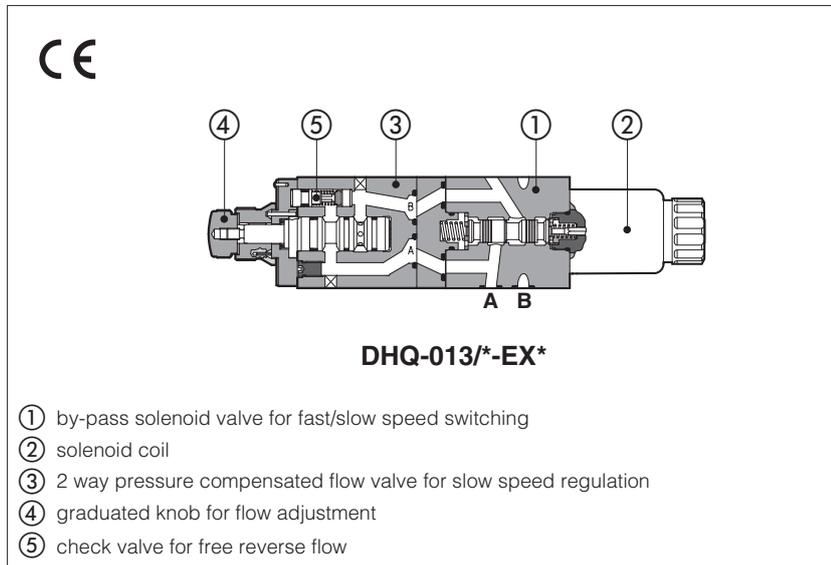


Modular fast/slow valves type **DHQ**

compensated flow control and by-pass solenoid valve, ISO 4401 size 06



- ① by-pass solenoid valve for fast/slow speed switching
- ② solenoid coil
- ③ 2 way pressure compensated flow valve for slow speed regulation
- ④ graduated knob for flow adjustment
- ⑤ check valve for free reverse flow

DHQ are modular valves for fast/slow speed control of hydraulic actuators.

They combine a pressure compensated flow control valve ③ type QV-06 (Tab. C210) for the slow speed regulation and a solenoid operated by-pass valve ① for the fast/slow speed switching.

Depending on execution **C** or **O**, the low speed is performed with solenoid de-energized or energized.

The low speed regulation is obtained by turning the graduated micrometer knob ④ of flow control valve. Optional versions with locking key on the adjustment knob are available on request.

The flow control valve is provided with a built-in check valve ⑤ to allow the free flow in the opposite direction.

Mounting surface: **ISO 4401 size 06**

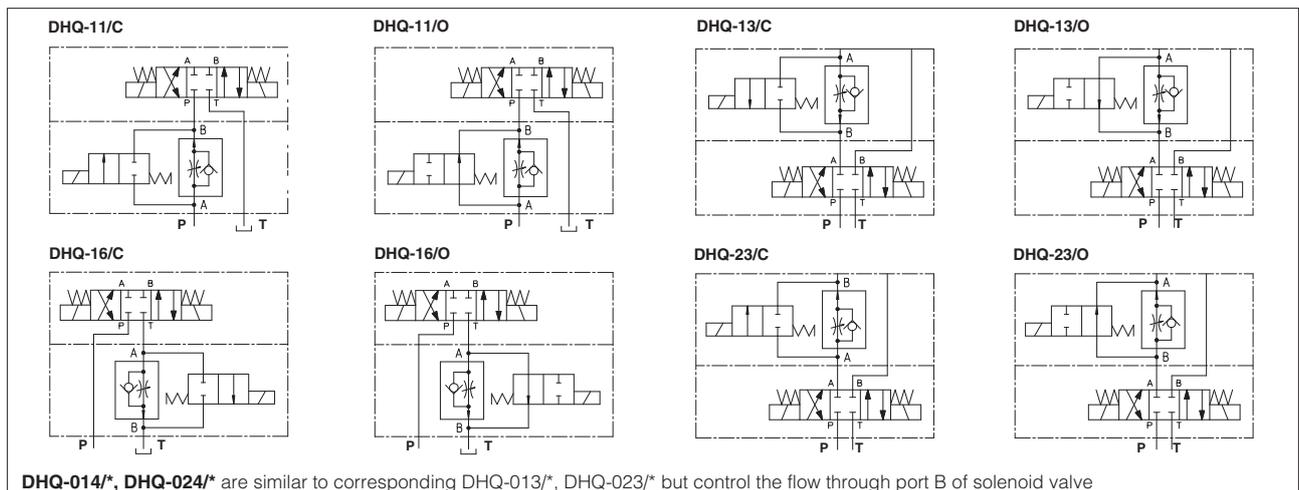
Max controlled flow: up to **1,5-6-11-16-24 l/min**

Free flow up to **40 l/min**.

Max pressure: up to **250 bar**

<p>1 MODEL CODE</p> <p style="text-align: center;">DHQ-0</p> <p>Modular flow control valve, pressure compensated</p> <p>Configuration, see section ②</p> <p>meter OUT control:</p> <p>13 = on port A 14 = on port B 16 = on port T</p> <p>meter IN control:</p> <p>11 = on port P 23 = on port A 24 = on port B</p> <p>Execution</p> <p>C = flow controlled when solenoid is de-energized O = flow controlled when solenoid is energized</p> <p>Maximum adjustable flow (low speed)</p> <p>00 = without flow control valve 1 = 1,5 l/min; 6 = 6 l/min; 11 = 11 l/min; 16 = 16 l/min; 24 = 24 l/min;</p>	<p>13 / C / 6 / K - E</p>	<p>X</p>	<p>24DC</p> <p>Voltage code, see section ⑦</p>	<p>** / *</p> <p>Series number</p>	<p>Seals material, see section ⑤:</p> <p>- = NBR PE = FKM BT = HNBR</p>
<p>Type of solenoid:</p> <p>E = solenoid OE for AC and DC supply with cURus certification</p>					
<p>Options:</p> <p>K = with lock key for the setting knob V = without by-pass check valve</p>					

2 CONFIGURATIONS



3 GENERAL CHARACTERISTICS

Assembly position	Any position
Subplate surface finishing to ISO 4401	Acceptable roughness index, Ra 0,4 - flatness ratio 0,01/100
Ambient temperature range	Standard = -30°C ÷ +70°C /PE option = -20°C ÷ +70°C /BT option = -40°C ÷ +70°C
Storage temperature range	Standard = -30°C ÷ +80°C /PE option = -20°C ÷ +80°C /BT option = -40°C ÷ +80°C
Surface protection	Body: zinc coating with black passivation Coil: zinc nickel coating (DC version) plastic incapsulation (AC version)
Compliance	CE to Low Voltage Directive 2014/35/EU RoHS Directive 2011/65/EU as last update by 2015/863/EU REACH Regulation (EC) n°1907/2006

4 HYDRAULIC CHARACTERISTICS

Valve model	/1	/6	/11	/16	/24
Max regulated flow [l/min]	1,5	6	11	16	24
Min regulated flow [cm ³ /min]	50	50	50	50	50
Regulating Δp [bar]	3	3	5	6,5	8
Max reverse flow through check valve [l/min]	24				
Max free flow through by-pass valve [l/min]	40				
Max pressure [bar]	250				

5 SEALS AND HYDRAULIC FLUID - for other fluids not included in below table, consult our technical office

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 HNBR seals (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C		
Recommended viscosity	15 ÷ 100 mm ² /s - max allowed range 2,8 ÷ 500 mm ² /s		
Max fluid contamination level	ISO4406 class 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog		
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	

6 ELECTRICAL CHARACTERISTICS

Insulation class	H (180°C) for DC coils; F (155°C) for AC coils Due to the occurring 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 EN 60529	IP 65 (with connectors 666, 667 correctly assembled)
Relative duty factor	100%
Supply voltage and frequency	See section 7
Supply voltage tolerance	± 10%

7 COIL VOLTAGE

External supply nominal voltage ± 10%	Voltage code	Type of connector	Power consumption (2)	Code of spare coil DHE	
12 DC	12 DC	666 or 667	30 W	COE-12DC	
14 DC	14 DC			COE-14DC	
24 DC	24 DC			COE-24DC	
28 DC	28 DC			COE-28DC	
48 DC	48 DC			COE-48DC	
110 DC	110 DC			COE-110DC	
125 DC	125 DC			COE-125DC	
220 DC	220 DC			COE-220DC	
24/50 AC	24/50/60 AC			58 VA (3)	COE-24/50/60AC (1)
48/50 AC	48/50/60 AC				COE-48/50/60AC (1)
110/50 AC	110/50/60 AC				COE-110/50/60AC (1)
230/50 AC	230/50/60 AC				COE-230/50/60AC (1)
115/50 AC	115/60 AC	80 VA (3)	COE-115/60AC		
230/50 AC	230/60 AC		COE-230/60AC		
110/50 AC - 120/60 AC	110 RC	669	30 W	COE-110RC	
230/50 AC - 230/60 AC	230 RC			COE-230RC	

(1) Coil can be supplied also with 60 Hz of voltage frequency: in this case the performances are reduced by 10 ÷ 15% and the power consumption is 52 VA.

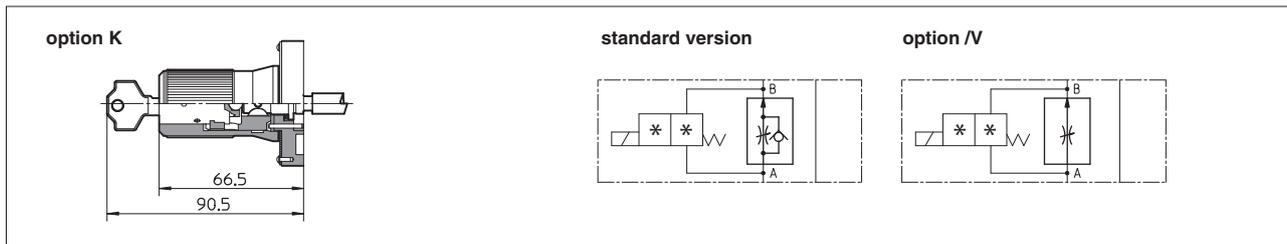
(2) Average values based on tests performed at nominal hydraulic condition and ambient/coil temperature of 20°C.

(3) When solenoid is energized, the inrush current is approx 3 times the holding current.

8 OPTIONS

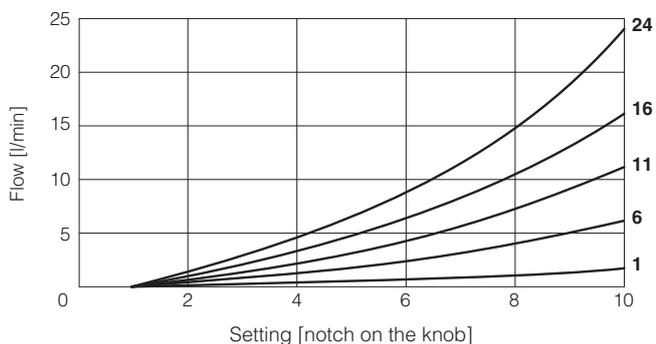
K = lock key for the setting knob

V = without by-pass check valve



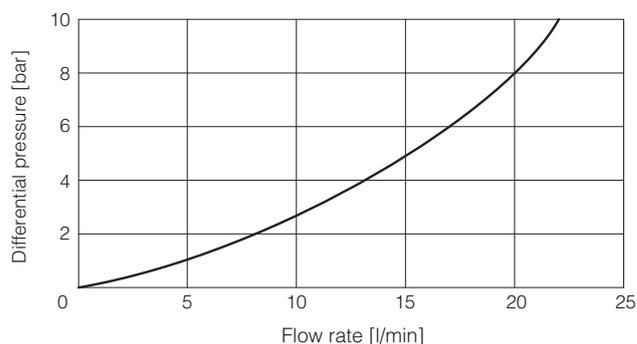
9 DIAGRAMS based on mineral oil ISO VG 46 at 50°C

9.1 Flow regulation diagram (low speed)

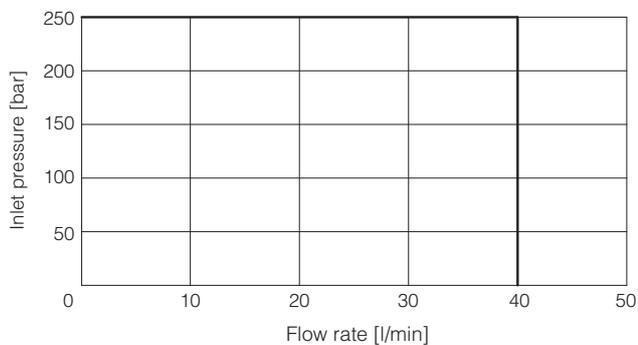


1 = DHQ-0*/*/1 6 = DHQ-0*/*/6 11 = DHQ-0*/*/11
 16 = DHQ-0*/*/16 24 = DHQ-0*/*/24

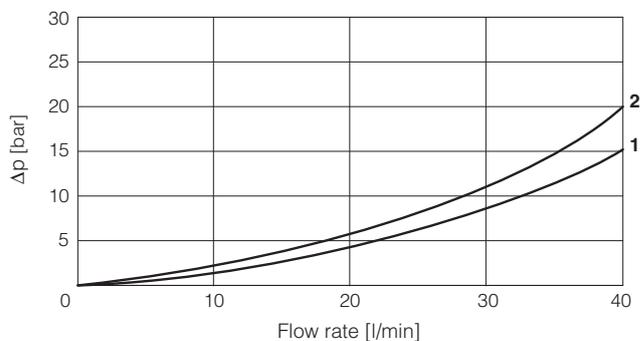
9.2 Q/Δp diagram through the check valve for reverse free flow



9.3 Operating limits of by-pass solenoid valve



9.4 Q/Δp diagram through the by-pass solenoid valve



1 = DHQ-013, DHQ-014
 2 = DHQ-011, DHQ-016, DHQ-023, DHQ-024

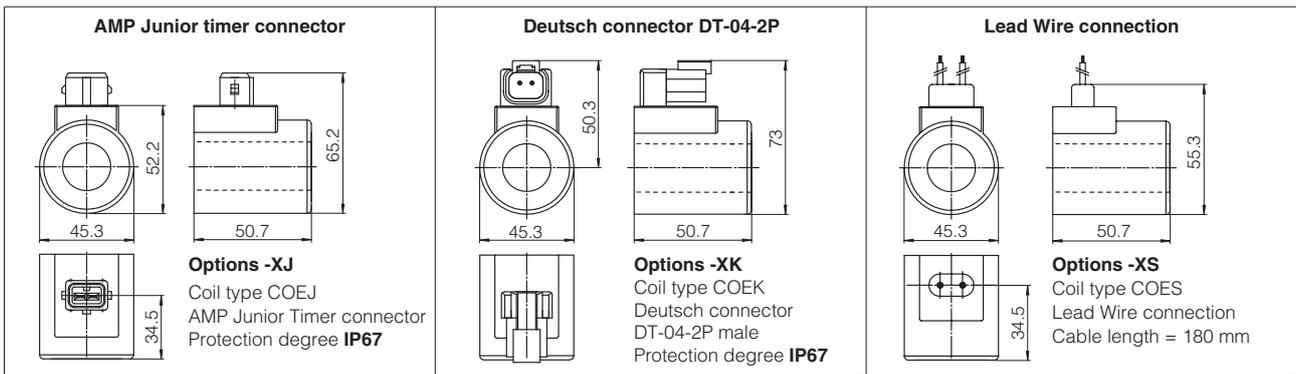
10 ELECTRIC CONNECTORS ACCORDING TO DIN 43650 (to be ordered separately, see tech table K500)

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 24 AC or DC, 110 AC or DC, 220 AC or DC

669 = with built-in rectifier bridge for supplying DC coils by alternate current (AC 110V and 230V - I_{max} 1A)

11 COIL WITH SPECIAL CONNECTORS only for voltage supply 12, 14, 24, 28 Vdc

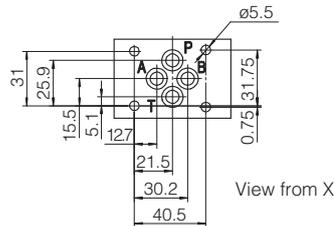


Note: for the electric characteristics refer to standard coils features - see section 7

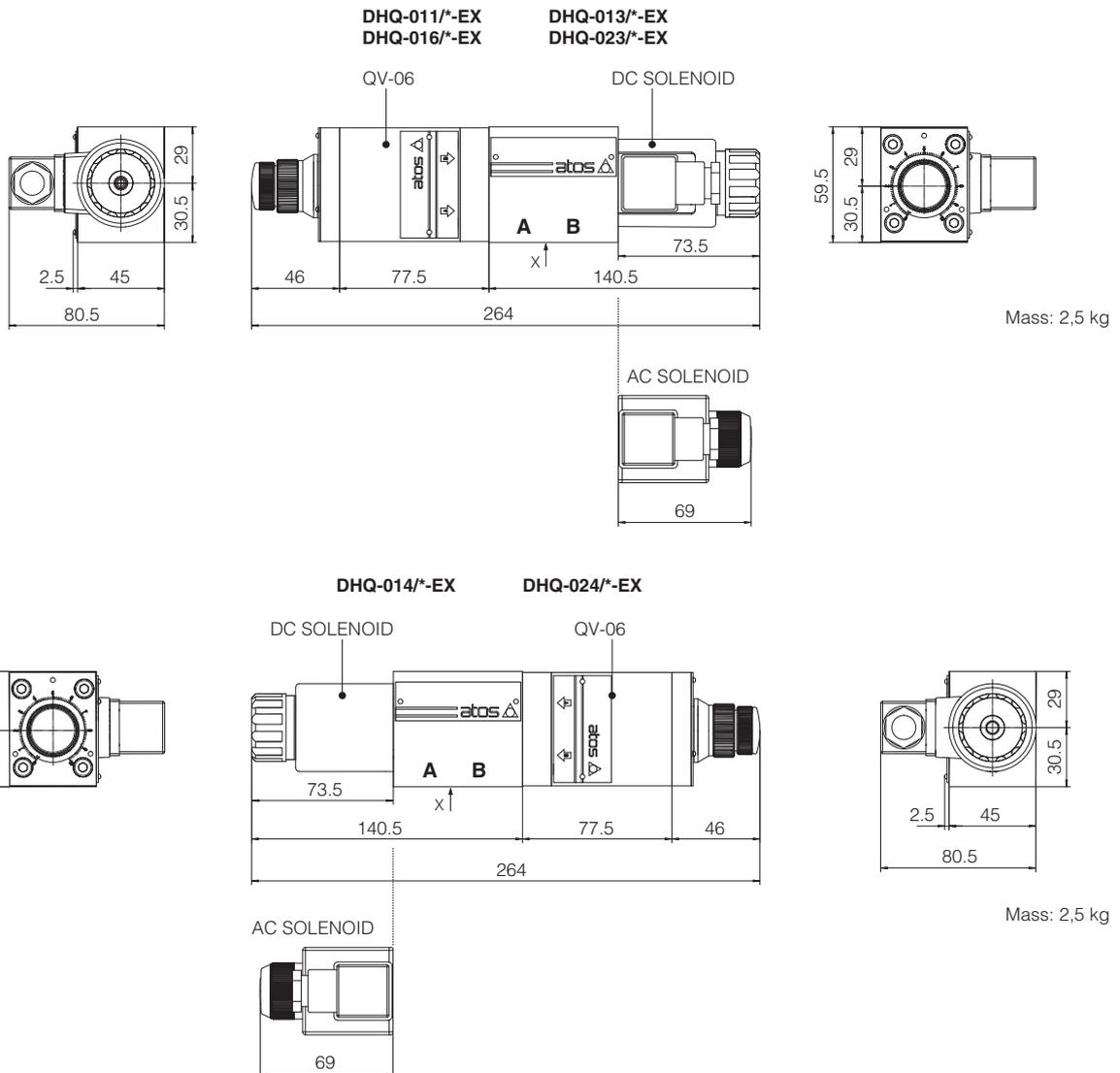
12 INSTALLATION DIMENSIONS [mm]

ISO 4401: 2005
Mounting surface: 4401-03-02-0-05
Diameter of ports P, A, B, T: $\varnothing = 7,5$ mm (max)
Seals: 4 OR 108

Fastening bolts: 4 socket head screws M5.
The length depends on number and type of modular elements associated



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



Mass: 2,5 kg

Mass: 2,5 kg

Overall dimensions refer to valves with connectors type 666