QUICKSTART BASIC OFF-BOARD DRIVER

QB040-0 - 11/22

for digital proportionals with LVDT transducer - analog reference signal

DIN-RAIL DIGITAL DRIVER FOR DIRECTIONAL AND FLOW VALVES

Industrial driver model:
E-BM-TEB/LEB series 20 or higher

Industrial valve models:

Direct operated
DLHZO-T DHZO-T QVHZO-T
DLKZOR-T DKZOR-T QVKZOR-T

Pilot operated
DPZO-T LIQZP-L
DPZO-L

Ex-Proof driver model:
E-BM-TEB/LEB **/A** series 20 or higher

Ex-Proof valve models:

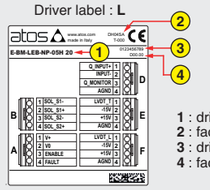
Direct operated
DLHZA-T DHZA-T QVHZA-T
DLKZA-T DKZA-T QVKZA-T

Pilot operated
DPZA-T LIQZA-T
DPZA-L

IDENTIFICATION

Driver identification label

Driver label : **L**



1 : driver code
2 : factory set code
3 : driver serial number
4 : factory firmware version

INSTALLATION TOOLS

Screwdriver	DIN-rail EN60715	Connectors
not included	not included	supplied with the driver
see STEP 1		see STEP 2

PROGRAMMING TOOLS - not included

Software	USB connection KIT		OR	Bluetooth connection KIT	
	Cable	Isolator		Cable	Adapter
E-SW-* programming software	**E-C-SB-USB/BM**	**E-A-SB-USB/OPT**		**E-C-SB-BM/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) **EW** (POWERLINK)	**BP** (PROFIBUS DP) **EI** (EtherNet/IP)	**EH** (EtherCAT) **EP** (PROFINET RT/IRT)	
E-SW-*/PQ	supports	drivers with **SP**, **SF**, **SL** alternated P/Q control			

E-SW-FIELDBUS supports also drivers without fieldbus communication; E-SW-*/PQ supports also drivers without P/Q control

REMARK Atos software is designed for Windows based operative systems - Windows XP SP3 or later

DOWNLOAD AREA

Download area
electronics

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
F***	Proportional valves with one or two LVDT - tech. table	**STARTUP BLUETOOTH**	Bluetooth adpter startup guide
P005	Mounting surface - tech. table	**E-MAN-BM-LEB**	TEB/LEB - driver operating manual
GS230	E-BM-TEB/LEB drivers - tech. table		
GS500	Programming tools - 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

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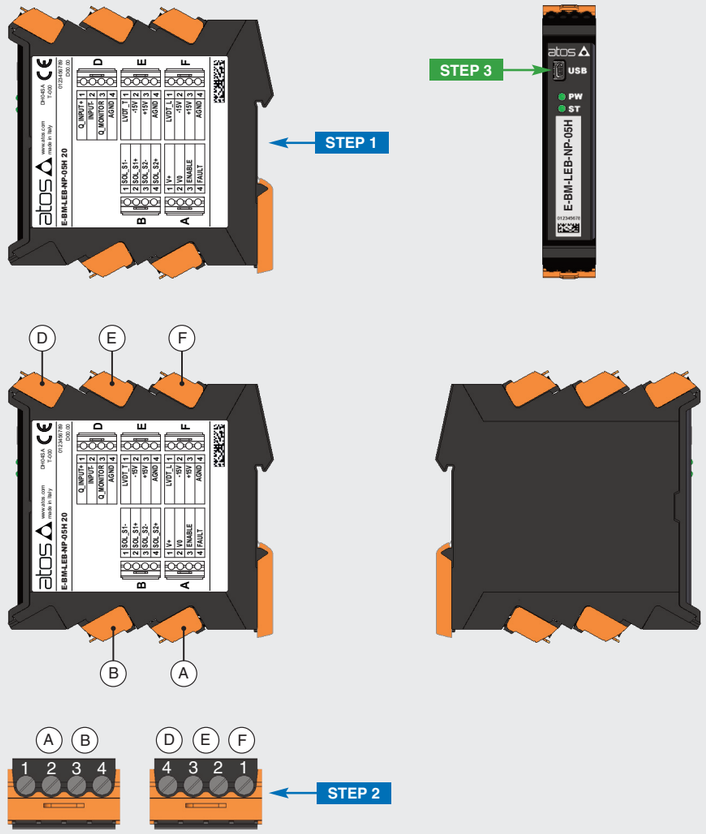
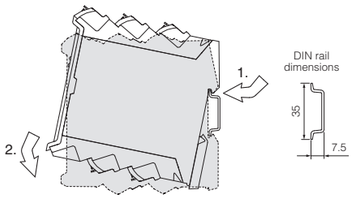
PRODUCTS OVERVIEW



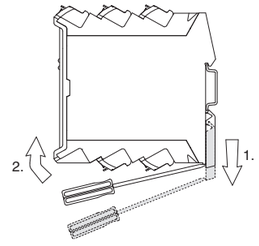
INSTALLATION		PROGRAMMING
STEP 1	STEP 2	STEP 3
MECHANICAL	ELECTRICAL	SOFTWARE

STEP 1 MECHANICAL

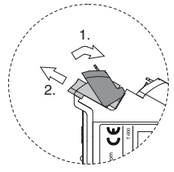
To lock the driver from the DIN rail:
1. place the attach located on the driver bottom on the DIN rail
2. press the driver against the DIN rail until the locking slide clicks



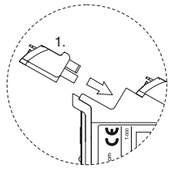
To unlock the driver from the DIN rail:
1. pull down the locking slide with a screwdriver
2. rotate up the driver



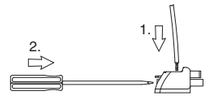
To extract the connectors:
1. push lever
2. pull connector



To insert the connectors:
1. push the connector in its slot



To wire cables in the connectors:
1. insert the cable termination
2. turn screw with a screwdriver



NOTE:
max conductor size 2,5 mm²
tightening torque 0,4 ÷ 0,6 Nm

NOTE: all connectors are supplied with a mechanical coding. This feature ensures a unique insertion of each connector in the own slot (e.g. connector A can not be inserted into connector slot of B,D,E,F)

STEP 2 ELECTRICAL

This section considers the different drivers executions, illustrating the multiple variants of the available electrical connections. The electrical connections have to be wired according to the selected driver code

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

Recommended LiYCY shielded cables: 0,5 mm² max 50 m - for logic - 1,5 mm² max 50 m - for power supply and solenoids

	Power supply		
A	1	**V+**	(power supply 24Vdc)
	2	**V0**	(power supply 0Vdc)
	3	**ENABLE**	(input 24Vdc)
	4	**FAULT**	(output 24Vdc)

	Enable and fault signals		
B	1	**SOL_S1-**	(negative current to solenoid S1)
	2	**SOL_S1+**	(positive current to solenoid S1)
	3	**SOL_S2-**	(negative current to solenoid S2)
	4	**SOL_S2+**	(positive current to solenoid S2)

	Pressure transducer		
D	1	**Q_INPUT+**	(±10Vdc / 4 ÷ 20mA)
	2	**INPUT-**	(negative reference for INPUT+)
	3	**Q_MONITOR**	(±10Vdc / 4 ÷ 20mA)
	4	**AGND**	(ground for monitor)

	LVDT position transducer - direct valve or pilot valve		
E	1	**LVDT_T**	(direct or pilot valve - transducer input signal)
	2	**-15V**	(power supply -15Vdc)
	3	**+15V**	(power supply +15Vdc)
	4	**AGND**	(ground for transducer power)

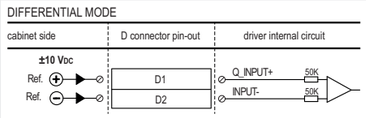
	LVDT position transducer - main stage valve		
F (1)	1	**LVDT_L**	(main stage valve - transducer input signal)
	2	**-15V**	(power supply -15Vdc)
	3	**+15V**	(power supply +15Vdc)
	4	**AGND**	(ground for transducer power)

(1) F connector is available only for LEB

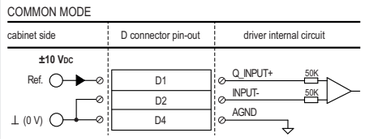
ELECTRICAL WIRING EXAMPLES FOR INDUSTRIAL VALVES - for **Ex-Proof** valves please refer to relevant tech. tables

REFERENCE INPUT - VOLTAGE

DIFFERENTIAL MODE

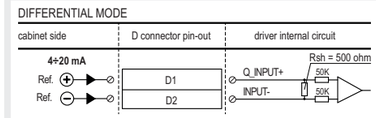


COMMON MODE

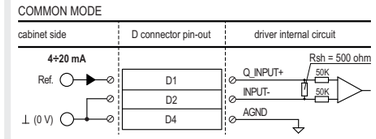


REFERENCE INPUT - CURRENT

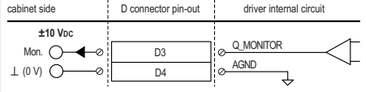
DIFFERENTIAL MODE



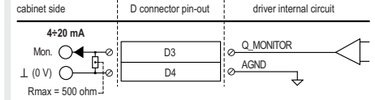
COMMON MODE



MONITOR OUTPUT - VOLTAGE

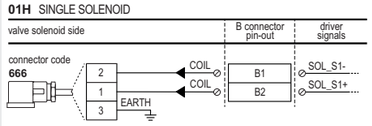


MONITOR OUTPUT - CURRENT

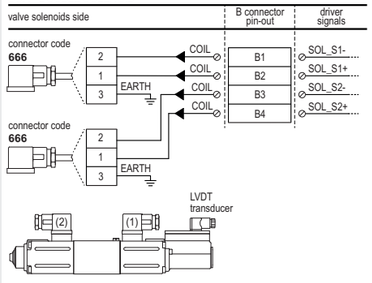


SOLENOIDS

01H SINGLE SOLENOID



05H DOUBLE SOLENOID

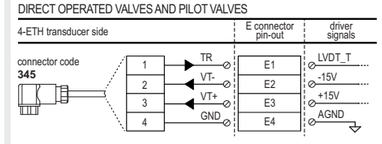


Plug in the connector (1) to the solenoid located at side of the LVDT transducer
Plug in the connector (2) to the solenoid located at opposite side of the LVDT transducer

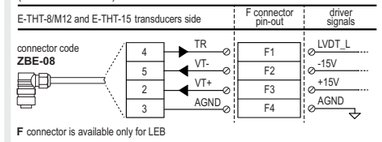
WARNING: for double solenoid valve pay attention to do not invert the connectors (1) and (2). If they are not inserted as shown in the example, the valve will not work properly and could cause eventual damages to the system.

LVDT TRANSDUCERS

DIRECT OPERATED VALVES AND PILOT VALVES

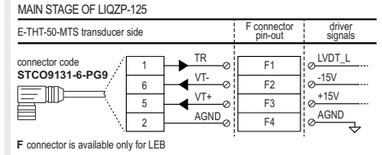


MAIN STAGE OF PILOT OPERATED VALVES WITH 2 TRANSDUCERS (EXCEPT LIQZP-125)



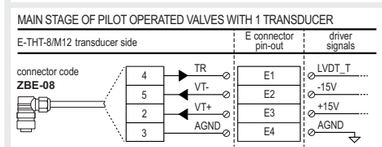
F connector is available only for LEB

MAIN STAGE OF LIQZP-125



F connector is available only for LEB

MAIN STAGE OF PILOT OPERATED VALVES WITH 1 TRANSDUCER



ELECTRICAL CONNECTIONS QUICK REPLACEMENT OF SERIES 20 OR HIGHER VS SERIES 10

POWER SUPPLY, ENABLE, FAULT

E-BM-TEB/LEB s20		E-BM-TEB/LEB s10	
A connector pin-out		A connector pin-out	
V+	A1	A1	V+
V0	A2	A2	V0
ENABLE	A3	C connector pin-out	
FAULT	A4	C2	ENABLE
		C4	FAULT

FLOW REFERENCE, FLOW MONITOR, AGND

E-BM-TEB/LEB s20		E-BM-TEB/LEB s10	
D connector pin-out		B connector pin-out	
Q_INPUT+	D1	B1	Q_INPUT+
INPUT-	D2	B2	INPUT-
Q_MONITOR	D3	B3	AGND
AGND	D4	C connector pin-out	
		C1	Q_MONITOR

COILS

E-BM-TEB/LEB s20		E-BM-TEB/LEB s10	
B connector pin-out		F connector pin-out	
SOL_S1-	B1	F1	SOL_S1-
SOL_S1+	B2	F2	SOL_S1+
SOL_S2-	B3	F3	SOL_S2-
SOL_S2+	B4	F4	SOL_S2+

LVDT TRANSDUCER

DIRECT VALVES AND PILOT STAGE OF PILOTED VALVES WITH 2 TRANSDUCERS

E-BM-TEB/LEB-*H s20		E-BM-TEB/LEB-*H s10	
E connector pin-out		E connector pin-out	
LVDT_T	E1	E1	LVDT_T
-15V	E2	E2	-15V
+15V	E3	E3	+15V
AGND	E4	E4	AGND

LVDT TRANSDUCER

MAIN STAGE OF PILOT OPERATED VALVES WITH 1 TRANSDUCER

E-BM-TEB-*HP s20		E-BM-TEB-*HP s10	
E connector pin-out		D connector pin-out	
LVDT_T	E1	D1	LVDT_L
-15V	E2	D2	-15V
+15V	E3	D3	+15V
AGND	E4	D4	AGND

LVDT TRANSDUCER

MAIN STAGE OF PILOT OPERATED VALVES WITH 2 TRANSDUCERS

E-BM-LEB-*H s20		E-BM-LEB-*H s10	
F connector pin-out		D connector pin-out	
LVDT_L	F1	D1	LVDT_L
-15V	F2	D2	-15V
+15V	F3	D3	+15V
AGND	F4	D4	AGND

NOTE: R_ENABLE (pin C3) and EARTH (pin B4) of E-BM-TEB/LEB series 10 are not supported by series 20

STEP 3 SOFTWARE

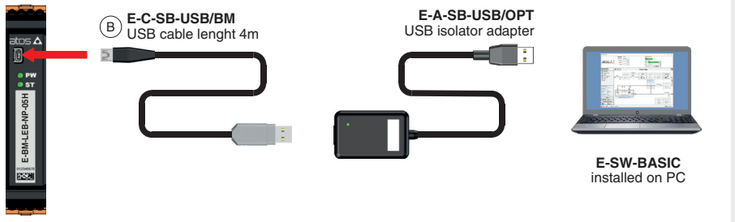
REMARK off-board drivers are factory preset with default parameters and ready to use after piping and electrical connections.
Play with parameters is optional, not mandatory!

PROGRAMMING			PC
3.1	3.2	3.3	3.4
CONNECTION	CONFIGURATION	STORE	BACK UP

3.1 CONNECTION

1 **In order to access valve parameterization:**
- Install E-SW software on PC
- Complete the electrical installation and power on the driver with **24VDC**

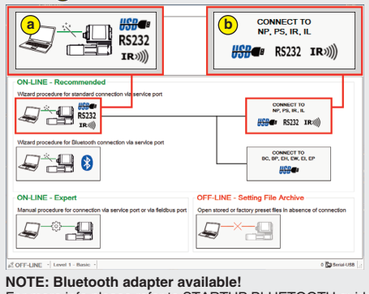
2 Connect driver to the PC as shown below



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

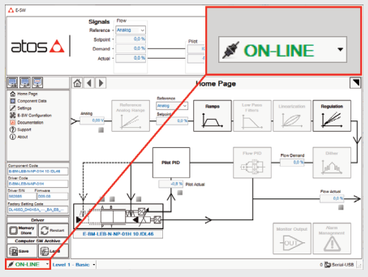
3 Launch the software using E-SW icon:
- **software does NOT detect valid connection**
  communication is not established, please follow wizard procedure **4**
- **software detects valid connection**
  communication automatically established **-** valve is **ON-LINE** see **5**

4 Press buttons according the below sequence:
(a) : ON-LINE - Recommended
Wizard procedure for standard connection
(b) : CONNECT TO NP, PS, IR, IL

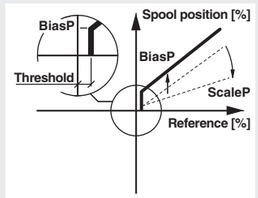
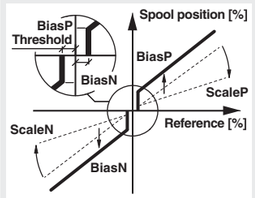
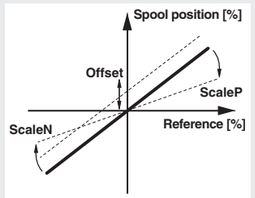


NOTE: Bluetooth adapter available!
For more info please refer to STARTUP BLUETOOTH guide

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

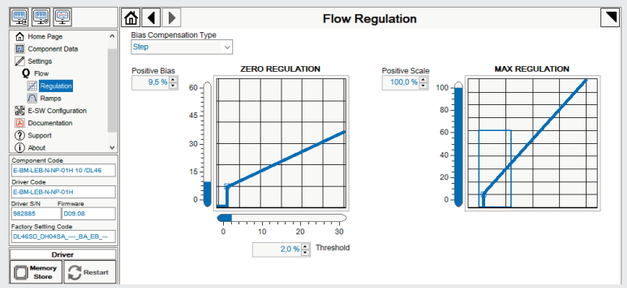


3.2 CONFIGURATION

Single solenoid directional control valve, 2 positions with positive overlapping, flow control valve and cartridges 2 way	Double solenoid directional control valve, 3 positions with positive overlapping	Single or double solenoid directional control valve, 3 positions with zero overlapping and cartridges 3 way
		
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**

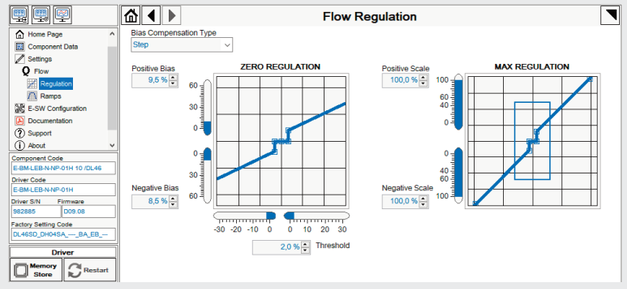
BIAS AND SCALE - 2 POSITION VALVES , FLOW CONTROL VALVES and CARTRIDGES 2 WAY

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



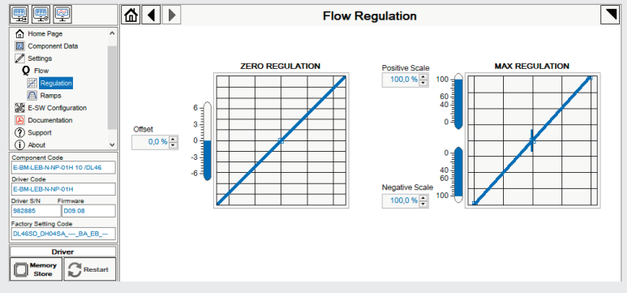
BIAS AND SCALE - 3 POSITION VALVES

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



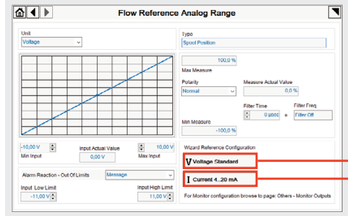
OFFSET AND SCALE – 3 POSITION VALVES, ZERO OVERLAP and CARTRIDGES 3 WAY

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

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:



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 Outputs**

3.3 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**

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.

3.4 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 tech. table of the connected valve

The valve does not follow the reference signal
- driver is powered off, verify presence of 24 Vdc power supply
- driver is disabled, verify presence of 24 Vdc on enable pin
- 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 pressure in X (for DPZO/E and LIQZP) or P line (DPZO) is compliant with the required value
- wrong pilot/drain configuration - check if the pilot/drain configuration of the valve corresponds to the effective system layout (only DPZO)

Software parameters modifications are lost when valve is switched off
- parameter store operation was not performed, check store procedure – see STEP 3, section 3.3

Software parameters modifications have no effect on the valve
- valve is OFF LINE, check connection procedure – see STEP 3, section 3.1

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!
  - perform the bias and scale configurations again!