QUICKSTART FULL
for digital proportionals without transducer - fieldbus

DIRECT OPERATED PROPORTIONAL DIRECTIONAL AND FLOW VALVES

Valve model:
DHZO-AES   QVHZO-AES
DKZOR-AES   QVKZOR-AES

Driver model:
E-RI-AES

IDENTIFICATION

Valve identification plates and label

Valve name plate : **N**
Driver label : **L**

1 : valve code
2 : valve matrix code
3 : hydraulic symbol
4 : driver code
5 : driver serial number
6 : factory firmware version

INSTALLATION TOOLS ACCORDING TO VALVE MODEL - not included

Fastening bolts	Wrenches	Main connectors std, /Q	/Z, /W	BC	BP	EH	Transducer cable /W
socket head screws	or — for fastening bolts and air bleeding	7 pin metallic	12 pin metallic	5 pin metallic	5 pin metallic	4 pin metallic	5 pin plastic
see STEP 1 and STEP 3		see STEP 2.1		see STEP 2.2			see STEP 2.3

PROGRAMMING TOOLS - not included

Software	USB connection KIT		OR	Bluetooth connection KIT	
	Cable	Isolator		Cable	Adapter
E-SW-* programming software	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)	**BP** (PROFIBUS DP)	**EH** (EtherCAT)	
		EW (POWERLINK)	**EI** (EtherNet/IP)	**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

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-FIELDBUS	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-AES	AES driver operating manual
P005	Mounting surface - tech. table	E-MAN-S-BC	CANopen protocol programming manual
GS500	Programming tools - tech. table	E-MAN-S-BP	PROFIBUS DP protocol programming manual
GS510	Fieldbus - tech. table	E-MAN-S-EH	EtherCAT protocol programming manual
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

PRODUCTS OVERVIEW

EH — STEP 2.2, STEP 4, STEP 2.3, STEP 1, STEP 3

BP / BC — STEP 2.2, STEP 2.3, STEP 4, STEP 2.1

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-AES

Mounting surface layout

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

n°1 OR 2025 (for option /Y)
n°4 OR 108

Fastening bolts socket head screws
Tightening torque: **8 Nm**
n°4 M5x50 class:12.9 — wrench 4 mm

DKZOR-AES

Mounting surface layout

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

n°1 OR 108 (for option /Y)
n°5 OR 2050

Fastening bolts socket head screws
Tightening torque: **15 Nm**
n°4 M6x40 class:12.9 — wrench 5 mm

QVHZO-AES

Mounting surface layout

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

n°4 OR 108

Fastening bolts socket head screws
Tightening torque: **8 Nm**
n°4 M5x50 class:12.9 — wrench 4 mm

QVKZOR-AES

Mounting surface layout

4401-05-04-0-05
Valve size ISO 4401: **10**

n°5 OR 2050

Fastening bolts socket head screws
Tightening torque: **15 Nm**
n°4 M6x40 class:12.9 — wrench 5 mm

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**

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

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

3 Connect the valve to the system

ZM-7P - 7 pin MAIN CONNECTOR (A1)
ZM-12P - 12 pin MAIN CONNECTOR (A2)

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	

/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	
	MONITOR	(0 ÷ 5Vdc) for /W option
9	NC	

/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	
9	VL+	(logic power supply 24Vdc)
10	VL0	(logic power supply 0Vdc)
11	FAULT	(output 24Vdc)
PE	EARTH	

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   FIELDBUS CONNECTORS

1 Remove fieldbus connectors caps **P3**

BC, BP

EH

2 Select fieldbus connectors according to valve code and proceed with wirings operations

(C1) male M12 Coding A Cable diameter 6 ÷ 8 mm
(C2) female M12 Coding B Cable diameter 6 ÷ 8 mm
(C3) female - IN / (C4) female - OUT M12 Coding D Cable diameter 4 ÷ 8 mm

	BC			BP			EH
1	CAN_SHLD	Shield	1	+5V	Termination supply signal	1	TX+ Transmitter
2	not used		2	LINE-A	Bus line (high)	2	RX+ Receiver
3	CAN_GND	Signal zero data line	3	DGND	Data line - termination signal zero	3	TX- Transmitter
4	CAN_H	Bus line (high)	4	LINE-B	Bus line (low)	4	RX- Receiver
5	CAN_L	Bus line (low)	5	SHIELD		housing	SHIELD

3 Connect the valve to the fieldbus network. For information about T connectors and fieldbus terminators see **GS500**

BC — **ZM-5PF** - 5 pin (C1)
BP — **ZM-5PM/BP** - 5 pin (C2)
EH — **ZM-4PM/E** - 4 pin (C3), **ZM-4PM/E** - 4 pin (C4)

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

2.3   REMOTE TRANSDUCER CONNECTOR - only for /W option

1 Remove transducer connector cap **P4**

BC, BP

EH

2 Proceed with wirings operations

/W option		
1	VF+ 24V	(power supply 24Vdc)
2	TR1	(0 ÷ 10Vdc / 4 ÷ 20mA)
3	AGND	
4	NC	
5	NC	

Recommended cable: 3 x 0,25 mm²

3 Connect the valve to the transducer

BC, BP
ZH-5PM/1.5 - 1.5 m length
ZH-5PM/5 - 5 m length
5 pin plastic - single cable

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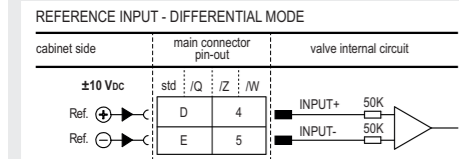**ZH-5PM/5** - 5 m length
5 pin plastic - single cable

ELECTRICAL WIRING EXAMPLES

MAIN CONNECTOR - VOLTAGE

REFERENCE INPUT - DIFFERENTIAL MODE

cabinet side	main connector pin-out				valve internal circuit
±10 Voc	std	/Q	/Z	/W	
Ref. (+)	D		4		INPUT+ 50K
Ref. (−)	E		5		INPUT− 50K

REFERENCE INPUT - COMMON MODE

cabinet side	main connector pin-out				valve internal circuit
±10 Voc	std	/Q	/Z	/W	
Ref. (+)	D		4		INPUT+ 50K
	E		5		INPUT− 50K
⊥ (0 V)	C	B	10		AGND / V0 / VL0

MAIN CONNECTOR - CURRENT

REFERENCE INPUT - DIFFERENTIAL MODE

cabinet side	main connector pin-out				valve internal circuit
4÷20 mA	std	/Q	/Z	/W	
Ref. (+)	D		4		INPUT+ Rsh = 500 ohm
Ref. (−)	E		5		INPUT−

REFERENCE INPUT - COMMON MODE

cabinet side	main connector pin-out				valve internal circuit
4÷20 mA	std	/Q	/Z	/W	
Ref. (+)	D		4		INPUT+ Rsh = 500 ohm
	E		5		INPUT−
⊥ (0 V)	C	B	10		AGND / V0 / VL0

MAIN CONNECTOR - MONITORS VOLTAGE ONLY

MONITOR OUTPUT

cabinet side	main connector pin-out			valve internal circuit
±5 Voc	std	/Q	/W	
Mon.	F		6	MONITOR
⊥ (0 V)	C	B	10	AGND / V0 / VL0

MONITOR2 OUTPUT - only for /W option

cabinet side	main connector pin-out		valve internal circuit
0÷5 Vcc	/W		
Mon.		8	MONITOR2
⊥ (0 V)		10	VL0
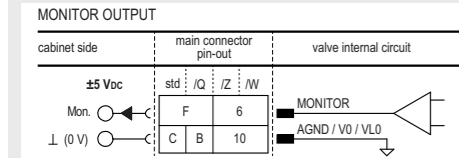
REMOTE TRANSDUCER - only for /W option

transducer side	transducer connector pin-out		valve internal circuit
	std	/C	
power supply (+) V+	1		VF +24V
V0	3	NC	AGND
signal TR	2		TR Rsh = 500 ohm (/C option)
	0÷10Vdc	4÷20mA	
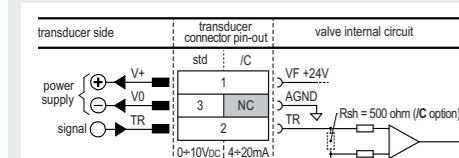
Wrenches types

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

Air bleeding:
- 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

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HINT ! - Wizard objects dictionary - only for BC, BP, EH

Press **CTRL** + **H** on the PC keyboard to open the context help form

Move arrow on parameter (e.g. **Unit**) to display the objects dictionary information to access the parameter via fieldbus

If present **List**, press ➡ to display values accepted by the parameter

NOTE: alternatively right click on any parameter
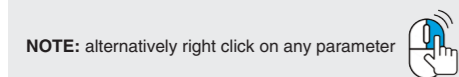
REMARK proportional valves with integral electronics are factory preset with default parameters, only few programming operations are mandatory for:
- setup the network parameters and the source of reference signals
- setup the feedback's scale for remote transducers only for **/W** option; please refer the E-MAN-RI-AES manual
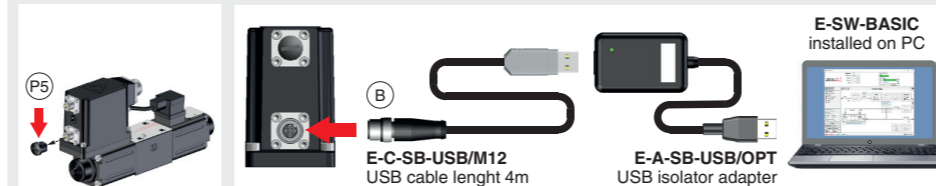
Valve programming can be performed through E-SW software or via fieldbus

PROGRAMMING				PC
4.1	4.2	4.3	4.4	4.5
CONNECTION	FIELDBUS	REFERENCES	STORE	BACK UP

4.1   CONNECTION

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

2 Remove USB plastic protection cap **P5** and connect valve to the PC as shown below

E-C-SB-USB/M12 USB cable lenght 4m

E-A-SB-USB/OPT USB isolator adapter

E-SW-BASIC installed on PC

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 BC, BP, EH, EW, EI, EP

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

Note: please also refer to the following parameter settings:
- see step 4.2 to change the network setup
- see step 4.3 to change the reference signals setup

a ON-LINE - Recommended
Wizard procedure for standard connection via service port

Wizard procedure for Bluetooth connection via service port

CONNECT TO BC, BP, EH, EW, EI, EP

ON-LINE - Expert
Manual procedure for connection via service port or via fieldbus port

OFF-LINE - Setting File Archive
Open stored or factory preset files in absence of connection

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 **P5** applying the correct tightening torque, in order to preserve valve's IP protection characteristics

Tightening torque **0,6 Nm**

4.2   FIELDBUS - Network Management

Node, Station Alias, IP Address, Baudrate, etc... can be set through:

1) Machine central unit (master) - please refer to E-MAN-S-** fieldbus protocol programming manual

2) E-SW software
- switch to Level 2 - **Advanced** and browse to **Network Management - Configuration** to change below default settings:

BC CANopen
Configuration file: **EDS**

Configuration
CANopen Node: 1
Speed: 50 Kbit/sec
CANopen Hardware Filter: Filter Active

BP PROFIBUS DP
Configuration file: **GSD**

Configuration
Profibus Node: 125
Defaults: Telegram 3
Telegram Selection: Telegram 3

EH EtherCAT
Configuration file: **XML**

Configuration
Station Alias: 0

Station Alias is assigned automatically by fieldbus master

- press **Memory Store** button and in **Fieldbus Parameters** press **Store User** button to save new setting into the driver (see 4.4)
- network configuration settings will be applied at next driver power-on or pressing the **Restart** button

NOTE: configuration files are available in USB memory stick of the software or in MyAtos area - **www.atos.com**

4.3   REFERENCES

The source of reference signals for valves with fieldbus:
- is preset as **Analog** by factory default
- can be managed through machine control unit by setting the source from **Analog** to **Fieldbus**

In **Valve - Reference** select **Fieldbus**

Signals / Valve: Reference - Analog (Analog / Internal / Fieldbus), Setpoint, Demand, Actual

Driver Memories: Valve - User, Fieldbus - User
Driver Status: Status - Active, Alarm - No Alarm, Alarms Numb. - 0 /Alarms...
Digital I/O: Enable (pinA3), DOut (pinA11)

4.4   STORE

Parameters modifications will be stored into driver permanent memory:
- press **Memory Store** button to access **Driver - Memory Store** window
- press **Store User** buttons to store **Valve Parameters** or **Fieldbus Parameters**

WARNING: During valve or fieldbus 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.

4.5   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

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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 – please refer to E-MAN-RI-AES operating manual

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 4.4

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!