atos

QUICKSTART BASIC
for digital proportionals with pressure transducer - analog reference signal

PROPORTIONAL PRESSURE CONTROL CARTRIDGES

Valve model:
LICZO-REB   LIMZO-REB   LIRZO-REB

Driver model:
E-RI-REB-P

IDENTIFICATION

Valve identification plates and label

1 : cartridge code

Cartridge name plate : M

Pilot valve name plate : N

2 : pilot valve code
3 : pilot valve matrix code
4 : pilot hydraulic symbol

Driver label : L

5 : driver code
6 : driver serial number
7 : factory firmware version

INSTALLATION TOOLS ACCORDING TO VALVE MODEL - not included

Fastening bolts	Wrenches	Screwdriver	Main connectors	
			std ,/Q	/Z
socket head screws	for fastening bolts	mechanical pilot relief	for air bleeding	7 pin - metallic	12 pin - metallic
	see STEP 1 and STEP 3		see STEP 2	

PROGRAMMING TOOLS - not included

Software	USB connection KIT		OR	Bluetooth connection KIT	
	Cable	Isolator		Cable	Adapter
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**	**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)		
		EW (POWERLINK)		**EI** (EtherNet/IP)	**EP** (PROFINET RT/IRT)		
E-SW-*/PQ	supports	valves with **SP**, **SF**, **SL** alternated P/Q control					

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
FS305	LI*ZO cartridges - tech. table	**STARTUP BLUETOOTH**	Bluetooth adpter startup guide
P006	Mounting surfaces - tech. table	**E-MAN-RI-REB**	REB - driver operating manual
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

STEP 1
STEP 2
STEP 4
STEP 3

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:

• remove the cartridge protection (do not remove connectors caps)
• check the presence and correct positioning of the seals on the mounting surface ports (**X** - **Y**) and on the cartridge (**K**)

surface seals

cartridge seals

• verify that valve mounting surface and the manifold cavity are 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 tightening torque according to valve model

SIZE 16 to 63
mounting surface layout
ISO 7368

LIRZO, LICZO, LIMZO

locating pin

n°2 OR
X   Y

n°4 fastening bolt
(supplied with the valve)

SIZE 80
mounting surface layout
ISO 7368

LIMZO

locating pin

n°2 OR
X   Y

n°8 fastening bolt
(supplied with the valve)

Type	Size	Pressure limiter	Fastening Bolt class: 12.9	Wrench (mm)	Tightening Torque (Nm)	O-Ring (X - Y)
LIRZO LICZO LIMZO	16	standard	n°4 M8 x 45	6	35	n°2 OR-108
	25	standard	n°4 M12 x 45	10	125	n°2 OR-108
	32	standard	n°4 M16 x 55	14	300	n°2 OR-2043
	40	/P option	n°4 M20 x 70	17	600	n°2 OR-3043
LICZO LIMZO	50	/P option	n°4 M20 x 80	17	600	n°2 OR-3043
	63	/P option	n°4 M30 x 90	22	2100	n°2 OR-3050
LIMZO	80	/P option	n°8 M24 x 90	19	1000	n°2 OR-4075

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

1 Remove main connector cap **P1**

WARNING: remove power supply before any electrical or wiring operations

2 Select main connector according to valve code and proceed with wirings operations

(A1)
(A2)

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

3 Connect the valve to the system

ZM-7P (metallic)
7 PIN MAIN CONNECTOR
(A1)

ZM-12P (metallic)
12 PIN MAIN CONNECTOR
(A2)

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

Standard	
A	V+ (power supply 24Vᴅᴄ)
B	V0 (power supply 0Vᴅᴄ)
C	AGND
D	P_INPUT+ (0 ÷ 10Vᴅᴄ / 4 ÷ 20mA)
E	INPUT-
F	P_MONITOR (0 ÷ 10Vᴅᴄ / 4 ÷ 20mA)
G	EARTH

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

/Z option	
1	V+ (power supply 24Vᴅᴄ)
2	V0 (power supply 0Vᴅᴄ)
3	ENABLE (input 24Vᴅᴄ)
4	P_INPUT+ (0 ÷ 10Vᴅᴄ / 4 ÷ 20mA)
5	INPUT-
6	P_MONITOR (0 ÷ 10Vᴅᴄ / 4 ÷ 20mA)
7	NC
8	NC
9	VL+ (logic power supply 24Vᴅᴄ)
10	VL0 (logic power supply 0Vᴅᴄ)
11	FAULT (output 24Vᴅᴄ)
PE	EARTH

ELECTRICAL WIRING EXAMPLES

MAIN CONNECTOR - VOLTAGE

REFERENCE INPUT - DIFFERENTIAL MODE

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

REFERENCE INPUT - COMMON MODE

cabinet side	main connector pin-out			valve internal circuit
	std	/Q	/Z	
0÷10 Vᴅᴄ Ref. P ◯	D		4	P_INPUT+ 50K
	E		5	INPUT- 50K
⊥ (0 V) ◯	C	B	10	AGND / V0 / VL0

MONITOR OUTPUT

cabinet side	main connector pin-out			valve internal circuit
	std	/Q	/Z	
0÷10 Vᴅᴄ Mon. P ◯	F		6	P_MONITOR
⊥ (0 V) ◯	C	B	10	AGND / V0 / VL0

MAIN CONNECTOR - CURRENT

REFERENCE INPUT - DIFFERENTIAL MODE

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

REFERENCE INPUT - COMMON MODE

cabinet side	main connector pin-out			valve internal circuit
	std	/Q	/Z	
4÷20 mA Ref. P ◯	D		4	P_INPUT+ Rsh = 500 ohm
	E		5	INPUT-
⊥ (0 V) ◯	C	B	10	AGND / V0 / VL0

MONITOR OUTPUT

cabinet side	main connector pin-out			valve internal circuit
	std	/Q	/Z	
4÷20 mA Mon. P ◯	F		6	P_MONITOR
⊥ (0 V) ◯	C	B	10	AGND / V0 / VL0
Rmax = 500 ohm				

STEP 3   HYDRAULICS

Screwdriver

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**

Mechanical pressure limiter setting – only for sizes 16, 25, 32 and /P option
For safety reasons the factory setting of the mechanical pressure limiter is fully unloaded (min pressure).
At the first commissioning it must be set at a value lightly higher than the max pressure regulated with the proportional control, proceeding as follow:
• apply the max reference input signal to the valve's driver. The system pressure will not increase until the mechanical pressure limiter remains unloaded
• release the locknut ②, turn clockwise the adjustment screw ① until the system pressure will increase up to a stable value corresponding to the pressure set-point at max reference input signal
• turn clockwise the adjustment screw ① of additional 1 or 2 turns to ensure that the mechanical pressure limiter remains closed during the proportional valve working, then tighten the locknut ②

protection cup
①   ②

Wrenches

6 mm adjustment screw
11 mm locking nut

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 valve. In case of prolonged pauses the valve operation during the machine cycle, it is always advisable to switch off or disable the driver (option /Q or /Z).
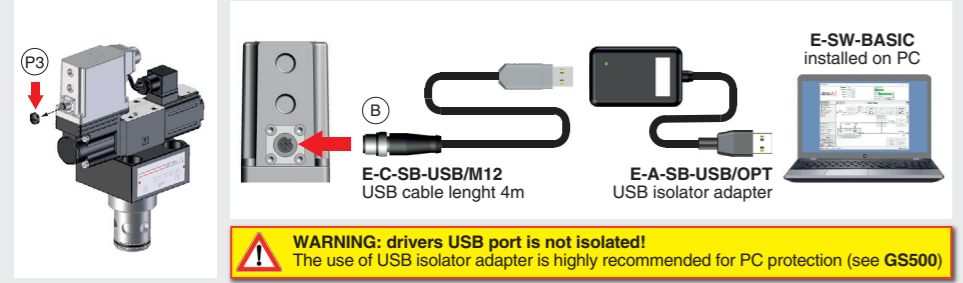
REMARK proportional valves with integral electronics are factory preset with default parameter and ready to use after piping and electrical connections. Play with parameters is optional, not mandatory!

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 to the valve and power on with **24Vᴅᴄ**

2 Remove USB plastic protection cap **P3** and connect valve to the PC as shown below

E-SW-BASIC installed on PC

(B)

E-C-SB-USB/M12 USB cable lenght 4m

E-A-SB-USB/OPT USB 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 software using E-SW icon:
• **software does NOT detect valid connection**
  communication is not established, please follow wizard procedure **4**
• **software detects valid connection**
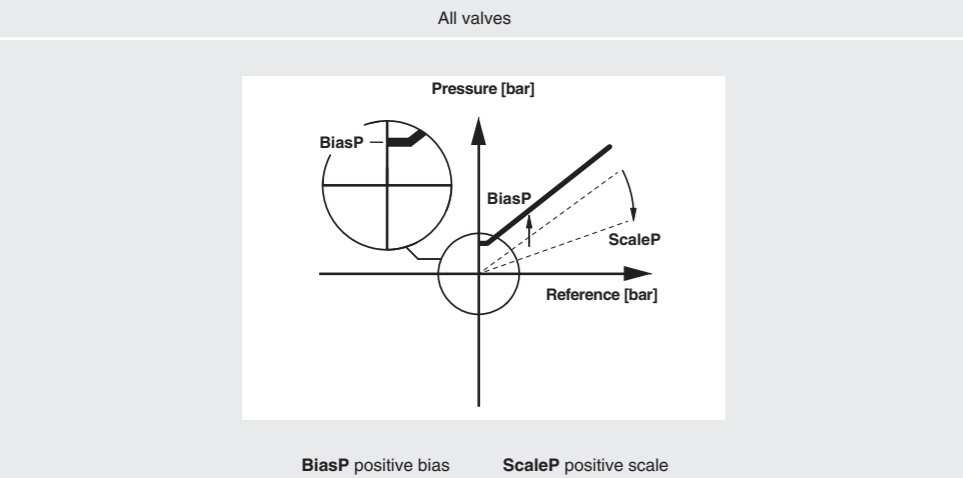 communication automatically established - valve is ON-LINE see **5**

E-SW

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

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

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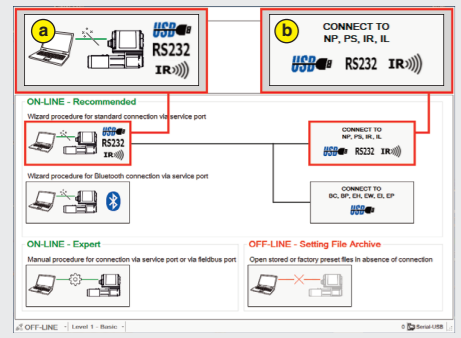
NOTE: Bluetooth adapter available!
For more info please refer to STARTUP BLUETOOTH guide

REMARK: once removed the USB cable E-C-SB-USB/M12, screw the plastic protection cap **P3** applying the correct tightening torque, in order to preserve valve's IP protection characteristics

Tightening torque **0,6 Nm**

4.2 CONFIGURATION

All valves

Pressure [bar]
BiasP
BiasP
ScaleP
Reference [bar]

**BiasP** positive bias   **ScaleP** positive scale

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BIAS AND SCALE

Bias setting: supply the input signal equal to 0 bar
• **relief valves:** increase the Bias until the pressure starts to increase, then lightly reduce the Bias just to bring back the pressure lightly over the minimum regulated value
• **reducing valves:** increase the Bias until is reached the minimum desired value of starting pressure

Scale setting: supply the max input signal; adjust the Scale to obtain the max regulated pressure

Pressure Regulation
ZERO REGULATION   MAX REGULATION
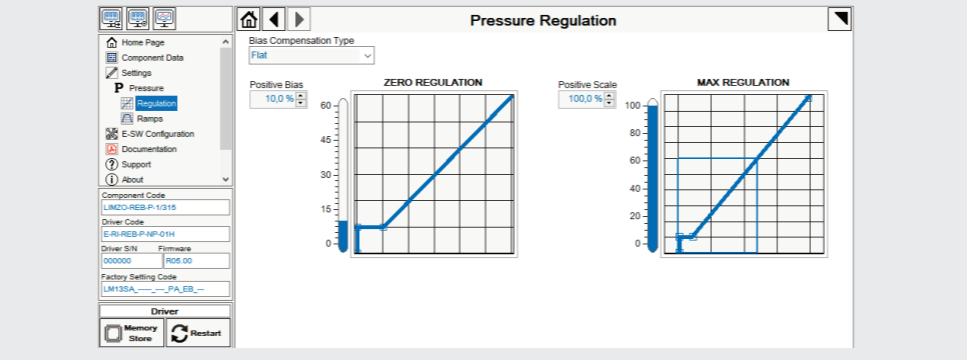
RAMPS

Ramps setting: select the required ramp configuration and adjust the ramp time to optimize the pressure response according to the system characteristics

No Ramp: no ramps selected   **Single Ramp**: setup **Ramp 1**   **Double Ramp** : setup **Ramp 1** and **2**

Pressure Ramps
Positive Regulation Ramps
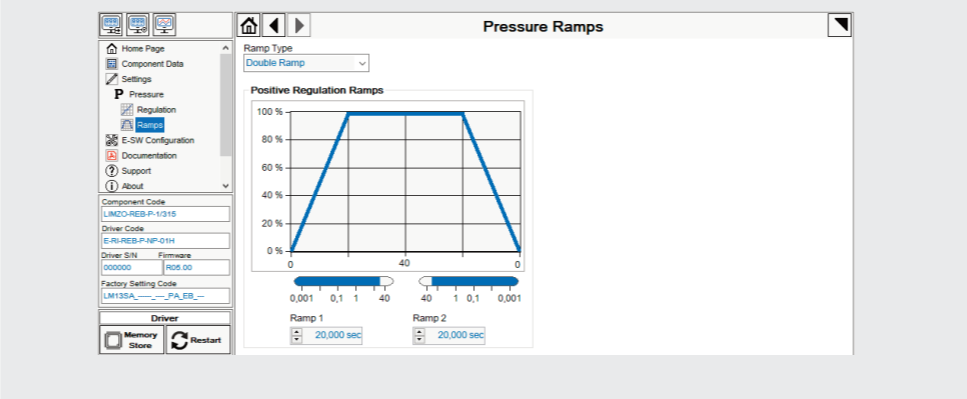
WIZARD REFERENCE - E-SW level 2 functionality

Reference input signal is factory preset according to selected valve code, defaults are 0 ÷ 10 Vᴅᴄ 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:

Pressure Reference Analog Range

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**

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.

Home Page
Pressure Smart Tuning

The valve is provided with 3 factory setting for the pressure control

PID1 Dynamic Fast response time for best dynamic performances - default

PID2 Balanced Average response time suitable for major applications

PID3 Smooth Attenuated response time for slow regulation without overshoots

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

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
• the mechanical pressure limiter interferes with the regulation (only for sizes 16, 25, 32 and /P option) – check the pressure limiter setting
• poppet sticking – contact Atos service center

Pressure instability or vibration
• select PID4 to operate the valve in open loop:
  - if the instability still persists, check eventual anomalies in the hydraulic circuit as the presence of air
  - if the instability disappears, select an alternative configuration within PID selection 1, 2 or 3 which better matches the application requirements
  - if no one of the above selection fulfills the application, tune P - I - D parameters at E-SW software level 2 to obtain the desired dynamic response

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 modification of valve parameters, the valve doesn't match the desired behavior:
• restore factory default settings pressing 'Restore Factory' button, located in 'Driver - Memory Store' window:
  - during restore, the current to the solenoid(s) will be temporarily switched off!
  - factory parameters will be applied at next driver restart or after power off-on sequence!