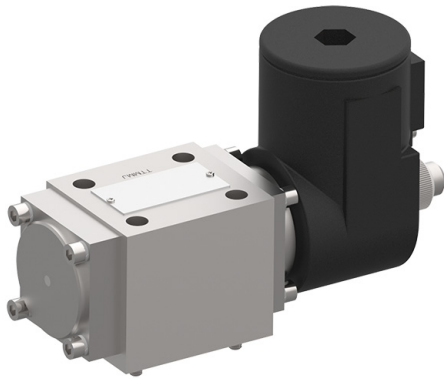


# 4/2 and 4/3 Solenoid Directional Valve, ISO Size 05

$Q_{max} = 90 \text{ l/min}$ ,  $p_{max} = 315 \text{ bar}$

Two-stage design, with EX-safety solenoid coil

Series EEXD-WEV...



Valve:

- Slip-on coil design, coils can be changed without opening hydraulic envelope
- With manual override
- Interface to ISO 4401-05-04

Solenoid coil:

- To EN 60079-0, EN 60079-1, EN 60079-31
- For equipment in Category 2

gas:  $\text{Ex}$  II 2 G Ex d IIC T6, T4 Gb

dust:  $\text{Ex}$  II 2 D Ex tb IIIC T85 °C, T130° C Db

## 1 Description

Series EEXD-WEV...-10 high performance spool valves are two-stage units which use the follower spool principle. The main valve components are a steel body, a spring-centered follower spool assembly and wet armature solenoids with pressure-tight core tube and a slip-on coil which is certified for use in explosion-hazard areas. The coil slips over the core tube and is retained by a knurled nut. The solenoid housing is made of cast iron with spray painted finish. The solenoid housing is threaded M20 x 1,5 for a cable entry gland. The cable entry gland (which also must be certified to IEC/EN 60079-1) is not supplied with the valve and, if required, must be ordered as a separate item:

Cable entry gland type AGRO 1820. 16.26 M20 x 1,5 (for cable  $\phi 11 \dots 13$ ). The valves provide reliable service even under the severest operating conditions such as high flow rates, high operating pressures, long periods without switching and large temperature fluctuations. The highly effective spool actuation method combines the advantages of both direct acting and two-stage solenoid valves, without incurring the well known disadvantages of either type. The main spool is offset by both the solenoid force and the P - T \*) pressure difference inside the valve. The greater the P - T pressure difference, the greater the offsetting force. It is brought back to its deenergised position in the same

way, using the P - T pressure difference and without the need for heavy centering springs. \*) The pressure in P must exceed that in T and the valve must be connected in the conventional manner i.e. pressure to P, T to tank.

**Ex:** Solenoid conforms to the European standards IEC/EN 60079-0, IEC/EN 60079-7, IEC/EN 60079-18

**Gas:**

**d:** Flameproof enclosures

**Group IIC:** For use in the potentially explosive area T6, T4: Temperature class for gas

**Gb:** For use in Zone 1 (Zone 2) with foreseeable faults

**Dust:**

**tb:** protection by enclosure

**Group IIIC:** For use in flammable dust atmospheres T85 °C, T130 °C: Temperature class for dust

**Db:** For use in Zone 21 (Zone 22) with foreseeable faults

**Verification certificates:**

Europe BVS 15 ATEX E135 (ATEX)

others on request

## 2 Technical data

General characteristics	Description, value, unit
Designation	4/2 and 4/3 solenoid directional valve
Design	manifold-mounting, two-stage
Mounting method	4 x $\phi 6,4$ holes for M6x60 cap screws
Tightening torque	9 Nm $\pm$ 10 %
Size	size 05 interface to ISO 4401-05-04 / DIN 24 340 A10

General characteristics		Description, value, unit
Weight		5.1 kg (1 solenoid) 7.1 kg (2 solenoid)
Mounting attitude		horizontal recommended (vertical mounting makes air bleeding difficult)
Ambient temperature range		see hydraulic and electrical characteristics
Hydraulic characteristics		Description, value, unit
Maximum operating pressure	port A, B and P port T	315 bar 15 bar
Maximum flow rate		90 l/min
Flow direction		see symbols
Hydraulic fluid		HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER
Ambient temperature range <sup>1)</sup>		-25 °C ... +80 °C
Hydraulic fluid temperature range <sup>1)</sup>		-25 °C ... +80 °C <sup>2)</sup>
Viscosity range		10...500 mm <sup>2</sup> /s (cSt), recommended 15...250 mm <sup>2</sup> /s (cSt)
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999		class 20/18/15
Electrical characteristics		Description, value, unit
Supply voltage		24 V DC/AC, 120 V DC/AC, 230 V DC/AC alternating voltage 40 ... 65 Hz ± 2 % direct or undulating voltage
Supply voltage tolerance		-15 % / +10 %
Ambient temperature range <sup>1)</sup>	operation as T4 / T130 °C operation as T5 / T95 °C operation as T6 / T80 °C	-50 °C ... +90 °C -50 °C ... +55 °C -50 °C ... +40 °C
Temperature class		T1 ... T6
EX-protection marking	Gas: Dust:	II 2 G, Ex db IIC (T6, T5 or T4) II 2 D, Ex tb IIIC (T80 °C, T95 °C or T130 °C)
Nominal power consumption		7 W at 20 °C
Relative duty cycle		100 %
Switching time	spool A / B, D, G  spool H	100 ms (energising) 40 ms (de-energising) 200 ms (energising) 40 ms (de-energising)  Depending on pressure, flow rate and viscosity as well as dwell time under pressure, the switching times may vary from the the stated values.
Protection class to ISO 20 653 / EN 60 529		IP 65  (with properly fitted cable gland and properly made cable connection)
Electrical connection		shipped without cable entry gland (M20 x 1.5) and without cable  screwed fittings have to be tested and are certified as per EN 60079-1 and EN 60079-31. <sup>3)</sup>
Fuse connected in series as per IEC 60127		24 V DC/AC 800 mA 120 V DC/AC 160 mA 230 V DC/AC 80 mA



**IMPORTANT!:**

1) The less favourable values from the hydraulic and electrical characteristics determine the temperature range of the whole valve.



**IMPORTANT!:**

2) The maximum fluid temperature must not exceed the permissible ambient temperature for the whole valve.



**IMPORTANT!:**

3) At ambient temperatures  $\geq 50\text{ }^{\circ}\text{C}$ , the temperature at the cable entry increases by  $20\text{ }^{\circ}\text{C}$ .

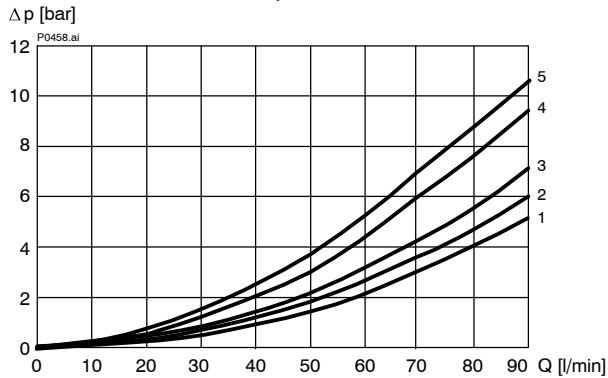
## 3 Symbol

4/2 functions	4/2 functions with A-solenoid	4/2 functions with B-solenoid	4/3 functions
EEX-WEV-42-A-10... 	EEX-WEV-42-AD-10... 	EEX-WEV-42-BD-10... 	EEX-WEV-43-D-10... 
EEX-WEV-42-B-10... 	EEX-WEV-42-AG-10... 	EEX-WEV-42-BG-10... 	EEX-WEV-43-G-10... 
Uebergangsstellung temporary position 	EEX-WEV-42-AH-10... 	EEX-WEV-42-BH-10... 	EEX-WEV-43-H-10... 

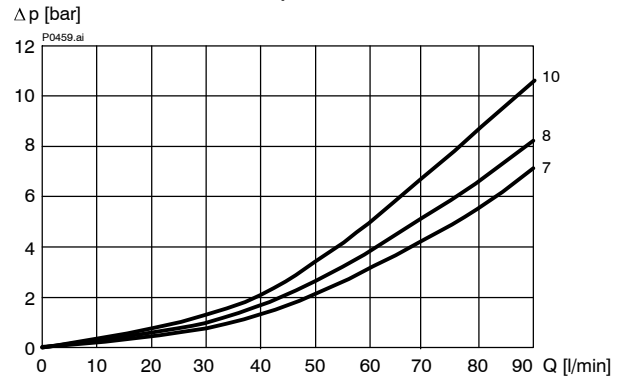
## 4 Performance graphs

measured with oil viscosity 33 mm<sup>2</sup>/s (cSt), coil at steady-state temperature and 5 % undervoltage

$\Delta p = f(Q)$  Pressure drop - Flow rate characteristic  
A / B, D, G and H spool



$\Delta p = f(Q)$  Pressure drop - Flow rate characteristic  
A / B, D, G and H spool

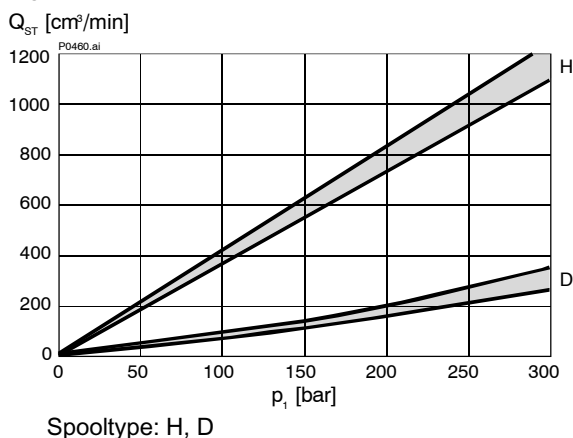


### IMPORTANT!

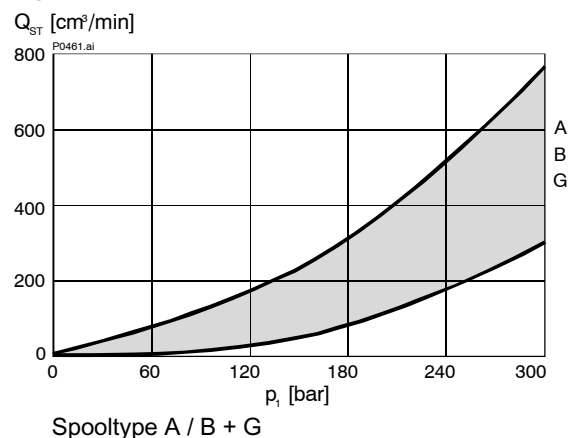
The quoted max. flow rates apply when symmetrical flows pass through the valve.  
For non-symmetrical flows, the max. flows are substantially reduced, in worst cases to only 25 % of the above valves.

Spool type	Flow direction					
	P ⇒ A	B ⇒ T	P ⇒ B	A ⇒ T	P ⇒ T	P, A + B ⇒ T
A / B	2	5	2	5	--	--
D	7	10	7	8	--	--
G	3	4	3	2	--	--
H	2	4	2	2	--	1

$Q_{ST}$  = Pilot-oil consumption



$Q_{ST}$  = Pilot-oil consumption



## 5 Installation information

### COMMISSIONING

- The solenoid coils must only be operated when they are fitted on the associated valve. For more information on installation and commissioning, please refer to the operating instructions supplied with the solenoid coil.



#### ATTENTION!

Ratings given in the operating instructions  
Pay attention to the relevant operating instructions from the solenoid coil! If in doubt, the less favourable values apply.



#### ATTENTION!

Only qualified personnel with mechanical skills may carry out any maintenance work. Generally, the only work that should ever be undertaken is to check, and possibly replace, the seals. When changing seals, oil or grease the new seals thoroughly before fitting them.

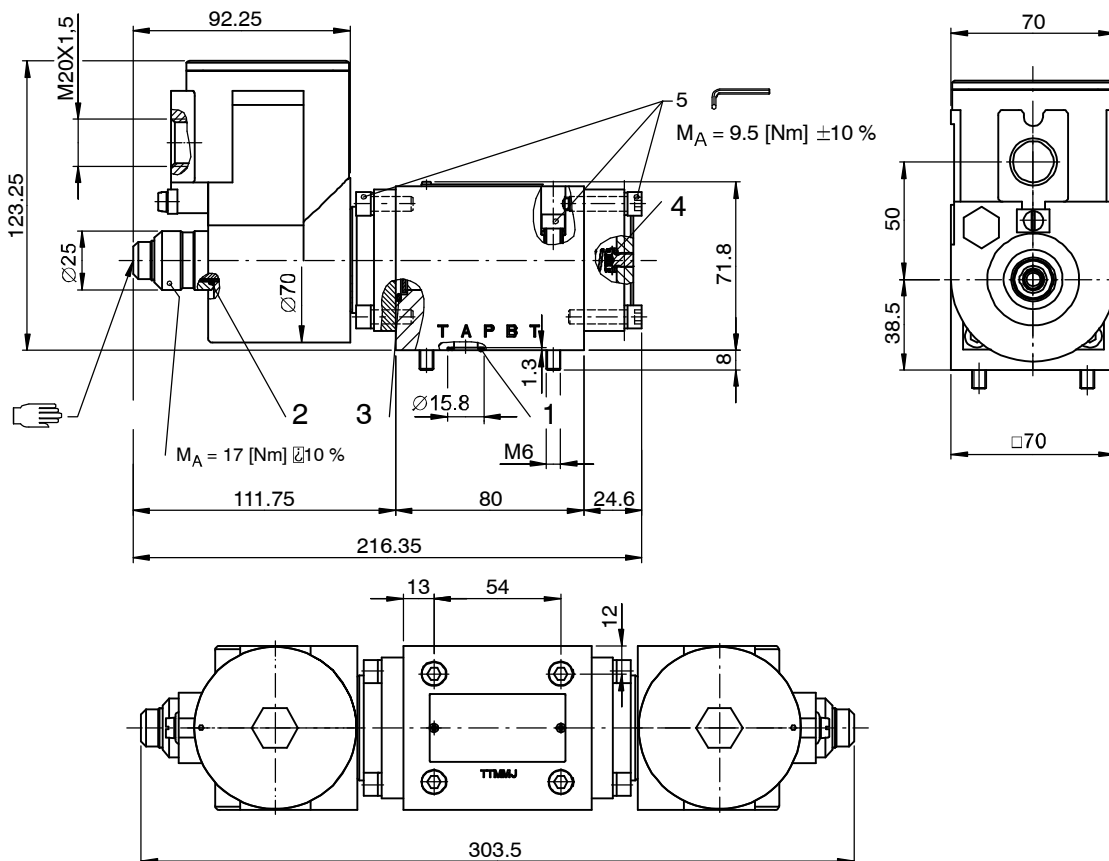


#### ATTENTION!

##### Authorised persons

The tasks described here may only be carried out by authorised personnel. Authorised personnel are those who have electro-technical training (EN 60204-1).

## 6 Dimensions & sectional view



Seal kit no. DS-092-N <sup>6)</sup>

Item	Qty. 8)	Qty. 9)	Description
1	5	5	O-ring no. 014 Ø 12,42 x 1,78 N90
2	1	2	O-ring no. 017 Ø 17,17 x 1,78 N90
3	2	2	O-ring no. 123 Ø 29,82 x 2,62 N90
4	1	-	Copper ring DIN7603A 6 / 10 x 1



### IMPORTANT!:

- 4) Valve mounting bolts M6X60 (included in the delivery)
- 5) Manual overid (on each solenoid)
- 6) Seal kit with Viton seals, no. DS-092-V
- 7) Cable entry gland, type AGRO 1820.16.26 M20 x 1,5 must be ordered separately.
- 8) 4/2 valves (1 solenoid)
- 9) 4/3 valves (2 solenoids)

## 7 Ordering code

Ex. **EEXD** - **W E V** - **43** - **G** - **10** - **-** - **-** - **24** **U**

- EEXD = EX-protected coil instead of standard sol. coil  
(for details, see electrical characteristics)
- W = directional valve
- E = electrically actuated
- V = two-stage
- 42 = 4-way, 2 positions
- 43 = 4-way, 3 positions
- A = 4/2 function solenoid at a end
- B = 4/2 function solenoid at b end
- AD, AG, AH = 4/2 function with 4/3 spool, solenoid at a end
- BD, BG, BH = 4/2 function with 4/3 spool, solenoid at b end
- D, G, H = 4/3 function
- 10 = ISO size 05 interface
- (blank) = NBR (Nitrile) seals (standard)
- V = FKM (Viton) seals  
(special seals - please contact BUCHER)
- 1 ... 9 = design number, seat valve (omit when ordering new units)
- ... = voltage e.g. 24 (24 V)
- U = current DC + AC

## 8 Related data sheets

Reference	(Old no.)	Description
400-P-050101	(i-41)	Size 05 interface to ISO 4401-05-04
...		Operating instructions for solenoid coil VACC-S18...EX4D

info.ch@bucherhydraulics.com

www.bucherhydraulics.com

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