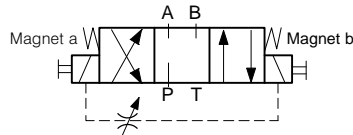
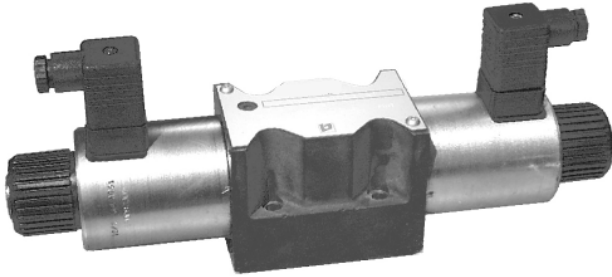


Solenoid Operated Spool Valve, ISO size 05

$Q_{max} = 100 \text{ l/min}$, $p_{max} = 315 \text{ bar}$
Direct Acting, Soft Switching
Series WEDEU...



- Switching time is steplessly variable from outside the valve
- Full adjustment range is 150 ... 1500 ms
- Special opening geometry, high switching performance
- High flow rates
- Good Δp -Q values: no narrowing of flow paths in energised position
- Slip-on coils: coils can be changed without opening the hydraulic envelope
- Pressures to 315 bar in P, A and B
- For subplate mounting, Interface ISO size 05 to ISO 4401-05-04

1 Description

Series WEDEU ...-10 solenoid operated spool valves are direct acting units that provide smooth, shock-free acceleration, deceleration and reversal of hydraulic cylinders and motors. The design incorporates low-cost ramp controls that are entirely hydraulic in operation. The principal components of the valve are a cast body, a control spool with centering springs, and wet armature solenoids with high-pressure core tubes and slip-on coils (DC only). A coil can be replaced, or the voltage changed, without opening the hydraulic envelope. The valve switching time is adjusted by means of a flow-control screw that is accessible from the outside of the valve. The effect of the throttle is to reduce the rate of oil transfer between the two spring chambers. This, in turn, dictates the speed at which the spool shifts. To en-

sure that the spring chambers are purged of air and completely filled with oil when the valve is commissioned, it must be operated through 6 ... 12 complete cycles (spool stroked end-to-end) with the flow control screw turned fully open. After this has been done, the flow control needle can then be screwed in half a turn at a time (2 mm Allen key required) until the required switching time is attained.

Warning: the flow control must never be screwed in fully i.e. until it "bottoms" - this would prevent any transfer of oil and the valve would no longer function. The system design must ensure that air cannot be sucked back through the tank line. To provide a reliable oil supply to the two spring chambers, the minimum tank line back pressure should be 1 bar.

2 Symbols

4/2 FUNCTIONS	4/2 FUNCTIONS WITH 4/3 SPOOLS	4/2 FUNCTIONS WITH 4/3 SPOOLS	4/3 FUNCTIONS
WEDEU-42-A-10 1	WEDEU-42-AD-10 4	WEDEU-42-BD-10 7	WEDEU-43-D-10 10
WEDEU-42-B-10 2	WEDEU-42-AG-10 5	WEDEU-42-BG-10 8	WEDEU-43-G-10 11
Crossover transients 3	WEDEU-42-AH-10 6	WEDEU-42-BH-10 9	WEDEU-43-H-10 12



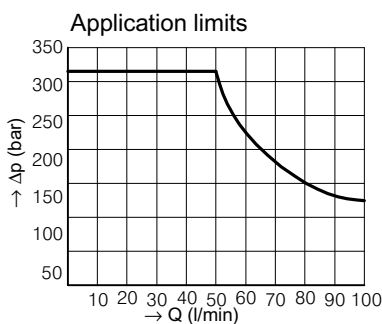
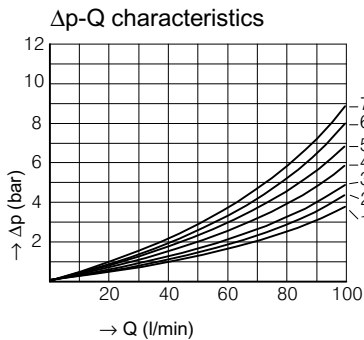
NOTE! Other spool types on request.

3 Technical data

General characteristics	Description, value, unit
Designation	4/2 and 4/3 solenoid operated directional spool valves
Design	direct acting, soft-switching
Mounting method	manifold mounting
Size	nominal size 10 mm, 4401-05-04 size 5 interface
Mass	1 solenoid = 4.8 kg 2 solenoids = 6.3 kg
Mounting attitude	horizontal recommended (vertical mounting makes air bleeding difficult)
Hydraulic characteristics	Description, value, unit
Maximum operating pressure	P, A and B 315 bar
Maximum return pressure	160 bar
Maximum flow rate	100 l/min
Switching frequency	max. 1200 cycles/h
Flow direction	see symbols
Hydraulic fluid	HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER
Hydraulic fluid temperature range	-30 °C ... +80 °C
Ambient temperature range	-30 °C ... +50 °C
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
Actuator type	solenoid coil
Solenoid coils type	pressure-tight wet armature design (slip-on coil system)
Supply voltage	12 V DC, 24 V DC, 196 V DC (Other voltages on request) 196 V DV: DIN (can be used with rectifier for 230 AC)
Supply voltage tolerance	± 10 %
Nominal power consumption	39 W
Relative duty cycle	100 %
Protection class to ISO 20 653 / EN 60 529	IP 65 to DIN 40050
Electrical connection	3-pin square plug rotatable 4x90° to DIN 43650 / ISO 4400

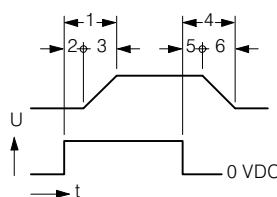
4 Performance graphs

measured with oil viscosity 33 mm²/s (cSt)



The quoted maximum flow rates apply when the flows passing through the valve are equal in both directions (symmetrical). For non-symmetrical flows, the maximum rates are substantially reduced, in worst cases to only 1/3 of the above values.

Switching times



- 1 = total energising time
- 2 = time until flow paths begin to open
- 3 = time for solenoid to open spool fully
- 4 = total spring-return time
- 5 = time until flow paths begin to close
- 6 = time for spring to close spool fully

	Solenoid				
	P → A	P → B	A → T	B → T	P → T
A- / B spools	3	3	5	6	--
D spool	2	2	4	5	--
G spool	OFF	--	--	5	6
	ON	3	3	6	7
H spool	OFF	--	--	--	3
	ON	1	1	6	7

The values 1 and 4 are jointly controlled by the setting of the flow control, but it is usually the case that they are not equal. Both values normally fall in the range 150 ... 1,500 ms. The switching times are also strongly influenced by the following factors:

- Solenoid force: = ± 15 % voltage variation
= ± 50 % switching time
- Cold / hot solenoid: = ± 20 % switching time
- Flow rate Q (l/min): = influences values 3 + 6
(lower Q = shorter t)
- Pressure diff. Δp (bar): = ± 75 % change in Δp
= ± 10 % switching time

There are a large number of factors that cannot easily be pre-determined. This means that the flow control cannot be factory-set and adjustment on-site is therefore essential. This is simple in practice, thanks to the externally-accessible flow control.

5 Installation information



ATTENTION!

All installation and servicing must be carried out with care, and by qualified personnel only. When servicing valves (cleaning, changing seals, etc.) note the following:

A (and B) spools must not be reversed, or the function P → A / B → T will become P → B / A → T (and vice versa). All other spools are symmetrical but should always be reassembled with their original orientation, in any case.



IMPORTANT! When changing seals, the new seals should be thoroughly oiled or greased before fitting them to the valve.

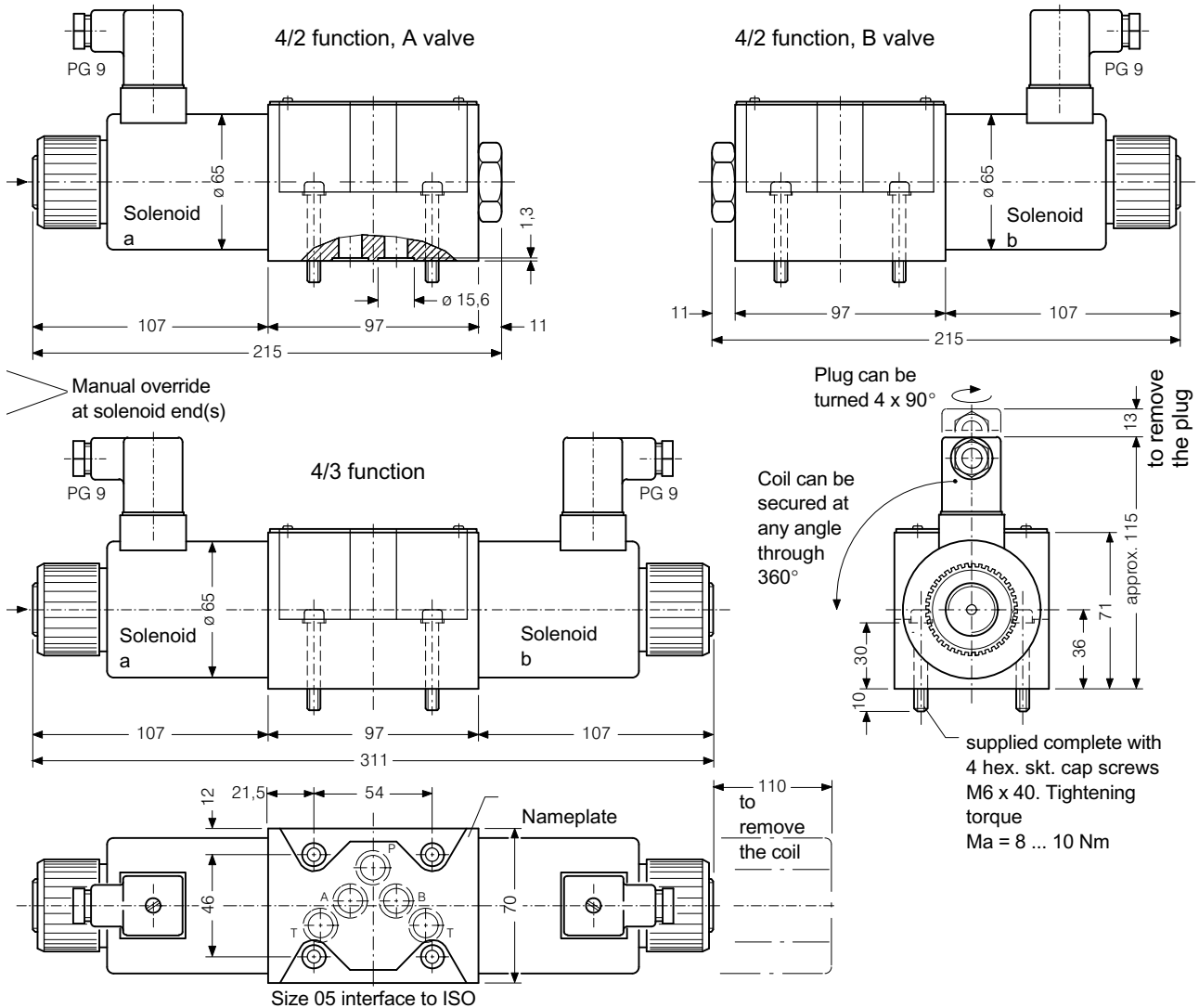


IMPORTANT! Use the correct tightening torque when fitting Spring cap, DC and Core tube.

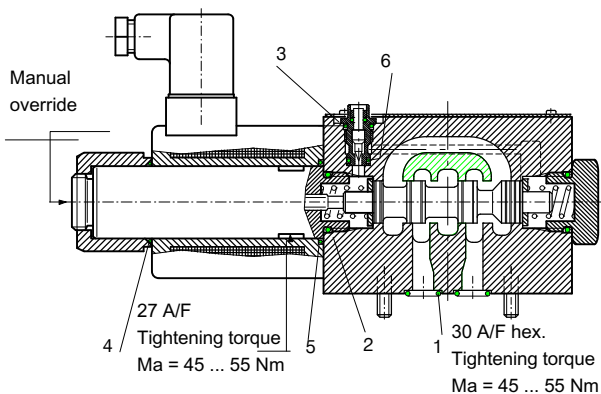


IMPORTANT! At installation, be sure to mount the valve with its hydraulic ports mating with those of the manifold block or subplate and, finally, use the correct tightening torque for the 4 x M6 mounting screws.

6 Dimensions & sectional view



7 Schematic section



Sealkit no. DS-122-V, comprising:

Itm.	Qty.	Description	Size
1	5	O-ring no. 014	∅ 12.42 x 1.78 N90
2	2	O-ring no. 118	∅ 21.89 x 2.62 N90
3	1	O-ring no. 012	∅ 9.25 x 1.78
4	2	O-ring	∅ 30.00 x 2.00 N70
5	2	O-ring	∅ 30.00 x 2.00 N70
6	1	O-ring no. 010	∅ 6.07 x 1.78 N90

8 Ordering code

Ex. WEDE U - 43 - D - 10 V - 1 24 D -

WEDE	=	Directional, valve, solenoid operated, direct acting	
U	=	soft-switching	
42	=	4/2 function	
43	=	4/3 function	
A	=	4/2 function, A spool	
B	=	4/2 function, B spool	
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 4401 size 5 interface	
V	=	FKM (fluorocarbon rubber / VITON) seals (special seals on request)	
1 ... 9	=	(special seals on request)	
...	=	voltage e.g. 24 (24 V)	
D	=	current DC	
blank	=	DIN EN 175301-803 connection, 3-pole 2 P+E, with mating plug, IP 65 (standard)	} mating plug not supplied
M100	=	DIN EN 175301-803 connection, 3-pole 2 P+E	
JT	=	Junior Timer radial plug connection (with protection diode, IP 65)	
DT	=	Deutsch plug connection (with protection diode, IP 67/69K) (only 12 and 24 V DC)	

9 Related data sheets

Reference	Description
400-P-050101	Size 05 interface to ISO 4401-05-04
400-P-515101	LRSA DIN plug

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