

# MEDENUS

Gas Pressure Regulation



## Gas Pressure Regulator

RSP 254 / RSP 255

Regulator

R 70-10 / R 70-20 / R 70-100

Actuator

AS 254 / AS 255

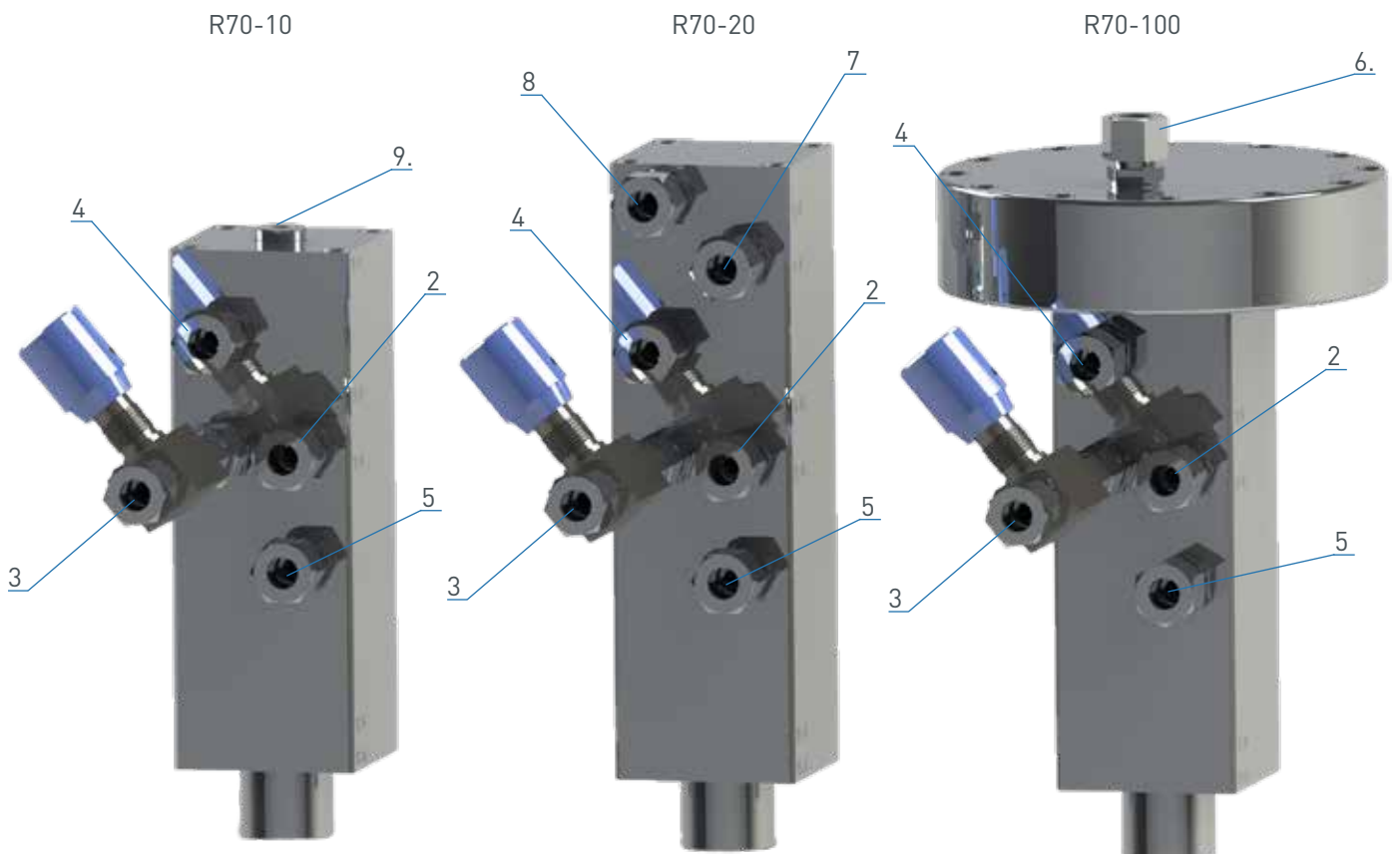
Operating and Maintenance Instructions



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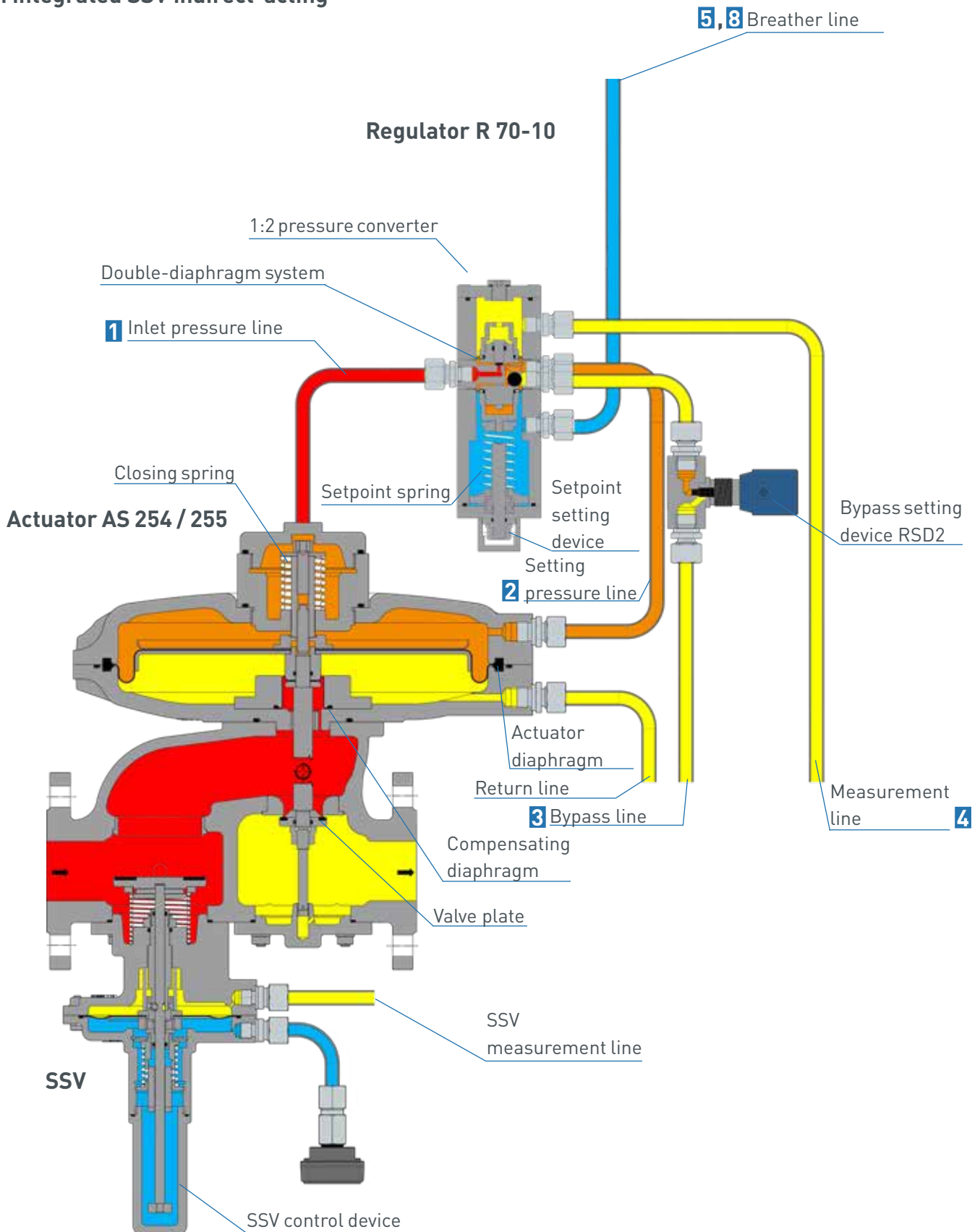
## Connections R70

Connection no.	R70-10		R70-20	R70-100	
<b>1</b>	Inlet pressure line		Inlet pressure line	Inlet pressure line	
<b>2</b>	Setting pressure line		Setting pressure line	Setting pressure line	
<b>3</b>	Bypass line		Bypass line	Bypass line	
<b>4</b>	Measurement line		Measurement line	Breather line	
<b>5</b>	Breather line	Pneumatic follow-up setpoint (I/P converter)	Breather line	Breather line	Pneumatic follow-up setpoint (I/P converter)
<b>6</b>				Measurement line	
<b>7</b>			Pneumatic follow-up setpoint (I/P converter)		
<b>8</b>			Breather line		
<b>9</b>					
<b>10</b>					
<b>11</b>					
<b>12</b>					



# Design of the gas pressure regulator RSP

Gas pressure regulator RSP 254 / RSP 255  
with integrated SSV indirect-acting



- |   |  |  |
|---|--|--|
| <span style="display: inline-block; width: 20px; height: 10px; background-color: red; margin-right: 5px;"></span> Inlet pressure  | <span style="display: inline-block; width: 20px; height: 10px; background-color: yellow; margin-right: 5px;"></span> Outlet pressure | <span style="display: inline-block; width: 20px; height: 10px; background-color: green; margin-right: 5px;"></span> Follow-up setpoint |
| <span style="display: inline-block; width: 20px; height: 10px; background-color: orange; margin-right: 5px;"></span> Set pressure | <span style="display: inline-block; width: 20px; height: 10px; background-color: blue; margin-right: 5px;"></span> Atmosphere        |  |

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# 1 General Information

The personnel entrusted with installation, operation or maintenance of the gas pressure regulator must have completely read and understood beforehand the following documents:

- **Gas Pressure Regulator RSP 254 / RSP 255 Product Information**  
The product information contains technical data, dimensions and a description of the design and the mode of operation.
- **Gas Pressure Regulator RSP 254 / RSP 255 Operating and Maintenance Instructions**  
This document allows safe and efficient handling of the device and contains information on assembly, commissioning, maintenance, troubleshooting, and repair according to regulations.  
It is an integral part of the scope of delivery of the device, must be kept in close proximity of the device and must be readily accessible to personnel at any time.  
The basic prerequisite for safe working is compliance with all safety instructions and instructions for action given in this manual. Accordingly, the information and instructions must be observed when working on the device or on the gas line. In addition, the local occupational safety regulations and general safety regulations for the application range of the device shall apply.  
The figures in these instructions are provided for basic understanding and may differ from the actual design. The contents of these instructions are protected by copyright. They may be used as part of operating the device. Any other use and/or reproduction is not permitted without prior authorization by MEDENUS Gas-Druckregeltechnik GmbH.

## 1.1 Warranty and Liability

Claims under warranty or liability for personal injury and material damage are generally void **if** one or several of the following **conditions are not observed**:

- Work on the device during the warranty period may only be performed in consultation with the manufacturer
- Designated use of the device in accordance with the established conditions of use
- Proper installation, commissioning, operation and maintenance of the device
- Operation of the device with properly installed and functioning safety devices only
- Operating and maintenance instructions of the device or of the system
- Compliance with the maintenance instructions
- Properly performed repairs
- Supply lines without defects
- The use of original MEDENUS® spare parts (p. 25) and lubricants listed in these instructions
- Force majeure

### It is generally prohibited

- To perform constructive modifications on the device
- To keep using the device despite the detection of a defect

## 1.2 Symbols, Notes

The instructions contain safety instructions marked with symbols to indicate possible consequences in case of non-observance:

This combination of symbol and signal word indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, damage to the device, the breakdown of the system, and material or environmental damage.



**ATTENTION**

This combination of symbol and signal word indicates an imminent hazardous situation which, if not avoided, will result in death or serious injury.



**DANGER**

This signal word highlights useful tips, recommendations, and information for efficient and trouble-free operation.

**Note**

## 1.3 Terms, Abbreviations

Terms and abbreviations are explained below:

AC	Accuracy class	$P_{d20}$	Outlet pressure R70-20	$W_{dsu}$	Lower adjustment range (SSV)
$AG_o$	Upper response pressure group	$P_{d20s}$	Outlet pressure R70-10 with pressure converter 1:2 for follow-up setpoint adjustment	$\Delta p_{wo}$	Min. re-engagement difference between upper response pressure and normal operating pressure
$AG_u$	Lower response pressure group	$P_{d10s}$	Outlet pressure R70-10 with 1:1 follow-up setpoint adjustment	$\Delta p_{wu}$	Min. re-engagement difference between lower response pressure and normal operating pressure
BV	Breather valve	$P_{d10}$	Outlet pressure R70-10	MOP	Maximum operating pressure in a system
HDS	High-pressure spindle	$Q_n$	Standard volumetric flow rate	$MOP_d$	Maximum operating pressure upstream of the system
$K_G$	(Valve) flow coefficient	RSD2	Throttle valve	FF	Fine filter
$p_d$	Outlet pressure	RSS	Switching valve		
$p_{ds}$	Setpoint of the outlet pressure	SSV	Safety shut-off valve		
$p_{dso}$	Upper SSV response pressure	SD	Setting device		
$p_{dsu}$	Lower SSV response pressure	SG	Closing pressure group		
PS	Maximum allowable pressure	At	Actuator		
$p_u$	Inlet pressure	$t_{uGas}$	Gas inlet temperature		
$\rho_n$	Standard gas density	VS	Valve seat		
$P_{dF}$	Pneumatic follow-up setpoint from I/P converter	$w_u$	Inlet gas velocity		
$P_{d100}$	Outlet pressure R70-100	$w_d$	Outlet gas velocity		
		$W_{dso}$	Upper adjustment range (SSV)		

## 2 Application, Characteristics

### 2.1 Application

Gas pressure regulator (GDR), indirect-acting (operating with auxiliary power), for systems acc. to DVGW work sheets G 491 (A) and G 600 (A) (TRGI).

Can be used as an equipment component on gas consumption facilities as defined in EC Directive EU/2016/426  
Can be used for the gases defined in DVGW work sheet G 260 / G 262 and neutral non-aggressive gases.  
(other gases on request)

### 2.2 Characteristics

- Regulator with double-diaphragm system
- Model according to DIN EN 334 / 14382
- Integral pressure-tight model (IS)
- Gas pressure regulator with or without integrated SSV
- Compact and maintenance-friendly modular design
- SSV functional class, optionally A ( $p_{ds\ u} + p_{ds\ o}$ ) or B ( $p_{ds\ o}$ )
- Open-air model\*

### 2.3 Type of Models (Options)

- fine filter FF upstream of the regulator
- pneumatic follow-up setpoint from I/P converter
- built-in noise reduction
- breather valve AV530
- SSV manual release
- electric position indicator SSV "Closed" via inductive proximity initiator or via Reed contact
- SSV electromagnetic remote release when power is applied or in case of power failure
- Coating with epoxy resin in RAL colors
- Special models such as Wobbe correction for burner control

$$Ws = \frac{Hs}{\sqrt{d}}$$

$$Ws - \sqrt{P} = \frac{Hs}{\sqrt{d}} - \sqrt{P} = \textit{konstant} \quad P = \textit{Brennerüberdruck}$$

## 3 Reasonably Foreseeable Misuse

- The regulators must not be used to control liquids.
- The regulators must not be used in temperature ranges below -20 °C or above 60 °C
- The regulators must not be used for pressure ranges higher than the pressure "PS" indicated on the nameplate.
- The regulators may only be used for the gases specified under item (2.1) Application in these operating instructions.

Other gases, such as oxygen or hydrogen, must be explicitly stated on the nameplate.

Please consult the manufacturer before use.

- The regulators must not be used in high-temperature areas without an upstream HTB fuse.

\*) Categories C1 to C5-I are guaranteed without additional coatings.  
For category C5-M, an epoxy resin coating is recommended.



## 4 Safety Instructions


National accident prevention regulations and the system operator's safety regulations are not superseded by these operating and maintenance instructions and must be taken into consideration with priority (in Germany, see, among others, DVGW work sheets G 600, G 459/II, G 491 and G 495).

When performing work on the device, the current general and specific safety regulations must be observed.

The application limits of the device with respect to the medium, operating pressure and operating temperature can be found on the nameplate affixed to the device or on the acceptance test certificate.

Using the device under different operating conditions must be agreed upon in consultation with MEDENUS Gas-Druckregeltechnik GmbH.

The mechanical components of the device do not have any potential ignition sources of their own nor any hot surfaces and are thus not covered by the scope of 2014/34/EU (ATEX). The electronic accessories used comply with the ATEX requirements.

Special care is required when performing maintenance work! Spring-loaded parts  or mechanical stress!

### 4.1 Hazards of Handling the Device

MEDENUS® devices conform with current standards and directives, the recognized technical rules and the recognized safety rules.

However, improper use can result in hazards to the user or to third parties. This can also result in damage to the device or to the system.

This is why the device may only be used:

- in accordance with its designated use
- in perfect condition
- while observing the notes given in these operating and maintenance instructions, and inspection and maintenance regulations, which apply to the functioning and safety of the overall system.

Malfunctions or faults must be eliminated immediately.

### 4.2 Personnel Requirements

The device may only be mounted by qualified personnel. Only authorized personnel with the required qualification is allowed to perform settings or repairs on the device.

### 4.3 Country-Specific Requirements

The rules and regulations applicable at the place of use with respect to

- gas lines, installation of the gas system
- gas supply
- work on the gas system
- accident prevention

must be observed and complied with.

### 4.4 Handover of the Operating and Maintenance Instructions

The supplier of the system shall hand over these operating and maintenance instructions to the operator of the system no later than during commissioning and training of the operating personnel with the reminder to carefully store these instructions.

## 4.5 Safety in Operation

The device may only be used when all protective devices on the device or in the system are fully functional.

The device must be inspected by a representative of the operator (see item 5) or by a qualified person for externally visible damage and for proper functioning at least once a year.

A more frequent inspection may become necessary, depending on the system conditions.

## 4.6 What to Do in Case of Danger

Information on what is to be done in case of danger and in case of accidents can be found in the respective operator's or specialist companies' work instructions.

## 5 Responsibility of the Operator

**Operator** An operator is a person who operates the device himself/herself for commercial or economic purposes or leaves it to a third party for use/application and is legally responsible for the safety of the user, the personnel or third parties during operation.

**Operator duties** The device is used in the commercial sector. The operator of the device is therefore subject to the legal obligations for occupational safety. In addition to the safety instructions contained in these instructions, the established maintenance intervals must be observed, taking into account the respective national standard (alarm and hazard prevention plan).

In particular, the following applies:

- The operator is obliged to perform work on MEDENUS® devices during the warranty period only after consultation with the manufacturer. Otherwise the claims under warranty will become void.
- The operator must obtain information on the current occupational safety regulations and determine additional hazards resulting from the special work conditions at the place of use of the device in a risk assessment. The operator must implement the results in the form of operating instructions for the device.
- During the entire time of use of the device, the operator must check whether the operating instructions issued by him/her conform to the current state of the regulations and, if necessary, adapt them.
- The operator must clearly regulate and define the responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- The operator must ensure that all persons handling the device have read and understood these instructions. In addition, the operator must train the personnel at regular intervals and inform them about the hazards.
- The operator must make available to the personnel the required protective equipment and oblige them to wear the required protective equipment.
- Moreover, the operator is responsible for the device always being in technically perfect condition.
- The operator must make sure that the maintenance intervals described in these instructions are observed.
- The operator must have all safety devices checked regularly for functionality and completeness.

## 6 Transport, Storage and Packaging

### 6.1 Transport

#### Note

The device is delivered with flange protection caps. They must be removed prior to installation. Make sure that the device is transported horizontally using suitable lifting gear. The device must be handled carefully and secured against impacts and knocks. In case of transport damage, we will require the following information from the nameplate affixed to the device:

- Fabrication number

### 6.2 Storage

#### Equipment and spare parts must be stored under the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free location.
- Store on a flat surface.
- Do not expose to aggressive media.
- Do not expose to ozone or ionizing radiation.
- Do not store adjacent to direct heat sources.
- Avoid mechanical vibrations.
- Storage temperature: 0 to 25 °C.
- Relative air humidity: < 55 %.

#### Spare parts:

- Components susceptible to corrosion must be provided with a suitable preservative.
- Do not store O-rings and seals for more than 5 years even if stored properly.
- Spare parts must be stored in their original packaging until use.

#### Storage period for devices:

- Storage of the device for up to one year:  
Store the gas pressure regulator in its original packaging and original condition at the time of supply. All protective caps of the device must remain mounted.
- Storage of the device for more than 1 year (e.g. as a spare device):  
Store the device in its original packaging and its original condition as delivered and check it for damage once a year. Check the housing surface for dirt, damage and corrosion. If necessary, clean all external parts. After 5 years, all O-rings and seals must be replaced.  
(Components of the spare parts set, see p. 25)

### 6.3 Packaging

- The individual packaged items have been packaged in view of the transport conditions to be expected.
- The symbols on the packaging must be observed during transport and storage.
- Only environmentally friendly materials have been used for packaging.
- The packaging is designed for protecting the individual components from transport damage, corrosion and other damage until mounting. This is why the packaging must not be destroyed and only removed just prior to mounting.

# 7 Mounting and Commissioning

## 7.1 Safety Instructions and Preparation

Prior to starting work on pressurized components:

- Close all connections to the gas line.
- Depressurize all pressurized components. Also discharge residual energies.
- Defective components charged with pressure in operation must be replaced immediately by an appropriate expert.

**DANGER**



Prior to starting work, ensure sufficient clearance for mounting.

Before installing the device, check whether the performance data (nameplate) and the scope of delivery coincide with the order or the system data, i.e., make sure that the provided devices are suitable for their intended purpose. In particular, the inlet pressure of the system must be lower than the maximum allowable pressure of the device.

**Note**

Direct contact of gas valves and fittings or the control system with hardening masonry, concrete walls or floors is not permitted. Provide suitable supports, working materials and protective equipment. The minimum distances to the masonry etc. must be carried out in acc. with DVGW worksheet G491 / G600.

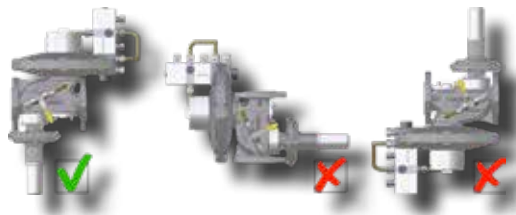
**Note**

Prior to commissioning, make sure that all installation work has been carried out and completed in accordance with the data and information given in these instructions and that no unauthorized persons stay in the danger zone.

**DANGER**



### Preferred installation position



## 7.2 Mounting

- Remove the packaging, flange protection caps and shipping braces.
- Check the device for wear and damage.
- Make sure that the device is installed free of stress (see DVGW info gas no. 19). Make sure to observe the direction of flow i.e., the arrow on the housing must point in the direction of flow.
- All breather lines (items 7.04 / 7.07) must be vented to the outside atmosphere.
- The measuring lines (items 7.05 / 7.08) must be connected in a pipeline section with a steady flow. There must be no installations that cause flow interference such as shutters, expansions, manifolds, junctions, isolation valves etc. directly upstream and downstream of the measurement point.

**Note**  
**Note**

**Note**

### Tightening torques $M_A^{*1}$

Gas pressure regulators		Flange tightening torques	
Screw size	Screw tightening torque $M_A$	Screw size	Screw tightening torque $M_A$
M6	8 Nm	M12	60 Nm
M8	18 Nm	M16	120 Nm
M10	36 Nm	M20	190 Nm
M12	62 Nm		

<sup>\*</sup>1) For the assembly of the flange connections, the maximum torques specified by the flange and gasket manufacturers must be observed. The values given here are maximum values in relation to the fitting...

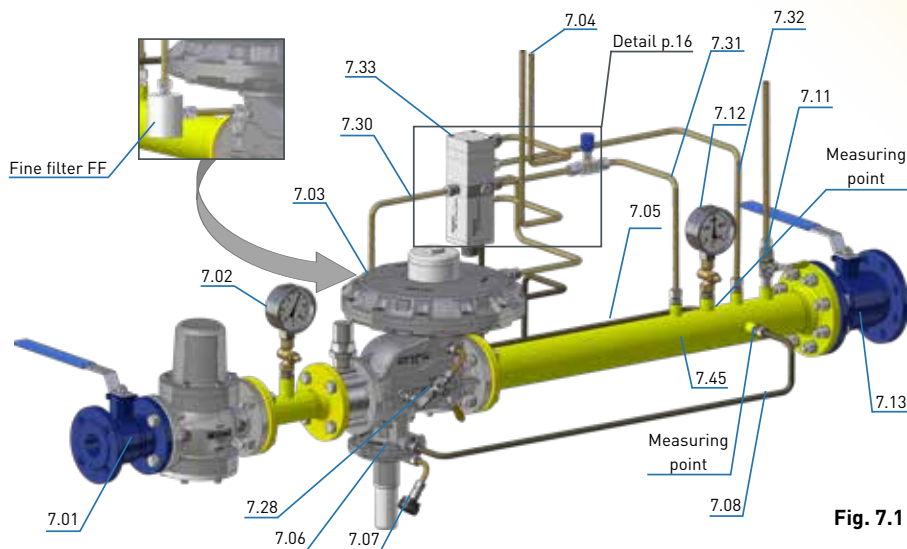
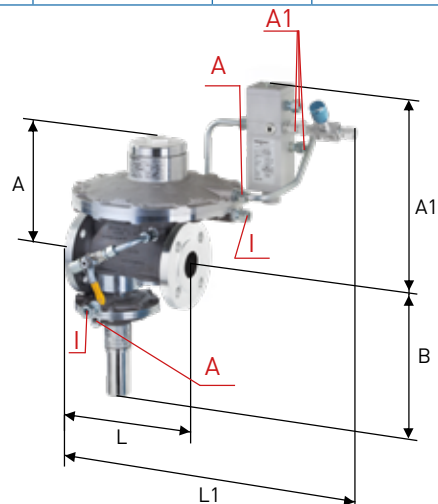


Fig. 7.1

The illustration shows the gas pressure regulator RSP 255 with actuator AS 255, regulator R 70-20 with follow-up setpoint, SSV with breather valve BV and fine filter FF (image detail)

- The measuring point should be behind the regulator at a distance of at least 10x the regulator nominal size DN or 5x the pipe nominal size DN.
- The maximum flow rate at the measuring point must not exceed 20 m/s, depending on the system conditions.
- In certain system circuits, such as gas control systems for gas motors and in gas burners, higher flow rates than 20 m/s are also possible. Please contact us.
- The measuring line must be connected to the pipeline or to the measuring point separately, laterally or at the top for each device (1 actuator (item 7.03); 1 gas pressure regulator (item 7.33); 1 integrated SSV (item 7.06)).
- The SSV measuring line (item 7.08) must always be connected upstream of the first shut-off valve (item 7.13) on the outlet side in such a way that it cannot be shut off.
- The SSV (item 7.06) can be rotated to any position.

Connection		DN Nennweite/nominal size							Anschluss Regler /connection Regulator			Anschluss Regler Öffnungsdurchmesser / connection Regulator opening diameter (mm)	
		RE	25	50	80	100	150	200	Impuls- leitung / impulse line (I)	Atmungs- leitung / breathing line (A)	R70-10/-20/-100 Funktions- / Atmungsleitung (A1)	Impulsleitung / impulse line (I) Atmungsleitung / breathing line (A)	Membranhaube Ø
RSP254	A	330	214	232	-	-	-	-	RP 3/8"	RP 3/8"	RP 1/4"	330	385/390
		385/390	-	-	293	308	370	510				4	6
	A1	R70-10	280	300	361	375	493	561					
		R70-20	312	332	392	406	525	593					
		R70-100	337	357	417	431	550	618					
	B		270	282	305	315	386	400					
L		230	230	310	350	480	600						
L1		452	452	541	583	666	756						
RSP255	A	330	-	-	-	-	-	-					
		385/390	-	292	370	441	-	-					
	A1	R70-10	-	361	421	493	-	-					
		R70-20	-	392	453	525	-	-					
		R70-100	-	418	478	549	-	-					
	B		-	305	311	386	-	-					
L		-	310	410	480	-	-						
L1		-	541	616	666	-	-						



## 7.3 Leakage Test (Test for External Leakage)

The devices are subjected to a strength and leakage test ex works at MEDENUS Gas-Druckregeltechnik GmbH.

The leakage test in the fully assembled system must be performed prior to commissioning and following maintenance work.

For the external leakage test in the fully assembled system, the following applies:

### For Germany:

According to DVGW work sheet G 491, the fully assembled system must be subjected to a leakage test with air or an inert gas at the installation site, using 1.1 times the maximum operating pressure of the system (MOP).

An exception is the room between the actuator and the first shut-off valve on the outlet side. This room must be checked using the test pressure corresponding to the maximum permissible pressure in the system in case of a malfunction (1.1 MOP<sub>d</sub>). In this test, all detachable connections must be checked using a foaming agent.

### For other countries:

The relevant national and international standards shall apply

### Procedure

- Close the ball valve upstream of the valves and fittings (item 7.01).
- Close the downstream shut-off devices (item 7.13) (ball valve, solenoid or pneumatic valve).
- Depressurize the system (item 7.11).
- If there is a SRV (safety relief valve) in the controlled section and the test pressure is higher than the response pressure of the SRV (item 7.09), the line upstream of the SRV (item 7.10) must be closed.
- Always increase the test pressure slowly and steadily.
- e.g.: 20 mbar/s

#### While doing so, you must ensure:

Pressure in the inlet chamber  $P_u$  (item 7.02)  $\geq$  pressure in the outlet chamber  $P_d$  (item 7.12)

#### Note

Pressure build-up always from the inlet side (inlet chamber)  
Pressure reduction always from the outlet side (outlet chamber)

- After leakage test:  
Open the ball valve in the SRV line (item 7.10) again.

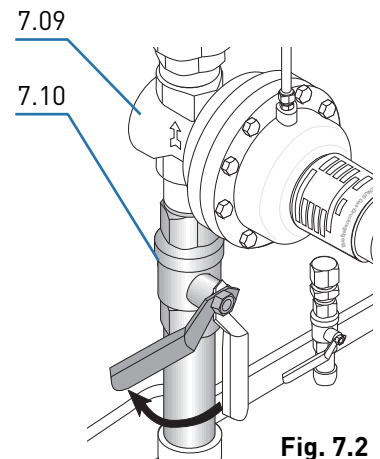


Fig. 7.2

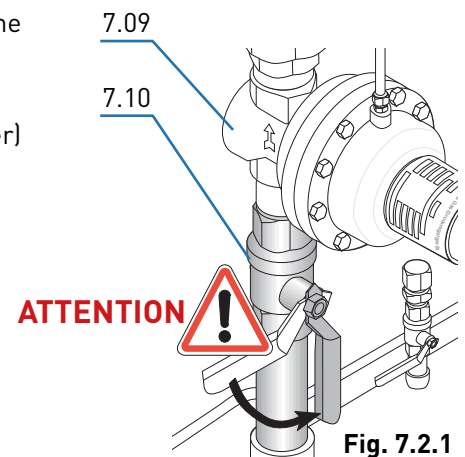


Fig. 7.2.1

## 7.4 Initial Commissioning / Recommissioning

Initial commissioning of the system components shall be carried out by the operator. For commissioning, please refer to the documents listed under item 1 "General Information" and the system operator's work instruction.

The devices delivered by MEDENUS Gas-Druckregeltechnik GmbH are factory-set to the operating data specified by the customer. This data is listed on the type plate and the Acceptance Test Certificate (ATC).

**Note** Prior to commissioning of the system, a functional test must be performed on the gas pressure regulator (GPR), if applicable, and the safety shut-off and safety relief valves.

### Procedure (fig. 7.1) inlet shut-off device

- Close the ball valve upstream of the valves and fittings (item 7.01).
- Close the downstream shut-off devices (item 7.13) (ball valve, solenoid or pneumatic valve).
- Depressurize the system (item 7.11).
- Close the venting ball valve (item 7.11).
- Slowly open ball valve upstream of the valves and fittings (item 7.01) (pressure increase approx. 0.5 bar/s).

**Note** If the inlet shut-off device is equipped with a bypass, the latter must be slowly opened for pressure compensation as step 1. This is followed by slowly opening the inlet shut-off valve which will close the bypass.

- Check the inner leakage of the SSV (item 7.06) by reading the pressure gauge installed downstream of the GPR (item 7.12).
- Unscrew the sealing cap (item 7.15) of the safety shut-off valve (SSV).
- On a GPR with bypass ball valve (item 7.28), carefully open the ball valve (item 7.28) of the bypass line while pulling the pull knob (item 7.14) until the SSV engages to perform pressure compensation.
- A closing pressure corresponding to the set value is established on the GPR.
- **Checking the upper response pressure of the SSV:**  
If an SRV is available in the section, close the ball valve in front of the SRV. Increase the outlet pressure up to the upper response pressure by using suitable means. Reduce the outlet pressure via adequate ventilation and engage the SSV by pulling the pull knob.

#### Checking the lower response pressure of the SSV:

Reduce the outlet pressure in the outlet section to the lower response pressure by suitable venting.

During the check, observe the manometer.

- It may be necessary to correct the setpoint values of the response pressures. This is done by turning the SSV setpoint setting screws (items 7.17 / 7.19) to the right (pressure increase) or left (pressure decrease) in order to increase/ decrease the setpoint value.

The inner setting screw (item 7.17) sets the underpressure shut-off level (lower trigger level) and the outer setting screw (item 7.19) sets the upper trigger level.

### Note

- Perform pressure compensation again via the SSV by carefully opening the ball valve of the bypass valve (item 7.28) and pulling the pull knob (item 7.14) and allow the SSV to engage.

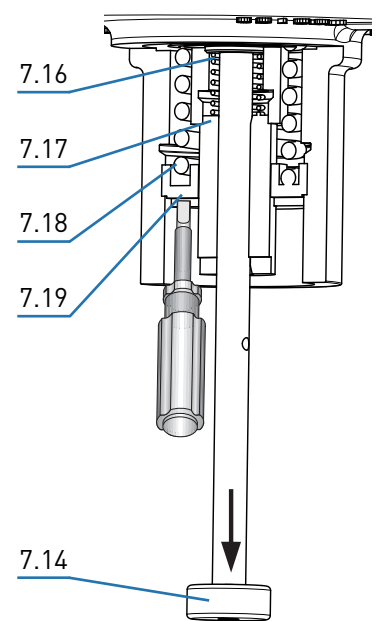
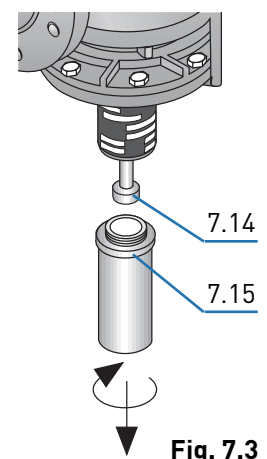


Fig. 7.4

- For the functional test of the GPR, let gas or other suitable media flow via the discharge line to the outside atmosphere and read the set regulating pressure on the outlet pressure gauge (item 7.12).
- After closing the discharge line, a constant closing pressure within the closing pressure class can be read on the outlet pressure gauge (item 7.12).
- Slowly open the outlet shut-off device (item 7.13) (0.5 bar/s).
- Screw on the sealing cap (item 7.15) of the safety shut-off valve (SSV) again.

### Changing the control range

Switching to the control range of a different setpoint spring can be done for the SSV while the device is pressurized.

### Safety shut-off valve

The SSV closes if the overpressure setpoint spring (upper trigger level) is removed from a pressurized system.

### Setting the gas pressure regulator:

Unscrew the protection cap (item 7.43) from the R70 and change the outlet pressure (Pd) by rotating the setpoint setting device (item 7.40). While doing this, observe the outlet pressure displayed on the manometer (p. 13, item 7.12) of the outlet pressure side.

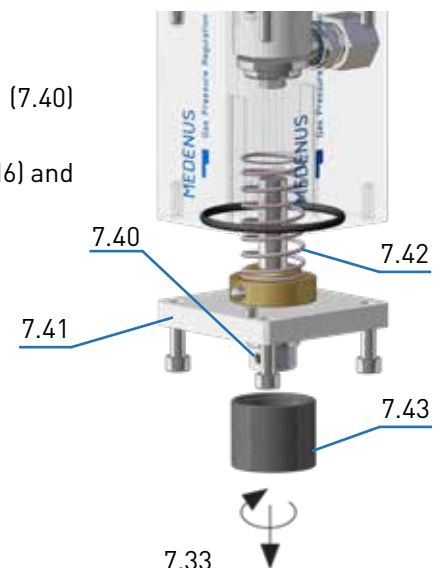
Turning clockwise - **pressure increase**

Turning counterclockwise - **pressure reduction**

For a precise setting, the gas on the outlet side must freely escape. Otherwise the closing pressure is also taken into account. If the desired outlet pressure cannot be set with the mounted spring, it may be necessary to replace the control spring in the regulator (R70).

### Replacing the control spring (R70)

- Release the control spring by turning the setpoint setting device (7.40) counterclockwise.
- Remove the sealing cover (item 7.41) from the diaphragm assembly (R70) (4x M6) and pay attention to the O-ring in the housing.
- Insert a suitable setpoint spring (item 7.42) and close the cover.
- Set the desired outlet pressure (Pd) as specified above.
- Screw the protection cap (item 7.43) again onto the R70.

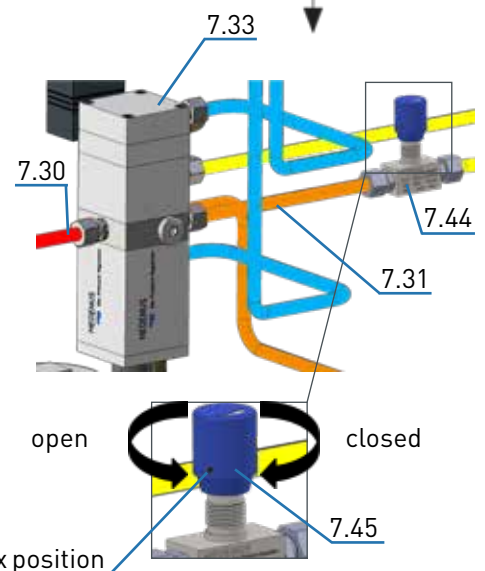


### 7.4.1 Bypass line, bypass setting device

The bypass line (item 7.31) is used to reduce the set pressure via the outlet pressure line (p. 13, item 7.45) if necessary.

In order to open the actuator (p. 13, item 7.03) when the gas flow quantity increases, the set pressure through the regulator (item 7.33) must be increased. If the gas flow quantity decreases, the actuator (p. 13, item 7.03) must be closed accordingly. For this, the regulator (item 7.33) reduces the set pressure and the excess set pressure in the diaphragm assembly of the actuator is reduced via the bypass line (item 7.31). The discharge velocity via the bypass line (item 7.31) can be set continuously with the help of the bypass setting device (item 7.44). The setting is made tool-free by means of a rotary knob and can be adjusted using a screw to be fixed. The throttle valve cannot be completely shut off, therefore a guaranteed minimum flow is ensured.

To increase the discharge velocity, the bypass setting device (item 7.44) must be opened by turning the rotary knob (item 7.45) in counterclockwise direction. To reduce the discharge velocity, the bypass setting device must be closed by turning the rotary knob in clockwise direction.





## 7.5 SSV setpoint spring table

RSP 254: DN 25 - 100 / RSP 255: DN 50 - 80										
small ball lock										
ND						MD				
to $W_{ds\ o}$ 200mbar						to $W_{ds\ o}$ 300mbar				
Spring data		Lower response pressure		Upper response pressure		Lower response pressure		Upper response pressure		
Feder Nr.	Farbe [RAL]	$W_{ds\ u}$ [mbar]	$\Delta p_{wu}$ [mbar]	$W_{ds\ o}$ [mbar]	$\Delta p_{wo}^{**}$ [mbar]	$W_{ds\ u}$ [mbar]	$\Delta p_{wu}$ [mbar]	$W_{ds\ o}$ [mbar]	$\Delta p_{wo}^{**}$ [mbar]	
FE 900	1028									
FE 901 VA	2002									
FE 902 VA	6010	3 - 7	15			0 - 12*	40			
FE 903	5015	5 - 9	15			4 - 14	40			
FE 904 VA	9005	7 - 13	15			8 - 18	40			
FE 905 VA	9010	13 - 25	15			18 - 42	40			
FE 906	4002					48 - 70	40			
FD 910	1028							35 - 45	40	
FD 911	2002			25 - 33	15			45 - 80	40	
FD 912	6010			33 - 56	15			70 - 120	40	
FD 913	5015			54 - 85	15			100 - 170	40	
FD 914	9005			85 - 119	15			140 - 230	40	
FD 915	9010			100 - 176	15			210 - 300	40	
FD 916	3020			152 - 200	15					
FD 917	5010									
FD 918	9006									
FD 919	4002									

RSP 254: DN 25 - 100 / RSP 255: DN 50 - 80										
small ball lock										
MD-R						HD				
to $W_{ds\ o}$ 3500mbar						to $W_{ds\ o}$ 16000mbar				
Spring data		Lower response pressure		Upper response pressure		Lower response pressure		Upper response pressure		
Feder Nr.	Farbe [RAL]	$W_{ds\ u}$ [mbar]	$\Delta p_{wu}$ [mbar]	$W_{ds\ o}$ [mbar]	$\Delta p_{wo}^{**}$ [mbar]	$W_{ds\ u}$ [mbar]	$\Delta p_{wu}$ [mbar]	$W_{ds\ o}$ [mbar]	$\Delta p_{wo}^{**}$ [mbar]	
FE 900	1028									
FE 901 VA	2002					20 - 120*	500			
FE 902 VA	6010	24 - 74	90			120 - 310*	500			
FE 903	5015	36 - 78	90			160 - 316	500			
FE 904 VA	9005	58 - 110	90			200 - 400	500			
FE 905 VA	9010	110 - 160	90			416 - 650	500			
FE 906	4002	162 - 250	90			560 - 940	500			
FD 910	1028			100 - 135	50					
FD 911	2002			130 - 250	50					
FD 912	6010			220 - 360	50					
FD 913	5015			320 - 510	50					
FD 914	9005			440 - 700	50					
FD 915	9010			630 - 1130	50			2200 - 4000	300	
FD 916	3020			1060 - 1750	50			3400 - 4750	300	
FD 917	5010			1420 - 2520	50			4700 - 7400	300	
FD 918	9006			1850 - 3200	50			7200 - 12100	300	
FD 919	4002			2800 - 3500	50			11700 - 16000	300	

\*) Standard spring

RSP 254: DN 150 - 200 / RSP 255: DN 100									
large ball lock									
ND					MD				
to $W_{ds\ o}$ 200mbar					to $W_{ds\ o}$ 300mbar				
Spring data		Lower response pressure		Upper response pressure		Lower response pressure		Upper response pressure	
Feder Nr.	Farbe [RAL]	$W_{ds\ u}$ [mbar]	$\Delta p_{wu}$ [mbar]	$W_{ds\ o}$ [mbar]	$\Delta p_{wo}$ [mbar]	$W_{ds\ u}$ [mbar]	$\Delta p_{wu}$ [mbar]	$W_{ds\ o}$ [mbar]	$\Delta p_{wo}$ [mbar]
FM 400	1028	3 - 25	20			10 - 40*	30		
FM 402	6010					35 - 115	30		
FM 404	9005					60 - 245	30		
FL 411	2002			45 - 81	20				
FL 412	6010			62 - 111	20			40 - 180	50
FL 413	5015			100 - 200	20			70 - 300	50
FL 415	9010								
FL 417	4010								

RSP 254: DN 150 - 200 / RSP 255: DN 100									
large ball lock									
MD-R					HD				
bis $W_{ds\ o}$ 3500mbar					bis $W_{ds\ o}$ 16000mbar				
Spring data		Lower response pressure		Upper response pressure		Lower response pressure		Upper response pressure	
Feder Nr.	Farbe [RAL]	$W_{ds\ u}$ [mbar]	$\Delta p_{wu}$ [mbar]	$W_{ds\ o}$ [mbar]	$\Delta p_{wo}$ [mbar]	$W_{ds\ u}$ [mbar]	$\Delta p_{wu}$ [mbar]	$W_{ds\ o}$ [mbar]	$\Delta p_{wo}$ [mbar]
FM 400	1028	20 - 180*	60			0 - 250	500		
FM 402	6010	155 - 380	60			150 - 1000*	500		
FM 404	9005	200 - 950	90			650 - 2050	500		
FL 411	2002								
FL 412	6010			145 - 670	180			380 - 1400	500
FL 413	5015			270 - 1230	180			800 - 2800	500
FL 415	9010			1200 - 3500	180			3200 - 5500	500
FL 417	4010							4500 - 16000	500

## 7.6 Regulator Setpoint Spring Table

R70-100		R70-20		R70-10		Spring data	
$P_{d100}$ [mbar]	$P_{d20}$ [mbar]	$P_{d20s}$ [mbar] (1:2)	$P_{d10}$ [mbar]	$P_{d10s}$ [mbar] (1:1)	Spring no.	Color [RAL]	
0-37	0-180	$P_{d20s} = P_{d10} + Ph * 2$		$P_{d10s} = P_{d10} + P_h$	FD 911	2002	
30-85	150-400				FD 912	6010	
55-160	250-750				FD 913	5015	
100-260	550-1250				FD 914	9005	
200-460	1000-2250				FD 915	9010	
400-500	2000-3000				FD 917	5010	
	3000-6500				FD 918	9006	

$Ph$  Pressure of the auxiliary pressure stage of the follow-up setpoint (0-6 bar)

$P_{d100}$  Outlet pressure R70-100

$P_{d20}$  Outlet pressure R70-20

$P_{d20s}$  Outlet pressure R70-20 with 1:2 follow-up setpoint adjustment

$P_{d10}$  Outlet pressure R70-10

$P_{d10s}$  Outlet pressure R70-10 with 1:1 follow-up setpoint adjustment

## 7.7 Decommissioning

For decommissioning, please refer to the documents listed under item 1 “General Information” and the system operator’s work instruction.

### Procedure (fig. 7.1)

- Slowly close the outlet shut-off valve (item 7.13) and
- Close the ball valve upstream of the valves and fittings (item 7.01).
- Depressurize the system (item 7.11). (Venting is always performed via the outlet side  $P_u \geq P_d$ )
- Close the venting ball valve (item 7.11).

**Note**

## 8 Maintenance

### 8.1 Maintenance Plan

The following sections describe the maintenance work required for optimal and trouble-free operation of the device. If increased wear is detected during regular inspections, the required maintenance intervals must be shortened in accordance with the actual wear.

For any questions on maintenance work and intervals, please contact the manufacturer.

The intervals for monitoring and maintenance work are strongly dependent on the operating situation and the condition of the gas. This is why no fixed intervals can be given. For Germany, it is recommended that the maintenance periods as specified in DVGW work sheet G 495 are observed initially. For each system, this must be followed by determining the maintenance interval independently on a medium-term basis.

During maintenance work, the components must be cleaned and subjected to a thorough visual inspection. This is also necessary if irregularities in the operating behavior have been detected during operation or during functional tests.

Damaged parts and O-rings dismantled during dismantling must be replaced with new ones.

The item numbers mentioned in chapter 8.2 (Maintenance Procedure) correspond to those listed in the spare parts drawings and spare parts lists.

It is recommended to stock the parts listed in chapter 11.5 for maintenance work.

Interval	Maintenance work	Personnel
According to the data given in DVGW work sheet G 495 or when required	Replacing O-rings	Qualified person
	Replacing diaphragms	
	Replacing the valve plate	

## 8.2 Maintenance Procedure

Instructions for our products can be found in the download area of our website. Should you have any problems, please feel free to contact us directly.

If components have been removed, make sure they are mounted correctly, reinstall all fastening elements and observe the screw tightening torques (8.3 Table of Screw Tightening Torques  $M_A$ ).

**ATTENTION**



Prior to recommissioning, observe the following:

- Make sure that all maintenance work has been carried out and completed in accordance with the data and information given in these instructions.
- Make sure that no unauthorized persons stay in the danger zone.
- Make sure that all covers and safety devices have been installed and are working properly.
- Perform a leakage test according to the procedure described under 7.3.

**DANGER**



For recommissioning, please refer to the relevant manufacturer's documentation of the gas pressure regulator installed in the system or chapter 1 and 7.4 as well as the work instructions of the system operator, and the other safety regulations for the system in which the regulator is installed.

To guarantee smooth operation, we recommend always keeping a maintenance set in reserve.

**Note**

### 8.3 Table of Screw Tightening Torques M<sub>A</sub>\*

#### Actuator

Item no.	Exception	AS 254 / 025 AS 254 / 050 AS 254 / 080 AS 254 / 100 AS 255 / 050	AS 254 / 150 AS 254 / 200 AS 255 / 080 AS 255 / 100
50		M10 / 36 Nm	
51		M8 / 18 Nm	M10 / 36 Nm
52		M8 / 18 Nm	M10 / 36 Nm
	DN 200		M12 / 62 Nm
53		M8 / 18 Nm	M10 / 36 Nm
	DN 200		M12 / 62 Nm
54		M6 / 8 Nm	M8 / 18 Nm

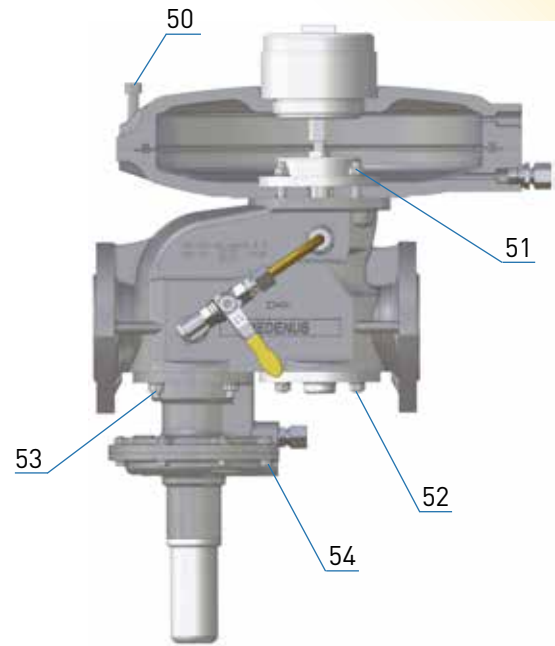


Fig. 8.1

#### Gas pressure regulator

Item no.	R 70-10	R 70-20	R 70-100
60		M6 / 8 Nm	
61		M4 / 2 Nm	
62		M6 / 8 Nm	
RP 1/4"		35 Nm	

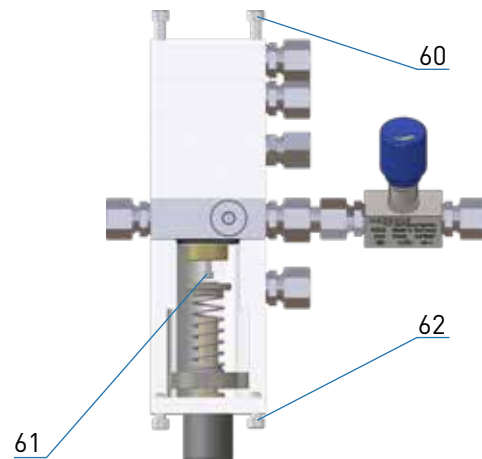


Fig. 8.2

#### Fine filter FF

Item no.	Fine filter FF
70	M6 / 8 Nm

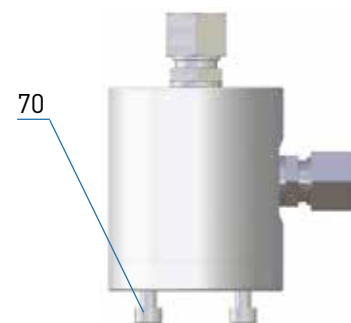


Fig. 8.3

### 8.4 Lubricants Table

Components (apply a thin layer)	Lubricants
All O-rings / balls	Syntheso Proba 270
All fastening and locking screws	

#### Oxygen model

For oxygen models, all parts must be cleaned with oxygen cleaner.

For oxygen models, only suitable grease with approval for oxygen according to BAM-list may be used.

\*) Guide values may differ depending on the device/lubrication

**ATTENTION**



## 9 Troubleshooting

### 9.1 Gas Pressure Regulator

Description of the error	Possible cause	Elimination
Closing pressure too high No closing pressure	Actuator dirty or damaged	Check valve plate (seal) and valve seat for damage and dirt, replace valve plate, if necessary
	Static sealing elements defective	Replace O-rings
	Clamping of the compensating diaphragm has come off Compensating membrane is damaged or mounted incorrectly	Check compensating diaphragm for fastening, damage, and correct fit, replace it, if necessary
	Valve plate has become disconnected from the valve stem	Tighten nut under the valve plate
	Valve plate dirty	Clean the valve plate (use exclusively NBR-compatible cleaning agent)
Unstable outlet pressure curve (vibrations, pulsation)	Device is working in the closing pressure range	Check the regulator configuration
	Vibration resonance in the control system	Install restrictor plate in breather line Install baffle plate in measuring line* Install a harder spring (setpoint spring of the next higher control range) Check setting of gas consumption devices Use of throttle valve RSD2 (optional accessory)
Control deviation too large	Unfavorable connection of the measuring line	Select a measuring point with steady flow, check measuring point ( $w \leq 20$ m/s)
	Sluggishness of the device due to dirt	Subject device to maintenance
	Main diaphragm or compensating diaphragm defective or mounted incorrectly	Check diaphragm and replace it, if necessary
	Wrong regulator size selected Wrong setpoint spring selected Wrong control cone selection	Check regulator configuration, setpoint spring / control cone and replace if necessary
	Inlet pressure supply is insufficient (pressure losses in the supply line too high)	Increase inlet pressure Check pipeline cross-section Check built-in filter
Inadmissible pressure peak Dynamic closing pressure too high	Damping of the device too high Control system too dynamic	Continue opening restrictor (throttle valve RSD2 available as an option) in measuring line by turning anticlockwise Remove restrictor plate from breather line
	Closing speed of downstream shut-off devices too high	Reduce closing speed of shut-off valve
Noise	Gas velocity too high	Check the regulator configuration
	Sluggishness of the device due to dirt / wear	Perform maintenance on actuator If worn-out mechanically, replace it, if necessary
	Noise caused by gas velocity	Install the noise reduction device (metal foam ring) (available as an option, see accessories p. 33)
Gas escapes through breather line	Fastening of the main diaphragm has come off Main diaphragm is damaged or has been mounted incorrectly	Check diaphragm for fastening, damage, and correct fit

\*) Excessive damping limits the actuation speed.

Normal flow noise does not constitute a fault. However, this noise can be reduced by installing a noise reduction device.

**Note**

## 9.2 Safety Shut-Off Valve

Description of the error	Possible cause	Elimination
No internal tightness in closed position	Actuator dirty or damaged	Check valve seat and valve plate (seal) for damage and dirt
	Pressure compensation valve (bypass line) in the actuator dirty or sealing elements damaged	Check O-rings in the pressure compensation valve or at the SSV spindle and replace them, if necessary Replace the bypass line
SSV spindle cannot be engaged	No pressure compensation at actuator	Perform pressure compensation by opening the bypass ball valve until the SSV spindle can be pulled
SSV cannot be engaged	Difference between response pressure and operating pressure or between upper and lower response pressure is too small	Correct response pressure settings consider required re-engagement differential (see RSP 254 / 255 product overview)
	Only in case of underpressure switching: Diaphragm in the control device defective or incorrectly installed	Check diaphragm and replace it, if necessary
	Pressure at the measuring point too high or low (only with underpressure switching)	Lower or increase pressure at measuring point to operating value (GPR setpoint value)
	Sluggishness of the trigger mechanism due to dirt / wear / damage	Service switching device and replace if worn-out mechanically
Permissible response pressure group is exceeded Irregularities in response behavior	Difference between response pressure and operating pressure or between upper and lower response pressure is too small	Correct response pressure settings consider required re-engagement differential (see RSP 254 / 255 product overview)*
	Diaphragm in the control device incorrectly installed	Check diaphragm for irregular tension
	Sluggishness of the trigger mechanism due to dirt / wear / damage	Service switching device and replace defective parts if worn-out mechanically
Gas escapes through breather line	Diaphragm clamping has become loose Diaphragm is damaged or has been mounted incorrectly O-ring sealing (item 35) dirty or damaged	Check diaphragm for fastening, damage, and correct fit Check O-ring and replace it, if necessary

\*) The pressure differences between GPR, SSV and system SRV must consider the response and closing pressure groups as well as the re-engagement differentials of the devices in order to avoid any unintended SSV switching.

**Note**

## 10 Replacement and Disposal

After the device has reached the end of its useful life, it must be dismantled and disposed of in an environmentally compatible manner.

During dismantling, components that may present a risk of injury by contamination, depending on the medium, are removed. Depending on the processed medium, the components must be properly decontaminated. Diffusible components (diaphragm, O-ring, etc.) may have to be taken to a special disposal unit, depending on the medium used.

**ATTENTION**



If no return or disposal agreement has been signed, dismantled components should be recycled:

- Metals should be scrapped
- The remaining components should be disposed of after sorting according to material.

Alternatively, scrapping by MEDENUS can be agreed with the service. The return is at your own expense, the disposal by MEDENUS is free of charge.

**For technical information, please contact our customer service:**

MEDENUS Gas-Druckregeltechnik GmbH  
Im Langen Feld 3  
D-57462 Olpe

Phone +49 (0) 2761 / 82788-0  
Fax +49 (0) 2761 / 82788-9

E-mail [service@medenus.de](mailto:service@medenus.de)  
Internet [www.medenus.de](http://www.medenus.de)

In addition, we are always interested in information, suggestions and experience resulting from the application and which can be valuable for improving our products.

**Note**



# 11 Spare Parts

## 11.1 Spare Parts Drawing Example: RSP254 DN080

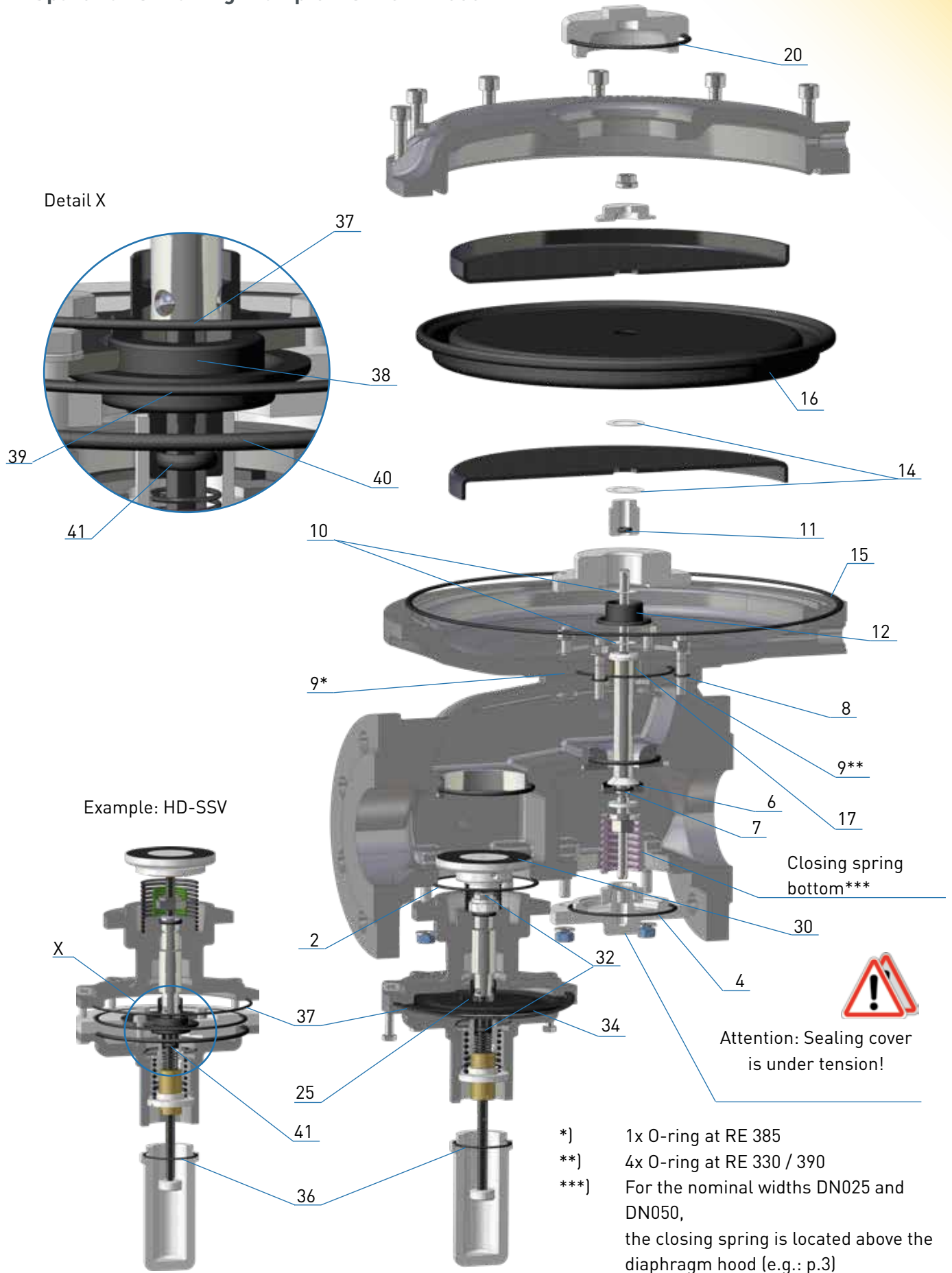
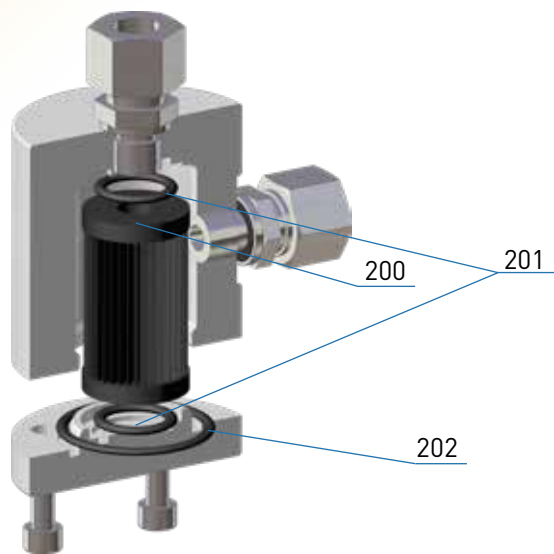
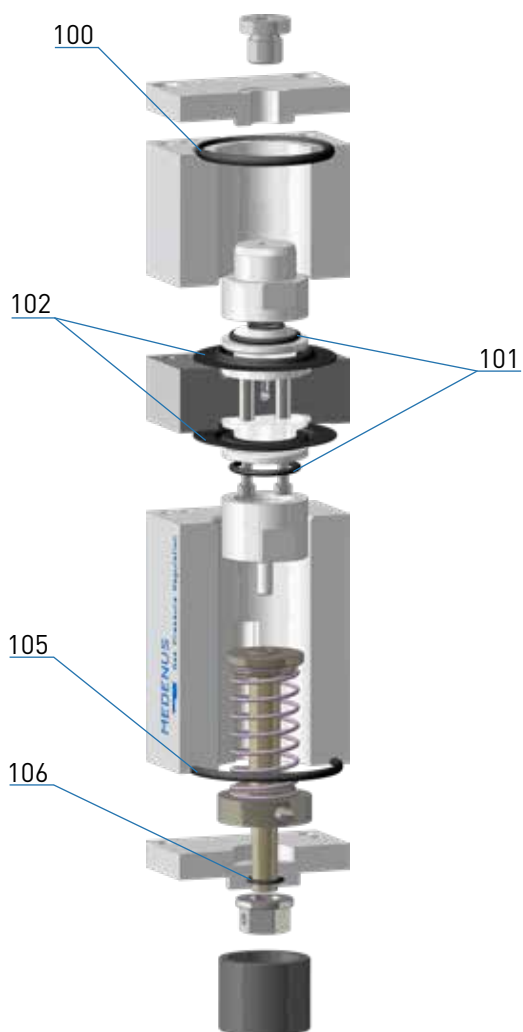


Fig. 11.1

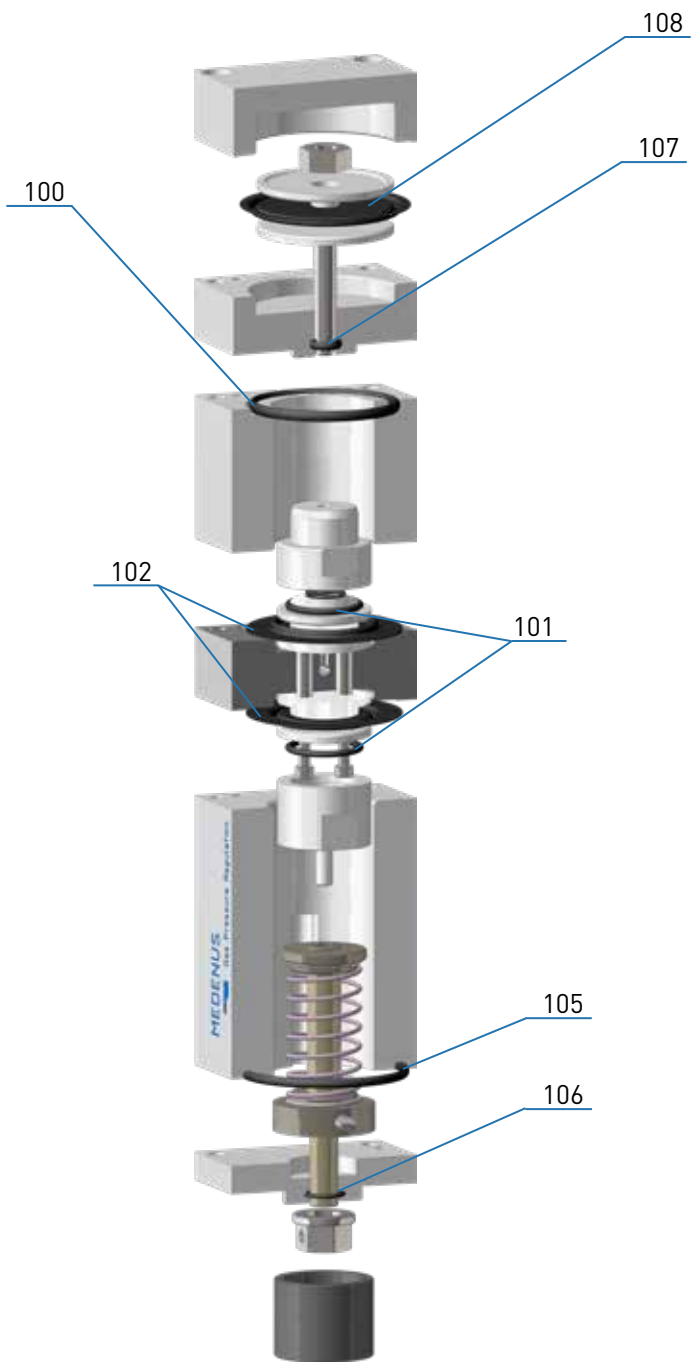
## 11.2 Spare Parts Drawing Option Fine Filter FF



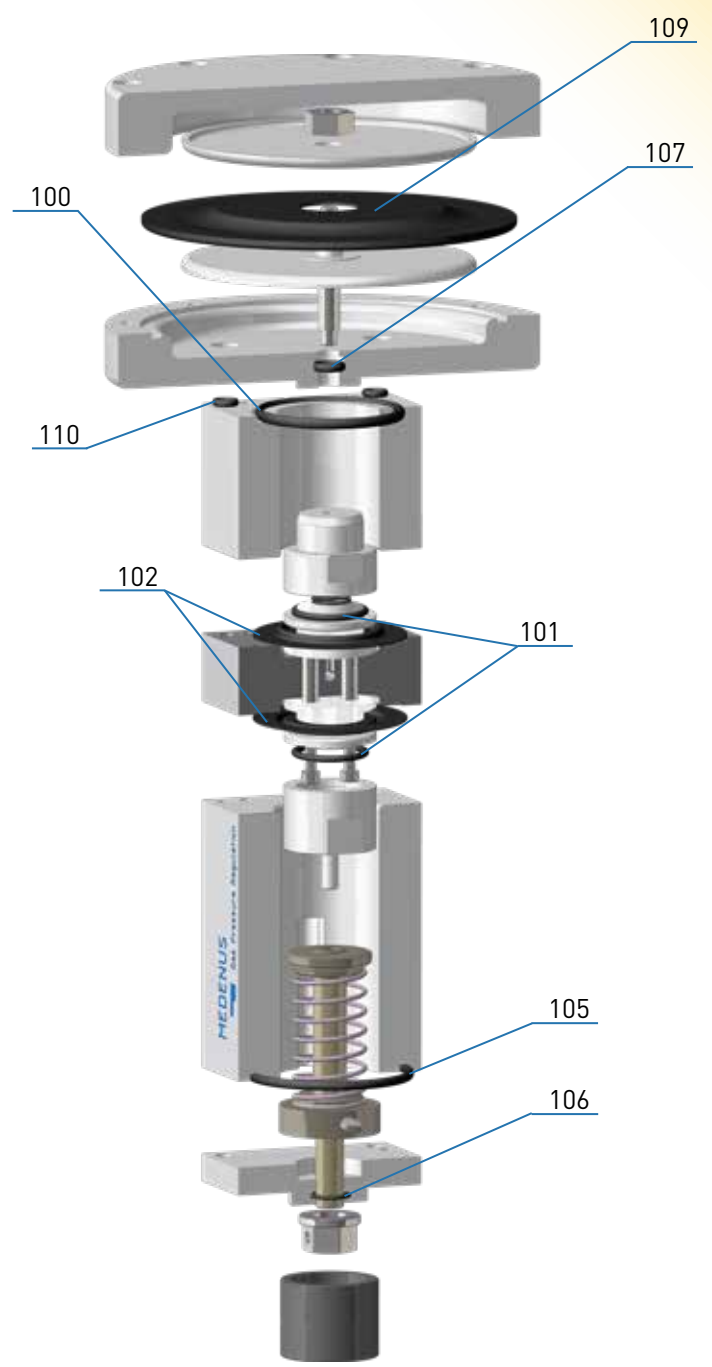
## 11.3 Spare Parts Drawing R 70-10 / R 70-20 / R 70-100



**R 70-10**



**R 70-20**



**R 70-100**

## 11.4 Parts for Maintenance Work Actuator

### Main diaphragm and O-ring

Item no.	Name	Pcs.	AS 254 / 025 AS 254 / 050	AS 254 / 080; AS 254 / 100; AS 255 / 050 AS 255 / 080; AS 254 / 150; AS 255 / 100; AS 254 / 200
			RE 330	RE 385 / 390 GMB
15	O-ring	1	O-033	O-042
16	Diaphragm	1	M-141	M-162
<b>Main diaphragm set order number:</b>			<b>MS-141</b>	<b>MS-162</b>

### Intermediate diaphragm

Item no.	Name	Pcs.	Valve	AS 254 / 025 AS 254 / 050	AS 254 / 080 AS 254 / 100 AS 255 / 050	AS 255 / 080	AS 254 / 150 AS 255 / 100	AS 254 / 200
12	Diaphragm	1	17.5	<b>M-001</b>				
			27.5	<b>M-002</b>	<b>M-003</b>			
			32.5	<b>M-004*</b>	<b>M-005</b>	<b>M-005</b>		
			42.5		<b>M-006</b>	<b>M-007</b>	<b>M-007</b>	
			52.5		<b>M-008**</b>	<b>M-009</b>	<b>M-009</b>	
			65			<b>M-010</b>	<b>M-010</b>	
			85			<b>M-011</b>	<b>M-011</b>	
			95				<b>M-012</b>	<b>M-012</b>
			115				<b>M-013</b>	

### Valve plate

Item no.	Name	Pcs.	Valve	AS 254 / 025 AS 254 / 050	AS 254 / 080 AS 254 / 100 AS 255 / 050	AS 255 / 080	AS 254 / 150 AS 255 / 100	AS 254 / 200
6	Valve plate	1	17.5	<b>VT-001</b>				
			27.5	<b>VT-002</b>	<b>VT-003</b>			
			32.5	<b>VT-004*</b>	<b>VT-005</b>	<b>M-005</b>		
			42.5		<b>VT-006</b>	<b>VT-006</b>	<b>VT-006</b>	
			52.5		<b>VT-007**</b>	<b>VT-007</b>	<b>VT-007</b>	
			65			<b>VT-008</b>	<b>VT-008</b>	
			85			<b>VT-009</b>	<b>VT-009</b>	
			95				<b>VT-010</b>	<b>VT-010</b>
			115				<b>VT-011</b>	

### Valve Plate SSV / Diaphragm SSV

Item no.	Name	Quantity	Exception	AS 254 / 025 AS 254 / 050	AS 254 / 080 AS 254 / 100 AS 255 / 050	AS 255 / 080	AS 254 / 150 AS 255 / 100	AS 254 / 200
30	Valve plate	1		<b>VT-201</b>	<b>VT-202</b>	<b>VT-206</b>	<b>VT-208</b>	<b>VT-210</b>
34	Diaphragm	1		<b>M-201</b>	<b>M-201</b>	<b>M-201</b>	<b>M-202</b>	<b>M-202</b>
38	Diaphragm	1	only for HD-SSV	<b>M-014</b>	<b>M-014</b>	<b>M-014</b>	<b>M-015</b>	<b>M-015</b>

## O-ring and sealing ring sets

Item no.	Name	Quantity pcs.	Exception	AS 254 / 025 AS 254 / 050	AS 254 / 080 AS 254 / 100 AS 255 / 050	AS 255 / 080	AS 254 / 150 AS 255 / 100	AS 254 / 200
2	O-ring	1		O-014	O-018	O-036	O-044	O-046
		2	DN 50	O-014				
		2	before 1992			O-036		
4	O-ring	1		O-014	O-018	O-037	O-044	O-046
7	O-ring	1		O-007	O-009	O-009	O-009	O-009
8	O-ring	1		O-014	O-035	O-038	O-026	O-026
			RE 330	O-004				
9	O-ring	1		O-019	O-039	O-040	O-031	O-031
		4	RE 330	O-002				
			RE 390		O-002			
10	NBR ring	2		N-001	N-002	N-002	N-002	N-002
			Valve 27.5		N-001			
			Valve 17.5	NO NBR-RING				
11	O-ring	1		O-007	O-009	O-009	O-009	O-009
			Valve 27.5		O-007			
14	NBR ring	2		N-001	N-003	N-003	N-003	N-003
17	O-ring	1		O-008				
20	O-ring	1		O-015	O-015	O-036	O-036	O-036
			Cast sealing cap	O-014	O-014	O-015	O-015	O-015
21	O-ring	1		O-012	O-012	O-016	O-016	O-016
24	O-ring	1		O-007	O-009	O-009	O-009	O-009
25	O-ring	1		O-001	O-001	O-001		
32	O-ring	1		O-007	O-007	O-007	O-009	O-009
35	O-ring	1		O-007	O-007	O-007	O-009	O-009
36	O-ring	1		O-013	O-013	O-013	O-014	O-014
37	O-ring	1		O-052	O-052	O-052		
<b>O-ring set order number:</b>				<b>OS-001</b>	<b>OS-002</b>	<b>OS-003</b>	<b>OS-004</b>	<b>OS-005</b>
<b>O-ring set order number (for actuator with HD-SSV):</b>				<b>OS-301</b>	<b>OS-302</b>	<b>OS-303</b>	<b>OS-304</b>	<b>OS-305</b>

\*) only in AS 254 / 050

\*\*) only in AS 254 / 100 and AS 255 / 050

## 11.5 Parts for Maintenance Work Regulator

### Diaphragm

Item no.	Name	Pcs.	R 70-10	R 70-20	R 70-100
102	Diaphragm	2	<b>M-204</b>	<b>M-204</b>	<b>M-204</b>
108		1		<b>M-205</b>	
109		1			<b>M-201</b>

### O-ring set

Item no.	Name	Pcs.	R 70-10	R 70-20	R 70-100
100	O-ring	1	O-014	O-014	O-014
101		2	O-049	O-049	O-049
103		1	O-009	O-009	O-009
104		1	O-006	O-006	O-006
105		1	O-050	O-050	O-050
106		1	O-048	O-048	O-048
107		1		O-007	O-007
110		4			O-053
<b>O-ring set Order number:</b>			<b>OS-101</b>	<b>OS-102</b>	<b>OS-102</b>

### Valve plate

Item no.	Name	Pcs.	R 70-10 R 70-20 R 70-100
102	Valve plate	1	<b>VT-301</b>

## 11.6 Parts for Maintenance Work Fine Filter FF

### Filter cartridge

Item no.	Name	Pcs.	FF
200	Filter cartridge	1	<b>FP-107</b>

### O-ring set

Item no.	Name	Pcs.	FF
201	O-ring	2	O-010
202		1	O-012
<b>Diaphragm O-ring Order number:</b>			<b>OS-103</b>

**Example:**

Designation:	Type	DN - Nominal width	RE - Diaphragm assembly	D - Nozzle (valve diameter)	SSV Control device
Gas pressure regulator:	RSP 254	080	390	27.5	MD-R

Spare parts according to tables in 11.5  
Example: Actuator AS254/080/390/27.5

Spare parts according to tables in 11.6  
Example: Regulator R 70-10

Main diaphragm and O-ring: **MS-162**  
 Intermediate diaphragms: **M-003**  
 Valve plate: **VT-003**  
 Valve plate SSV: **VT-202**  
 Diaphragm SSV: **M-201**  
 O-ring and sealing ring set: **OS-002**

Diaphragm: **M-204 (2 Stk.)**  
 Valve plate: **VT-301**  
 O-ring set: **OS-101**

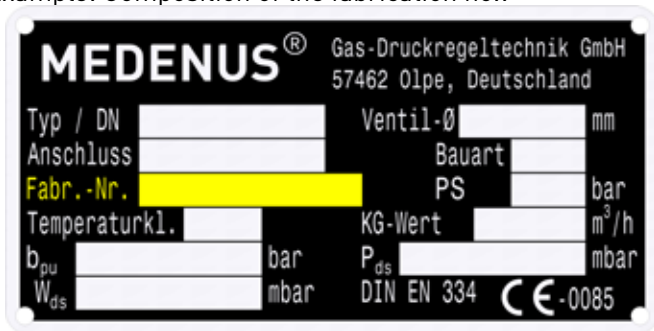
The allocation of individual parts is done according to the item no. in the tables in 11.5 to 11.7, conforming to the spare parts drawings in 11.1. and 11.4.

**Note**

**Note**

When ordering, please specify the fabrication no. shown on the nameplate.

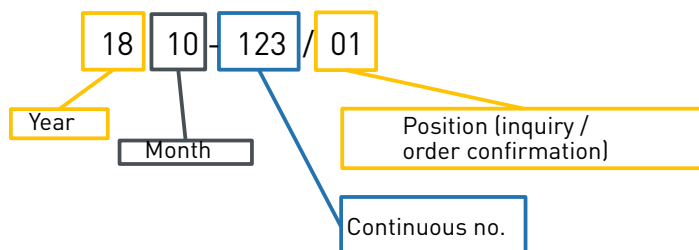
Example: Composition of the fabrication no.:



Type plate actuator AS 254/ AS 255



Type plate regulator R 70



Spare parts must only be replaced by trained and authorized persons.



**ATTENTION**





## 12 Accessories / Options

### 12.1 Noise Reduction

#### 12.1.1 Use

- Gas pressure regulators RS 250 / RS 251
- Gas pressure regulators RS 254 / RS 255
- Gas pressure regulators RS 254 / RSP 255
- Gas pressure regulators R101



#### 12.1.2 Application / Function

The noise reduction made of metallic foam is inserted into the housing of the gas pressure regulator between the valve seat and the housing cover and reduces noise in the gas pressure regulator produced by the flow rate by up to -15 dB ( $\pm 3$  dB).

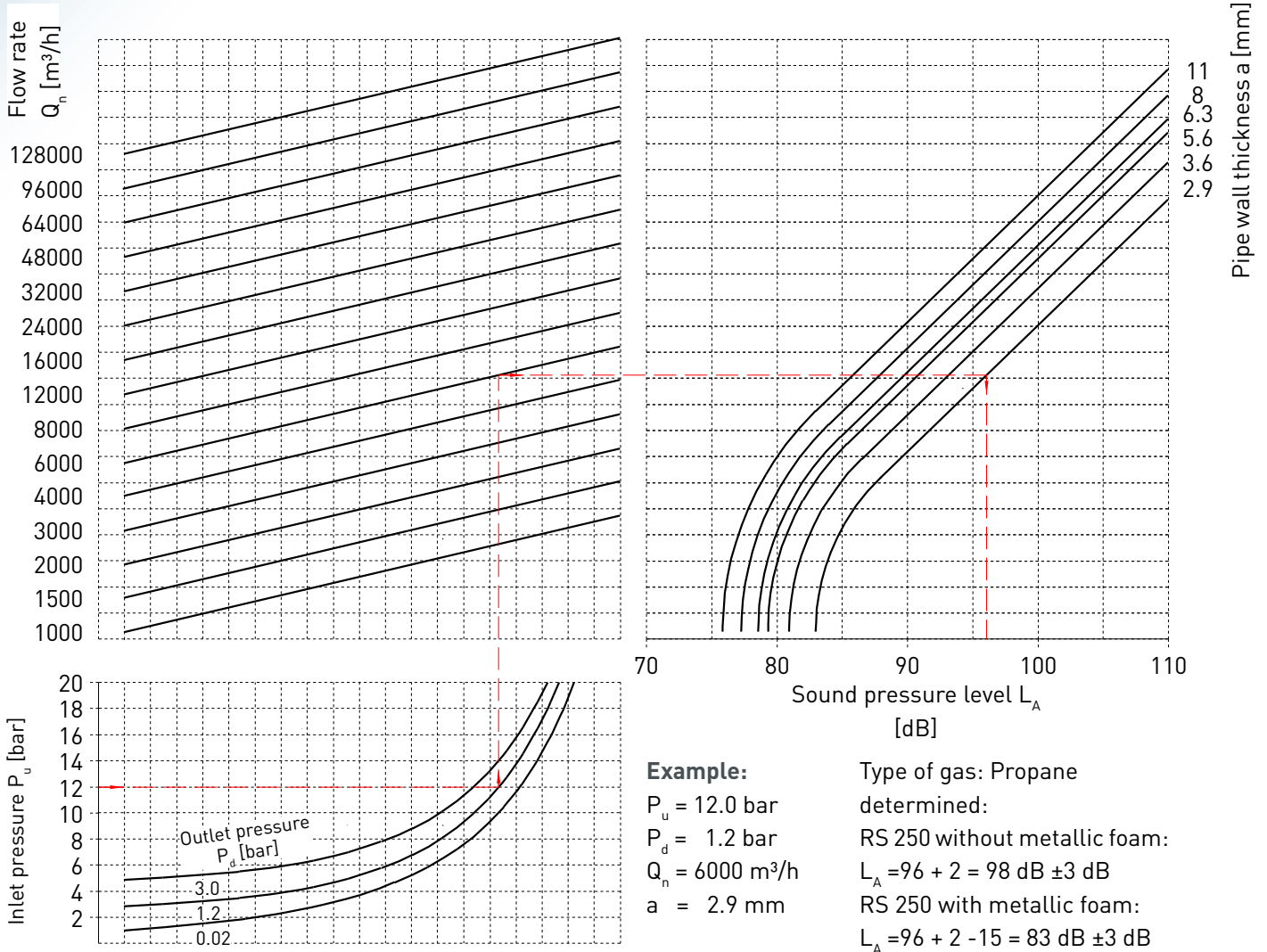
#### 12.1.3 Mounting

- Unscrew the cover
- Slide the noise reduction (metallic foam) over the spindle and the valve plate until it makes contact with the valve seat or the housing (observe the tightening torque 8.3).
- Screw down the cover again which presses the noise reduction firmly against the valve seat in order to fix it.



## 12.1.4 Determination of the sound pressure level $L_A$

The noise of gas expansion at a maximum flow rate of approx. 65 m/s on the outlet side is shown.



Reference site: Outlet of the gas pressure regulator, lateral distance 1m

Accuracy:  $\pm 3$  dB

Correction factor for metallic foam design:  $\Delta L_A$  up to -15 dB

Correction factors for some gases and gas mixtures

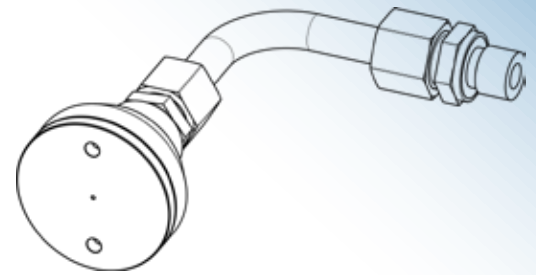
Gas, gas mixtures	$\Delta L_A$ [dB]
Acetylene	0
Natural gas	0
Helium	-5.5
Air	+1
Methane	0
Propane	+2
Hydrogen	-9

## 12.2 Breather valve AV530

### 12.2.1 Use

- On SSV control devices
- On regulators (pilots)
- With low-dynamic regulation sections (one full stroke)
- On the SRV

(Option not available for hydrogen version H<sub>2</sub>)



### 12.2.2 Application / Function

The breather valve is used as replacement for the costly and time-consuming laying of breather lines and for securing the installation room against inadmissible escape of gas from diaphragm comparator compartments of gas pressure regulators and safety shut-off valves.

Safety shut-off valves (SSV) of functional class A are triggered automatically and seal gas-tight.

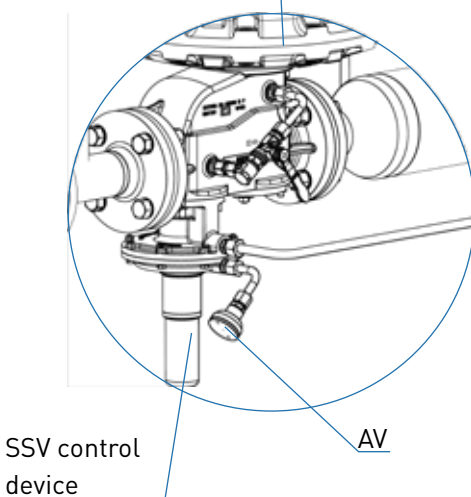
In compliance with EN 12186:2014, the use of the AV guarantees that in case of a defect of the working diaphragm, escape of gas from the breather connection of the gas pressure regulator or of the safety shut-off valve of more than 30 l/h is prevented.

### 12.2.3 Technical Data

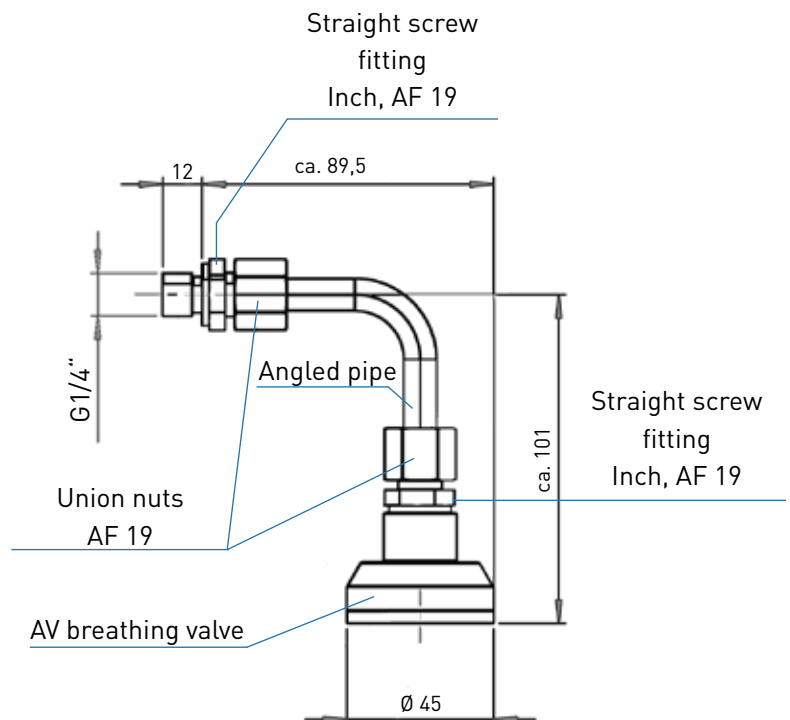
• <b>Type</b>	AV
• <b>Max. allowable pressure PS</b>	25 bar
• <b>Max. operating pressure p<sub>max</sub></b>	25 bar
• <b>Max. allowable flow rate</b>	30 l/h

- **Connection type** Male thread G 1/4"
- **Temperature range class 2** (operating/ambient temperature) -20 °C to +60 °C

Gas Pressure Regulator



Application example on the SSV



## 12.3 RSD2 Restrictor Valve

### 12.3.1 Use

- For installation in the sensing/impulse line or breathing line of the control device

### 12.3.2 Application / Function

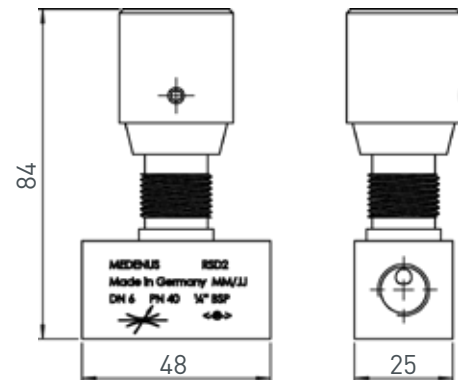
- For the finer adjustment of the control behavior of the regulator
- For a outlet pressure control without fluctuations in the low load range of the regulators



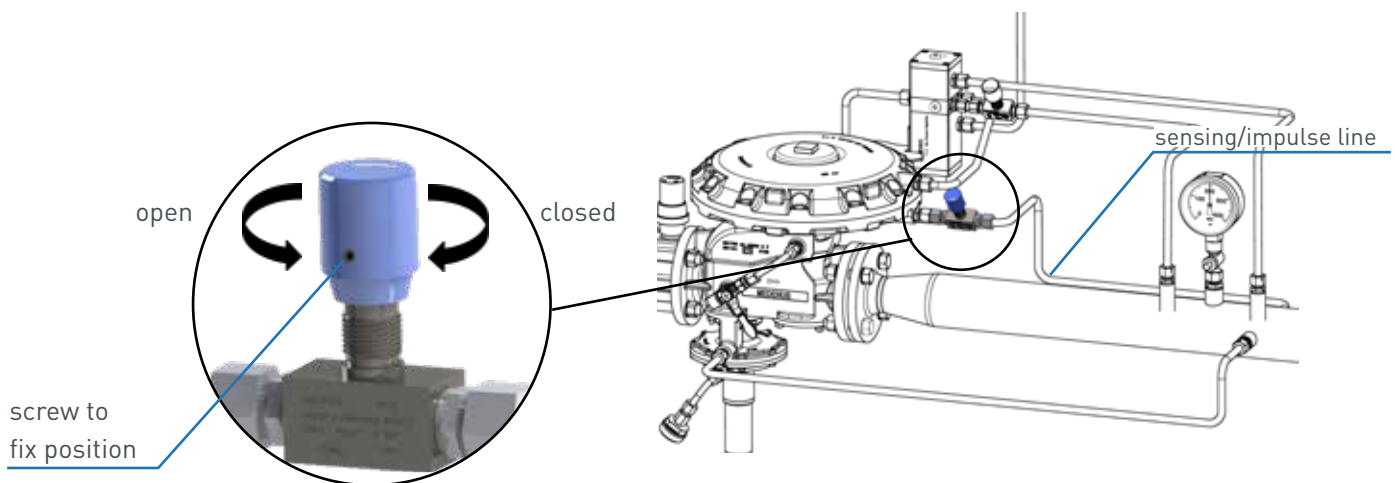
The RSD2 is a throttle valve which regulates the volume flow in the sensing/impulse line by means of a continuously adjustable cross-sectional reduction. The setting is made tool-free by means of a rotary knob and can be adjusted using a screw to be fixed. The throttle valve cannot be completely shut off, therefore a guaranteed minimum flow is ensured.

### 12.3.3 Technical Data

- **Type** RSD2
- **Max. allowable pressure PS** 40 bar
- **Max. operating pressure  $p_{max}$**  40 bar
- **Connection type** on both sides G 1/4"  
Female thread
- **Material** free-cutting steel  
galvanized / aluminum
- **Temperature range, class 2** (operating/ambient temperature) -30°C to +100°C
- **Ex protection**  
The mechanical components of the device do not have any potential ignition sources of their own and are thus not covered by the scope of ATEX 95 (94/9/EC).



### 12.3.4 Application example



## 12.4 Signal Transmitter/ Reed Contact

### 10.4.1 Use

- On SSV control devices

### 12.4.2 Application / Function

The signal transmitter, in conjunction with products from Medenus GmbH, is used for monitoring the position (position closed or open) of the safety shut-off valve via remote display.



A built-in neodymium magnet in the pull knob of the SSV and a set switching distance to the reed contact cause a sensor to query the position of the safety shut-off valve and to transmit a signal via remote display. If the SSV drops into the closed position, the switching distance will be exceeded and the sensor will lose the signal. This guarantees continuous monitoring of the SSV control devices.

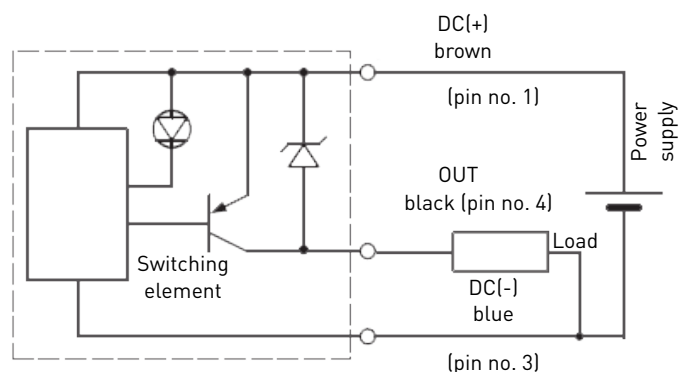
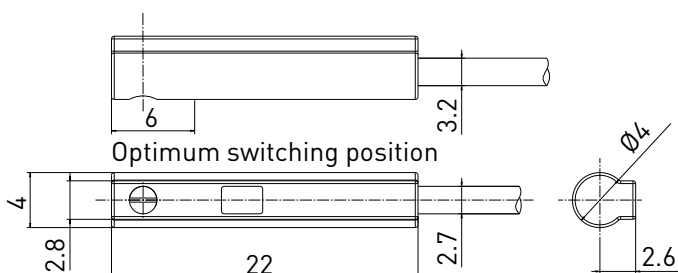
### 12.4.3 Technical Data

Signal transmitter model	D-M9P(V)
• Wiring	3-wire
• Output	PNP
• Application	IC control/ PLC relay
• Supply voltage	5/12/24VDC (4.5 to 28VDC)
• Current consumption	max. 10 mA
• Operating voltage	-
• Load current	max. 40 mA
• Internal voltage drop	max. 0.8 V
• Leakage current	max. 100 µA at 24VDC
• Response time	max. 1 ms
• Operational status indicator	ON: red LED
• Electrical inputs	potted cables
• Connecting cables	oil-resistant vinyl cables 2.7 x 3.2 oval, 0.15 mm <sup>2</sup> , 3-wire (D-M9P)
• Shock resistance	1000 m/s <sup>2</sup>
• Insulation resistance	max. 50M Ω at 500VDC Mega
• Test voltage	AC 1000 V over 1 minute (connecting cable, between housings)
• Ambient temperature	-10 to 60°C
• Degree of protection	IP67 IEC60529, JISC0920

### 12.4.4 ATEX marking

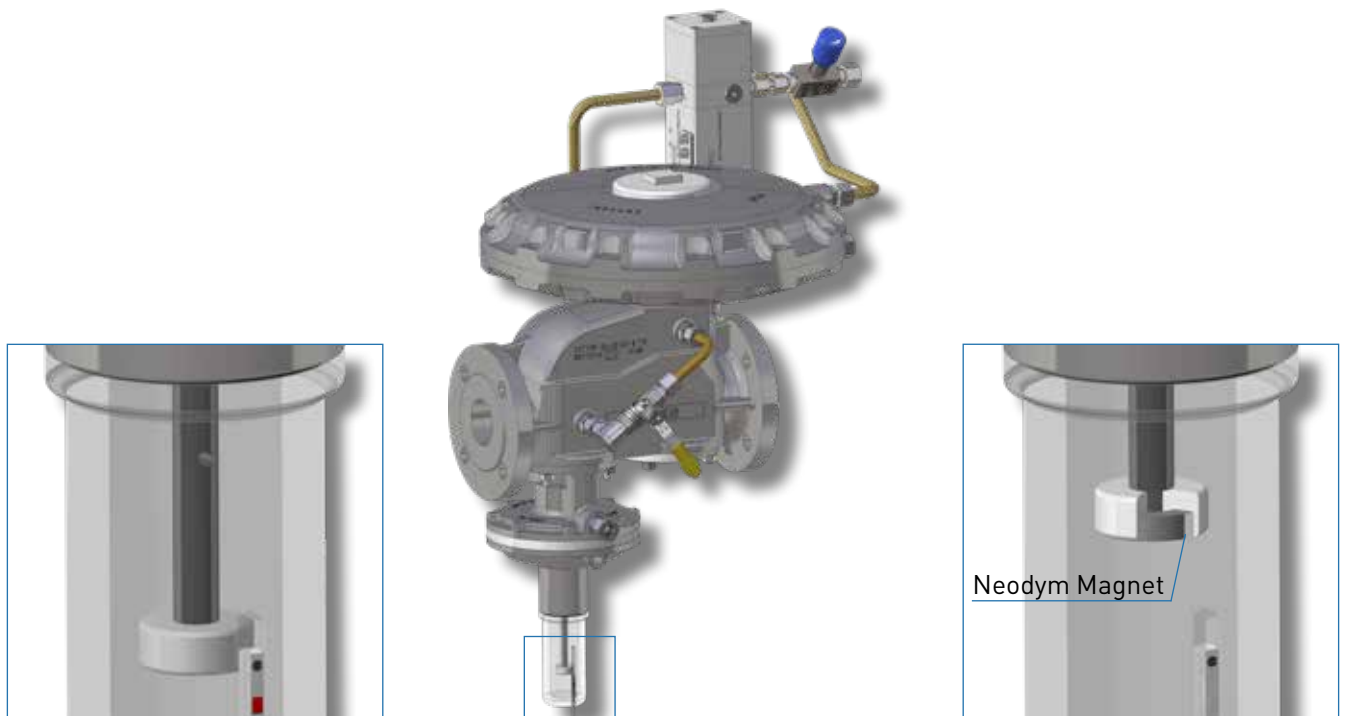
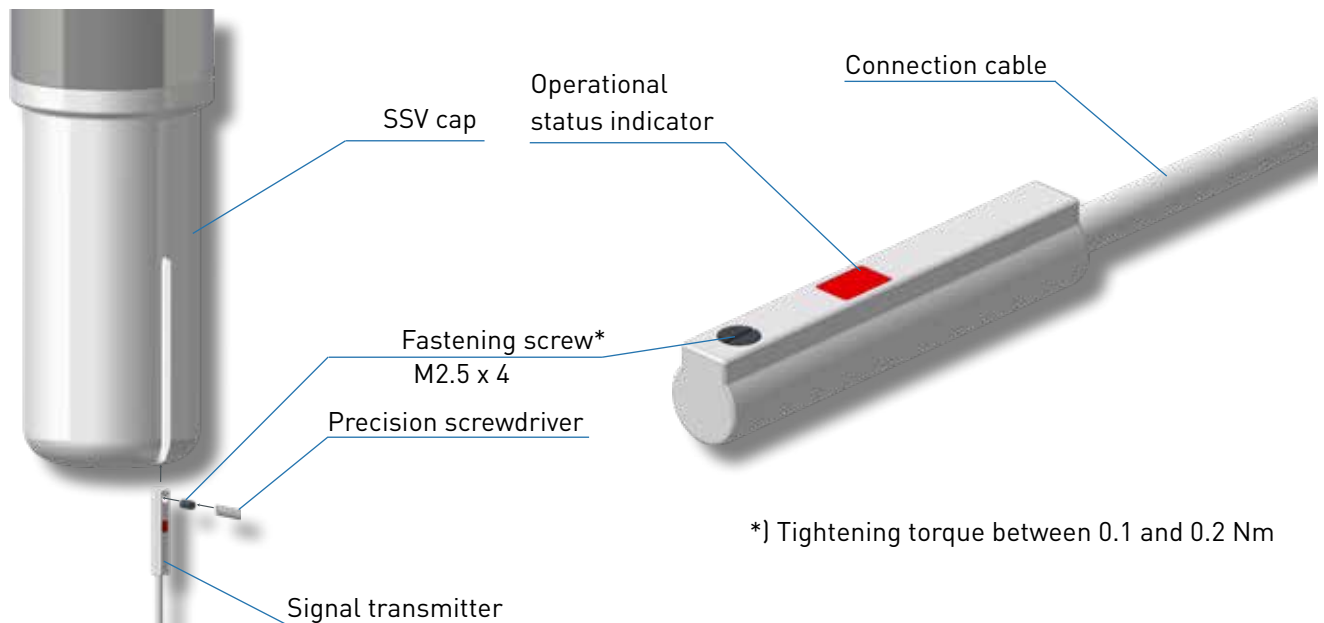
**II 3G Ex nA II T5 X -10°C ≤ Ta ≤ +60°C**  
**II 3D tD A22 IP67 T93°C X**

- Device group II
- Category 3
- Gas- (G) and dust-containing (D) environments
- Ex – conformity with European standards
- nA – spark-free device
- II – for all types of gas
- T5 – temperature classification
- tD – protected by a housing
- A22 – for Zone 22
- IP67 – type of protection
- Ta – ambient temperature
- T93°C – max. surface temperature
- X – Special conditions, see instructions



## 12.4.4 Mounting

- Replace the pull knob of the SSV spindle with the pull knob with the neodymium magnet.
- Mount the SSV cap included in the delivery, make sure that the SSV is open and slide the signal transmitter into the groove provided for this purpose at the SSV cap.  
(Until the operational status indicator is lit)
- Finally fasten the signal transmitter to the desired position by tightening\* the fastening screw M2.5 x 4 using a precision screwdriver.
- Perform a functional test by removing the SSV cap and thus the reed contact from the neodymium magnet. When the contact gets lost, the operational status indicator will go out.



With the SSV open, the operational status indicator will light in red.

With the SSV closed, the operational status indicator will go out.

(Neodymium magnet in the pull knob)

(Neodymium magnet in the pull knob)

## Safety instructions

### Must be read prior to using the neodymium magnet!

#### Important safety instructions for general and responsible handling of the neodymium magnet

Please pass on these instructions to all employees, customers and other people who are handling our products or parts derived from them.

Please read these instructions carefully before using the neodymium magnets. For any further questions, please feel free to contact us.

The company "magnets4you GmbH" shall not assume any liability for damage caused by improper handling of the magnets.

#### Hazards caused by magnets



**Risk of injury caused by crushing**  
**Risk of injury caused by splinters**  
**Hazards caused by magnetic fields**  
**Pacemakers, magnetic data carriers (credit cards, memory cards, etc.)**  
**Electronic devices (mobile phones, computers, monitors, etc.)**  
**Risk of fire**  
**Health risks in contact with foods and drinking water**

#### Handling

Do not place any iron-containing parts (tools, nails, knives, etc.) in the vicinity of the magnets.  
Magnets can collide or adhere to other metallic surfaces, possibly resulting in splinters or brittleness.  
Wear safety goggles and protective gloves – in order to avoid eye injuries and crushing!  
Persons wearing pacemakers must not be exposed to magnetic fields.  
Electronic devices and magnetic data carriers must be kept away from magnetic fields.  
Magnets should not be processed mechanically, sawed or drilled.  
The resulting drilling/magnet dust is extremely flammable.  
Alternatively, magnets can be glued / sunk for fastening.  
Keep the magnets away from open heat and flames!  
The magnets are provided with a thin coating (nickel, gold or zinc) that can be removed or changed by excessive use.

It is recommended never to use AlNiCo magnets in direct contact with foods, since metal ions can dissociate in water-containing media.

#### Transport

When shipping magnets, the current regulations for scattered magnetic fields during air transport must be observed (IATA Hazardous Goods Regulations).  
These regulations also apply to built-in magnets.

Neodymium magnets and end products prepared from them may not be imported directly or indirectly to the following countries: USA, Canada and Japan.

#### Increased caution for children

Keep neodymium magnets out of the reach of children.  
Children are at risk of playing with the magnets, inserting them into sockets, swallowing them or their fingers getting caught!  
Children under the age of 10 should not handle magnets at all.

Source: magnets4you GmbH / Safety instructions Use of neodymium magnets / URL <http://www.magnet-shop.net> / Last update: 11/2013

## 12.5 Inductive Signal Transmitter

### 12.5.1 Use

- On SSV control devices

### 12.5.2 Application / Function

The inductive transmitter, in conjunction with products from Medenus GmbH, is used for monitoring the position (position closed or open) of the safety shut-off valve via remote display.



A sensor queries the position of the safety shut-off valve and a signal is transmitted via remote display. If the SSV drops into the closed position, the switching distance will be exceeded and the sensor will lose the signal. This guarantees continuous monitoring of the SSV control devices.

### 12.5.3 ATEX marking

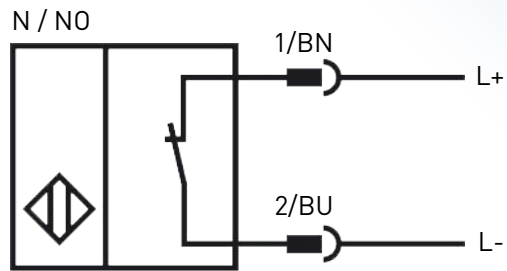
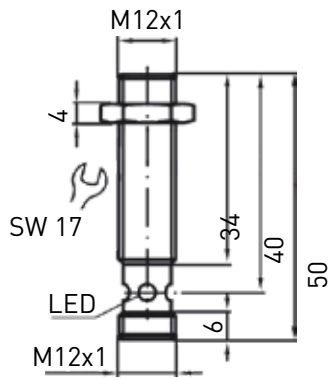
Field of application	Certificate	Group, category, type of ignition protection
ATEX 1G	PTB 00 ATEX 2048 X	⚠ II 1G Ex ia IIC T6...T1 Ga The Ex-relevant marking can also be printed on the enclosed adhesive label.
ATEX 2G	PTB 00 ATEX 2048 X	⚠ II 1G Ex ia IIC T6...T1 Ga The Ex-relevant marking is shown on the enclosed adhesive label.
ATEX 3G (ic)	PF 13 CERT 2895 X	⚠ II 3G Ex ic IIC T6...T1 Gc The Ex-relevant marking is shown on the enclosed adhesive label.
ATEX 1D	PTB 00 ATEX 2048 X	⚠ II 1D Ex ia IIIC T135°C Da The Ex-relevant marking can also be printed on the enclosed adhesive label.

### 12.5.4 Technical Data

• Switching element function	NAMUR opener
• Switching distance $s_n$	2 mm
• Installation	flush
• Safe switching distance $s_a$	0 ... 1.62 mm
• Reduction factor $r_{Al}$	0.23
• Reduction factor $r_{Cu}$	0.21
• Reduction factor $r_{V2A}$	0.7
• Rated voltage $U_o$	8 V
• Operating voltage $U_B$	5 ... 25 V
• Switching frequency $f$	0 ... 1000 Hz
• Hysteresis $H$	1 ... 10 typ. 3 %
• Reverse-polarity protection	yes
• Short-circuit protection	yes
• Current consumption	
Measuring plate does not detect	3 mA
Measuring plate detects	1 mA

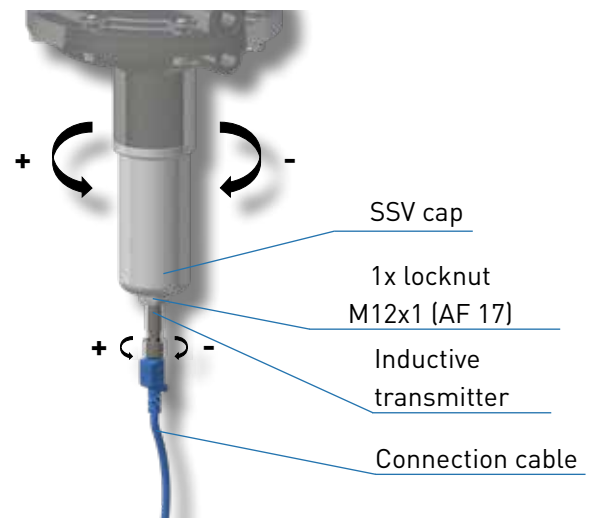
• Switching state indication	Multi-hole LED, yellow
• EMC according to	IEC / EN 60947-5-2:2004; NE 21
• Standards	DIN EN60947-5-6 (NAMUR)
• Ambient temperature	-25 ... 100 °C (248 ... 373 K)
• Storage temperature	-40 ... 100 °C (233 ... 373 K)
• Connection type	V1 device plug
• Enclosure material	Stainless steel
• Front face	PBT
• Degree of protection	IP67
• Use in hazardous area	see operating instructions
• Category	1G; 2G; 1D



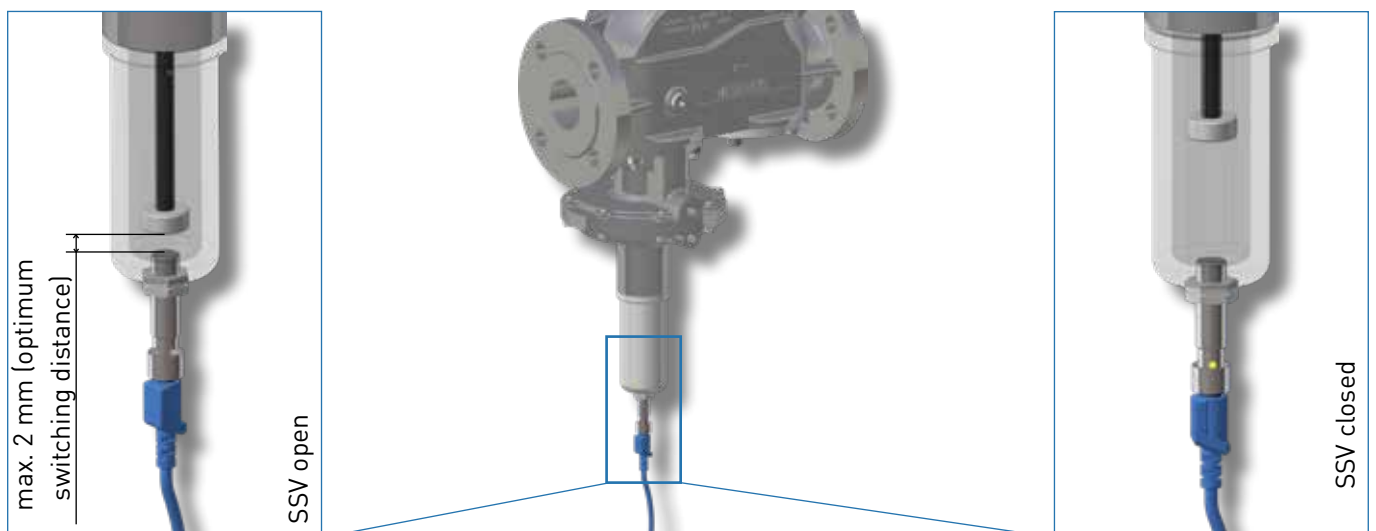


## 12.5.5 Mounting

- Unscrew the SSV cap of your Medenus gas pressure regulator (-) and replace it with the SSV cap with M12 threaded hole for the inductive transmitter and the pull knob, if necessary. (During mounting, make sure that the O-ring has been inserted into the SSV cap)
- Now screw the inductive transmitter into the thread provided for this purpose, ensuring that the inductive transmitter has a max. switching distance to the pull knob of 2 mm. (1- max. 2 turns back)
- Then secure the inductive transmitter with the enclosed locknut AF 17.
- Finally connect the delivered connecting cable to the inductive transmitter by means of a screw cap.
- Check the function of the display in the open and closed positions of the SSV.



With the SSV closed, the operational status indicator of the inductive transmitter will light in yellow. With the SSV open, the operational status indicator of the inductive transmitter will go out.



## 12.6. SSV manual and remote release

### 12.6.1 Use

- On SSV control devices

### 12.6.2 Application / Function

The direct-acting solenoid valve is used as electromagnetic remote release for closing the safety shut-off valve. Only for SSV control devices of functional class A.

The solenoid valve is normally closed, so that in the event of a power failure, the gas flow from the measuring line to the SSV is interrupted. The gas from the control chamber of the SSV is blown off and the SSV is triggered by reaching the lower response pressure. As a result, the SSV actuator shuts off the gas flow gas-tight.

After being released, the safety shut-off valve can only be opened by hand and engaged in the open position.

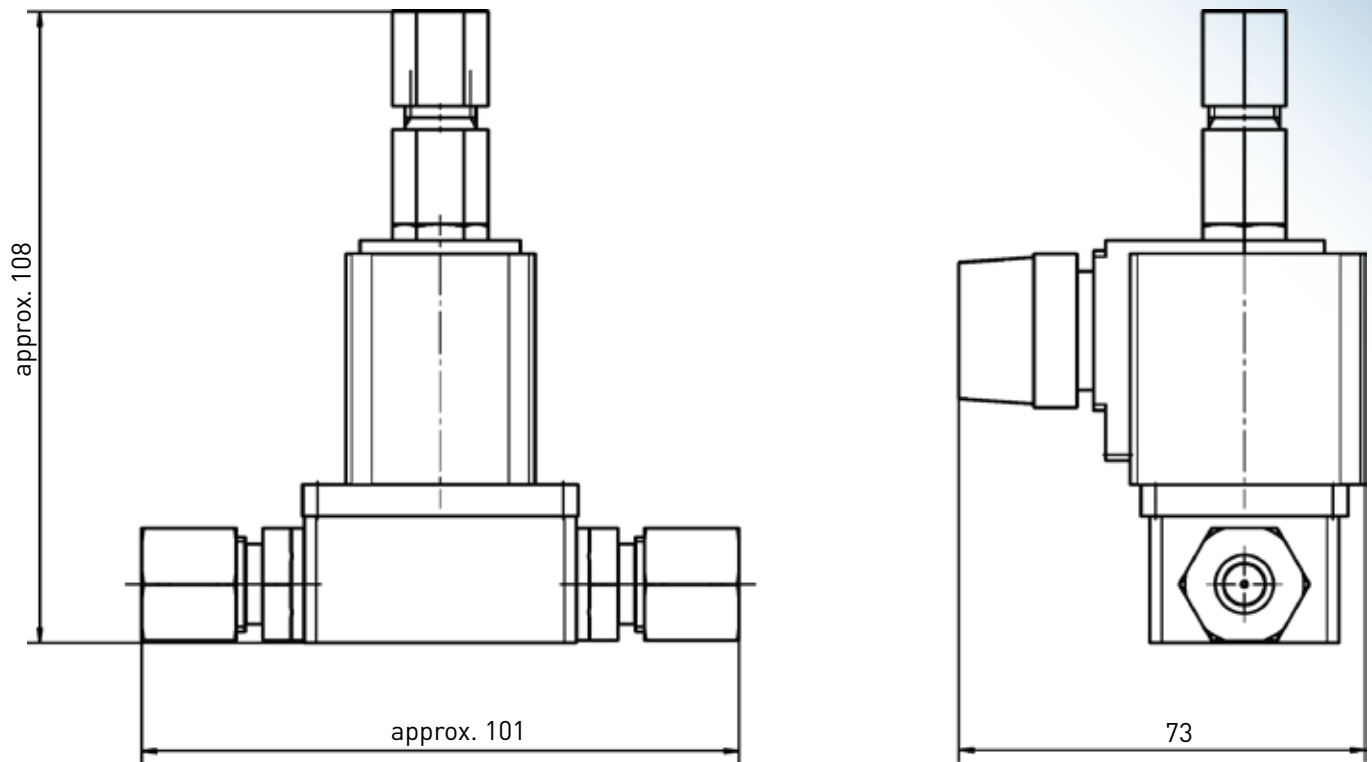


### 12.6.3 Technical Data

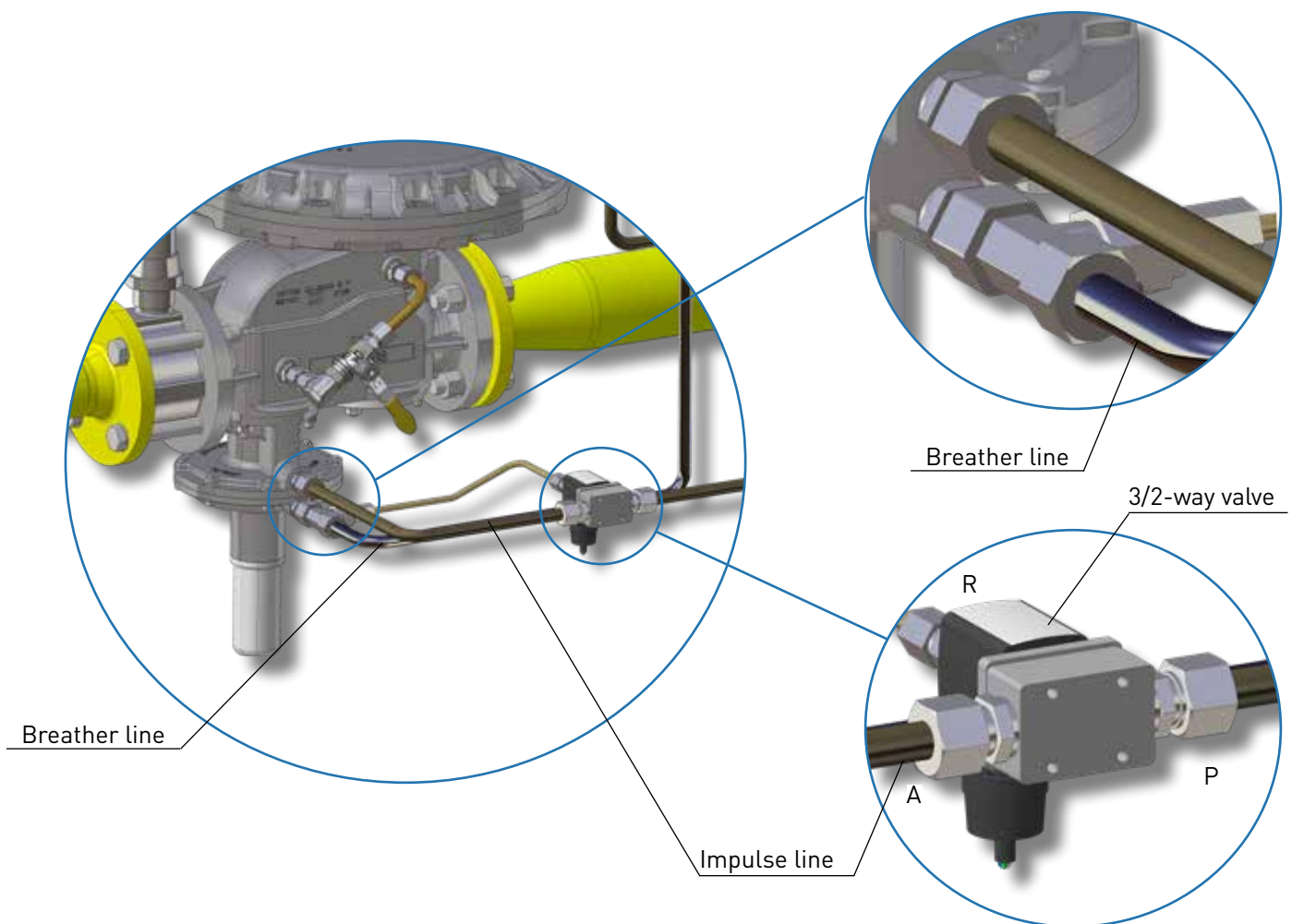
- Housing material stainless steel, polyamide (flange)
- Sealing material FKM (EPDM upon request)
- Media Neutral gases and liquids (e.g. compressed air, city gas, grid gas, water, hydraulic oil, petrol). Suitable for technical grade vacuum.
- Media temperature -10° to +100 °C (PA coil) up to 120 °C epoxy
- Polyamid coil (FKM seal) Coil
- Ambient temperature max. +55 °C
- Viscosity max. 21 mm<sup>2</sup>/s
- Line connection G 1/8, G 1/4, flange (SFB)
- Operating voltage 24 V AC/DC, 24 V/50 Hz, 230 V/50 Hz
- (other voltages upon request)
- Voltage tolerance ±10%
- Nominal operating mode / Single valve Permanent operation 100%
- Electrical connection DIN EN 175301-803 form A for device socket
- Type 2508 (see ordering table accessories)
- ATEX/IECEx version potted with 3 m cable
- Installation position Any, preferably drive pointing upwards
- Degree of protection IP65 with device socket, ATEX/IECEx terminal connection version
- and cable connection version
- NEMA 4x with device socket 2508 or 2509
- for VA versions (other versions upon request)
- Thermal insulation class coil Polyamide class B (epoxy class H upon request)
- Coil material polyamide (epoxy upon request)
- Nominal width DN 1.5 - 2.5

Further technical data and information on the 3/2-way valve, such as information on ATEX, are available for download on the manufacturer's homepage.

**Note**



### 12.6.4 Application example



## 12.7 Fine Filter FF

### 12.7.1 Use

- for regulator R70

### 12.7.2 Application / Function

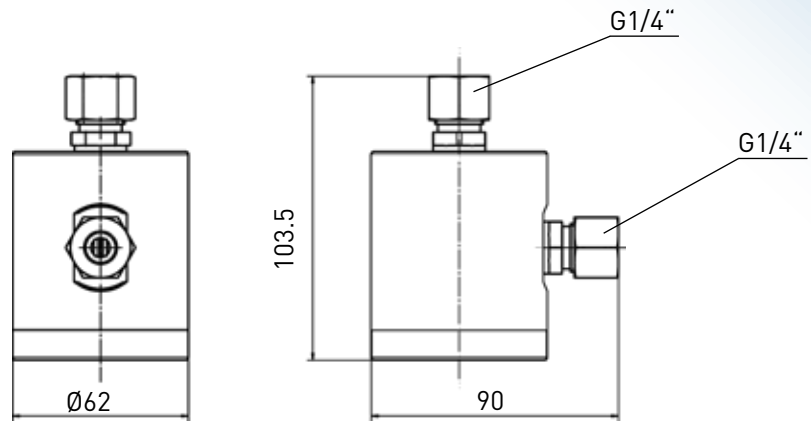
Fine filters FF are intended to separate gas impurities such as dust, rust, and other solids in gas-carrying lines at a defined point. They are used in the inlet pressure line between the actuator RSP and the regulator R70. Fine filters FF can be used for gases according to DVGW work sheet G 260/G 262 and for neutral non-aggressive gases. (other gases on request)



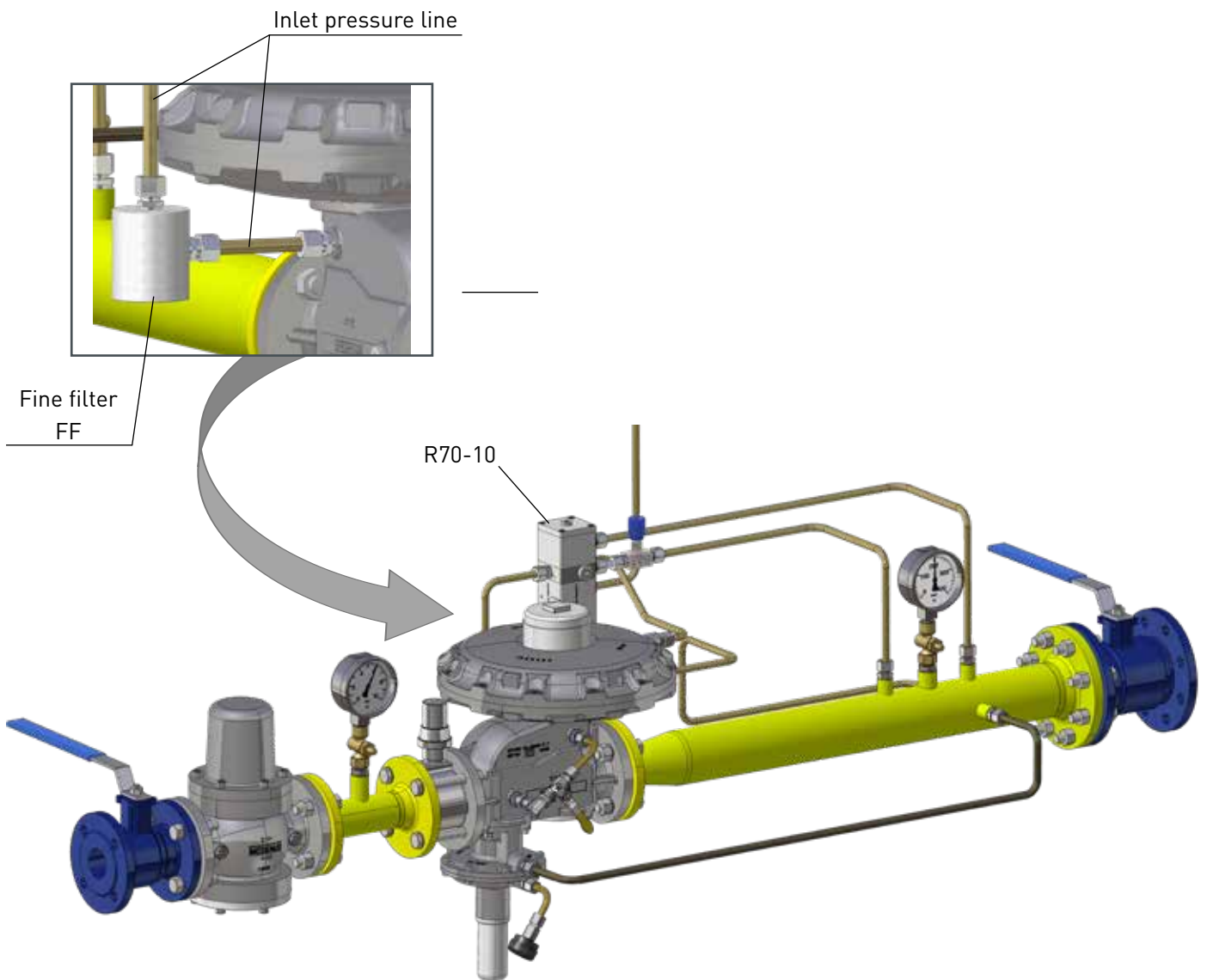
### 12.7.3 Technical Data

<b>Type</b>	FF
<b>Max. allowable pressure PS</b>	16 bar
<b>Connection type</b>	G 1/4" for threaded pipe connections according to DIN EN ISO 8434-1 (DIN 2353)
<b>Material</b>	Housing - Aluminum* Filter - Polyester-reinforced cellulose paper Seals - NBR
<b>Temperature range</b> (operating/ambient temperature)	- 20°C to + 60°C
<b>Filtration efficiency</b>	Standard 99.9 % of the particle size > 2 µm
<b>Recommended differential pressure in pure state</b>	50 to 100 mbar
<b>Recommended differential pressure for cartridge replacement</b>	800 to 1,000 mbar
<b>max. adm. differential pressure</b>	2,000 mbar
<b>Ex protection</b>	The mechanical parts of the device do not have any potential ignition sources of their own and therefore do not fall within the scope of ATEX 95 (94/9/EC). Electrical components fitted to the device comply with the ATEX requirements.

- \*) Corrosivity category to DIN EN ISO 12944-2.  
Categories C1 to C5-I are guaranteed without additional coatings.  
For category C5-M, an epoxy resin coating is recommended.



### 12.7.4 Application example



## 13 Tools

### 13.1 SSV Tightening Tool

The tightening tool made of stainless steel is used for replacing the SSV diaphragm in your MEDENUS safety shut-off valve.

#### Old design

- Width across flats 22
- Stainless steel 42CrMo4

#### New design

- Width across flats 32
- EN AW-2007 or similar



Old design



New design

# Declaration of Conformity

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Manufacturer: Medenus Gas-Druckregeltechnik GmbH

Address: Im Langen Feld 3  
D-57462 Olpe

---

declares under sole responsibility that the products:

R 254 / RS 254 / RP 254 / RSP 254

R 255 / RS 255 / RP 255 / RSP 255

Gas Pressure regulator (spring-loaded proportional regulator), optionally with safety shut-off valve (SSV) for upper and lower shut-off pressure, and / or with pilot support, have been subjected to an EC-type examination and conform to the basic requirements of the directives GAR (EU) 2016/426 EC-Gas Appliances Regulation and 2014/68/EU A III B EC-Pressure Equipment Directive in the respective current version.

---

Marking (PIN) according to Pressure Equipment Directive and Gas Appliances Regulation

CE-0085AQ0882 model R 254 / RS 254 / RP 254 / RSP 254

CE-0085AQ0883 model R 255 / RS 255 / RP 255 / RSP 255

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Notified body (EU type examination: Module B)

DVGW CERT GmbH  
Josef Wirmer Straße 1-3  
D-53123 Bonn, Germany  
Notified Body number: 0085

The basis of the EC type examination are the harmonized European standards and / or national standards, as well as the European directives and / or regulations:

2014/68/EU A III B EC Pressure Equipment Directive	(15.04.2014)
GAR (EU) 2016/426 A III B EC Gas Appliances Regulation	(09.03.2016)
DIN EN 334	(01.11.2019)
DIN EN 14382	(01.11.2019)

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Monitoring of the EC quality assurance system (module D)

DVGW CERT GmbH  
Notified Body number: 0085


Registration No. Pressure Equipment Directive SD-0085BQ0510

Registration No. Gas Appliances Regulation SE-0085BQ0510

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Olpe,

07.08.2023

  
Alexander Christiani  
Managing Director

## Notes

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