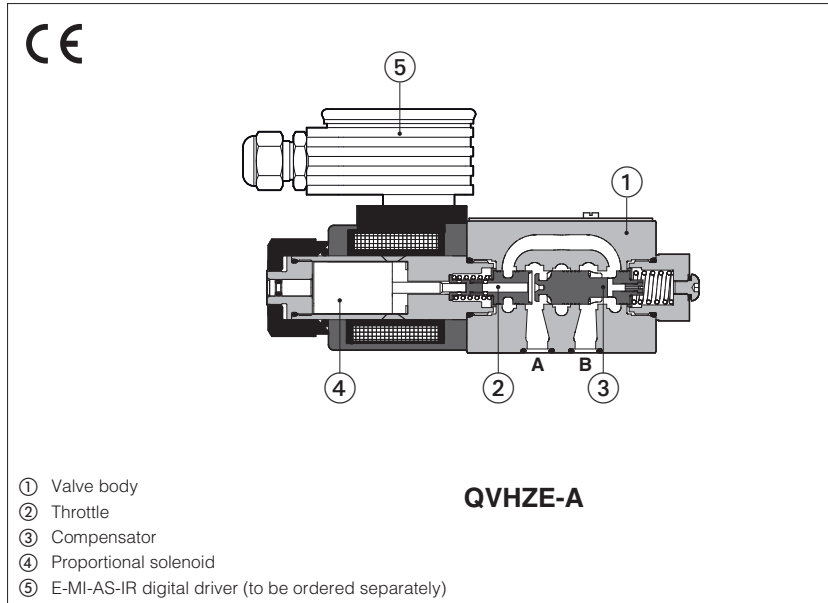


Proportional flow valves

direct, pressure compensated, without transducer



QVHZE-A, QVKZE-A

Proportional flow control valves, direct operated, pressure compensated, without position transducer, for load independent flow regulations.

They operate in association with off-board drivers, which supply the proportional valves with proper current to align the valve regulation to the reference signal supplied to the driver.

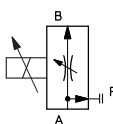
The solenoids are certified according to North American standard **cURus**.

QVHZE:	QVKZE:
Size: 06 - ISO 4401	Size: 10 - ISO 4401
Max flow: 45 l/min	Max flow: 90 l/min
Max pressure: 210 bar	Max pressure: 210 bar

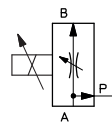
1 MODEL CODE

QVKZE	-	A	-	10	/	65	/	*	-	*	/	*	/	*	/	*											
<p>Pressure compensated flow control valves, direct QVHZE = size 06 QVKZE = size 10</p> <p>A = for off-board driver, see section 3</p> <p>Valve size ISO 4401: 06 = 06 10 = 10</p> <p>Max regulated flow:</p> <table border="0" style="width: 100%;"> <tr> <td>QVHZE</td> <td></td> <td>QVKZE:</td> </tr> <tr> <td>3 = 3,5 l/min</td> <td>36 = 35 l/min</td> <td>65 = 65 l/min</td> </tr> <tr> <td>12 = 12 l/min</td> <td>45 = 45 l/min</td> <td>90 = 90 l/min</td> </tr> <tr> <td>18 = 18 l/min</td> <td></td> <td></td> </tr> </table> <p>Hydraulic options - see section 11 : D = quick venting of port B</p> <p>Hand lever options, only for QVHZE - see section 12 : MO = horizontal hand lever MV = vertical hand lever</p> <p>Seals material, see section 8 : - = NBR PE = FKM BT = NBR low temp.</p> <p>Series number</p> <p>Coil voltage, see section 13 : - = standard coil for 24VDC Atos drivers 6 = optional coil for 12VDC Atos drivers 18 = optional coil for low current drivers</p> <p>Coil with special connectors, see section 14 : - = omit for standard DIN connector J = AMP Junior Timer connector K = Deutsch connector S = Lead Wire connection</p>																QVHZE		QVKZE:	3 = 3,5 l/min	36 = 35 l/min	65 = 65 l/min	12 = 12 l/min	45 = 45 l/min	90 = 90 l/min	18 = 18 l/min		
QVHZE		QVKZE:																									
3 = 3,5 l/min	36 = 35 l/min	65 = 65 l/min																									
12 = 12 l/min	45 = 45 l/min	90 = 90 l/min																									
18 = 18 l/min																											

2 HYDRAULIC SYMBOLS



2 way connection



3 way connection

The valves can be used in 2 or 3 way connection, depending to the application requirements.

In **2 way** the P port must not be connected (blocked)
In **3 way** the P port has to be connected to tank or to other user lines
The port T must be always not connected (blocked)

For application examples of 2 and 3 way connections, see section [10](#)

3 OFF-BOARD ELECTRONIC DRIVERS

Drivers model	E-MI-AC-01F		E-MI-AS-IR		E-BM-AS-PS		E-BM-AES
Type	Analog			Digital			
Voltage supply (VDC)	12	24	12	24	12	24	24
Valve coil option	/6	std	/6	std	/6	std	std
Format	plug-in to solenoid				DIN-rail panel		
Tech table	G010		G020		G030		GS050

4 GENERAL NOTES

Atos digital proportionals valves are CE marked according to the applicable directives (e.g. Immunity and Emission EMC Directive). Installation, wirings and start-up procedures must be performed according to the general prescriptions shown in tech table **FS900** and in the user manuals included in the E-SW-* programming software.

5 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 valves according to EN ISO 13849	150 years, see technical table P007
Ambient temperature range	Standard = -20°C ÷ +70°C /PE option = -20°C ÷ +70°C /BT option = -40°C ÷ +60°C
Storage temperature range	Standard = -20°C ÷ +80°C /PE option = -20°C ÷ +80°C /BT option = -40°C ÷ +70°C
Surface protection	Body: zinc coating with black passivation Coil: zinc nickel coating
Corrosion resistance	Salt spray test (EN ISO 9227) > 200 h
Compliance	CE according to EMC directive 2014/30/EU (Immunity: EN 61000-6-2; Emission: EN 61000-6-3) RoHS Directive 2011/65/EU as last update by 2015/863/EU REACH Regulation (EC) n°1907/2006

6 HYDRAULIC CHARACTERISTICS - based on mineral oil ISO VG 46 at 50 °C

Valve model	QVHZE					QVKZE	
	3	12	18	35	45	65	90
Max regulated flow [l/min]	3,5	12	18	35	45	65	90
Min regulated flow [cm³/min]	15	20	30	50	60	85	100
Max flow on port A [l/min]	40			50	55	70	100
Max pressure [bar]	210						
Response time 0-100% step signal [ms]	≤ 30					≤ 45	
Hysteresis	≤ 5 [% of the regulated max flow]						
Linearity	≤ 3 [% of the regulated max flow]						
Repeatability	± 1 [% of the regulated max flow]						

Note: above performance data refer to valves coupled with Atos electronic drivers, see section 3

7 ELECTRICAL CHARACTERISTICS

Valve model	QVHZE			QVKZE		
	standard	option /6	option /18	standard	option /6	option /18
Coil voltage code	standard	option /6	option /18	standard	option /6	option /18
Max. solenoid current	2,2 A	2,7 A	1,1 A	2,2 A	2,7 A	1,1 A
Coil resistance R at 20°C	3,1 Ω	2,1 Ω	13,1 Ω	3,2 Ω	2,1 Ω	13,7 Ω
Insulation class	H (180°) Due to the occurring surface temperatures of the solenoid coils, the European standards ISO 13732-1 and EN982 must be taken into account					
Protection degree to DIN EN60529	IP65 with mating connectors					
Duty factor	Continuous rating (ED=100%)					
Certification	cURus North American Standard					

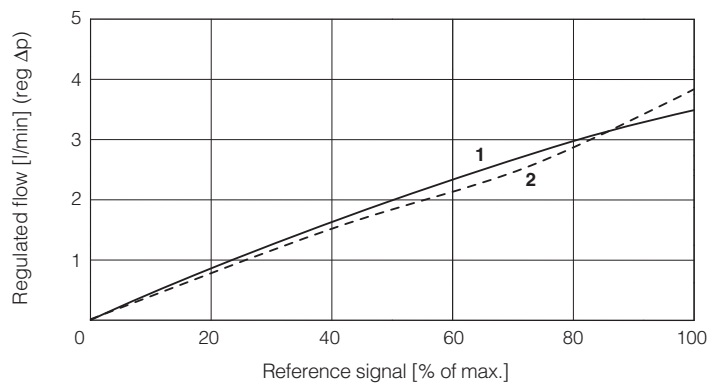
8 SEALS AND HYDRAULIC FLUIDS - for other fluids not included in below table, consult our technical office

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 NBR low temp (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C		
Recommended viscosity	20 ÷ 100 mm ² /s - max allowed range 15 ÷ 380 mm ² /s		
Max fluid contamination level	normal operation	ISO4406 class 18/16/13	NAS1638 class 7
	longer life	ISO4406 class 16/14/11	NAS1638 class 5
			see also filter section at www.atos.com or KTF catalog
Hydraulic fluid	Suitable seals type	Classification	Ref. Standard
Mineral oils	NBR, FKM, NBR low temp.	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR, NBR low temp.	HFC	

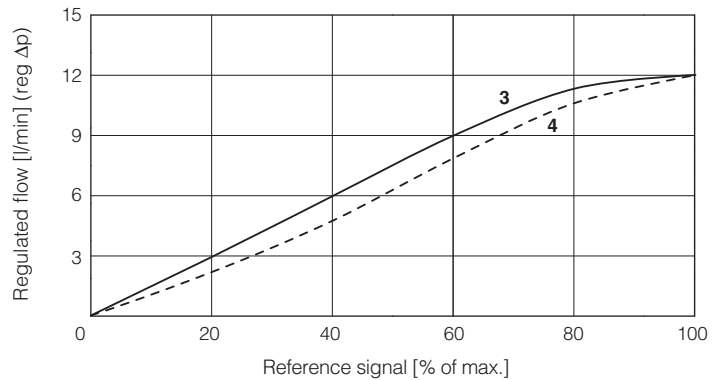
9 DIAGRAMS - based on mineral oil ISO VG 46 at 50 °C

9.1 Regulation diagrams

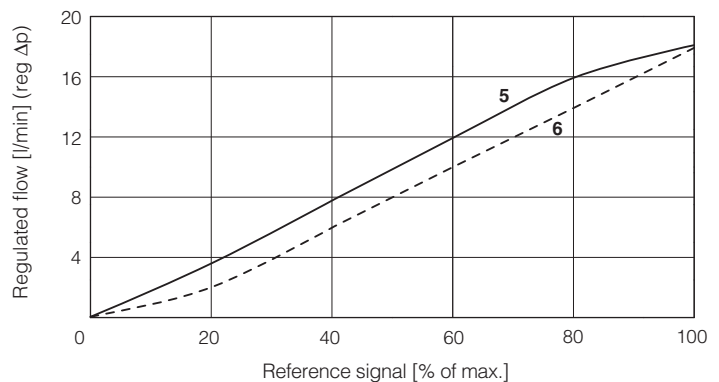
- 1 = QVHZE-*-06/3 2 way
- 2 = QVHZE-*-06/3 3 way



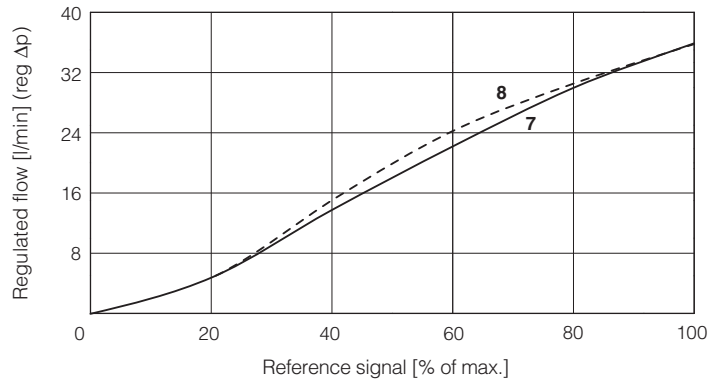
- 3 = QVHZE-*-06/12 2 way
- 4 = QVHZE-*-06/12 3 way



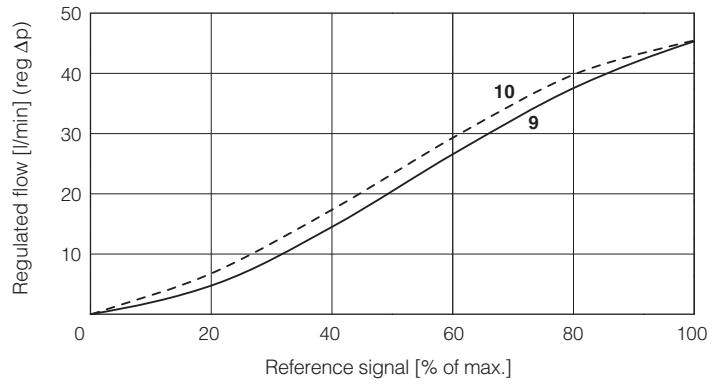
- 5 = QVHZE-*-06/18 2 way
- 6 = QVHZE-*-06/18 3 way



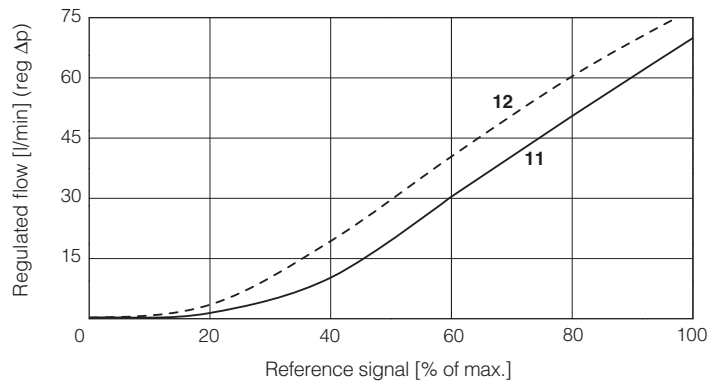
7 = QVHZE-*-06/36 2 way
8 = QVHZE-*-06/36 3 way



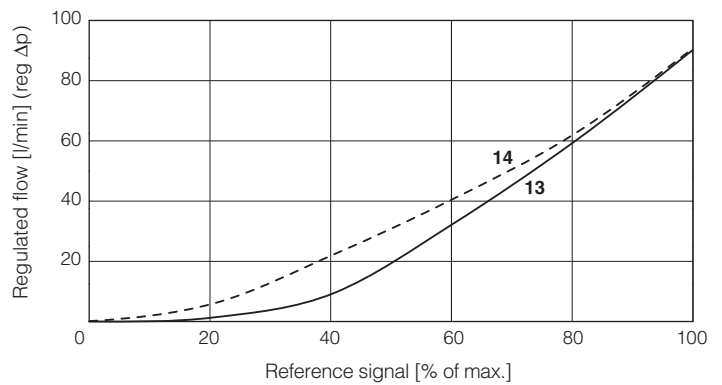
9 = QVHZE-*-06/45 2 way
10 = QVHZE-*-06/45 3 way



11 = QVKZE-*-10/65 2 way
12 = QVKZE-*-10/65 3 way



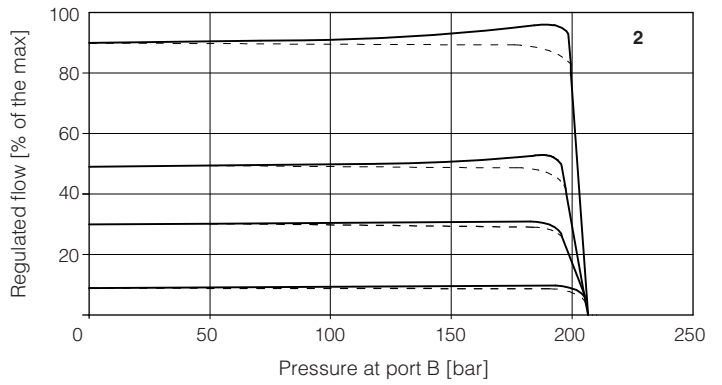
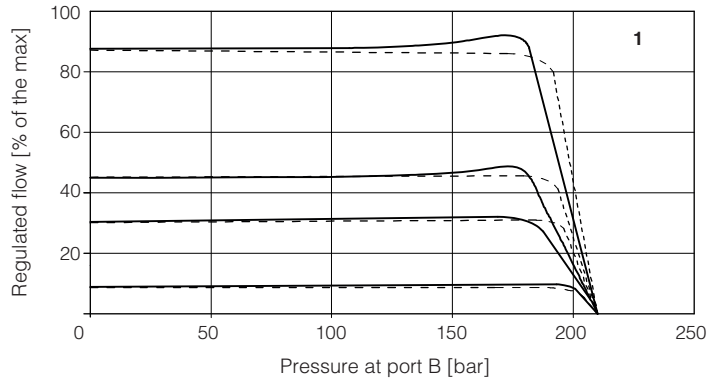
13 = QVKZE-*-10/90 2 way
14 = QVKZE-*-10/90 3 way



9.2 Regulated flow/outlet pressure diagrams
with inlet pressure = 210 bar

- 1 = QVHZE
- 2 = QVKZE

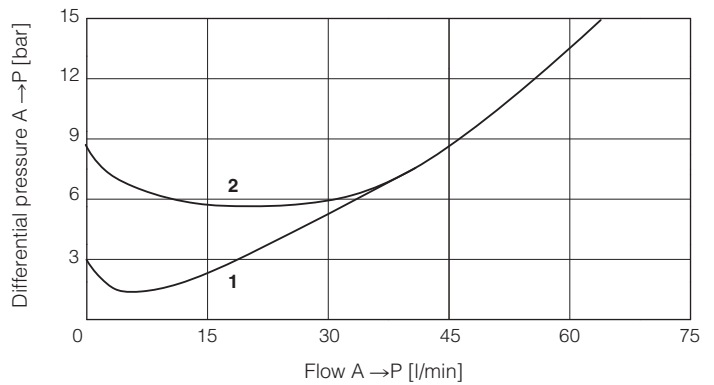
Dotted line for 3-way versions



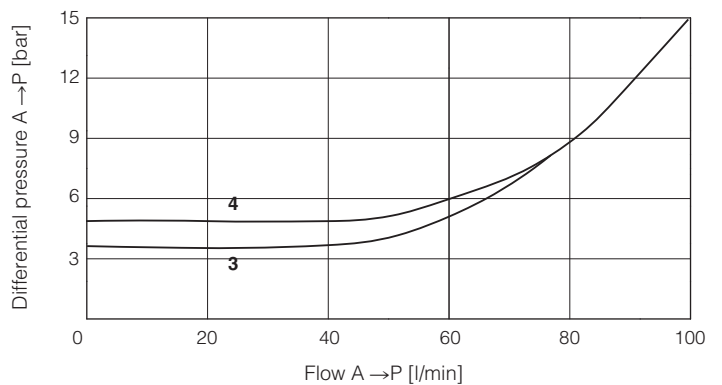
9.3 Flow A →P/Δp diagrams
3-way configuration

Values in above diagrams are measured without pressure on port B.
If port B is pressurized, the values in the diagrams must be increased by the same value

- 1 = QVHZE-A-06/3
QVHZE-A-06/12
QVHZE-A-06/18
- 2 = QVHZE-A-06/36
QVHZE-A-06/45



- 3 = QVKZE-A-10/65
- 4 = QVKZE-A-10/90



10 APPLICATIONS AND CONNECTIONS

compensated flow

2 way connection

compensated flow

exceeding flow

3 way connection

compensated flow primary circuit (priority)

not compensated flow (secondary line)

priority connection

2 way connection
The 2 way connection is normally used to control the flow in one part of the hydraulic circuit or to regulate the speed of a specific actuator. The metered flow in the controlled line is kept constant, independently to the load variations. If the valve is directly installed on the pump main line, the exceeding flow is returned to tank through the pressure relief valve.

3 way connection
The 3 way connection is normally used when the valve directly controls the pump flow (main line). The metered flow in the controlled line is kept constant, independently to the load variations. The exceeding flow (not metered by the valve) it is returned to tank trough the valve P port = T line (3rd way).

Priority connection
The priority connection guarantees the pressure compensated flow supply to the primary circuit (B port). The exceeding flow (not required by the primary circuit) is bypassed through the valve P port, to secondary circuit operating at lower pressure and not requiring compensated flow regulations.

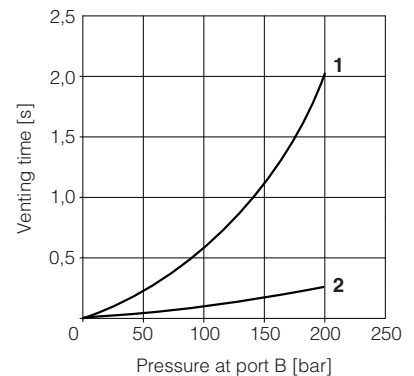
11 HYDRAULIC OPTIONS

D = This option provides a quick venting of the use port B when the valve is closed or de-energized.

The valve must be connected in 3 way, with P port connected to tank. When the proportional throttle is fully closed, the valve's port B is internally connected to port P (tank), permitting a quickly decompression of the pressure in the use line.

In the diagram aside are represented the venting times of **QVHZE** and **QVKZE** with option /D respect to standard versions:

1 = standard version **2** = option /D



12 HAND LEVER OPTION - only for QVHZE

It allows to operate the valve in absence of electrical power supply.

MO = Horizontal hand lever **MV** = Vertical hand lever

13 COIL VOLTAGE OPTIONS

6 = Optional coil to be used with Atos drivers with power supply 12 VDC.

18 = Optional coil to be used with electronic drivers not supplied by Atos.

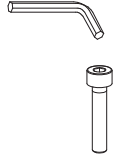

14 COILS WITH SPECIAL CONNECTORS

J option	K option	S option
Coil type COZEJ (QVHZE) Coil type CAZEJ (QVKZE) AMP Junior Timer connector Protection degree IP67	Coil type COZEK (QVHZE) Coil type CAZEK (QVKZE) Deutsch connector, DT-04-2P male Protection degree IP67	Coil type COZES (QVHZE) Coil type CAZES (QVKZE) Lead Wire connection Cable lenght = 180 mm

15 SOLENOID CONNECTION

PIN	SIGNAL	TECHNICAL SPECIFICATION	Connector code 666
1	COIL	Power supply	
2	COIL	Power supply	
3	GND	Ground	

16 FASTENING BOLTS AND SEALS

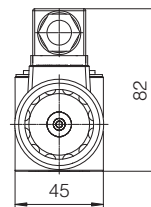
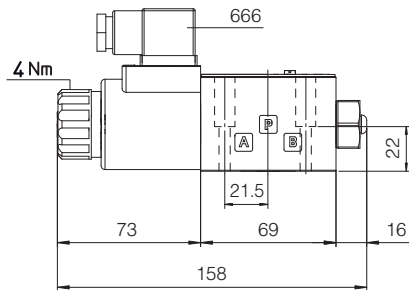
	<p>QVHZE</p> <p>Fastening bolts: 4 socket head screws M5x30 class 12.9 Tightening torque = 8 Nm</p>	<p>QVKZE</p> <p>Fastening bolts: 4 socket head screws M6x40 class 12.9 Tightening torque = 15 Nm</p>
	<p>Seals: 4 OR 108 Diameter of ports A, B, P, T: Ø 7,5 mm</p>	<p>Seals: 5 OR 2050 Diameter of ports A, B, P, T: Ø 11,2 mm</p>

17 INSTALLATION DIMENSIONS FOR QVHZE [mm]

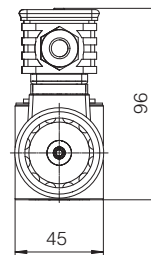
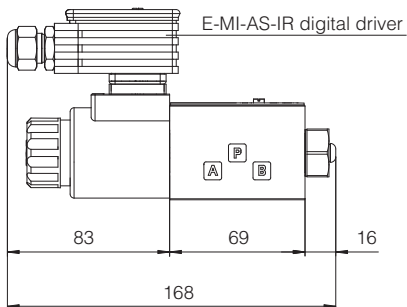
ISO 4401: 2005
Mounting surface: 4401-03-02-0-05 (see tab. P005)

Mass [kg]	
QVHZE	1,8
QVHZE + E-MI-AS-IR	2,3
Option /MV, /MO	+0,6

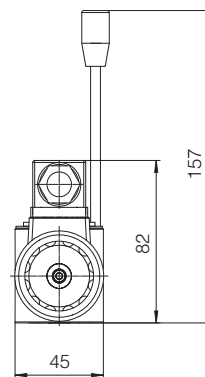
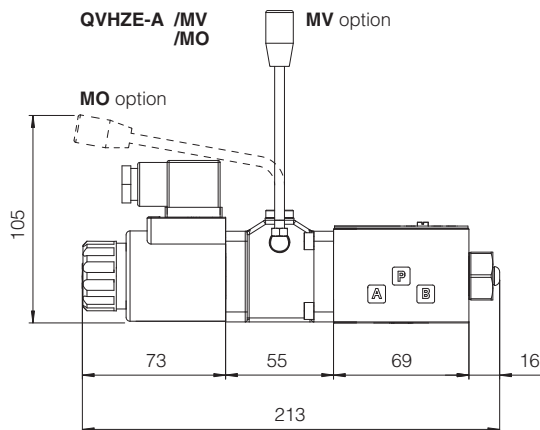
QVHZE-A



QVHZE-A with E-MI-AS-IR digital driver



QVHZE-A /MV /MO



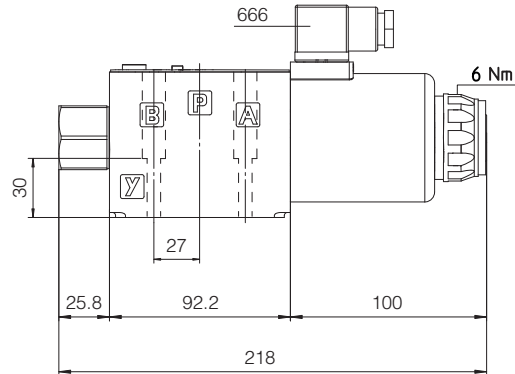
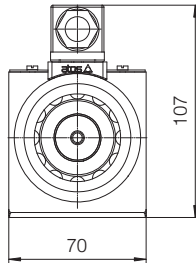
18 INSTALLATION DIMENSIONS FOR QVKZE [mm]

ISO 4401: 2005

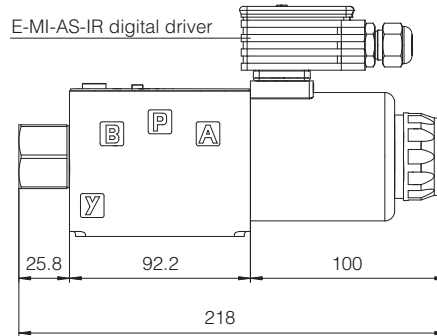
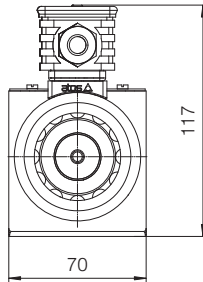
Mounting surface: 4401-05-04-0-05 (see tab. P005)

Mass [kg]	
QVKZE	4,8
QVKZE + E-MI-AS-IR	5,3

QVKZE-A



QVKZE-A with E-MI-AS-IR



19 RELATED DOCUMENTATION

FS001	Basics for digital electrohydraulics	GS050	E-BM-AES digital driver
FS900	Operating and maintenance information for proportional valves	GS500	Programming tools
G010	E-MI-AC analog driver	GS510	Fieldbus
G020	E-MI-AS-IR digital driver	K800	Electric and electronic connectors
G030	E-BM-AS digital driver	P005	Mounting surfaces for electrohydraulic valves