QUICKSTART BASIC

QB320-8 - 01/25

for digital proportionals with LVDT transducer - analog reference signal

PILOTED OPERATED PROPORTIONAL DIRECTIONAL VALVES

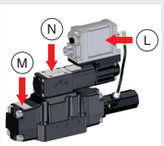
Valve model:
DPZO-LEB-1 DPZO-LEB-4M
DPZO-LEB-2 DPZO-LEB-6
DPZO-LEB-4 DPZO-LEB-8

Valve model:
DPZO-TEB-1 DPZO-TEB-4M
DPZO-TEB-2 DPZO-TEB-6
DPZO-TEB-4

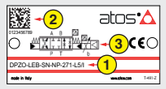
Driver models:
E-RI-LEB/TEB-N-NP for valves without IO-Link communication interface **NP**
E-RI-LEB/TEB-N-IL for valves with IO-Link communication interface **IL**

IDENTIFICATION

Valve identification plates and label

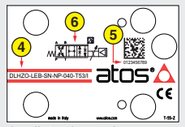


Valve name plate : **M**



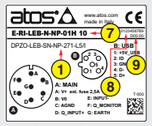
1 : valve code
2 : valve matrix code
3 : valve hydraulic symbol

Pilot valve name plate : **N**



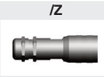
4 : pilot valve code
5 : pilot valve matrix code
6 : pilot hydraulic symbol

Driver label : **L**



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	**/Z**	
socket head screws	for fastening bolts and air bleeding	7 pin - metallic	 12 pin - metallic	5 pin - metallic
see STEP 1 and STEP 3		see STEP 2.1		see STEP 2.2

PROGRAMMING TOOLS - not included

PC software	mobile App	Bluetooth OR USB connection KIT		
		Adapter	Cable	Isolator
E-SW-SETUP	**Atos CONNECT**	**E-A-BTH**	**E-C-SB-USB/M12**	**E-A-SB-USB/OPT**

NOTE: Atos CONNECT supports Atos digital valve drivers equipped with E-A-BTH or with built-in Bluetooth, see STEP 5

PC SOFTWARE

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

REMARK Atos PC software is designed for Windows based operative systems - Windows 10 or later

PC SOFTWARE DOWNLOAD

Download PC software at **www.atos.com** accessing to "**MyAtos** -> **Download area** electronics"

Free registration by filling the form at **www.atos.com/en-it/login**

E-SW-SETUP is free and available in Download area

RELATED DOCUMENTATION - www.atos.com

FS900	Operating and maintenance information - tech. table	**STARTUP BLUETOOTH**	Bluetooth adapter startup guide
FS172	DPZO one LVDT transd. positive spool overlap - tech. table	**E-MAN-RI-LEB**	TEB/LEB - driver operating manual
FS175	DPZO two LVDT transd. positive spool overlap - tech. table	**E-MAN-S-IL**	IO-Link protocol programming manual
FS178	DPZO two LVDT transd. zero spool overlap - tech. table		
P005	Mounting surfaces - tech. table		
GS500	Programming tools - tech. table		
GS520	IO-Link features - tech. table		
K800	Electric and electronic connectors - tech. table		

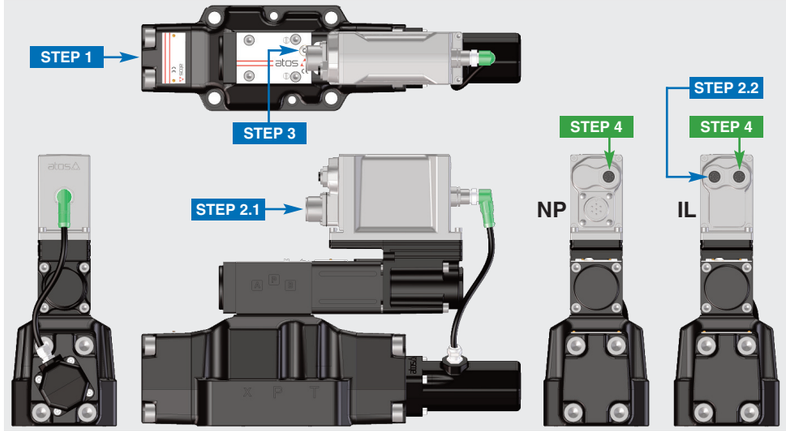
ATTENTION !

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

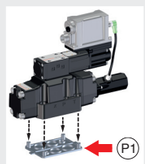
Atos spa - Italy - 21018 Sesto Calende www.atos.com support@atos.com

PRODUCTS OVERVIEW



INSTALLATION			PROGRAMMING	
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
MECHANICAL	ELECTRICAL	HYDRAULICS	PC SOFTWARE	MOBILE APP

STEP 1 MECHANICAL

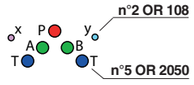


In case of first commissioning, before the valve installation the whole system must be correctly flushed to grant the required cleanliness level:
During the flushing operation use on-off or by-pass valves in place of the proportional valve

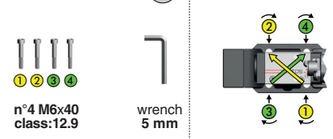
- remove protection pad **P1** located on the valve bottom face only immediately before installation (do not remove connectors caps)
- check the presence and correct positioning of the seals on valve ports
- verify that valve mounting surface is clean and free from damages or burrs
- verify the correct 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

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

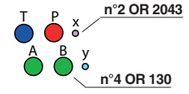


Fastening bolts socket head screws
Tightening torque: **15 Nm**

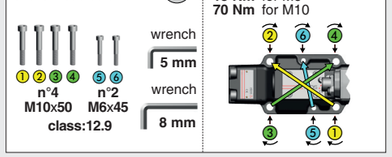


DPZO-LEB-*-2 DPZO-TEB-*-2

Mounting surface layout
4401-07-07-0-05
Valve size ISO 4401: **16**

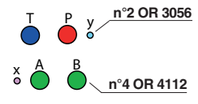


Fastening bolts socket head screws
Tightening torque:
15 Nm for M6
70 Nm for M10

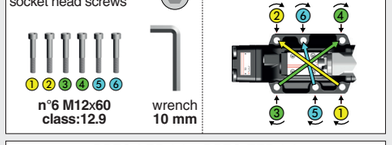


DPZO-LEB-*-4 DPZO-TEB-*-4

Mounting surface layout
4401-08-08-0-05
Valve size ISO 4401: **25**

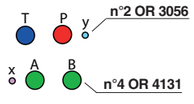


Fastening bolts socket head screws
Tightening torque: **125 Nm**

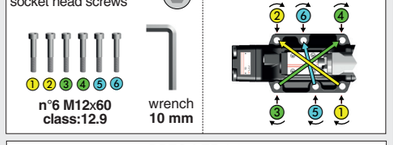


DPZO-LEB-*-4M DPZO-TEB-*-4M

Mounting surface layout
4401-08-08-0-05
Valve size ISO 4401: **27**

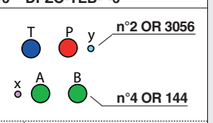


Fastening bolts socket head screws
Tightening torque: **125 Nm**

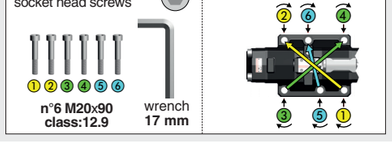


DPZO-LEB-*-6 DPZO-TEB-*-6

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

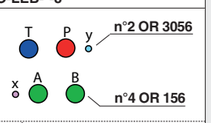


Fastening bolts socket head screws
Tightening torque: **600 Nm**

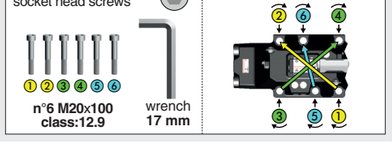


DPZO-LEB-*-8

Mounting surface layout
4401-10-09-0-05
Valve size ISO 4401: **35**



Fastening bolts socket head screws
Tightening torque: **600 Nm**

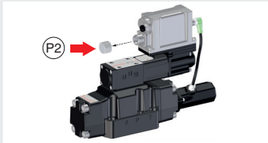


STEP 2 ELECTRICAL

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

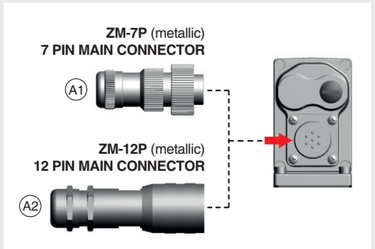
2.1 MAIN CONNECTOR - only for NP

1 Remove main connector cap **P2**



WARNING: remove power supply before any electrical or wiring operations

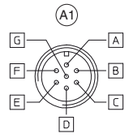
3 Connect the valve to the system



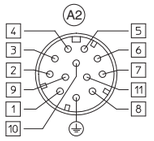
NOTE: the use of above metallic connectors is strongly recommended in order to fulfill EMC requirements

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

2 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	**Q_INPUT+**	(±10VDC / 4 ÷ 20mA)
E	**INPUT-**	
F	**Q_MONITOR**	(±10VDC / 4 ÷ 20mA)
G	**EARTH**	

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

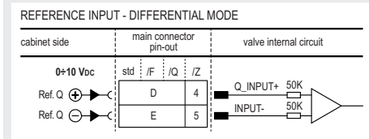
/F option		
A	**V+**	(power supply 24VDC)
B	**V0**	(power supply 0VDC)
C	**AGND**	
D	**Q_INPUT+**	(±10VDC / 4 ÷ 20mA)
E	**INPUT-**	
F	**FAULT**	(output 24VDC)
G	**EARTH**	

/Z option		
1	**V+**	(power supply 24VDC)
2	**V0**	(power supply 0VDC)
3	**ENABLE**	(input 24VDC)
4	**Q_INPUT+**	(±10VDC / 4 ÷ 20mA)
5	**INPUT-**	
6	**Q_MONITOR**	(±10VDC / 4 ÷ 20mA)
7	**AGND**	
8	**R_ENABLE**	(output 24VDC)
9	**NC**	
10	**NC**	
11	**FAULT**	(output 24VDC)
PE	**EARTH**	

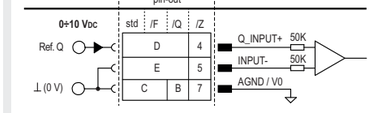
ELECTRICAL WIRING EXAMPLES - only for NP

MAIN CONNECTOR - VOLTAGE

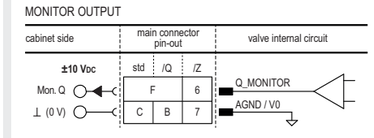
REFERENCE INPUT - DIFFERENTIAL MODE



REFERENCE INPUT - COMMON MODE

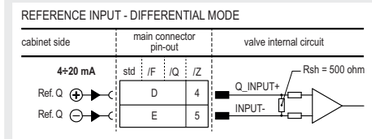


MONITOR OUTPUT

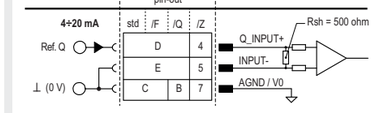


MAIN CONNECTOR - CURRENT

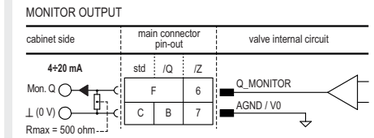
REFERENCE INPUT - DIFFERENTIAL MODE



REFERENCE INPUT - COMMON MODE

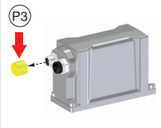


MONITOR OUTPUT

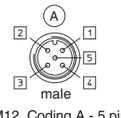


2.2 IO-Link CONNECTOR - only for IL

1 Remove IO-Link connector caps **P3**



2 Proceed with wirings operations

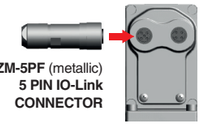


M12 Coding A - 5 pin
Valve port class B
Cable diameter 6 ÷ 8 mm

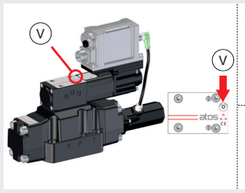
1	**L+**	(power supply 24VDC - IO-Link)
2	**P24**	(power supply 24VDC - others) **(1)**
3	**L-**	(power supply 0VDC - IO-Link)
4	**C/Q**	IO-Link data-line
5	**N24**	(power supply 0VDC - others) **(1)**

(1) max power consumption 50 W; for master ports class A connect P24/N24 to an external power supply

3 Connect the valve to the IO-Link network of the system



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)

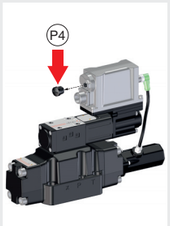
STEP 4 PC SOFTWARE

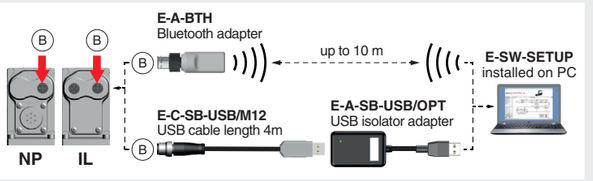
REMARK proportional valves with on-board electronics are factory preset with default parameter and ready to use after piping and electrical connections. **Play with parameters is optional, not mandatory!**

4.1 CONNECTION

1 **In order to access valve parameterization:**
- Install E-SW-SETUP 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 show below via Bluetooth (adapter only) or USB (cable and isolator adapter)

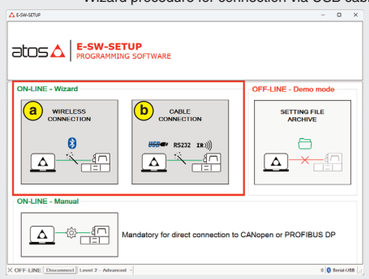




WARNING: drivers USB port is not isolated!
The use of USB isolator adapter is highly recommended for PC protection (see **GS500**)

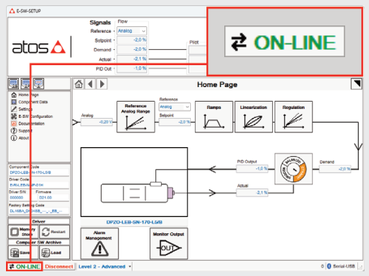
3 Launch the PC software using E-SW-SETUP icon:
- **PC software does NOT detect valid connection** communication is not established, please follow wizard procedure **4**
- **PC software detects valid connection** communication automatically established **-** valve is **ON-LINE** see **5**

4 In **ON-LINE - Wizard** press button:
- **a : WIRELESS CONNECTION** Wizard procedure for connection via Bluetooth
- **b : CABLE CONNECTION** Wizard procedure for connection via USB cable

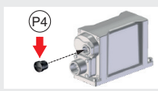


NOTE: for more info about E-A-BTH Bluetooth adapter, please refer to STARTUP BLUETOOTH guide

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



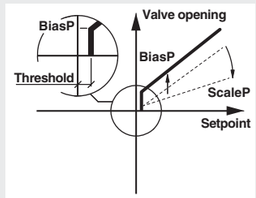
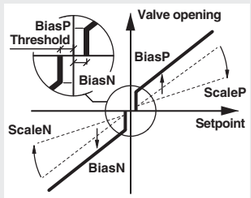
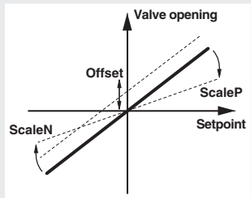
REMARK: once removed the E-A-BTH Bluetooth adapter or E-C-SB-USB/M12 USB cable, screw the plastic protection cap **P4** applying the correct tightening torque, in order to preserve valve's IP protection characteristics



Tightening torque

0,6 Nm

4.2 CONFIGURATION

Single solenoid directional control valve, 2 positions with positive overlapping	Double solenoid directional control valve, 3 positions with positive overlapping	Single or double solenoid directional control valve, 3 positions with zero overlapping
		
BiasP positive bias **ScaleP** positive scale **Threshold** = 2% (200mV or 0,32mA for **/I** option)	**BiasP** positive bias **ScaleP** positive scale **BiasN** negative bias **ScaleN** negative scale **Threshold** = 2% (±200mV or ±0,16mA for **/I** option)	**ScaleP** positive scale **ScaleN** negative scale **Offset**

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

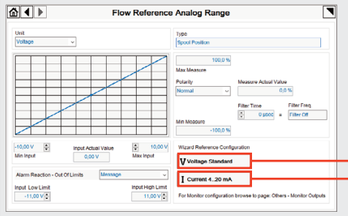
OFFSET AND SCALE – 3 POSITION VALVES, ZERO OVERLAP

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-SETUP - 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 PC 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

V Voltage Standard

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

I 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 Output**

4.3 SMART TUNING - E-SW-SETUP

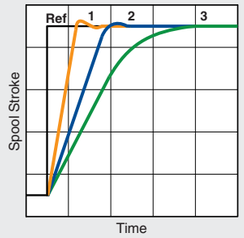
Smart tuning allows to adjust the valve dynamic response in order to match different performance requirements.

The valve is provided with 3 factory setting for the spool control:

dynamic fast response time and high sensitivity for best dynamic performances (default factory setting)

balanced average response time and sensitivity suitable for major applications

smooth attenuated response time and sensitivity to improve control stability in critical applications or in environments with electrical disturbances



1 = dynamic
2 = balanced
3 = smooth

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

STEP 5 MOBILE APP

ATOS CONNECT for smartphones and tablets is a free downloadable app which allows quick access to valve main functional parameters and configuration via Bluetooth, thus avoiding physical cable connection and significantly reducing commissioning times.

ATOS CONNECT app requirements:
- iOS 14 / Android 9
- Bluetooth Low Energy (BLE), version 4.2 or higher
- Atos digital valves/drivers equipped with E-A-BTH Bluetooth adapter or with built-in Bluetooth

Download on the App Store

GET IT ON Google Play

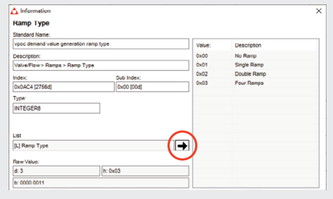
EXPLORE IT ON AppGallery

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 incompliance 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

PC 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

PC 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 PC software parameters the valve does not work properly
- restore valve factory parameters using 'Load Factory Set' button, located in 'Driver - Memory Save' 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!