

2/2- and 3/2- directional poppet valve with switch position monitoring solenoid-operated, direct-acting WSER 6

DESCRIPTION

HYDAC 2/2- and 3/2- directional poppet valves of the WSER 6 series are directional valves with switch position monitoring for processing signals in safety controls. These valves close leakage-free due to their seat tight design.

Depending on the version, either the initial position (0) or the switched position (A) or both positions (0, A) can be detected. The poppet elements have an overlap range caused by applying the electrical switching signal just before reaching the end position. This ensures that the potential flow at the switch points close to the seat is reduced to a minimum.

FEATURES

- Patented function principle
- Pressure-compensated construction
- Seat tight closing
- Hardened poppet elements
- Interface according to DIN 24340 Form A6, ISO 4401-03
- Removable high-performance solenoid coil, no need to open the hydraulic system during replacement
- With integrated sensor to monitor the switching position



Nominal size 6
up to 12 l/min
up to 350 bar

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MODEL CODE

3 WSE R0 6 D H01 - 24 DG /V / /

Ports

2 or 3

Type

Directional poppet valve, direct acting

Monitored position

See "Monitored positions" on page 3

Nominal size

6

Symbol ¹

See "Symbols" on page 3

Series

H01 = specified by manufacturer

Nominal voltage ¹

24 = 24 V DC

Connector types ¹

DG = DIN connector type A according to EN 175301-803

Sealing material ¹

V = FKM (standard)

Orifice insert

Not specified = no orifice insert

/YXX : Y = P, A, B, T = port

XX = diameter (e.g. 14 = 1.4 mm)

preferred series: 0.5 mm; 0.7 mm; 1 mm; 1.4 mm; 2 mm

Check valve

Not specified = no check valve

/RV = check valve in port P with a cracking pressure of 0.6 bar

¹⁾ Other models on request

SPOOL TYPES / SYMBOLS

2/2-DIRECTIONAL POPPET VALVES

Type	Basic symbol	With intermediate position
E2		
BE2		
E4		
BE4		

3/2-DIRECTIONAL POPPET VALVES

Type	Basic symbol	With intermediate position
D		
Y		

MONITORED SWITCHING POSITION

Sensor	Type	Symbol	Description
Sensor for one switching position	R0		Monitoring of initial position
Sensor for one switching position	RA		Monitoring of the switched position
Sensor for both switching positions	R0A		Monitoring of the initial and switched position

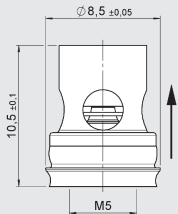
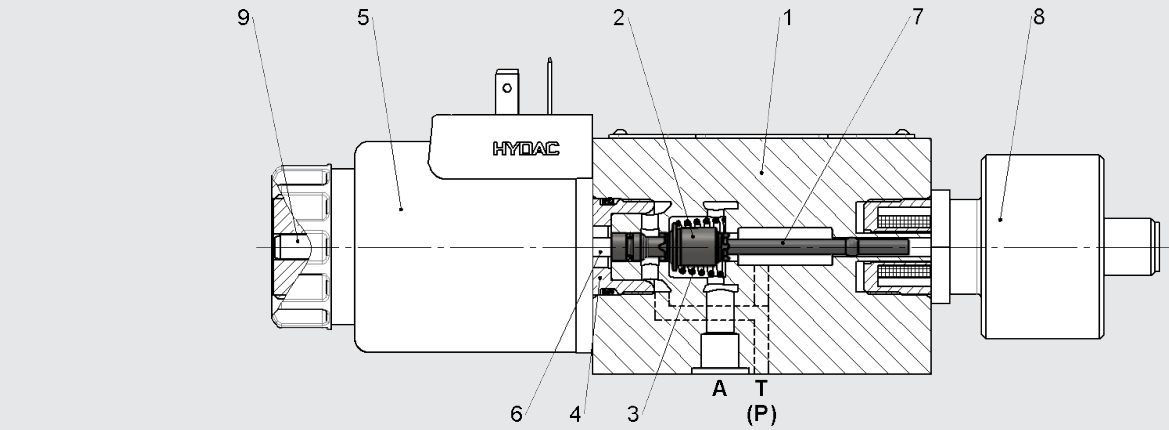
FUNCTION

The solenoid-operated directional poppet valves of the WSER 6 series are used to control a flow.

The valve consists of a valve casing (1) and a poppet element (2) that can be moved linearly between two seats or end positions. The valve moves into switched position A caused by energization of the coil (5), which pushes the solenoid anchor guided into pole tube (4) to the poppet element via guide rod (6). Thereby the flow directions between the respective ports are released or seat tight closed. If the coil has been switched off, the poppet element of the return spring (3) is shifted back into initial position 0. The switching position is recorded by sensor rod (7) of the position sensor (8). This sensor rod is permanently mechanically fixed to the poppet element.

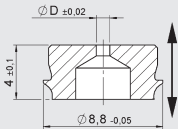
If de-energised, the valve can be switched by the manual override (9).

SECTION VIEW



Check valve

Closes up port P to prevent reverse oil flow.



Orifice insert

To throttle nominal flows, which are outside of the valve's operating limits.

TECHNICAL DATA ¹⁾

General specifications	
MTTF _d :	According to EN ISO 13849-1:2016 Tables C1 & C2
Ambient temperature:	[°C] -20 to +60
Installation position:	No orientation restrictions
Weight:	[kg] 1.8
Material:	Valve casing: Steel
	Pole tube: Steel
	Coil casing: Steel
	Name plate: Aluminium
Surface coating:	Valve casing: Phosphate plated
	Pole tube: Zn-coating
	Coil casing: ZnNi-coating
Hydraulic specifications	
Operating pressure:	[bar] Port P, A, B: p _{max} = 350
	Port T: p _{max} = 70
Nominal flow:	[l/min] 12
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 20/18/15 according to ISO 4406
Max. switching frequency:	[1/h] 3,600
Manual override:	up to approx. 50 bar tank pressure available
Sealing material:	FKM
Electrical specifications	
Switching time:	[ms] See table, page 6
Type of voltage:	DC
Rated voltage:	[V] 24
Voltage tolerance:	[%] ±10
Nominal power:	[W] 30
Duty cycle:	[%] 100
Max. surface temperature of the coil:	[°C] 150
Protection class according to DIN EN 60529:	with electrical connection "G" IP65 ²⁾
Sensor data	
Supply voltage:	24 Volt: 20 to 32 VDC
Reverse polarity protection of supply:	Yes
Outputs:	2 with change-over function, PNP, positive switching
Output load:	≤ 400 mA, 100% continuous
Short circuit protection:	Resistant to short circuits
Connector:	Round connector M12x1 (4-pin)
Protection class:	IP65 as per DIN 40050
EC conformity:	93/68/EEC 2014/30/EU
EMC:	DIN EN 6100-6-1-2-3-4
Humidity requirements:	0–95% rel. (as per DIN 40040)
Sensor diagram:	See page 7 "Sensor connections"

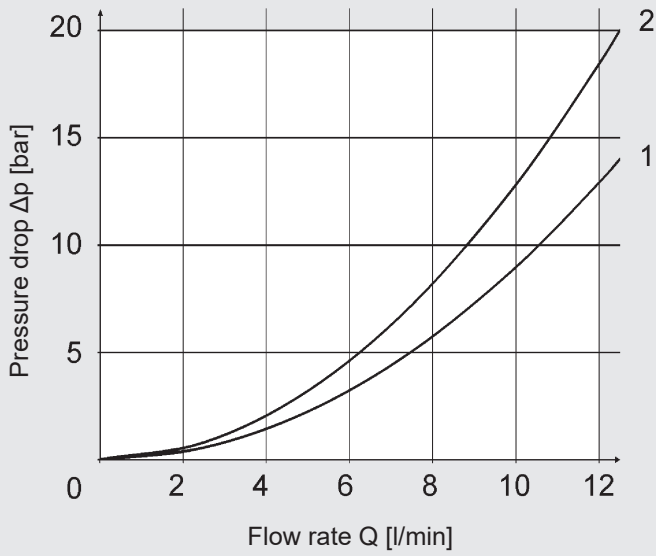
¹⁾ see "Conditions and Instructions for Valves" in brochure 53.000

²⁾ if installed correctly

PERFORMANCE

Pressure drop

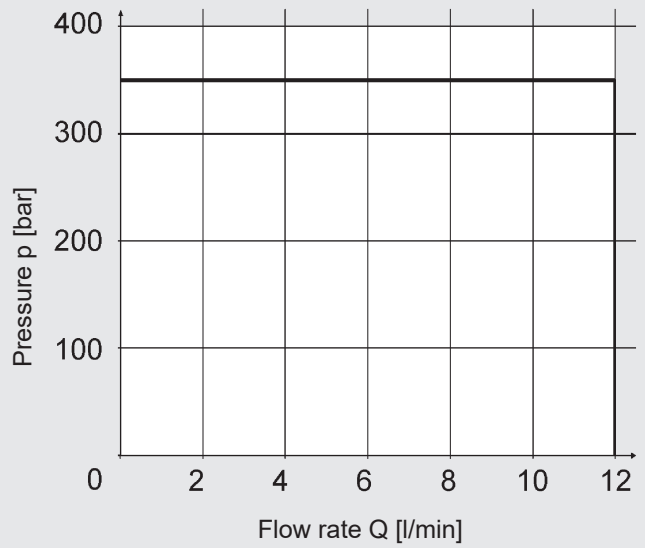
measured at $v = 30 \text{ mm}^2/\text{s}$ and $T = 45 \text{ }^\circ\text{C}$



Performance limits

Switch-on current $I_{\text{ON}} \leq 0.7 \times I_N$

Switch-off current $I_{\text{OFF}} \geq 0.07 \times I_N$



Performance assignment to the associated spools:

Ports	Symbol	Pressure drop						Switching times		
		a			0			On [ms]		Off [ms]
		P-A	P-T	A-T	P-A	P-T	A-T	$0.7 \times I_N$	$1.0 \times I_N$	
2	E2	2						110	50	25
2	BE2				1			110	50	25
2	E4		2					60	40	25
2	BE4					1		60	40	25
3	D			1	2			110	50	25
3	Y	2					1	60	40	25

The performance limits were determined with solenoids at operating temperature and 10% low voltage.

$0.7 \times I_N$ corresponds to switching times at operating temperature

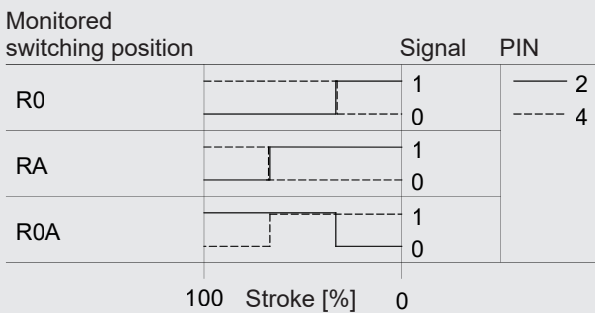
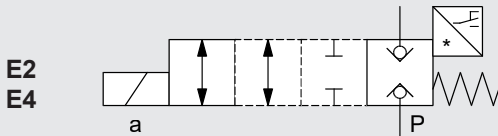
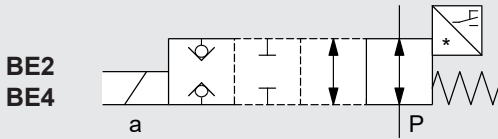
$1.0 \times I_N$ corresponds to switching times at full nominal current

SWITCHING LOGIC

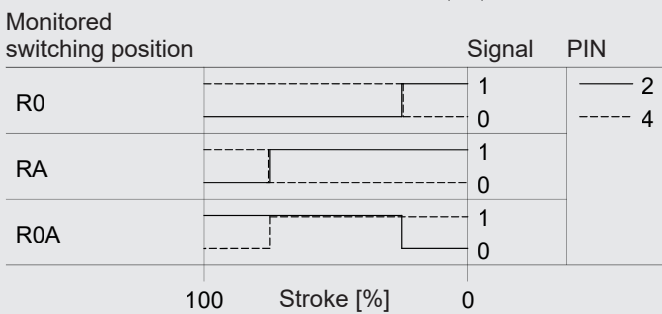
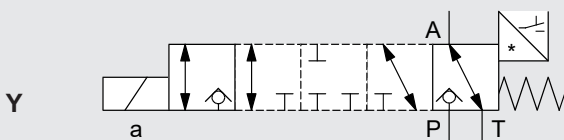
Detection is performed in an almost open and/or closed position.

The almost closed position guarantees reduced leakage.

Symbol

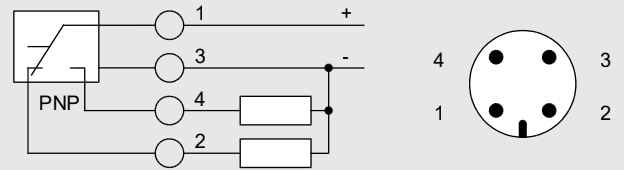


Symbol



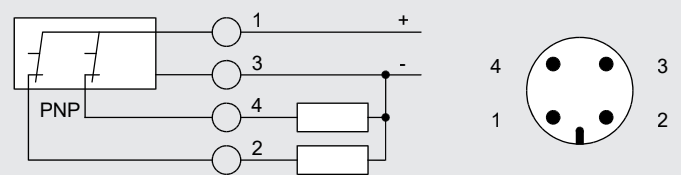
SENSOR DIAGRAMS

Monitoring of one switching position (type R0 and RA)



Pin	Value
1	+24 VDC (supply)
2	See "SWITCHING LOGIC"
3	0 V
4	See "SWITCHING LOGIC"

Monitoring of both switching positions (type R0A)

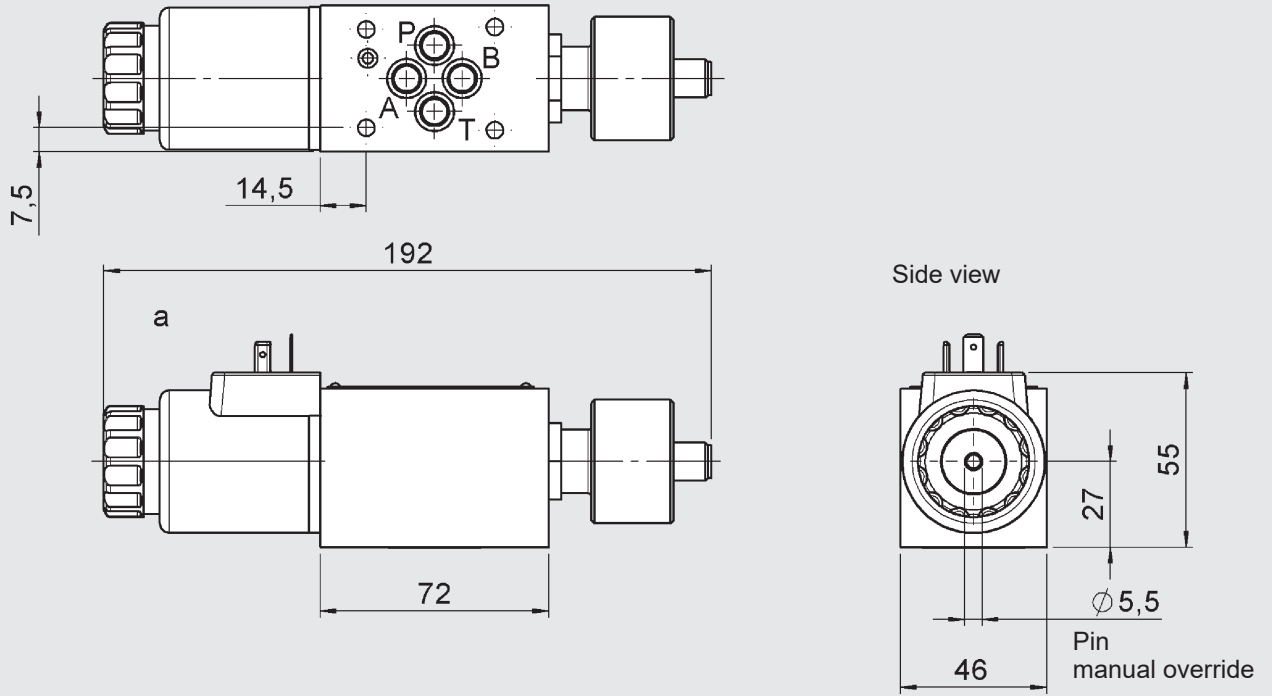


Pin	Value
1	+24 VDC (supply)
2	See "SWITCHING LOGIC"
3	0 V
4	See "SWITCHING LOGIC"

DIMENSIONS

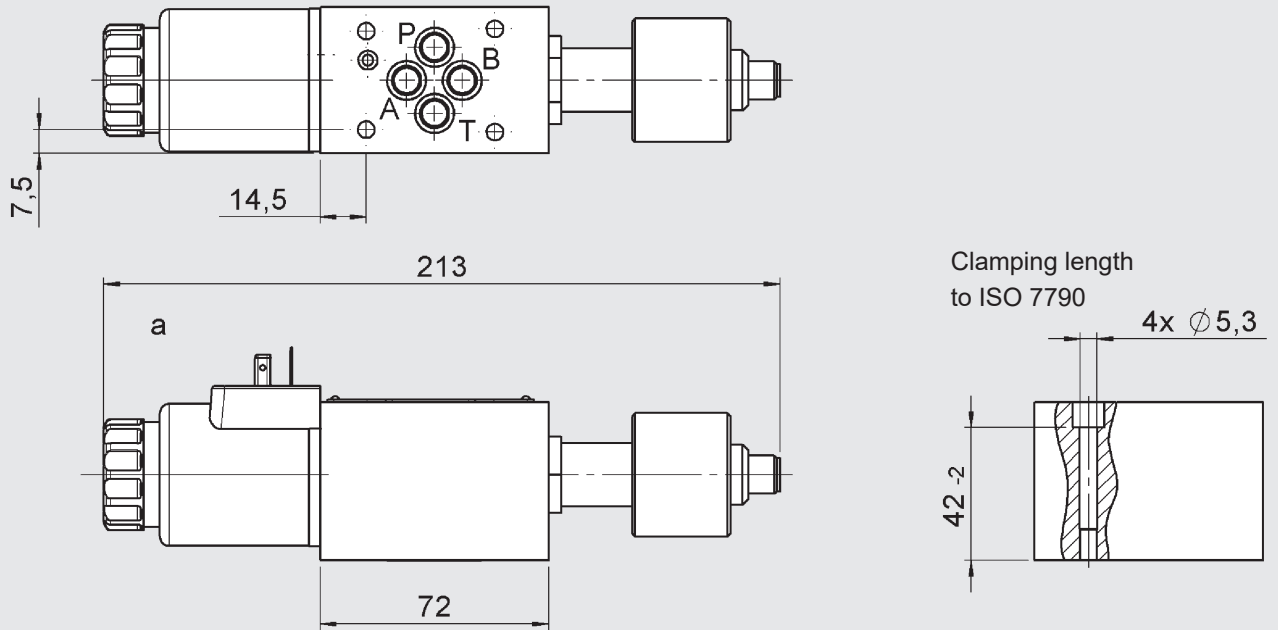
Monitoring of one switching position (type R0 and RA)

2/2, 3/2



Monitoring of both switching positions (type R0A)

2/2, 3/2



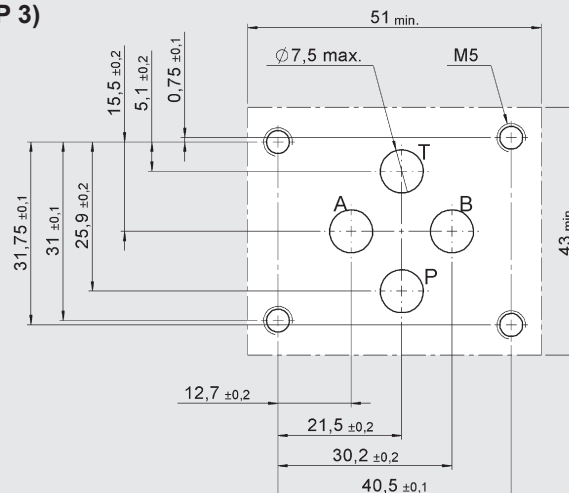
Interface according to ISO 4401-03-02-0-05 (CETOP 3)

Mounting screws:

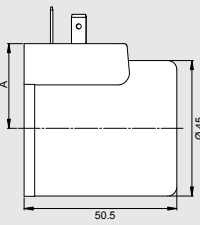
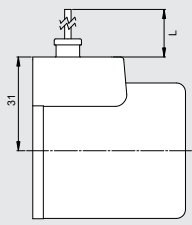
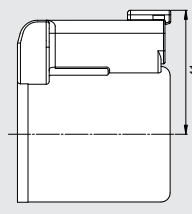
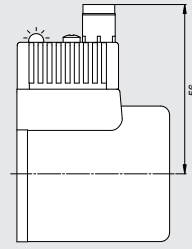
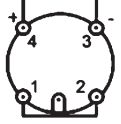
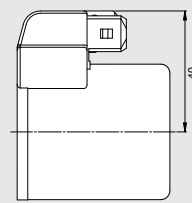
(not included in delivery)

DIN EN ISO 4762 – M5 x 50 – 10.9

Tightening torque: 7 Nm

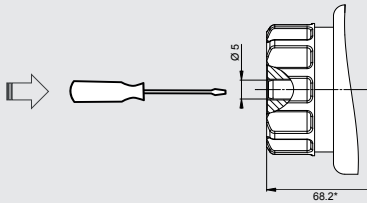
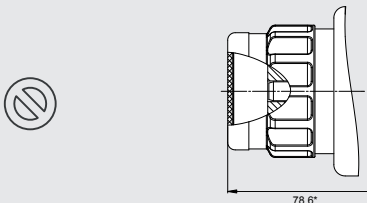


ELECTRICAL CONNECTIONS

G Device connector DIN EN 175301-803 A		<ul style="list-style-type: none"> ● IP65 ● A = 28 mm for DC (DG)
L 2 strands		<ul style="list-style-type: none"> ● IP65 ● Standard strands length L = 457 mm ● Optional with suppressor diode
N Device connector, Deutsch (DT04-2P)		<ul style="list-style-type: none"> ● IP65 / IP67 ● Optional with suppressor diode
O Device connector M12		<ul style="list-style-type: none"> ● IP65 ● With yellow LED as operation indicator ● Pin assignment 
U Device connector Junior Timer (axial)		<ul style="list-style-type: none"> ● IP65 ● Optional with suppressor diode

Other models on request

MANUAL OVERRIDES

Standard with concealed manual override		Operation with tool
M2 with covered manual override		Manual override covered, operation only possible after disassembly of cap

* 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.

ACCESSORIES

	Designation	Part No.
Seal kits (4-part set)	9.25 x 1.78 80 Sh FKM	3120269
Mounting screws (4 pcs)	DIN EN ISO 4762 - M5 x 50 - 10.9	4312231
Solenoid coils	COIL 24DG -50-2345 -S	4244171
	COIL 24DN -50-2345 -S	4244172
	COIL 24DO -50-2345 -S	4250885
	COIL 24DU -50-2345 -S	4250892
Seal kit for solenoid coil	Nut open, O-ring	4317299
	Nut with cap, O-ring	4317302
Connector	Z4 standard 2-pole without PE	394287
	Z4L incl. LED	394285
Orifice insert	BL700-6-D8-0.5-A*00	3687934
	BL700-6-D8-0.7-A*00	3687956
	BL700-6-D8-1.0-A*00	3687961
	BL700-6-D8-1.4-A*00	3656890
	BL700-6-D8-2.0-A*00	3687970
Check valve	RV for WSER 6 H01	4371006

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.

Technical modifications are reserved.