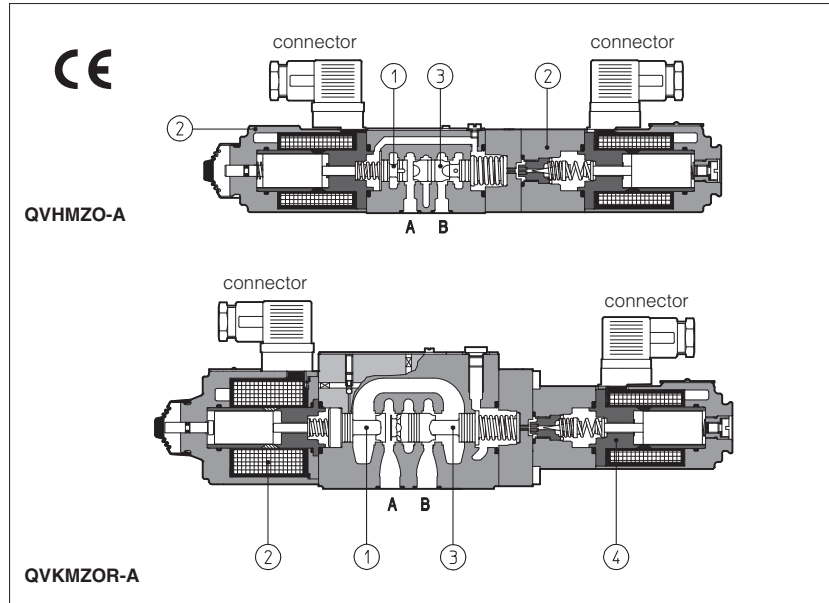


# Proportional pressure and flow control type QVHMZO, QVKMZOR

independent pressure and 3-way compensated flow regulation, ISO 4401 size 06 and 10

**Available only on request**



QVHMZO and QVKMZOR are proportional valves, direct operated, which provide independent pressure and 3-way compensated flow controls according to the electronic reference signals.

They operate in association with electronic drivers, see section 8 which supply the proportional valves with correct current signal to align valve regulation to the reference signal supplied to the electronic driver.

The flow is controlled by a throttle ①, directly operated by the proportional solenoid ②. The mechanical pressure compensator ③ keeps a constant  $\Delta p$  across the throttle ①, thus the regulated flow is independent to the load conditions.

The exceeding flow is returned to tank through the port P.

The pressure is controlled by the compensator ③, piloted by the proportional pressure relief valve ④.

The coils are fully plastic encapsulated (insulation class H) and valves have anti-vibration, antishock and weather-proof features.

Surface mounting: **ISO 4401, size 06 and 10.**  
Max flow respectively up to **45 l/min** and **90 l/min**

Max pressure = **210 bar**

## 1 MODEL CODE

|                                                                                                                                                                                                                         |   |          |   |           |   |           |   |            |   |          |           |   |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------|---|-----------|---|-----------|---|------------|---|----------|-----------|---|----------|
| <b>QVKMZOR</b>                                                                                                                                                                                                          | - | <b>A</b> | - | <b>10</b> | / | <b>65</b> | / | <b>210</b> | / | <b>*</b> | <b>**</b> | / | <b>*</b> |
| Pressure compensated flow control valves<br><b>QVHMZO</b> = size 06<br><b>QVKMZOR</b> = size 10                                                                                                                         |   |          |   |           |   |           |   |            |   |          |           |   |          |
| <b>A</b> = without position transducer                                                                                                                                                                                  |   |          |   |           |   |           |   |            |   |          |           |   |          |
| Valve size, see section 2<br><b>06</b> = ISO 4401, size 06<br><b>10</b> = ISO 4401, size 10                                                                                                                             |   |          |   |           |   |           |   |            |   |          |           |   |          |
| Max regulated flow: for <b>QVHMZO</b> :<br><b>30</b> = 35 l/min<br><b>40</b> = 45 l/min                                                                                                                                 |   |          |   |           |   |           |   |            |   |          |           |   |          |
| for <b>QVKMZOR</b> :<br><b>65</b> = 65 l/min<br><b>90</b> = 90 l/min                                                                                                                                                    |   |          |   |           |   |           |   |            |   |          |           |   |          |
| max pressure:<br><b>210</b> = 210 bar                                                                                                                                                                                   |   |          |   |           |   |           |   |            |   |          |           |   |          |
| Seals material<br>- = NBR<br><b>PE</b> = FKM                                                                                                                                                                            |   |          |   |           |   |           |   |            |   |          |           |   |          |
| Series number                                                                                                                                                                                                           |   |          |   |           |   |           |   |            |   |          |           |   |          |
| <b>Coil voltage (only for -A execution)</b><br>- = standard coil for 24V <sub>DC</sub> Atos drivers<br><b>6</b> = optional coil for 12V <sub>DC</sub> Atos drivers<br><b>18</b> = optional coil for low current drivers |   |          |   |           |   |           |   |            |   |          |           |   |          |

## 2 HYDRAULIC CHARACTERISTICS (based on mineral oil ISO VG 46 at 50 °C)

|                                                |                    |    |                     |         |
|------------------------------------------------|--------------------|----|---------------------|---------|
| Hydraulic symbols                              |                    |    |                     |         |
| <b>Note:</b><br>Port T must always be plugged. |                    |    |                     |         |
| Valve model                                    | <b>QVHMZO-A-06</b> |    | <b>QVKMZOR-A-10</b> |         |
| Max regulated flow [l/min]                     | 35                 | 45 | 65                  | 90      |
| Min regulated flow [cm³/min]                   | 50                 | 60 | 85                  | 100     |
| Regulating $\Delta p$ [bar]                    | 10-12              | 15 | 6 - 8               | 10 - 12 |
| Max flow on port A [l/min]                     | 50                 | 55 | 70                  | 100     |
| Max regulating pressure [bar]                  | 210                |    |                     |         |
| Response time 0÷100% step signal (1) [ms]      | 30                 |    | 45                  |         |
| Hysteresis [% of the regulated max flow]       | ≤ 5                |    | ≤ 5                 |         |
| Linearity [% of the regulated max flow]        | ≤ 3                |    | ≤ 3                 |         |
| Repeatability [% of the regulated max flow]    | ≤ 1                |    | ≤ 1                 |         |

Above performance data refer to valves coupled with Atos electronic drivers, see sections 8.

(1) Response times at step signal (0%÷100%) are measured from 10% to 90% of step value and are strictly referred to the valve regulation.

### 3 MAIN CHARACTERISTICS OF PROPORTIONAL PRESSURE AND FLOW VALVES TYPE QVHMZO-A AND QVKMZOR-A

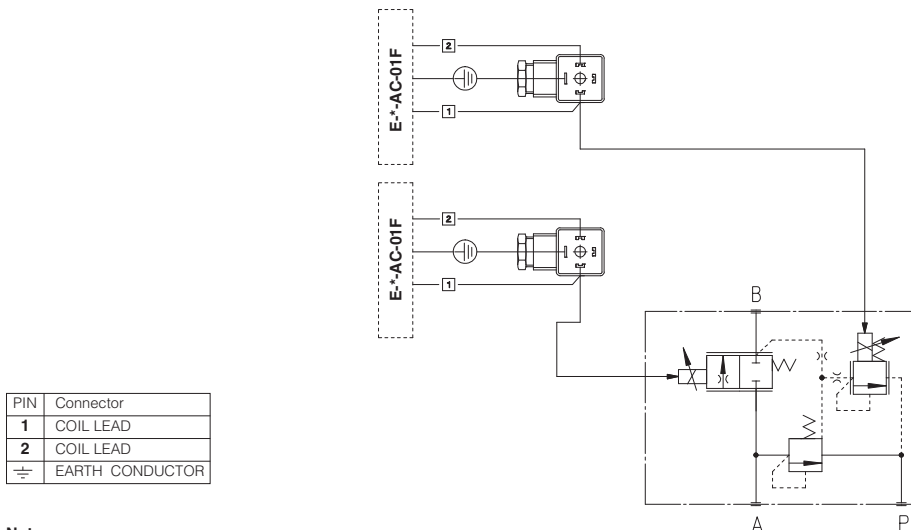
|                            |                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------|
| Assembly position          | Any position                                                                                          |
| Subplate surface finishing | Roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101)                                           |
| Ambient temperature        | -20°C ÷ +70°C for -A execution                                                                        |
| Fluid                      | Hydraulic oil as per DIN 51524 ... 535 for other fluids see section 1                                 |
| Recommended viscosity      | 15 ÷ 100 mm²/s at 40°C (ISO VG 15÷100)                                                                |
| Fluid contamination class  | ISO 4406 class 20/18/15 NAS 1638 class 9, in line filters of 10 µm (β <sub>10</sub> ≥ 75 recommended) |
| Fluid temperature          | -20°C +60°C (standard seals)    -20°C +80°C (/PE seals)                                               |

#### 3.1 Coils characteristics

| Valve model                      |          | QVHMZO-A                    |           |             | QVKMZOR-A   |             |             |
|----------------------------------|----------|-----------------------------|-----------|-------------|-------------|-------------|-------------|
|                                  |          | Standard                    | option /6 | option /18  | Standard    | option /6   | option /18  |
| Coil resistance R at 20°C        | pressure | 3 ÷ 3,3 Ω                   | 2 ÷ 2,2 Ω | 13 ÷ 13,4 Ω | 3 ÷ 3,3 Ω   | 2 ÷ 2,2 Ω   | 13 ÷ 13,4 Ω |
| Max. solenoid current            | pressure | 2,6 A                       | 3,25 A    | 1,5 A       | 2,6 A       | 3,25 A      | 1,5 A       |
| Coil resistance R at 20°C        | flow     | 3 ÷ 3,3 Ω                   | 2 ÷ 2,2 Ω | 13 ÷ 13,4 Ω | 3,8 ÷ 4,1 Ω | 2,2 ÷ 2,4 Ω | 12 ÷ 12,5 Ω |
| Max. solenoid current            | flow     | 2,2 A                       | 2,75 A    | 1,2 A       | 2,6 A       | 3,25 A      | 1,2 A       |
| Max. power                       |          | 30 Watt                     |           |             | 35 Watt     |             |             |
| Protection degree (CEI EN-60529) |          | IP65                        |           |             |             |             |             |
| Duty factor                      |          | Continuous rating (ED=100%) |           |             |             |             |             |

### 4 ELECTRIC WIRING

Electric wiring to reference generators must be made using shielded cables: the sheat must be connected to the power supply zero **on the generator side**. The power supply must be properly stabilized or rectified and filtered. For complete electric wiring with all available options, see section G

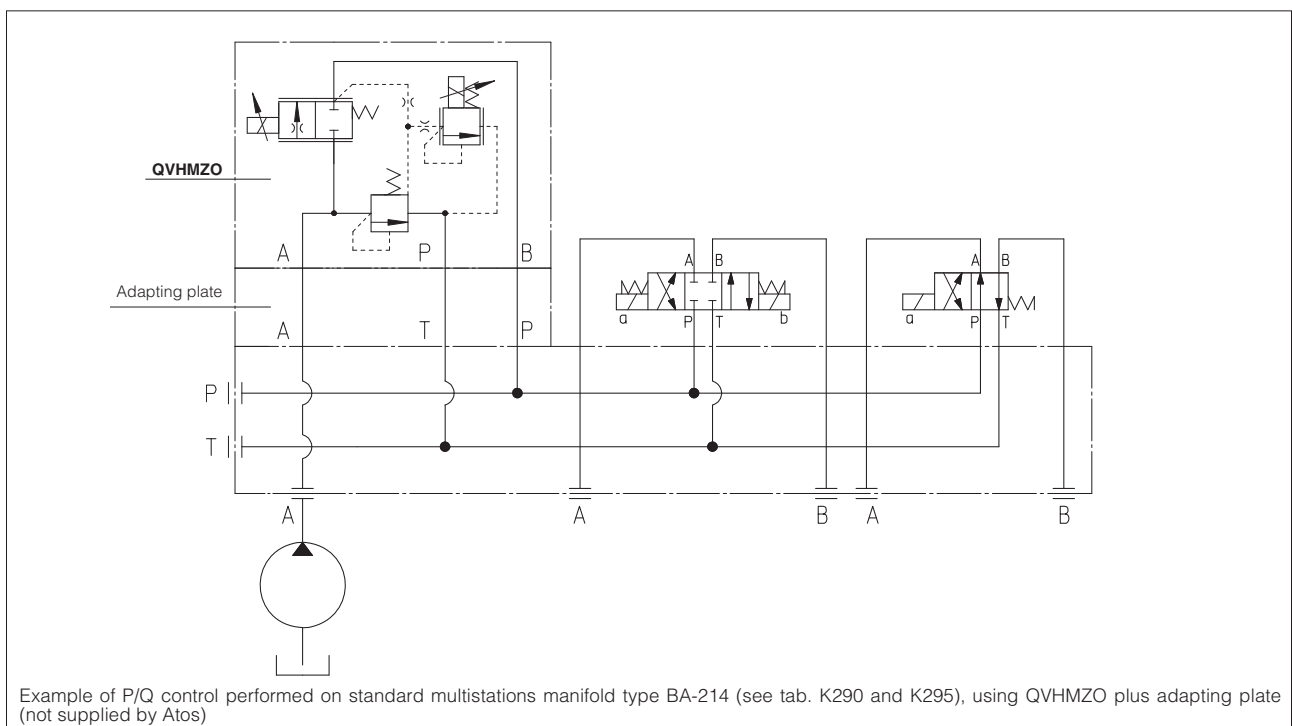


#### Note:

In case the A inlet flow is < 18 l/min for QVHMZO and < 25 l/min for QVKMZOR, a check valve with cracking pressure 2 bar is suggested in P port to improve the valve stability.

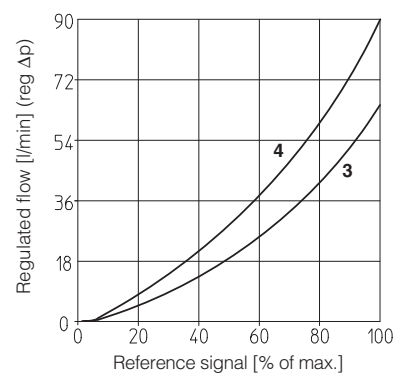
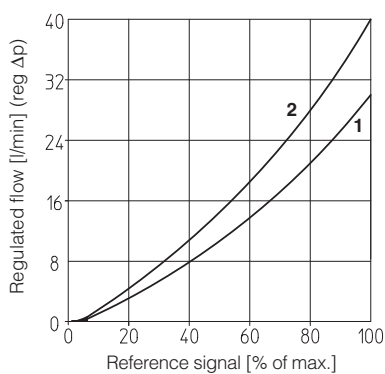
**Note:**  
basic information for commissioning and start-up are present on installation notes always enclosed to the specific technical tables and relevant components.

### 5 TYPICAL APPLICATION SKETCH



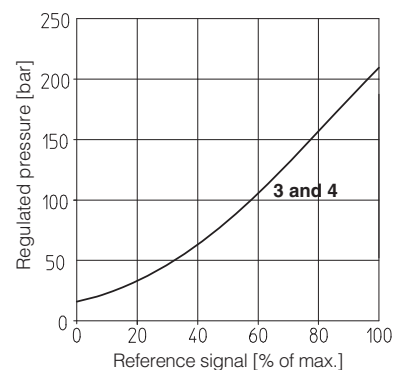
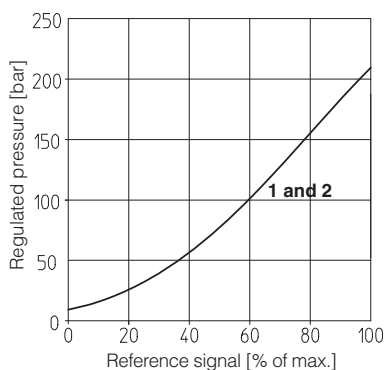
### 6.1 Flow regulation diagrams

- 1 = QVHMZO-A-06/30  
 2 = QVHMZO-A-06/40  
 3 = QVKMZOR-A-10/65  
 4 = QVKMZOR-A-10/90



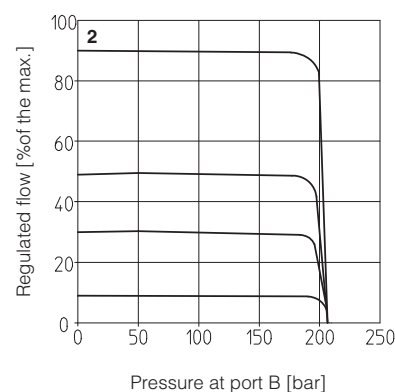
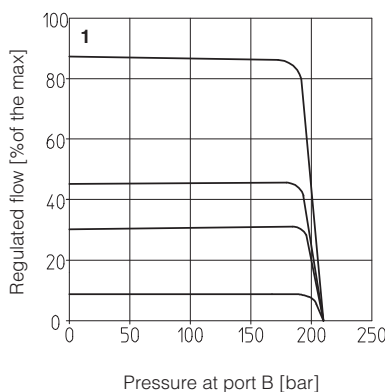
### 6.2 Pressure regulation diagrams

- 1 = QVHMZO-A-06/30  
 2 = QVHMZO-A-06/40  
 3 = QVKMZOR-A-10/65  
 4 = QVKMZOR-A-10/90



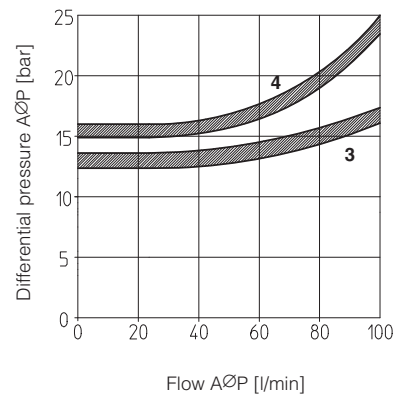
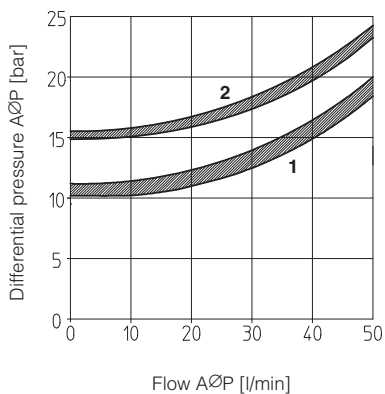
### 6.3 Regulated flow/outlet pressure diagrams with inlet pressure = 210 bar

- 1 = QVHMZO-A  
 2 = QVKMZOR-A



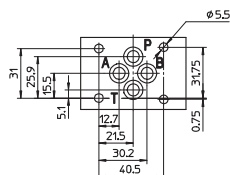
### 6.4 Flow A $\emptyset$ P/ $\Delta$ p diagrams 3-way configuration

- 1 = QVHMZO-A-06/30  
 2 = QVHMZO-A-06/40  
 3 = QVKMZOR-A-10/65  
 4 = QVKMZOR-A-10/90



## 7 INSTALLATION DIMENSIONS [mm]

### QVHMZO



**A** = INLET PORT  
**B** = OUTLET PORT  
**P** = DISCHARGE PORT  
**T** = NOT USED  
 (it must be plugged)

**ISO 4401: 2005**

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

Fastening bolts:

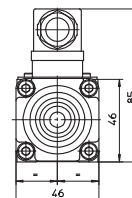
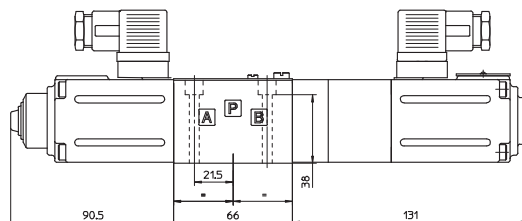
4 socket head screws M5x50 class 12.9

Tightening torque = 8 Nm

Seals: 4 OR 108;

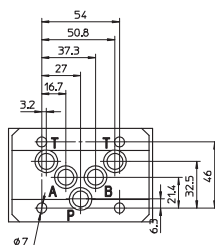
Diameter of ports A, B, P, T:

Ø 7,5 mm (max)



Mass: 2,8 kg

### QVKMZOR



**A** = INLET PORT  
**B** = OUTLET PORT  
**P** = DISCHARGE PORT  
**T** = NOT USED  
 (it must be plugged)

**ISO 4401: 2005**

**Mounting surface: 4401-05-04-0-05**

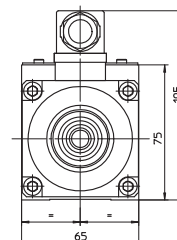
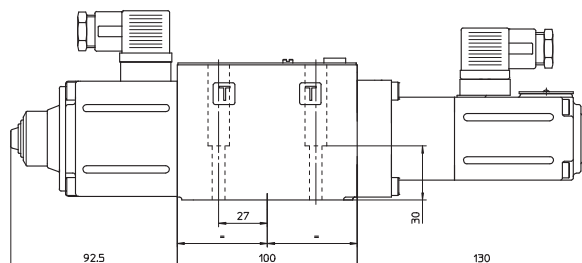
Fastening bolts:

4 socket head screws M6x40 class 12.9

Tightening torque = 15 Nm

Seals: 5 OR 2050;

Diameter of ports A, B, P, T: Ø 11,2 mm (max)



Mass: 4,3 kg

## 8 ELECTRONIC DRIVERS FOR QVHMZO-A AND QVKMZOR-A

| Valve model   | -A          |            |              |         |             |             |
|---------------|-------------|------------|--------------|---------|-------------|-------------|
| Drivers model | E-MI-AC-01F | E-MI-AS-IR | E-BM-AC-011F | E-BM-AS | E-ME-AC-01F | E-RP-AC-01F |
| Data sheet    | G010        | G020       | G025         | G030    | G035        | G100        |

For complete information about the drivers characteristics and relevant options, see the technical data sheet specified in the table.

## 9 MOUNTING PLATES

| Size | Model      | Ports location                                     | Gas ports<br>A, B, P, T | Ø Counterbore<br>A, B, P, T | Mass<br>[kg] |
|------|------------|----------------------------------------------------|-------------------------|-----------------------------|--------------|
| 06   | BA-202     | Ports A, B, P, T underneath;                       | 3/8"                    | —                           | 1,2          |
|      | BA-204     | Ports P, T underneath; ports A, B on lateral side  | 3/8"                    | 25,5                        | 1,8          |
|      | BA-302     | Ports A, B, P, T (X, Y) underneath;                | 1/2" (1/8")             | 30 (16,5)                   | 1,8          |
| 10   | BA-308     | Ports A, B, P, T underneath;                       | 1/2"                    | 30                          | 2,5          |
|      | BA-428     | Ports A, B, P, T underneath;                       | 3/4"                    | 36,5                        | 5,5          |
|      | BA-434 (Y) | Ports P, T (X, Y) underneath; A, B on lateral side | 3/4" (1/4")             | 36,5 (21,5)                 | 8,5          |