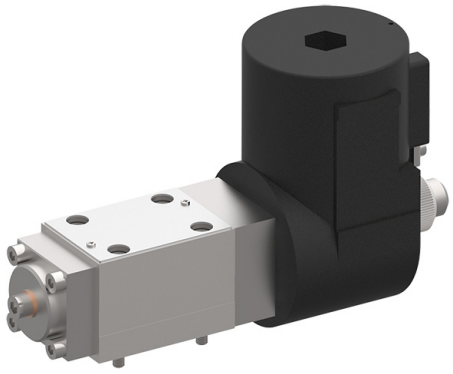
4/2 and 4/3 Solenoid Directional Valve, ISO Size 03

Q_{max} = 60 l/min, p_{max} = 315 bar
Two-stage design, with EX-safty solenoid coil
Series EEXD-WEV…



Valve:

- Slip-on coil design, coils can be changed without opening hydraulic envelope
- With manual override
- Interface to ISO 4401-03-02

Solenoid coil:

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

gas: Ex II 2 G Ex d IIC T6, T4 Gb

dust: Ex II 2 D Ex tb IIIC T85 °C, T130° C Db

1 Description

Series EEXD-WEV...-6 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 ø11...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 ∅ 5,5 holes for M5x45 cap screws
Tightening torque	5.2 Nm ± 10 %
Size	size 03 interface to ISO 4401-03-02 / DIN 24 340 A6

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General characteristics	Description, value, unit
Weight	3.4 kg (1 solenoid) 5.4 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		60 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		-25 °C … +80 °C
Hydraulic fluid temperature range [1]		-25 °C … +80 °C [2]
Viscosity range		10…500 mm^2/s (cSt), recommended 15...250 mm^2/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 [1]		
	operation as T4 / T130 °C	-50 °C … +90 °C
	operation as T5 / T95 °C	-50 °C … +55 °C
	operation as T6 / T80 °C	-50 °C … +40 °C
Temperatue class		T1 … T6
EX-protection marking	Gas: Dust:	II 2 G, Ex d IIC (T6, T4 Gb) II 2 D, Ex tb IIIC (T85 °C, T130 °C Db)
Nominal power consumption		7 W at 20 °C
Switching time		90 ms (energising) 40 ms (deenergising) Depending on pressure, flow rate and viscosity as well as dwell time under pressure, the switching times may vary from the the stated values.
Relative duty cycle		100 %
Protection class to EN 942017-2		IP 65 / 67 (with properly fitted cable gland and properly made cable connection)
Electrical connection		shipped **without** cable 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. [3]
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.

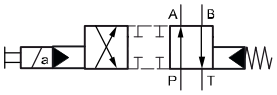
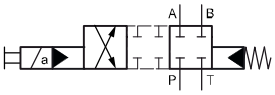
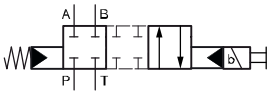
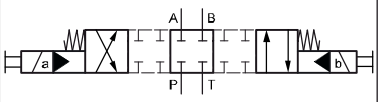
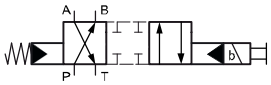
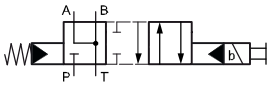
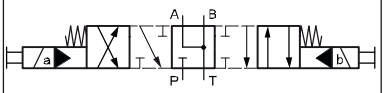
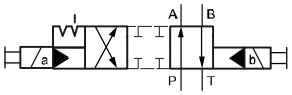
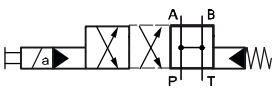
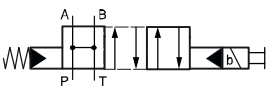
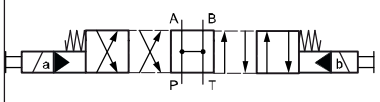
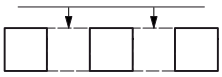
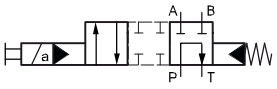
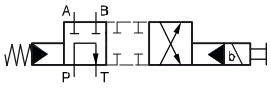
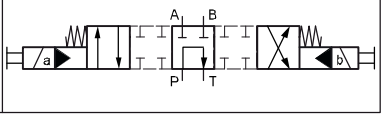
IMPORTANT!:

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

IMPORTANT!:

3) At ambienttemperatures ≥ 50 °C, the temperature at the cable entry increases by 20 °C.

3 Symbol

4/2 functions	4/2 functions with A-solenoid	4/2 functions with B-solenoid	4/3 functions
EEXD–WEV–42–A–6... 	EEXD–WEV–42–AD–6... 	EEXD–WEV–42–BD–6... 	EEXD–WEV–43–D–6... 
EEXD-WEV-42-B-6... 	EEXD-WEV-42-AG-6... 	EEXD-WEV-42-BG-6... 	EEXD-WEV-43-G-6... 
EEXD-WEV-42-C-6... 	EEXD-WEV-42-AH-6... 	EEXD-WEV-42-BH-6... 	EEXD-WEV-43-H-6... 
Uebergangsstellung temporary position 	EEXD-WEV-42-AJ-6... 	EEXD-WEV-42-BJ-6... 	EEXD-WEV-43-J-6... 

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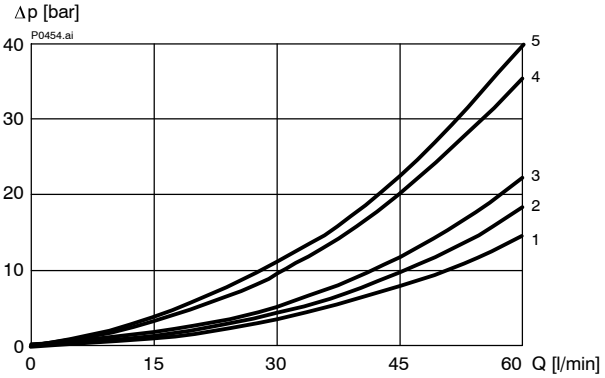
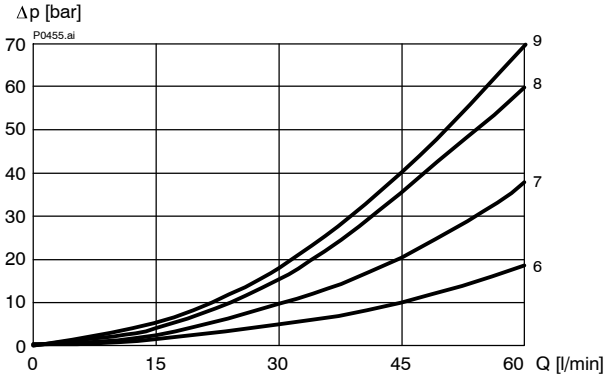
4 Performance graphs

measured with oil viscosity 33 mm²/s (cSt), coil at steady-state temperature and 5 % undervoltage

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



Δp = f (Q) Pressure drop - Flow rate characteristic
J spool



IMPORTANT!

The quored max. flow rates apply when symmetrical flows pass through the valve.

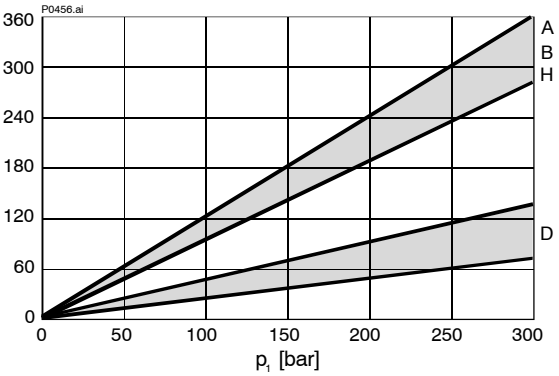
IMPORTANT!

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	3	5	3	5	--	--
G	3	4	3	4	--	--
H	1	4	1	4	--	2
J	7	9	7	8	6	--

Q_{ST} = Pilot-oil consumption

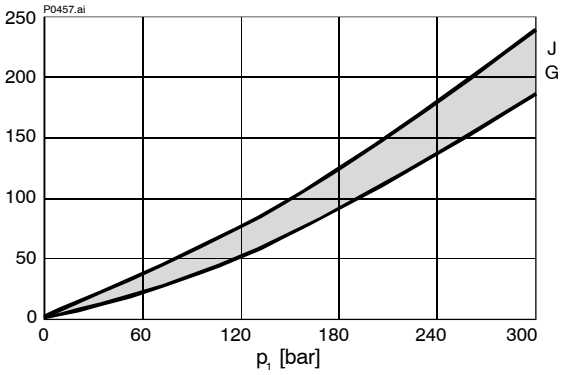
Q_L [cm³/min]



Spooltype: A / B, H, D

Q_{ST} = Pilot-oil consumption

Q_{ST} [cm³/min]



Spooltype J + G

5 Installation information

COMMISSIONING

- For short-circuit protection, each solenoid must be preceded by a fuse conforming to IEC 60127 with a maximum rating of three times the rated current of 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.

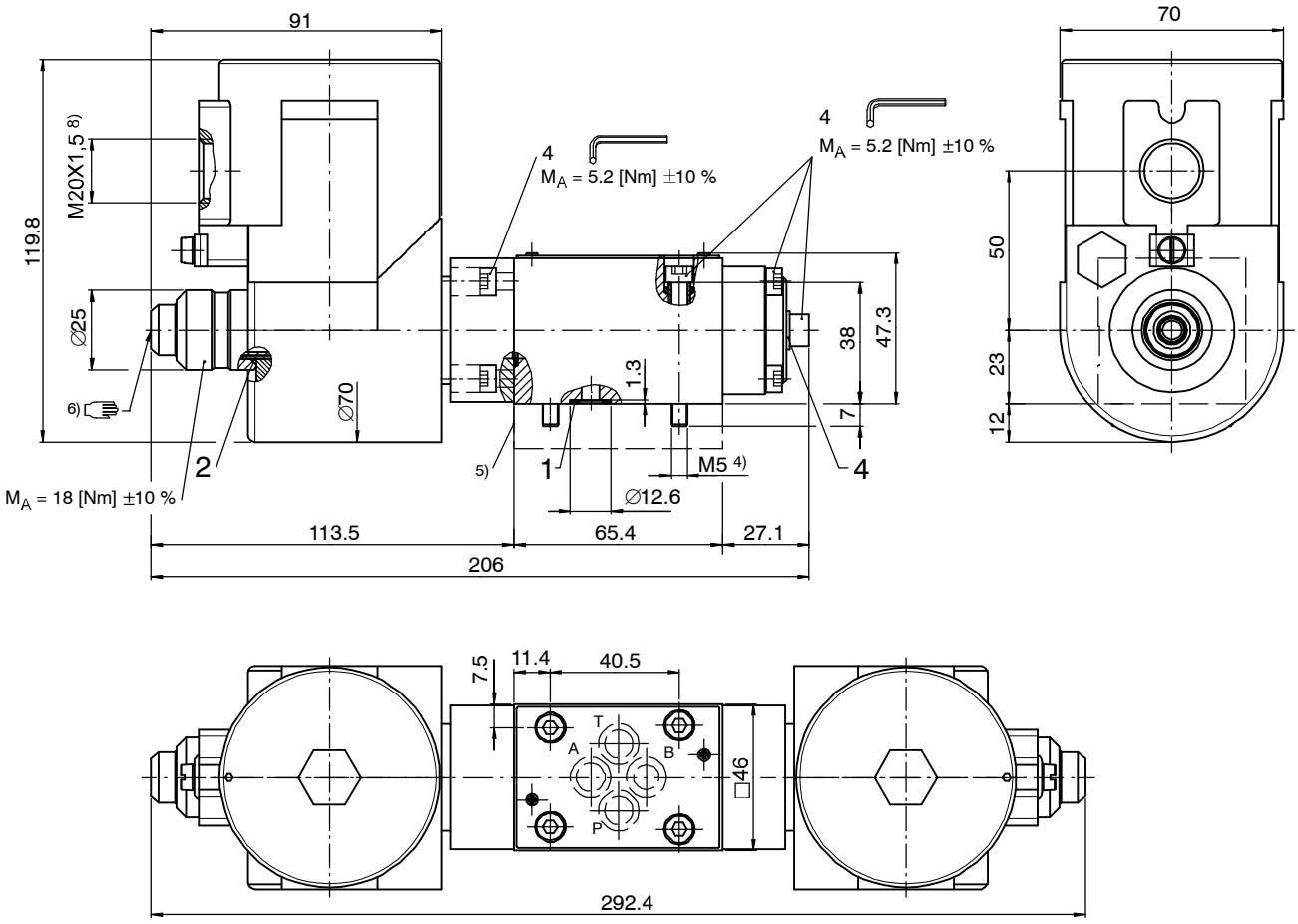
ATTENTION!

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



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Seal kit no. DS-083-N [7]

Item	Qty. [9]	Qty. [10]	Description
1	4	4	O-ring no. 012 ∅ 9,25 x 1,78 N90
2	1	2	O-ring no. 017 ∅ 17,17 x 1,78 N90
4	1	-	Copper ring DIN7603A 6 / 10 x 1

IMPORTANT!:

[4] Valve mounting bolts M5X45 (included in the delivery)

[5] stack mounting spacer plate SZ-16-6 must be ordered separately.

[6] Manual overid (on each solenoid)

[7] Seal kit with Viton seals, no. DS-083-V

[8] Cable entry gland, type AGRO 1820.16.26 M20 x 1,5 must be ordered separately.

[9] 4/2 valves (1 solenoid)

[10] 4/3 valves + 4/2 valves detent (2 solenoids)

7 Ordering code

EEXD - W E V - 43 - G - 6 _ - _ - 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
C = 4/2 function solenoid at both end (detented model)
AD, AG, AH oder AJ = 4/2 function with 4/3 spool, solenoid at a end
BD, BG, BH oder BJ = 4/2 function with 4/3 spool, solenoid at b end
D, G, H, J = 4/3 function
6 = ISO size 03 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-030501	(i-31)	Size 03 interface to ISO 4401-03-02
…		Operating instructions for solenoid coil VACC-S18…EX4D

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Classification: 430.300.-.305.310.300