# QUICKSTART BASIC

QB100-6 - 04/22

**for digital proportionals without transducer - analog reference signal**

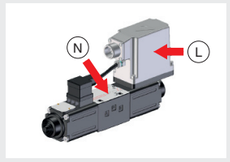
## DIRECT OPERATED PROPORTIONAL DIRECTIONAL AND FLOW VALVES

**Valve model:**
DHZO-AEB QVHZO-AEB
DKZOR-AEB QVKZOR-AEB

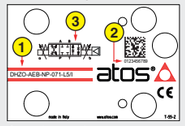
**Driver model:**
E-RI-AEB

## IDENTIFICATION

Valve identification plates and label

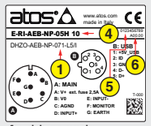



Valve name plate : **N**




**1** : valve code
**2** : valve matrix code
**3** : hydraulic symbol

Driver label : **L**




**4** : driver code
**5** : driver serial number
**6** : factory firmware version

## INSTALLATION TOOLS ACCORDING TO VALVE MODEL- not included

| Fastening bolts | Wrenches | Main connectors | | Transducer cable |
|---|---|---|---|---|
| | | **std, /Q** | **/Z, /W** | **/W** |
| socket head screws | for fastening bolts and air bleeding | 7 pin - metallic | 12 pin - metallic | 5 pin - plastic |
| see STEP 1 and STEP 3 | | see STEP 2.1 | | see STEP 2.2 |

## PROGRAMMING TOOLS - not included

| Software | USB connection KIT | | OR | Bluetooth connection KIT | |
|---|---|---|---|---|---|
| | Cable | Isolator | | Cable | Adapter |
| **E-SW-BASIC** free basic software download from **MyAtos** at **www.atos.com** | **E-C-SB-USB/M12** | **E-A-SB-USB/OPT** | | **E-C-SB-M12/BTH** | **E-A-SB-USB/BTH** |

## PROGRAMMING SOFTWARE

The software is available in different versions according to the driver's options:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **E-SW-BASIC** | supports | **NP** (USB) | **IL** (IO-Link) | **PS** (Serial) | **IR** (Infrared) |
| **E-SW-FIELDBUS** | supports | **BC** (CANopen) **EW** (POWERLINK) | **BP** (PROFIBUS DP) **EI** (EtherNet/IP) | **EH** (EtherCAT) **EP** (PROFINET RT/IRT) | |
| **E-SW-*/PQ** | supports | valves with **SP**, **SF**, **SL** alternated P/Q control | | | |

E-SW-FIELDBUS supports also valves without fieldbus communication; E-SW-*/PQ supports also valves without P/Q control

**REMARK** Atos software is designed for Windows based operative systems - Windows XP SP3 or later

## DOWNLOAD AREA


Download area
electronics

Perform the registration at **www.atos.com/en-it/login** by filling the form. In MyAtos area, perform login with personal username and password and then press the **Download area electronics** button

Free version of E-SW-BASIC can be downloaded and used by the "FREE Activation Code"

The software remains active for 10 days from the installation date and then it stops until the user inputs the Activation Code

## RELATED DOCUMENTATION - www.atos.com - section Catalog on-line

| | | | |
|---|---|---|---|
| **FS900** | Operating and maintenance information - tech. table | **STARTUP E-SW-BASIC** | Software startup guide |
| **FS160** | DHZO, DKZOR positive spool overlap - tech. table | **STARTUP BLUETOOTH** | Bluetooth adpter startup guide |
| **FS410** | QVHZO, QVKZOR flow controls - tech. table | **E-MAN-RI-AEB** | AEB - driver operating manual |
| **P005** | Mounting surface - tech. table | | |
| **GS500** | Programming tools - tech. table | | |
| **K800** | Electric and electronic connectors - tech. table | | |

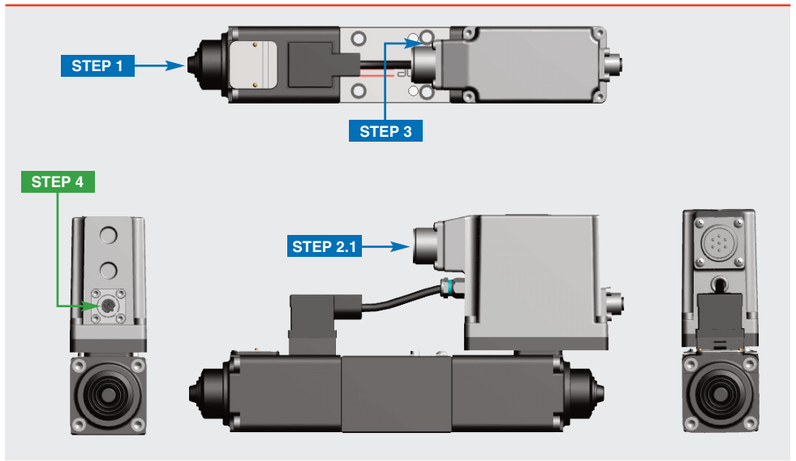
## ATTENTION !

The purpose of this quickstart guide is show a logical sequence of basic operations. This guide does not cover all details or variants of Atos valves. All operations described in this document should be performed only by qualified personnel.
Operations and images could be subject to change without notice. For further information please refer to related documentation.

## CONTACT US

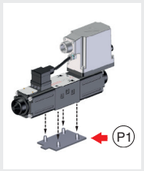

Atos spa - Italy - 21018 Sesto Calende www.atos.com support@atos.com


## PRODUCTS OVERVIEW




| INSTALLATION | | | PROGRAMMING |
|---|---|---|---|
| STEP 1 | STEP 2 | STEP 3 | STEP 4 |
| MECHANICAL | ELECTRICAL | HYDRAULICS | SOFTWARE |

## STEP 1 MECHANICAL

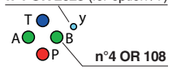



**In case of first commissioning, before the valve installation the whole system must be correctly flushed to grant the required cleanliness level**
During the flushing operation use on-off or by-pass valves in place of the proportional valve

- remove protection pad **P1** located on the valve bottom face only immediately before installation (do not remove connectors caps)
- check the presence and correct positioning of the seals on valve ports
- verify that valve mounting surface is clean and free from damages or burrs
- verify the correct valve orientation according to the pattern of the relevant mounting interface
- lock the fastening bolts respecting below sequence and tightening torque according to valve model

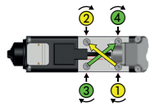
### DHZO-AEB

Mounting surface layout
**4401-03-02-0-05**
**4401-03-03-0-05** (for /Y without X port)
Valve size ISO 4401: **06**



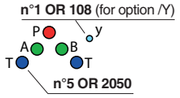

Fastening bolts socket head screws
**n°4 M5x50 class:12.9**
wrench **4 mm**

Tightening torque: **8 Nm**



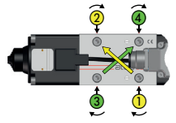
### DKZOR-AEB

Mounting surface layout
**4401-05-04-0-05**
**4401-05-05-0-05** (for /Y without X port)
Valve size ISO 4401: **10**




Fastening bolts socket head screws
**n°4 M6x40 class:12.9**
wrench **5 mm**

Tightening torque: **15 Nm**

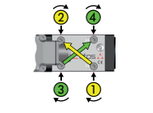


### QVHZO-AEB

Mounting surface layout
**4401-03-02-0-05**
Valve size ISO 4401: **06**


Fastening bolts socket head screws
**n°4 M5x50 class:12.9**
wrench **4 mm**

Tightening torque: **8 Nm**

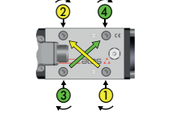


### QVKZOR-AEB

Mounting surface layout
**4401-05-04-0-05**
Valve size ISO 4401: **10**


Fastening bolts socket head screws
**n°4 M6x40 class:12.9**
wrench **5 mm**

Tightening torque: **15 Nm**

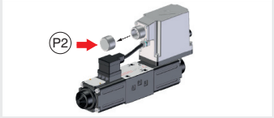


## STEP 2 ELECTRICAL

This section considers the different valves options, illustrating the multiple variants of the available electrical connections.
The electrical connections have to be wired according to the selected valve code

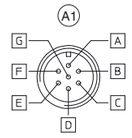
### 2.1 MAIN CONNECTOR

**1** Remove main connector cap **P2**

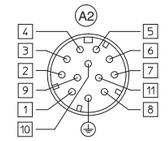



**WARNING:** remove power supply before any electrical or wiring operations

**2** Select main connector according to valve code and proceed with wirings operations




Recommended LiYCY shielded cables:
7 x 0,75 mm² max 20 m
7 x 1 mm² max 40 m




Recommended LiYCY shielded cable:
12 x 0,75 mm² max 20 m

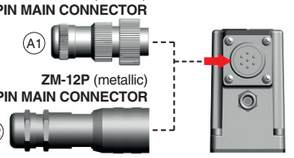
| Standard | | |
|---|---|---|
| A | **V+** | (power supply 24Vdc) |
| B | **V0** | (power supply 0Vdc) |
| C | **AGND** | |
| D | **INPUT+** | (±10Vdc / 4 ÷ 20mA) |
| E | **INPUT-** | |
| F | **MONITOR** | (±5Vdc 1V=1A) |
| G | **EARTH** | |

| /Q option | | |
|---|---|---|
| A | **V+** | (power supply 24Vdc) |
| B | **V0** | (power supply 0Vdc) |
| C | **ENABLE** | (input 24Vdc) |
| D | **INPUT+** | (±10Vdc / 4 ÷ 20mA) |
| E | **INPUT-** | |
| F | **MONITOR** | (±5Vdc 1V=1A) |
| G | **EARTH** | |

| /Z and /W options | | |
|---|---|---|
| 1 | **V+** | (power supply 24Vdc) |
| 2 | **V0** | (power supply 0Vdc) |
| 3 | **ENABLE** | (input 24Vdc) |
| 4 | **INPUT+** | (±10Vdc / 4 ÷ 20mA) |
| 5 | **INPUT-** | |
| 6 | **MONITOR** | (±5Vdc 1V=1A) |
| 7 | **NC** | |
| 8 | **NC** for **/Z** option<br>**MONITOR2** (0 ÷ 5Vdc) for **/W** option | |
| 9 | **VL+** | (logic power supply 24Vdc) |
| 10 | **VL0** | (logic power supply 0Vdc) |
| 11 | **FAULT** | (output 24Vdc) |
| PE | **EARTH** | |

**3** Connect the valve to the system

**ZM-7P** (metallic)
**7 PIN MAIN CONNECTOR**



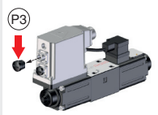

**ZM-12P** (metallic)
**12 PIN MAIN CONNECTOR**

**NOTE:** the use of above metallic connectors is strongly recommended in order to fulfill EMC requirements

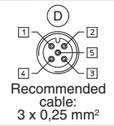
**WARNING:** a safety fuse is required in series to driver power supply - 2,5 A time lag fuse

### 2.2 PRESSURE TRANSDUCER CONNECTOR - only for /W option

**1** Remove transducer connector cap **P3**



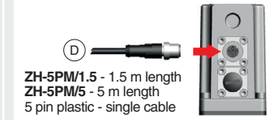

**2** Proceed with wirings operations




Recommended cable:
3 x 0,25 mm²

| /W option | | |
|---|---|---|
| 1 | **VF+ 24V** | (power supply 24Vdc) |
| 2 | **TR** | (0 ÷ 10Vdc / 4 ÷ 20mA) |
| 3 | **AGND** | |
| 4 | **NC** | |
| 5 | **NC** | |

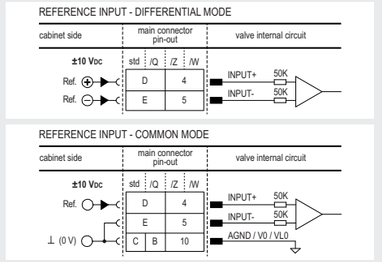
**3** Connect the valve to the transducer



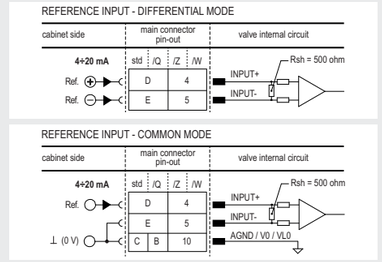

**ZH-5PM/1.5** - 1.5 m length
**ZH-5PM/5** - 5 m length
5 pin plastic - single cable

## ELECTRICAL WIRING EXAMPLES

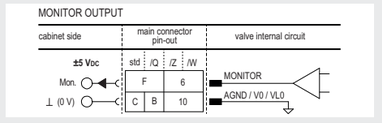
### MAIN CONNECTOR - VOLTAGE

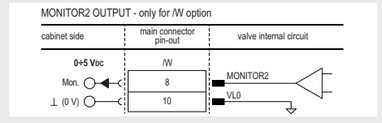



### MAIN CONNECTOR - CURRENT

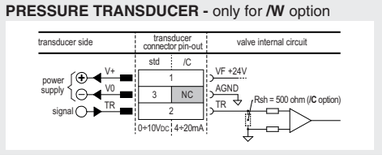



### MAIN CONNECTOR - MONITORS VOLTAGE ONLY

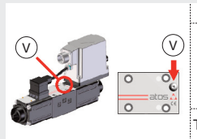



### PRESSURE TRANSDUCER - only for /W option




## STEP 3 HYDRAULICS




Wrenches types

| DHZO | DKZOR | |
|---|---|---|
| 3 mm | 4 mm | or 13 mm |
| Tightening torque 4 Nm | Tightening torque 8 Nm | |

**Air bleeding** - only **DHZO** and **DKZOR:**

- release 2 or 3 turns the air bleed screw **V**
- cycle the valve at low pressure until the oil leaking from the **V** port is exempted from air bubbles
- lock the air bleed screw **V**

**NOTE:** to facilitate bleeding operations, apply a light backpressure (1 or 2 bar) on T port by adding a check valve on T line

Consult tech table **FS900** for general guidelines about component's commissioning

## STEP 4 SOFTWARE

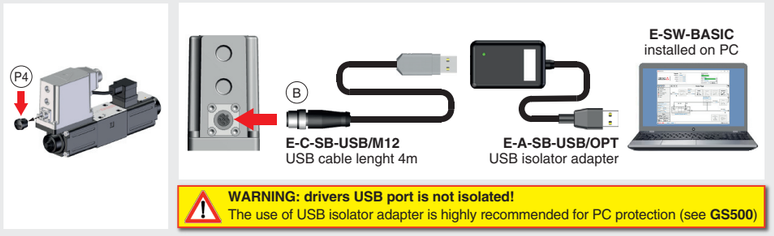
**REMARK** proportional valves with integral electronics are factory preset with default parameter and ready to use after piping and electrical connections. **Play with parameters is optional, not mandatory!**

| PROGRAMMING | | | PC |
|---|---|---|---|
| 4.1 | 4.2 | 4.3 | 4.4 |
| CONNECTION | CONFIGURATION | STORE | BACK UP |

### 4.1 CONNECTION

**1** **In order to access valve parameterization:**
- Install E-SW-BASIC software on PC
- Insert main connector to the valve and power on with **24VDC**

**2** Remove USB plastic protection cap **P4** and connect valve to the PC as shown below

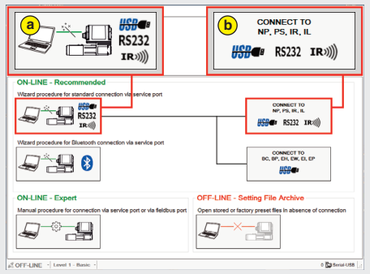


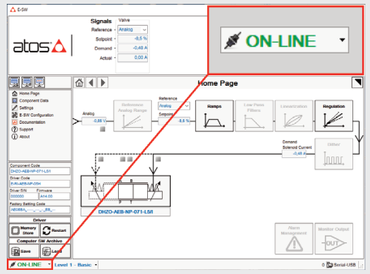

**WARNING: drivers USB port is not isolated!**
The use of USB isolator adapter is highly recommended for PC protection (see **GS500**)

**3** Launch the software using E-SW icon:
- **software does NOT detect valid connection**
  communication is not established, please follow wizard procedure **4**
- **software detects valid connection**
  communication automatically established **-** valve is **ON-LINE** see **5**


**4** Press buttons according the below sequence:
(a) : **ON-LINE - Recommended**
Wizard procedure for standard connection
(b) : **CONNECT TO NP, PS, IR, IL**

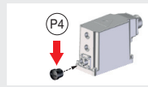
**5** Communication established, valve is **ON-LINE** and it is possible change parameters




**NOTE: Bluetooth adapter available!**
For more info please refer to STARTUP BLUETOOTH guide

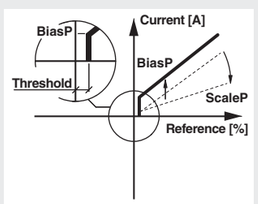
**REMARK:** once removed the USB cable E-C-SB-USB/M12, screw the plastic protection cap **P4** applying the correct tightening torque, in order to preserve valve's IP protection characteristics




Tightening torque
**0,6 Nm**

### 4.2 CONFIGURATION

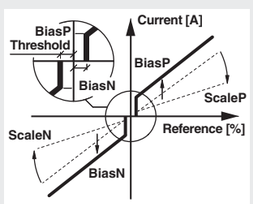
Single solenoid directional control valve, 2 positions with positive overlapping and flow control valve




**BiasP** positive bias
**ScaleP** positive scale

**Threshold** = 2%
(200mV or 0,32mA for **/I** option)

Double solenoid directional control valve, 3 positions with positive overlapping

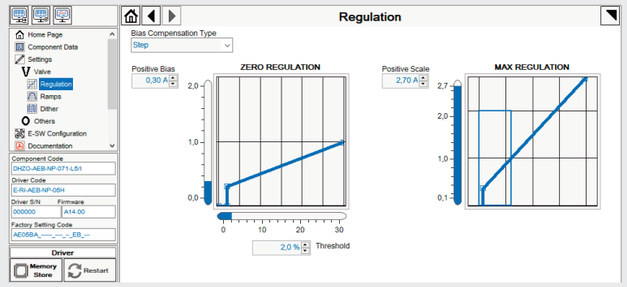



**BiasP** positive bias
**ScaleP** positive scale
**BiasN** negative bias
**ScaleN** negative scale

**Threshold** = 2%
(±200mV or ±0,16mA for **/I** option)

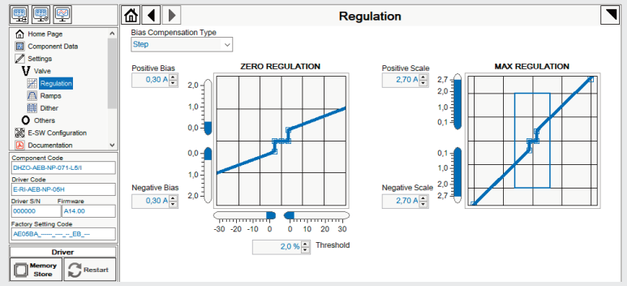
## BIAS AND SCALE - 2 POSITION VALVES and FLOW CONTROL VALVES

**Bias setting:** supply input signal just over the Threshold value; increase the Bias until the actuator is start moving, then lightly reduce the Bias just to stop the actuator
**Scale setting:** supply the max input signal; adjust the Scale to obtain the max actuator speed




## BIAS AND SCALE - 3 POSITION VALVES

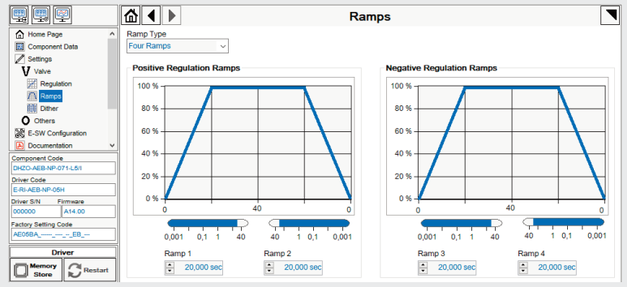
Follow the same indications reported for 2 position valves for both valve's solenoids




## RAMPS

**Ramps setting:** select the required ramp configuration and adjust the ramp time to optimize the actuator's acceleration and deceleration

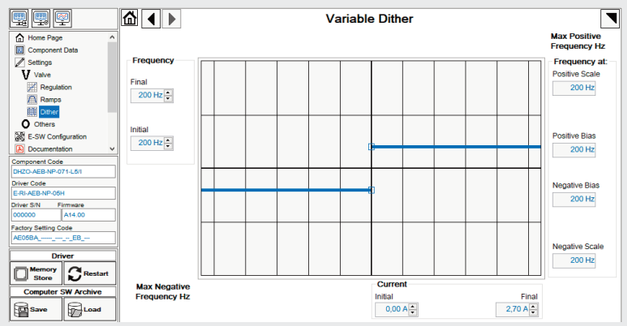
**No Ramp** : no ramps selected
**Single Ramp** : setup **Ramp 1**
**Double Ramp** : setup **Ramp 1** and **2**
**Four Ramps** : setup **Ramp 1**, **2**, **3** and **4** (only 3 way)




## DITHER

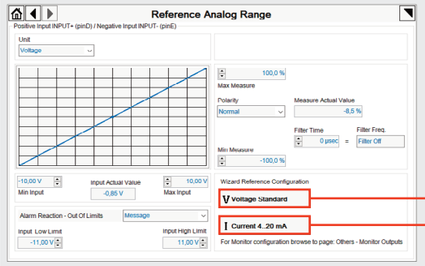
**Dither setting:** factory default 200 Hz

- lower frequencies reduce the hysteresis of the valve, too low values can affect the valve stability
- higher frequencies increase regulation stability, but increase also the hysteresis of the valve




## WIZARD REFERENCE - E-SW level 2 functionality

Reference input signal is factory preset according to selected valve code, defaults are ±10 VDC for standard and 4 ÷ 20 mA for /I option. Input signal can be reconfigured via software selecting between voltage and current, browsing to **Reference Analog Range** page:




press **Voltage Standard** button to automatically set the analog input signal to voltage

**Voltage Standard**

press **Current 4..20 mA** button to automatically set the analog input signal to current

**Current 4..20 mA**

**REMARK: Voltage Standard** or **Current 4..20 mA** buttons do not act on Monitor output signal configuration!
For Monitor output signal configuration browse to page **Others - Monitor Outputs**

### 4.3 STORE

Parameters modifications will be stored into driver permanent memory:

- press **Memory Store** button to access **Driver - Memory Store** window
- press **Store User** button to store **Valve Parameters**

**WARNING:** During valve parameters storing operations, the driver automatically shuts down the solenoid power supply for a short time. Do not perform any storing commands while the system is working.

### 4.4 BACK UP

Parameter modifications will be saved into PC memory:

- press **Save** button to access **Computer SW Archive - Setting Files** page, **Setting File Name** pop-up appears
- input a valid name into **Description** field and press **Ok** button

## TROUBLESHOOTING

**Valve vibration or noise**
- presence of air in the solenoid; perform air bleeding procedure – see STEP 3
- dither frequency too low; increase value of the frequency – see STEP 4.2

**The valve does not follow the reference signal**
- valve is powered off, verify presence of 24 Vdc power supply
- valve is disabled, verify presence of 24 Vdc on enable pin - only for /Q, /Z and /W options
- flow/pressure values exceeding the valve's performance limits, verify that hydraulic operating conditions are incompliance with the valve's characteristics
- big hysteresis or spool stick-slip, reduce the dither frequency
- spool sticking, contact Atos service center

**Software parameters modifications are lost when valve is switched off**
- parameter store operation was not performed, check store procedure – see STEP 4, section 4.3

**Software parameters modifications have no effect on the valve**
- valve is OFF LINE, check connection procedure – see STEP 4, section 4.1

**After the modifications of software parameters the valve does not work properly**
- restore valve factory parameters using 'Restore Factory' button, located in 'Driver - Memory Store' window:
  - during restore, the current to the solenoid(s) will be temporarily switched to off!
  - factory parameters will be applied at next driver restart or after power off-on sequence!