

4/2 and 4/3 directional spool valves with switch position monitoring solenoid-operated, direct-acting **4WER 10**

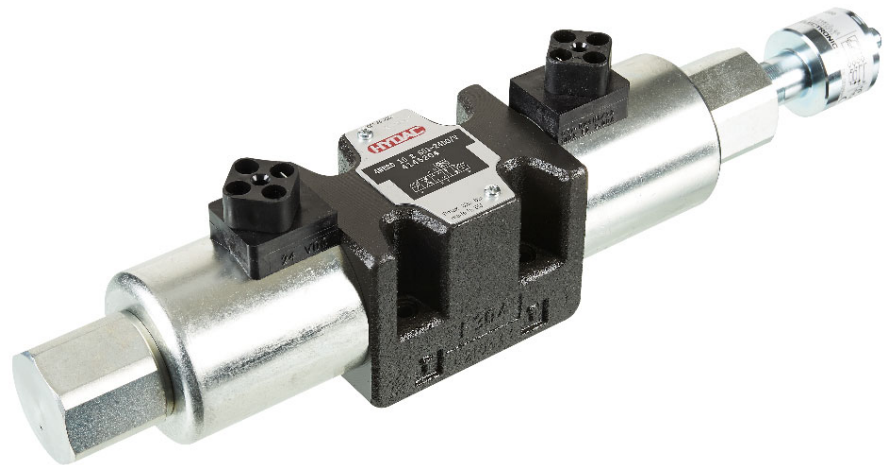
DESCRIPTION

HYDAC 4/2 and 4/3 directional spool valves in the series 4WER 6 are directional valves for oil-hydraulic systems which serve to open and close flow paths. The valve is actuated by an oil-immersed solenoid. During this process, the solenoid pushes the valve's control spool into the respective position to obtain the desired flow path.

Depending on the version, either the starting position 0, the position A or the position B can be detected. As the electric switching signal is already applied shortly before the end position is reached, the spool elements have an overlap range. This ensures that the possible flow in the switching points is minimal.

FEATURES

- Direct acting, solenoid-operated directional valve
- Low hysteresis of switching points
- Interface according to ISO 4401-05
- With integrated sensor for switch position monitoring



Nominal size 10
up to 120 l/min
up to 320 bar

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MODEL CODE

4WE RA 10 D S01 - 24 D G /V

Type

4/2 or 4/3 directional valve, direct acting

Switch position monitoring

R0 = de-energised switch position monitoring with a sensor

RA = energised switch position monitoring of coil A with a sensor

RB = energised switch position monitoring of coil B with a sensor

Nominal size

10

Symbol

see page 2

Series

S01 = specified by the manufacturer

Rated voltage of the solenoid coil

12 = 12 V DC

24 = 24 V DC

110 = 110 V DC

220 = 220 V DC

Type of voltage

D = DC voltage

Electrical connection

G = device connector, DIN EN 175301-803 A

Sealing material

N = NBR

V = FKM

SPOOL TYPES / SYMBOLS

4/2 DIRECTIONAL SPOOL VALVES

Type	Basic symbol
D	
EA	
EB	

4/2 DIRECTIONAL SPOOL VALVES

Type	Basic symbol
GA	
UK	
Y	

SPOOL TYPES / SYMBOLS

4/3 DIRECTIONAL SPOOL VALVES

Type	Basic symbol
E	
G	
L	

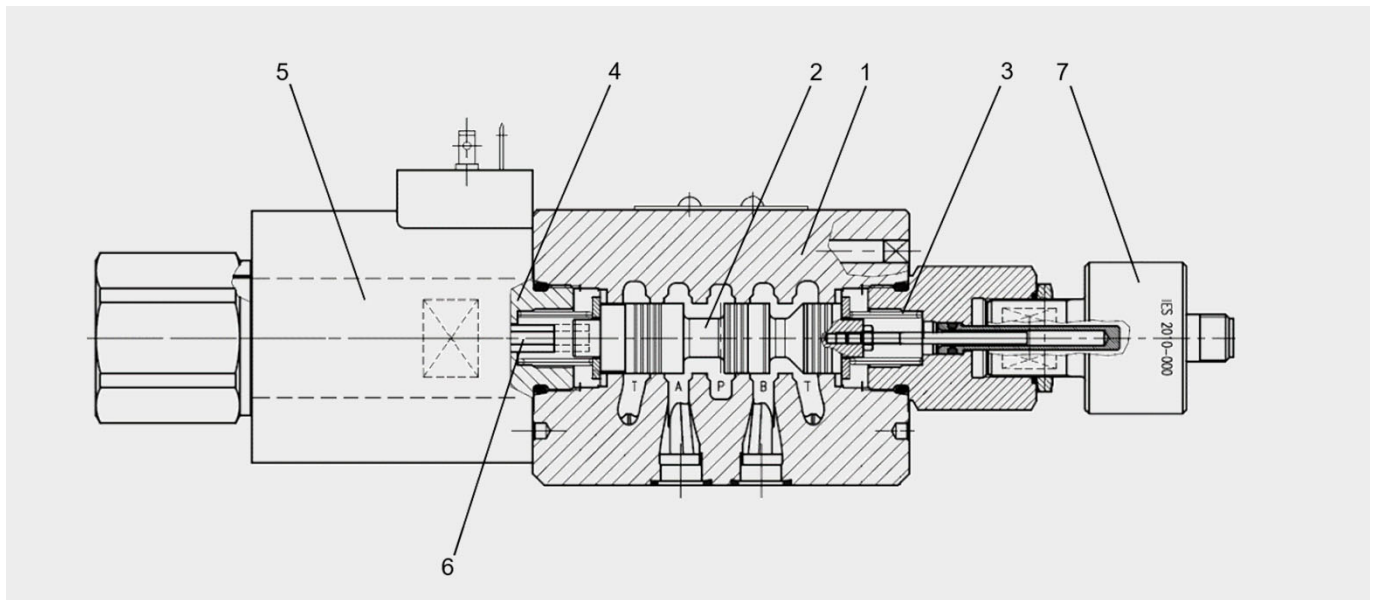
FUNCTION

The solenoid-operated directional spool valves of the type 4WER 10 are used to control nominal flow and are made up of one valve casing (1) and an associated valve spool (2). Depending on the type, the valve is equipped with two return springs and (3) one or two pole tubes (4) and solenoid coils (5) each.

The valve is hydraulically controlled by operating the valve spool using solenoids.

The energised solenoid uses the guide rod (6) to move the valve spool into the desired position. This causes the nominal flow directions between the respective ports to be released or closed. Leaving the initial position and reaching the end position is detected by a non-contact position sensor (7) with a change in the output signal. To obtain the valve's optimum switching capacity, the pressure-tight chamber of the pole tube should always be filled with oil.

The valve spool is pushed back into the starting position by the appropriate return spring after de-energisation of the solenoid.



TECHNICAL DATA ¹

General specifications	
MTTF _d	150 - 1200 years, according to DIN EN ISO 13849-1:2016; Table C.1, confirmation of ISO 13849-2:2013; Tables C.1 and C.2
Ambient temperature	[°C] -20 to +50
Installation	No orientation restrictions
Weight	[kg] 5.0 with one solenoid; 5.9 with two solenoids
Material	Valve casing: Cast iron
	Coil casing: Steel
	Name plate: Aluminium
Surface coating	Valve casing: Phosphate plated
	Coil casing: Zn-coating
Hydraulic specifications	
Operating pressure	[bar] Port P, A, B: 320
	Port T: 210
Flow rate	[l/min] max. 120
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 to 400
Permitted contamination level of operating fluid	Class 20/18/15 according to ISO 4406 or cleaner
Max. switching frequency	[1/h] 13,000
Sealing material	FKM, NBR
Electrical specifications	
Switching time	[ms] energised: approx. 100 - 150
	de-energised: approx. 20 - 50
Type of voltage	DC voltage
Nominal voltage	[V] 12 24
Voltage tolerance	[%] ±10
Nominal power	[W] 45 48
Duty cycle	[%] 100
Protection class according to DIN EN 60529	with electrical connection "G" IP65 ²
Sensor data	
Supply voltage	24 Volt: 20 to 32 VDC 12 Volt: 10.5 to 16 VDC
Reverse polarity protection for supply	Yes
Outputs	2 with change-over function PNP
Output load	≤ 400 mA
Short circuit protection	Resistant to short circuits
Connector	Round connector M12x1 (4-pole)
Protection class (for complete valve)	IP65 according to DIN EN 60529
EC conformity / EMV	2014/30/EU

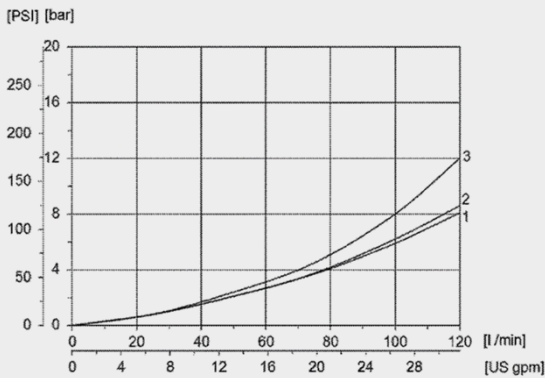
¹ See "Conditions and Instructions for Valves" in brochure 53.000

² If installed correctly

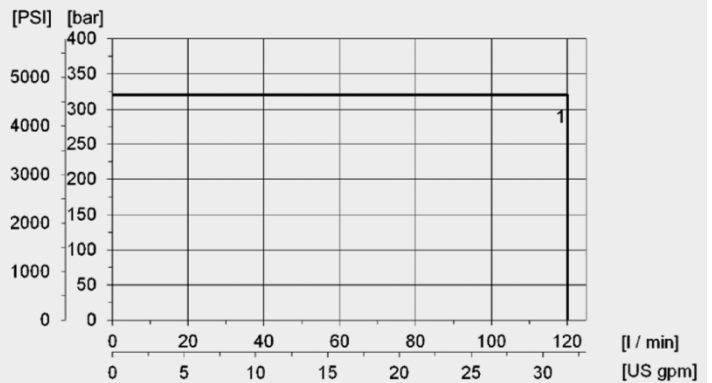
PERFORMANCE

measured at $T_{oil} = 50^{\circ}\text{C}$ and $36 \text{ mm}^2/\text{s}$

Pressure loss



Power limits



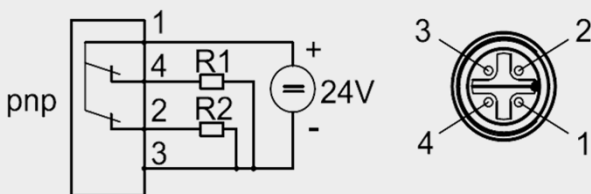
Performance assignment to the associated spools:

Spools	Pressure loss					Performance limits
	P→A	B→T	P→B	A→T	P→T	
D	3	2	3	2	-	1
E, EA	2	1	2	1	-	1
L	-	-	-	-	-	-
Y	3	2	3	2	-	-

The specified power limits for directional valves are applicable to use with two nominal flow directions. In the case of only one flow direction, the power limits may be lower.

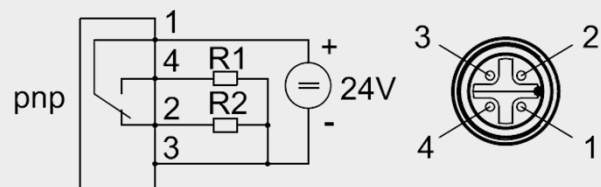
For operation with G96/G205 coils, the max. flow rate shown in the graph must be reduced by 10 %. The switching times are extended.

SWITCH POSITION MONITORING R0



Pin	Value	Function
1	+24 V	supply
2	NC	normally closed
3	0 V	-
4	NC	normally closed

SWITCH POSITION MONITORING RA / RB



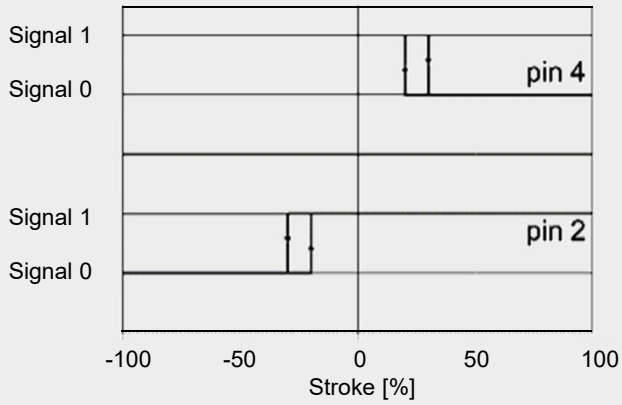
Pin	Value	Function
1	+24 V	supply
2	NC	normally closed
3	0 V	-
4	NO	normally open

SWITCHING LOGIC

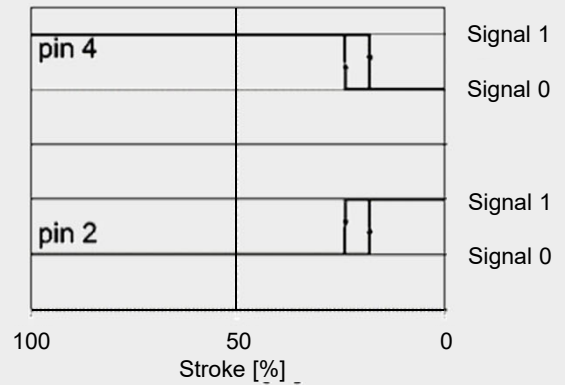
Note: Check the compatibility of the symbol and sensor type.

Sensor type	Symbol			
	D	EA	E / L	Y
R0	x	x	x	
RA	x	x		x
RB				x

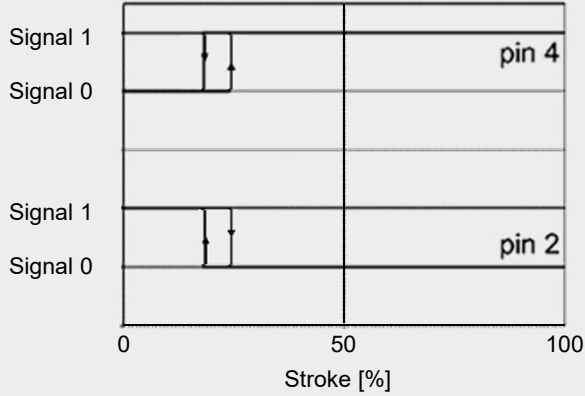
Sensor type R0 (Symbols E and L)



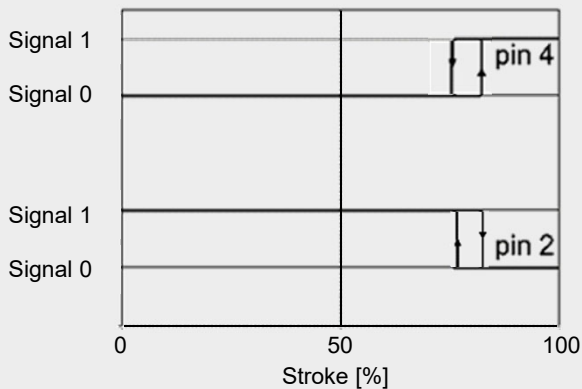
Sensor type R0 (Symbol Y)



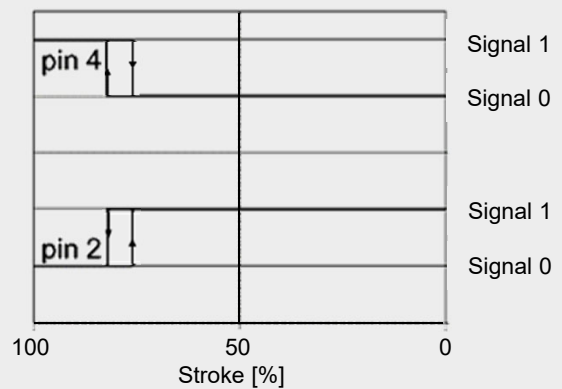
Sensor type R0 (Symbols D and EA)



Sensor type RA (Symbols D and EA)

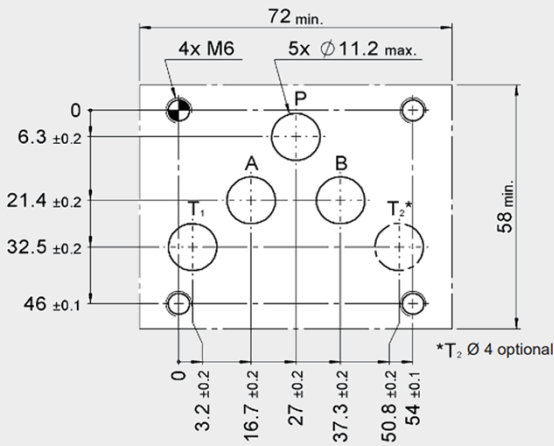


Sensor type RB (Symbol Y)



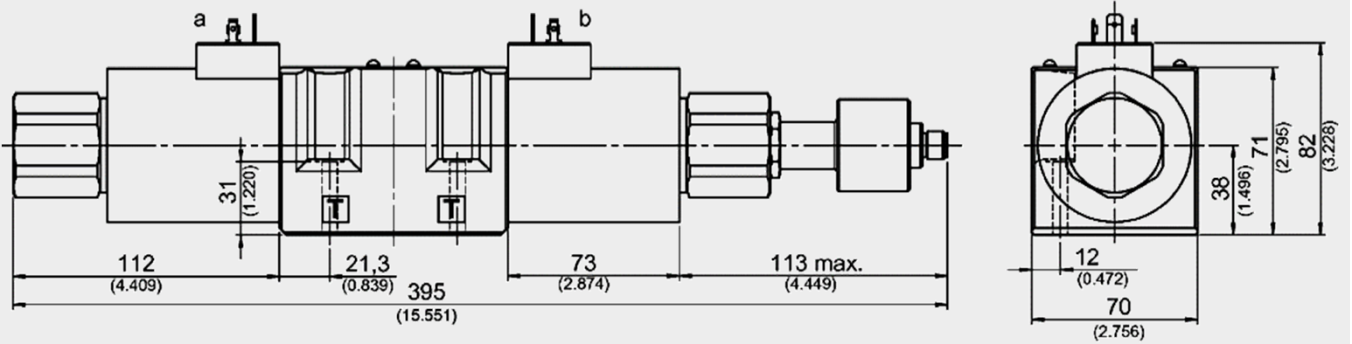
DIMENSIONS

Interface according to ISO 4401-05-04-0-05

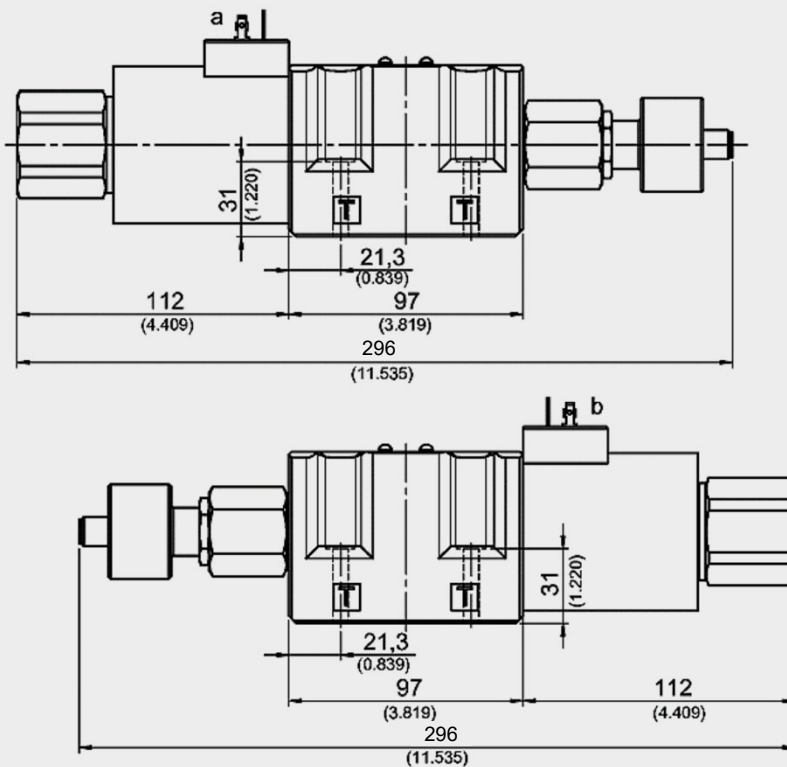


Mounting screws:
(not included in the scope of delivery)
DIN EN ISO 4762 – M6x40 – 10.9
Torque: 8 Nm

With two solenoids



With one solenoid



Note: In accordance with EN 693:2011, the valves have no manual override.

ACCESSORIES

	Designation	Part no
Seal kits (4-piece set)	12,42 x 1,78-NBR -80Sh	4348706
	12,4 2x 1,78-FKM -80Sh	4348705
Mounting screws	DIN EN ISO 4762 - M6 x 40 - 10.9	3524314

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.