Operation and maintenance instructions for Series PRE Electronic proportional regulator

CE   *Made in Italy*

The products are designed and manufactured in conformity with the following directives:

- 2014/30/UE "Electromagnetic compatibility"

They also comply partially or totally with regard to the applicable parts of the following standards:

- EN 61000-6-2:2005 Electromagnetic compatibility (EMC) — Part 6-2:
  Generic standards - Immunity for industrial environments
- EN 61000-6-4:2007 Electromagnetic compatibility (EMC) — Part 6-4: Generic standards - Emissions for industrial environments
- UL 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements and the following technical standards

and to the following technical standards:

- EN ISO 4414:2010 Pneumatics - General rules and safety requirements for systems and their components.

For more information regarding the declarations of conformity, see the Certifications section

on the website **http://catalogue.camozzi.com.**

Sommario

1. Product identification

	Conversion table for the production date.	86-1400-0001 Rev. D
CAMOZZI		Leaf 02 / 02

Position 1 and 2: n° of the week.			
01	14	27	40
02	15	28	41
03	16	29	42
04	17	30	43
05	18	31	44
06	19	32	45
07	20	33	46
08	21	34	47
09	22	35	48
10	23	36	49
11	24	37	50
12	25	38	51
13	26	39	52

Position 3: One letter for the present Year.				
A		1996	2021	2046
B		1997	2022	2047
C		1998	2023	2048
D		1999	2024	2049
E		2000	2025	2050
F		2001	2026	2051
G		2002	2027	2052
H		2003	2028	2053
I		2004	2029	2054
K		2005	2030	2055
L		2006	2031	2056
M		2007	2032	2057
N		2008	2033	2058
O		2009	2034	2059
P		2010	2035	2060
Q		2011	2036	2061
R		2012	2037	2062
S	1988	2013	2038	2063
T	1989	2014	2039	2064
U	1990	2015	2040	2065
V	1991	2016	2041	2066
W	1992	2017	2042	2067
X	1993	2018	2043	2068
Y	1994	2019	2044	2069
Z	1995	2020	2045	2070

Example of composition.	
03P	
Description:	
03	Week n° 03
P	Year 2010

Managing authority:	Date:	Created by:	Approved by:
Industrial Engineering	**9 April 2010**	**Marco Bontempi**	**Bruno Ghizzardi**

2. Introduction

This manual illustrates how to properly use the **Series PRE electronic pressure regulator in its version with analog inputs and with digital inputs (preset)**.

This version of the Controller is identified with code 0234 xx xx xxx x xxxxx, where 0234 indicates the analog version with external sensor and is followed by year, week, machine, station and serial number.

For more information, refer to the manual dedicated to the Camozzi UVIX supervision software (Universal Visual Interface X).

3. General recommendations

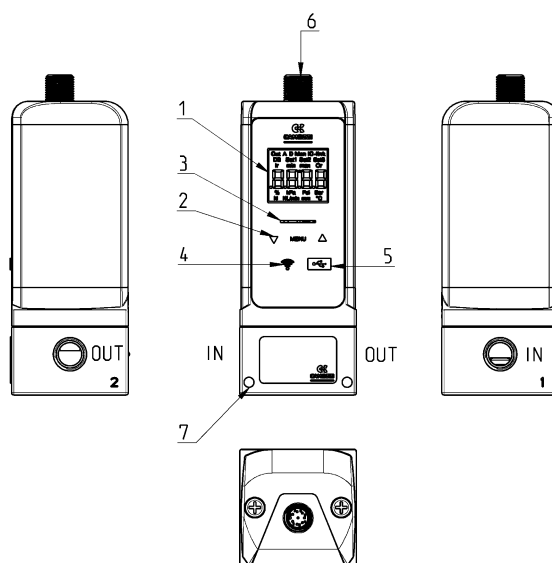The recommendations regarding safe use in this document should be observed at all times.

- Some hazards can only be associated with the product after it has been installed on the machine/equipment. It is the task of the final user to identify these hazards and reduced the associated risks accordingly.
- The products dealt with in this manual may be used in circuits that must comply with the standard EN ISO 13849-1.
- For information regarding component reliability, contact Camozzi.
- Before proceeding with use of the product, carefully read all information in this document.
- The instructions in this manual must be observed together with the instructions and additional information regarding the product in this manual, available from the following reference links:
  - o web site http://www.camozzi.com
  - o Camozzi general catalogue
  - o Technical assistance service
- Assembly and start-up operations must be performed exclusively by qualified and authorized personnel on the basis of these instructions.
- It is the responsibility of the system/machine designer to ensure the correct selection of the most suitable pneumatic component according to the intended application.
- For all situations not contemplated in this manual and in situations in which there is the risk of potential damage to objects, or injury to persons or animals, contact Camozzi for advice.
- Never make unauthorized modifications to the product. In this case, any damage or injury to objects, persons or animals will be the responsibility of the user.
- All relevant product safety standards must be observed at all times.
- Never intervene on the machine/system before verifying that all working conditions are safe.
- Before installation and maintenance, ensure that the specific envisaged safety locks are active, and then disconnect the electrical mains (if necessary) and system pressure supply, discharging all residual compressed air from the circuit and deactivating residual energy stored in springs, condensers, recipients and gravity.

- To reduce the noise levels caused by the discharge of air from the component, envisage the use of silencers or convey the fluid to a zone where no personnel are envisaged during normal operation.
- Avoid covering the equipment with paint or other substances that may reduce heat dissipation.
- Avoid cleaning with aggressive agents such as to dull the plastics and make it difficult to read the screen
- **In the event of an electrical power failure and pneumatic supply at the port connection 1, the regulated pressure on port connection 2 will not be maintained and can be discharged**.

4. Product description:

The Series PRE electronic pressure regulator is composed of:

- M12 12 pin connector (6): provides connection to power supply, command signal, read the signal from external sensor, feedback signals and to the output signal (for more details refer to the paragraph "Installation and Commissioning").
- LCD display (1): if present (depends on the code), it shows the measurement of the regulated pressure and allows to configure some parameters.
- General diagnostic LED bar (3): provides a quick indication of the general status of the device (for more details, refer to the "Use" paragraph).
- Function keys (2): if the LCD display is present (depends on the code), these keys allow to access and navigate the Regulator menu (for more details, refer to the "Use" paragraph).
- Micro USB connector (5) and wireless communication LED (4) to connect to the UVIX: the device can be connected to the UVIX supervision software via wireless (if present) or USB that allows to configure and monitor the device.

The analog version with external sensor of the Series PRE electronic pressure regulator is available with two different command signal types:

- Analog Voltage: voltage command signal 0 - 10 V.
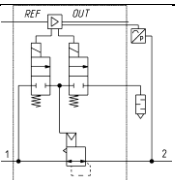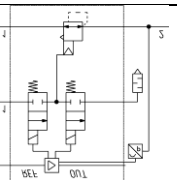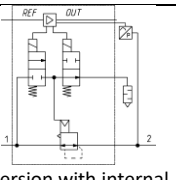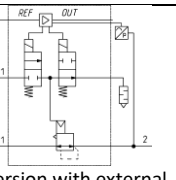- Analog Current: current signal 4 - 20 mA.
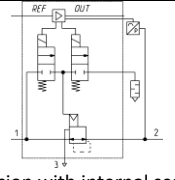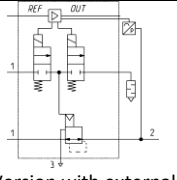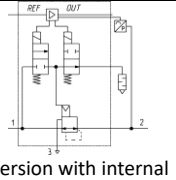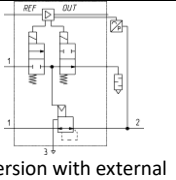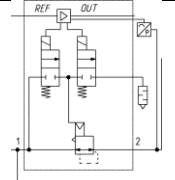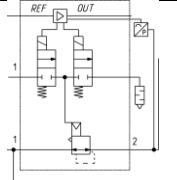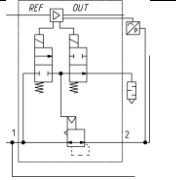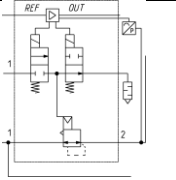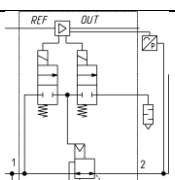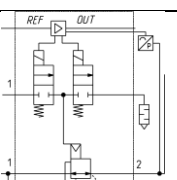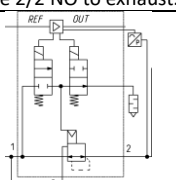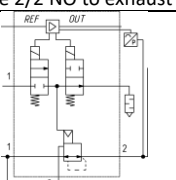
The choice between the two models must be made when ordering the regulator.

The configuration of some features of the Series PRE electronic pressure regulator is done through the UVIX supervision software.

Two operating modes have been implemented:

- Automatic: the pressure target is set via the analog input. At startup the Regulator is in this mode.
- Manual: the pressure target is set using the function keys or through a special command of the UVIX supervision software. The regulator must be set in this mode during the configuration phase in order to avoid unwanted pressure adjustments.
- In addition, using the NFCamApp app it is possible to configure the parameters of WiFi communication (only for models that provide for WiFi communication) and view some features of the PRE series electronic pressure regulator.

5. Pneumatic simbol:

SIZE 1 AND 2			
Version with internal servo-pilot supply, two pilot valves 2/2 NC.	Version with external servo-pilot supply, two pilot valves 2/2 NC.	Version with internal servopilot supply and two pilot valves; one 2/2 NC and one 2/2 NO (exhaust).	Version with external servopilot supply and two pilot valves; one 2/2 NC and one 2/2 NO (exhaust).
Version with internal servo-pilot supply and two pilot valves 2/2 NC, exhaust conveyable.	Version with external servopilot supply and two pilot valves 2/2 NC, exhaust conveyable.	Version with internal servopilot supply and two pilot valves; one 2/2 NC and one 2/2 NO to exhaust, exhaust conveyable.	Version with external servopilot supply and two pilot valves; one 2/2 NC and one 2/2 NO to exhaust, exhaust conveyable.
SIZE 1 AND 2 MANIFOLD			
Manifold version with internal servo-pilot supply and two pilot valves 2/2 NC.	Manifold version with external servo-pilot supply and two pilot valves 2/2 NC.	Manifold version with internal servo-pilot supply and two pilot valves; one 2/2 NC and one 2/2 NO to exhaust.	Manifold version with external servo-pilot supply and two pilot valves; one 2/2 NC and one 2/2 NO to exhaust
Manifold version with internal servo-pilot supply and two pilot valves 2/2 NC and exhaust conveyable.	Manifold version with external servo-pilot supply and two pilot valves 2/2 NC and exhaust conveyable	Manifold version with internal servo-pilot supply and two pilot valves; one 2/2 NC and one 2/2 NO to exhaust, exhaust conveyable.	Manifold version with external servo-pilot supply and two pilot valves; one 2/2 NC and one 2/2 NO to exhaust, exhaust conveyable.

6. General characteristics and conditions of use

| General characteristics and conditions of use		
	PRE1	**PRE2**
Reference standards	CE; RoHs	
Materials	Body: Aluminum Cover: Technopolymer Seal:NBR and FKM	
Assembly position	Any	
Overall dimensions	L = 50 mm; W = 50 mm; H = 140 mm	L = 50 mm; W = 50 mm; H = 185 mm
Weight	350gr circa	630gr circa
Medium and its quality	Filtered and non-lubricated compressed air of class 7.4.4 according to ISO 8573.1. Inert gases and oxygen only for OX1 versions.	
Maximum free flow rate (Pin 10 bar) **Measured at ±5% of Preg**	Pout 6 bar: 1.100 l/min ANR (PRE104) Pout 4 bar: 1.200 l/min ANR (PRE104)	Pout 6 bar: 4.500 l/min ANR (PRE238) Pout 4 bar: 5.200 l/min ANR (PRE238)
Maximum leakage rate	20 cc/min	10 cc/min
Maximun inlet pressure	11 bar	
Regulated pressure range	0,05 - 10,3 bar (0,72-150 PSI)	
Number of ways	3	
Ambient temperature	0 ÷ 50 °C	
Protection class	IP65 (according to EN 60529) Open-type (according to UL 61010)	
Pneumatic ports	Standard version: G1/4; G1/8; 1/4 NPTF Manifold version: G1/4; 1/4 NPTF	Standard version: G1/4, G3/8 Manifold version: G1/4
Vibrations sine **According to EN 60068 part 2-6:2009-11 (table B.1)**	Frequency range: 10-500Hz Displacement 0-peak: 0,75mm or 100 m/s^2 Number of cycle: 10	
Continuous shock **According to DIN EN 60068-2-27:2010-02 (table A.1)**	Peak acceleration: 150 m/s^2 Duration: 11ms Pulse shape: half sine	
Electric port	M12 12 Pin Male A-key	
Input signal setpoint	Analog version: 0÷10V (2), 4÷20 mA (4)	
Analog Output signal (feedback)	0÷5 V DC and 4÷20 mA (both present in the analog version (2) and (4))	

External sensor signal	0÷10 V DC or 4÷20 mA (selectable)	
Electrical power supply	24Vdc ±10%	
Current consumption	Max 0,250A (refer to the table below for more details, external sensor consumption is not included)	
Hysteresis (*)	0,5% FS	0,7% FS
Repeatability (*)	0,4% FS	0,4% FS
Linearity (*)	0,4% FS	0,4% FS
Resolution (*)	0,3% FS	0,6% FS
Overpressure discharge	With relieving	
Modularity	With Series MD	

Display	WIFI module	Integrated exaust valve	Code	Maximum current consumption
NO	NO	NO	PRExxx-Ex5xxx-xx PRExxx-Ex7xxx-xx	0,105 A
YES	NO	NO	PRExxx-Dx5xxx-xx PRExxx-Dx7xxx-xx	0,135 A
NO	YES	NO	PRExxx-Ex5xxx-xxxW PRExxx-Ex7xxx-xxxW	0,145 A
YES	YES	NO	PRExxx-Dx5xxx-xxxW PRExxx-Dx7xxx-xxxW	0,165 A
NO	NO	YES	PRExxx-Ex6xxx-xx PRExxx-Ex8xxx-xx	0,190 A
YES	NO	YES	PRExxx-Dx6xxx-xx PRExxx-Dx8xxx-xx	0,215 A
NO	YES	YES	PRExxx-Ex6xxx-xxxW PRExxx-Ex8xxx-xxxW	0,230 A
YES	YES	YES	PRExxx-Dx6xxx-xxxW PRExxx-Dx8xxx-xxxW	0,250 A

- FLOW CHARTS SIZE 1 - Standard version (1/4G)

Typical curve for version PRE104-x2…
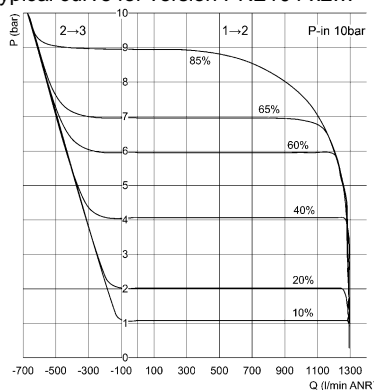
P = Regulated outlet pressure and exhaust pressure

Q = Flow

% = Percentage of the command signal

- FLOW CHARTS SIZE 1 – Manifold version (1/4G)

Typical curve for version PRE1M4-x2…

P = Regulated outlet pressure and exhaust pressure

Q = Flow

% = Percentage of the command signal

DECAY FACTOR FOR MANIFOLD REGULATOR SIZE 1

N° = number of regulators in manifold configuration

% = relative percentage decay of the maximum flow rate

Note: the air inlet is only from one side, in case it should be on the right and on the left, only consider the positions as from 1 ÷ 3..

- FLOW CHARTS SIZE 2 - Standard version (1/4G)

Typical curve for version PRE204-x2…

P = Regulated outlet pressure and exhaust pressure

Q = Flow

% = Percentage of the command signal

- FLOW CHARTS SIZE 2 - Standard version (3/8G)
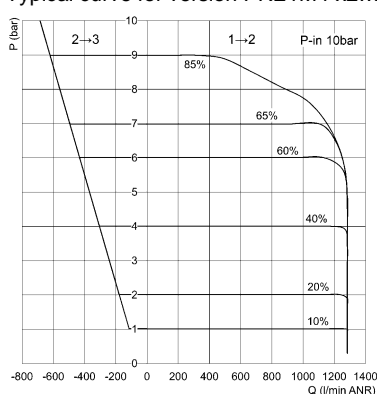
Typical curve for version PRE238-x2…

P = Regulated outlet pressure and exhaust pressure

Q = Flow

% = Percentage of the command signal

- FLOW CHARTS SIZE 2 – Manifold version (1/4G)

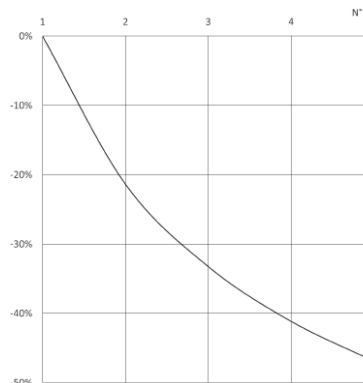Typical curve for version PRE2M4-x2…
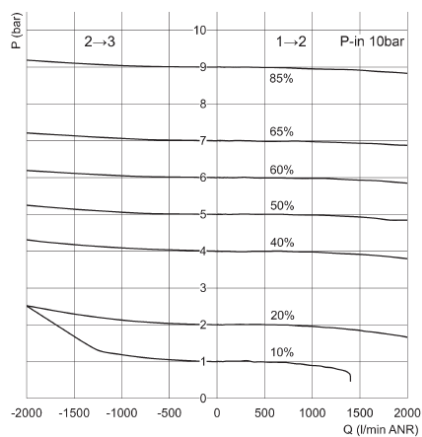
P = Regulated outlet pressure and exhaust pressure

Q = Flow

% = Percentage of the command signal

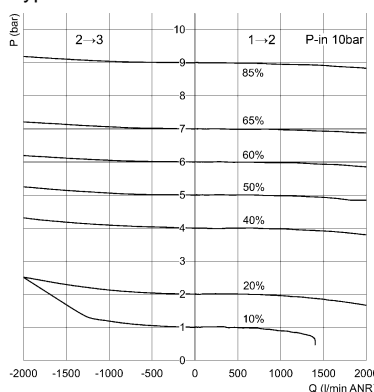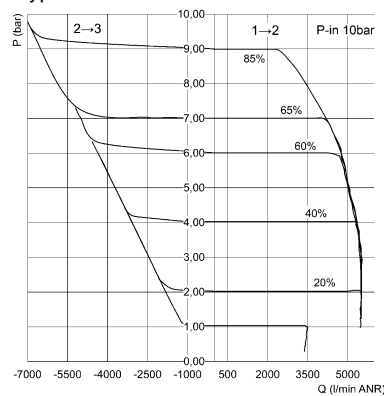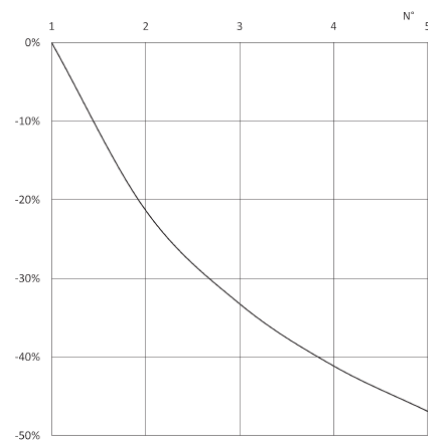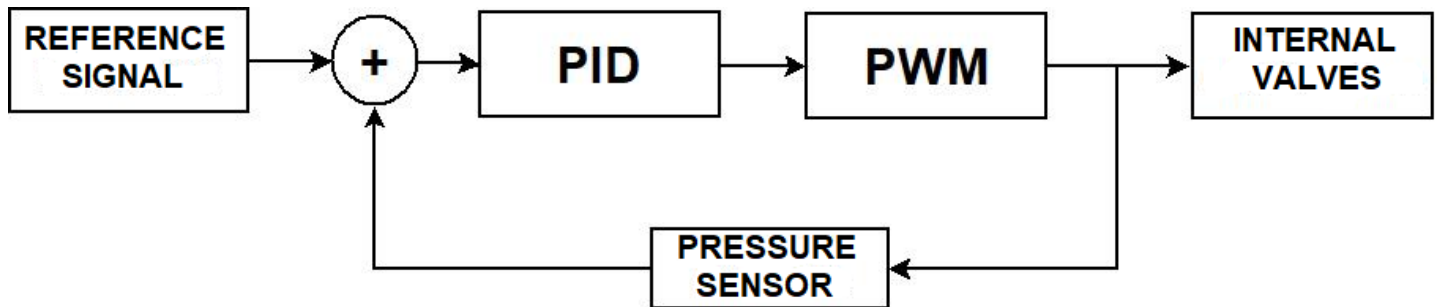DECAY FACTOR FOR MANIFOLD REGULATOR SIZE 2

N° = number of regulators in manifold configuration

% = relative percentage decay of the maximum flow rate

Note: the air inlet is only from one side, in case it should be on the right and on the left, only consider the positions as from 1 ÷ 3..

7. Electrical/Pneumatic circuit

8. Product storage and transport

- Adopt all measures possible to avoid accidental damage to the product during transport, and when available use the original packaging.
- Observe the specified storage temperature range of -20 ÷ 70 °C.

9. Installation and start-up

- During unpacking, take great care not to damage the product.
- Check whether there are any faults caused by product transport or storage.
- Separate all packaging material to enable the recovery or disposal in accordance with current standards in the country of use.
- Where possible avoid the risk of repeated pressure surges on the circuit where the component is installed.
- The components must be fixed correctly using, where possible, the specific anchors and ensuring that the fixture remains efficient even when the actuator is repeatedly used at a high frequency and in the presence of strong vibrations.
- Once the component is installed, ensure that all air ways are securely connected to the respective couplings.
- If the power supply is turned off, residual pressure may remain on the secondary side of the regulators. The manufacturer must provide for additional exhaust components.
  Recommended pneumatic circuit
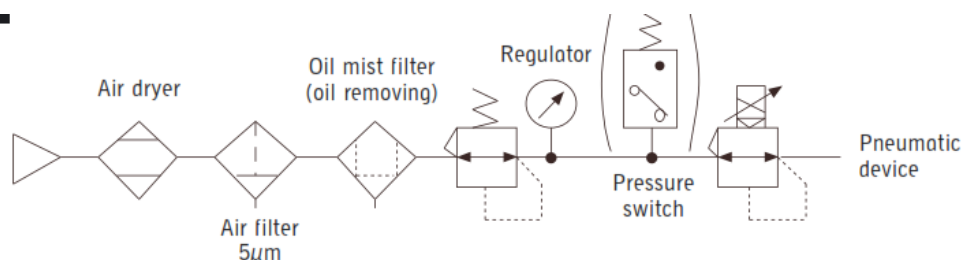
- Keep the protective cap of the M12 connector until the regulator is completely installed

- PRE series electronic regulator can be connected to DIN rails using the relative elements PCF-E520 fitted on the rear of the body using two M4 threaded holes.
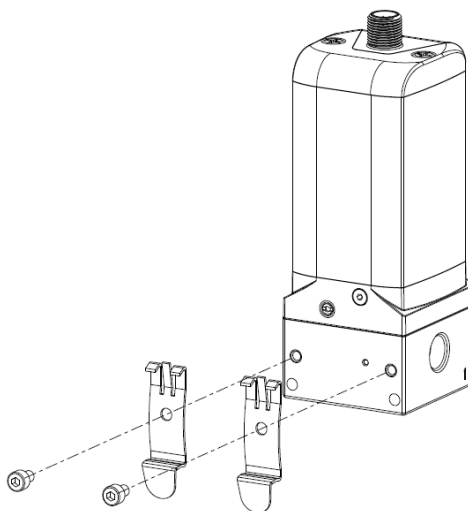
- The Series PRE electronic regulator can be directly fixed to a support using the 2 through holes with diameter 4mm present on the body (not available in the PRE1 manifold version).
- The PRE1 electronic regulator can be fixed to the wall with the optional bracket code MD1-ST/1 (if the two through holes in the body have a 34 mm center distance) or with the optional bracket code PRE-ST (if the two through holes in the body have a 42 mm center distance); the PRE2 electronic regulator can be fixed to the wall with the optional bracket code PRE-ST:

  1. Fix the bracket to the wall with suitable screws
  2. Connect the fittings G1/4; G3/8 or NPTF according to the PRE regulator size
  3. Connect the regulator to the bracket with the two M4 x 55 screws supplied
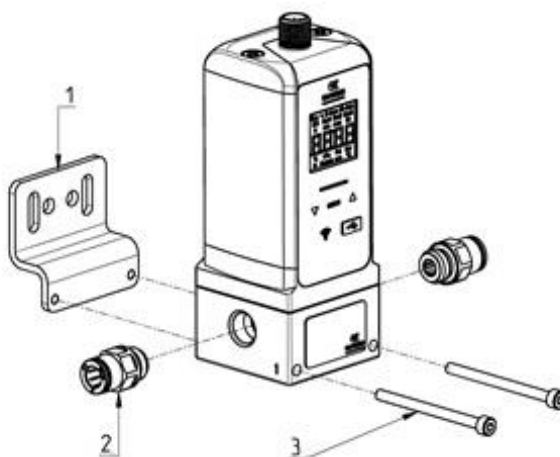
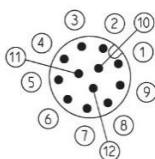- Make sure that the bracket is completely resting on the wall
- Connection of Manifold regulators with related Kit PRE-M-Pin-1-2

  1. Insert the pins (1) in the seats on the regulator body
  2. Insert the O-ring seal (3) into the special seat on the side face of the body
  3. Bring the two modules sideways up until contact
  4. Tighten the four grub screws (2) until they are locked (Tightening torque: 2,5 ± 0,5 Nm)
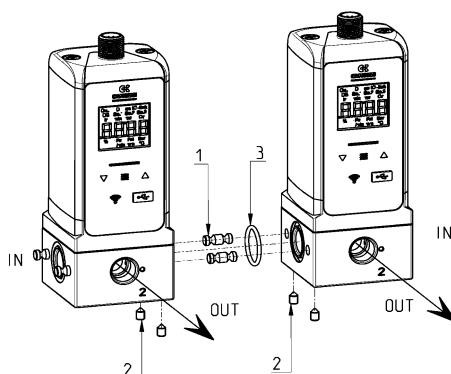
- There are 2 additional pneumatic ports on the PRE series electronic regulator:
  - M5 to discharge the exhaust valve to the outside. It is important to keep this port free and clean to ensure that air is discharged without obstructions that could limit the flow. If necessary, only for version with conveyable port, remove the pre-assembled filter, connect a suitable coupling and use a hose to convey discharged air to a suitable area.
  - M5 for external servo-pilot supply. The regulator is supplied with a preassembled cap for the versions with internal servo-pilot supply and with the fitting 6625 3-M5 for the versions with external servo-pilot supply.
- In order to connect the regulator with MD series, use the PRE-1/4-C kit for regulator with G1/4 pneumatic port or use the PRE-3/8-C kit for regulator with G3/8 pneumatic port.
- The board implements a protection against inversion of polarity on the power supply voltage.
- The board is also fitted with a resettable 1A fuse to limit the maximum current absorption of the servovalve. Use a power supply unit able to deliver a current of at least 0,5A (recommended 1.0A).
- If UL/CSA standard compliance is required, the unit shall be supplied by an isolated power source which fulfils at least one of the following the requirements of:
  - Limited-Energy Circuit in accordance with UL/CSA 61010-1/ UL/CSA 61010-2-201
  - Limited Power Source (LPS) in accordance with UL/CSA 60950-1
  - a Class 2 supply source which complies with the National Electrical Code (NEC), NFPA 70, Clause 725.121 and Canadian Electrical Code (CEC), Part I, C22.1. (typical examples are a Class 2 transformer or a Class 2 power sources in compliance with, UL 5085-3/ CSA-C22.2 No. 66.3 or UL 1310/CSA-C22.2 No. 223). In order to respect the UL/CSA 61010 requirements, install the regulator inside a box, not in external environment.
  If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- The power supply voltage must be within the range of 24V±10%.
- The board implements a protection against overload of the reference signal.
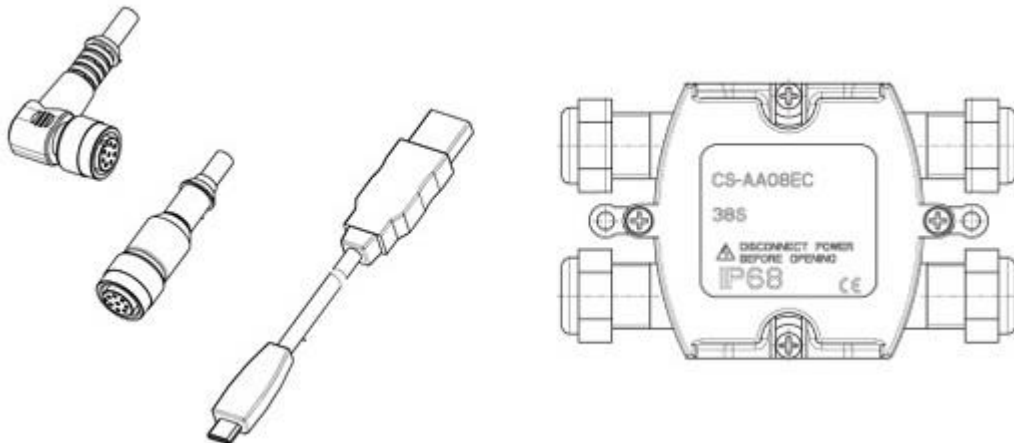- The M12 12 pin male connector has the following pinout

PIN	NAME	DESCRIPTION
1	24 VDC	**Power supply**
2	GND	Connect to the positive pole (24VDC) and to the negative pole (GND) of the power supply.
3	IN+	**Input of voltage (0-10V) or current (4-20mA) reference signal** Connect to the positive pole (IN+) and to the negative pole (IN-) of the reference signal generator. Internal resistance with voltage input: >10kΩ. Use reference signal generator with low impedance and with output current >1mA@10V.
4	IN-	Internal resistance with current input: 100Ω. **It is mandatory to connect all negative poles of the power supply and the reference signal generator together (pin 2 and pin 4).**
5	Vout+	**Voltage analog feedback signal (0-5V)** Connect the positive pole (Vout+) and the negative pole (Vout-) to the voltage input. Output resistance: <10MΩ.
6	Vout-	Do not connect the negative pole (Vout-) with other negative poles (pin 2 and pin 4): as noise, input signal errors or feedback signal errors might occur.
7	Iout+	**Current analog feedback signal (4-20mA)** Connect to the positive pole of the current input. Connect the negative pole of the current input to GND (pin 2).
8	OUT	**Digital output signal (0-24V)** Connect to a digital input. If the input is of the NPN type, use pin 1 (24VDC) as reference of digital input; otherwise if the input is of the PNP type, use pin 2 (GND) as reference of digital input. Output resistance: >15MΩ. Max current: 50mA.
9	EXT+	**Voltage (0-10V) or current (4-20mA) analog external sensor signal** Connect the output (EXT+) and the reference (EXT-) of the external sensor. Internal resistance with voltage input: >10kΩ. Use reference signal generator with low impedance and with output current >1mA@10V.
10	EXT-	Internal resistance with current input: 100Ω. **It is mandatory to connect all negative poles of the power supply and the external sensor together (pin 2 and pin 10).**
11	NC	**Not connected**
12	NC	**Not connected**

- For the electrical connection the following cable types are available:

CODE	DESCRIPTION
CS-LF12HC-C200	co-moulded connector M12 12 pole, female, straight with 2-metre cable unshielded
CS-LF12HC-C500	co-moulded connector M12 12 pole, female, straight with 5-metre cable unshielded
CS-LR12HC-C200	co-moulded connector M12 12 pole, female, bend with 2-metre cable unshielded
CS-LR12HC-C500	co-moulded connector M12 12 pole, female, bend with 5-metre cable unshielded
CS-LF12HC-D200	co-moulded connector M12 12 pole, female, straight with 2-metre cable shielded
CS-LF12HC-D500	co-moulded connector M12 12 pole, female, straight with 5-metre cable shielded
CS-LR12HC-D200	co-moulded connector M12 12 pole, female, bend with 2-metre cable shielded
CS-LR12HC-D500	co-moulded connector M12 12 pole, female, bend with 5-metre cable shielded
CS-AA08EC	4-ways T connector for external transducer, power supply and command signal
G11W-G12W-2	Micro USB cable (it may be used during the configuration phase)

10. CoilVision

With the integrated CoilVision technology the proportional regulator is able to constantly monitor the operation of the coils inside it and prevent any malfunctions.

Depending on the model chosen, the proportional regulator can have three different levels of diagnostics:

- Without diagnosticc: the CoilVision technology isn't implemented.
- Basic diagnostics: CoilVision technology is active and will advice the user when the coils are nearing the end of their life cycle
- CoilVision diagnostics: CoilVision technology is active and, in addition to advice the user when the coils are nearing the end of their life cycle, constantly sends information about their current health status to the UVIX environment.

11. Digital output

The digital output (OUT signal, pin 8) is a 0-24V digital signal. Through the UVIX configuration software it is possible to set the logic of this output:
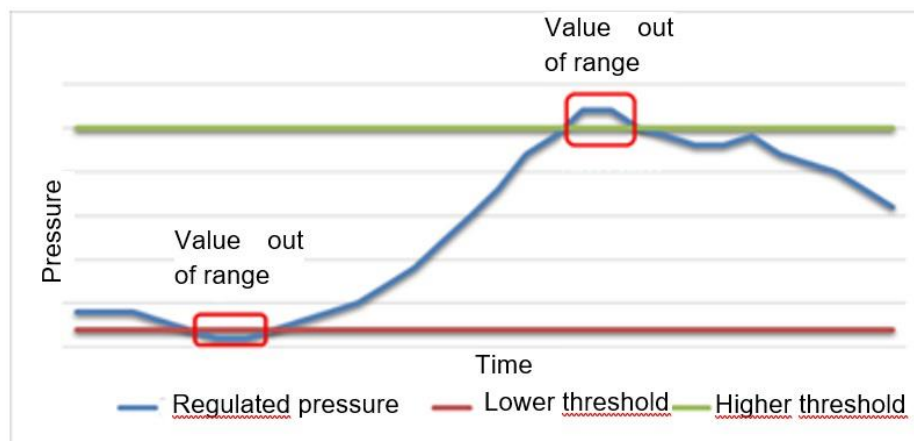
- Active – high level: if the output is activated, its value is brought to a high logic level.
- Active – low level: if the output is activated, its value is brought to a low logic level.

Furthermore, based on the electrical connection made by the user, the following configurations can be obtained:

- PNP: in this configuration the output signal refers to GND (pin 2), therefore the PNP digital input of the control system must be connected between pin 8 (OUT) and pin 2 (GND).
- NPN: in this configuration the output signal refers to + 24V (pin 1), therefore the NPN digital input of the control system must be connected between pin 8 (OUT) and pin 1 (+ 24V)

The operating mode of the digital output depends on what code is ordered. There are three different operating modes:

- Error: the digital output changes state if the Regulator detects an error.
- Switch pressure: with this operating mode it is possible to set two fixed pressure thresholds, a lower one and a higher one. The digital output changes state if the regulated pressure is outside the range delimited by the two thresholds set. This is a useful way to check whether the regulated pressure lies within the preset pressure range.

- Window pressure: with this operating mode it is possible to set two thresholds, a lower one and a higher one, which determine a pressure range with respect to the target pressure value. The digital output changes state if the regulated pressure is outside the instantaneous range (depending on the value of the target pressure at that moment) delimited by the two thresholds set.

  This is a useful way to check whether the regulated pressure lies within the pre-established precision range.
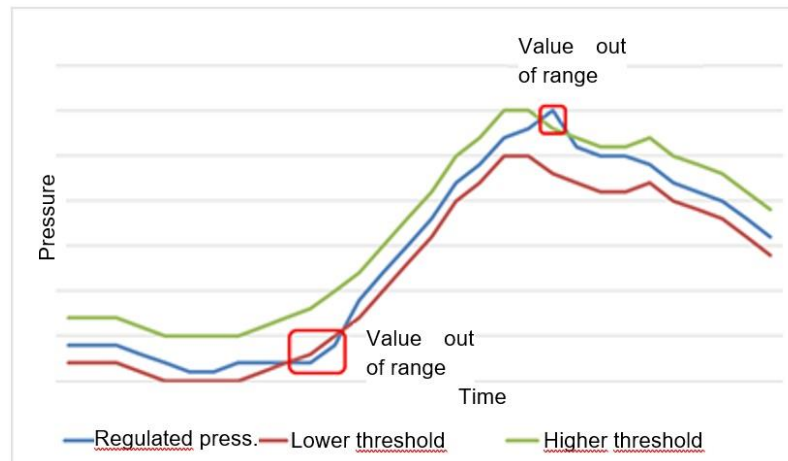
12.NFCanApp

NFCamApp is a configuration application that can be installed on android mobile device and available on Play Store.
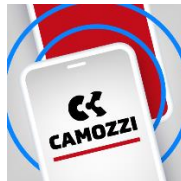
NFCamApp communicates with the Series PRE electronic pressure regulator via NFC connection and is able view some device parameters and modify, if present, the parameters of the wi-fi card. The NFC antenna is located under the front label in the lower left corner.
For installation and use of the NFCamApp, please refer to the dedicated manual.

12.1. Monitoring

This section (**ⓘ**) displays the information about selected device.

- Type: description of device type.

- Subtype: description of device sub-type.

- Firmware: firmware version.

- WiFi connection: indicates if the WiFi connection is present

- Fieldbus connection: indicates the fieldbus connection available

- Serial number: univocal serial number device assigned by producer.

- Setup version: internal memory mapping version.

13. Universal visual interface X (UVIX)

UVIX is a supervisor software that can be installed on PC or on server that is part of the company network and accessible from other PCs.
UVIX communicates with the Series PRE electronic pressure regulator via wireless connection (if present) or via USB cable and is able to monitor and configure the device.
Following the monitoring and configurator of the Series PRE electronic pressure regulator is described in detail. For installation and use of the UVIX, please refer to the dedicated manual.
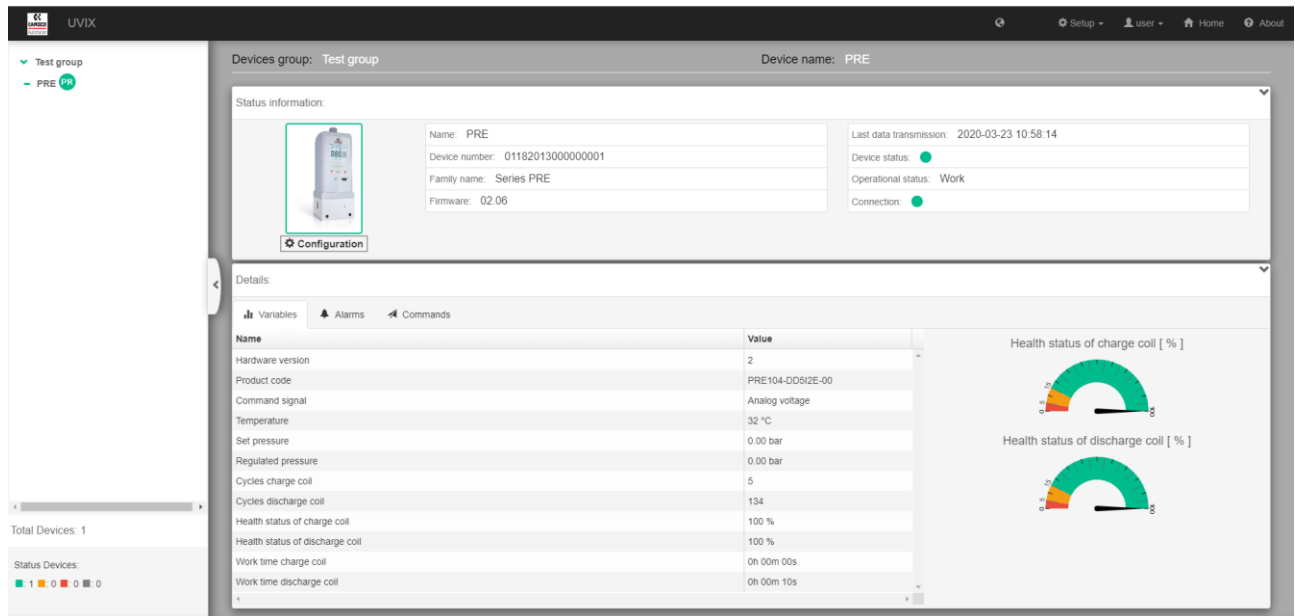
13.1.   Monitoring

Once the device is selected, the work page will be displayed. This page is divided into two parts;

- Status information
- Details

13.1.1. Status information

This section displays the following fields related to the selected device. These information are the same for all devices manageable by UVIX.

- o A picture of the device with a coloured frame based on its global state (green is status is ok, yellow/orange if a warning occurs, red if an error occurs)

- o Name: name given by the user

- o Device number: univocal serial number device assigned by producer.

- o Family name: description of device type

- o Firmware: firmware version

- o Last transmission: date and time of last data received

- o Device status: global state of device

- o Operational status: operational status of device that can either be "work" if the target pressure is received by the command signal (analog input or digital inputs) or "manual" if the target pressure is received by UVIX.

- o Connection: indicates if the device is transmitting or, more precisely, if the UVIX is receiving data from it. The indication is given by the color of the dot that turns green if the device is connected or red if it is not connected.

- o Under the device picture the "Configuration" command is located. Via this command it is possible to open the configuration window of the selected device

13.1.2. Details

This section is divided into 3 sub-sections and lists specific information about selected device.

VARIABLES

This sub-section lists all variables sended from device to UVIX, including those related to Coil Vision if the device is setted with advanced diagnostic.

- Hardware Version: device hardware version.
- Product Code: commercial code of the device.
- Command signal: reference signal used by the device.
- Temperature: device temperature value.
- Supply Voltage: power supply value.
- Set Pressure target pressure value.
- Regulated Pressure: regulated pressure value.
- Charge coil cycles: number of cycle of charge coil.
- Exhaust coil cycles: number of cycle of exaust coil.
- Charge coil health status: health status of charge coil.
- Exhaust coil health status: health status of exaust coil.
- Charge coil work time: total working time for charge coil.
- Exhaust coil work time: total working time for exaust coil.

ALARM

This section lists all the possible warnings and alarms, for each of them the status is specified and, if active, the date on which the error occurred.
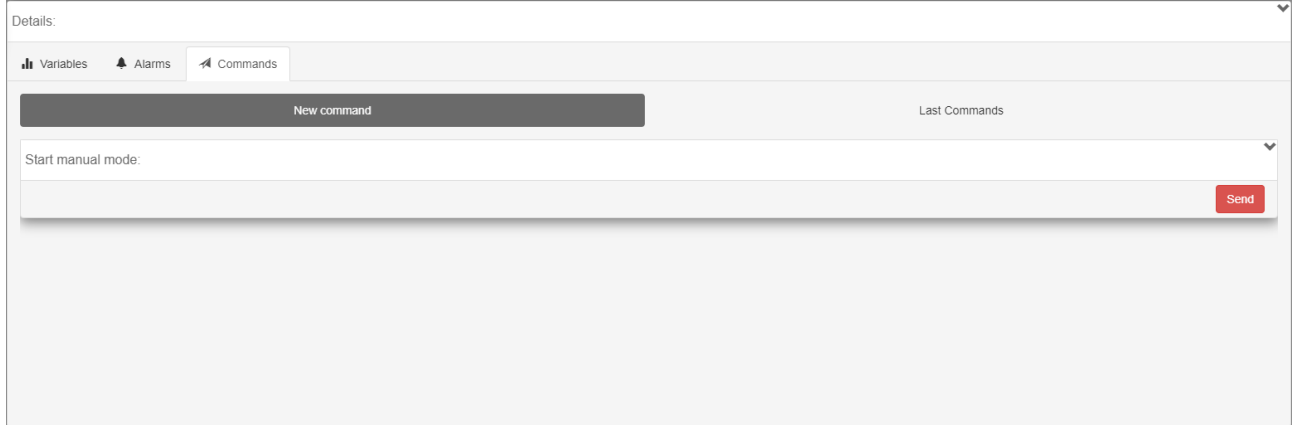

For more details and for the complete list of errors and warnings, refer to the paragraph "Troubleshooting and/or exceptional circumstances ".

COMMANDS

In this section it is possible to send a new command to the device or to check the history of the commands sent.

If the device is in the Automatic operating mode, the only command that can be sent is "Start manual mode" which allows the activation of the Manual operating status.

If the Manual operating mode is activated on the device, it is possible to send the following commands:

- End manual mode: which allows to activate the Automatic operating mode.
- Set Pressure: the target pressure value is set viathis command.

13.2.   Configurator

By clicking on the button below the image of the device (⚙ Configuration) it is possible to open   the   configurator.
In order to change the parameters, the device must be setted in "Manual" mode.

The parameters are divided into groups and can only be modified by the user with the necessary permissions, furthermore, based on the version of the regulator, only some parameters will be visible.

13.2.1. User setup

Visible parameters (only for versions with LCD):

- Led timeout: Set the LCD screen timeout. When this time-out expires, the LED-backlit LCD display and the backlit function keys are switched off. To switch them on again, just press any key.

Parameters visible only for versions with wireless connection:

- SSID: network name to connect.
- Password: password of network name to connect.
- IP address: IP address of data destination. This is the IP address of PC or gateway where UVIX used by device is installed.
- Host port: port number used to send and receive data with the UVIX component designated for this task

Parameters visible in all versions:

- External sensor interface: set the type of external sensor electrical signal: Voltage (0-10V) or Current (4-20mA)
- Unit of measurement (regulator): serves to set the unit of measurement of the device, all pressure values present on the LCD (if present, depends on the code) will be expressed in this unit of measurement. Possible values are: psi, bar or kPa.
- Pressure regulation check mode: serves to set the event type, warning or alarm, in case the regulated pressure doesn't reach the target value. Refer to the "Pressure regulation check timeout" parameter.
- Pressure regulation check timeout: enables to control the regulated pressure. This control is similar to the "window" function of the digital output (for more details regarding this function, refer to paragraph "Digital output"): the regulator checks if the regulated pressure reaches the pressure target within a certain settable time (Pressure regulation timeout). This control uses the values "Lower limit window control" and "Upper limit window control" to determine the tolerance range on the regulated pressure.
- Pressure regulation timeout: serves to set the timeout value for the pressure regulation check. Refer to the "Pressure regulation check timeout" parameter.
- Lower limit window control: serves to set the lower threshold to define the control window. Refer to the "Pressure regulation check timeout" parameter.
- Upper limit window control: serves to set the upper threshold to define the control window. Refer to the "Pressure regulation check timeout" parameter.

- Protection Timeout: sets the inactivity time of the regulator when the target pressure is not reached before the expiration of the Pressure regulation timeout. During the period of inactivity, the regulator maintains the current pressure without trying to reach the target pressure. After this inactivity time has expired, the regulator will try again to reach the target pressure

- Dead band: available only with FW version 3.01 or higher. When this parameter is set to a value higher than 0, the regulator will not make any adjustment as long as the absolute error of the regulated pressure (difference between the regulated pressure and the target pressure) remains lower than the set dead band value (red line).
  On the other hand, when the absolute error of the regulated pressure exceeds the value of the set dead band, the regulator returns to carry out normal regulation (green line).
  This operating mode makes it possible to avoid continuous adjustments by the regulator, increasing its life cycle. On the other hand, the achievement of the target pressure according to the declared performance is not guaranteed: the adjusted pressure error will depend directly on the dead band value set.
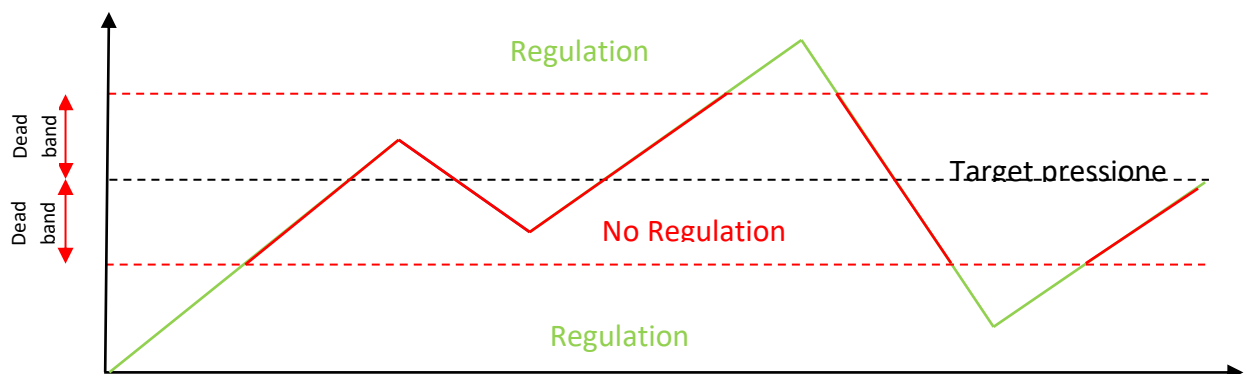

- Hysteresis value: available only with FW version 3.01 or higher and if the dead band value is greater than 0. When the absolute error of the adjusted pressure (difference between the adjusted pressure and the target pressure) remains below the dead band value set for a sufficient time, the regulated pressure is considered stable and the hysteresis operating mode (A) is activated. If, on the other hand, the absolute error of the regulated pressure remains lower than the dead band value set for a NOT sufficient time, the regulated pressure is deemed NOT stable and the hysteresis operating mode (B) is NOT activated.
  When the hysteresis operating mode is active, the regulator will not make any adjustment as long as the absolute error of the regulated pressure remains less than the value of the sum of the dead band and hysteresis values set (C).
  When the absolute error of the regulated pressure exceeds the value of the sum of the dead band and hysteresis values set, the hysteresis operating mode is deactivated (D) and therefore the regulator will not carry out any regulation only if the absolute error of the regulated pressure becomes lower than the set dead band value (E). To reactivate the hysteresis operating mode, the absolute error of the regulated pressure must remain below the dead band value set for a sufficient time.

This operating mode allows to reach the target pressure with sufficient precision, according to the dead band value set, and to define a wider range, defined by the set hysteresis value, in which the regulator will not perform any regulation.

Compatibly with the application carried out by the regulator, it is recommended to set:

o the dead band value as small as possible, in order to obtain a good regulation precision of the regulated pressure

o the hysteresis value as large as possible, generally greater than the dead band value, in order to limit the number of actuations of the regulator.
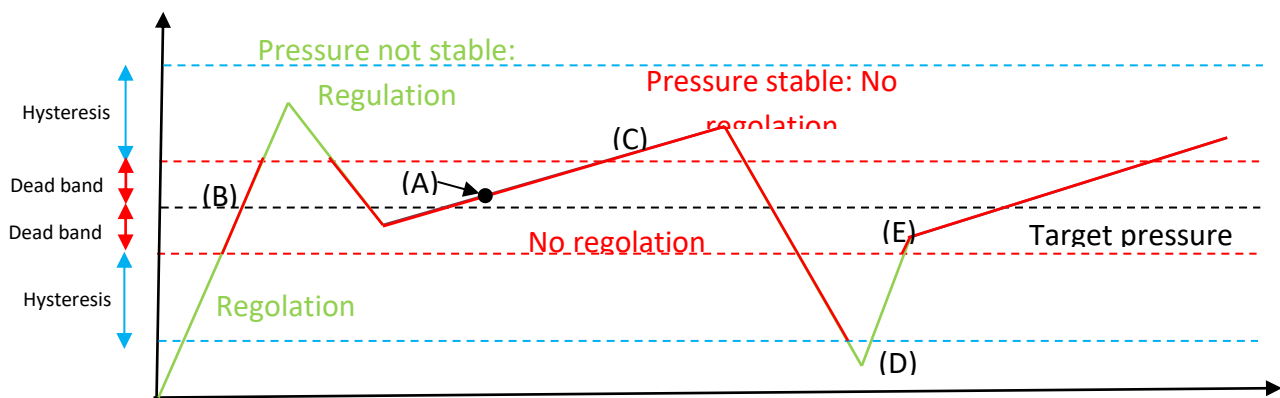
- External sensor filter cutoff: available only with FW version 3.01 or higher , this parameter sets the cutoff frequency [Hz] of the digital filter applied to the external sensor signal. Use this parameter to eliminate noise in the regulated pressure signal. A big value of this parameters increases the time response of the regulator. If the value of this parameter is 0, the filter is disabled.

- Target signal filter cutoff: available only for FW version 3.01 or higher. This parameter sets the cutoff frequency [Hz] of the digital filter applied to the analog target signal. Use this parameter to eliminate noise in the analog target signal. A big value of this parameters increases the time response of the regulator. If the value of this parameter is 0, the filter is disabled.

- Pid mode: if the "Custom PID enable" command is disabled, it sets the PID gain based on the volume used. The possible values are: SET1 (SLOW, suitable for small volumes), SET2 (MEDIUM, suitable for medium volumes), SET3 (FAST, suitable for large volumes). If the "Custom PID enable" command is enabled, it displays the selection of the SET4 (CUSTOM) value.

- Custom PID enable: it allows you to select the SET4 (CUSTOM) value for the "Pid mode" parameter. When this parameter is enabled, it is possible to indicate the values of the PID gains. For details, refer to the "Custom PID parameters" paragraph.

13.2.1.1. Custom PID parameters

This group is available only if Pid Mode SET4 (CUSTOM) is selected and contains the parameters in order to set the PID.

ATTENTION: the system could be instable if you use values too high. Increase carefully the K parameters values. Do not create a system instability. The mechanical and electronic internal

components could be damage. Avoid continuously oscillations of regulator (you hear an hammered noise). In this case decrease the K parameters values in order to eliminate the oscillations.

- KpUpCustom: proportional gain for upload coil
- KiUpCustom: integral gain for upload coil
- KdUpCustom: derivative gain for upload coil
- KpDownCustom: proportional gain for download coil
- KiDownCustom: integral gain for download coil
- KdDownCustom: derivative gain for download coil

13.2.2. Range setup

This group contains the parameters to set the regulation ranges. These parameters are available only for versions with analog input:

- Minimum target e Maximum target pressure: may be possible to set a minimum and a maximum point of the regulated pressure range and is expressed as an absolute value [bar].
  The software "UVIX" verifies consistency of the two values and ensures that the minimum point is not greater than the maximum point.
  This function enables the user to limit the regulated pressure range with respect to the nominal range while continuing to use the entire range of the analog input signal on the PRE series electronic regulator.
  Therefore, a minimum and maximum value of the reference signal are associated with the minimum and maximum point controlled
  For example, if the minimum controlled point is set at 3 with a reference signal type 0-10V, when the reference signal is 0V the regulated pressure moves to 3 bar.
  For example, if the maximum controlled point is set at 8 with a reference signal type 0-10V, when the reference signal is 10V the regulated pressure moves to bar.
  This function does not always improve resolution, which may in any event be limited by the intrinsic characteristics of the PRE series electronic regulator and its internal components.
  The values can also be set using the "SET" keys: the pressure value read by the internal sensor is shown.
- Minimum target e Maximum target signal: may be possible to set a minimum and a maximum point of the reference signal.
  The value that identifies these points varies between the minimum and maximum point of the reference signal (±10V, 0÷10V or 4÷20mA depending on the code number of the PRE electronic regulator). The software "UVIX" verifies consistency of the two values and ensures that the minimum point is not greater than the maximum point.
  This function enables the user to limit the reference signal range with respect to the nominal range while continuing to control the entire range of the regulated pressure on the PRE electronic regulator.
  Therefore, the two maximum positive and negative values of the regulated pressure on the PRE electronic regulator are associated respectively with the set minimum and maximum reference signal values.
  For example, if the type of reference signal is 0-10V and the minimum controlled point is set at 2V and the maximum controlled point is set at 7V, at a reference signal of 2V the output

pressure is regulated to the minimum value of the pression nominal range, while at a signal of 7V the output pressure is regulated to the maximum value of the pression nominal range. This function does not always improve resolution, which may in any event be limited by the intrinsic characteristics of the PRE series electronic regulator and its internal components.

- Minimum/Maximum external sensor output: è possibile impostare il range del segnale elettrico del sensore esterno. I valori Minimum external sensor output e Maximum external sensor output corrispondono rispettivamente al valore minimo e massimo del range del segnale elettrico del sensore esterno. Il software di supervisione "UVIX" verifica la coerenza dei due valori imponendo che il punto di minimo non sia maggiore del punto di massimo. Questi parametri permettono di adattare il range del segnale elettrico del sensore esterno rispetto al range nominale dell'ingresso del PRE.

  Se, ad esempio, l'uscita del sensore esterno è nel range 0,5-4,5V, impostare Minimum external sensor output pari a 0,5V, Maximum external sensor output pari a 4,5V e il parametro External Sensor interface nel menù User Interface sul valore "voltage" (range nominale 0-10V).

  Se invece, ad esempio, l'uscita del sensore esterno è nel range 4-20mA, impostare Minimum external sensor output pari a 4mA, Maximum external sensor output pari a 20mA e il parametro External Sensor interface nel menù User Interface sul valore "current" (range nominale 4-20mA).

13.2.3. Digital output setup

This group contains the parameters to set the digital output. For more details regarding this function, refer to the paragraph "Digital output".

- Digital output mode: sets the digital output operating mode. The available options are: Error, Switch or Window.
- Digital output level: sets the operating logic of the digital output based on the type of connection.
- Lower limit switch control: sets the lower threshold for the pressure switch mode.
- Upper limit switch control: sets the upper threshold for the s pressure witch mode.
- Lower limit window control: sets the lower differential for the pressure window mode.
- Upperr limit window control: sets the higher differential for the pressure window mode.

13.2.4. Pressure sensor setup

The parameters of the pressure sensor are contained in this group: these parameters cannot be modified by the user.

- Pressure sensor minimum pressure: displays the minimum value in the external pressure sensor range. Value expressed in the unit of measure setted in the UVIX menù "Unit of measure preference".

- Pressure sensor maximum pressure: displays the maximum value in the external pressure sensor range. Value expressed in the unit of measure setted in the UVIX menù "Unit of measure preference".

The maximum pressure value regulated directly by the PRE series regulator is 150 PSI, a limit determined by its internal components. To regulate higher pressure values, an external pressure amplification system must be provided.

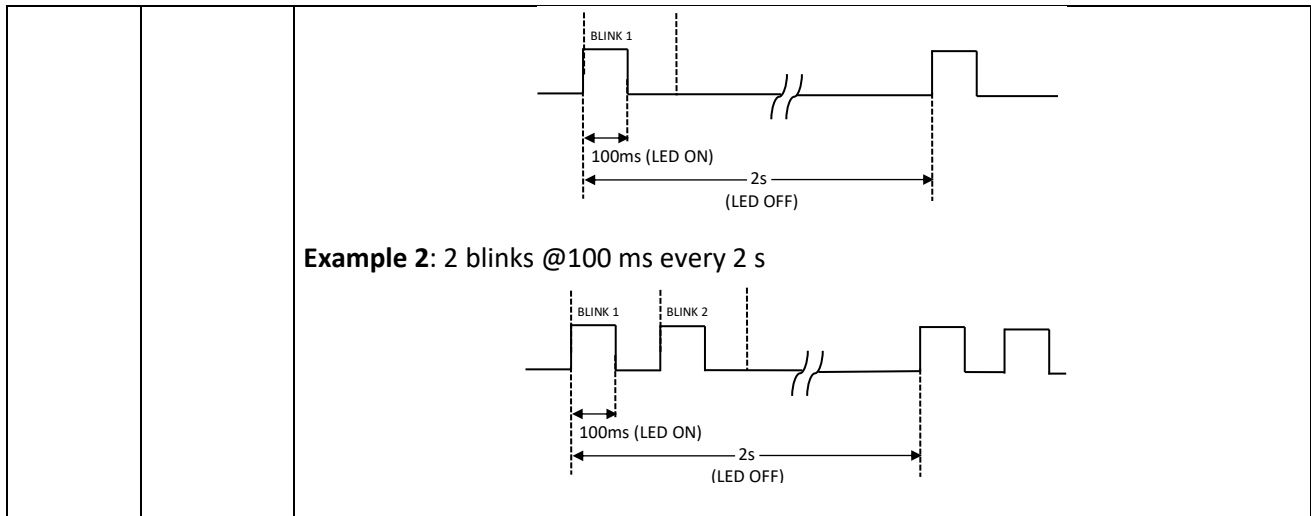### 13.3. External sensor configuration - examples

- External sensor with measured pressure range 0-100 PSI, output signal 0,5-4,5V:
  - o Pressure sensor minimum pressure = 0 PSI
  - o Pressure sensor maximum pressure = 100 PSI
  - o External sensor interface = Voltage
  - o Minimum external sensor output = 0,5
  - o Maximum external sensor output = 4,5
- External sensor with measured pressure range 0-10 bar, output signal 4-20mA:
  - o Pressure sensor minimum pressure = 0 bar
  - o Pressure sensor maximum pressure = 10 bar
  - o External sensor interface = Current
  - o Minimum external sensor output = 4
  - o Maximum external sensor output = 20
- External sensor with measured pressure range 0-300 bar, output signal 0-10V:
  - o Pressure sensor minimum pressure = 0 PSI
  - o Pressure sensor maximum pressure = 300 bar
  - o External sensor interface = Voltage
  - o Minimum external sensor output = 0
  - o Maximum external sensor output = 10

14.Use

- Ensure that the pressure in the compressed air supply system and all other operating conditions remain within the admissible values.
- Use with liquids or gas is not permitted according to the intended use
- The LED bar on the regulator provides information regarding the status of the product, please refer to the table below.

SYMBOL	LED STATUS	DESCRIPTION
⚪	LED OFF	LED is OFF.
⚪	LED ON	LED is fixed ON.
🔴	BLINKING	LED is blinking according to a specific sequence associated to the different diagnostic state: @XX [ms/Hz] per YY [s] ▪ XX is the ON/OFF time duration of a blink. ▪ YY is the repetition time of blinking sequence. **Example 1**: 1 blink @100 ms every 2 s

Example 2: 2 blinks @100 ms every 2 s

VERSION WITH DISPLAY	
LED BAR STATUS	**MEANING**
🟢 GREEN ON	Regulator is working with no errors or warnings.
🔴 RED ON	The regulator has registered an **ERROR**. Pressure regulation is interrupted.
🟠 YELLOW/ORANGE ON	The regulator has registered a **WARNING**. Pressure regulation is not interrupted.
During startup operation, the LED bar is red fixed. When an **ERROR** or a **WARNING** appears, the relative code is shown on the display.	

| VERSION WITHOUT DISPLAY		
DEVICE STATUS	**LED STATUS**	**MEANING**
Normal operation.	🟢 GREEN ON	Regulator is working with no errors or warnings.
The regulator has registered an **ERROR**. Pressure regulation is interrupted.	🔴 1 RED blink @200 ms every 3 s	ALARM_INTERNAL: an internal component of regulator don't work properly.
	🔴 2 RED blinks @200 ms every 3 s	ALARM_PRESSURE: the regulator is not able to reach the target pressure.

	4 RED blinks @200 ms every 3 s	ALARM_COIL: generic error during pilot valve power on, probably caused by interrupted or short-circuited coil.
The regulator has registered a **WARNING**. Pressure regulation is not interrupted.	**1 YELLOW/ORANGE blink** @200 ms every 3 s	WARNING_INTERNAL: an internal component of regulator don't work properly
	2 YELLOW/ORANGE blinks @200 ms every 3 s	WARNING _PRESSURE: the regulator is not able to reach the target pressure.
	3 YELLOW/ORANGE blinks @200 ms every 3 s	WARNING_ANALOG_SIGNAL: the analog target signal is out of range. WARNING_EXTERNAL_SIGNAL: the analog external sensor signal is out of range .
	4 YELLOW/ORANGE blinks @200 ms every 3 s	WARNING_UNDERVOLTAGE: power supply is below the minimum value
	5 YELLOW/ORANGE blinks @200 ms every 3 s	(Signalling available only if the device is equipped with the coil vision function) WARNING_COIL: a coil is near the end of its life cycle.
During startup operation, the LED bar is red fixed.		

WIRELESS LED STATUS	MEANING
BLUE ON	Wireless board is available and the regulator is connected to the supervisor software UVIX
Blinking BLUE 1Hz	Wireless board is available but the regulator is not connected to the supervisor software UVIX
OFF	Wireless board is not available

- If present, the display provides the following information

    Area 1 - Display of the measured pressure by external sensor or a warning / error code. If the unit of measure is setted as Kpa and the maximum value of the regulated pressure exceed 9999 Kpa, the value of measured pressure by external sensor is showed on LCD reduced by a factor 1/10.

    Area 2 - Display of the unit of measurement of the regulated pressure

    Area 3 – Indication of "Digital output active"

    Area 4 - The target value of the regulated pressure is set via the analog input

    Area 5 - The target value of the regulated pressure is set by a command from the UVIX software supervisor

    Area 6 - Indication of which parameter setting is used for regulation

    Area 7 – Set of regulated pressure range.
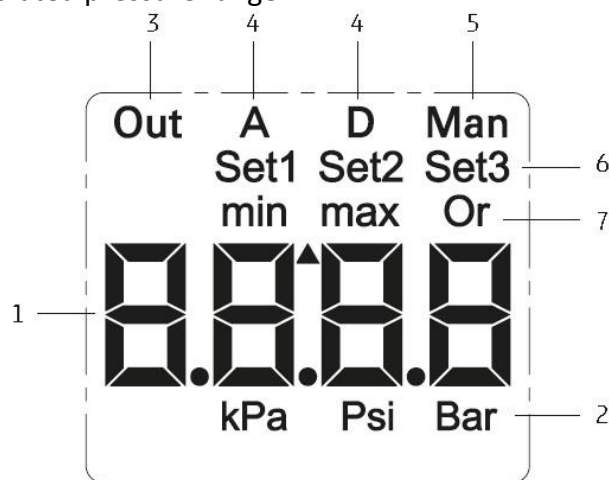
The LCD display and the 3 function keys, if present, show the device status (for example pressure set and / or any warnings or errors) and to configure some parameters. These same parameters can also be configured using the UVIX supervision software.

When a time-out expires, the display shows the main screen and at the end of another time-out, settable with the default value of 2 minutes, the LED-backlit LCD display and the backlit function keys are switched off. To switch them on again, just press any key.

When one or more warnings appear during operation, the display shows the one with the lowest number and the LED on the regulator turns yellow.

If there is only one warning and the conditions that caused it are subsequently resolved, the LED turns green and the LCD display continues to indicate the number of the warning.

By pressing any key, the display will return to indicate the value of the regulated pressure.

If, on the other hand, there are several warnings, the display will show the one with the lowest number. If only the conditions that caused the warning that is displayed on the LCD screen are resolved, the LED remains yellow and the LCD display continues to indicate the number of the warning. By pressing any key, the display will switch to indicate the number of the warning that is still active.

The following parameters are settable via LCD:

- Unit of measurement: serves to set the unit of measurement of the Regulator (kPa, psi or bar).

- PID mode: serves to set the parameters for the PID behavior; choice between Set1 (slow), Set2 (medium) or Set3 (fast).
- Input type: serves to set the source of the pressure target between Automatic or Manual.
- Minimum and maximum values for regulated pressure range

15. Troubleshooting and/or exceptional circumstances

Code	Name	Description
ERROR = The control operations are interrupted	
E001	Alarm sensor	Communication error regarding pressure sensor, the sensor doesn't communicate in the right way or a diagnostic error is present
E002		
E003	Alarm ADC	ADC starting error, this error regards the conversion, that is necessary to read the target pressure, or an error was detected during the process.
E004		
E005	Alarm EEprom	Memory writing, reading or accessing error of information that is essential to the process.
E006		
E007		
E009	Pressure out of range	The regulator is not able to reach the target pressure.
E010	Fault up coil	Generic error during pilot valve power on, probably caused by interrupted or short-circuited coil.
E011	Fault down coil	Generic error during pilot valve power off, probably caused by interrupted or short-circuited coil.
WARNING = The control operations are not interrupted but performance is not guaranteed	
A129	Undervoltage Power	Power supply is below the minimum value.
A130	Pressure out of range	The regulator is not able to reach the target pressure.
A131	No activation valve	No activation valve error
A132	Wrong analog signal	The analog target signal is out of range
A133	Warning EEprom	Memory writing, reading or accessing error of information that is not essential to the process.
A134		
A136		
A135	Wrong ADC calibration	Error on ADC calibration.
A142	Wrpng external sensor signal	The analog external sensor signal is out of range

If the device is equipped with the coil vision function, the following signals are also available:

Codice	Nome	Descrizione
WARNING = The control operations are not interrupted but performance is not guaranteed	
A137	Warning charge coil	The charge coil valve is near the end of its life cycle.
A138	Warning exhaust coil	The discharge coil valve is near the end of its life cycle.

	Operation and maintenance instructions	5000056022
CAMOZZI Automation	**Series PRE proportional pressure regulator** **External sensor version**	Ver. 01

16.Limitations on use

- Never exceed the technical specifications stated in the paragraph "General characteristics" and the Camozzi general catalogue.
- With the exception of specific intended applications, do not use the product in environments where there is the risk of direct contact with corrosive gas, chemical products, salt water, water or steam.
- If possible, do not install the device:
  - in closed and small spaces
  - exposed to direct sunlight (if necessary provide a shield)
  - near heat sources or in areas subject to sudden changes in temperature
  - near power on parts with no proper insulation
  - near conductors or electrical devices with high alternate or impulsive currents (danger of parasitic currents);
  - near sources of high intensity electromagnetic waves (antennas) (danger of parasitic currents and / or arcing of electric arcs).
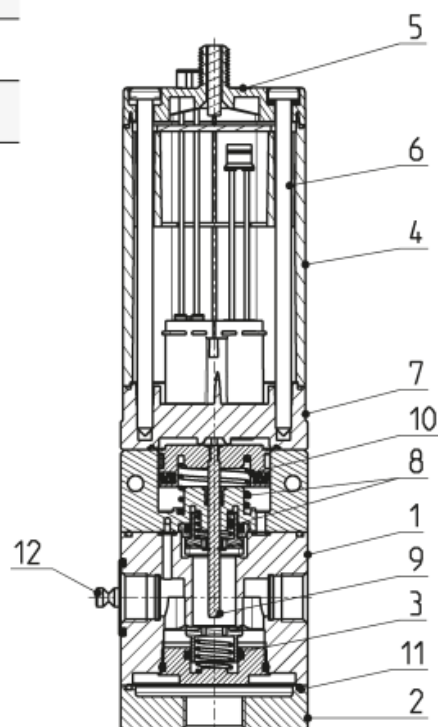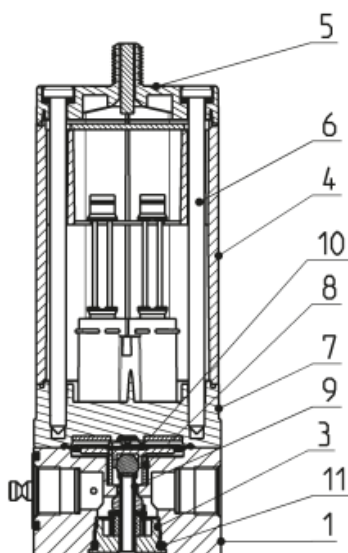
17.Maintenance

- Check all conditions to prevent the inadvertent release of parts, and disconnect the power supply to enable the discharge of residual pressure from the system before performing work.
- Discharge all pressure from the system and the actuator itself.
- Check whether it is possible to have the product serviced at a technical assistance centre.
- Never disassemble units when pressurized.
- Shut off all pneumatic, hydraulic and electric supplies before maintenance.

18.Environmental notes

- At the end of the product's life cycle, separate the relative materials to enable recycling.
- Observe all current standards in the country of use governing waste disposal.
- The product and relative parts all comply with the standards ROHS and REACH.

Operation and maintenance instructions
Series PRE proportional pressure regulator
External sensor version

5000056022

Ver. 01

Parts		Materials
1 =	body	Anodised aluminium
2 =	end cover	Anodised aluminium
3 =	plug	brass
4 =	cover	PA6 CM 30%
5 =	cap	PA6 CM 30%
6 =	screws	stainless steel
7 =	valve body	PARA GF50%
8 =	springs	stainless steel
9 =	piston rod	stainless steel
10 =	piston seal	NBR
11 =	seals and O-Ring	NBR standard version FKM oxygen version
12 =	pin for manifold version	stainless steel only for manifold version

19. Contacts

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Product certification

product certifications

CE marking

declarations of conformity and instructions

productcertification@camozzi.com

Technical assistance

Technical information

Product information

Special products

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