

4/3 proportional spool valve Control valve with On-Board Electronic and transducer solenoid-operated, direct-acting **C4WERE 10**

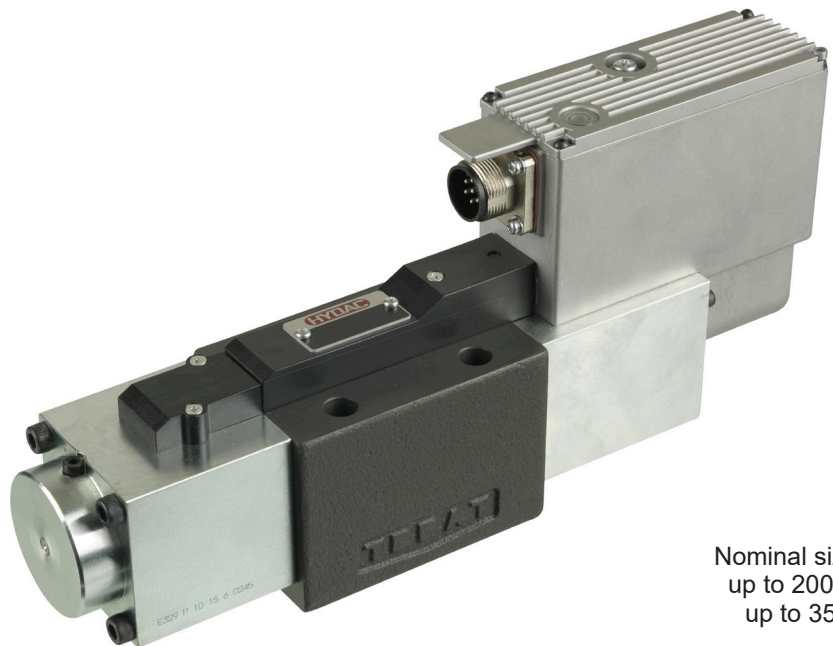
DESCRIPTION

HYDAC 4/3 control valves of the C4WERE 10 series are direct acting, electrically operated spool valves.

The valve operates by oil-immersed control solenoid. During this process, the solenoid quickly and precisely pushes the valve's control spool into the respective position to obtain the desired flow path. The position of the piston is proportional to the input signal and is controlled by integrated electronics and direction control (LVDT).

FEATURES

- Application for position, pressure and speed control
- Resistant to contamination due to powerful solenoids
- Easy to use due to plug-and-play design
- High dynamic and very good response
- Interface according to ISO 4401-05; DIN 24340 Form A10



Nominal size 10
up to 200 l/min
up to 350 bar

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MODEL CODE

C4WERE 10 Z - FA 80 K01 / E0B / V

Type

Solenoid-operated control valve with integrated electronic and position transducer, direct-acting

Nom. size

10

Piston symbol

See page 3

Fail-safe function

Not specified = no fail-safe function (standard)

FA = ports P and B to ports A and T

FB = ports P and A to ports B and T

Flow rate (at 10 bar Δp port P to T)

40 = 40 l/min

80 = 80 l/min

Type

K01 = standard

Input signal

E0B = voltage ± 10 V

E1B = current 4–20 mA

Sealing material

N = NBR

V = FKM (standard)

SPOOL TYPES / SYMBOLS

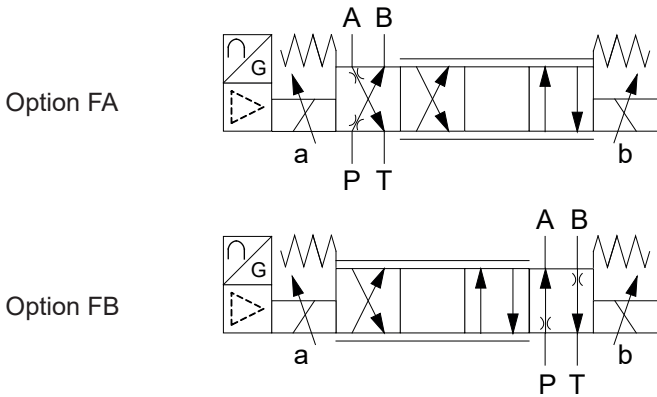
4/3-DIRECTIONAL SPOOL VALVES

Type	Symbol	Description
Q		
E		10% overlap with total stroke*
Z		2% overlap with total stroke*

*Full piston stroke = 3 mm

FAIL-SAFE FUNCTION (OPTION)

Position of the piston in the absence of power supply:



Designation	Spool position	Symbol
C4WERE 10 E .. K01/.../.	Centre position: All ports blocked	Spool E
C4WERE 10 Q .. K01/.../.	Centre position: From port A and B low leakage to T	Spool Q
C4WERE 10 .-FA .. K01/.../.	20% of total stroke Equivalent to approx. 20% of Q_{NOM}	Spool E, Z and Q
C4WERE 10 .-FB .. K01/.../.	20% of total stroke Equivalent to approx. 20% of Q_{NOM}	Spool E, Z and Q

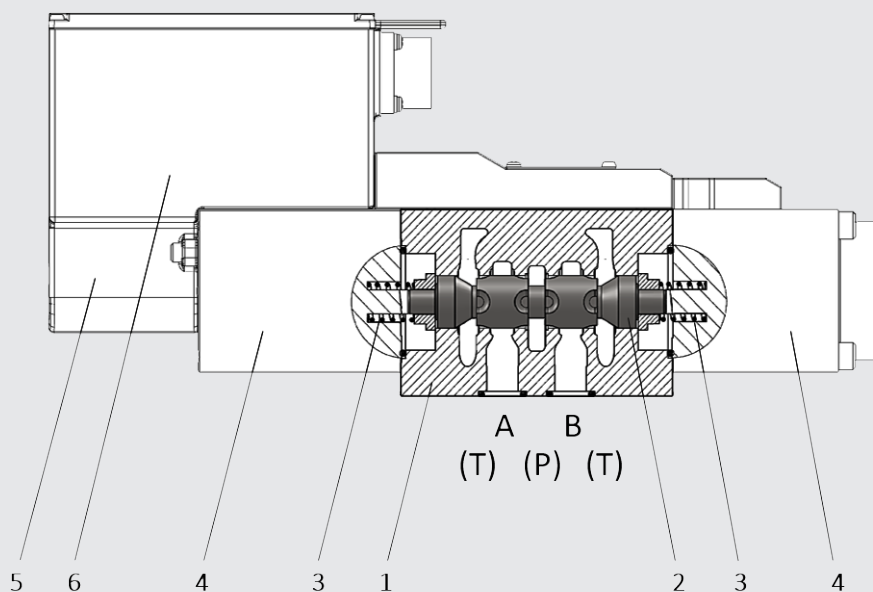
FUNCTION

The solenoid-operated proportional directional spool valves of the C4WERE 10 series are used to control a flow precisely and dynamically.

The valve consists of a valve casing (1) with corresponding valve piston (2). It has two return springs (3) and is equipped with two powerful control solenoids (4), as well as a transducer (5) and On-Board Electronic (6).

The on-board electronics convert an analogue nominal value signal into a proportional piston displacement in relation to the return spring. This causes the nominal flow directions between the respective connections to be released or closed. The force needed to perform the displacement is generated by the solenoid. The positional transducer constantly records the current position and the on-board electronics compares the actual position with the target position and sets the pilot flow to the level required to correct any difference. This makes it possible to have a steadily increasing flow even if the pressure difference across the valve is increasing. If the valve is de-energised, the return springs return the valve piston to a safe position (fail-safe function).

SECTION VIEW



TECHNICAL DATA ¹⁾

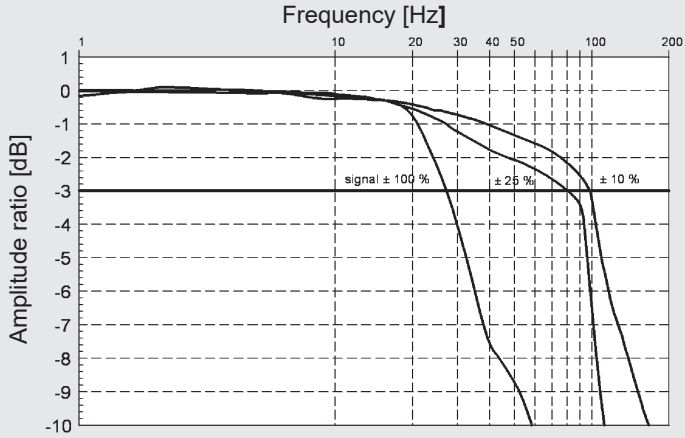
General specifications		
Ambient temperature:	[°C]	0 to 50
Installation position:		Horizontal ±15° of centre axis
Weight:	[kg]	7.3
Material:		Valve casing: Cast iron Electronic casing: Metal die-cast Coil casing: Steel Name plate: Aluminium
Surface coating:		Valve casing: Phosphate plated
Hydraulic specifications		
Operating pressure:	[bar]	350
Tank pressure:	[bar]	210
Flow rate: Q _{NOM} (at 10 bar Δp p→T)	[l/min]	40 = 40 l/min 80 = 80 l/min
Operating fluid:		Hydraulic oil to DIN 51524 Part 1, 2 and 3
Temperature range of operating fluid:	[°C]	-15 to +60
Viscosity range:	[mm ² /s]	15 to 400
Permitted contamination level of operating fluid:		Class 18/16/13 according to ISO 4406
Sealing material:		FKM (standard), NBR
Electrical specifications		
Hysteresis:	[%]	0.1
Repeatability:	[%]	0.1
Protection class according to DIN EN 60529:		IP65

¹⁾see "Conditions and Instructions for Valves" in brochure 53.000

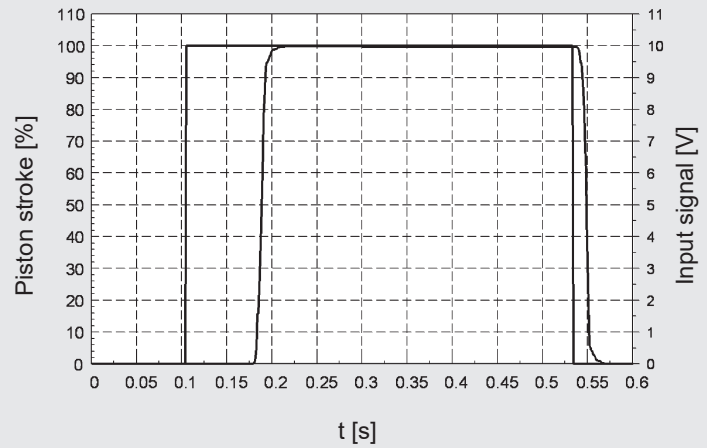
PERFORMANCE

Example Z spool

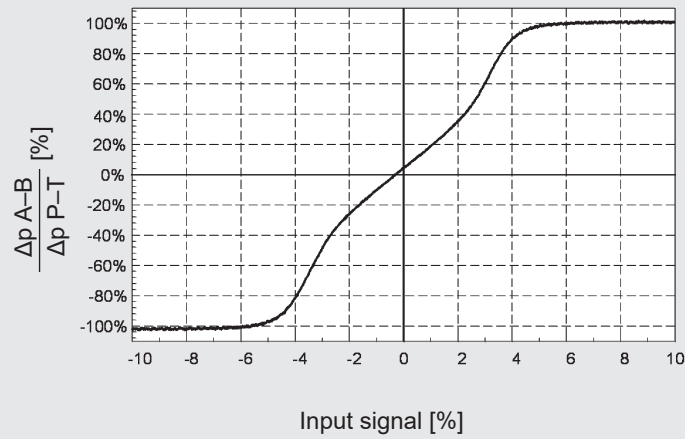
Frequency range



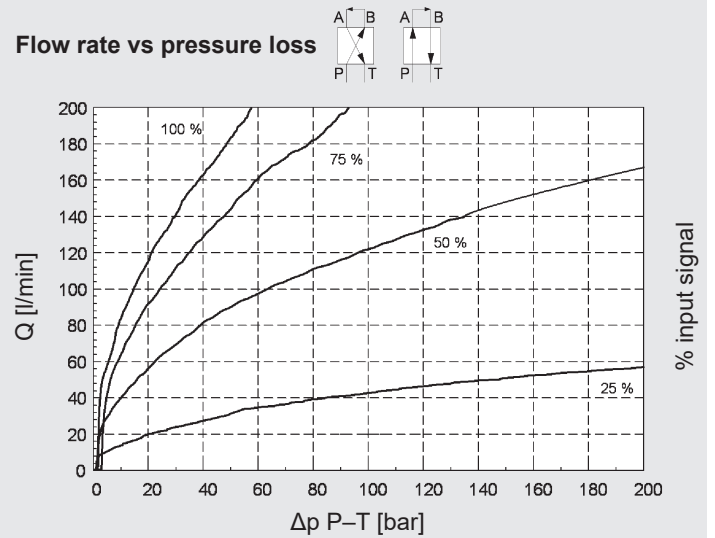
Switching times



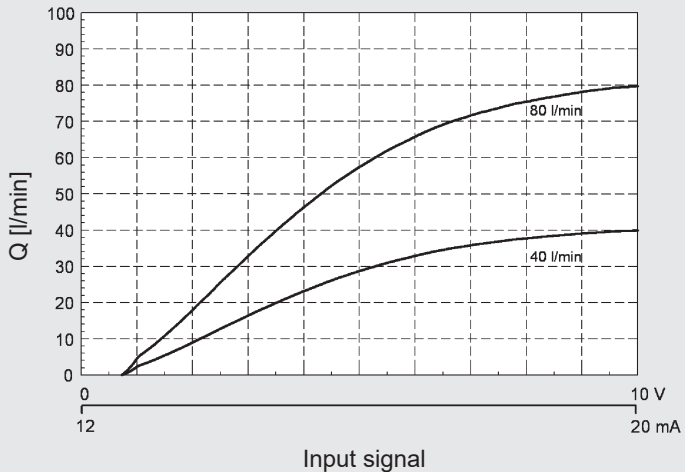
Pressure increase



Flow rate vs pressure loss



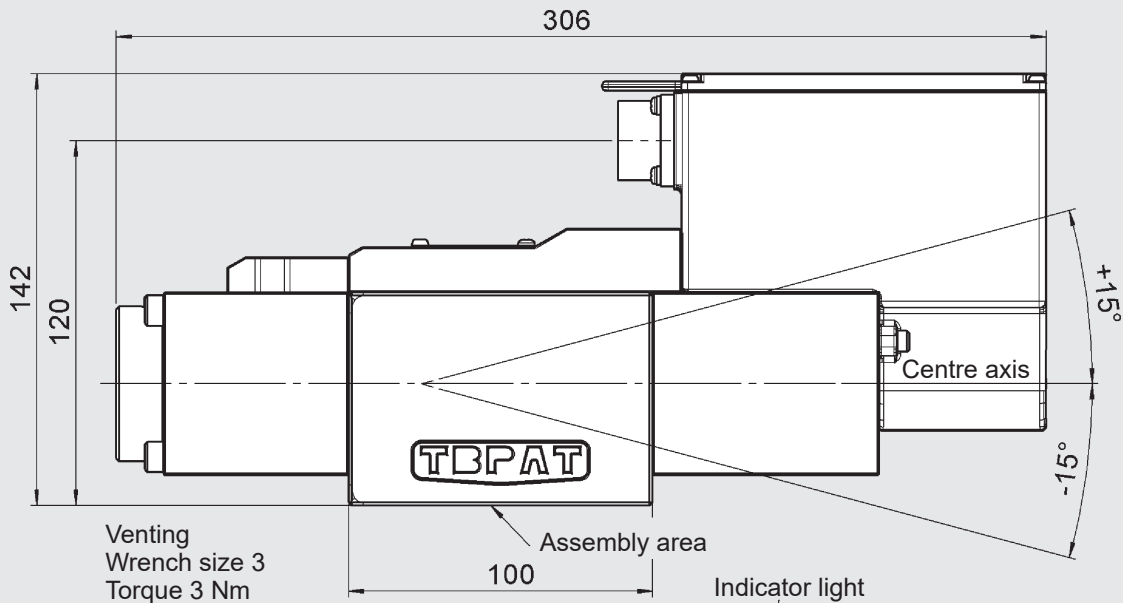
Flow increase (Δp P-T: 10 bar)



Calculation of the flow rate (at pressure difference > 10 bar)

$$Q_x = Q_{NOM} \times \sqrt{\frac{\Delta p_x}{10}}$$

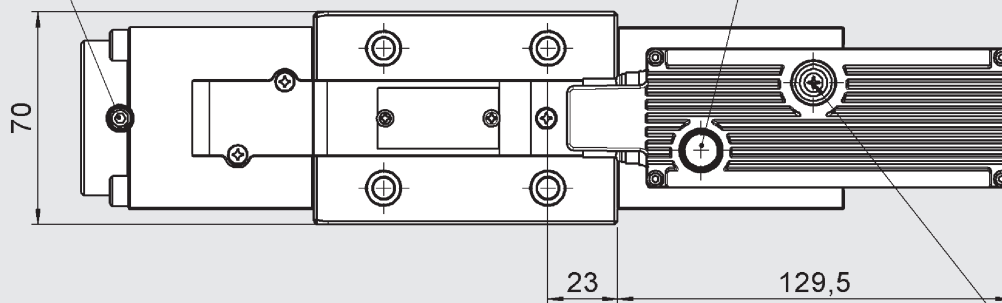
DIMENSIONS



Venting
Wrench size 3
Torque 3 Nm

Assembly area

Indicator light



!
Protective screw
NULL adjustment hole:
NULL position is adjusted at
factory.
For NULL adjustment remove
the screw and turn the
trimmer behind it.
After adjustment attach the
screw again.

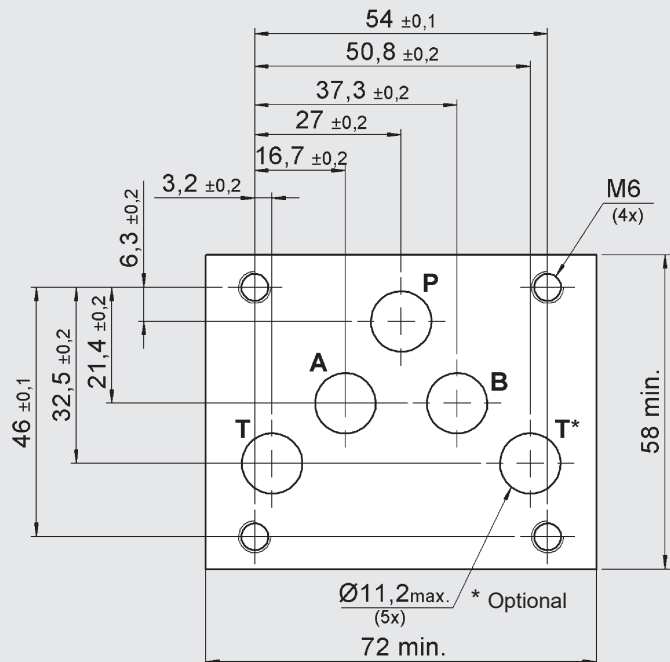
Interface to ISO 4401-05-04-0-05 (CETOP 4.2-4-05-320)

Mounting screws (included in delivery):

4 Screws ISO 4762 M6x35

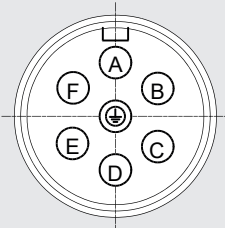
Tightening torque: 13–16 Nm (screws A 10.9)

Clamping length: 26 mm

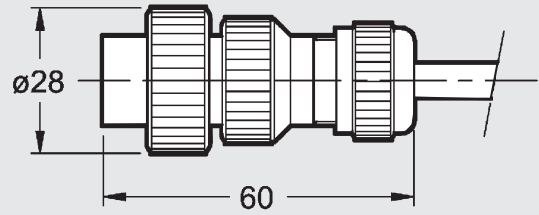


ELECTRONICS

Pin assignment



Metal connector



The outside diameter of the cable sheath for the connector (cable and connector are not included in delivery) must be min. 8 mm and can be max. 10 mm.

OPERATING MODALITIES

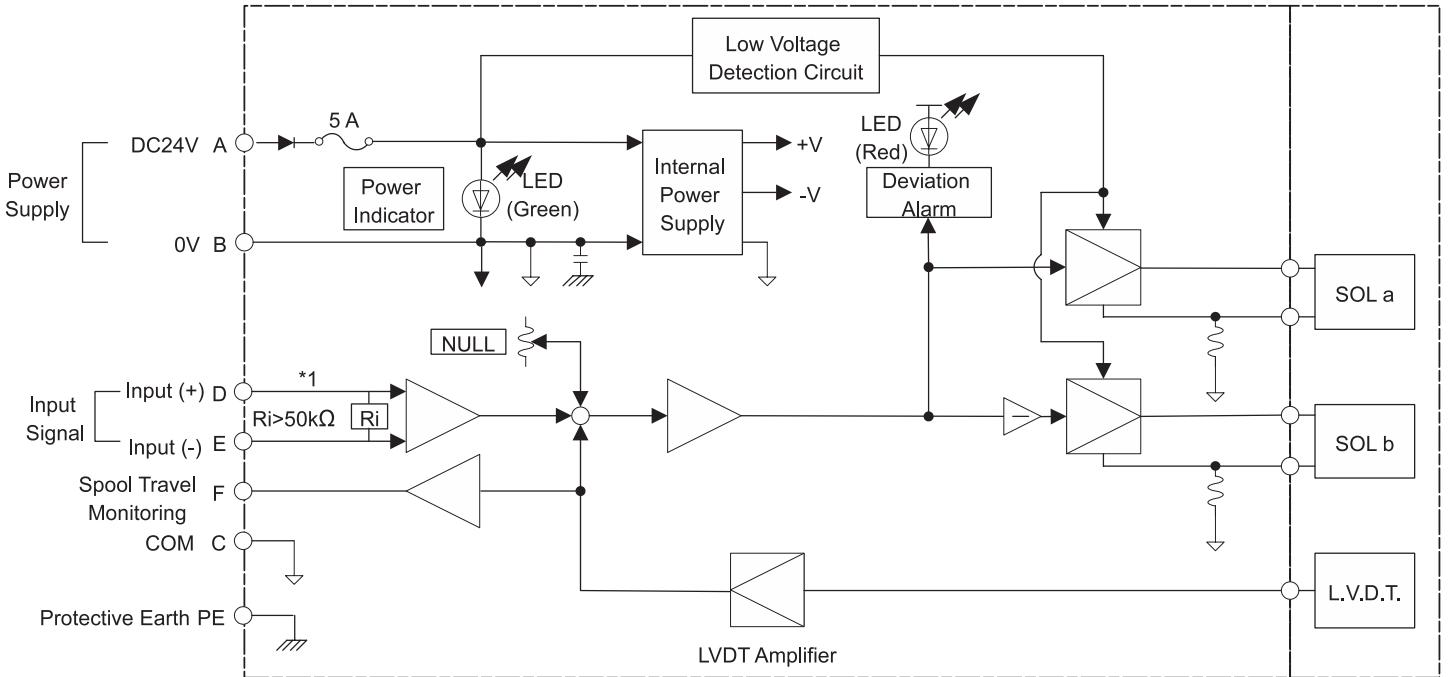
Pin	Code	C4WERE.../E1B	C4WERE.../E0B
PIN A	Power supply	24 V DC (21.6–26.4 V DC) * ³	
PIN B		0 V	
PIN C	Signal common	COM (0 V)	
PIN D	Input (+) (differential) * ¹	4–20 mA Ri = 200 Ω	± 10 V
PIN E	Input (-) (differential) * ¹		Ri ≥ 50 kΩ
PIN F	Spool travel monitoring	4–20 mA Ri = 100 - 500 Ω* ²	± 10 V Ri ≥ 10 kΩ
PIN	Protective earth	-	

*¹ The different input signal is only used for the type C4WERE.../E0

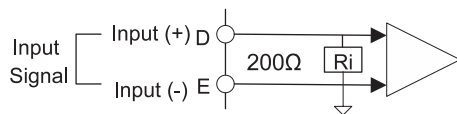
*² Recommended load resistance Ri = 200 Ω

*³ Power consumption max. 75 VA and without nominal value setting min. 16 VA

BLOCK DIAGRAM



*¹ The input stage for input signal 4–20 mA is as follows:



ACCESSORIES

Designation	Part no.
Connector for valves with On-Board Electronic	6080324

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

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