QUICKSTART FULL
for digital proportionals without transducer - fieldbus

PILOTED OPERATED PROPORTIONAL DIRECTIONAL VALVES

Valve model:
DPZO-AES-1   DPZO-AES-2   DPZO-AES-4   DPZO-AES-6

Driver model:
E-RI-AES

IDENTIFICATION

Valve identification plates and label

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

Valve name plate : M

Pilot valve name plate : N
4 : pilot valve code
5 : pilot valve matrix code
6 : pilot 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			Fieldbus connectors			Transducer cable
		std, /Q	/Z, /W	BC	BP	EH		/W
socket head screws	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
FS170	DPZO positive spool overlap - tech. table	STARTUP BLUETOOTH	Bluetooth adpter startup guide
P005	Mounting surface - tech. table	E-MAN-RI-AES	AES - driver operating manual
GS500	Programming tools - tech. table	E-MAN-S-BC	CANopen protocol programming manual
GS510	Fieldbus - tech. table	E-MAN-S-BP	PROFIBUS DP protocol programming manual
K800	Electric and electronic connectors - tech. table	E-MAN-S-EH	EtherCAT protocol programming manual

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

EH
STEP 2.2
STEP 4
STEP 2.3

BP
BC
STEP 2.2
STEP 2.3
STEP 4

STEP 1
STEP 3
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

DPZO-AES-*-1
Mounting surface layout

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

n°2 OR 108
n°5 OR 2050

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

Tightening torque: **15 Nm**

DPZO-AES-*-2
Mounting surface layout

4401-07-07-0-05
Valve size ISO 4401: **16**

n°2 OR 2043
n°4 OR 130

Fastening bolts socket head screws
n°4 M10x50   n°2 M6x45   class:12.9

Tightening torque:
15 Nm for M6
70 Nm for M10
5 mm wrench
8 mm wrench

DPZO-AES-*-4
Mounting surface layout

4401-08-08-0-05
Valve size ISO 4401: **25**

n°2 OR 3056
n°4 OR 4112

Fastening bolts socket head screws
n°6 M12x60 class:12.9
wrench 10 mm

Tightening torque: **125 Nm**

DPZO-AES-*-6
Mounting surface layout

4401-10-09-0-05
Valve size ISO 4401: **32**

n°2 OR 3056
n°4 OR 144

Fastening bolts socket head screws
n°6 M20x90 class:12.9
wrench 17 mm

Tightening torque: **600 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**

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)

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

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

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

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

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

male
M12 Coding A
Cable diameter 6 ÷ 8 mm
(C1)

female
M12 Coding B
Cable diameter 6 ÷ 8 mm
(C2)

female - IN   female - OUT
M12 Coding D
Cable diameter 4 ÷ 8 mm
(C3) (C4)

BC
1	CAN_SHLD	Shield
2	not used	
3	CAN_GND	Signal zero data line
4	CAN_H	Bus line (high)
5	CAN_L	Bus line (low)

BP
1	+5V	Termination supply signal
2	LINE-A	Bus line (high)
3	DGND	Data line - termination signal zero
4	LINE-B	Bus line (low)
5	SHIELD	

EH
1	TX+	Transmitter
2	RX+	Receiver
3	TX-	Transmitter
4	RX-	Receiver
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 24Vᴅᴄ)
2	TR1 (0 ÷ 10Vᴅᴄ / 4 ÷ 20mA)
3	AGND
4	NC
5	NC

Recommended cable:
3 x 0,25 mm²

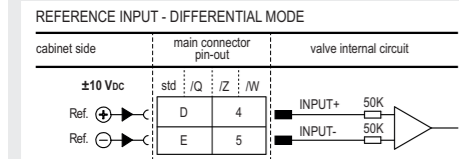**3** Connect the valve to the transducer

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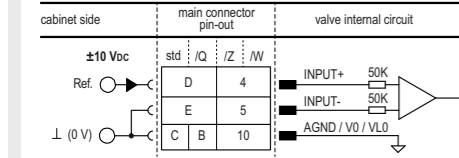ZH-5PM/5 - 5 m length
5 pin plastic - single cable

EH
ZH-5PM/1.5 - 1.5 m length
ZH-5PM/5 - 5 m length
5 pin plastic - single cable
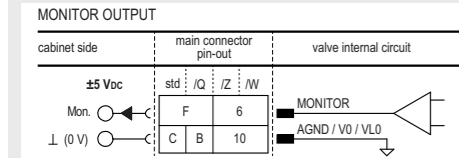
ELECTRICAL WIRING EXAMPLES
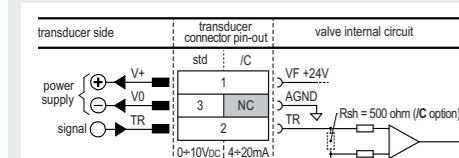
MAIN CONNECTOR - VOLTAGE

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 - 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

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	

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

MONITOR2 OUTPUT - only for /W option

cabinet side	main connector pin-out	valve internal circuit
0÷5 Vdc	/W	
Mon.	8	MONITOR2
⊥ (0 V)	10	VL0

Wrench type

3 mm

Tightening torque

4 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**

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

---

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-SW-BASIC installed on PC

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

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

⚠ **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

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**

Defaults: Telegram 3

Configuration
Profibus Node
125
Telegram Selection
Telegram 3

EH EtherCAT
Configuration file: **XML**

Station Alias is assigned automatically by fieldbus master

Configuration
Station Alias
0

• 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**

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

---

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
• missing piloting pressure, verify that hydraulic power level is compliant with valve's characteristics
• wrong pilot/drain configuration - check if the pilot/drain configuration of the valve corresponds to the effective system layout

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 off!
 - factory parameters will be applied at next driver restart or after power off-on sequence!