

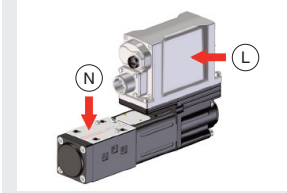
DIRECT OPERATED PROPORTIONAL DIRECTIONAL AND FLOW VALVES

Valve model:
DHZO-TEB DKZOR-TEB QVHZO-TEB
DLHZO-TEB DLKZOR-TEB QVKZOR-TEB

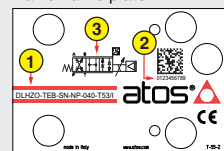
Driver models:
E-RI-TEB-N-NP for valves without IO-Link communication interface NP
E-RI-TEB-N-IL for valves with IO-Link communication interface IL

IDENTIFICATION

Valve identification plates and label

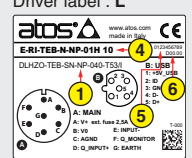


Valve name plate : N







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 NP	IO-Link connector IL
 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

PC software	mobile App	Bluetooth Adapter	OR	USB connection KIT
 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



WELCOME
enter your email
Password
Forgot your password?
Register

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
FS165 DHZO, DKZOR positive spool overlap - tech. table	E-MAN-RI-LEB TEB/LEB - driver operating manual
FS168 DHZO, DKZOR zero spool overlap - tech. table	E-MAN-S-IL IO-Link protocol programming manual
FS180 DLHZO, DLKZOR servoproportional - tech. table	
FS412 QVHZO, QVKZOR flow controls - 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 !

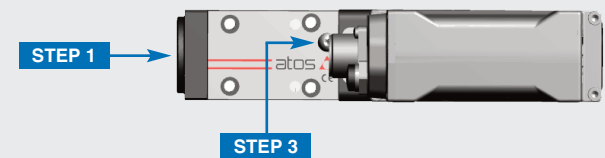
The purpose of this quickstart guide is show a logical sequence of basic operations. This guide does not cover all details or variants of Atos valves. All operations described in this document should be performed only by qualified personnel. Operations and images could be subject to change without notice.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

CONTACT US

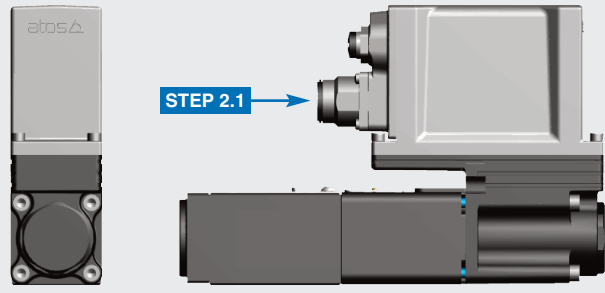
Atos spa - Italy - 21018 Sesto Calende www.atos.com support@atos.com

PRODUCTS OVERVIEW

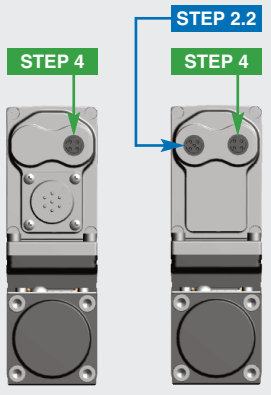
STEP 1




STEP 2.1




STEP 2.2



NP

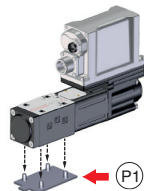


IL



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

STEP 1 MECHANICAL



P1

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-TEB / DLHZO-TEB

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

T A B P

n°4 OR 108

Fastening bolts socket head screws

Tightening torque: 8 Nm

n°4 M5x50 class:12.9 wrench 4 mm

DKZOR-TEB / DLKZOR-TEB

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

P A B T

n°5 OR 2050

Fastening bolts socket head screws

Tightening torque: 15 Nm

n°4 M6x40 class:12.9 wrench 5 mm

QVHZO-TEB

Mounting surface layout

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

T A B P

n°4 OR 108

Fastening bolts socket head screws

Tightening torque: 8 Nm

n°4 M5x50 class:12.9 wrench 4 mm

QVKZOR-TEB

Mounting surface layout

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

P A B T

n°5 OR 2050

Fastening bolts socket head screws

Tightening torque: 15 Nm

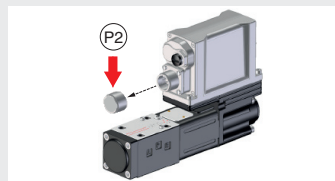
n°4 M6x40 class:12.9 wrench 5 mm

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 - only for NP

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

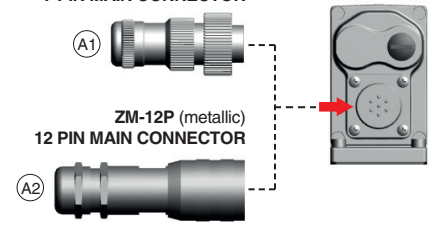
Standard	/Z option
A V+ (power supply 24Vdc)	1 V+ (power supply 24Vdc)
B V0 (power supply 0Vdc)	2 V0 (power supply 0Vdc)
C AGND	3 ENABLE (input 24Vdc)
D Q_INPUT+ (±10Vdc / 4 ÷ 20mA)	4 Q_INPUT+ (±10Vdc / 4 ÷ 20mA)
E INPUT- (±10Vdc / 4 ÷ 20mA)	5 INPUT- (±10Vdc / 4 ÷ 20mA)
F Q_MONITOR (±10Vdc / 4 ÷ 20mA)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

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

ELECTRICAL WIRING EXAMPLES - only for NP

MAIN CONNECTOR - VOLTAGE

REFERENCE INPUT - DIFFERENTIAL MODE

cabinet side	main connector pin-out	valve internal circuit
0÷10 Vdc	std / F / Q / Z	
Ref. Q ⊕	D 4	Q_INPUT+ 50K
Ref. Q ⊖	E 5	INPUT- 50K

REFERENCE INPUT - COMMON MODE

cabinet side	main connector pin-out	valve internal circuit
0÷10 Vdc	std / F / Q / Z	
Ref. Q ⊖	D 4	Q_INPUT+ 50K
⊥ (0 V)	E 5	INPUT- 50K

MONITOR OUTPUT

cabinet side	main connector pin-out	valve internal circuit
±10 Vdc	std / Q / Z	
Mon. Q ⊖	F 6	Q_MONITOR
⊥ (0 V)	C B 7	AGND / V0

MAIN CONNECTOR - CURRENT

REFERENCE INPUT - DIFFERENTIAL MODE

cabinet side	main connector pin-out	valve internal circuit
4÷20 mA	std / F / Q / Z	
Ref. Q ⊕	D 4	Q_INPUT+ Rsh = 500 ohm
Ref. Q ⊖	E 5	INPUT-

REFERENCE INPUT - COMMON MODE

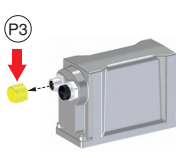
cabinet side	main connector pin-out	valve internal circuit
4÷20 mA	std / F / Q / Z	
Ref. Q ⊖	D 4	Q_INPUT+ Rsh = 500 ohm
⊥ (0 V)	E 5	INPUT-

MONITOR OUTPUT

cabinet side	main connector pin-out	valve internal circuit
4÷20 mA	std / Q / Z	
Mon. Q ⊖	F 6	Q_MONITOR
⊥ (0 V)	C B 7	AGND / V0

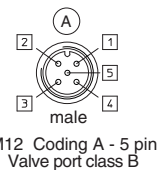
2.2 IO-Link CONNECTOR - only for IL

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

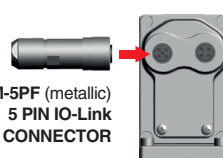


1 L+ (power supply 24Vdc - IO-Link)
2 P24 (power supply 24Vdc - others) (1)
3 L- (power supply 0Vdc - IO-Link)
4 C/Q IO-Link data-line
5 N24 (power supply 0Vdc - others) (1)

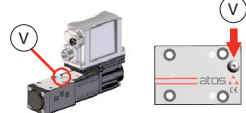
(1) max power consumption 50 W; for master ports class A connect P24/N24 to an external power supply

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




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



STEP 3 HYDRAULICS



Wrenches types

DHZO DLHZO	 3 mm	Tightening torque 4 Nm
DKZOR DLKZOR	 or  4 mm 13 mm	Tightening torque 8 Nm

Air bleeding - only DHZO, DLHZO, DKZOR and DLKZOR:

- 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 T line for standard valves or on Y line for valves with /Y option

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

STEP 4 PC SOFTWARE

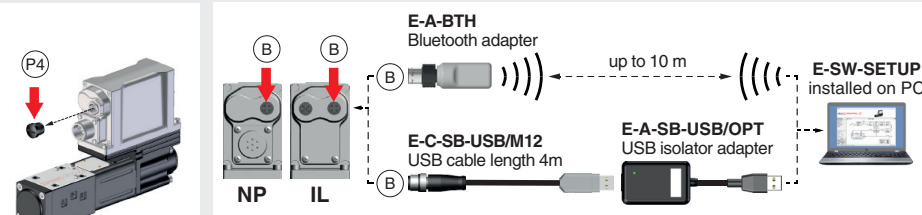
REMARK proportional valves with on-board electronics are factory preset with default parameter and ready to use after piping and electrical connections. **Play with parameters is optional, not mandatory!**

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)

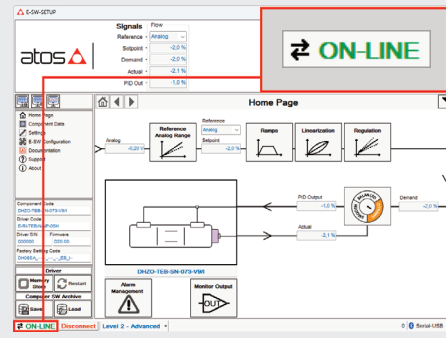
3 Launch the PC software using E-SW-SETUP icon:

- **PC software does NOT detect valid connection** communication is not established, please follow wizard procedure
- **PC software detects valid connection** communication automatically established - valve is **ON-LINE** see **5**

4 In **ON-LINE** - Wizard press button:

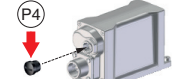
- a** : **WIRELESS CONNECTION**
Wizard procedure for connection via Bluetooth
- b** : **CABLE CONNECTION**
Wizard procedure for connection via USB cable

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



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

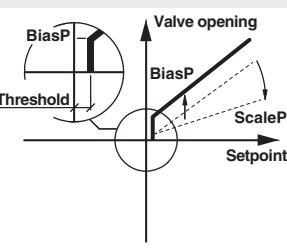
REMARK: once removed the E-A-BTH Bluetooth adapter or E-C-SB-USB/M12 USB cable, screw the plastic protection cap **P4** applying the correct tightening torque, in order to preserve valve's IP protection characteristics



Tightening torque
0,6 Nm

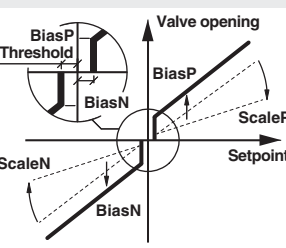
4.2 CONFIGURATION

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



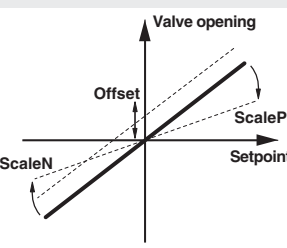
BiasP positive bias
ScaleP positive scale

Double solenoid directional control valve, 3 positions with positive overlapping



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

Single or double solenoid directional control valve, 3 positions with zero overlapping



ScaleP positive scale
ScaleN negative scale
Offset

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

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 and flow controls valves for both valve's solenoids

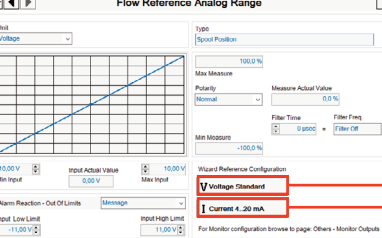
OFFSET AND SCALE – 3 POSITION VALVES, ZERO OVERLAP

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

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

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

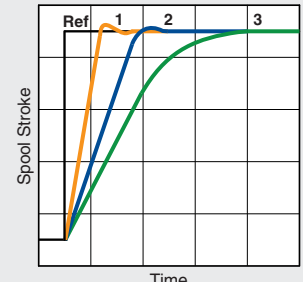
Smart tuning allows to adjust the valve dynamic response in order to match different performance requirements.

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

4.4 STORE

Parameters modifications will be stored into driver permanent memory:

• press **Memory Store** button to access **Driver - Memory Save** window

• press **Save User Set** 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.

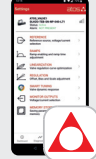
4.5 BACK UP

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

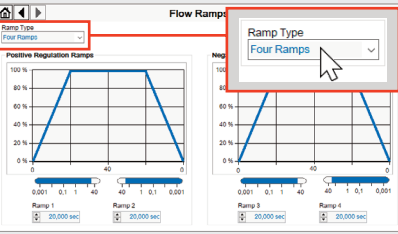



HINT ! - Wizard objects dictionary - only for IL

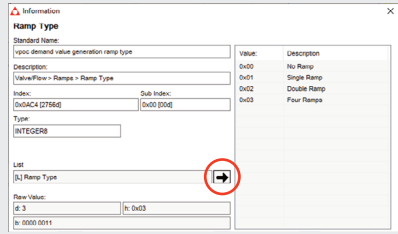
Press **CTRL + H** on the PC keyboard to open the context help form

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

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!