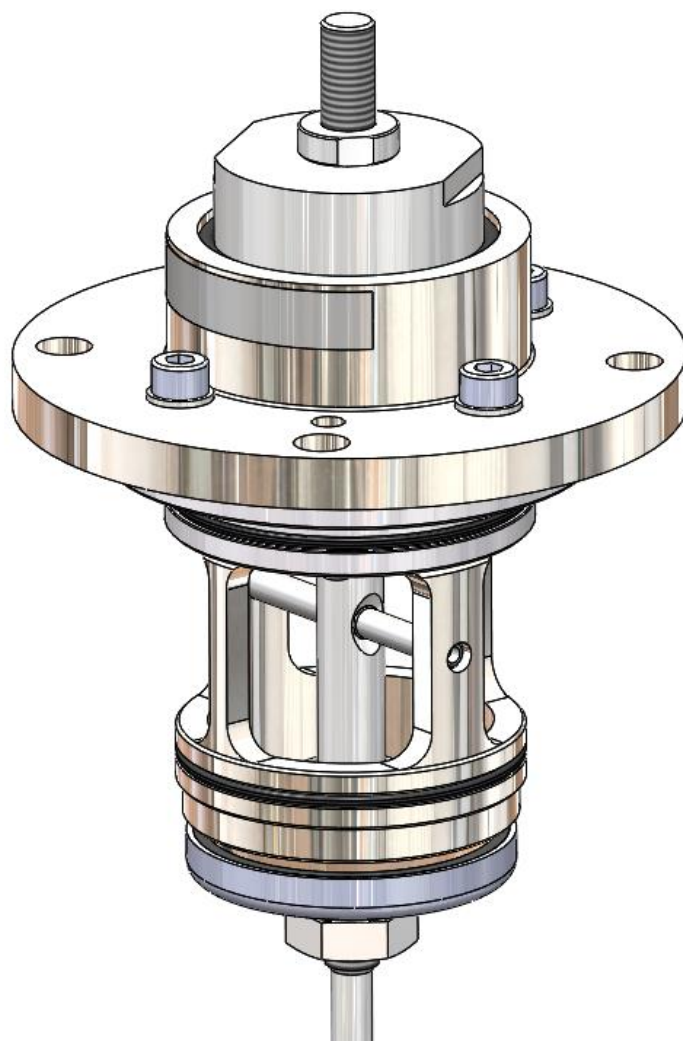


## Insert gas pressure regulator RS350S PN16



**Wigersma  
& Sikkema**  
*Since 1921*

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# Preface


- This manual provides important information on the use of the insert of the insert. Read this manual carefully.
- Various comments and warnings in this manual are marked with symbols. Read these carefully and, if necessary, take measures.

The symbols used have the following meanings:


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	Suggestions and advice to make it easier to perform tasks.
<b>REMARK</b>	

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	A note alerts the user to possible problems.
<b>NOTE</b>	

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	If the operation is not performed correctly, a dangerous situation may arise or data or settings may be lost.
<b>WARNING</b>	

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The guarantee becomes invalid if the product described here is not handled properly, repaired or modified by unauthorized persons or if replacement parts are used which are not genuine parts from Wigiersma & Sikkema B.V.

## 1. Conditions of use

- Pressure range of inlet pressure from 0.5 to 16.0 bar.
- Pressure range of outlet pressure from 0.02 to 6.4 bar.
- Ambient temperature -20 to +60 °C.

## 2. Transport and storage

To prevent damage to the insert during transport and storage, the following points must be carefully observed:



- The insert must be transported and stored in its original packaging.
- Transport and storage temperature -20 to + 60 °C.
- Impulse loads (shocks) must be prevented.

## 3. Scope of delivery and identification insert

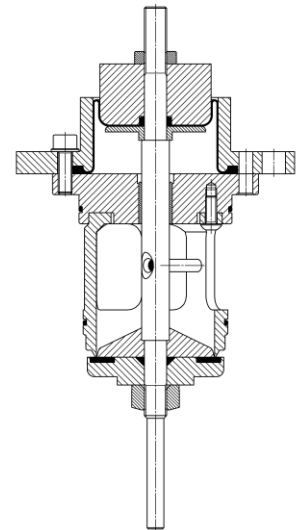
The insert is equipped with O-rings and a locking shaft and has been checked for leakage. Supplied with the insert:

- Label with valve size and KG value.
- 1x P90941 - O-ring for sealing diaphragm case parts (fig 1, pos. 9)
- 1x P92007 - Rubber ring for sealing diaphragm case (fig. 1, pos. 7)
- 1x P90937 - O-ring for sealing diaphragm case and regulator house (fig. 1, pos. 10)
- Installation manual.

### 3.1. Insert versions

Valve size insert	Article code insert	Article code locking spring	KG value* Natural gas sm <sup>3</sup> /h
17.5 mm	D004210V	W42350	185
22.5 mm	D004220V	W42350	440
27.5 mm	D004230V	W42350	640
37.5 mm	D004240V	W42352	1000
42.5 mm	D004250V	W42352	1250

\* at 15 °C and 1,01325 bar



The inserts with valve sizes 37.5 and 42.5 mm have a different locking spring compared to the underlying valve sizes. When changing from one group to another, the locking spring must be exchanged. This must be ordered separately.



The insert valve sizes 17.5 mm, 22.5 mm and 27.5 mm are equipped with a flow guide. This must be taken into account when exchanging inserts with a different valve size to the insert already fitted.

For more information on the flow guide and optional noise damper, see manual *DDD3007MHEN*.

### 3.2. Insert label

<b>R350 INSERT</b> <b>R1000003</b> <b>KG 440</b> <b>Valve Ø 22,5 mm</b>
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KG	Flow coefficient
Valve	Valve diameter

## 4. Decommissioning the gas pressure regulator



- Work may only be carried out by an authorized employee, at a pressureless gas pressure regulator.
- During the work, the gas present in the gas pressure regulator may be released, gas detection is necessary.

When taking the gas pressure regulator out of operation, follow the next steps:

- Close the inlet valve;
- Close the outlet valve;
- Depressurize the gas pressure regulator by slowly opening the adjusting valve.



First depressurize the outlet section, and only then may the inlet section be depressurized. This is to prevent warping of the diaphragm plate.

## 5. Changing the insert

Remove both the pilot pressure regulator and the levelling valve by loosening the pipe connections on the regulator. Unscrew all M8 bolts (1) evenly (see figure 1), do not remove the bolts and washers, but leave them in position allowing them to be removed simultaneously with the removal of the top diaphragm case (3). Put the diaphragm case away so that the bolts remain positioned in their holes. Dismantle the M8 nut (6) with its washer.

Remove the main diaphragm (2) with its two diaphragm plates (4) revealing the insert (12). Unscrew and remove the four M8 nuts (5) including their washer. Pull the insert (12) straight up out of the regulator. **CAUTION! Make sure the lower diaphragm case does not move out of position!**



If removing the insert is difficult due to too much resistance, temporarily remove an M5 socket-head screw (8) from the insert. Screw an M5 bolt with a longer threaded section into the vacant threaded hole. Tighten this bolt until it has pulled the insert out of its bore so that it can be easily removed. Then replace the longer bolt with the original bolt, so that the insert is original again.

Before fitting the new insert, clean the exposed bores in the regulator housing. If the lower diaphragm tray has remained in position, the O-ring (10) can in principle be reused.



Check the correct location O-ring (10) in its groove if the lower diaphragm case (3) has been out of position.

If there is any doubt about the quality of the O-ring, replace it as a precaution.

If necessary, fit another locking spring. The insert is equipped with a self-lubricating bearing which must **not** be lubricated. Push the insert straight into the regulator housing, with the label on the insert positioned towards the outlet side of the regulator. This ensures that the position of the locking shaft (11) is transverse to the regulator housing, in line with the opposite threaded holes.



The locking shaft (11) should be positioned so that it aligns with both threaded holes in the side of the regulator housing (see figure 1). With the label on the insert facing the outlet side, this is ensured.

Push the insert gently by hand until it no longer wants to go any further. Make sure that the shaft of the insert goes into the bearing of the valve cover without resistance. Fit the four M8 nuts (5) with their washers and tighten them crosswise to the prescribed torque (15 Nm). The mounting surface of the insert must fully engage with the lower diaphragm case. Place a new (supplied) rubber ring (7) around the shaft of the insert (12). Slide the main diaphragm (2) with its corresponding diaphragm (4) around the shaft. Mount the M8 nut (6) with its corresponding washer on the insert shaft (12). Tighten it to the prescribed torque (15 Nm).



It is recommended to hold the main diaphragm and its covers (4) during the tightening of the spindle nut (6) in order to prevent it from turning.

Place the top diaphragm case (3) on the bottom diaphragm case and tighten the M8 bolts (1) crosswise with the prescribed torque (15 Nm). Install the process line from the top connection and remove the process line from the side connection together with the angled coupling to the regulator house. Insert an hexagonal wrench into the bore (D=2.5mm) of the locking shaft (11) and slide the shaft out of the insert into the opposite tapped hole in the regulator housing. Remove the locking shaft (11) and add it to the disassembled insert. **Note:** The locking shaft (11) can only be pushed out of the insert (12) in **one direction**. Fit the pilot regulator and install the plug into its tapped hole on the opposite side. If necessary, adjust the pilot regulator to the stable control (see Chapter 7).



When installing an insert with a different valve size, remove the sticker with the valve diameter and  $K_G$  value on the diaphragm case and replace it with the sticker supplied with the insert.

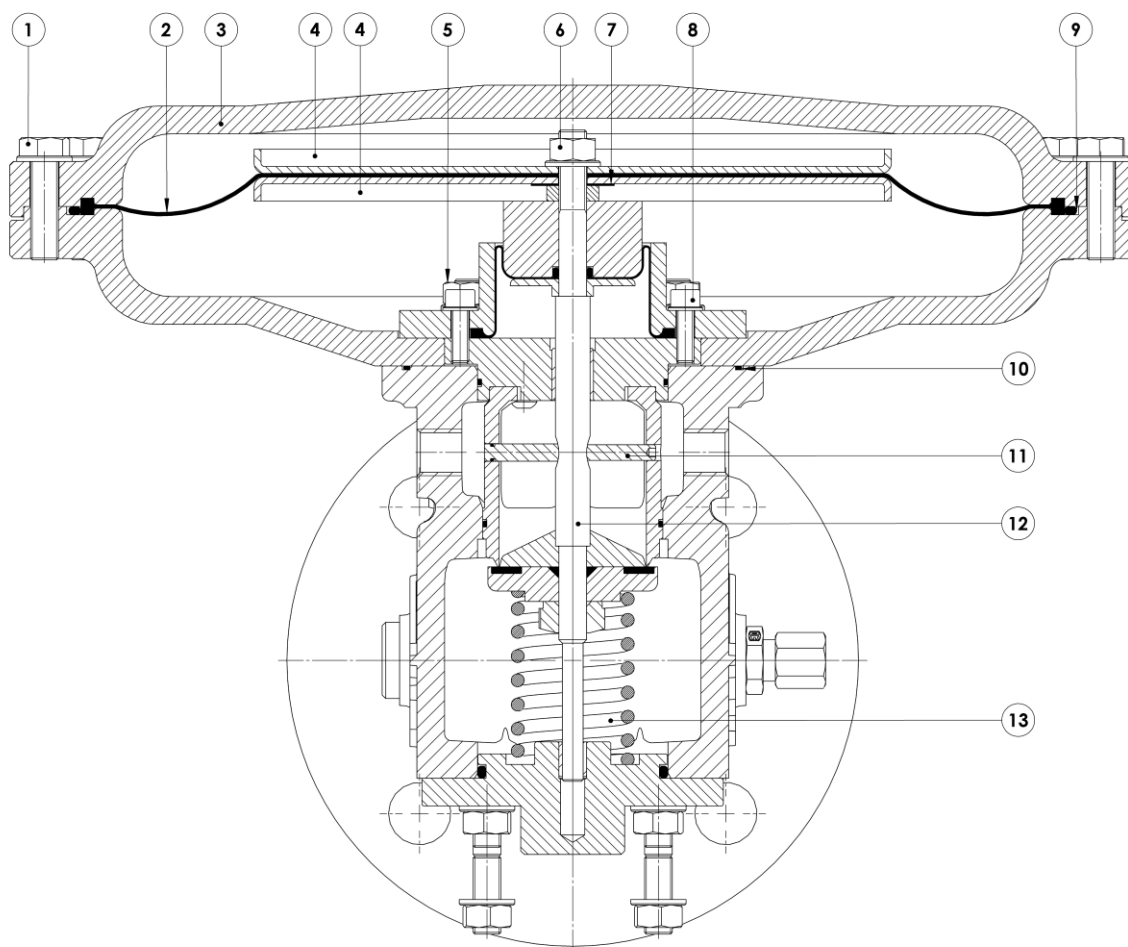


Figure 1

## 6. Commissioning the gas pressure regulator



The next step releases gas  
Take measures to avoid dangerous situations.

The gas pressure regulator may be put into operation if the following points are met:

- Check that the set pressure values  $P_d$  correspond to the design of the gas pressure regulation station. See control report, which is included with the regulator.
- The outlet side must be depressurized
- The outlet valve must be closed
- Open the inlet valve (pressure build-up)

If the inlet pressure  $P_u$  is present (increase the pressure slowly), the pressure difference over the safety shut-off valve can be slowly released by actuating the pressure equalization valve on the body of the gas pressure regulator. During pressure equalization,  $P_d$  will rise to the set value. The safety shut-off valve can then be reset. The gas pressure regulator will deliver when the adjustment valve is opened.



First apply pressure to the inlet section, then apply pressure to the outlet section.  
This is to prevent warping of the diaphragm plate.

## 7. Adjusting the pilot regulator

Adjusting the pilot regulator can be carried out once the regulator has been put into operation. The pilot regulator of the RS350S has only **one** setting at which the control is optimal. This setting is within a twist of about half a turn of the adjusting device (underneath the regulator, under the sealing cap) relative to the zero point at which the regulator is set. If proper control is not obtained during the adjustment in this area, this indicates a problem elsewhere in the gas pressure regulator/installation. For detailed information, see Service Documentation *DDD3002MHEN*, Section 6.

Adjust the outlet pressure to the desired value (e.g., using a digital manometer):

- $P_d > 50$  mbar: Set to set point value + 2.5% (AC2.5),
- $P_d < 50$  mbar: Set to set point value + 5% (AC5),

At 50% load, the regulator will regulate the outlet pressure with a value corresponding to the set point value.

The figure 2 shows the process of setting up RS350S graphically. The times indicated depend on the type of RS350S gas pressure regulator, inlet pressure and outlet pressure.

The spread of the times displayed are:

Situation 1	cycle time between 0.5 and 1 s
Situation 2	transition from situation 1 to 3
Situation 3	cycle time greater than 10 s

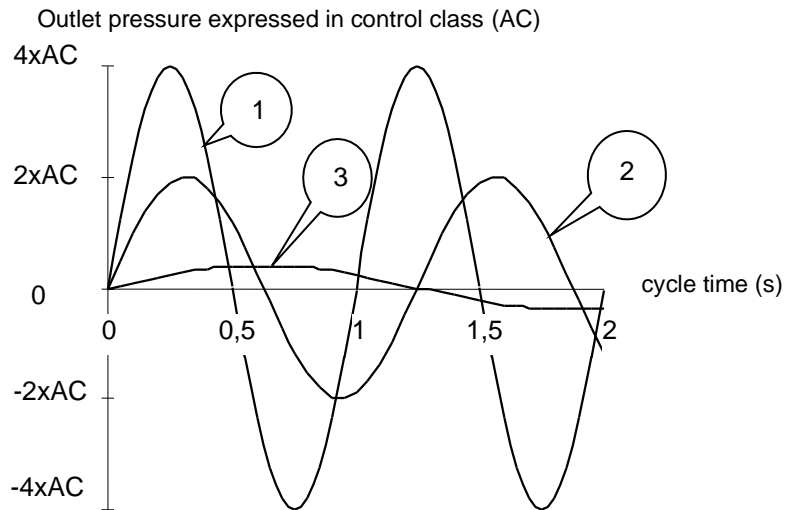


Figure 2

When turning to the stable control, on regulators with  $P_d < 100$  mbar, it is clearly visible that when stable control is reached, the regulated outlet pressure decreases slightly. If the setting is set to the point at which the outlet pressure just does not decrease, then the closing pressure is minimal, and the closing speed is maximal.

Note: Tightening the lock nut after the last adjustment turn may slightly change the setting.

## 8. Verification of functioning

### Checking the closing pressure

Open the adjustment valve and measure the outlet pressure. Close the adjusting valve slowly, the pressure will increase slowly. Open the adjustment valve briefly so that the outlet pressure drops to a value that is approximately 3% higher than the just measured outlet pressure. Now, the static closing pressure is created without the influence of control actions of the regulator.  $P_d > 50$  mbar, SG 5%,  $P_d < 50$  mbar, SG 10%

### Check regulated outlet pressure value regulator

Have the regulator adjusted (small volume) with the adjustment valve almost closed to the desired outlet pressure. The outlet pressure may vary slightly from time to time:

$\pm 2.5$ % of $P_d$ at $P_d > 50$ mbar (AC2.5)
$\pm 5.0$ % of $P_d$ at $P_d < 50$ mbar (AC5)

When opening the adjustment valve, check that the regulator remains at the desired outlet pressure. Then close the balancing valve and open the outlet valve to allow the regulator to supply the grid. Then check whether the regulator responds to the mains properly.

Caution: 30 mbar regulators are very sensitive to setting, allow the regulator to stabilize, e.g., by waiting 15 minutes. This regulator may require some fine-tuning.

For detailed information: service documentation *DDD3002MHEN* including fault analysis.

## 9. Reuse

Place the removed insert with locking shaft in the packaging of the newly inserted insert. The removed insert can be sent to W&S in this packaging with accompanying order, so that W&S can perform service on the insert (new valve, roller diaphragm, etc.).

After the overhaul and a functional check, the insert is returned by W&S, completed with new parts according to chapter 3. The insert is then again ready for installation in a controller.



*Since 1921*

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