QUICKSTART FULL OFF-BOARD DRIVER

QF050-1 - 11/24

for digital proportionals without transducer - fieldbus

DIN-RAIL DIGITAL DRIVER FOR DIRECTIONAL, PRESSURE AND FLOW VALVES

Industrial driver model:
E-BM-AES

Ex-Proof driver model:
E-BM-AES **/A**

Industrial valve models:

Directional

DHZO-A
DKZOR-A
DHZE-A
DKZE-A

DPZO-A
DPZE-A
DHZEM-A

Flow

QVHZO-A
QVKZOR-A
QVHMZO-A
QVKMZOR-A

Pressure

RZMO-A
RZME-A
CART RZME-A
AGMZO-A
AGMZE-A

RZGO-A
RZGE-A
CART RZGE-A
AGRCZO-A

HZMO-A
HZGO
KZGO
DRHZO-A
DRHZE-A

LIMZO-A
LIRZO-A
LICZO-A

Ex-Proof valve models:

Directional

DHZA-A
DKZA-A
DPZA-A

Flow

QVHZA-A
QVKZA-A

Pressure

RZMA-A
HZMA-A
AGMZA-A
DHRZA-A

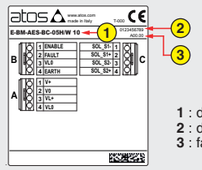
RZGA-A
HZGA-A
KZGA-A
AGRCZA-A

LIMZA-A
LIRZA-A
LICZA-A

IDENTIFICATION

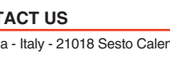
Driver identification label

Driver label : **L**



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

INSTALLATION TOOLS

Screwdriver	DIN-rail EN60715	Connectors
		
not included	not included	supplied with the driver
see STEP 1		see STEP 2.1

PROGRAMMING TOOLS - not included

PC software	USB connection KIT	
	Cable	Isolator
E-SW-SETUP	**E-C-SB-USB/BM**	**E-A-SB-USB/OPT**

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 area
electronics

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	**E-MAN-BM-AES**	AES - driver operating manual
F***	Proportional valves with one or two LVDT - tech. table	**E-MAN-S-BC**	CANopen protocol programming manual
P005	Mounting surface - tech. table	**E-MAN-S-BP**	PROFIBUS DP protocol programming manual
GS050	E-BM-AES drivers - tech. table	**E-MAN-S-EH**	EtherCAT protocol programming manual
GS500	Programming tools - tech. table		
GS510	Fieldbus - tech. table		
K800	Electric and electronic connectors - tech. table		

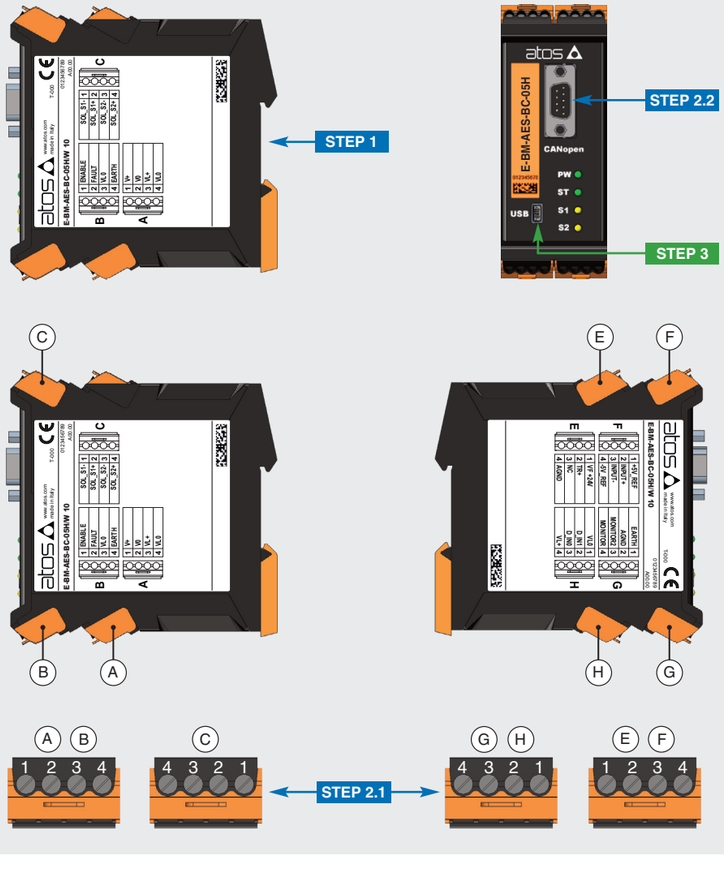
ATTENTION !

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

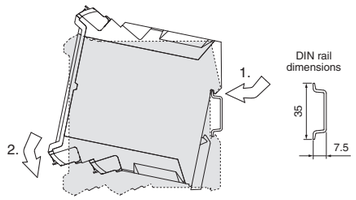
PRODUCTS OVERVIEW



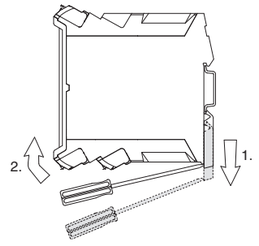
INSTALLATION		PROGRAMMING
STEP 1	STEP 2	STEP 3
MECHANICAL	ELECTRICAL	SOFTWARE

STEP 1 MECHANICAL

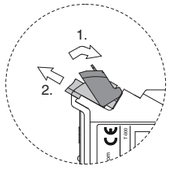
To lock the driver from the DIN rail:
1. place the attach located on the driver bottom on the DIN rail
2. press the driver against the DIN rail until the locking slide clicks



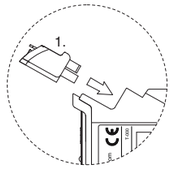
To unlock the driver from the DIN rail:
1. pull down the locking slide with a screwdriver
2. rotate up the driver



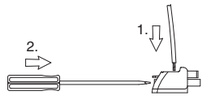
To extract the connectors:
1. push lever
2. pull connector



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,C,E,F,G,H)

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

2.1 CONNECTORS

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

E-BM-AES

Power supply			
A	1	**V+**	(power supply 24Vdc)
	2	**V0**	(power supply 0Vdc)
	3	**VL+**	(power supply 24Vdc)
	4	**VL0**	(power supply 0Vdc)
Enable and fault signals			
B	1	**ENABLE**	(input 24Vdc)
	2	**FAULT**	(output 24Vdc)
	3	**VL0**	(ground for ENABLE and FAULT)
	4	**EARTH**	
Solenoids			
C	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)
Valve signal and potentiometer power supply			
F	1	**+5V_REF**	(power supply +5Vdc)
	2	**INPUT+**	(±10Vdc / 4 ÷ 20mA)
	3	**INPUT-**	(negative reference for INPUT+)
	4	**-5V_REF**	(power supply -5Vdc)
Monitor signal			
G	1	**EARTH**	
	2	**AGND**	(ground for MONITOR and potentiometer)
	3	**NC**	
	4	**MONITOR**	(±5Vdc ; 1V=1A)
Digital inputs			
H	1	**VL0**	(power supply 0Vdc for digital input)
	2	**D_IN1**	(input 24Vdc)
	3	**D_IN0**	(input 24Vdc)
	4	**VL+**	(power supply 24Vdc for digital input)

E-BM-AES
drivers with /W option

Power supply			
A	1	**V+**	(power supply 24Vdc)
	2	**V0**	(power supply 0Vdc)
	3	**VL+**	(power supply 24Vdc)
	4	**VL0**	(power supply 0Vdc)
Enable and fault signals			
B	1	**ENABLE**	(input 24Vdc)
	2	**FAULT**	(output 24Vdc)
	3	**VL0**	(ground for ENABLE and FAULT)
	4	**EARTH**	
Solenoids			
C	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			
E (1)	1	**VF +24V**	(power supply 24Vdc)
	2	**TR+**	(±10Vdc / 4 ÷ 20mA)
	3	**NC**	
	4	**AGND**	(ground for transducer and potentiometer)
Valve signal and potentiometer power supply			
F	1	**+5V_REF**	(power supply +5Vdc)
	2	**INPUT+**	(±10Vdc / 4 ÷ 20mA)
	3	**INPUT-**	(negative reference for INPUT+)
	4	**-5V_REF**	(power supply -5Vdc)
Monitor signals			
G	1	**EARTH**	
	2	**AGND**	(ground for MONITOR and potentiometer)
	3	**MONITOR2**	(0 ÷ 5Vdc) **(2)**
	4	**MONITOR**	(±5Vdc ; 1V=1A)
Digital inputs			
H	1	**VL0**	(power supply 0Vdc for digital input)
	2	**D_IN1**	(input 24Vdc)
	3	**D_IN0**	(input 24Vdc)
	4	**VL+**	(power supply 24Vdc for digital input)

(1) E connector is available only for /W option
(2) MONITOR2 signal is available only for /W option

2.2 FIELDBUS CONNECTORS - only for BC, BP, EH

Select fieldbus connectors according to driver code and proceed with wirings operations

BC

BC (DB9 - 9 pin)		
2	**CAN_L**	Bus line (low)
3	**CAN_GND**	Signal zero data line
5	**CAN_SHLD**	Shield
7	**CAN_H**	Bus line (high)

BP

BP (DB9 - 9 pin)		
1	**SHIELD**	
3	**LINE-B**	Bus line (low)
5	**DGND**	Data line - termination signal zero
6	**+5V**	Termination supply signal
8	**LINE-A**	Bus line (high)

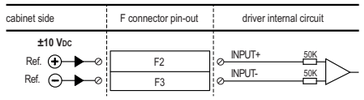
EH

EH (RJ45 - 8 pin)		
1	**TX+**	Transmitter
2	**RX-**	Receiver
3	**TX-**	Transmitter
6	**RX-**	Receiver

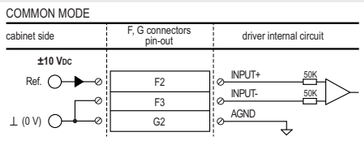
ELECTRICAL WIRING EXAMPLES FOR INDUSTRIAL VALVES - for **Ex-Proof** valves please refer to relevant tech. tables

REFERENCE INPUT - VOLTAGE

DIFFERENTIAL MODE

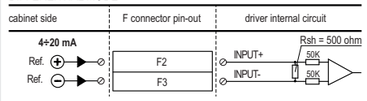


COMMON MODE

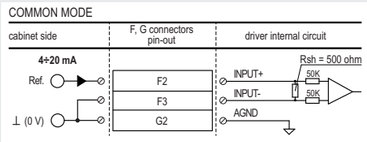


REFERENCE INPUT - CURRENT

DIFFERENTIAL MODE

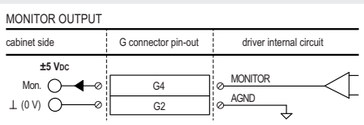


COMMON MODE

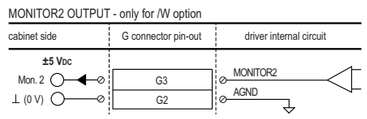


MONITORS OUTPUT - VOLTAGE ONLY

MONITOR OUTPUT

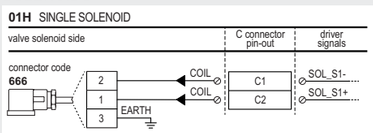


MONITOR2 OUTPUT - only for /W option

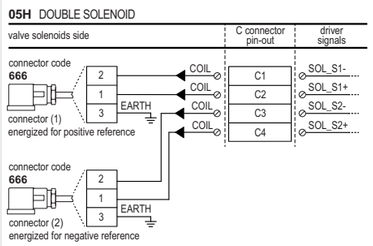


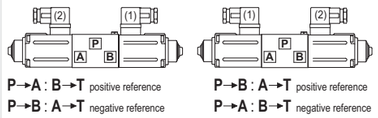
SOLENOIDS

01H SINGLE SOLENOID

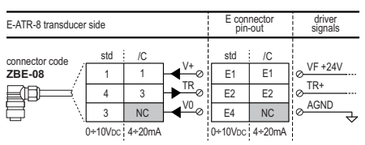


05H DOUBLE SOLENOID



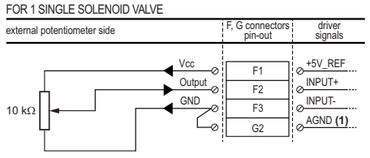


PRESSURE TRANSDUCER - only for /W option



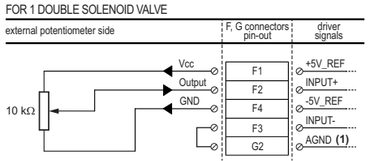
EXTERNAL POTENTIOMETER

FOR 1 SINGLE SOLENOID VALVE



(1) Only for **/W** option, as alternative the **AGND** on pin **E4** can be used

FOR 1 DOUBLE SOLENOID VALVE



(1) Only for **/W** option, as alternative the **AGND** on pin **E4** can be used

STEP 3 PC SOFTWARE

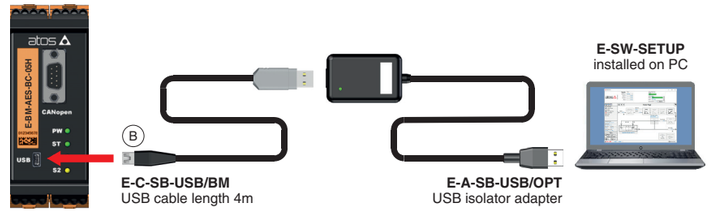
REMARK off-board drivers are factory preset with default parameters, only few programming operations are mandatory for:
- setup the network parameters and the source of reference signals
- setup the feedback's scale for pressure transducers only for **/W** option; please refer the E-MAN-BM-AES manual

Driver programming can be performed through E-SW-SETUP software or via fieldbus

3.1 CONNECTION

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

2 Connect driver to the PC as shown below

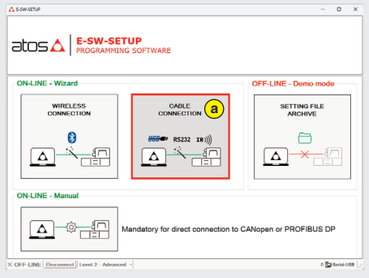


WARNING: drivers USB port is not isolated!
The use of USB isolator adapter is highly recommended for PC protection (see **GS500**)

3 Launch the 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:

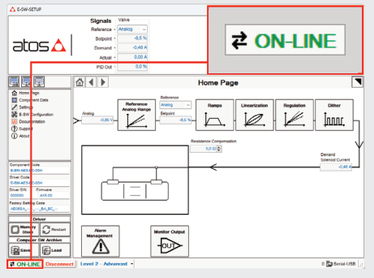
(a): CABLE CONNECTION
Wizard procedure for connection via USB cable



NOTE: Bluetooth not available for E-BM-AES

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

NOTE: please also refer to the following parameter settings:
- see step 3.2 to change the network setup
- see step 3.3 to change the reference signals setup



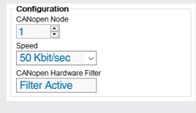
3.2 FIELDBUS - Network Management - only for BC, BP, EH

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

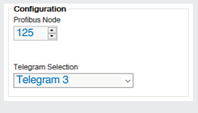
2) E-SW-SETUP software
- browse to **Network Management - Configuration** to change below default settings:

BC CANopen
Configuration file: **EDS**



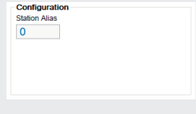
BP PROFIBUS DP
Configuration file: **GSD**

Defaults: Telegram 3



EH EtherCAT
Configuration file: **XML**

Station Alias is assigned automatically by fieldbus master



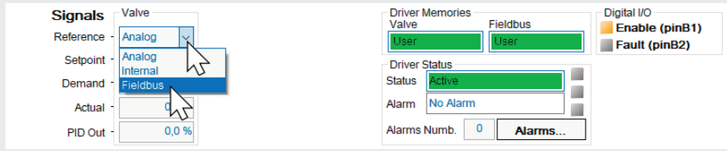
- press **Memory Store** button and press **Save User Set** button to save new setting into the driver (see 3.4)
- network configuration settings will be applied at next driver power on or pressing the **Restart** button

NOTE: configuration files are available in MyAtos area - **www.atos.com**

3.3 REFERENCES - only for BC, BP, EH

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**



3.4 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.

3.5 BACK UP

Parameter modifications will be saved into PC memory:

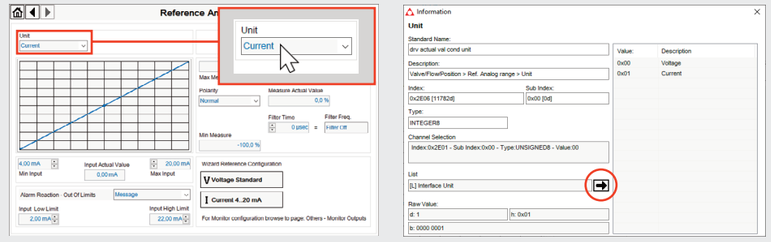
- press **Save** button to access **Computer SW Archive - Setting Files** page, **Setting File Name** pop-up appears
- input a valid name into **Description** field and press **Ok** button

HINT ! - Wizard objects dictionary - only for 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

TROUBLESHOOTING

Valve vibration or noise
- presence of air in the solenoid; perform air bleeding procedure – see tech. table of the connected valve
- dither frequency too low; increase value of the frequency – please refer to E-MAN-BM-AES operating manual

The valve does not follow the reference signal
- driver is powered off, verify presence of 24 Vdc power supply and the coil(s) connection
- 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
- big hysteresis or spool stick-slip, reduce the dither frequency
- the mechanical pressure limiter interferes with the regulation (only AGMZO and AGRCZO with /P option and only LIRZO, LICZO, LIMZO sizes 16, 25, 32 and /P option) – check the pressure limiter setting
- spool sticking, contact Atos service center
- poppet sticking (only LIRZO, LICZO, LIMZO) – contact Atos service center
- missing piloting pressure, verify that hydraulic pressure in X (for valves with external pilot /E) or system pressure 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

PC software parameters modifications are lost when driver is switched off
- parameter store operation was not performed, check store procedure – see STEP 3, section 3.4

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

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!
  - perform the bias and scale configurations again!