



BACK PRESSURE REGULATOR

PaintCare BPR-L®

Equipment reference

155 275 010

User Manual 582118110

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Index H

SAMES KREMLIN SAS



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Dear customer, you have just purchased your new equipment and we thank you for it.

We have taken the utmost care, from design to manufacture, so that this equipment gives you complete satisfaction.

For a good use and an optimal availability, we invite you to read this manual carefully before using your equipment.

Warranty

We reserve the right to make any changes or improvements even after receipt of an order without being able to attribute a non-compliance to the descriptions contained in the instruction manuals and selection guides.

Our equipment is checked and tested in our workshops before shipment.

To be valid, any complaint concerning a material will have to be formulated to us in writing within 10 days of the delivery.

SAMES KREMLIN equipment, equipped with its original identification plates, has a one-year warranty or 1800H of operation (first term reached) from the date of ex-factory against any defect of material or defect of its construction which is up to us to see and appreciate.

The warranty excludes wear parts, deterioration or wear resulting from abnormal or unscheduled use by **SAMES KREMLIN**, failure to observe instructions for proper operation or lack of maintenance.

The warranty is limited to the repair or exchange of parts returned to our factory and recognized as defective by us and does not cover the listed wear parts or not.

Any costs resulting from an operating outage can not be charged to us. The costs of return to our workshops are the responsibility of the customer.

An intervention can be carried out on site at the customer's request.

In this case, the transportation and accommodation costs of the technician (s) will remain the responsibility of the applicant.

Any changes made to our equipment without our consent will void the warranty.

Our guarantee is limited to that of the suppliers of materials which enter in the composition of our sets.

1 Safety instructions

1.1 Personal safety

Overview



Read all operating instructions and device labels carefully before putting the equipment into service.

Personnel using this equipment must have been trained in its use.

The workshop manager must ensure that the operators have fully understood all the instructions and safety rules of this equipment and other elements and accessories of the installation.

Misuse or operation can cause serious injury. This material is for professional use only. It must be used only for the purpose for which it was intended.

Do not modify or transform the material. Parts and accessories must only be supplied or approved by manufacturer.

The equipment must be checked periodically. Defective or worn parts must be replaced.

Never exceed the maximum working pressures of the equipment components.

Always respect the laws in force regarding security, fire, electricity and explosion protection of the destination country of the equipment.

Only use products or solvents that are compatible with the parts in contact with the product (see product manufacturer's technical data sheet).

Personnel qualifications



Tasks on the pump must only be performed in accordance with existing rules and statutory regulations, by personnel who have been instructed and are qualified in this regard, in compliance with due diligence obligations.

The following requirements must be fulfilled:

- ✓ Personnel must have special skills and experience in the respective technical area. This particularly applies for maintenance and repair tasks on mechanical and pneumatic fixtures of the Back Pressure Regulator.
- ✓ Personnel must have knowledge of applicable standards, directives, accident prevention regulations and operating conditions.
- ✓ Personnel must have been authorised by the person responsible for safety to perform the respectively required tasks.
- ✓ Personnel must be capable of recognising and avoiding possible dangers.

The required personnel qualifications are subject to different statutory regulations depending on the implementation site. The owner must ensure compliance with the applicable laws.

Meaning of the pictograms

 <p>Danger pinching, crushing</p>	 <p>Danger moving parts</p>	 <p>Danger : high pressure</p>	 <p>Risks of product emanation</p>
 <p>Danger : hot parts or surfaces</p>	 <p>Danger : flammability risks</p>	 <p>Danger : electricity</p>	 <p>Risk of explosion</p>
 <p>Danger (user)</p>	 <p>Glasses required</p>	 <p>Gloves required</p>	 <p>Grounding</p>

Security devices



CAUTION

- ✓ Guards (motor cover, coupling guard, housings, ...) are set up for safe use of the equipment.
- ✓ The manufacturer can not be held responsible for any bodily injury as well as failures and / or damage to the equipment resulting from the destruction, the occultation or the total or partial removal of the protectors.
- ✓ Never exceed the maximum working pressures of the equipment components.



Danger to personnel and to the equipment

- ✓ Observe all safety and hazard warnings on the equipment and keep them in a complete and legible condition
- ✓ Observe all general and special safety instructions in this Operating Manual and the operating instructions of third party manufacturers.
- ✓ Refrain from any unsafe working method.
- ✓ Keep the Operating Manual on hand at all times.
- ✓ Shut down the media supply system immediately and notify the responsible department or person when safety-relevant modifications have been made or the operational behaviour of the equipment changes.
- ✓ Shut down the media supply system immediately and notify the responsible department or person when safety installations are damaged, defective or have been modified.
- ✓ Follow the applicable regulations for safety at work and health protection (DGUV regulations).
- ✓ Do not remove or modify safety installations and warning signs at the equipment.
- ✓ Do not modify the equipment without authorisation.
- ✓ The access to the equipment is not allowed for unauthorized persons.

Danger of Pressure



Safety requires that a decompressed air shutoff valve be mounted on the back pressure regulator supply circuit to allow trapped air to escape when the supply is shut off.

Without this precaution, the residual air from the engine may cause the back pressure regulator to operate and cause a serious accident.

Similarly, a **product purge valve** must be installed on the product circuit so that it can be purged (after shutting off engine air and decompressing it) before any intervention on the equipment. These valves should remain closed for air and open for the product during the procedure.

Injection hazards

"HIGH PRESSURE" technology requires the utmost care.

Operation can cause dangerous leaks. There is a risk of product injection into exposed parts of the body, which can lead to serious injury and the risk of amputation:

- ✓ An injection of product into the skin or other parts of the body (eyes, fingers ...) must be treated urgently by appropriate medical care.
- ✓ Do not look at the gun nozzle when it is under pressure.
- ✓ Never direct the jet to another person.
- ✓ Never attempt to stop the jet with the body (hands, fingers ...) or with rags or similar.

Fire hazards, explosion, electric arc, static electricity



Improper grounding, insufficient ventilation, open flames or sparks can cause an explosion or fire which could result in serious injury.

To avoid these risks, especially when using back pressure regulator, it is imperative:

- ✓ To connect the equipment, the parts to be treated, the cans of products and cleaners to the ground,
- ✓ To ensure good ventilation,
- ✓ Keep the work area clean and free of rags, papers, solvents,

- ✓ Do not operate electrical switches in the presence of vapors or during removal,
 - ✓ Immediately stop the application in the presence of arcs,
 - ✓ Store all liquids outside the work areas.
 - ✓ Use products whose flash point is as high as possible to avoid any risk of formation of flammable gases and vapors (consult the product safety data sheets).
 - ✓ To equip the drums with a lid to reduce the diffusion of gases and vapors in the cabin.
 - ✓ It is forbidden to pump explosive materials
 - ✓ During the assembly and disassembly, during the transport to/from the place of use and during the repair, there is the risk involved of generating sparks, e.g. through friction, impact or grinding processes or through electrostatic charge. Ensure that during this work interval these hazards will be reliably prevented or that no explosive atmosphere will exist.
-

Hazards of toxic products

Toxic products or vapors can cause serious injury through contact with the body, in the eyes, under the skin, but also by ingestion or inhalation.

It is imperative :

- ✓ To know the type of product used and the dangers it represents,
- ✓ Store the products to be used in appropriate areas,
- ✓ Contain the product used in the application in a container designed for that purpose,
- ✓ Evacuate the products in accordance with the legislation of the country where the equipment is used,
- ✓ To wear protective clothing designed for that purpose,
- ✓ Wearing goggles, hearing protectors, gloves, shoes, coveralls and masks for the respiratory tract.



CAUTION

The use of halogenated hydrocarbon solvents and products containing these solvents in the presence of aluminum or zinc is prohibited.

Failure to follow these instructions exposes the user to the risk of explosion resulting in serious injury or death.

1.2 Integrity of the materials

Material recommendations



Protectors are put in place for safe use of the equipment.

Examples :

- ✓ Engine hood.
- ✓ Coupling protector.
- ✓ Carters.

The manufacturer can not be held responsible in case of:

- ✓ Bodily injury.
- ✓ As well as breakdowns and / or damage to the equipment resulting from the destruction, modification, the occultation or the total or partial withdrawal of the protectors.

Regulator



Recommendations for back pressure regulator:

- ✓ Never exceed the maximum working pressures of the equipment components.
- ✓ Do not operate the back pressure regulator with a product that does not meet the manufacturer's requirements in terms of viscosity, abrasiveness, etc.
- ✓ The presence of solid residues in the product used can seriously damage the back pressure regulator and especially the diaphragms.
- ✓ Keep hands clear of moving parts.
- ✓ The parts constituting this movement must be kept clean.
- ✓ Before starting up or using the back pressure regulator, carefully read the DECOMPRESSION PROCEDURE.
- ✓ Only use genuine **SAMES KREMLIN** accessories and spare parts designed to withstand the back pressure regulator's operating pressures.

Painting phase back pressure regulator and pressure gun



- ✓ Mandatory wearing of PPE during this phase of painting where the back pressure regulator, pump and the gun are under pressure.
- ✓ Do not look at the gun nozzle when it is under pressure.
- ✓ Rinse at a maximum of 1 bar / 14.5 psi at the pressure gauge of the air equipment (variable pressure depending on the length of the pipes).

Rinsing the back pressure regulator



- ✓ Wearing PPE (glasses + gloves + safety shoes)
- ✓ Do not look at the gun nozzle when it is under pressure
- ✓ Rinse at a maximum of 1 bar / 14.5 psi at the pressure gauge of the air equipment (variable pressure depending on the length of the pipes).

Defusing the pump



- ✓ PPE port mandatory.

Risk of hydraulic heating during defusing



- ✓ Risk of overheating of the hydraulics in case of defusing.

Mass cable



- ✓ It is mandatory to ground the back pressure regulator. The input and output port are conductive.

Tubing

Recommandations for pipes.

- ✓ Keep hoses away from traffic areas, moving parts and hot areas.
- ✓ Never subject product hoses to temperatures above 60 °C / 140°F or below 0 °C / 32°F.
- ✓ Do not use hoses to pull or move equipment.
- ✓ Tighten all connections, hoses and connectors before commissioning the equipment.
- ✓ Check hoses regularly, replace them if damaged.
- ✓ Never exceed the maximum working pressure stated on the hose (MWP).
- ✓ For fitting the hoses and gun: PPE is mandatory.
- ✓ Tighten to block stop (hoses + gun).

Normal stop

To make a normal stop:

- ✓ Use the air regulator to gradually decompress the back pressure regulator.
-

Products implemented

Given the diversity of the products implemented by the users and the impossibility of listing all the characteristics of the chemical substances, their interactions and their evolution over time **SAMES KREMLIN** and the manufacturer can not be held responsible:

- ✓ The poor compatibility of materials in contact.
- ✓ Inherent risks to staff and the environment.
- ✓ Wear and tear, maladjustment, malfunction of equipment or machines and the quality of the finished product.
- ✓ In the event of a diaphragm rupture, a large area of the environment may be contaminated with the pumped medium.

The back pressure regulator, should only be used in environments that do not alter the properties of the products used in a negative way.

Checking the compatibility of materials is the responsibility of the user.

The user will have to identify and prevent the potential dangers inherent to the implemented products such as:

- ✓ Toxic vapors.
- ✓ Fire.
- ✓ Explosions.

It will determine the risks of immediate reactions or due to repeated exposures to the staff.

SAMES KREMLIN and the manufacturer decline any responsibility, in case of:

- ✓ Bodily or psychic injuries.
- ✓ Direct or indirect material damage due to the use of chemical substances.

The following points must be observed if the hazard analysis conducted by the operator reveals that a possible leakage of the medium poses an increased risk:

- ✓ The installation of media shut-off valves at the medium inlets and outlets to shut off the medium flow in case of a leakage on the **back pressure regulator**.
 - ✓ If **diaphragms** are completely defective, the medium to be **pumped** can react with materials in the compressed air circuit. The operator must evaluate the risk before taking it into operation and take appropriate measures.
-

2 Environment



The equipment is firmly fixed by the input and output connection.

To avoid risks due to static electricity, the equipment and its components must be grounded.

- ✓ Have the earth continuity checked by a qualified electrician. If earth continuity is not assured, check terminal, wire and grounding point. Never operate the equipment without solving this problem.

Note: all objects in the work area must also be grounded.

For reasons of ground continuity, the regulator must be connected to a metal pipe that is itself connected to earth.

Material marking



Each device is equipped with a sign plate with the name of the manufacturer, the reference of the device, important information for the use of the device (pressure, power, ...) and sometimes against the pictogram shown below.

The equipment is designed and manufactured with high quality materials and components that can be recycled and reused.

European Directive 2012/19 / EU applies to all devices marked with this logo (crossed out bin). Find out about the collection systems available for electrical and electronic devices.

Comply with the rules in your area and **do not dispose of old appliances with household waste**. Proper disposal of this old device will help prevent adverse effects on the environment and human health.

3 Presentation of the equipment

3.1 Complete system

3.1.1 Generic presentation visual



3.2 Operating principle

Functional description

The Back pressure regulator PaintCare BPR-L® works by balancing the pressure of the fluid flowing through it with the pilot air pressure pressing against the diaphragms.

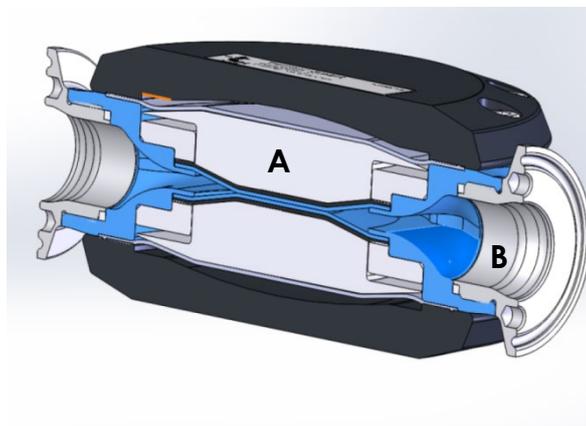
If the fluid pressure is lower than the pilot air pressure, then the diaphragms inflate and reduce the flow cross-section. This results in a higher pressure drop and, consequently, an increase in the pressure upstream of the regulator.

On the opposite, if the fluid pressure is higher than the pilot air pressure, then the membranes move away.

This reduces the pressure drop and the pressure upstream of the regulator. This balance allows a fluid pressure more or less equal to the pilot air pressure to be obtained.

Two conditions are necessary for the proper functioning of the regulator:

- ✓ There must be a minimum fluid flow through the regulator.
- ✓ The pressure of the pumping system upstream of the regulator must be able to be higher than the pilot pressure.



Item	Description
A	Pilot air pressure
B	Fluid pressure

Context of use

The Back pressure regulator PaintCare BPR-L® is exclusively designed to regulate the medium pressure of pressure systems installed upstream the equipment.

The Back pressure regulator PaintCare BPR-L® is exclusively intended to control liquid, non-explosive media.

The Back pressure regulator PaintCare BPR-L®:

- ✓ Low maintenance and ease of use.
- ✓ No fluid packing.
- ✓ Easy flushing.

The Back pressure regulator PaintCare BPR-L® recommended to:

- ✓ maintain a constant pressure in a circulating system.
-

Unintended use

The equipment is exclusively designed to regulate the medium pressure of pressure systems installed upstream the equipment.

The equipment is exclusively intended to control liquid, non-explosive media. The equipment is exclusively designed for commercial use.

The equipment is designed for use in potentially explosive zones. The suitable explosive zone could be deduce from the explosion category on the equipment's label (see Chapter 4.1 "Description of the marking of the plate")

Any risks resulting from the installation of the equipment into an overall system must be assessed and secured by the manufacturer of the overall system or by the operating company. The manufacturer of the overall system or the operating company must

- ✓ ground the equipment before the first commissioning via the media connections.
- ✓ ensure that the conveyed medium does not introduce impurities or solids into the Material back pressure regulator (e.g. by installing filters).
- ✓ Realize devices for the monitoring of the pressure.

The operating company of the equipment is responsible for the selection of the medium to be conveyed. The medium to be conveyed must

- ✓ correspond to the parameters specified in Chapter 5 Technical characteristics,

- ✓ fall into the scope of restrictions stated in Chapter 4.1 "Description of the marking of the plate" and
- ✓ compatible with the material of the equipment.

The equipment must be used only within the limits of performance listed in Chapter 5.1 "Technical characteristics".

Any other use or use that extends beyond the specified intended use is considered improper. Sames Kremlin and the manufacturer are not liable for damages resulting from this.

Intended use also includes:

- ✓ Observing all notes and instructions in the operating manual and all accompanying documents.
- ✓ Complying with prescribed intervals specified in the operating manual and its accompanying documents for inspections and maintenance operations.

The intended use of the equipment in a potentially explosive atmosphere additionally includes:

- ✓ The implementation of the relevant requirements (e.g. Industrial Safety Regulation, Regulation on Dangerous Chemicals and Directive 1999/92/EC) through the operating company.
 - ✓ The safeguarding through the operating company that the pressures permissible for the Equipment are not exceeded during operation (this may happen, for example, by a sudden closing of valves or pressure surges).
 - ✓ The equipment is exclusively intended to control continuous volume flows, a snore mode must be excluded.
-

Foreseeable misuse

Misuse exists in particular when:

- ✓ The conveyed media do not meet the product specification.
- ✓ Conveying solid or gas-type substances.
- ✓ Using the equipment as an overpressure valve.
- ✓ The equipment is used for other purposes.
- ✓ Operating a damaged equipment.
- ✓ Operating the equipment with bypassed or incomplete safety devices.
- ✓ Operating, maintaining and repairing the equipment through unauthorised and / or untrained personnel.
- ✓ Operating in the open air.
- ✓ Using non-genuine spare parts.
- ✓ Operating outside the parameters/operating data specified.
- ✓ Operating at a location that is not vibration-free.
- ✓ Operating at a location with ignition risks due to source of ignition in the vicinity of the equipment.
- ✓ Using or operating the equipment by private users.
- ✓ Modifying or converting the equipment.
- ✓ Failing to comply with maintenance intervals.
- ✓ Operating in potentially explosive atmospheres without prior implementation of the requirements of Directive 1999/92/EC and national regulations for explosion protection by the operating company.
- ✓ First commissioning without checking the area and the equipment through a person qualified for that purpose.
- ✓ Operating the equipment in gas- and dust ex-zones, for which the equipment is not intended.
- ✓ Installing the material back pressure regulator without correct integration into the potential equalization.
- ✓ Replacing ex-protected sub-devices as defined in Directive 2014/34/EU with non-compliant devices or those that are unsuitable for the application conditions.
- ✓ Immersing the equipment into liquid media.
- ✓ Operating with unsuitable media such as conveying media that are chemically incompatible with the materials used to manufacture the equipment. The operating company of the

equipment is obliged to test the chemical compatibility of the conveyed media.

- ✓ Conveying liquids with temperatures above 60 °C / 140 °F.
 - ✓ Conveying contaminated media. The owner must ensure that the conveyed medium does not contain any impurities or solids (e.g. by installing filters).
 - ✓ Operating the equipment without the secure prevention of an overpressure, e.g. through an over- pressure valve.
 - ✓ Using the equipment in snore mode.
-

4 Identification

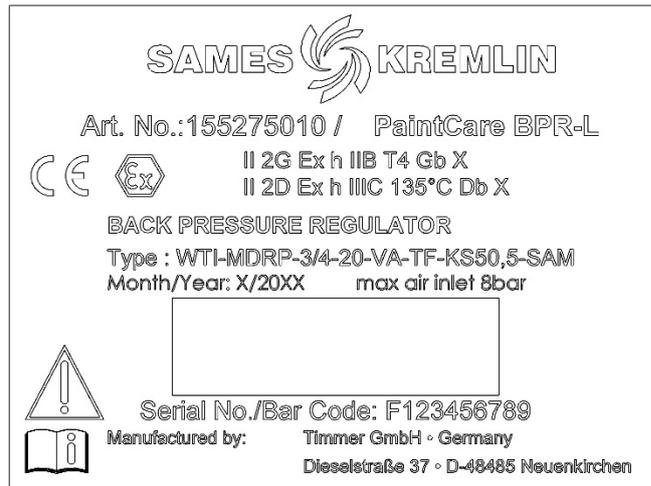
4.1 Description of the marking of the plate

Principles

The back pressure regulator PaintCare BPR-L® is designed to be installed in a paint booth.

This equipment complies with the following provisions:

- ✓ Machinery Directive (2006/42 / EC),
- ✓ ATEX Directive (2014/34 / EU: II 2 G - Group II, Category 2, Gas).
- ✓ ATEX Directive (2014/34 / EU: II 2 D - Group III, Category 2, Dust).



Description	
Sigle SAMES KREMLIN	Distributor's mark
CE	CE : European conformity
155275010	Article number of regulator
PaintCare BPR-L®	Distributor type
	: Use in explosive area
II	II : group II
2 G/D	<p>2 : category 2 equipment of equipment category 2 (avoidance of effective sources of ignition, also in case of anticipated faults). The equipment may be used as intended in explosive gas and dust atmospheres of Zones 1 and 2. Using the equipment in a Zone 0 is not permitted.</p> <p>G : gas D : dust</p>
X	<p>Special conditions for intended use in potentially explosive atmospheres: In order to counteract the risk of a generation of propagating brush discharges at the diaphragms with media contact, no severely charge-generating processes shall be active at the diaphragms. Such processes are, for example, the fast flow of non- conductive liquids along the diaphragms in the equipment. Limitation of the ambient temperature of the equipment, see Chapter "Technical characteristics".</p>
IIB	IIB : Reference gas for equipment qualification
IIIC	IIIC : Reference gas for equipment qualification
T4	T4 : Maximum permissible surface temperature 135 °C
135°C	Maximum heating up of equipment including safety margin.
Gb/Db	Specifies the EPL (equipment Protection Level). EPL Gb or Db: equipment with "high" protection level to be used in potentially explosive atmospheres, in which no risk of ignition exists under normal operating conditions or in case of foreseeable faults/malfunctions.
Type : WTI-MDRP-3/4-20-TF-KS50,5-SAM	Type of regulator
Month/Year	Marking of the manufacturing Month/Year
max air inlet 8bar	Maximum air pressure air inlet 8bar/116psi
Serial No. / Bar Code	Serial number
Timmer Gmbh	Manufacturer Mark

4.2 Identified ignition risks and protective measures

Possible potential ignition sources are hot surfaces, mechanically generated sparks and static electricity. Due to the restriction of the relative speed between the individual components, the use of suitable materials as well as the restrictions of the surface dimensions, these ignition sources will be efficiently prevented for the equipment category stated at the device.

5 General specifications

5.1 Technical characteristics

Back pressure regulator

PaintCare BPR-L®

Ideal operating range, liquid side	3-20 bar / 43.51-290 psi 5-40 l/min
Control range, liquid side	0 à 20 bar / 0-290 psi, 0-40 l/min
Maximum liquid pressure	25 bar / 362.6 psi max
Weighted sound pressure (LAeq)	< 70 dB(A)
Ambient temperatures	+5°C à +35°C / + 41°F to 95°F
Media connection	Tri-clamp (50.5)

A pilot pressure of 1 to 6.5 bar of air corresponds to a control of approx. 3 to 20 bar of medium (depending on the viscosity of the medium).

Wetted parts in contact with the materials

Back pressure regulator PaintCare BPR-L®	
Diaphragms	PTFE
Connections	Stainless steel

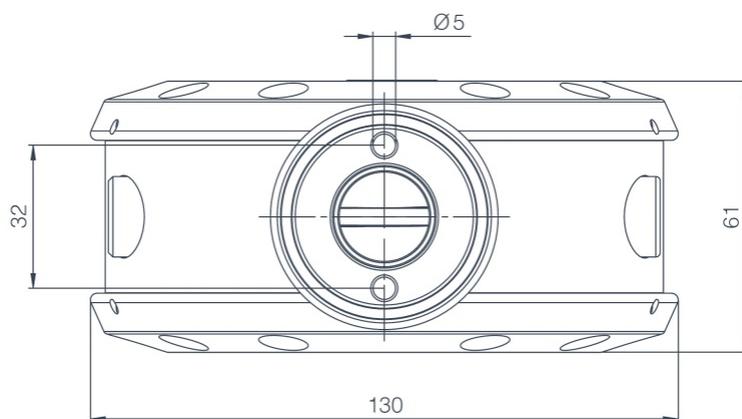
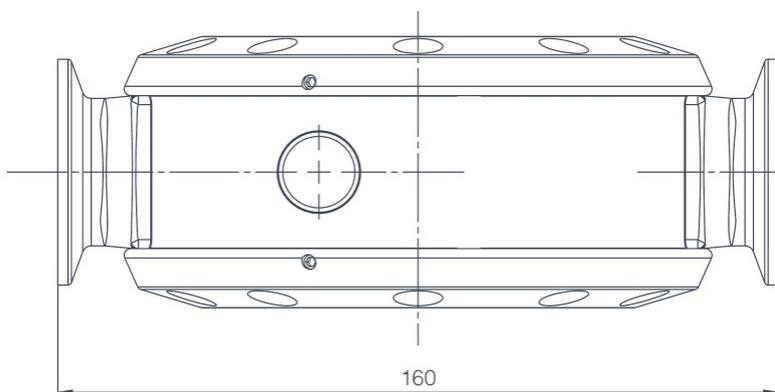
Pneumatically controlled

Compressed air connection	G1/4"
Compressed air	8 bar / 116 psi max
Dimensions (W x D x H)	160 mm x 131 mm x 61mm
Transmission ratio (compressed air)	3 :1
Total weight	< 2.8 kg / 6.17 lbs

Media

Maximum medium viscosity	≈ 15,000 mPa·s
Conveyed medium temperature	+5 à +60 °C / + 41°F to 140°F
Conductivity of the liquid	> 10000 pS/m, if additional safety measures are taken, it is possible to convey media with lower conductivity.

Dimensions



5.2 Connection



Figure 1 Back pressure regulator PaintCare BPR-L®

Item	Description	Function
A	External pilot connection	Connect device with pilot pressure supply
C	Inlet - medium connection	Connect device with media supply system and feed liquid to the back pressure regulator PaintCare BPR-L®
D	Outlet - medium connection	Connect device with media supply system and discharge liquid.

Connection of material back pressure regulator PaintCare BPR-L®

The back pressure regulator PaintCare BPR-L® is installed into the planned system using the connection adapter with a Tri-Clamp adapter.

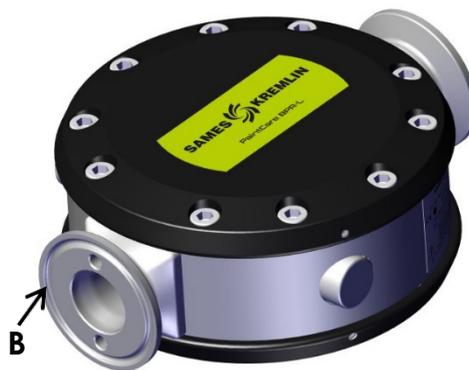


Figure 2 Connection of the back pressure regulator PaintCare BPR-L®

Item	Description	Function
B	Connection adapter	Adapter for the connection of the respective plant system, e.g. Tri-Clamp connection

The sectional view in the Figure 3 shows the pneumatic material back pressure regulator PaintCare BPR-L®.

The medium flow to be controlled flows through the volume marked in blue.

The flow cross-section is regulated through pushing together the two opposite diaphragm layers.

Two pistons are used to push together the diaphragm layers. The force required results from the chamber with compressed air fed in at the respective rear side of the piston.

The surface relations have been chosen, so that a medium pressure of up to 25 bars / 362.6 psi can be controlled with an operating pressure of up to 8 bars / 116psi.

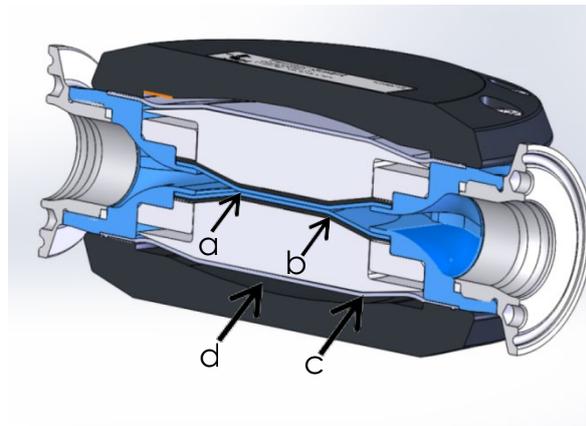


Figure 3 Sectional view back pressure regulator PaintCare BPR-L®

Item	Description
a	Diaphragm with medium contact (PTFE)
b	Diaphragm with piston contact (NBR)
c	Diaphragm with compressed air contact (PTFE)
d	Compressed air chamber

6 Transport

Transport the back pressure regulator PaintCare BPR-L® only in its original packaging as far as possible to prevent transport damage.

6.1 Check scope of delivery

- ✓ Remove the transport packaging of the pump.
 - ✓ Dispose of the packaging material correctly.
 - ✓ Examine the regulator for transport damage.
 - Immediately notify the transport company and the manufacturer of transport damage in writing.
 - Protect the regulator from further damage.
 - ✓ Use the packing slip to verify the completeness of the delivery.
-

7 Installation

Back pressure regulator PaintCare BPR-L®

The back pressure regulator PaintCare BPR-L® is designed for installation in a paint distribution room.

7.1 Assembly and initial start-up

The equipment must be assembled, connected, put into operation and dismantled again after the termination of the service life through by trained and qualified personnel.

The equipment must be properly integrated into the potential equalisation before the initial start-up

Before the initial start-up, the operating company must implement the relevant requirements from, e.g., the Industrial Safety Regulations, the Regulations on Hazardous Chemicals and the Directive 1999/92/EU.

The back pressure regulator PaintCare BPR-L® must be installed vibration and torque-free.

Danger



Danger to personnel and to the equipment!

The following compulsory measures must be observed when integrating the equipment into the circulating system:

- ✓ Installation of stop valves at medium inlet and outlet for the secure locking in case of a diaphragm rupture or of repair works.
- ✓ Drain valve for the residue-free drainage of the material back pressure valves.
- ✓ Safe installation location, so that no danger to people will occur in case of a penetration of medium.
- ✓ Follow all instructions and information given in this Operating Manual.
- ✓ Only use the equipment in potentially explosive atmospheres, for which it is intended.
- ✓ The manufacturer of the complete system or the operating company must ensure the safety of interfaces to the machinery of the operating company and the protection from hazards arising from the installation in the system.

-
- ✓ The operating company needs to use filters to ensure that no solids enter the device through the medium.
 - ✓ Shall ensure, that the drain is not clogged or closed.
 - ✓ Stray currents (e.g. in systems with electrical corrosion protection) shall not be routed via the equipment.
-

Supplemental information on pneumatic material back pressure valve:

In order to ensure a safe mode of operation, a compressed air supply with a low level of fluctuations is compulsory.

Pressure fluctuations have a direct impact on the control quality of the material dynamic pressure valve.

The emergency shut-off for the compressed air must be realised externally via the compressed air supply.

Route the compressed air hoses, so that no danger will result from the loosening of the hose connection from the material back pressure regulator or in case of line damages.

A pressure controller must be installed upstream the compressed air feed to set the pilot air pressure.

The compressed air must be dry and oil-free to avoid any accumulations of water and oil in the material back pressure regulator. If this is not the case, make sure to install an oil and water separator upstream the material back pressure regulator.

The pneumatic connection material must fulfil the requirements of the operating pressure and of explosion protection.

Assembly and initial start-up



Danger to personnel and to the equipment!

- ✓ Only qualified specialist personnel may install the equipment.
- ✓ Do not immerse the equipment into the medium to be conveyed.
- ✓ The device must be checked for proper function and leaks during and after the initial start-up. In case of a leak or of an improper function, the initial start-up must be stopped. It is not allowed to put the equipment into operation.
- ✓ Choose location of installation, so that liquids penetrating in case of a diaphragm rupture will not result in a hazard to persons or property.
- ✓ Choose the location of installation, so that the material back pressure regulator will be protected against potential impacts.
- ✓ Do not use the equipment as a support for the piping system.
- ✓ Ensure that the system components are properly supported to avoid stress on the equipment.

Prerequisites:

- ✓ The liquid chamber of the back pressure regulator PaintCare BPR-L® has been rinsed properly with appropriate rinsing agents to remove any foreign substances from the interior of the material back pressure regulator.
- ✓ The safety instructions have been read and implemented.
- ✓ If necessary, filtering devices for the transported material can be installed.
- ✓ Pressure monitoring devices put in place.
- ✓ Compressed air supply is switched off.
- ✓ The system lines have been professionally integrated via a protective conductor into the local potential equalisation, so that the equipment can be earthed via the connections.

How to start up the back pressure regulator PaintCare BPR-L®:

- ✓ Connect the material back pressure regulator with the connection system required, such as the Tri-Clamp locking clamps, to the media system.
 - ✓ Set the outgoing pressure at the compressed air controller to a minimum.
 - ✓ When using a pneumatic material back pressure regulator, screw in compressed air connection and connect to compressed air system.
 - ✓ Switch on compressed air system and slowly ventilate device.
 - ✓ Switch on medium conveying system and very slowly increase volume flow.
 - ✓ Set back-pressure at material back pressure regulator PaintCare BPR-L® via the outgoing pressure at the pressure controller.
 - ✓ Check all connections for tightness and proper seating.
 - ✓ If necessary, carry out fine adjustment again during operating mode.
-

7.1 Decommissioning and removal

Ensure the following prior to dismantling:

- ✓ Shut down the circulating system.
- ✓ Switch off pressure and power before uninstalling the media system lines and secure the conveying system against unexpected restart.
- ✓ De-pressurise the compressed air supply before starting to uninstall.
- ✓ Before uninstalling, check the disassembly area for possible sources of ignition and remove these sources.
- ✓ Remove the medium from the material back pressure regulator PaintCare BPR-L® before uninstallation.
- ✓ Flush material back pressure regulator before uninstallation.

Uninstallation

- ✓ Remove compressed air connections, if installed
- ✓ Undo and remove connections.

7.2 Storage

Back pressure regulator PaintCare BPR-L®

Ensure the following prior to storing:

- ✓ The equipment shall only be stored after a thorough cleaning.
- ✓ Extreme storage conditions accelerate the ageing process and must be avoided.

Note: We recommend a storage temperature between +10°C and +25°C (+50°F and +77°F).

7.3 Dismantling

For disposal, dismantle the equipment properly and submit the individual components to appropriate recycling

8 Operation and decommissioning

Note

The equipment shall only be used in accordance with the intended use.

8.1 Safety instructions



Warning

Observe safety instructions!



Explosion hazard through improper operation

A snore mode must be avoided.

The pneumatic material back pressure regulator will suddenly open up due to sudden severe fluctuations of the compressed air pressure. The operating company is responsible to check possible hazards for the equipment.

The use of the material back pressure regulator has an impact onto the control characteristics of the system. The operating company is responsible to check possible hazards for the equipment.

The temperature of the medium may be critically increased due to an accumulation of frictional heat of the medium in the circular system. The operating company is responsible to check possible hazards for the equipment.

8.2 Mandatory checks before and during operation

Familiarise yourself with the work environment before starting work. Inspect the equipment visually for noticeable defects at least once a day (visual inspection). Follow the intervals for inspections and maintenance

Before turning on the equipment, take note of any irregularities in the area of the complete system. The following characteristics point out to irregularities:

- ✓ Increased noise level or irregular / unusual noises.
- ✓ Unusual odours.
- ✓ Smoke development.
- ✓ Stains of the medium conveyed (ink, solvent etc.) at the equipment or on the ground.
- ✓ Conveyed medium is escaping.
- ✓ Change of the control behaviour.

Shut down the machine immediately in case of first signs of the characteristics mentioned before. Immediately notify maintenance personnel for a precise assessment of the technical state.

The maintenance personnel has to decide whether the operation can be continued without further restrictions of the functionality of the equipment. Initiate repair measures immediately when a failure can be anticipated from the determined damage.

8.3 Switching on

Pneumatic material back pressure regulator:

- ✓ Set the outgoing pressure at the compressed air controller to a minimum.
- ✓ Switch on compressed air system and slowly ventilate device.
- ✓ Switch on medium conveying system and very slowly increase volume flow.
- ✓ Set back-pressure at material back pressure regulator via the outgoing pressure at the pressure regulator PaintCare BPR-L®.
- ✓ The material back pressure regulator PaintCare BPR-L® is ready for operation.

8.4 Shutdown

Pneumatic diaphragm pressure regulator:

- ✓ Slowly reduce medium volume flow to zero and switch off medium conveying system.
 - ✓ Reduce outgoing pressure at pressure regulator to a minimum.
 - ✓ Switch off compressed air and ventilate.
 - ✓ In case of a prolonged standstill, flush and drain diaphragm pressure regulator.
-

9 Troubleshooting

9.1 Faults in the work sequence

In the case of faults in the work sequence of the equipment, inform the maintenance department.

Remedies

Fault	Cause	Remedy
Liquid pressure/flow level is not reached or slowly decreases.	Media supply system is not active.	Activate external supply system.
	Incorrect adjustment of the pneumatic pressure on the regulator control.	Set back-pressure required.
	Circulating pressure or flow rate too low	Set a higher operating pressure / flow rate.
	Diaphragm in material back pressure regulator defective.	Replace diaphragm.
	Foreign body inside a line or inside the material back pressure regulator PaintCare BPR-L®.	Remove the foreign body.
	Line and/or material back pressure regulator soiled or clogged.	Clean line and/or material back pressure regulator PaintCare BPR-L®.
	Filter in filter controller soiled.	Clean or replace filter.
Back-pressure cannot be regulated.	Interruption of compressed air supply or regulator malfunction	Check the stability of the compressed air supply, restore it if necessary. Or change the regulator
	Defective pneumatic diaphragm	Replace diaphragm.
Unusual noises	Wear and tear of components	Immediate shutdown of the installation, disassemble the controller, check the condition of the components and replace them if necessary.
Unusual odour	Device components are overheating.	Immediate shutdown of the installation, disassemble the controller, check the condition of the components and replace them if necessary.
Leaks	Incipient material damages.	Immediate shutdown of the installation, disassemble the controller, check the condition of the components and replace them if necessary.

10 Maintenance and care

To ensure proper operation of the equipment as intended, it is necessary to follow the care and maintenance instructions in this chapter. Regular care and maintenance extend the service life and increase the efficiency.

For safe operation of the equipment, maintenance work must be carried out regularly and intervals must be observed. Non-compliance may cause damage and an increased risk of accidents.

Use only the materials as well as operating and auxiliary materials recommended by the manufacturer. Recommended lubricants are specified where required. Mixing lubricants is generally not permitted.

10.1 Preventive maintenance plan



Warning

Observe safety instructions!



Warning

Danger to personnel and to the equipment!

- ✓ First, switch off media supply system and secure against unexpected restart, afterwards carry out works at the equipment.
- ✓ Carry out set-up and maintenance works, repairs and elimination of faults without pressure.
- ✓ Only authorised personnel may set up and maintain the equipment and remedy faults.
- ✓ Observe the safety instructions in this operating manual and in the operating instructions of third party manufacturers before carrying out maintenance and repair works.
- ✓ Familiarise yourself with the individual maintenance and repair instructions before carrying out the work.
- ✓ Cordon off the area required for set-up, maintenance, service and troubleshooting.

- ✓ Use utmost care when carrying out set-up and troubleshooting requiring the deactivation of safety installations. Clearly define responsibilities and work areas.
- ✓ Reattach all removed safety devices immediately after completion of the work.
- ✓ Be careful and alert throughout the working range of the equipment.



Warning

Risk of explosion from improper working!

- ✓ Carry out works pressure-free.
- ✓ Comply with operating instructions and processes by the operating company, for example, procedures such as permits for working with sources of ignition in areas with a potentially explosive atmosphere.
- ✓ Observe the safety instructions in this Operating Manual and in the operating instructions of third party manufacturers before carrying out maintenance and repair.
- ✓ Follow and implement maintenance intervals.
- ✓ Check the devices regularly for damage.
- ✓ Check the equipment regularly for damage or leaks.
- ✓ Check all pipes, hoses and fittings regularly for leaks and visible signs of damage. Remedy damage immediately.
- ✓ Only qualified specialist personnel may carry out repairs.
- ✓ Use only original spare parts.
- ✓ Only authorised specialists are allowed to work on liquid-carrying parts of the equipment.
- ✓ After completion of all work on liquid-carrying parts, check liquid-carrying parts before each start-up according to the maintenance plan for proper seat and tightness. Retighten if necessary.
- ✓ Remove all tools and objects from the interior and exterior of the equipment after setting up, maintenance, repair, service and troubleshooting.

**Warning**

Risk of injury during works at liquid-carrying parts of the equipment!

Media escaping under high pressure develop unexpectedly high forces and may cause severe injuries.

- ✓ First, switch off media supply system and secure against unexpected restart, afterwards carry out works at the equipment.
 - ✓ Release pressure from compressed air system and ventilate equipment, before starting to work.
 - ✓ Use appropriate tools to detect leaks, do not use your hands.
 - ✓ Avoid skin contact. Wear personal protective equipment PPE.
 - ✓ Seek immediate medical attention in case of injuries due to liquids escaping under high pressure. Severe infections or systemic reactions may be the result if you do not seek immediate medical attention.
-

10.2 Maintenance table

Device part	Task	Interval
Complete material back pressure regulator PaintCare BPR-L®.	Check proper condition and cleanliness of the device.	Every shift start
	Check for proper function.	Every shift start
	Check and, if required, re-tighten all screws.	Monthly
	Remove dust from the housing.	Monthly or if required
Material back pressure regulator PaintCare BPR-L®, general	Replace diaphragm	Annually, in case of heavy loads, shorter intervals must be used
	Flushing of diaphragm chamber	The interval depends on the liquid to be conveyed and its tendency to generate deposits.
	Check medium-contacting housing parts for wear; in case of severe abrasive wear, replace material back pressure regulator	Annually

10.3 Flushing of liquid chamber of material back pressure regulator PaintCare BPR-L®

Note: damaging of material back pressure regulator due to hardening, crystallising media!

- ✓ When conveying fluids that contain solids that harden, crystallise, or that can corrode device materials due to chemical or physical properties, the material back pressure regulator PaintCare BPR-L® must be cleaned before long standstill periods.
- ✓ The definition of a long standstill time depends on the previously conveyed medium and its aggregate state change from liquid to solid.
- ✓ The definition is the responsibility of the operator and should always be observed to avoid damage to the Material back pressure regulator PaintCare BPR-L®.
- ✓ Only use suitable cleaning agents depending on the device material and on the media conveyed when flushing the liquid chamber.
- ✓ Water or solvents may be suitable.
- ✓ Liquid and solid detergents must not exceed a temperature of 60 °C / 140°F.

The device can be flushed within the scope of the regular flushing of the overall system. The operating parameters of the device shall not be exceeded during the flushing process.

10.4 Cleaning the back pressure regulator PaintCare BPR-L® housing

Use only a damp antistatic cloth to clean the housing. Use an appropriate cleaning product to remove any residues of dried product. Therefore, we recommend regular inspection of the back pressure regulator PaintCare BPR-L®.

- ✓ When rinsing the product chamber, use only appropriate cleaning products depending on the materials of the equipment and the product used.
 - ✓ Water or solvents may be suitable.
 - ✓ Liquid and solid detergents must not exceed a temperature of 60 °C / 140 °F.
-

11 Replacing the diaphragm



Warning

Observe safety instructions!



Warning

Danger to personnel and to the equipment!

- ✓ First, switch off media supply system and secure against unexpected restart, afterwards carry out works at the equipment.
 - ✓ Carry out set-up and maintenance works, repairs and elimination of faults without pressure.
 - ✓ Only authorised personnel may set up and maintain the equipment and remedy faults.
 - ✓ Observe the safety instructions in this operating manual and in the operating instructions of third party manufacturers before carrying out maintenance and repair works.
 - ✓ Familiarise yourself with the individual maintenance and repair instructions before carrying out the work.
 - ✓ Cordon off the area required for set-up, maintenance, service and troubleshooting.
 - ✓ Use utmost care when carrying out set-up and troubleshooting requiring the deactivation of safety installations. Clearly define responsibilities and work areas.
 - ✓ Reattach all removed safety devices immediately after completion of the work.
 - ✓ Be careful and alert throughout the working range of the equipment.
-

**Warning****Danger to personnel and to the equipment!**

- ✓ Only authorised specialists are allowed to work on liquid-carrying parts of the equipment.
- ✓ Before disassembling, observe the safety data sheets of the previously conveyed chemicals.
- ✓ Release pressure from media system lines and secure against unexpected restart before starting to dismantle.
- ✓ Release pressure from compressed air system and ventilate the equipment before starting to dismantle
- ✓ Avoid skin contact. Wear personal protective equipment PPE.
- ✓ Seek immediate medical attention in case of injuries due to liquids escaping under high pressure. Severe infections or systemic reactions may be the result if you do not seek immediate medical attention.

To maintain the smooth operation of the equipment as intended, repairs may be necessary or cannot be avoided.

The use of genuine spare and wear parts as well as authorised accessories ensures the operational reliability of the equipment and protects personnel and the environment from unforeseeable hazards.

11.1 Operation

Ensure the following prior to replacing the diaphragms:

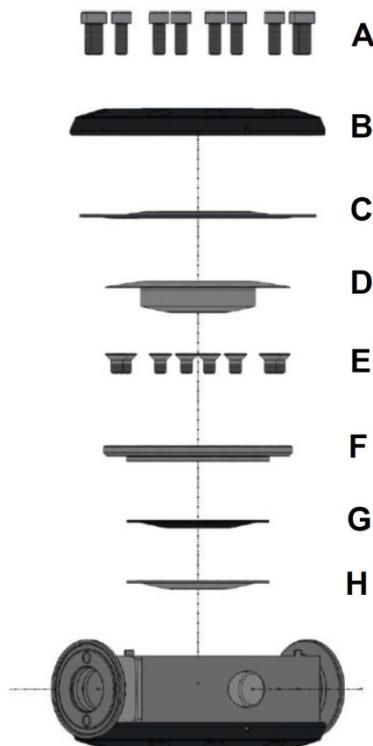
- ✓ Switch off device.
- ✓ Before uninstalling, check the disassembly area for possible sources of ignition and remove these sources.
- ✓ Ventilate the compressed air supply before starting to uninstall.
- ✓ Flush material back pressure regulator before uninstallation.

Pneumatic material back pressure regulator:

The layout of the back pressure regulator PaintCare BPR-L® is symmetrical. The following procedure must be carried out on both sides of the back pressure regulator PaintCare BPR-L®.

Figure 1 Replacing the diaphragm

- ✓ Dismantle the components A to H in alphabetical sequence on both sides of the material back pressure regulator.



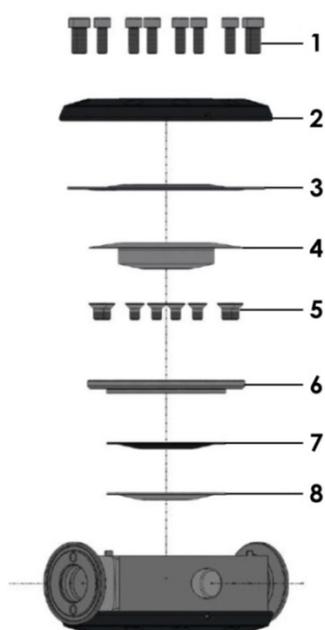
- ✓ The components A/B/C/D/E/F are made of conductive materials. The components G/H are made of non-conductive materials.
- ✓ Clean the inside of the device.
- ✓ Check the device for wear.
- ✓ Replace the diaphragms C/G/H on both sides of the device.

Note : The blue side of the diaphragm H faces towards the center (medium).

- ✓ Assemble the components in reverse order. Use a torque spanner for tightening-up. The torque for the bolts A and E is 10 Nm. Before mounting the bolts, apply grease onto the threads. Tighten up the bolts cross-wise at several steps. Increase the torque step by step.
 - ✓ Put the device into operation.
-

12 Spare parts

Use only genuine **SAMES KREMLIN** accessories and spare parts designed to withstand the foreseeable pressure and other operating parameters.



Ind	#References	Description	Qty	Spare part level**
1	155 275 011	Screw Chc M6x16 stainless steel A2	10	
2	N.C.	Cover	1	
3*	N.C.	Diaphragm	1	1
4	N.C.	Piston	1	
5	155 275 012	Screw F TORX M6x10 stainless steel A4	8	
6	N.C.	Flange	1	
7*	N.C.	Diaphragm	1	1
8*	N.C.	Diaphragm	1	1

Ind	#References	Description	Qty	Spare part level**
*	155 275 019	Diaphragms Kit (ind. 3 (x2), 7 (x2), 8 (x2))	1	1

* Recommended maintenance parts.

**Level 1 : Preventive maintenance

N S: Denotes parts are not serviceable.

Level 2 : Corrective maintenance

Level 3 : Exceptional maintenance

13 Declaration of Conformity

CATEGORY : MATERIAL BACK PRESSURE REGULATOR

Model: WTI-MDRP

Distributor model: BPR-L

ATEX marking :   II2G Ex h IIB T4 Gb X
II2D Ex h IIIC 135°C Db X

This material back pressure regulator has been designed and manufactured in accordance with the following EC/EU Directives:

Directive 2006/42/EC EU Gazette L157/24 of 17 May 2006

Directive 2014/34/EU, EU Gazette, L 96/309 of 26 February 2014

Under the sole responsibility of (Manufacturer):

Timmer GmbH

Dieselstraße 37

D-48485 Neuenkirchen

www.timmer.de

The following harmonized standards have been applied:

EN ISO 12100:2011-03 Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010); German version EN ISO 12100:2010

EN 1127-1:2011-10 Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology; German version EN 1127-1:2011

EN 80079-36:2016-12 Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements (ISO 80079-36:2016); German version EN ISO 80079-36:2016

EN ISO 4414:2010--04 Pneumatic fluid power - General rules and safety requirements for systems and their components (ISO 4414:2010); German version EN ISO 4414:2010

Person responsible for documentation: Timmer GmbH

Address: see manufacturer

Neuenkirchen, 08.2020 _____

Place, date

_____ Managing Director (Klaus Gehrman)