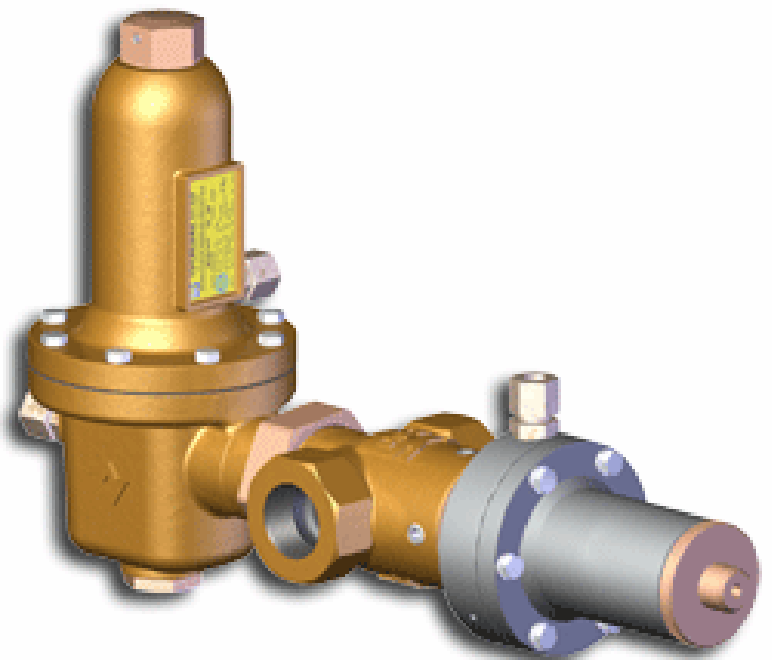


PRESSURE REGULATOR RTG 406



Introduction

RTG 406 regulators are of direct action type and are intended for low flow rates. These regulators are used for reducing and regulating the pressure of natural gases and LPG and they ensure constant maintenance of outlet pressure within the regulating class limits, irrespective of the variations of inlet pressure and flow rate. They are designed for natural gas transportation and distribution networks.

The pressure regulator can be optionally equipped with a shut-off valve.

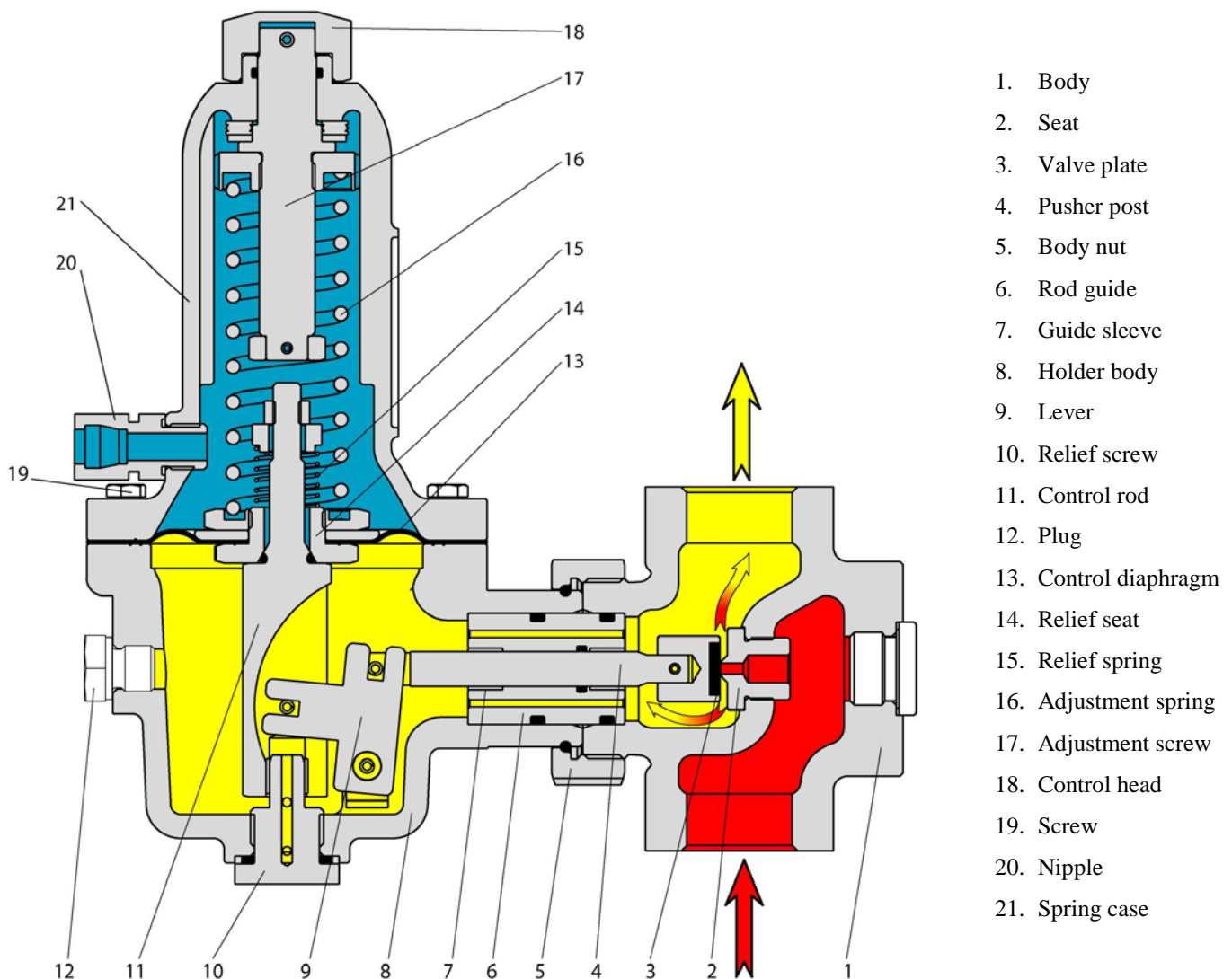


Figure 1 – Functional diagram of RTG 406 regulator

RTG 406 regulator operation

The regulator operation is explained on the basis of the diagram in Figure 1.

RTG 406 regulator is of normally open type.

When the inlet pipeline is pressurized, the gas enters the regulator via the threaded inlet connection of the body (1) and reaches the lower chamber below the seat (2). The gas passes through the seat and reaches the body (1) upper chamber, then passes through the outlet connection.

At the same time, the gas enters the holder body (8) through the holes in the rod guide (6). The gas pressure in the holder body (8) acts on the control diaphragm (13) generating a force that opposes the force exerted by the adjustment spring (16).

The increase of the pressure under the diaphragm over a certain level triggers the movement of the control rod (11). This movement is transmitted to the pusher post (4) by means of the lever (9).

The movement of the assembly composed of the pusher post (4), holder and valve plate (3) determines the modification of the distance between the seat (2) and the valve plate (3). This results in gas flow fluctuation. When the regulated pressure increases over a certain value, the seat orifice is sealed and the gas flow rate in the regulator is null.

If the outlet pressure increases accidentally over a certain value (0.4 bar over the set value), the force exerted by the pressure under the diaphragm overcomes the force given by the relief spring (15), the control rod does not move, instead the set composed of the control diaphragm (13) and the relief seat (14) move. Consequently, the O-ring on the control rod (11) does not seal and the excess pressure is vented into the atmosphere through connection (20).

Technical characteristics

Design features:

- Normally open
- Closure with null flow

Table 1 – Main characteristics

| Main characteristics | RTG 406 |
|--------------------------------------|---|
| Body design pressure P_{ZUL} [bar] | 64 (40) |
| Inlet pressure P_e [bar] | 0.5 ÷ (40); 0.5 ÷ 64 (depending on model) |
| Outlet pressure P_a [bar] | 0.5 ÷ 6 |
| Accuracy class AC | up to $\pm 10 \div 20$ % |
| Lock-up pressure class SG | up to $20 \div 30$ % |
| Intervention accuracy class (AG) | - minimum up to 2.5% - maximum up to 1% (depending on the control pressure) |
| Connection type – threaded | inlet G3/4", G1"; outlet G3/4", G1" |
| Measuring line | internal or external |
| Seat diameter [mm] | 3; 4; 5; 6; 8; 10; 12 |
| Overall dimensions [mm] | 238 × 115 × 251 (Figure 3) |
| Working temperature [°C] | - 10 ÷ 60 |
| Ambient temperature [°C] | - 30 ÷ 80 |

RTG 406 pressure regulators constructive variants

RTG 406 – simple variant – has only regulating functions;

RTG 406 D – incorporated relief valve – has regulating and overpressure protection functions;

RTG 406 SB – incorporated shut-off valve – has regulating and protection functions in case of pressure increase and decrease;

RTG 406 D SB – incorporated relief and shut-off valves – has regulating and protection functions in case of pressure increase and decrease.

Materials

| Part | Material |
|----------------|-----------------------------------|
| Bodies | Fgn; WCB; EN AW 6082T6 (SB 78) |
| Seat | AISI 316 |
| Rod | CuZn39Pb2; X39Cr13 |
| Caps | Fgn; EN AW 6082T6 |
| Valve plate | Polyurethane |
| Diaphragm | Rubber (NBR) with textile insert |
| O-rings | Rubber (NBR) |
| Internal parts | CuZn39Pb2; AISI 316; EN AW 6082T6 |

Safety devices and optional accessories

- Incorporated relief valve
- External impulse

SB 78 shut-off valve operation

The shut-off valve operation is explained on the basis of the diagram in Figure 2.

The working position of the SB 78 shut-off valve is normally open.

The valve control pressure is applied through the lower cap (9) connection.

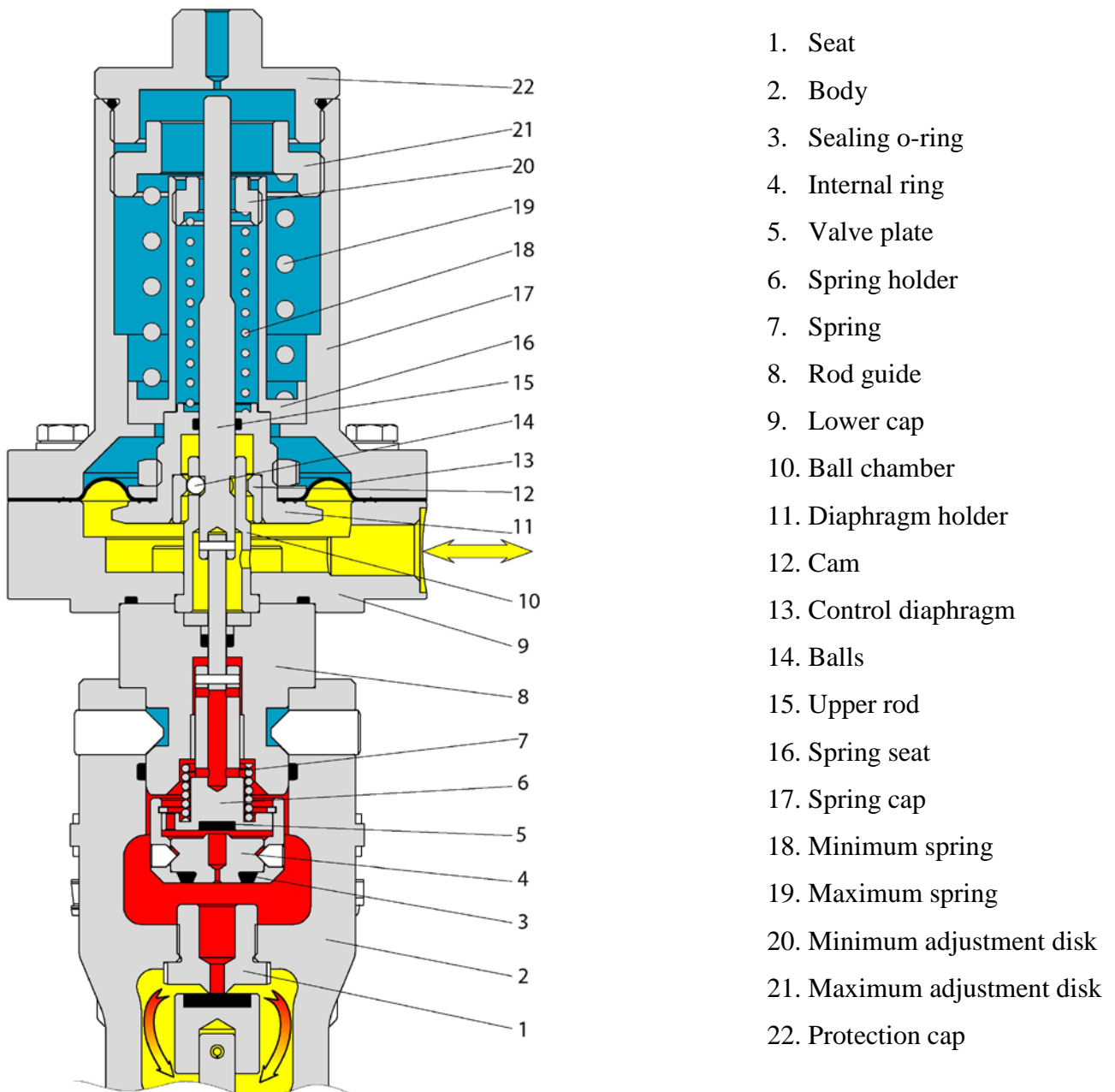


Figure 2 – Shut-off valve – Operating principle

The pressure acts on the control diaphragm (13). If the pressure increases above the set value, the assembly comprising the diaphragm, diaphragm holder (11) and cam (12) overcomes the force exerted by the maximum spring (19) and travels upwards. Consequently, at a certain moment, the balls (14) are released. The upper rod (15) travels under the action of the spring (7) and the O-ring (3) seals against the seat (1).

If the pressure decreases below the set value, the assembly comprising the diaphragm, diaphragm holder (11) and cam (12) travels downwards under the action of the minimum spring. At a certain moment, the balls are released and the valve intervenes.

Adjustment springs for RTG 406 and SB 78

Tables 2 and 3 list the springs that can equip RTG 406 regulator, SB 78 shut-off valve and the pressure ranges covered.

Table 2 – Adjustment springs for RTG 406 pressure regulators

| Regulator | Spring code | Setting range [bar] |
|----------------|-------------|---------------------|
| RTG 406 | 1450248 | 0.2 ÷ 0.4 |
| | 1450249 | 0.4 ÷ 0.8 |
| | 1450250 | 0.7 ÷ 2 |
| | 1450251 | 1.5 ÷ 3.5 |
| | 1450252 | 2.5 ÷ 6 |

Table 3 – Adjustment springs for SB 78 shut-off valves

| Equipment | Minimum spring | | Maximum spring | |
|--------------|----------------|---------------------|----------------|---------------------|
| | Code | Setting range [bar] | Code | Setting range [bar] |
| SB 78 | 1450205 | 0.05 ÷ 0.1 | 1450215 | 0.4 ÷ 0.9 |
| | 1450206 | 0.09 ÷ 0.2 | 1450216 | 0.6 ÷ 1.1 |
| | 1450207 | 0.1 ÷ 0.3 | 1450217 | 0.9 ÷ 1.9 |
| | 1450208 | 0.3 ÷ 0.6 | 1450218 | 1.2 ÷ 2.7 |
| | 1450209 | 0.5 ÷ 1.2 | 1450220 | 2.3 ÷ 4.9 |
| | 1450210 | 1.2 ÷ 2.8 | 1450374 | 4 ÷ 8 |

Overall dimensions

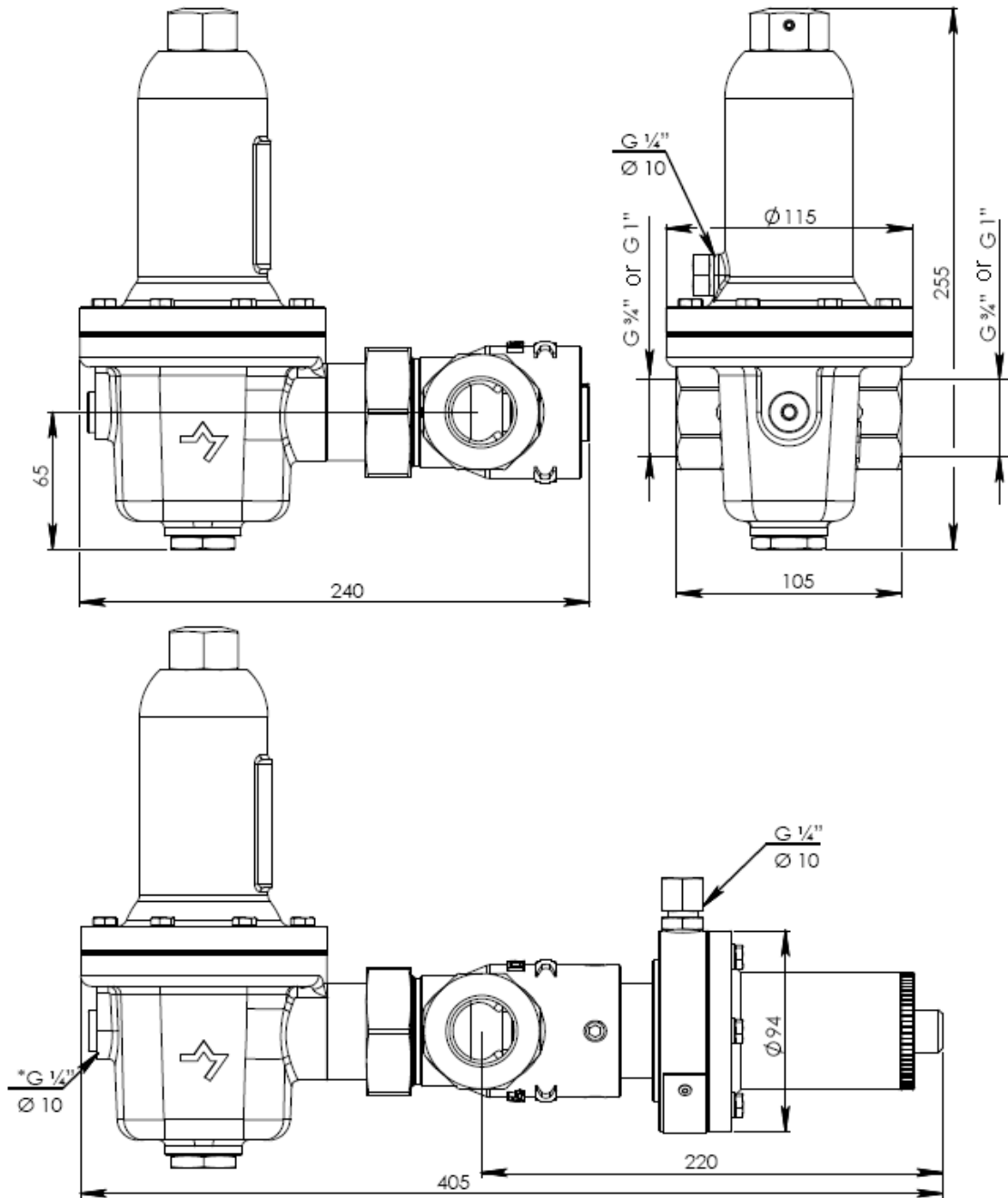


Figure 3 – RTG 406 – Overall dimensions

| Regulator | Weight [kg] |
|------------|-------------|
| RTG 406 | 7.3 |
| RTG 406 SB | 9.4 |

The manufacturer reserves the right to make modifications without any prior notification.

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