

PILOTED OPERATED PROPORTIONAL DIRECTIONAL VALVES

Valve model:	Valve model:
DPZO-LEB-1 DPZO-LEB-4M	DPZO-TEB-1 DPZO-TEB-4M
DPZO-LEB-2 DPZO-LEB-6	DPZO-TEB-2 DPZO-TEB-6
DPZO-LEB-4 DPZO-LEB-8	DPZO-TEB-4 DPZO-TEB-8
Driver models:	
E-RI-LEB/TEB-N-NP for valves without IO-Link communication interface NP	
E-RI-LEB/TEB-N-IL for valves with IO-Link communication interface IL	

IDENTIFICATION

Valve identification plates and label

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

4 : pilot valve code
5 : pilot valve matrix code
6 : pilot hydraulic symbol

7 : driver code
8 : driver serial number
9 : factory firmware version

INSTALLATION TOOLS ACCORDING TO VALVE MODEL- not included

Fastening bolts	Wrenches	Main connectors NP	IO-Link connector IL
		std, /Q, /F	
socket head screws	for fastening bolts and air bleeding	7 pin - metallic	5 pin - metallic
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
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
		Adapter	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)	
E-SW-/PQ	supports valves with SP, SF, SL alternated P/Q control	EW (POWERLINK)	EI (EtherNet/IP)	EP (PROFINET RT/IRT)

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-BASIC Software startup guide
FS172 DPZO one LVDT transd. positive spool overlap - tech. table	STARTUP BLUETOOTH Bluetooth adapter startup guide
FS175 DPZO two LVDT transd. positive spool overlap - tech. table	E-MAN-RI-LEB TEB/LEB - driver operating manual
FS178 DPZO two LVDT transd. zero spool overlap - tech. table	E-MAN-S-IL IO-Link protocol programming manual
P005 Mounting surfaces - tech. table	
GS500 Programming tools - tech. table	
GS520 IO-Link features - 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

PRODUCTS OVERVIEW

STEP 1 MECHANICAL

STEP 2 ELECTRICAL

STEP 3 HYDRAULICS

STEP 4 SOFTWARE

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-LEB-*-1 DPZO-TEB-*-1	DPZO-LEB-*-2 DPZO-TEB-*-2
<p>Mounting surface layout</p> <p>4401-05-05-0-05 Valve size ISO 4401: 10</p> <p>Fastening bolts: n°4 M6x40 class:12.9, wrench 5 mm</p> <p>Tightening torque: 15 Nm</p>	<p>Mounting surface layout</p> <p>4401-07-07-0-05 Valve size ISO 4401: 16</p> <p>Fastening bolts: n°4 M10x50 M6x45 class:12.9, wrench 5 mm and 8 mm</p> <p>Tightening torque: 15 Nm for M6, 70 Nm for M10</p>
DPZO-LEB-*-4 DPZO-TEB-*-4	DPZO-LEB-*-4M DPZO-TEB-*-4M
<p>Mounting surface layout</p> <p>4401-08-08-0-05 Valve size ISO 4401: 25</p> <p>Fastening bolts: n°6 M12x60 class:12.9, wrench 10 mm</p> <p>Tightening torque: 125 Nm</p>	<p>Mounting surface layout</p> <p>4401-08-08-0-05 Valve size ISO 4401: 27</p> <p>Fastening bolts: n°6 M12x60 class:12.9, wrench 10 mm</p> <p>Tightening torque: 125 Nm</p>
DPZO-LEB-*-6 DPZO-TEB-*-6	DPZO-LEB-*-8
<p>Mounting surface layout</p> <p>4401-10-09-0-05 Valve size ISO 4401: 32</p> <p>Fastening bolts: n°6 M20x90 class:12.9, wrench 17 mm</p> <p>Tightening torque: 600 Nm</p>	<p>Mounting surface layout</p> <p>4401-10-09-0-05 Valve size ISO 4401: 35</p> <p>Fastening bolts: n°6 M20x100 class:12.9, wrench 17 mm</p> <p>Tightening torque: 600 Nm</p>

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 - only for NP

- Remove main connector cap **P2**
- Select main connector according to valve code and proceed with wirings operations
- Connect the valve to the system

WARNING: remove power supply before any electrical or wiring operations

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

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

Standard		/Z option	
A V+	(power supply 24Voc)	1 V+	(power supply 24Voc)
B V0	(power supply 0Voc)	2 V0	(power supply 0Voc)
C AGND		3 ENABLE	(input 24Voc)
D Q_INPUT+	(±10Voc / 4 ÷ 20mA)	4 Q_INPUT+	(±10Voc / 4 ÷ 20mA)
E INPUT-	(±10Voc / 4 ÷ 20mA)	5 INPUT-	(±10Voc / 4 ÷ 20mA)
F Q_MONITOR	(±10Voc / 4 ÷ 20mA)	6 Q_MONITOR	(±10Voc / 4 ÷ 20mA)
G EARTH		7 AGND	
		8 R_ENABLE	(output 24Voc)
		9 NC	
		10 NC	
		11 FAULT	(output 24Voc)
		PE	EARTH

/Q option	
A V+	(power supply 24Voc)
B V0	(power supply 0Voc)
C ENABLE	(input 24Voc)
D Q_INPUT+	(±10Voc / 4 ÷ 20mA)
E INPUT-	(±10Voc / 4 ÷ 20mA)
F Q_MONITOR	(±10Voc / 4 ÷ 20mA)
G EARTH	

/F option	
A V+	(power supply 24Voc)
B V0	(power supply 0Voc)
C AGND	
D Q_INPUT+	(±10Voc / 4 ÷ 20mA)
E INPUT-	(±10Voc / 4 ÷ 20mA)
F FAULT	(output 24Voc)
G EARTH	

ELECTRICAL WIRING EXAMPLES - only for NP

MAIN CONNECTOR - VOLTAGE			MAIN CONNECTOR - CURRENT		
REFERENCE INPUT - DIFFERENTIAL MODE			REFERENCE INPUT - DIFFERENTIAL MODE		
cabinet side	main connector pin-out	valve internal circuit	cabinet side	main connector pin-out	valve internal circuit
0+10 Vdc	std / /F / /Q / /Z	Q_INPUT+ 50K	4+20 mA	std / /F / /Q / /Z	Q_INPUT+ Rsh = 500 ohm
Ref. Q ⊕	D 4	INPUT-	Ref. Q ⊕	D 4	INPUT-
Ref. Q ⊖	E 5		Ref. Q ⊖	E 5	
REFERENCE INPUT - COMMON MODE			REFERENCE INPUT - COMMON MODE		
cabinet side	main connector pin-out	valve internal circuit	cabinet side	main connector pin-out	valve internal circuit
0+10 Vdc	std / /F / /Q / /Z	Q_INPUT+ 50K	4+20 mA	std / /F / /Q / /Z	Q_INPUT+ Rsh = 500 ohm
Ref. Q ⊕	D 4	INPUT-	Ref. Q ⊕	D 4	INPUT-
⊥ (0 V)	C 7	AGND / V0	⊥ (0 V)	C 7	AGND / V0
MONITOR OUTPUT			MONITOR OUTPUT		
cabinet side	main connector pin-out	valve internal circuit	cabinet side	main connector pin-out	valve internal circuit
±10 Vdc	std / /Q / /Z	Q_MONITOR	4+20 mA	std / /Q / /Z	Q_MONITOR
Mon. Q ⊖	F 6	AGND / V0	Mon. Q ⊖	F 6	AGND / V0
⊥ (0 V)	C 7		⊥ (0 V)	C 7	

2.2 IO-Link CONNECTOR - only for IL

- Remove IO-Link connector caps **P3**
- Proceed with wirings operations
- Connect the valve to the IO-Link network of the system

WARNING: remove power supply before any electrical or wiring operations

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

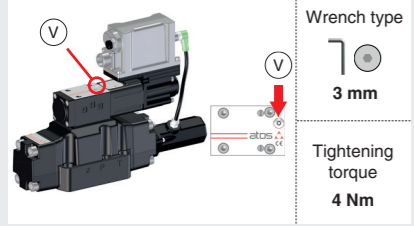
NOTE: the use of above metallic connectors is strongly recommended in order to fulfill EMC requirements

1 L+	(power supply 24Voc - IO-Link)
2 P24	(power supply 24Voc - others)
3 L-	(power supply 0Voc - IO-Link)
4 C/Q	IO-Link data-line
5 N24	(power supply 0Voc - others)

ZM-5PF (metallic) 5 PIN IO-Link CONNECTOR

M12 Coding A - 5 pin
Cable diameter 6 ÷ 8 mm

STEP 3 HYDRAULICS



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**

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

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

WARNING: To avoid overheating and possible damage of the electronic driver, the valves must be never energized without hydraulic supply to the pilot stage. In case of prolonged pauses of the valve operation during the machine cycle, it is always advisable to switch off or disable the driver (option /Q or /Z)

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!**

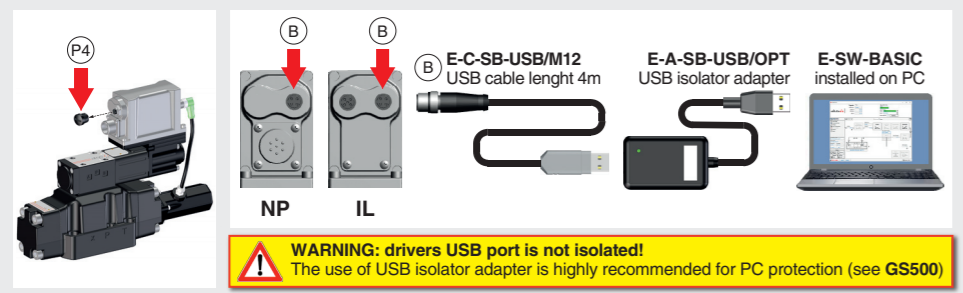
PROGRAMMING				PC
4.1	4.2	4.3	4.4	4.5
CONNECTION	CONFIGURATION	SMART TUNING	STORE	BACK UP

4.1 CONNECTION

1 In order to access valve parameterization:

- Install E-SW-BASIC software on PC
- Insert main connector or IO-Link 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



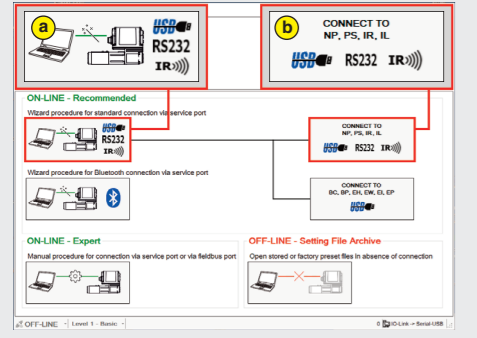
3 Launch the software using E-SW icon:

- software does NOT detect valid connection communication is not established, please follow wizard procedure
- software detects valid connection communication automatically established - valve is ON-LINE see

4 Press buttons according the below sequence:

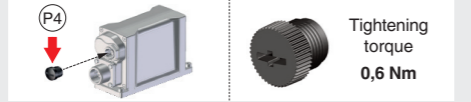
a) ON-LINE - Recommended
Wizard procedure for standard connection

b) CONNECT TO NP, PS, IR, IL
Wizard procedure for standard connection

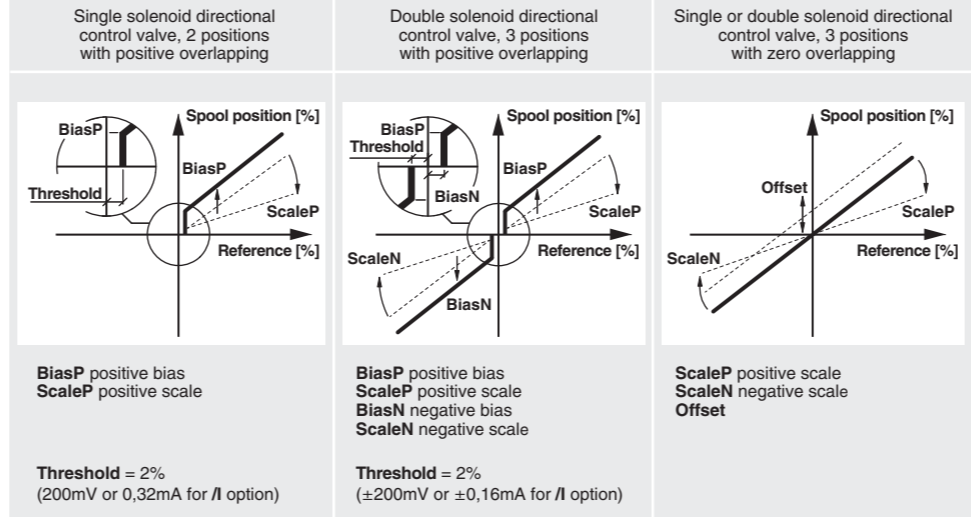


NOTE: Bluetooth adapter available!
For more info please refer to STARTUP BLUETOOTH guide

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



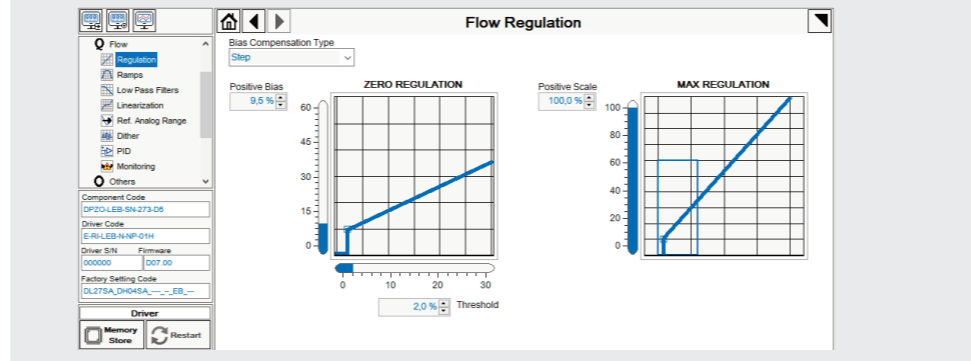
4.2 CONFIGURATION



BIAS AND SCALE - 2 POSITION VALVES

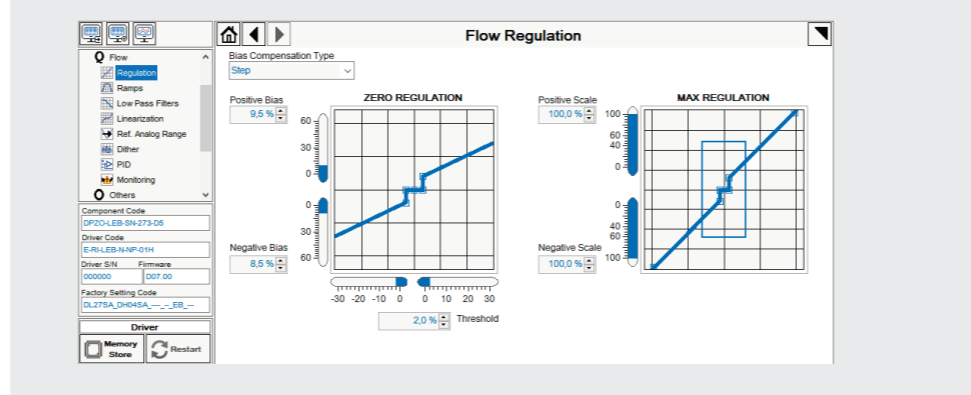
Bias setting: supply input signal just over the Threshold value; increase the Bias until the actuator is start moving, then lightly reduce the Bias just to stop the actuator

Scale setting: supply the max input signal; adjust the Scale to obtain the max actuator speed



BIAS AND SCALE - 3 POSITION VALVES

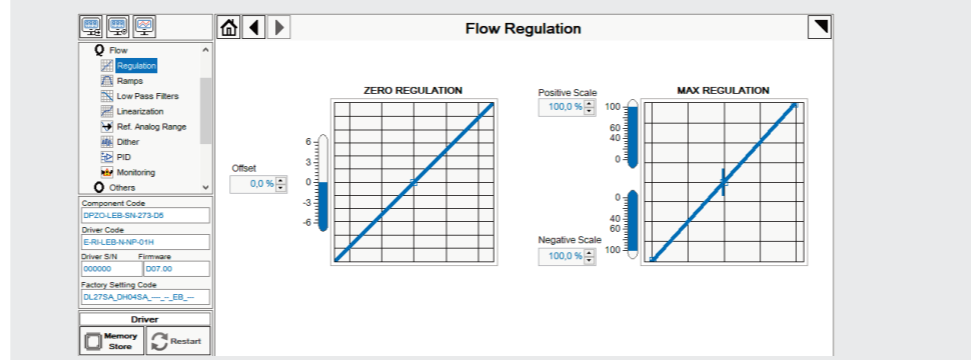
Follow the same indications reported for 2 position valves for both valve's solenoids



OFFSET AND SCALE - 3 POSITION VALVES, ZERO OVERLAP

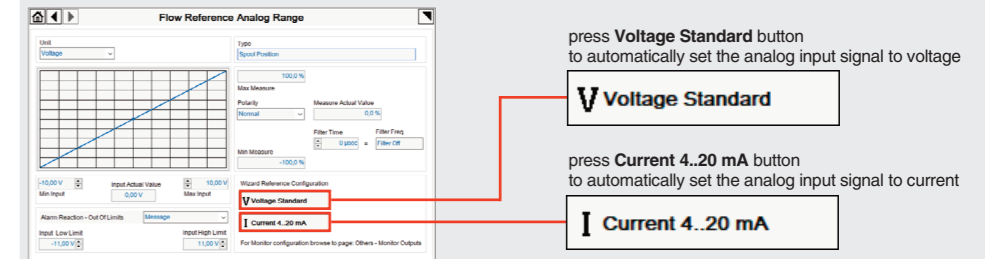
Offset setting: supply the input signal equal to 0%; adjust the Offset until the actuator is stopped

Scale setting: supply the max input signal (positive/negative); adjust the Scale to obtain the max actuator speed in both directions



WIZARD REFERENCE - E-SW level 2 functionality - only for NP

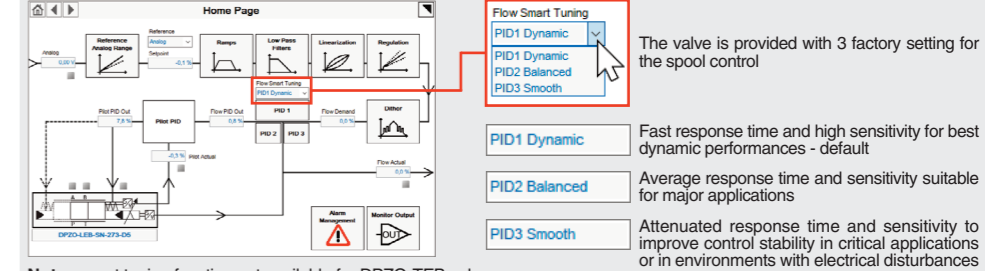
Reference input signal is factory preset according to selected valve code, defaults are ± 10 Vdc for standard and 4 ± 20 mA for /I option. Input signal can be reconfigured via software selecting between voltage and current, browsing to **Reference Analog Range** page:



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 SMART TUNING - E-SW level 2 functionality

Smart tuning allows to adjust the valve dynamic response in order to match different performance requirements.



Note: smart tuning function not available for DPZO-TEB valves

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** 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.

4.5 BACK UP

Parameter modifications will be saved into PC memory:

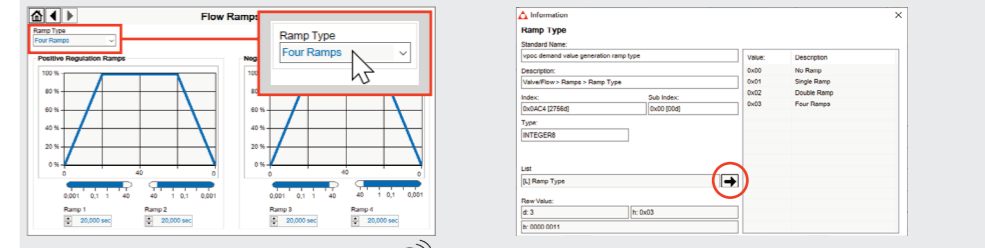
- press **Save** button to access **Computer SW Archive - Setting Files** page, **Setting File Name** pop-up appears
- input a valid name into **Description** field and press **Ok** button

HINT ! - Wizard objects dictionary - only for IL

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

Move arrow on parameter (e.g. **Ramp Type**) to display the objects dictionary information to access the parameter via IO-Link

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



NOTE: alternatively right click on any parameter

TROUBLESHOOTING

Valve vibration or noise

- presence of air in the solenoid; perform air bleeding procedure – see STEP 3

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 and /Z options
- flow/pressure values exceeding the valve's performance limits, verify that hydraulic operating conditions are in compliance with the valve's characteristics
- 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 to off!
 - factory parameters will be applied at next driver restart or after power off-on sequence!