LUCIFER®

EPP3 Series Electropneumatic pressure regulator

with integrated electronic control

Catalogue 8677/GB
March 1999

Parker

INTRODUCTION

The product

A range of electropneumatic pressure regulators G1/4 and G1/2 which, by means of an integrated electronic control system and pulse width modulated solenoid valves, controls the output pressure proportionally to an analog electrical signal. A high precision is achieved by means of an internal feed-back through an integrated pressure sensor.

Applications

Pressure control independent of flow in electropneumatic control systems, in particularly the following industries:

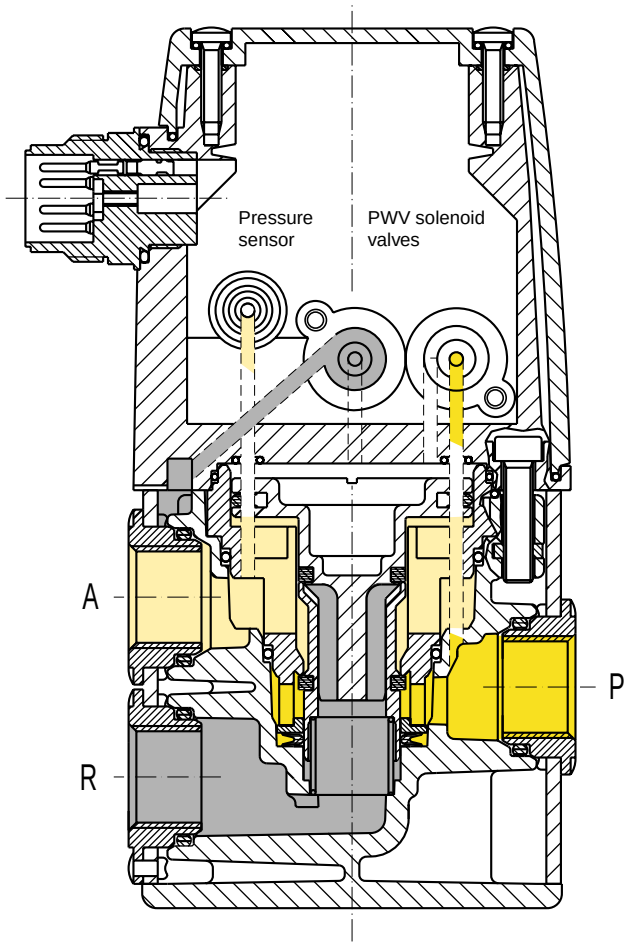
- Robotics: welding, painting lines, etc.
- Paper and printing: tension regulation, speed- and brake control for rolls
- Machine Tools: Plastic moulding, laser welding, presses, polishing, etc.
- Trucks and Trains: control of adaptive suspensions.

Benefits

- Simplification of control systems by reducing the number of components
- More flexibility of the controls
- Very fast response times
- Excellent linearity and hysteresis
- No air consumption in rest position
- Increase of the productivity (performances, quality, reliability)
- Direct interface to programmable controllers.

THE REGULATOR EPP3 - DESCRIPTION OF OPERATION

The EPP3 Series is a family of electrically remote-controlled pneumatic pressure regulators with closed loop integrated electronic control. It allows to regulate the outlet pressure proportionally to an electrical control signal.
The EPP3 regulator comprises a traditional servo-operated pneumatic pressure regulator, where the pilot chamber is fed by one or the other of two pulse width modulated 2-way solenoid valves. The pressure sensor measures the outlet pressure of the regulator and provides a feedback signal to the amplifier. Any difference between the control signal and the feedback signal is converted to a digital signal to energize the coil of one or the other 2-way valves to correct the position of the regulator.
The control signal can be a voltage (0 - 10V) or a current (4 - 20 mA). The inlet of the “filling valve” is connected directly to the main inlet P of the regulator; when energized this valve will fill the servo-chamber for increasing the pressure at the outlet A of the regulator.
When the other “exhaust valve” is energized (reduction of pressure at the outlet A of the regulator), the pressure of the servo-chamber will be exhausted through a discharge orifice located between the cover and the body and directly fed to the atmosphere without silencer. The exhaust of the main regulated pressure will be made through the quick exhaust R. The use of a conventional silencer is recommended. Both solenoid valves assure the filling or emptying of the servo-chamber in order to increase or decrease the pressure at the outlet of the regulator. In rest position of the valves all ports are blocked.



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TECHNICAL DATA

Fluid:	Lubricated or non lubricated air and neutral gases (recommended filtration: 25-50 μ)
Temperature range:	ambient 0 to 50° C fluid 0 to 50° C
Inlet pressure range:	1 to 12 bar (the inlet pressure must always be at least 1 bar above the regulated pressure).
Outlet pressure range:	0.2 to 10 bar
Hysteresis:	≈ 100 mbar (Factory set up)
Linearity:	1% f.s.o.
Air consumption at constant control signal:	0
Supply voltage:	24 V DC ± 15 % (Max. ripple 1 V)
Power consumption:	max. 6 W with 24 V DC and constant changes of the control signal < 1 W without change of control signal.
Control signal:	analog 0-10 V Impedance: 10 kΩ analog 4-20 mA Impedance: 0.5 kΩ
Outlet sensor signal:	A) proportional pressure outlet signal 0-10 V from integrated sensor (recommended load resistance 10 kΩ) B) proportional pressure outlet signal 4-20 mA from integrated sensor (recommended load resistance 0.5 kΩ) C) "Alarm" output signal 0/24 V with adjustable triggering level. (Difference between control signal and sensor pressure signal) (Imax. = 40 mA) - factory set up: diff. signal = ± 0.8 V to ± 1 V - possible set up: diff. signal = ± 0.1 V to ± 5 V To neutralize the alarm output signal during the control signal changes, the use of a synchronized time lag relay is required.
Indicative response time:	With a volume of 330 cm^3 at the outlet of the regulator: Filling: 2 to 4 bar - 2 to 8 bar Step response: ≈ 60 ms - ≈ 120 ms Emptying: 4 to 2 bar - 8 to 2 bar Step response: ≈ 70 ms - ≈ 130 ms.
Safety position:	In case of control failure or if it is less than 1% of its full scale value, the regulated pressure drops automatically to 0 bar (atmospheric pressure). In case of voltage supply failure, the regulated pressure will be kept constant (with eventual discrepancy due to loss of pressure in the servo-chamber).
Electrical connection:	4 screw terminals under the protection cover with Pg 13.5 cable gland or through DIN 43651 connector (6 P + E).
Life expectancy:	> 50 Mio changes of control signal steps.
Mounting position:	Indifferent (recommended position: upright; electronic part on top).
Resistance to vibrations:	30 g in all directions.
External sensors:	All pressure sensors with following characteristics are compatible with the EP-transducer: Sensitivity: 0.5 V/bar up to 10 V/bar Zero offset: – 3 V to + 3 V.
Degree of protection:	IP 65.
Assembly:	Silicone free.
Electromagnetic compatibility:	In accordance with IEC 801-4 part 4 standards.
Installation and setting instructions:	See publication MI-9202 and appendix supplied with the product.

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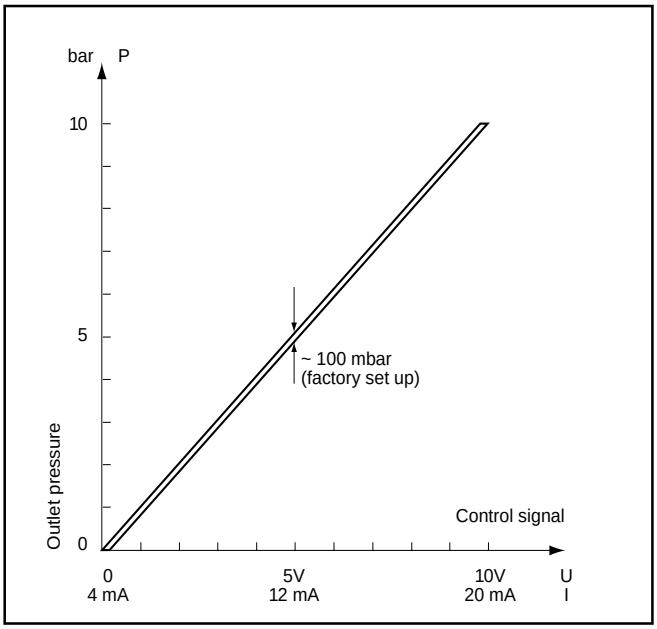
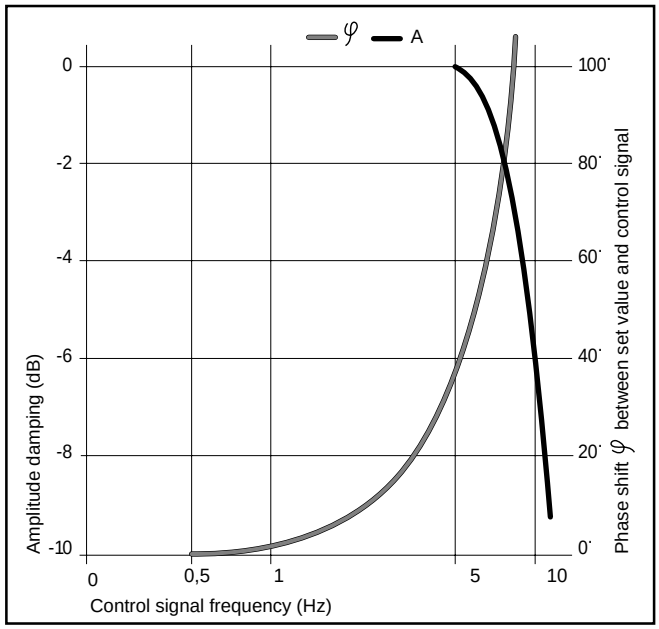
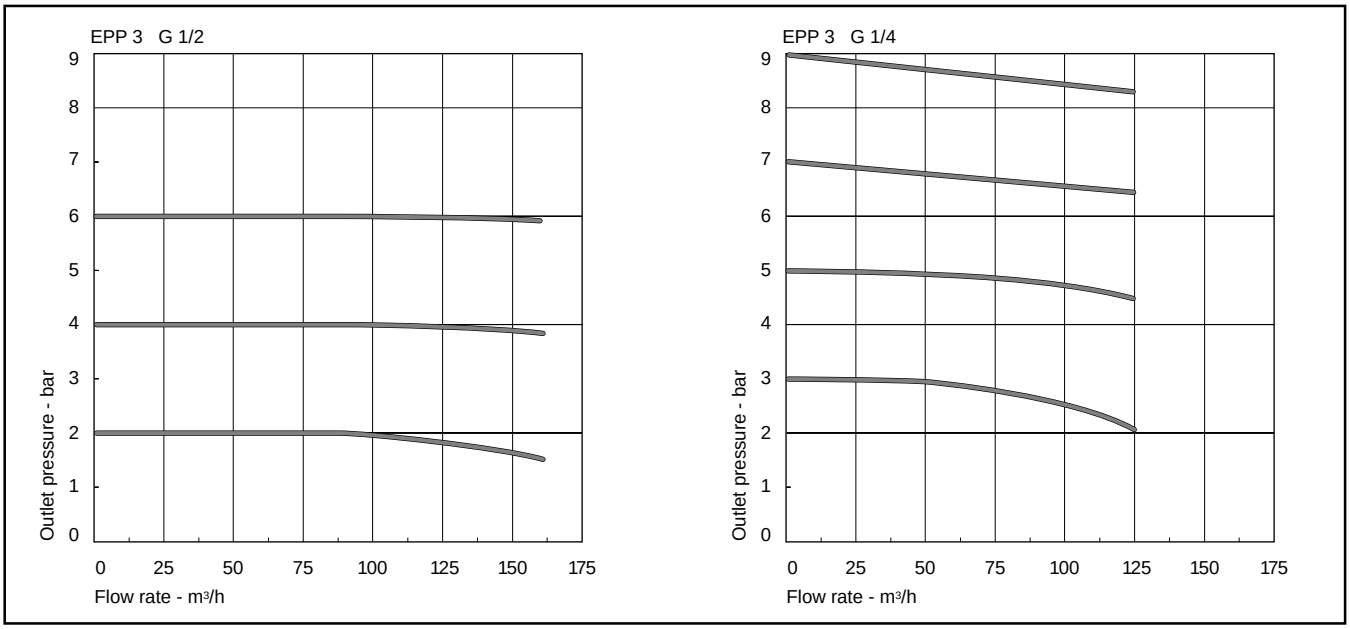
HYSTERESIS DIAGRAM



TRANSFER DIAGRAM



FLOW DATA - OUTLET PRESSURE IN FUNCTION OF FLOW AT CONSTANT CONTROL SIGNAL (P1 = 10 bar)



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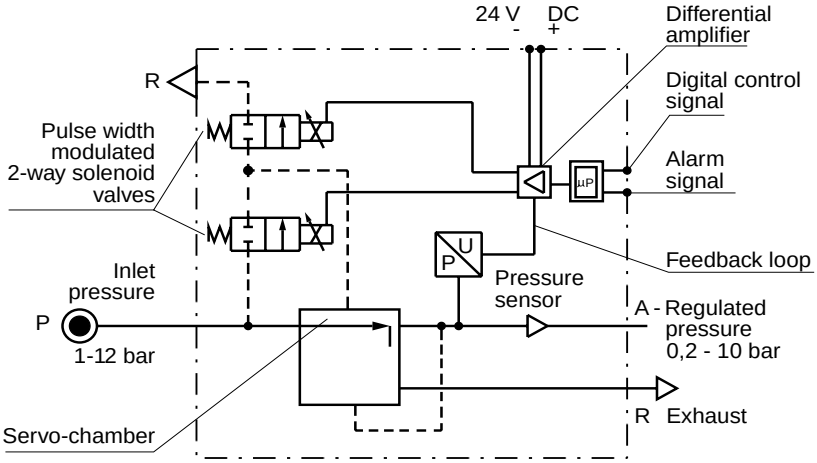
EPP3 - BLOCK DIAGRAMS

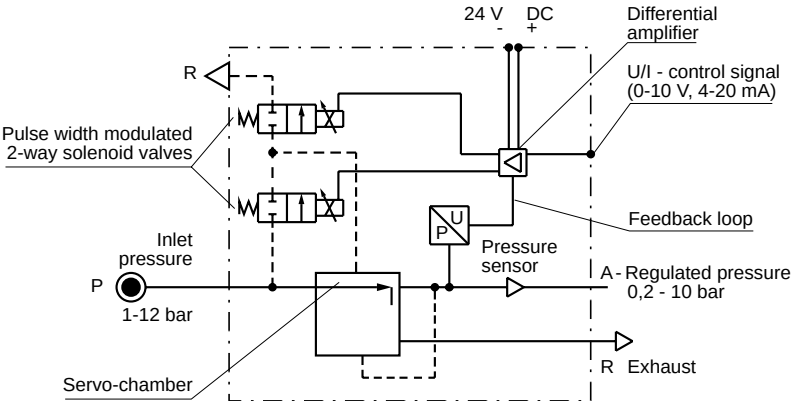
Series ... 600/700 ...
with integrated pressure sensor
and output signal module

The microprocessor receives through a differential amplifier both the control signal (set pressure) and the feedback signal from the sensor (outlet pressure). Any difference between the two amplifier inputs results in a corresponding output which drives the appropriate 2-way pulse width modulated solenoid valve so that the pilot piston moves to correct the pressure.



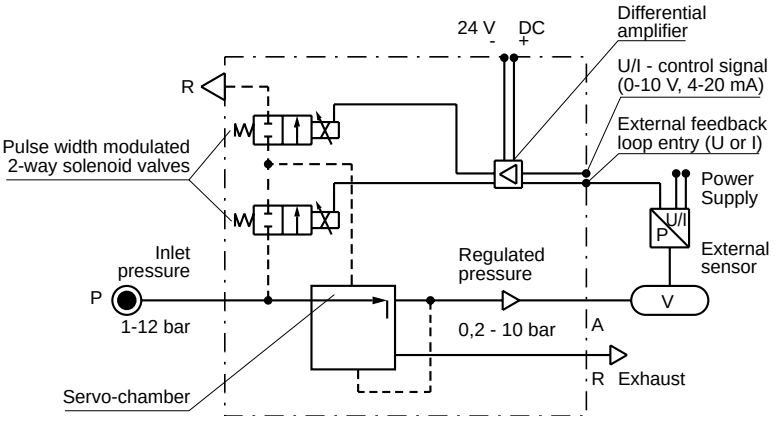
Series ... 100 ...
with integrated pressure sensor
without output signal module

Similar principle of operation as explained under pt. 1, but without output signal module.



Series ... 130 ...
without pressure sensor and
without output signal module

Similar principle of operation as explained under pt. 1, but without integrated pressure sensor and without output signal module, but with external feedback loop entry. A vast range of sensors can be used as proximity -, level -, pressure sensors etc providing the regulation system responds proportionally to the pressure.
Example: opening of a large valve through a pneumatically driven actuator. If the angle of rotation of the gate is proportional to the pressure, the EPP3 can be controlled by a proximity sensor.



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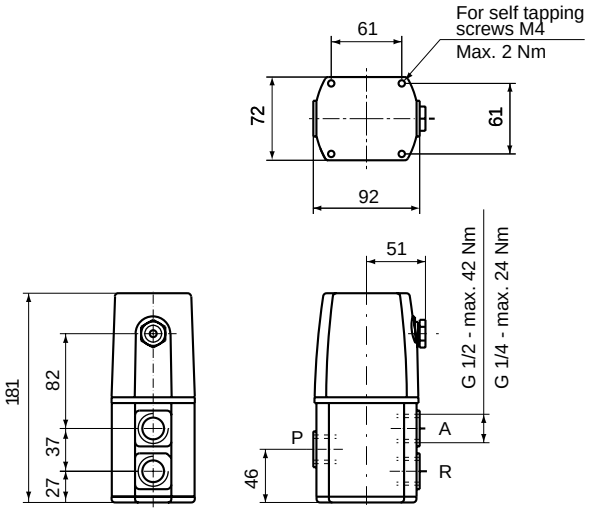
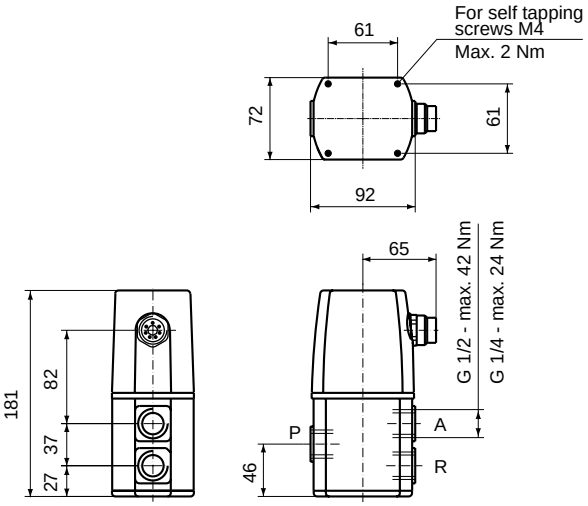
DIMENSIONS - TORQUES

EPP3JC ... 100 ...
with Pg 13.5 cable gland connection

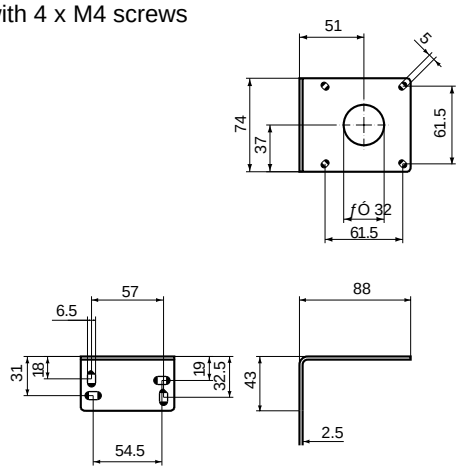


EPP3JC ... 130/600/700 ...
with DIN circular plug-in connection 6 P + E
(connector included)



ACCESSORIES

Mounting brackets
Supplied with 4 x M4 screws



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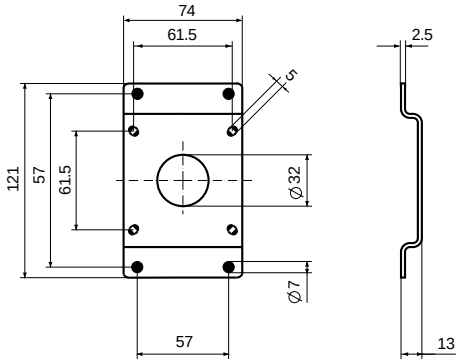

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DESIGNATION CODE

EPP3 J C 21 U 100 10 ...

Manufacturing date

Pressure range
10 = up to 10 bar

Special design reference

Outlet signal options
1 = without outlet signal or without sensor
6 = outlet signal 0-10 V and 4-20 mA
7 = outlet signal 0-10 V and 0/24 V alarm

Type of input signal (control value)
U = voltage 0-10 V
I = current 4-20 mA

Sensor option reference
1 = pressure sensor at the outlet of the regulator
3 = without internal pressure sensor, feedback 0-10 V
4 = without internal pressure sensor, feedback 4-20 mA

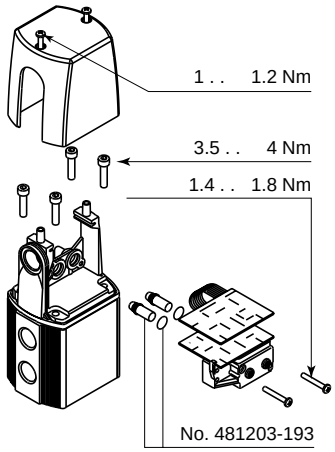
Port size reference
2 = 1/4", 4 = 1/2"

Port thread
C = BSP
O = NPT

Body type
J = plastic body with aluminium jacket

MAINTENANCE KIT

Torques; kit n° 481203-193
Plungers and seals for pilot valves



SUMMARY OF TYPES

	Connection G	With integrated pressure sensor	Entry options for external sensor signal		Outlet signal options			Electrical connection	
			feedback signal 0 - 10 V	feedback signal 4 - 20 mA	without	0 - 10 V 4 - 20 mA	0 - 10 V 0/24 V alarm	DIN 43651 connector	cable gland Pg. 13.5
EPP3JC 21U/I100 10	1/4	•			•				•
21U/I600 10	1/4	•				•		•	
21U/I700 10	1/4	•					•	•	
EPP3JC 23U/I130 10	1/4		•		•			•	
24U/I130 10	1/4			•	•			•	
EPP3JC 41U/I100 10	1/2	•			•				•
41U/I600 10	1/2	•				•		•	
41U/I700 10	1/2	•					•	•	
EPP3JC 43U/I130 10	1/2		•		•			•	
44U/I130 10	1/2			•	•			•	

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Catalogue 8677/GB
March 1999

LUCIFER®

EPP3 Series
EP-Transducer

with integrated electronic control

Catalogue 8678/GB
March 1999

Parker

INTRODUCTION

The product

A range of electropneumatic EP-transducers G1/8 and G1/4 which, by means of an integrated electronic control system and built-in pulse width modulated solenoid valves, controls the output pressure proportionally to an analog electrical control signal. High precision is achieved by means of an internal feedback loop through an integrated pressure sensor.

Applications

- Large flow valve pilot control
- Pressure remote control
- Mass braking
- Air motors speed regulation
- Contact forces control
- Tool clamping

Industries

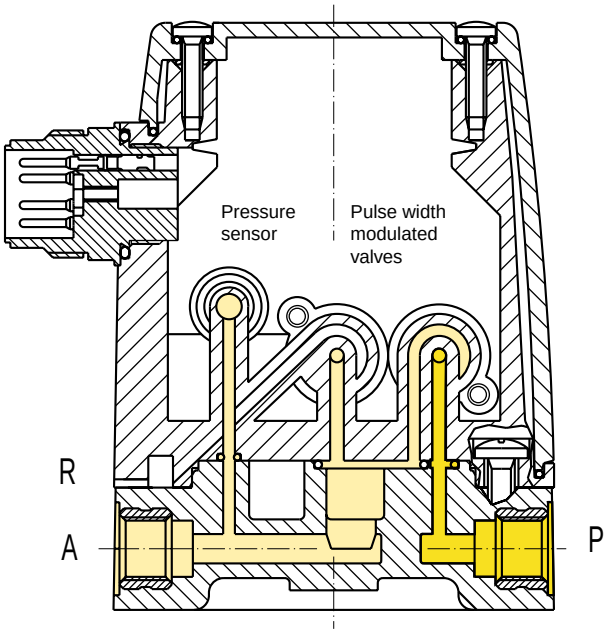
- Robotics: welding, painting lines etc.
- Paper and printing: tension regulation
- Food and Chemistry: processing
- Instrumentation: mixing
- Packaging: metering

Benefits

- Simplification of control systems by reducing the number of components
- More flexibility of the controls
- Increase in productivity
- Increase in safety
- Reduce maintenance
- Reduce rejects

DESCRIPTION OF OPERATION

The EP-transducer allows regulation of the outlet pressure proportionally to an electical control signal. It comprises an integrated closed loop electronic control and two pulse width modulated 2-way solenoid valves. The pressure sensor measures the outlet pressure and provides a feedback signal to the differential amplifier. Any difference between the control signal and the feedback signal is converted to a digital signal to energize the coil of one or the other 2-way valves. This is then followed by an immediate, soft correction of the outlet pressure without overshoot.
The control signal can be a voltage (0 - 10 V) or a current (4 - 20 mA). The inlet of the “filling valve” is connected directly with the inlet P of the transducer. When energized, this valve will increase the pressure at the outlet A. When the “exhaust valve” is energized, the pressure at the outlet A will decrease. The pressure will be exhausted through a discharge orifice located between the cover and the body and directly fed to the atmosphere without silencer.
Both solenoid valves assure the filling or emptying of the servo-chamber of a main flow control valve in order to increase or decrease the outlet pressure. In the rest position of the pilot valves, all ports are blocked.



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TECHNICAL DATA

Fluid:	lubricated or non lubricated air and neutral gases (recommended filtration: 25-50 μ)
Temperature range:	ambient 0 to 50° C. fluid 0 to 50° C.
Inlet pressure range:	G 1/8 - 1 to 10 bar G 1/4 - 1 to 7 bar
Outlet pressure range:	G 1/8 - 0.2 to 10 bar G 1/4 - 0.2 to 7 bar
Hysteresis:	≈ 50 mbar (Factory set up)
Linearity:	1% f.s.o.
Air consumption at constant control signal:	0
Supply voltage:	24 V DC ± 15 % (Max. ripple 1 V.)
Power consumption:	G 1/8 - max. 6 W) with 24 V DC and constant changes G 1/4 - max. 7 W) of the control signal < 1 W without change of control signal
Control signal:	analog 0-10 V Impedance: 10 kΩ analog 4-20 mA Impedance: 0.5 kΩ
Outlet sensor signal:	for types with output signal module. Proportional pressure output signal supplied by the pressure sensor. A) 0-10V, voltage signal (recommended load resistance min. 10 kΩ) B) 4-20 mA, current signal (recommended load resistance 0.5 kΩ max.) Voltage- and current signal can be received simultaneously. Both are protected against short-circuits. C) "Alarm" output signal 0/24 V (I max. = 40 mA) with adjustable triggering level. (Difference between control signal and sensor pressure signal) - factory set up: diff. signal = ± 0.8 V to ± 1 V - possible set up: diff. signal = ± 0.1 V to ± 5 V To neutralize the alarm output signal during the control signal changes, the use of a synchronized time lag relay is required.
Indicative reponse time:	with a volume of 30 cm^3 at the outlet of the EP-transducer. filling : 2 to 4 bar emptying: 4 to 2 bar step response: G 1/8: ≈ 100 ms - 120 ms G 1/4: ≈ 70 ms - 100 ms
Conductance C (dm^3/s.bar):	G 1/8 - 0.1 G 1/4 - 0.2
Outlet pressure/Flow rate:	G 1/8 - pressure drop 0.5 bar at 1.0 Nm^3/h (P1 = 7 bar, Pout = 6 bar) G 1/4 - pressure drop 0.5 bar at 2.1 Nm^3/h (P1 = 7 bar, Pout = 6 bar)
Safety position:	in case of control failure or if it is less than 1% of its full scale value, the regulated pressure drops automatically to 0 bar (atmospheric pressure). In case of voltage supply failure, the regulated pressure will be kept constant.
Electrical connection:	4 screw terminals under the protection cover with Pg 13.5 cable gland or through DIN 43651 connector (6 P + E).
Life expentancy:	> 50 Mio changes of control signal steps.
Mounting position:	indifferent (recommended position: upright; electronic part on top).
Resistance to vibrations:	30 g in all directions.
External sensors:	all pressure sensors with following characteristics are compatible with the EP-transducer: Sensitivity: 0.5 V/bar up to 10 V/bar Zero offset: -3 V to +3 V
Degree of protection:	IP 65.
Electromagnetic compatibility:	in accordance with IEC 801-4 part 4 standards.
Installation and setting instructions:	see publication MI-9202 and appendix supplied with the product.

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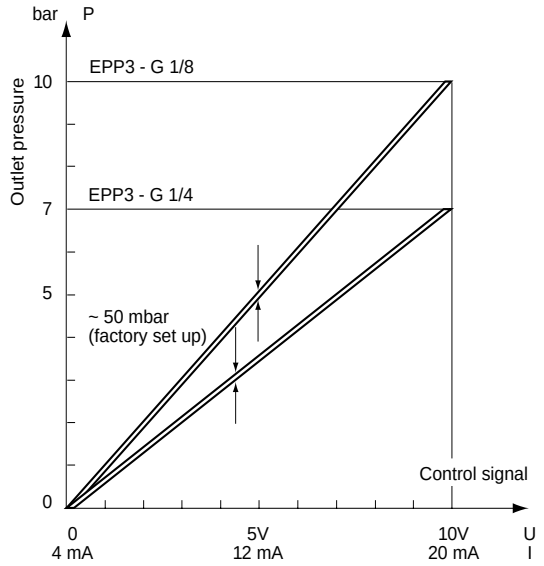
HYSTERESIS DIAGRAM

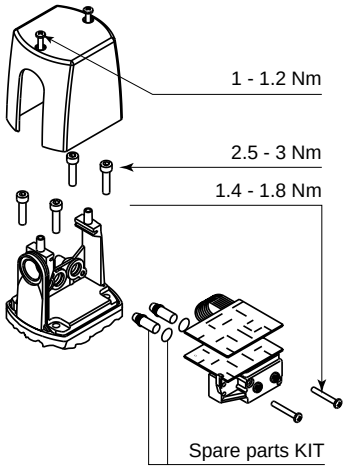


SPARE PARTS KIT

Plungers and seals

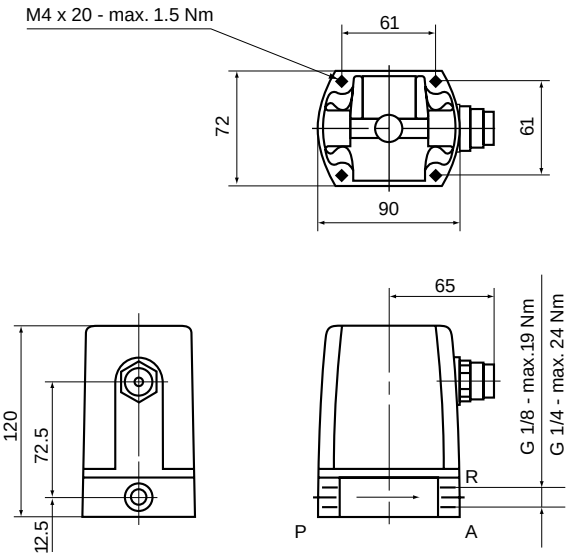
order No 481203-193
for EPP3-G 1/8

order No 481203-215
for EPP3-G 1/4

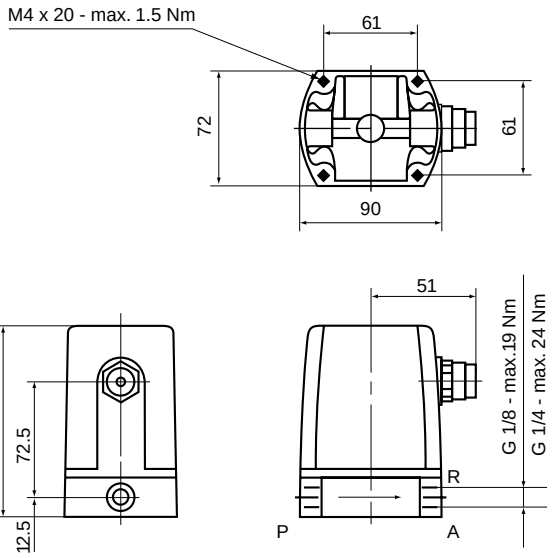


DIMENSIONS - TORQUES

EPP 3PC...
with DIN circular plug-in connection 6 P + E
(connector included)



EPP 3PC...
with Pg 13.5 cable gland connection.



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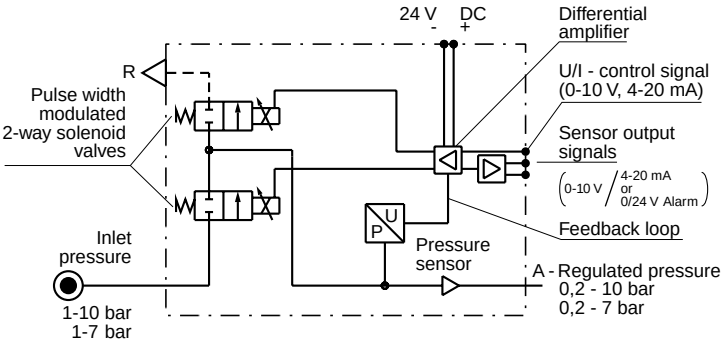
BLOCK DIAGRAMS

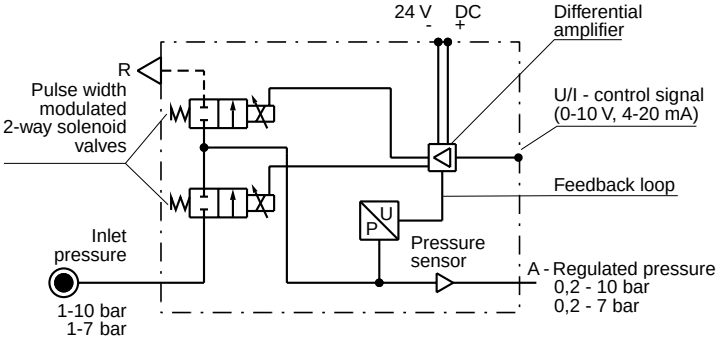
1. EP-Transducer with integrated pressure sensor, and output signal module.

Through a differential amplifier, the electronic control unit receives both the control signal (set pressure) and the feedback signal from the sensor (outlet pressure). Any difference between the two amplifier inputs results in a corresponding output which drives the appropriate 2-way pulse width modulated solenoid valve. The closing and opening of these pilots corrects the outlet pressure. An integrated output signal module allows the utilization of voltage- and current output signals (0-10 V, 4-20 mA) proportionally to the outlet pressure, or a voltage output signal and an alarm output signal 0/24 V DC.



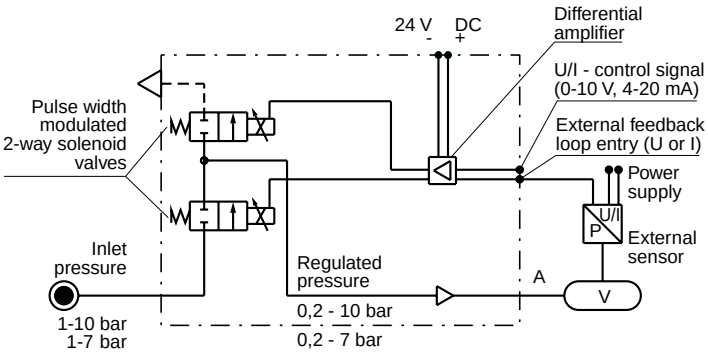
2. EP-Transducer with integrated pressure sensor, without output signal module.

Similar principle of operation as explained under pt. 1, but without output signal module.



3. EP-Transducer without pressure sensor and without output signal module.

Similar principle of operation as explained under pt. 1, but without output signal module and without integrated sensor. A vast range of sensors can be used as proximity-, level-, pressure sensors etc. providing the regulation system responds proportionally to the pressure.
Example: opening of a large valve through a pneumatically driven actuator. If the angle of rotation of the gate is proportional to the pressure, the EP-transducer can be controlled by a proximity sensor.



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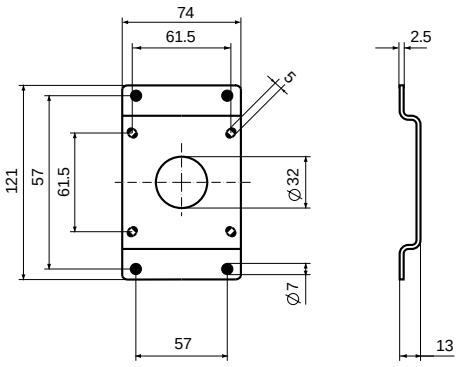
CH-1227 Carouge-Geneva

ACCESSORIES

Mounting bracket
Supplied with 4 x M4 screws



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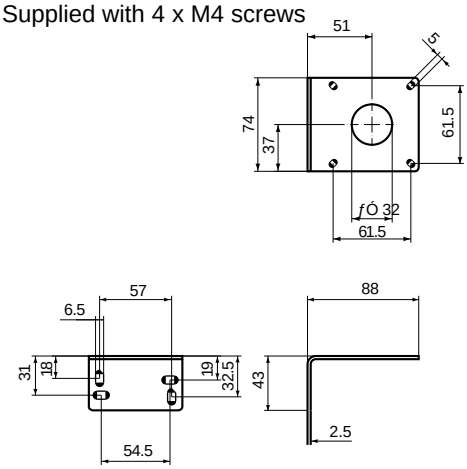
Mounting bracket
Supplied with 4 x M4 screws



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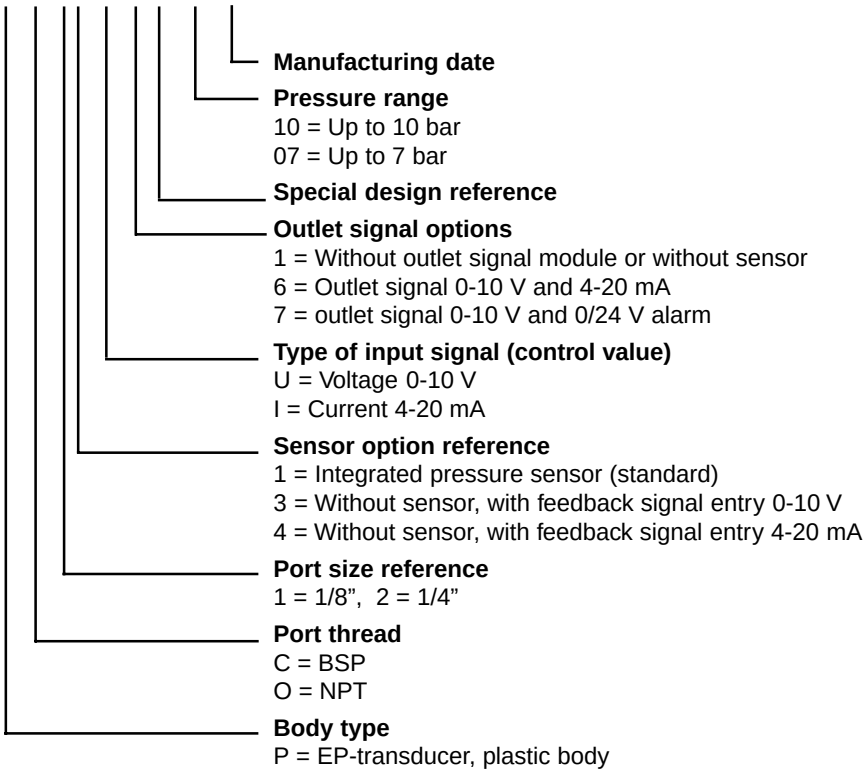
CH-1227 Carouge-Geneva

DESIGNATION CODE

EPP3 P C 21 U 100 10 ...



Manufacturing date

Pressure range
10 = Up to 10 bar
07 = Up to 7 bar

Special design reference

Outlet signal options
1 = Without outlet signal module or without sensor
6 = Outlet signal 0-10 V and 4-20 mA
7 = outlet signal 0-10 V and 0/24 V alarm

Type of input signal (control value)
U = Voltage 0-10 V
I = Current 4-20 mA

Sensor option reference
1 = Integrated pressure sensor (standard)
3 = Without sensor, with feedback signal entry 0-10 V
4 = Without sensor, with feedback signal entry 4-20 mA

Port size reference
1 = 1/8", 2 = 1/4"

Port thread
C = BSP
O = NPT

Body type
P = EP-transducer, plastic body

SUMMARY OF TYPES

	Connection G	With integrated pressure sensor	Entry options for external sensor signal		Outlet signal options			Electrical connection	
			feedback signal 0 - 10 V	feedback signal 4 - 20 mA	without	0 - 10 V 4 - 20 mA	0 - 10 V 0/24 V alarm	DIN 43651 connector	cable gland Pg. 13.5
EPP3PC11U/I10010	1/8	•			•				•
11U/I60010	1/8	•				•		•	
21U/I70010	1/8	•					•	•	
EPP3PC13U/I13010	1/8		•		•			•	
14U/I13010	1/8			•	•			•	
EPP3PC21U/I10007	1/4	•			•				•
21U/I60007	1/4	•				•		•	
21U/I70007	1/4	•					•	•	
EPP3PC23U/I13007	1/4		•		•			•	
24U/I13007	1/4			•	•			•	

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Catalogue 8678/GB
March 1999

LUCIFER®

EPP3 High Flow Series G1, G2 Electropneumatic pressure regulator

with integrated electronic control

Catalogue 8679/GB
February 2000

Parker

INTRODUCTION

The product

A range of electropneumatic pressure regulators G1 and G 2 which, by means of an integrated electronic control system and pulse width modulated solenoid valves, controls the output pressure proportionally to an analog electrical signal. High precision is achieved by means of an internal feed-back loop through an integrated pressure sensor.

Applications

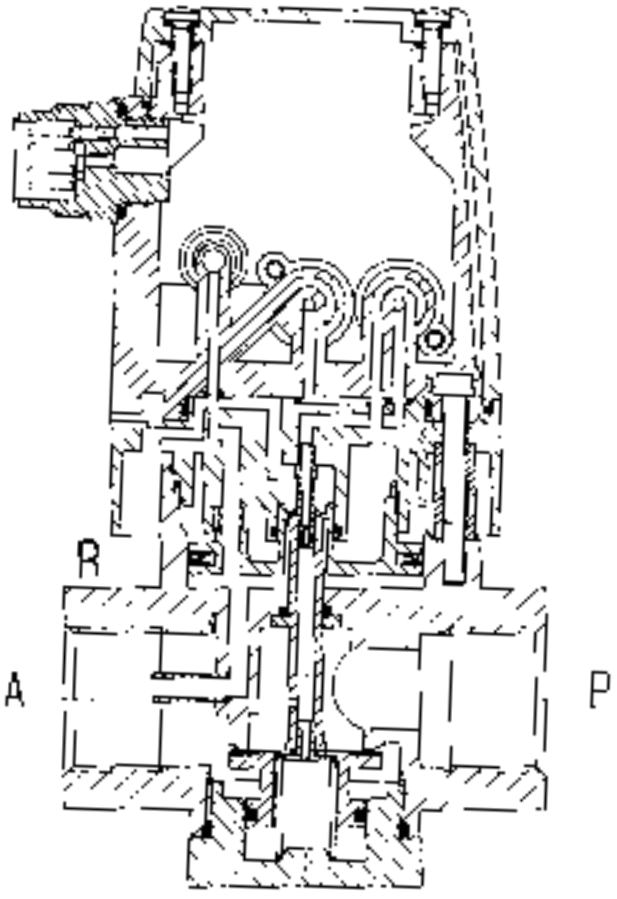
Pressure control independent of flow in electropneumatic control systems for the following main segments:
- Plastic processing machinery (plastic moulding, plastic blowing)
- Sand blasting
- Metal press balancing

Benefits

- Simplification of control systems by reducing the number of components
- More flexibility of the controls
- Increase of the productivity (performances, quality, reliability)
- Increase in safety
- Reduce installation cost
- Reduce maintenance

THE REGULATOR EPP3 - DESCRIPTION OF OPERATION

The EPP3 - High Flow Series is a family of electrically remote-controlled pneumatic pressure regulators.
The EPP3 regulator allows regulation of the outlet pressure proportionally to an electrical control signal. It comprises an integrated closed loop electronic control and two pulse width modulated 2-way solenoid valves. The pressure sensor measures the outlet pressure and provides a feed-back signal to the differential amplifier.
Any difference between the control signal and the feedback signal is converted to a digital signal to energize the coil of one or the other 2-way valves. This is then followed by an immediate soft correction of the outlet pressure without overshoot.
The analog control signal can be a voltage (0-10V) or a current (4 - 20 mA). The inlet of the “filling valve” is connected directly to the main inlet P of the regulator. When energized this valve will increase the pressure at the outlet A.
When the “exhaust valve” is energized the pressure at the outlet A will decrease. The pressure will be exhausted through a discharge slot located betweeen the cover and the body and directly fed to the atmosphere without silencer.The exhaust of the main regulated pressure will be made through the exhaust R.
The solenoid valves assure the filling or emptying of the servo-chamber in order to increase or decrease the pressure at the outlet of the regulator. In rest position of the valves, all ports are blocked.



Parker Lucifer SA
CH-1227 Carouge-Geneva

TECHNICAL DATA

Fluid:	Lubricated or non lubricated air and neutral gases (recommended filtration: 25-50 μ).
Temperature range:	ambient 0 to 50° C fluid 0 to 50° C
Inlet pressure range:	1 to 12 bar (the inlet pressure must always be at least 1 bar above the regulated pressure).
Outlet pressure range:	0.2 to 10 bar
Hysteresis:	≈ 100 mbar (Factory set up)
Linearity:	1% f.s.o.
Air consumption at constant control signal:	0
Supply voltage:	24 V DC ± 15 % (Max. ripple 1 V)
Power consumption:	max. 6 W with 24 V DC and constant changes of the control signal < 1 W without change of control signal.
Control signal:	analog 0-10 V Impedance: 10 kΩ analog 4-20 mA Impedance: 0.5 kΩ
Outlet sensor signal:	A) proportional pressure outlet signal 0-10 V from integrated sensor (recommended load resistance min. 10 kΩ) B) proportional pressure outlet signal 4-20 mA from integrated sensor (recommended load resistance 0.5 kΩ) C) "Alarm" output signal 0/24 V with adjustable triggering level. (Difference between control signal and sensor pressure signal) (Imax. = 40 mA) - factory set up: diff. signal = ± 0.8 V to ± 1 V - possible set up: diff. signal = ± 0.1 V to ± 5 V To neutralize the alarm output signal during the control signal changes, the use of a synchronized time lag relay is required.
Safety position:	In case of control failure or if it is less than 1% of its full scale value, the regulated pressure drops automatically to 0 bar (atmospheric pressure). In case of voltage supply failure, the regulated pressure will be kept constant (with eventual discrepancy due to loss of pressure in the servo-chamber).
Electrical connection:	Through DIN 43651 circular plug-in connector (6 P + E).
Life expectancy:	> 20 Mio changes of control signal steps.
Mounting position:	Indifferent (recommended position: upright; electronic part on top).
Resistance to vibrations:	30 g in all directions.
Degree of protection:	IP 65.
Assembly:	Silicone free.
Electromagnetic compatibility:	In accordance with IEC 801-4 part 4 standards.
Installation and setting instructions:	See publication MI-9202 and appendix supplied with the product.

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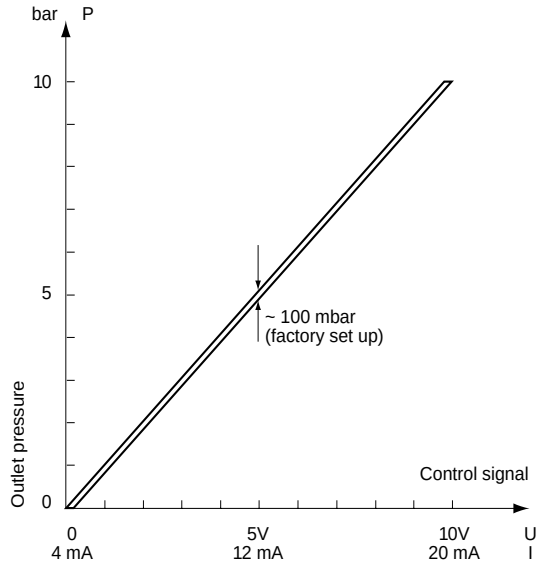
HYSTERESIS DIAGRAM



MAINTENANCE KIT

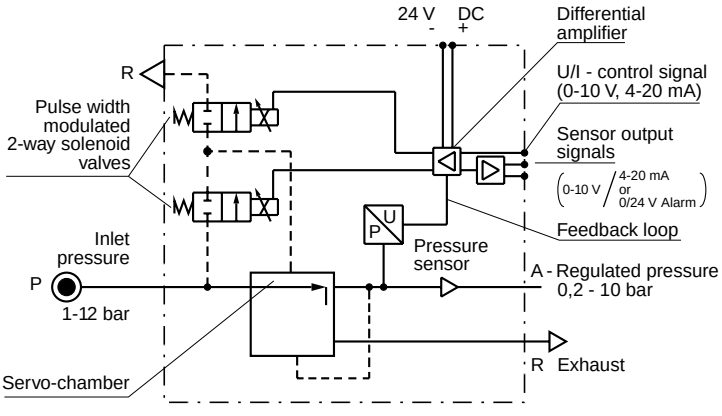
Kit n° 481203-193
Plungers and seals for pilot valves

Torques

EPP3 - BLOCK DIAGRAMS

with integrated pressure sensor and output signal module

Through a differential amplifier, the electronic control unit receives both the control signal (set pressure) and the feedback signal from the sensor (outlet pressure). Any difference between the two amplifier inputs results in a corresponding output which drives the appropriate 2-way pulse width modulated solenoid valve. The closing and opening of these pilots corrects the outlet pressure. An integrated output signal module allows the utilization of voltage- and current output signals (0-10 V, 4-20 mA) proportionally to the outlet pressure, or a voltage output signal and an alarm output signal 0/24 V DC.



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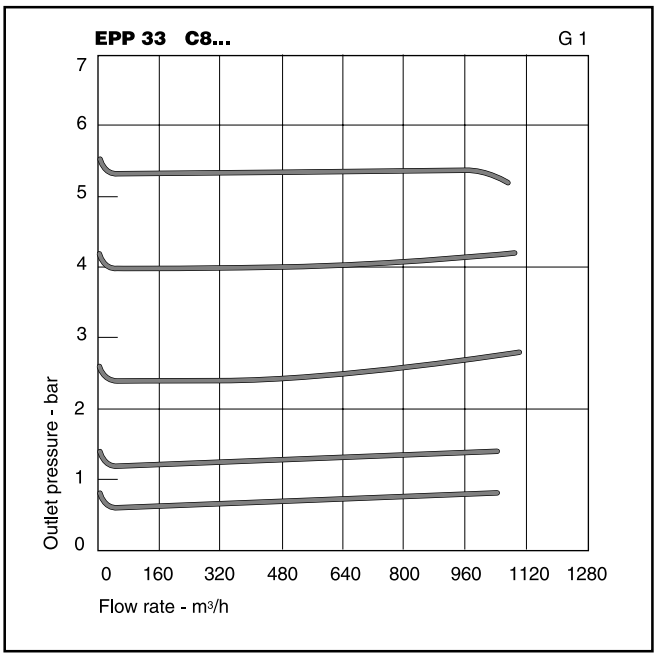
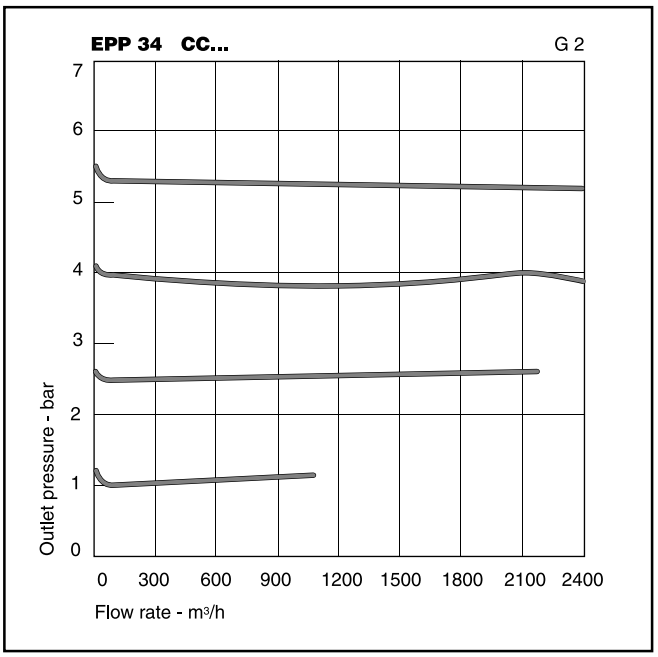
FLOW DATA - OUTLET PRESSURE IN FUNCTION OF FLOW AT CONSTANT CONTROL SIGNAL P_{INLET} = 10 bar, P_{REG} = 6 bar, ❐P = 1 bar





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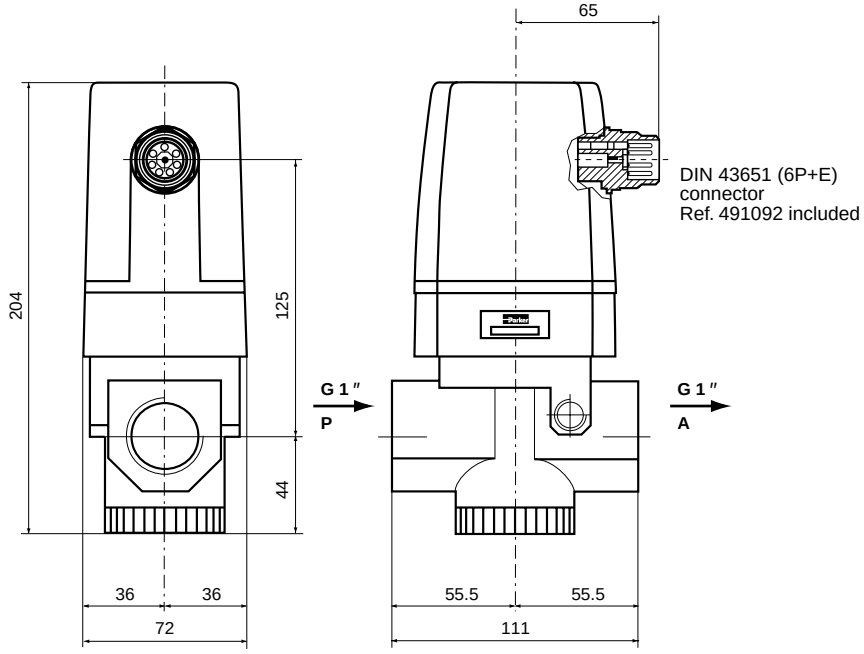
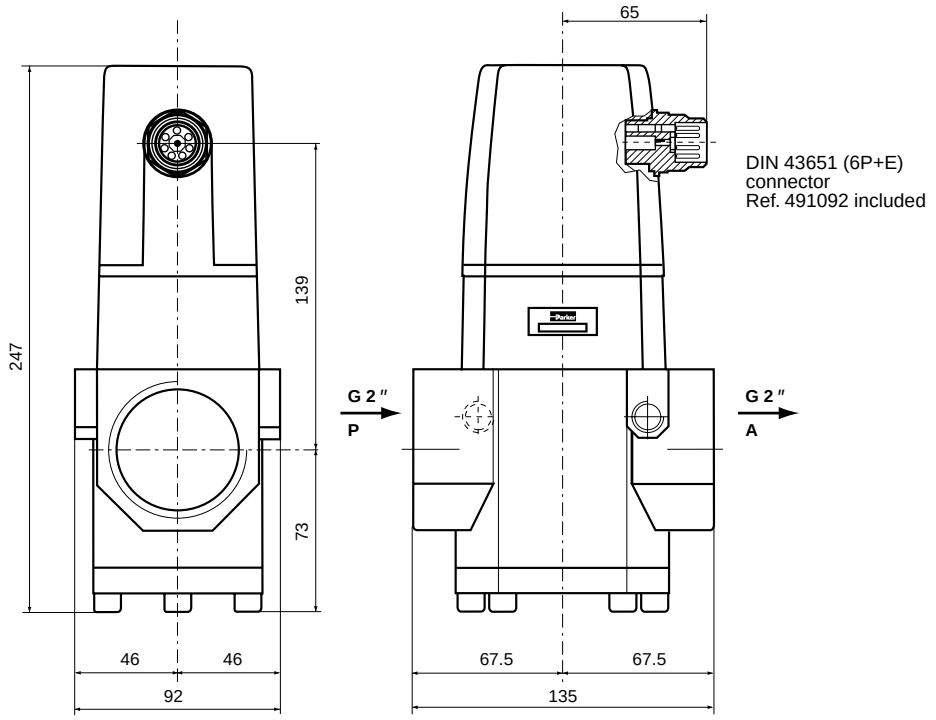
DIMENSIONS

EPP33 C8 ...



EPP34 CC ...



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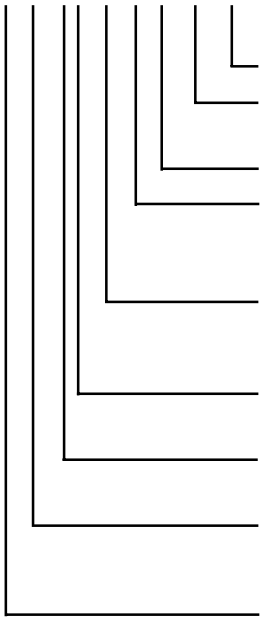
DESIGNATION CODE

EPP3 3 C 81 U 600 10 ...



Manufacturing date

Pressure range
10 = up to 10 bar

Special design reference

Outlet signal options
6 = outlet signal 0-10 V and 4-20 mA
7 = outlet signal 0-10 V and 0/24 V alarm

Type of input signal (control value)
U = voltage 0-10 V
I = current 4-20 mA

Sensor option reference
1 = integrated presure sensor

Port size reference
8 = 1", C = 2"

Port thread
C = BSP
O = NPT

Body type
3 = alu-size 111 mm
4 = alu-size 135 mm

SUMMARY OF TYPES

	Connection G	With integrated pressure sensor	Outlet signal options		Electrical connection
			0 - 10 V 4 - 20 mA	0 - 10 V 0/24 V alarm	DIN 43651 connector
EPP3 3C8 1U/I 600 10	1	•	•		•
1U/I 700 10	1	•		•	•
EPP3 4CC 1U/I 600 10	2	•	•		•
1U/I 700 10	2	•		•	•

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Catalogue 8679/GB
February 2000

LUCIFER®

EPP3 Series Electropneumatic pressure regulator

with digital control signal

Catalogue 8680/GB
April 1999

Parker

INTRODUCTION

The product

A range of electropneumatic pressure regulators G1/4 and G1/2 which, by means of an integrated electronic control system and pulse width modulated solenoid valves, controls the output pressure proportionally to a digital electrical signal. A high precision is achieved by means of an internal feed-back through an integrated pressure sensor.

Applications

Pressure control independent of flow in electropneumatic control systems, particularly in the following industries:

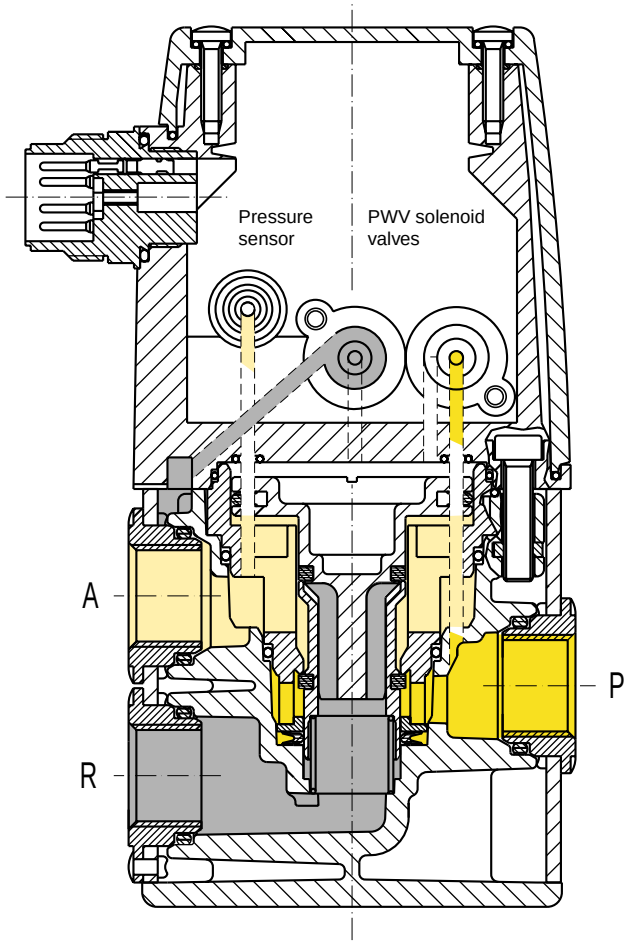
- Robotics: welding, painting lines, etc.
- Paper and printing: tension regulations, speed- and brake control for rolls
- Machine Tools: Plastic moulding, laser welding, presses, polishing, etc.
- Trucks and Trains: control of adaptive suspensions.

Benefits

- Simplification of control systems by reducing the number of components
- More flexibility of the controls
- Very fast response times
- Excellent linearity and hysteresis
- No air consumption in rest position
- Increase of the productivity (performances, quality, reliability)
- Direct interface to programmable controllers.

THE REGULATOR EPP3 - DESCRIPTION OF OPERATION

The EPP3 Series is a family of electrically remote-controlled pneumatic pressure regulators with closed loop integrated electronic control. It allows to regulate the outlet pressure proportionally to an electrical control signal.
The EPP3 regulator comprises a traditional servo-operated pneumatic pressure regulator, where the pilot chamber is fed by one or the other of two pulse width modulated 2-way solenoid valves. The pressure sensor measures the outlet pressure of the regulator and provides a feed-back signal to the amplifier. Any difference between the control signal and the feedback signal is converted to a digital signal to energize the coil of one or the other 2-way valves to correct the position of the regulator.
The control signal is digital (6 bit + parity + enable).
The inlet of the “filling valve” is connected directly to the main inlet P of the regulator; when energized, this valve will fill the servo-chamber for increasing the pressure at the outlet A of the regulator.
When the other “exhaust valve” is energized (reduction of pressure at the outlet A of the regulator), the pressure of the servo-chamber will be exhausted through a dis-charge orifice located between the cover and the body and directly fed to the atmosphere without silencer.
The exhaust of the main regulated pressure will be made through the quick exhaust R. The use of a conventional silencer is recommended. Both solenoid valves assure the filling or emptying of the servo-chamber in order to increase or decrease the pressure at the outlet of the regulator. In rest position of the valves all ports are blocked.



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CH-1227 Carouge-Geneva

TECHNICAL DATA

Fluid:	Lubricated or non lubricated air and neutral gases (recommended filtration: 25-50 μ).
Temperature range:	ambient 0 to 50° C fluid 0 to 50° C.
Inlet pressure range:	up to 12 bar (the inlet pressure must always be at least 1 bar above the regulated pressure).
Outlet pressure range:	0.2 to 10 bar, ≈ 160mbar/step.
Hysteresis:	≈ 200 mbar (Factory set up).
Air consumption at constant control signal:	0
Supply voltage:	24 V DC ± 15 % (Max. ripple 1 V).
Power consumption:	max. 6 W with 24 V DC and constant changes of the control signal.
Control signal:	Digital 6 bits.
Parity signal:	Sent by user at the same time as the control signal. Parity + data must be even.
Enable signal:	Sent by user after control signal and parity. Ramp-up part of the signal is considered active (signal duration = 10 ms mini).
Electronic level:	Level 0 = 0 to 6 V Level 1 = 10 to 26 V Impedance 4.2 KΩ.
Alarm signal:	24 V if parity and output pressure are correct 0 V if there is something wrong I = 100 mA maxi.
Indicative response time:	With a volume of 330 cm^3 at the outlet of the regulator: Filling: 2 to 4 bar - 2 to 8 bar Step response: ≈ 60 ms - ≈ 120 ms Emptying: 4 to 2 bar - 8 to 2 bar Step response: ≈ 70 ms - ≈ 130 ms.
Safety position:	In case of voltage supply failure, the regulated pressure will be kept constant (with eventual discrepancy due to loss of pressure in the servo-chamber).
Electrical connection:	Connector (11 P +E).
Life expectancy:	> 50 Mio changes of control signal steps.
Mounting position:	Indifferent (recommended position: upright; electronic part on top).
Resistance to vibrations:	30 g in all directions.
Degree of protection:	IP 65.
Assembly:	Silicone free.
Electromagnetic compatibility:	In accordance with IEC 801-4 part 4 standards.
Installation and setting instructions:	See publication MI-9202 and appendix supplied with the product.

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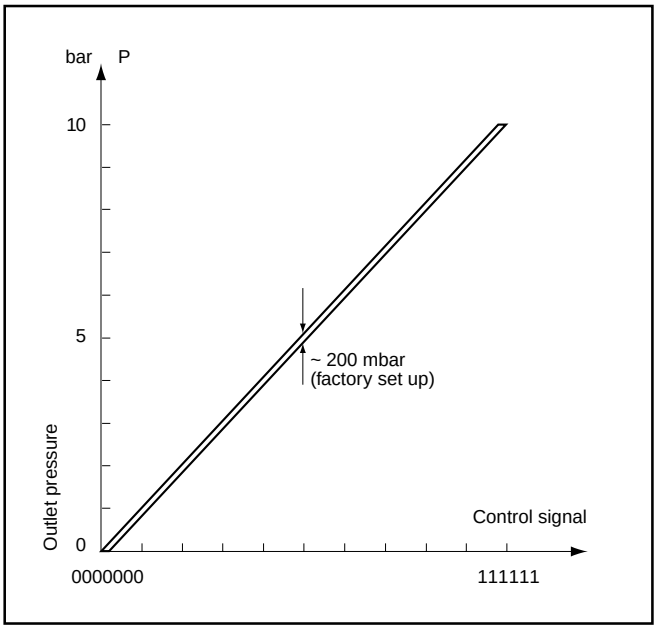
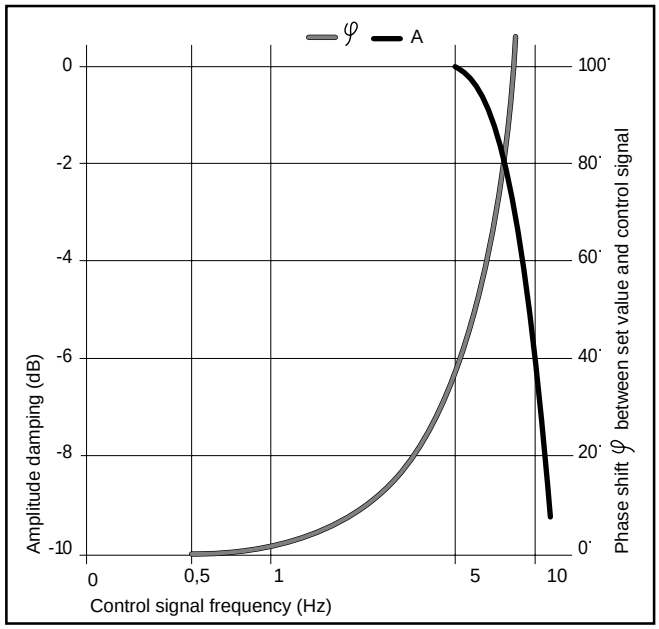
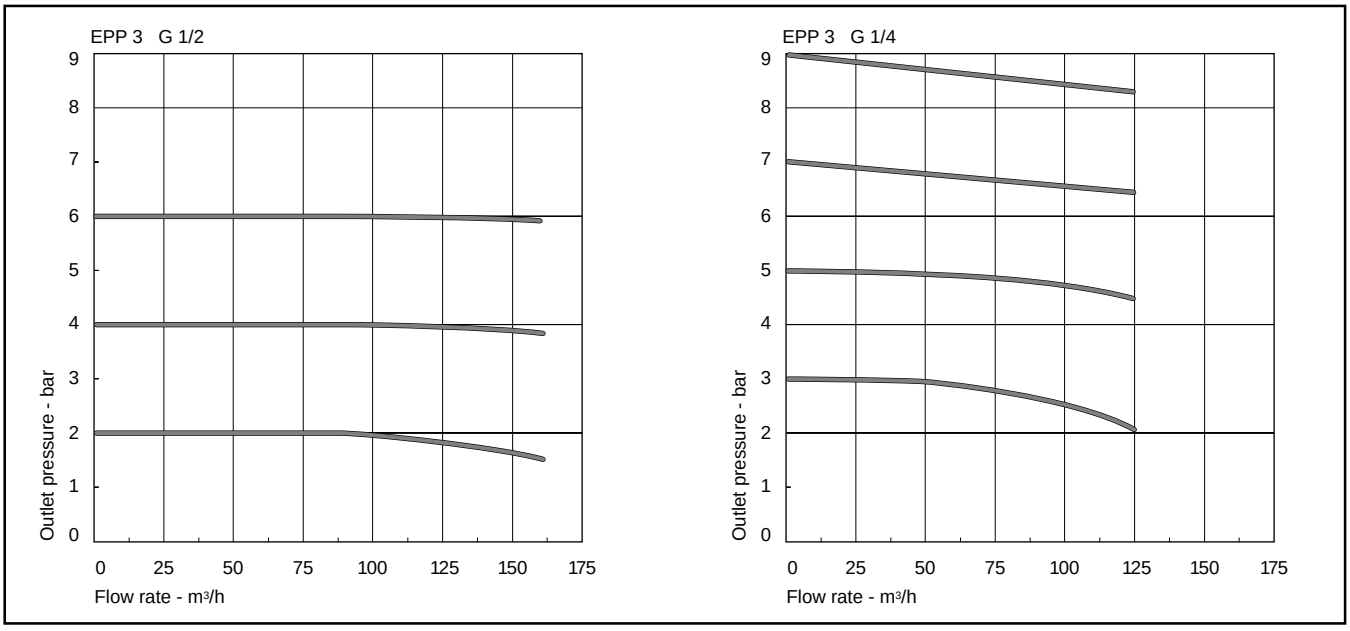
HYSTERESIS DIAGRAM



TRANSFER DIAGRAM



FLOW DATA - OUTLET PRESSURE IN FUNCTION OF FLOW AT CONSTANT CONTROL SIGNAL (P1 = 10 bar)



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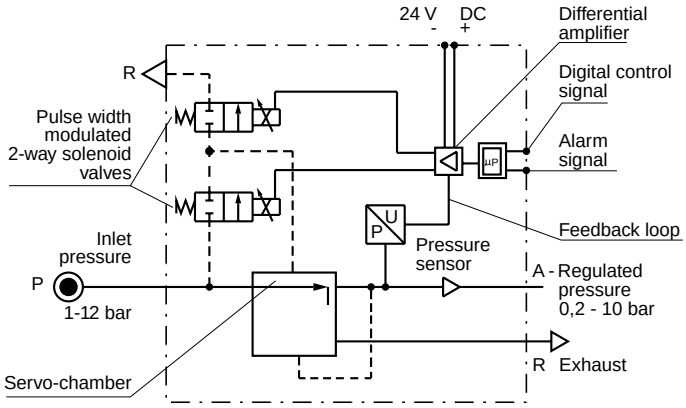
EPP3 - BLOCK DIAGRAMS

The microprocessor receives first datas and parity, then an enable signal (ramp-up transient). After a validity checking of the datas, the microprocessor generates an analogic signal which is compared to the feedback signal sent by the pressure sensor in the differential amplifier of the electronic control unit.

Any difference between both amplifier inputs results in a corresponding output which drives the appropriate 2-way pulse width modulated solenoid valve so that the pilot piston moves to correct the pressure.

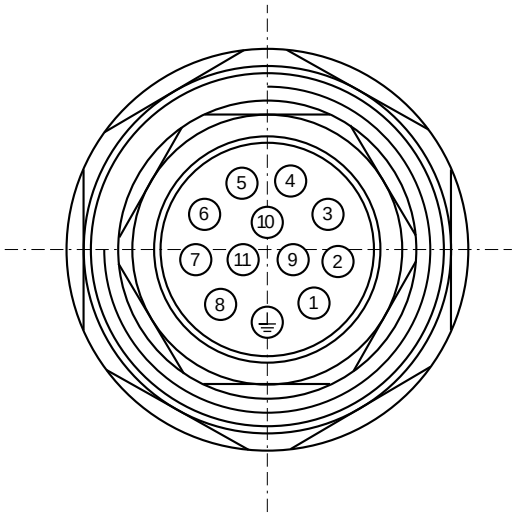


CONNECTOR

Type: Hirschmann N 11 R AM/N 11 R FF

Pins			
1	0 Volt	)	Power supply
2	24 Volt DC	)	
3(LSB)	D3	)	
4	D4	)	
5	D5	)	
6	D6	)	Data
7	D7	)	
8(MSB)	D8	)	
9(PB)	Parity bit	)	
10(E)	Enable	)	Latching
11	*24V-0V	)	Alarm
⏚	not connected		

* Alarm voltage = supply voltage - 15% /+0%



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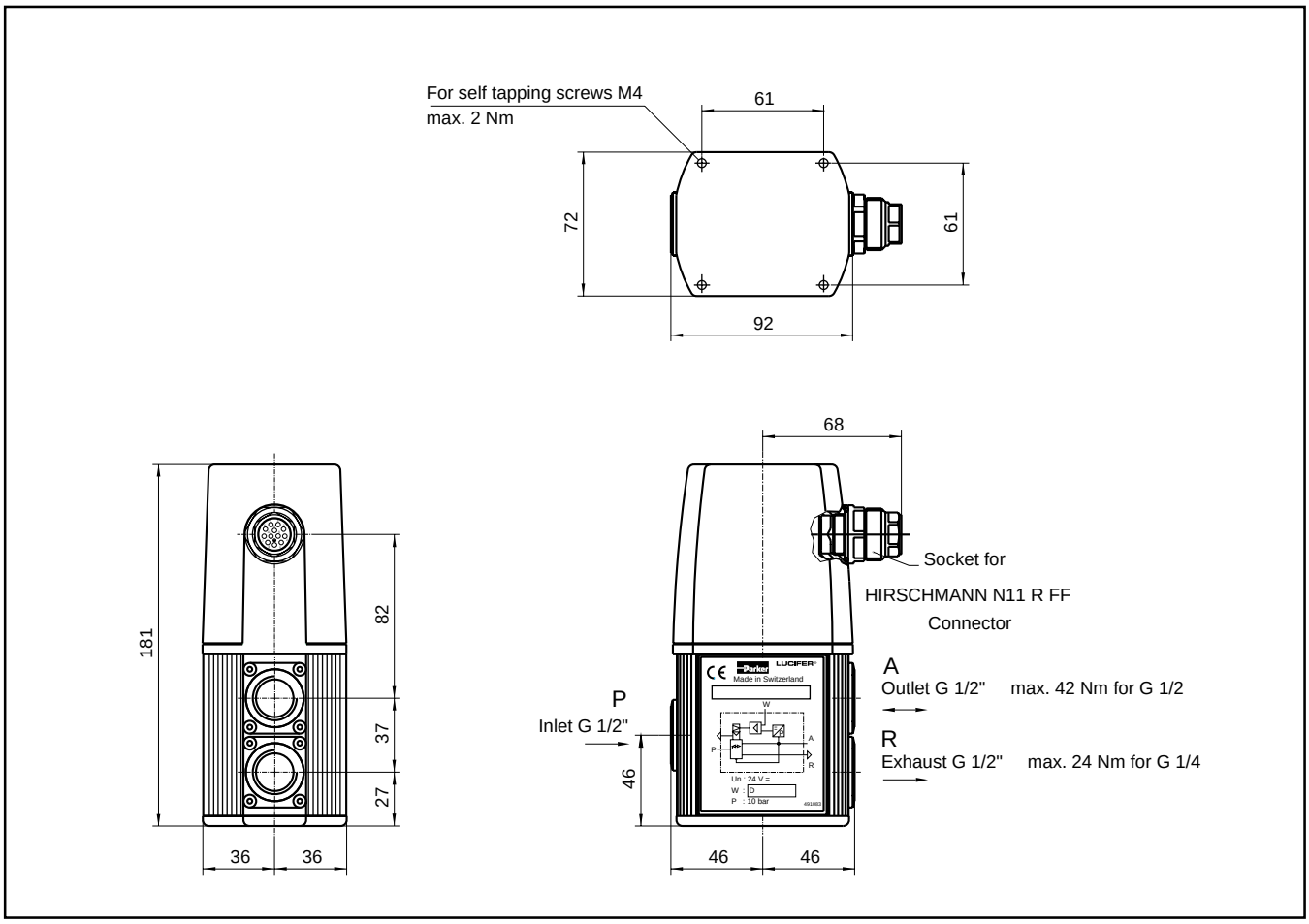
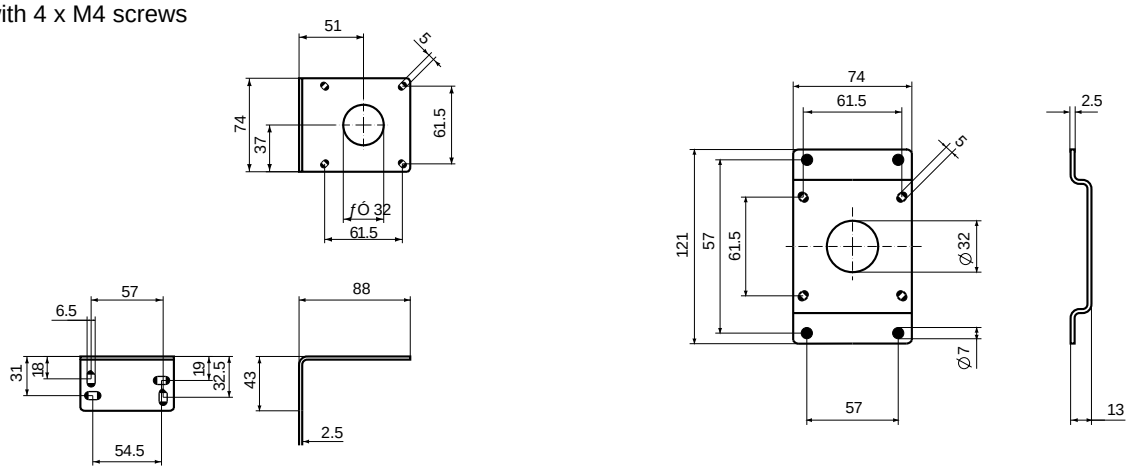
DIMENSIONS - TORQUES



ACCESSORIES

Mounting brackets
Supplied with 4 x M4 screws



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DESIGNATION CODE

EPP3 J C 41 D A06 10 ...

Manufacturing date

Max. regulated pressure value
10 = up to 10 bar

Special design reference

Digital control signal (6 bits)

Integrated pressure sensor

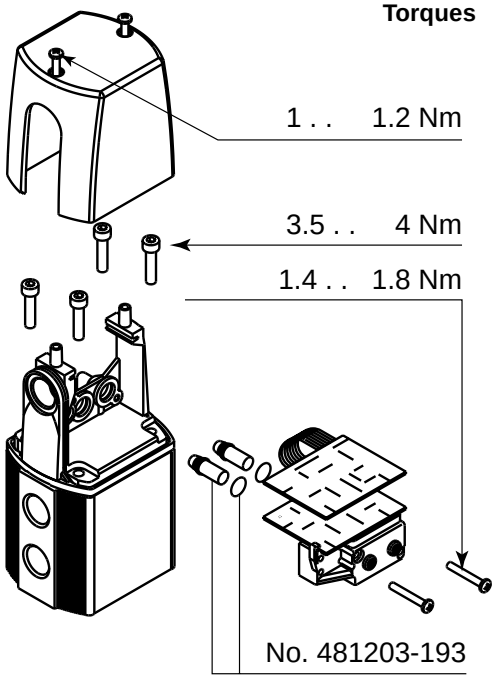
Port size reference
2 = 1/4”, 4 = 1/2”

Port thread
C = BSP
O = NPT

Body type
J = plastic body with aluminium jacket

MAINTENANCE KIT

Kit n° 481203-193
Plungers and seals for pilot valves



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April 1999