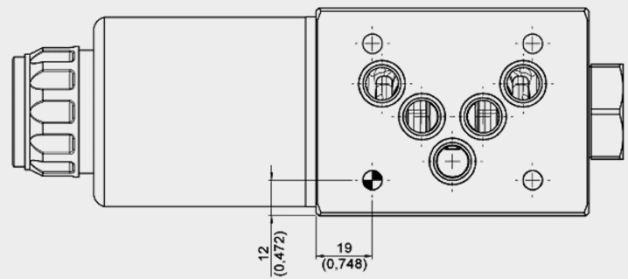
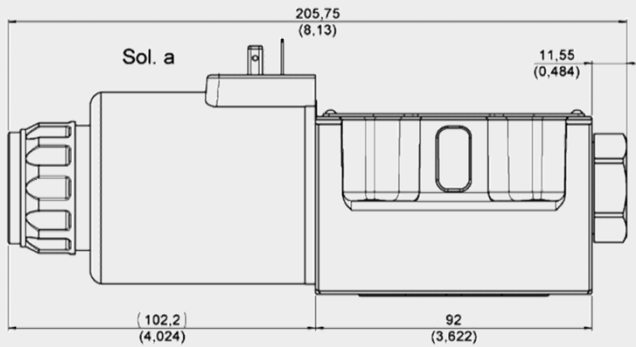


Mounting screws:
 (not included in delivery)
 DIN EN ISO 4762 - M6x40 - 10.9
 Torque: 10 Nm

With two solenoids



With one solenoid



ELECTRICAL CONNECTIONS

G Device connector DIN EN 175301-803 A		<ul style="list-style-type: none"> • IP65
N Device connector Deutsch (DT04-2P)		<ul style="list-style-type: none"> • IP65 / IP67 • Optional with Suppressor diode

Other models on request

NOTHANDBETÄTIGUNG

Standard with concealed manual override		Operation with tool
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* Dimensions up to valve housing

In case of emergency, the valve can also be operated manually. There are different forms of manual override available.

The tank pressure should not exceed 50 bar. If the tank pressure is higher, the force required to operate the manual override increases accordingly.

For valves with two solenoids, simultaneous operation of both manual overrides is not permitted.

ACCESSORIES

	Designation	Part no.
Seal kits (4-part set)	12,42 x 1,78-NBR -80Sh	4348706
	12,4 2x 1,78-FKM -80Sh	4348705
Mounting screws (4 Stk)	DIN EN ISO 4762 - M6 x 40 - 10.9	3524314
Solenoids coils	COIL 12PG - 3,2 - 75-3164	4362749
	COIL 24PG - 5,5 - 75-3164	4362402
	COIL 12PN - 3,2 - 75-3164	4406246
	COIL 24PN - 5,5 - 75-3164	4406247
Seal kit for solenoid coil	Nut open, O-ring	4348711
Connector	Z4 standard 2-pole without PE	394287
	ZW4 incl. rectifier	394293
	Z4L incl. LED	394285
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.

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