Operation and maintenance instructions for Series PME 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 PME electronic pressure regulator**.

This version of the Controller is identified with code 0184 xx xx xxx x xxxxx, where 0184 indicates the version of regulator and is followed by year, week, machine, station and serial number.

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 PME electronic pressure regulator is composed of:
- M12 5 pin connector (1): provides connection to power supply, command signal and to the output digital signal (for more details refer to the paragraph "Installation and Commissioning").
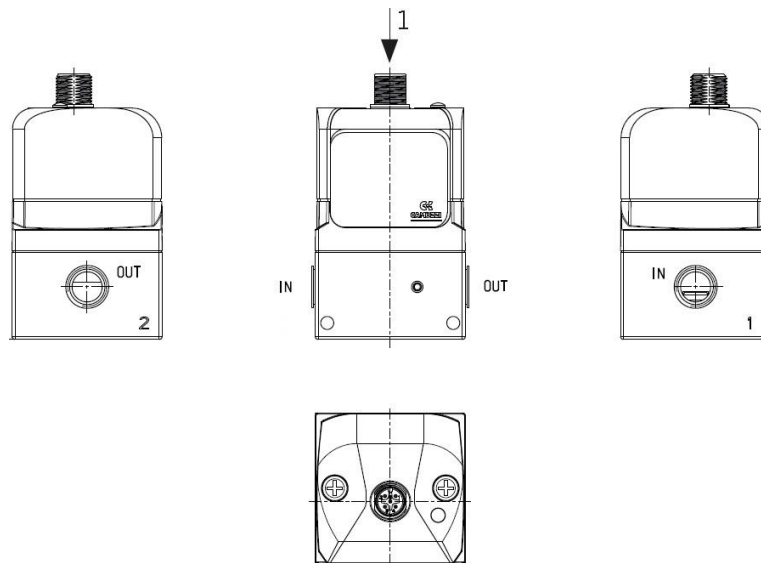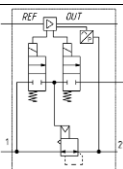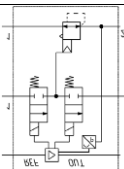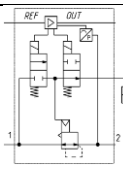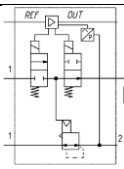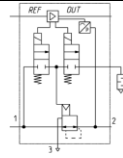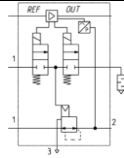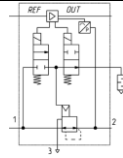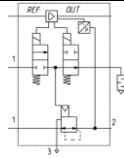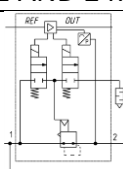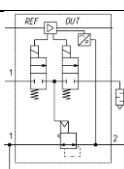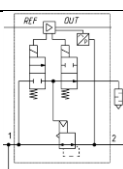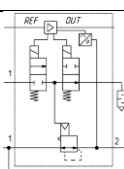

The analog version of the Series PME electronic pressure regulator is available with two different command signal types:
- Analog Voltage: voltage command signal 0 - 10 V.
- Analog Current: current signal 4 - 20 mA.

The choice between the two models must be made when ordering the regulator.

The configuration of some features of the Series PME electronic pressure regulator is done through the NFCamApp app.

5. Pneumatic simbol:

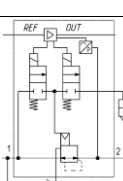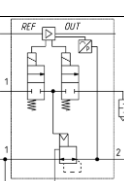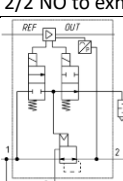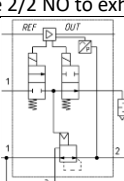| SIZE 1 AND 2			
Version with internal servo-pilot supply, two pilot valves 2/2 NC.	Version with external servo-pilot supply, two pilot valves 2/2 NC.	Version with internal servopilot supply and two pilot valves; one 2/2 NC and one 2/2 NO (exhaust).	Version with external servopilot supply and two pilot 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		
	PME1	**PME2**
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 = 88 mm	L = 50 mm; W = 50 mm; H = 133 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 (refer to coding table)	11 bar (D); (G) and (F)	
Regulated pressure range	0,05 - 10,3 bar (0,72-150 PSI)(D) 0,05 - 6 bar (0,72-87 PSI)(F) 0,05 - 7 bar (0,72-101,5 PSI) (G)	
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; G1/8; 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 5 Pin Male A-key	
Input signal setpoint	Analog version: 0÷10V (2), 4÷20 mA (4)	
Electrical power supply	24Vdc ±10%	
Current consumption	Max 0,250A (refer to the table below for more details)	

Hysteresis (*)	0,5% FS	0,7% FS
Repeatability (*)	0,4% FS	0,4% FS
Linearity (*)	0,3% FS	0,3% FS
Resolution (*)	0,3% FS	0,6% FS
Overpressure discharge	With relieving	
Modularity	With Series MD	

(*) measured with Inlet pressure = Maximum regulated pressure + 1bar and a volume connected to the outlet without any loss.

Integrated exaust valve	Code	Maximum current consumption
NO	PMExxx-Ex5xxx-xx PMExxx-Ex7xxx-xx	0,110 A
SI	PMExxx-Ex6xxx-xx PMExxx-Ex8xxx-xx	0,200 A

- Efficiency curve

Efficiency curve 10,33 bar

$y = 0{,}1033x$
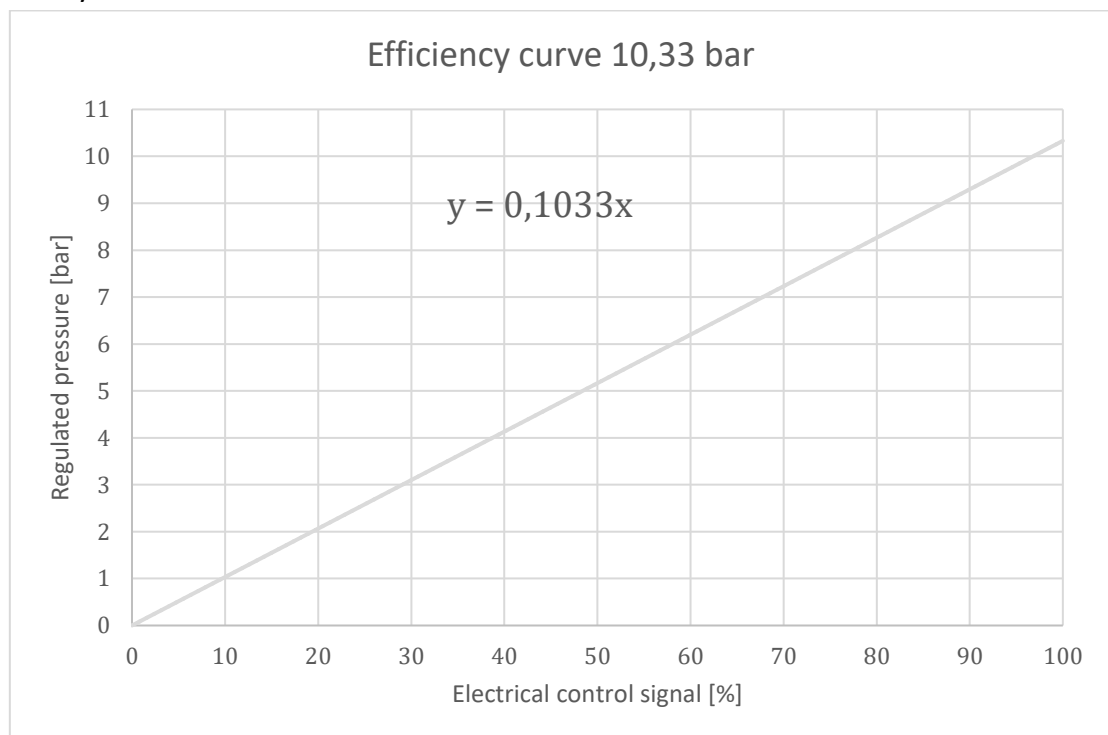
- FLOW CHARTS SIZE 1 - Standard version (1/4G)

Typical curve for version PME104-EF…
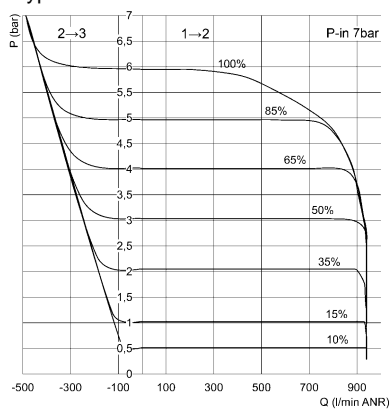
P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

Typical curve for version PME104-EG…

P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

Typical curve for version PME104-ED…

P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

- FLOW CHARTS SIZE 1 – Manifold version (1/4G)
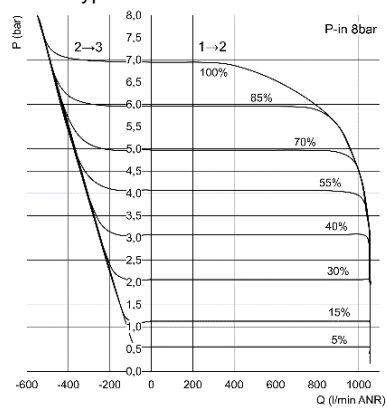
Typical curve for version PME1M4-EF…

P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

Typical curve for version PME104-EG…

P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

Typical curve for version PME104-ED…

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 PME204-EF…
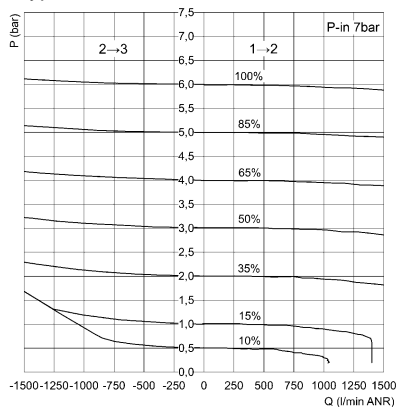
P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

Typical curve for version PME204-EG…

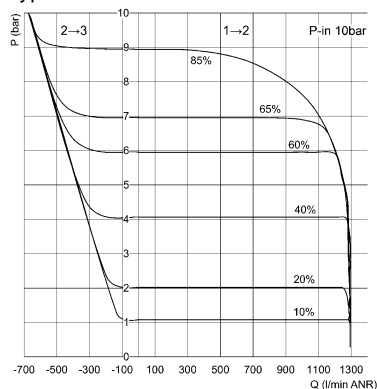P = Regulated outlet pressure and exhaust pressure
Q = Flow
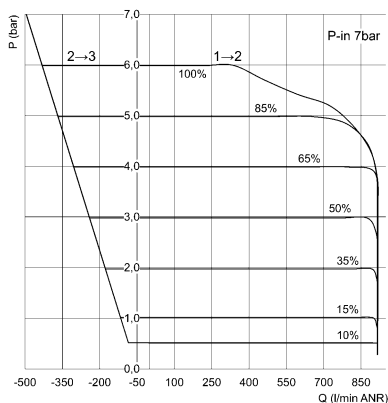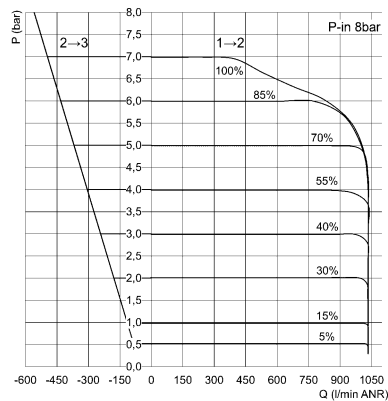% = Percentage of the command signal

Typical curve for version PME204-ED…

P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

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CAMOZZI Automation	**Series PME proportional pressure regulator**	Ver. 04

- FLOW CHARTS SIZE 2 - Standard version (3/8G)

Typical curve for version PME238-EF…
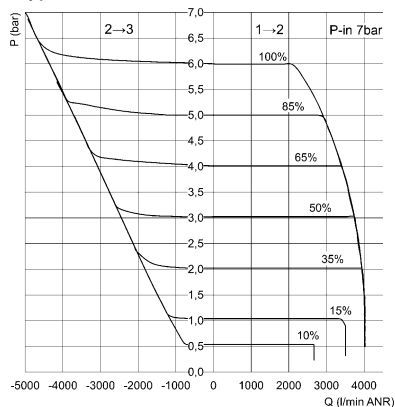
P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal
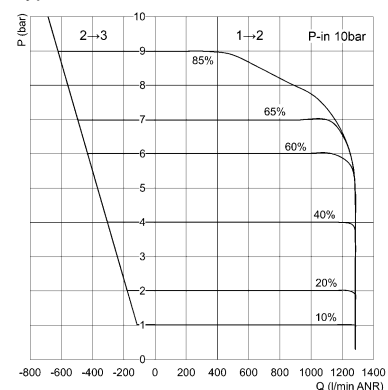
Typical curve for version PME238-EG…
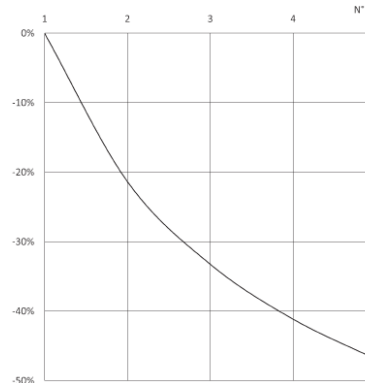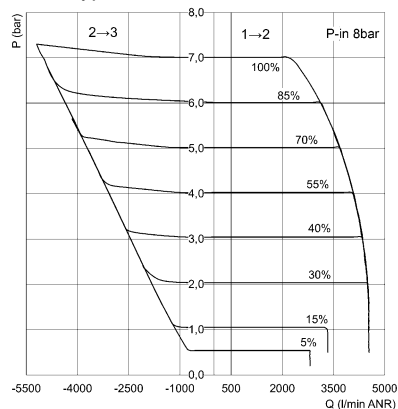

P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

Typical curve for version PME238-ED…
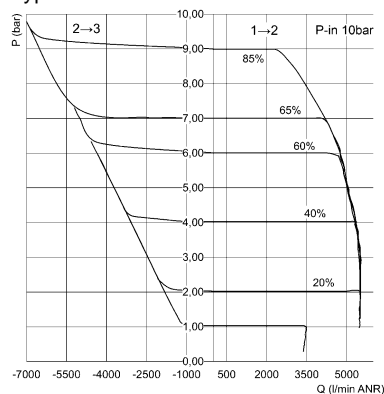
P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

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

Typical curve for version PME2M4-EF…
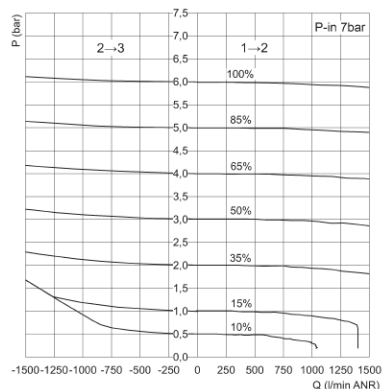
P = Regulated outlet pressure and exhaust pressure
Q = Flow
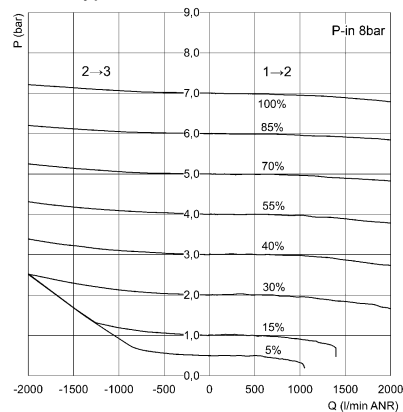% = Percentage of the command signal
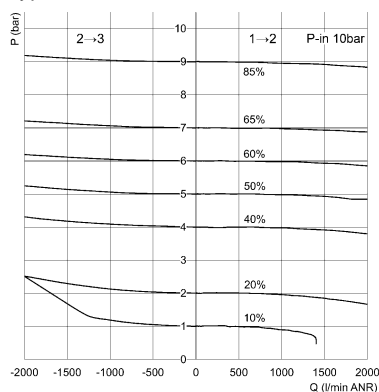
Typical curve for version PME204-EG…
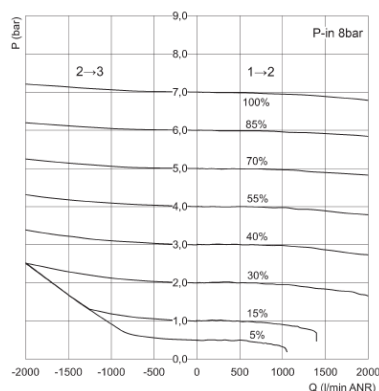
P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

Typical curve for version PME204-ED…
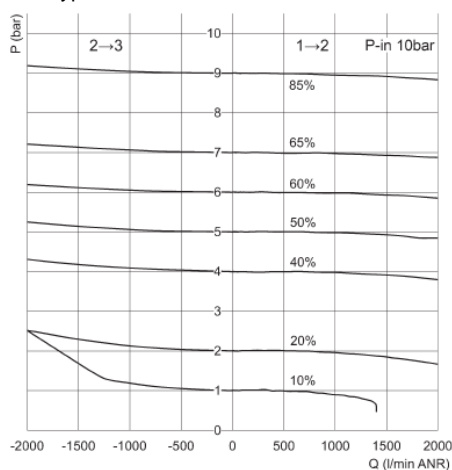
P = Regulated outlet pressure and exhaust pressure
Q = Flow
% = Percentage of the command signal

DECAY FACTOR FOR MANIFOLD REGULATOR SIZE 2
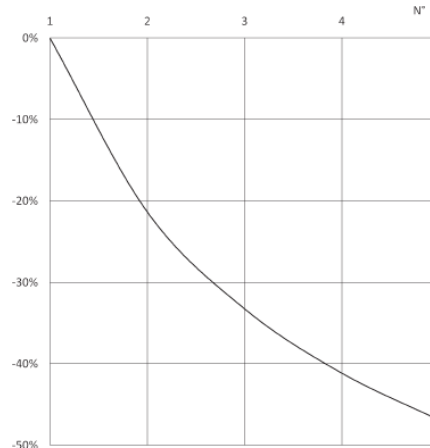
N° = number of regulators in manifold configuration
% = relative percentage decay of the maximum flow rate
Note: the air inlet is only from one side, in case it should be on the
right and on the left, only consider the positions as from 1 ÷ 3..

- Step response (Values determined according to ISO 10094-1)

PME-104				
Type of Dynamic tests	Dynamic Characteristics	No tank	Volume 0,4L	Volume 2L
Step 0% to 100%	Shifting Time [ms]	36	82	175
	Response Time [ms]	260	372	1.261
	Settling Time [ms]	179	247	934
Step 100% to 0%	Shifting Time [ms]	39	64	177
	Response Time [ms]	678	957	4.152
	Settling Time [ms]	470	708	3.170
PME-238				
Type of Dynamic tests	Dynamic Characteristics	No tank	Volume 0,4L	Volume 2L
Step 0% to 100%	Shifting Time [ms]	60	60	95
	Response Time [ms]	350	465	850
	Settling Time [ms]	250	325	650
Step 100% to 0%	Shifting Time [ms]	60	60	80
	Response Time [ms]	850	860	870
	Settling Time [ms]	600	590	565

7. Electrical/Pneumatic circuit
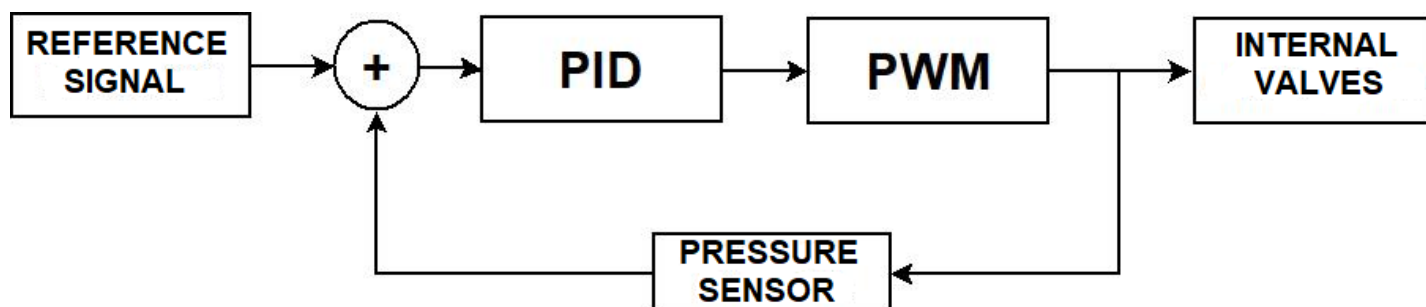
8. Product storage and transport

- 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
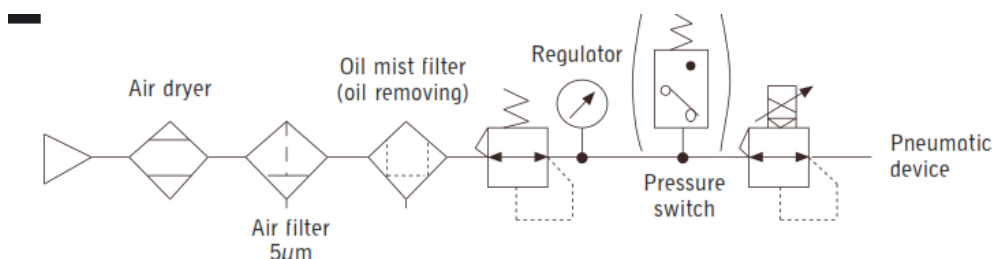
- Keep the protective cap of the M12 connector until the regulator is completely installed.

- PME1 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.
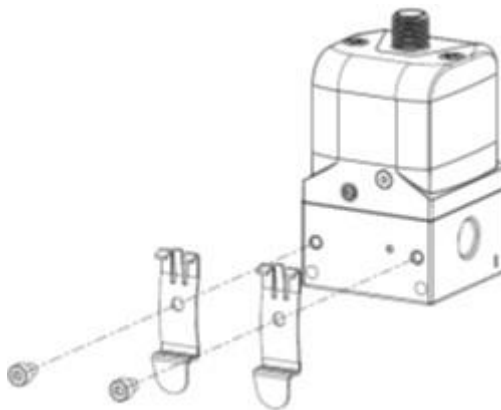
- The Series PME electronic regulator can be directly fixed to a support using the 2 through holes with diameter 4mm present on the body (not available in the PME1 manifold version).
- The PME electronic regulator can be fixed to the wall with the optional bracket code PRE-ST:
  1. Fix the bracket to 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
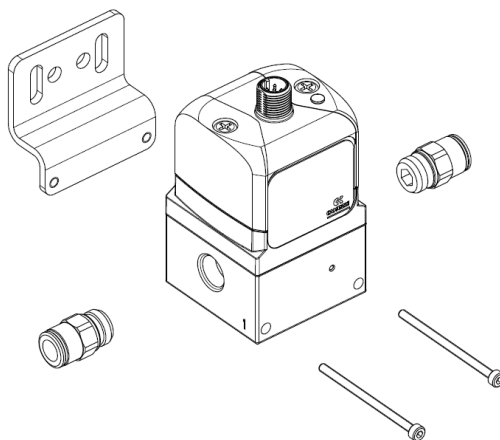
- Make sure that the bracket is completely resting on the wall
- Connection of Manifold regulators with related Kit PRE-M-Pin-1-2
  1. Insert the pins (1) in the seats on the regulator body
  2. Insert the O-ring seal (3) into the special seat on the side face of the body
  3. Bring the two modules sideways up until contact
  4. Tighten the four grub screws (2) until they are locked (Tightening torque: 2,5 ± 0,5 Nm)
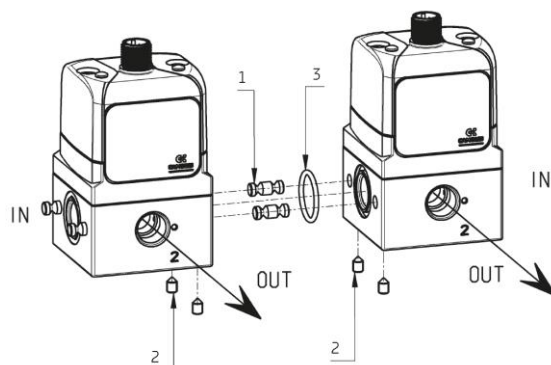
- There are 2 additional pneumatic ports on the PME series electronic regulator:
  - M5 to discharge the exhaust valve to the outside. It is important to keep this port free and clean to ensure that air is discharged without obstructions that could limit the flow. If necessary, only for version with 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.
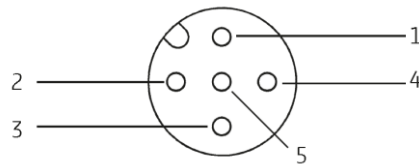- The board implements a protection against inversion of polarity on the power supply voltage.
- The board is also fitted with a non-resettable 1A fuse to limit the maximum current absorption of the servovalve. Use a power supply unit able to deliver a current of at least 0,5A (recommended 1.0A).
- If 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 5 pin male connector has the following pinout

PIN	NAME	DESCRIPTION
1	24 VDC	**Power supply**
4	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 of the reference signal generator. Internal resistance with voltage input: >10kΩ. Use reference signal generator with low impedance and with output current >1mA@10V. Internal resistance with current input: 100Ω. **It is mandatory to connect all negative poles of the power supply and the reference signal generator together.**
2	N.C.	**NOT CONNECTED**
5	Dout	**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.

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

CODE	DESCRIPTION
CS-LF05HB-D200	co-moulded connector M12 5 pole, female, straight with 2-metre cable shielded
CS-LF05HB-D500	co-moulded connector M12 5 pole, female, straight with 5-metre cable shielded
CS-LR05HB-D200	co-moulded connector M12 5 pole, female, 90° with 2-metre cable shielded
CS-LR05HB-D500	co-moulded connector M12 5 pole, female, bend with 5-metre cable shielded
CS-LF05HB-C200	co-moulded connector M12 5 pole, female, straight with 2-metre cable unshielded
CS-LF05HB-C500	co-moulded connector M12 5 pole, female, straight with 5-metre cable unshielded
CS-LR05HB-C200	co-moulded connector M12 5 pole, female, 90° with 2-metre cable unshielded
CS-LR05HB-C500	co-moulded connector M12 5 pole, female, 90° with 5-metre cable unshielded
CS-LR03HB-C200	co-moulded connector M12 5 pole 3 wires, female, 90° with 2-metre cable unshielded
CS-LR03HB-C500	co-moulded connector M12 5 pole 3 wires, female, 90° with 5-metre cable unshielded

NOTE: in the cable versions with 3 wires, only pins 1 (24 VDC), 4 (GND) and 3 (IN +) are available.
Pin 5 (Dout) is not available.

10. Digital output

The digital output (OUT signal, pin 5) is a 0-24V digital signal. Through the NFCamApp application 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 4), therefore the PNP digital input of the control system must be connected between pin 5 (Dout) and pin 4 (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 5 (Dout) and pin 1 (+ 24V)
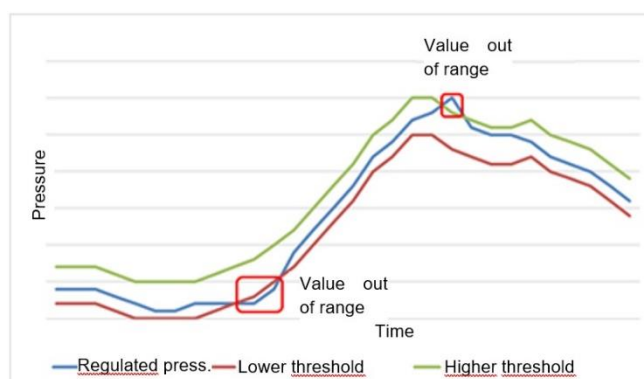
The operating mode of the digital output depends on what code is ordered. There are three different operating modes:

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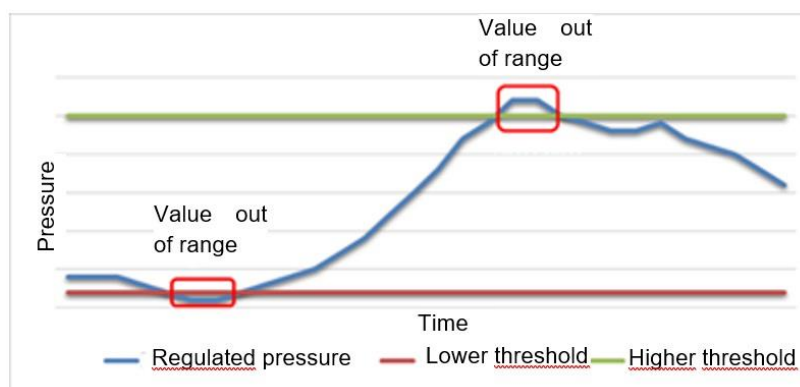
- Window pressure: with this operating mode it is possible to set two thresholds, a lower one and a higher one, which determine a pressure range with respect to the target pressure value.
  The digital output changes state if the regulated pressure is outside the instantaneous range (depending on the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

11. Device Configuration

NFCamApp is a configuration application that can be installed on android mobile device and available on Play Store.

NFCamApp communicates with the Series PME electronic pressure regulator via NFC connection and is able to configure the device. . The NFC antenna is located under the label with the product code.

Following the configurator of the Series PME electronic pressure regulator is described in detail. For installation and use of the NFCamApp, please refer to the dedicated manual.
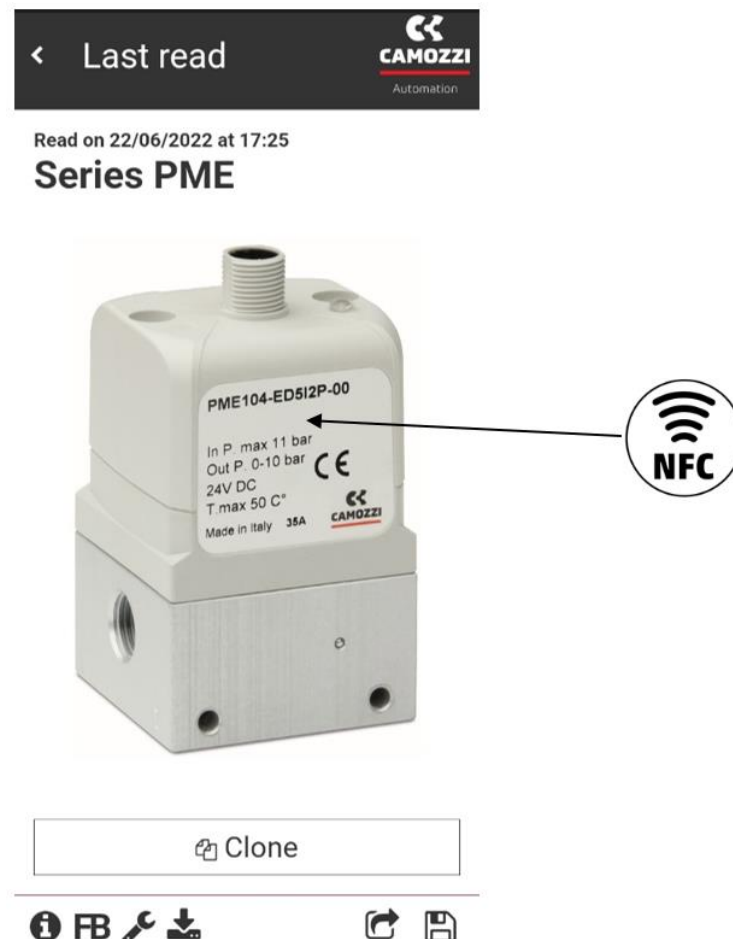
11.1. Information

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 (not available for the Series PME electronic pressure regulator)

- *Fieldbus*: indicates if the fieldbus connection is present

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

- *Setup version*: internal memory mapping version.

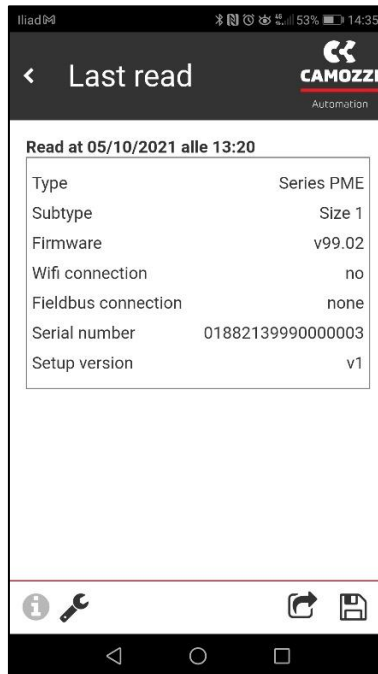## 11.2. Configurator

By clicking on the button 🔧 it is possible to open the configurator.

Two not editables parameters are showed:

- Set Point Signal: indicates the input type signal available, "Current" (4-20mA) or "Voltage" (0-10V).
- Commercial Code: commercial code of regulator

The editables parameters are divided into th following groups.

11.2.1. User setup

- Pid Mode: serves to set the PID gains according to the air volume used. The available values are: SET1 (SLOW, suitable for small volumes), SET2 (MEDIUM, suitable for medium volumes), SET3 (FAST, suitable for big volumes) or SET4 (CUSTOM).
- 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.
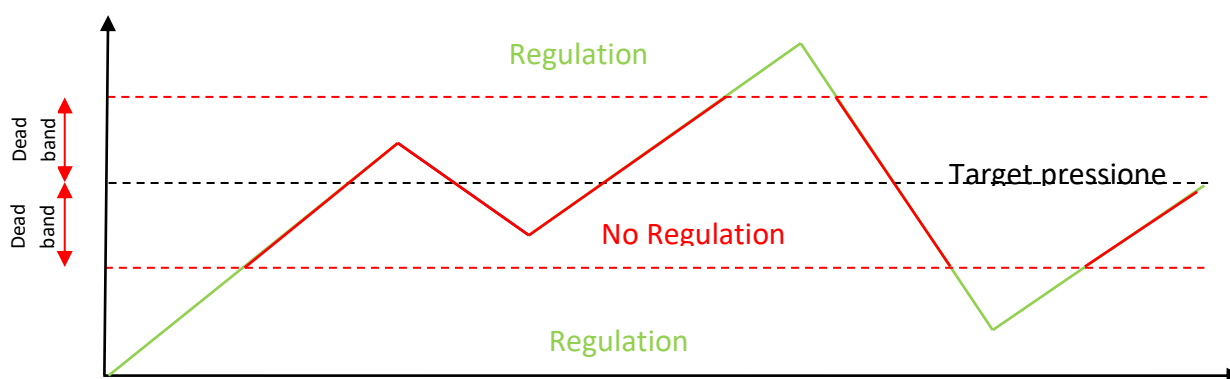
- Protection Timeout: sets the inactivity time of the regulator when the target pressure is not reached before the expiration of the Pressure regulation timeout. During the period of inactivity, the regulator maintains the current pressure without trying to reach the target pressure. After this inactivity time has expired, the regulator will try again to reach the target pressure. Use this parameter if you want to avoid that the regulator keeps the internal valves activated for too long, reducing their expected lifetime. If the parameter is 0, the function is disabled.
- Internal sensor filter cutoff: available only for PME FW version 3.01 or higher. This parameter sets the cutoff frequency [Hz] of the digital filter applied to the internal 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 PME 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.
- 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 "Negative window level" and "Positive window level" 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 "Enable pressure regulation check" parameter.

- 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.
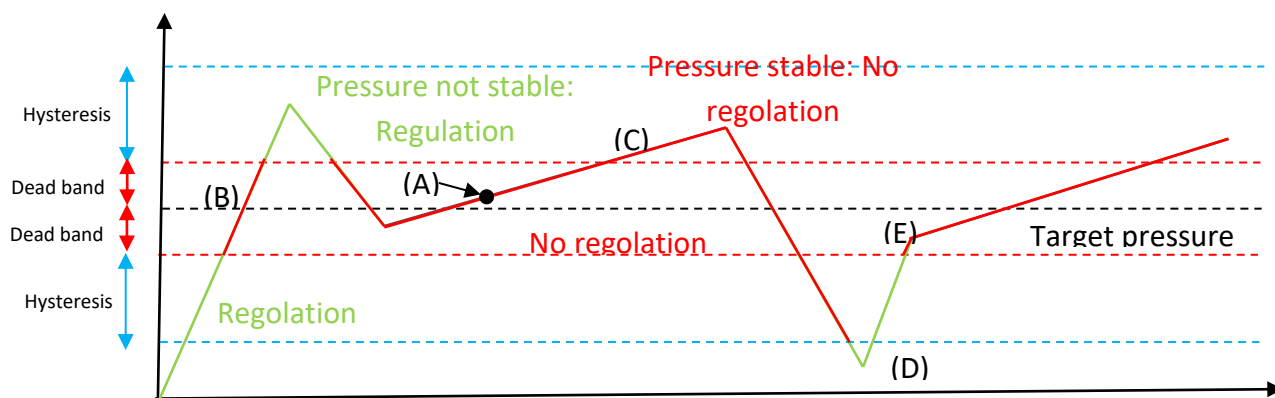
When the hysteresis operating mode is active, the regulator will not make any adjustment as long as the absolute error of the regulated pressure remains less than the value of the sum of the dead band and hysteresis values set (C).

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.

11.2.2. K 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

11.2.3. Range setup

This group contains the parameters to set the regulation ranges.

- Minimum and Maximum target pressure: may be possible to set a minimum and a maximum point of the regulated pressure range.
  The values that identify these points vary between the minimum and maximum values of the regulated pressure range
  The NFCamApp application 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 PME 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.
- Minimum and Maximum target input: 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 (0÷10V or 4÷20mA depending on the code number of the PRE electronic regulator). The NFCamApp application 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.

11.2.4.   Feedback 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 function: 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.
- Upper limit window control: sets the higher differential for the pressure window mode.
- Lower limit window control: sets the lower differential for the pressure window mode.
- 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.
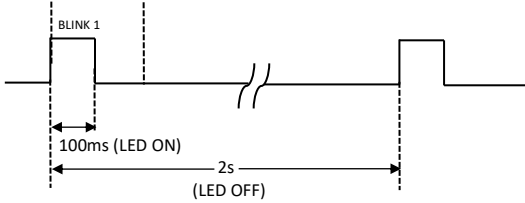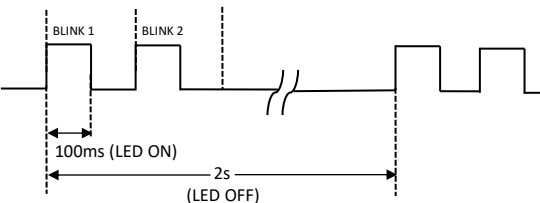
11.2.5.   Password

By pressing the "Set new password" button you can enter a new password (up to 4 alphanumeric characters) which will be saved in the device memory. If you forget the customized password, it will no longer be possible to modify the regulator parameters (in this case, contact the Camozzi Service to reset the regulator password to the factory settings). The password is not required to view the parameters.

11.2.6.   Saving parameters

All modified parameters (including the password) are saved in the regulator memory by pressing the "Write new parameters" button. The procedure requires entering the regulator password. The factory password is "0000".

12. 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

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.
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 ...
	☀️ 4 YELLOW/ORANGE blinks @200 ms every 3 s	WARNING_UNDERVOLTAGE: power supply is below the minimum value

Note: during startup operation, the led is red fixed.

13. 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).
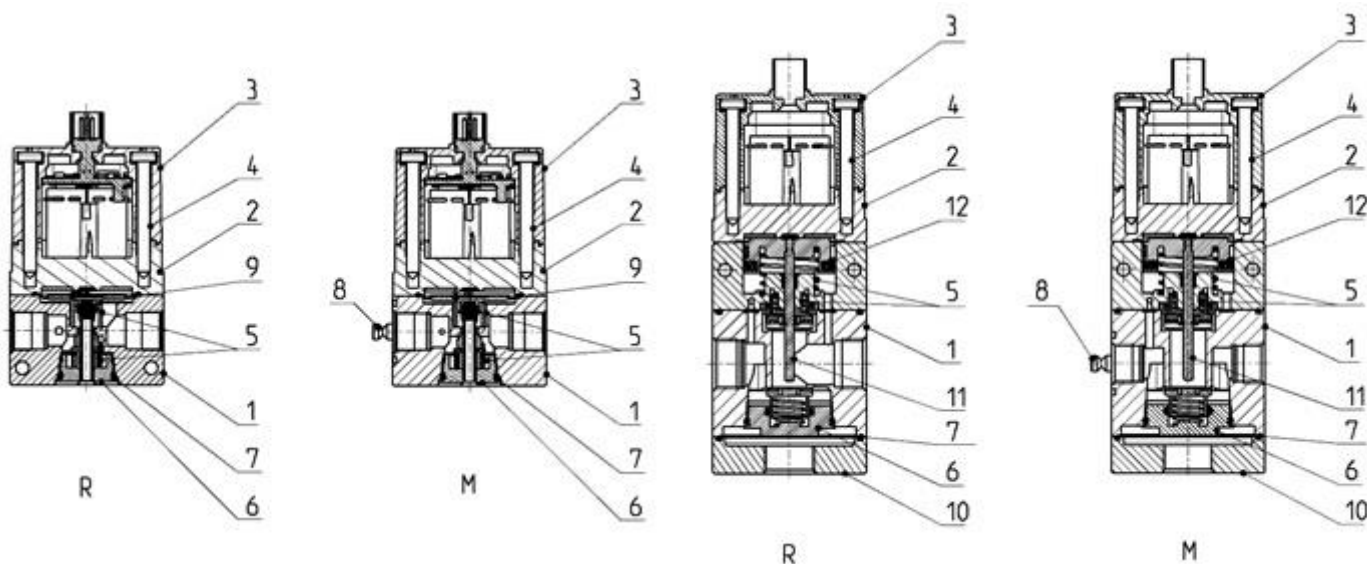
14. Maintenance

- 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 center.
- Never disassemble units when pressurized.
- Shut off all pneumatic, hydraulic and electric supplies before maintenance.

15. 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.

Parti	Materiali
1 = corpo	Alluminio Anodizzato
2 = corpo valvola	PARA GF50%
3 = copertura	PA6 CM 30%
4 = viti	Acciaio Inox
5 = molle	Acciaio Inox
6 = tappo	Ottone Nichelato
7 = guarnizioni e OR	NBR
8 = perni per visione manifold	Acciaio Inox solo per versione manifold
9 = membrana	NBR
10 = fondello	Alluminio Anodizzato
11 = stelo pistone	Acciaio Inox
12 = guarnizione pistone	NB

16.Contacts

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Product certification

product certifications

CE marking

declarations of conformity and instructions

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Technical assistance

Technical information

Product information

Special products

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