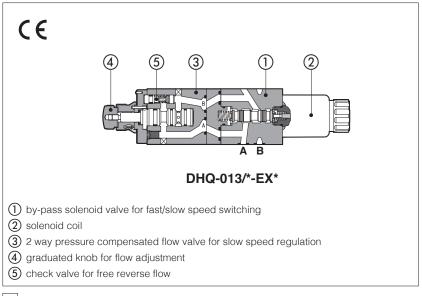


# Modular fast/slow valves type DHQ

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



**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  ${\bf C}$  or  ${\bf O}$ , the low speed is performed with solenoid de-energized or energized.

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

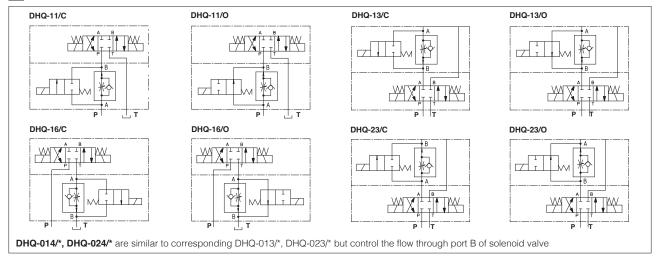
The flow control valve is provided with a built-in check valve (§) to allow the free flow in the opposite direction.

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** 

#### 1 MODEL CODE DHQ-0 X **24DC** Modular flow Seals material, control valve see section 5: pressure compensated Voltage code, = NRR see section 7 Series number Configuration, see section 2 PE = FKM meter OUT control: **BT** = HNBR 13 = on port A **00-AC** = AC solenoids without coils 14 = on port B**00-DC** = DC solenoids without coils **16** = on port T **X** = without connector meter IN control: See section 10 for available connectors, to be ordered separately **11** = on port P Coils with special connectors, see section [1] 23 = on port A**XJ** = AMP Junior Timer connector **24** = on port B XK = Deutsch connector XS = Lead Wire connection **C** = flow controlled when solenoid is de-energized **O** = flow controlled when solenoid is energized Type of solenoid: $\boldsymbol{\mathsf{E}} = \mathsf{solenoid}$ OE for AC and DC supply with $\boldsymbol{\mathsf{cURus}}$ certification Maximum adjustable flow (low speed) **00** = without flow control valve Options: 1 = 1,5 l/min;6 = 6 l/min;**11** = 11 l/min; 16 = 16 l/min; **24** = 24 l/min; **K** = with lock key for the setting knob V = without by-pass check valve

## 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	<b>Standard</b> = $-30^{\circ}$ C $\div +70^{\circ}$ C <b>/PE</b> option = $-20^{\circ}$ C $\div +70^{\circ}$ C <b>/BT</b> option = $-40^{\circ}$ C $\div +70^{\circ}$ C		
Storage temperature range	<b>Standard</b> = $-30^{\circ}$ C $\div +80^{\circ}$ C <b>/PE</b> option = $-20^{\circ}$ C $\div +80^{\circ}$ C <b>/BT</b> option = $-40^{\circ}$ C $\div +80^{\circ}$ 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/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	[cm <sup>3</sup> /min]	50	50	50	50	50
Regulating □p	[bar]	3	3	5	6,5	8
Max reverse flow through check valve [I/min]		24				
Max free flow through by-pa	ass 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 $\div$ +80°C, with HFC hydraulic fluids = -20°C $\div$ +50°C FKM seals (/PE option) = -20°C $\div$ +80°C HNBR seals (/BT option)= -40°C $\div$ +60°C, with HFC hydraulic fluids = -40°C $\div$ +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	

## 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

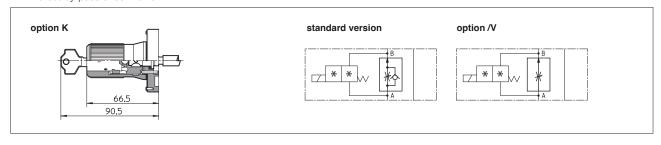
External supply nominal voltage ± 10%	Voltage code	Type of connector	Power consumption (2)	Code of spare coil DHE
12 DC	12 DC			COE-12DC
14 DC	14 DC			COE-14DC
24 DC	24 DC			COE-24DC
28 DC	28 DC		30 W 58 VA (3)	COE-28DC
48 DC	48 DC			COE-48DC
110 DC	110 DC			COE-110DC
125 DC	125 DC	666		COE-125DC
220 DC	220 DC	or — 667		COE-220DC
24/50 AC	24/50/60 AC			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	COE-115/60AC
230/50 AC	230/60 AC		(3)	COE-230/60AC
110/50 AC - 120/60 AC	110 RC	669	30 W	COE-110RC
230/50 AC - 230/60 AC	230 RC	003	30 W	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

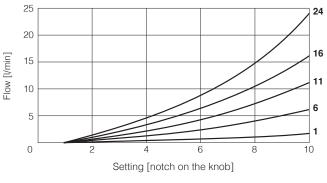
**K** = lock key for the setting knob

V = without by-pass check valve



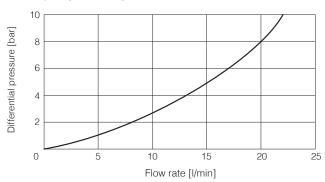
### 9 DIAGRAMS based on mineral oil ISO VG 46 at 50°C

#### 9.1 Flow regulation diagram (low speed)

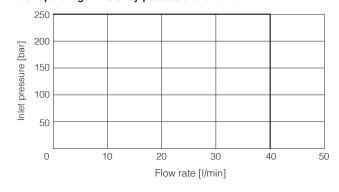


**1** = DHQ-0\*/\*/1 **16**= DHQ-0\*/\*/16 **6** = DHQ-0\*/\*/6 **24** = DHQ-0\*/\*/24 **11** = DHQ-0\*/\*/11

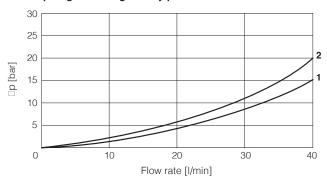
### 9.2 Q/ $\square$ p diagram through the check valve for reverse free flow



9.3 Operating limits of by-pass solenoid valve



9.4 Q/\(\top\) diagram through the by-pass solenoid valve



**1** = DHQ-013, DHQ-014

2 = DHQ-011, DHQ-016, DHQ-023, DHQ-024

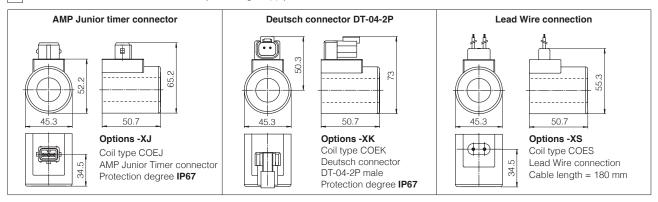
10 ELECTRIC CONNECTORS ACCORDING TO DIN 43650 (to be ordered separately, see tech table K500)

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 - Imax 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 🗵

## 12 INSTALLATION DIMENSIONS [mm]

