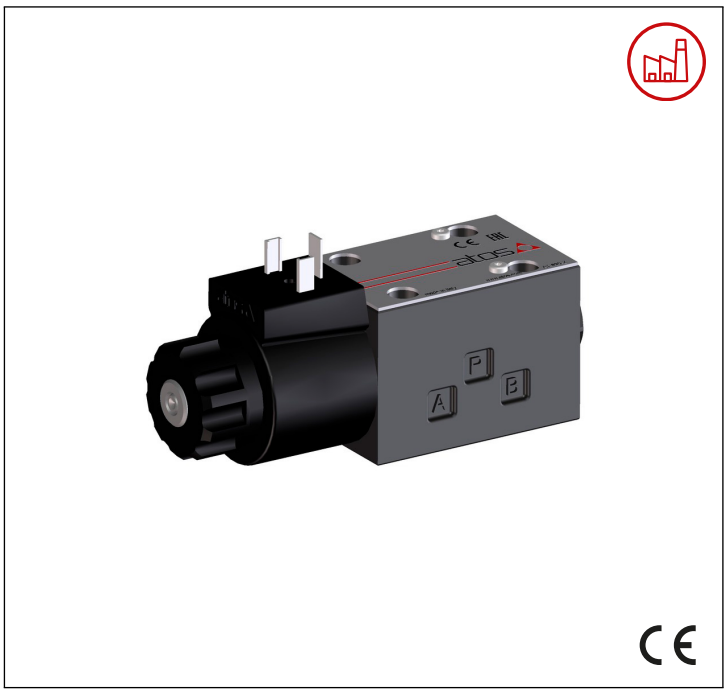
DHI

Directional valves

Direct, spool type, subplate, DC solenoids, compact execution, DIN or Deutsch connectors



Sizes	Qmax	Pmax
06 ISO 4401	80 l/min	350 bar

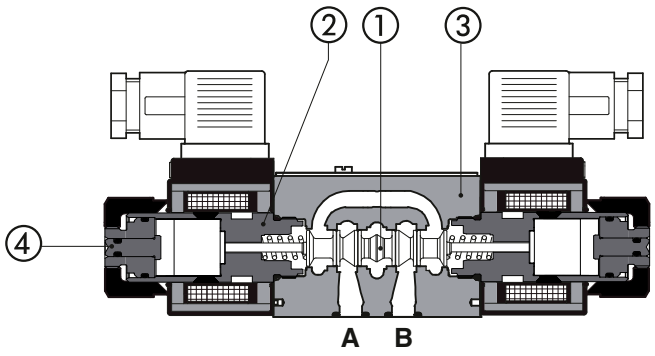
Features

- 4/3 or 4/2 way
- Subplate mounting ISO 4401-03-02-0-05
- Plastic encapsulated solenoids
- Electric connection DIN EN 175301-803 (IP65) or optional Deutsch (IP69)
- Optional manual override with rubber cap
- Auxiliary hand lever

Description

Spool type, two or three position direct operated valves with threaded solenoids in compact execution.
Solenoids are made by:
• wet type screwed tube, DC power supply, with integrated manual override pin
• interchangeable plastic encapsulated coils, specific for DC power supply, easily replaceable without tools

Overview



1 - Spool
2 - Solenoid tube
3 - Valve body
4 - Manual override pin

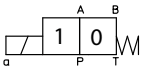
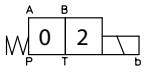
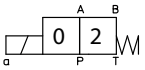
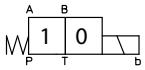
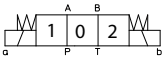
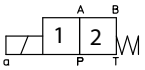
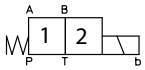
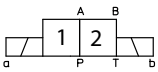
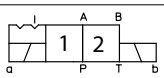
1 MODEL CODE

DHI	-	0	61	1	/	A	-	X	24DC	*	/	*
1		2	3	4		5		6	7	8		9

1 - **Valve type**	
DHI	Directional control

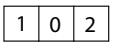
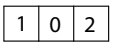
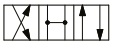
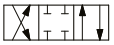
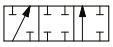
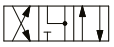
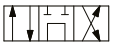
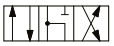
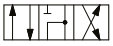
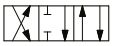
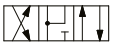
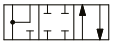
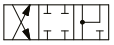
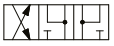
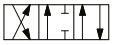
2 - **Valve size, ISO 4401**	
0	Size 06

3 - **Configuration**

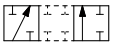
	standard	option /A
61		
67		
71		
63		
70		
75		

4 - **Spool type**

Configuration: 61, 61/A, 67, 67/A, 71

			
0		**1**	
2		**3**	
4		**5**	
58		**6**	
7		**8**	
91		**19**	
93		**39**	
16		**17**	

Configuration: 63, 63/A, 70, 75

			
0/2		**1/2**	
2/2 (1)			

(1) Not available for configuration 75
Spools type 0 and 3 are also available as **0/1** and **3/1** with restricted oil passages in central position, from user ports to tank.
Spools type 1, 4, 5 and 58 are also available as **1/1, 4/8, 5/1** and **58/1**. They are properly shaped to reduce water-hammer shocks during the switching.
Spools type 1, 1/2, 3, 8 are available as **1P, 1/2P, 3P, 8P** to limit valve internal leakages.

5 - **Construction options**		
A	Solenoid at side of port B	only for 61, 63, 67
	Hand lever at side of port B	only for 71, with MO or MV option
MO	Horizontal hand lever	
MV	Vertical hand lever	
WP	Prolonged manual override protected by rubber cap	

WP option cannot be combined with **MO** or **MV** options
WP manual override operation can be possible only if the pressure at T port is lower than 50 bar
MO, MV, AMO, AMV are available for configuration: 61 - 63 - 71, spools: 0 - 0/2 - 1 - 1P - 1/2 - 1/2P - 3 - 3P - 4 - 7

6 - **Coil and connector options**	
00-DC	DC solenoids without coils
X	without connector
XK	Deutsch connector

See section 4.4

7 - **Voltage code**	
12DC	12 VDC
14DC	14 VDC
24DC	24 VDC
28DC	28 VDC

See section 4.2

8 - **Series identification** - not required for ordering	
.....	series number

9 - **Seals material**	
-	NBR
PE	FKM

2 GENERAL CHARACTERISTICS

Assembly position	Any position
Subplate surface finishing to ISO 4401	Acceptable roughness index, Ra ≤0,8 recommended Ra 0,4 - flatness ratio 0,01/100
MTTFd values according to EN ISO 13849	150 years, for further details see technical table P007
Ambient temperature range	Standard = -30°C ÷ +50°C; /PE option = -20°C ÷ +50°C
Storage temperature range	Standard = -30°C ÷ +80°C; /PE option = -20°C ÷ +80°C
Surface protection	Body: zinc coating with black passivation; Coil: plastic incapsulation
Corrosion resistance	Salt spray test (EN ISO 9227) > 200 h
Compliance	Comply with Directive 2011/65/EU as amended (RoHS 2), including Delegated Directive (EU) 2015/863 and all subsequent Delegated Directives in force on the date of this statement REACH Regulation (EC) n°1907/2006

3 HYDRAULIC CHARACTERISTICS

Operating pressure	Ports P,A,B: 350 bar; Port T 210 bar for all DC version
Rated flow	See diagrams Q/Δp at section 5
Maximum flow	80 l/min, see operating limits at section 6

Recommended viscosity	15÷100 mm2/s - max allowed range 2,8 ÷ 500 mm2/s
Max fluid contamination level	ISO4406 class 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog

Seals, recommended fluid temperature	NBR seals (standard) = -20°C ÷ +80°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C

Hydraulic fluid	**Suitable seals type**	Classification	Ref. Standard
Mineral oils	NBR, FKM	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR	HFC	

4 ELECTRICAL CHARACTERISTICS

4.1 Coils characteristics

Insulation class	H (180°C) for all DC coils Due to the occuring surface temperatures of the solenoid coils, the European standards EN ISO 13732-1 and EN ISO 4413 must be taken into account
Protection degree to DIN EN60529	IP 65 (with connectors 666, 667 correctly assembled)
Duty factor	100%
Supply voltage and frequency	See section 4.2
Supply voltage tolerance	± 10%

4.2 Voltage code

External supply nominal voltage ± 10%	**Voltage code**	**Type of connector**	**Power consumption (1)**	**Code of spare coil**
12 DC	12 DC	666 or 667	28,8 W	COI-12DC
14 DC	14 DC			COI-14DC
24 DC	24 DC			COI-24DC
28 DC	28 DC			COI-28DC

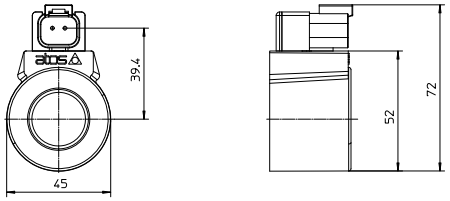
(1) Average values based on tests preformed at nominal hydraulic condition and ambient/coil temperature of 20°C.

4.3 Electric connectors according to DIN EN 175301-803 (to be ordered separately, see tech table K800)

666 = standard connector IP-65, suitable for direct connection to electric supply source
667 = as 666, but with built-in signal led. Available for power supply voltage 24DC

4.4 Coil with special connectors only for voltage supply 12, 14, 24, 28 VDC

Deutsch connector DT-04-2P



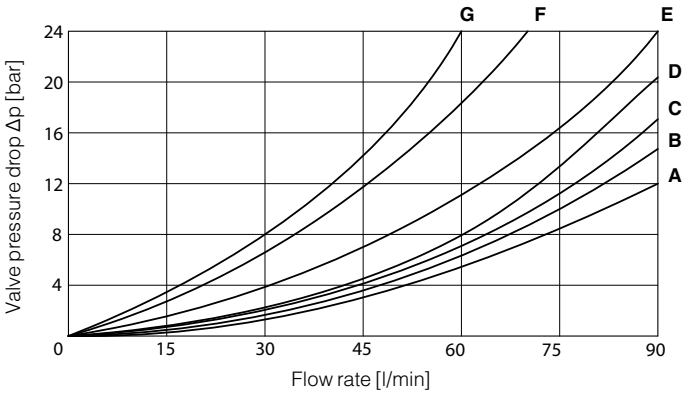
Option -XK

Coil type COIK, Deutsch connector DT-04-2P male
Protection degree IP69

Note: For the electric characteristics refer to standard coils features - see section 4.2

5 Q/ΔP DIAGRAMS based on mineral oil ISO VG 46 at 50°C

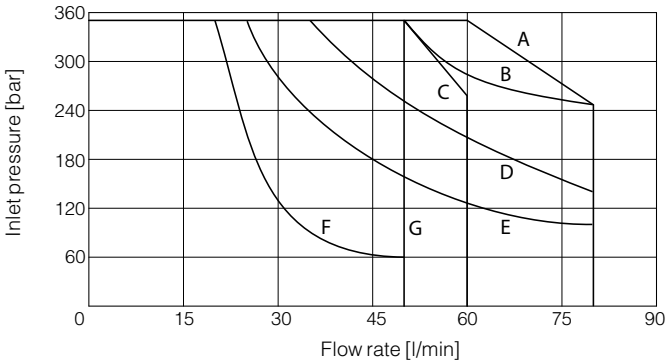
Spool type	Flow direction				
	P-A	P-B	A-T	B-T	P-T
0	A	A	C	C	D
1, 1P, 1/1	C	C	C		
3, 3P, 3/1	D	D	A	A	
4, 4/8, 5	F	F	G	C	E
0/2, 1/2, 1/2P	D	D	D	D	
6, 7, 16, 17	D	D	D	D	
8, 8P	A	A	E	E	
2	D	D			
2/2	F	F			
19, 91	E	E	D	D	
39, 93	F	F	G	G	



6 OPERATING LIMITS based on mineral oil ISO VG 46 at 50°C

The diagrams have been obtained with warm solenoids and power supply at lowest value (Vnom - 10%). The curves refer to application with symmetrical flow through the valve (i.e. P-A and B-T). In case of asymmetric flow and if the valves have the devices for controlling the switching times the operating limits must be reduced.

Curve	DC version, spool type		
	Config. 63	Config. 75	All others
A			1
B	1/2	0/2	0
C	0/2		
D			3
E			6
F			4
G		1/2	



7 SWITCHING TIMES (average values in msec)

Response times are measured according to ISO 6403, from 50% of the coil voltage signal edge to 90% of spool stroke

Test conditions:
- 20 l/min; 150 bar
- nominal voltage
- 2 bar of counter pressure on port T
- mineral oil: ISO VG 46 at 50°C

The elasticity of the hydraulic circuit and the variations of the hydraulic characteristics and temperature affect the response time.

Valve	Switch-on DC	Switch-off DC
DHI	65 - 70	55 - 80

8 SWITCHING FREQUENCY

Valve	DC (cycles/h)
DHI + 666 / 667	15000

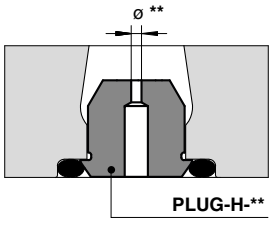
9 PLUG-IN RESTRICTOR (to be ordered separately)

The use of plug-in restrictors in valve's ports P or A or B may be necessary in case of particular conditions as long flexible hoses or the presence of accumulators which could cause at the valve switching instantaneous high flow peaks over the max valve's operating limits.

PLUG-H	-	**	A

08, 10, 12, 15 calibrated orifice diameter in tenths of mm
Example PLUG-H-**12** = orifice diameter **1,2 mm**
Other orifice dimensions are available on request

Short calibrated orifice



10 FASTENING BOLTS AND SEALS

Fastening bolts	**Seals**
4 socket head screws M5x30 class 12.9 Tightening torque = 8 Nm	4 OR 108; Diameter of ports A, B, P, T: Ø 7,5 mm (max)

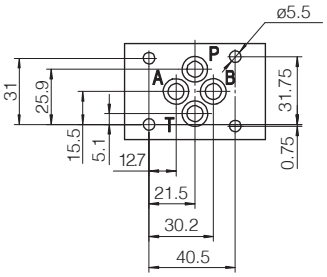
11 DIMENSIONS [mm]

ISO 4401: 2005
Mounting surface: 4401-03-02-0-05

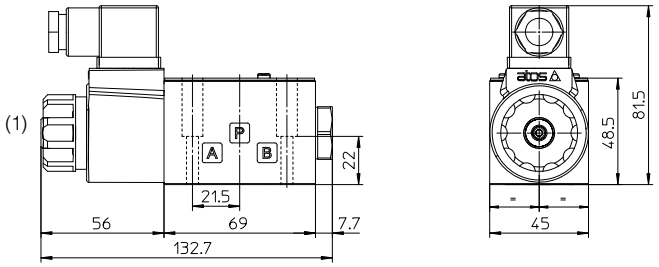
Mass (Kg)	
DHI-06	1,3
DHI-07	1,6
option MV or MO	+0.9

P = PRESSURE PORT
A, B = USE PORT
T = TANK PORT

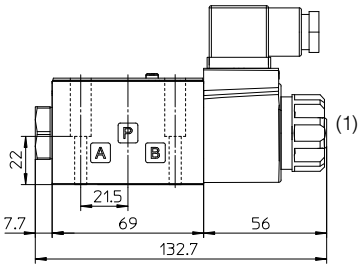
Valve's bottom view



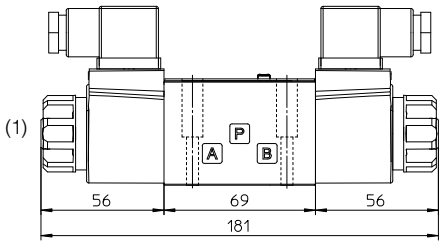
DHI-06



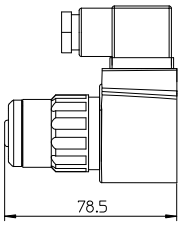
DHI-06*/A



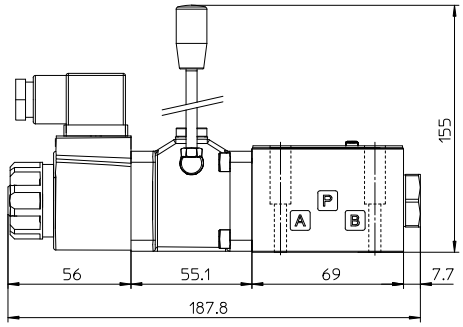
DHI-07



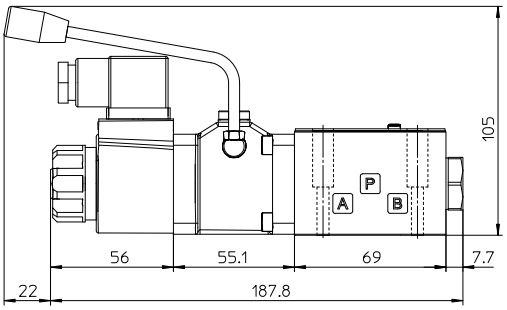
option /WP



option /MV



option /MO



(1) Standard manual override PIN

⚠ The manual override operation can be possible only if the pressure at T ports is lower than 50 bar

12 RELATED DOCUMENTATION

E001	Basics for solenoid directional valves	P005	Mounting surfaces for electrohydraulic valves
K280	Single and modular subplates	E900	Operating and maintenance information
K800	Electric and electronic connectors		