

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 encapsulation (AC version)
Compliance	CE to Low Voltage Directive 2014/35/EU RoHS Directive 2011/65/EU as last update by 2015/863/UE 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 [cm³/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 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		
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 20 ÷ 25% and the power consumption is 52 VA.

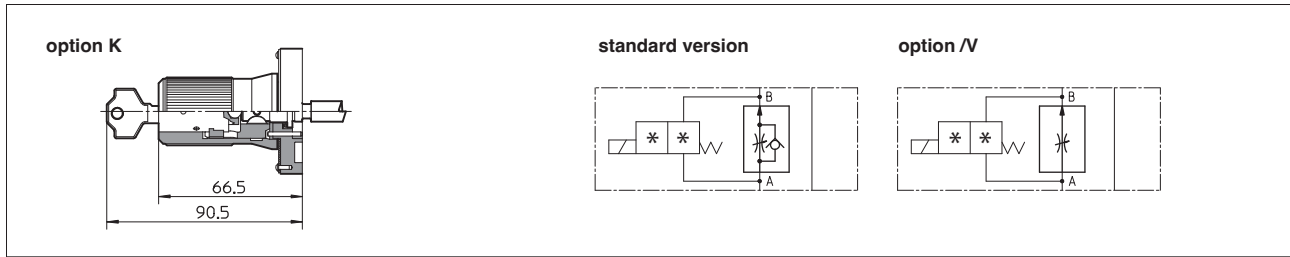
(2) Average values based on tests preformed at nominal hydraulic condition and ambient/coil temperature of 20°C.

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

8 OPTIONS

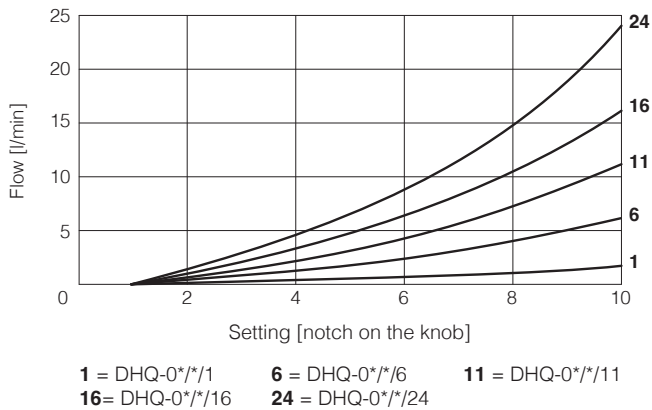
K = lock key for the setting knob

V = without by-pass check valve

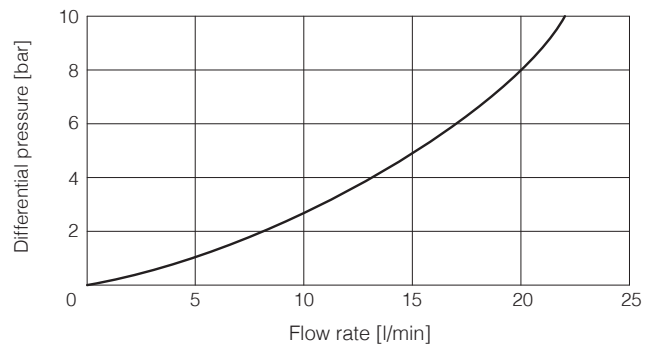


9 DIAGRAMS based on mineral oil ISO VG 46 at 50°C

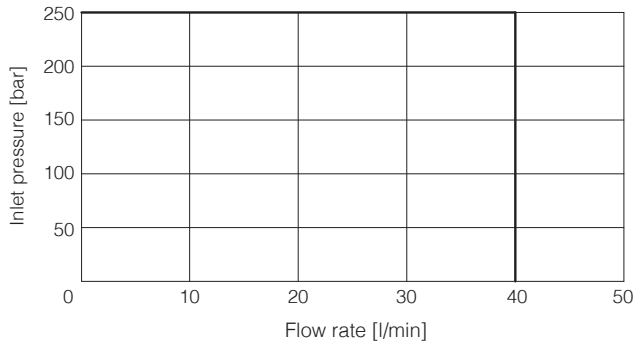
9.1 Flow regulation diagram (low speed)



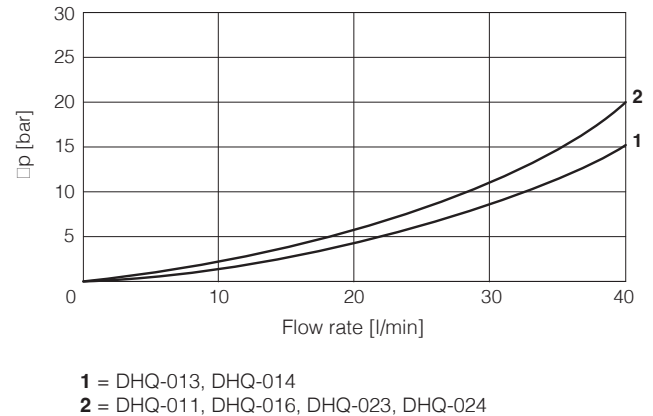
9.2 Q/Δp diagram through the check valve for reverse free flow



9.3 Operating limits of by-pass solenoid valve



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



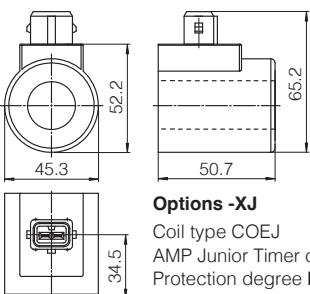
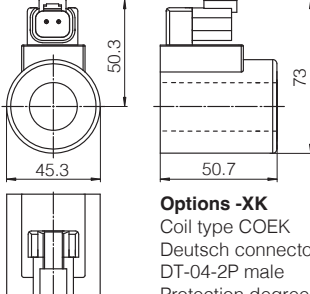
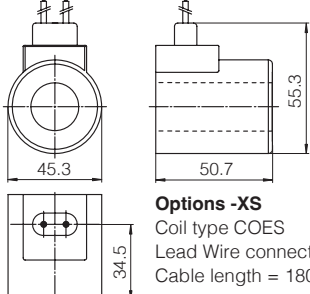
10 ELECTRIC CONNECTORS ACCORDING TO DIN 43650 (to be ordered separately, see tech table K500)

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

AMP Junior timer connector	Deutsch connector DT-04-2P	Lead Wire connection
		

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

12 INSTALLATION DIMENSIONS [mm]

ISO 4401: 2005

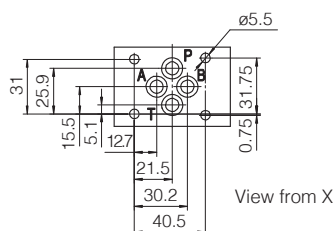
Mounting surface: 4401-03-02-0-05

Diameter of ports P, A, B, T: $\varnothing = 7,5$ mm (max)

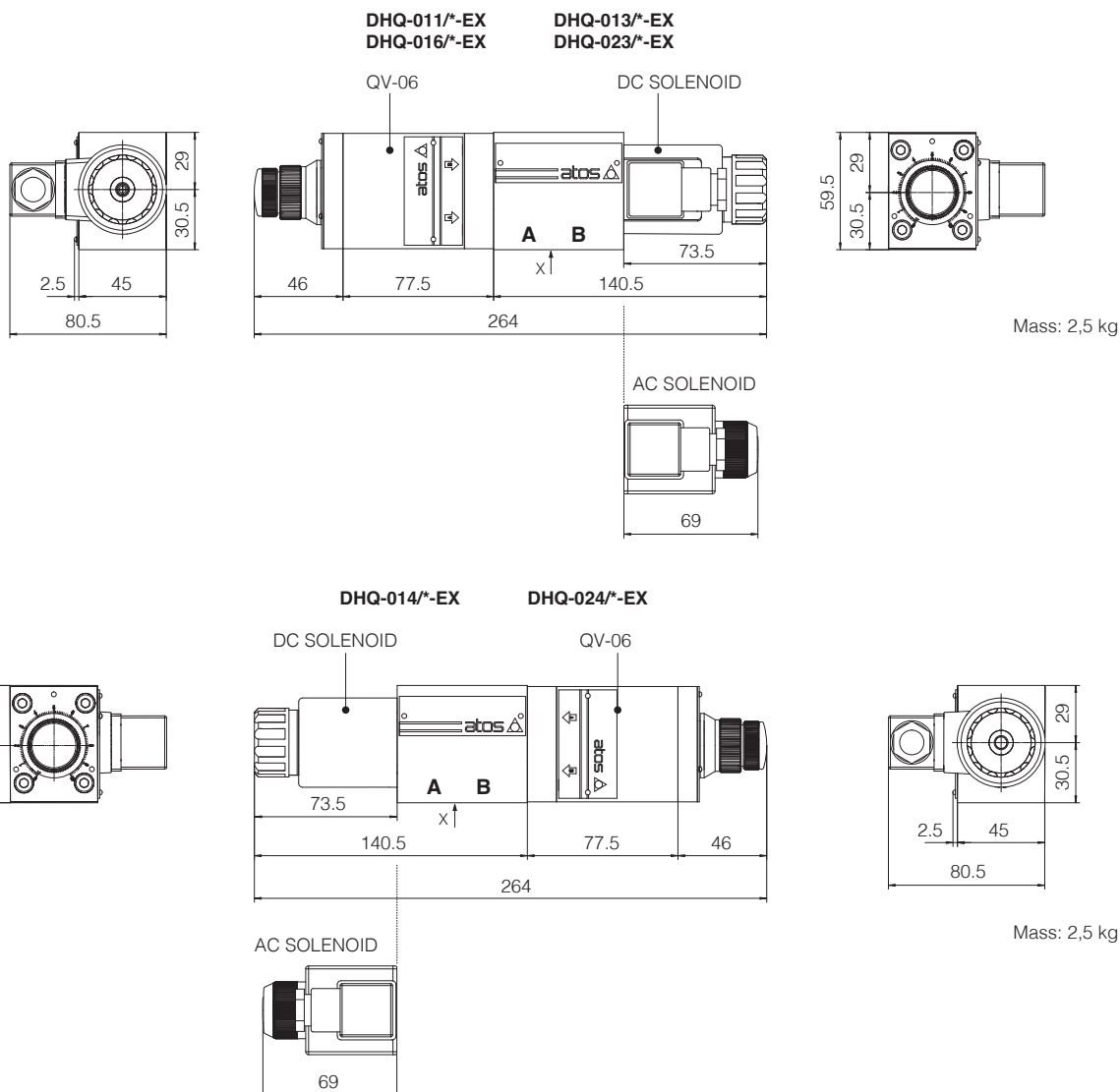
Seals: 4 OR 108

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



Overall dimensions refer to valves with connectors type 666