

## T 2595 EN

### Self-operated Pressure Regulators · Accessories

Compensation chamber · Screw fittings · Control line connection · Control line

#### Application

Accessories for Type 41-23 Universal Pressure Reducing Valve, Type 41-73 Universal Excess Pressure Valve, Type 2422/2424 Pressure Reducing Valve and Type 2422/2425 Excess Pressure Valve

Various accessories are available for the pressure regulators listed:

- **Standard screw joint with restriction G  $\frac{3}{8}$**

For connection of the control line to the actuator. Male thread R  $\frac{1}{4}$ , female thread G  $\frac{3}{8}$  for control line connection, other connections for 6 x 1, 8 x 1, 10 x 1 pipe are possible.

Furthermore, Serto (8 x 1, 10 x 1), Swagelok fittings ( $\varnothing 12$ ,  $\frac{1}{2}$ "") and  $\frac{1}{2}$ " NPT screw joints with restrictions are available (see also Screw joints with restriction for Types 2413, 2424 and 2425 Actuators).

- **Control line**

For transmitting the pressure to the operating diaphragm of the regulator.

6 x 1 mm pipe with standard screw joint with restriction (standard for DIN versions of regulators)

- **Compensation chamber <sup>1)</sup>**

Required for steam or liquids above 150 °C. To collect condensation in applications with vapors and for protection of the operating diaphragm against high temperatures.

- **Funnel tube <sup>1)</sup>**

To help fill the diaphragm chamber including the compensation chamber and the control line with the process medium.



**Fig. 1:** Type 41-23 Universal Pressure Reducing Valve with control line

<sup>1)</sup> The accessories are not included in the scope of delivery and must be ordered separately.

The specified permissible temperatures apply to the Type 41-23, Type 41-73, Type 2422/2424 and Type 2422/2425 Regulators, depending on the process medium and additional equipment.

**Table 1: Process medium and permissible medium temperature depending on the accessories used and the diaphragm material in the actuator · Metal-seated plug**

| Process medium                | Accessories  |  |   |   | Min./Max. <sup>1) 2) 3)</sup> medium temperature in °C |            |            |           |
|-------------------------------|--|--|---|---|--|------------|------------|-----------|
|                               | Control line kit without compensation chamber for pressure tapping at the valve body or screw joint with restriction G 3/8 | Compensation chamber, screw joint with restriction G 3/8, and funnel tube or control line kit with compensation chamber for pressure tapping at the valve body | Compensation chamber with welding connections, screw joint with restriction G 3/8 and funnel tube | Control line kit for process medium with high or low temperatures <sup>4)</sup> | Actuator diaphragm (material)                          |            |            |           |
|                               |  |  |   |   | EPDM   | FKM        | NBR        | Bellows   |
| Water <sup>5)</sup>           | •  |  |   |   | -30 to 150   |            |            |           |
| Air                           | •  |  |   | •   | -30 to 80  | 0 to 150   | -30 to 80  | Up to 350 |
|                               |  |  |   |   | -50 to 150   | -20 to 220 | -50 to 150 |           |
| Nitrogen                      | •  |  |   | •   | -30 to 80  | 0 to 150   | -30 to 80  | Up to 350 |
|                               |  |  |   |   | -50 to 150   | -20 to 220 | -50 to 150 |           |
| CO <sub>2</sub>               | •  |  |   | •   | -30 to 80  | 0 to 150   |            | Up to 350 |
|                               |  |  |   |   | -50 to 150   | -20 to 220 | -50 to 150 |           |
| Flammable gases <sup>6)</sup> | •  |  |   | •   |  | 0 to 150   | -30 to 80  | Up to 350 |
|                               |  |  |   |   |  | -20 to 220 | -50 to 150 |           |
| Steam                         | •  |  |   |   |  |            |            | Up to 350 |
|                               |  | •  |   |   | Up to 250  |            |            |           |
|                               |  |  | •   |   | Up to 350  |            |            |           |
| Mineral oils <sup>6)</sup>    | •  |  |   |   |  | 0 to 150   | -30 to 80  | Up to 350 |
|                               |  | •  |   |   |  | Up to 250  | Up to 250  |           |
|                               |  |  | •   |   |  | Up to 350  | Up to 350  |           |
| Liquids <sup>6)</sup>         | •  |  |   |   | -30 to 150   | 0 to 150   | -30 to 80  | Up to 350 |
|                               |  | •  |   |   | Up to 250  | Up to 250  | Up to 250  |           |
|                               |  |  | •   |   | Up to 350  | Up to 350  | Up to 350  |           |

**Table 2: Process medium and permissible medium temperature · Soft-seated plug**

| Process medium                | Min./Max. <sup>1) 2)</sup> medium temperature in °C |          |           |
|-------------------------------|---|----------|-----------|
|                               | Soft-seated plug (material)                         |          |           |
|                               | EPDM  | FKM      | NBR       |
| Water <sup>5)</sup>           | -30 to 150  |          |           |
| Air                           | -30 to 80   | 0 to 150 | -30 to 80 |
| Nitrogen                      | -30 to 80   | 0 to 150 | -30 to 80 |
| CO <sub>2</sub>               | -30 to 80   | 0 to 150 | -30 to 80 |
| Flammable gases <sup>6)</sup> |   | 0 to 150 | -30 to 80 |
| Steam                         |   |          |           |
| Mineral oils <sup>6)</sup>    |   | 0 to 150 | -30 to 80 |
| Liquids <sup>6)</sup>         | -30 to 80   | 0 to 150 | -30 to 80 |

<sup>1)</sup> The minimum or maximum permissible temperature may be restricted by the valve material. See temperature diagrams in ► T 2500, Fig. 2.

<sup>2)</sup> Medium temperatures below 0 °C may cause ice to form on the valve, depending on the air humidity. This may affect, in particular, the functioning of the stem guide or set point adjuster. This must be prevented on site by taking appropriate precautions (e.g. enclosure, trace heater etc.).

<sup>3)</sup> Temperature limits for metal-seated plug. Deviating temperatures may arise when a soft-seated plug is used (see Table 2).

<sup>4)</sup> The ambient temperature must be at least 30 °C above the lowest medium temperature or 100 °C below the highest medium temperature. Example: lowest medium temperature -45 °C → ambient temperature at least -15 °C.

<sup>5)</sup> If applicable, use antifreeze. In principle, the materials are also resistant to high concentrations of glycol. Nevertheless, glycol may decompose gradually during use. During which, corrosive substances, e.g. acids may form under certain circumstances. We cannot prevent this reaction. Therefore, plant operators must prevent it by using suitable inhibitors.

<sup>6)</sup> Specific compatibility with the process medium on request. The viscosity must not exceed 100 cSt.

## Control line kits

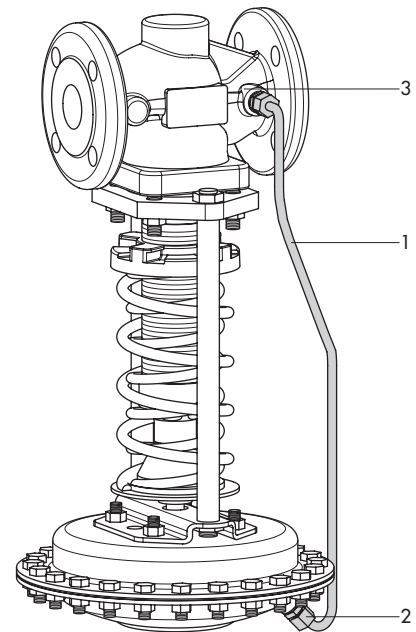
**Note:** Depending on the process conditions, how the pipeline is routed and the adjusted set point, adverse flow conditions may arise at the point of tapping at the body, possibly leading to pressure fluctuations. Therefore, we recommend using an external pressure tapping for a set point lower than 0.8 bar.

### Control line kit without compensation chamber for Type 41-23 or Type 41-73

**Table 3:** Control line kit <sup>1)</sup> without compensation chamber with order number

| Nominal size DN | Order no. Actuator area |                    |                       |                     |                     |
|-----------------|-------------------------|--------------------|-----------------------|---------------------|---------------------|
|                 | 33 cm <sup>2</sup>      | 62 cm <sup>2</sup> | 40/80 cm <sup>2</sup> | 160 cm <sup>2</sup> | 320 cm <sup>2</sup> |
| 15              | 1402-1339               | 1402-1345          | 1402-1348             | 1402-1351           | 1402-1354           |
| 20              | 1402-1340               | 1402-1346          | 1402-1349             | 1402-1352           | 1402-1355           |
| 25              | 1402-1341               | 1402-1347          | 1402-1350             | 1402-1353           | 1402-1356           |
| 32              | 1402-1342               | On request         | 1400-8867             | 1400-8868           | 1400-8869           |
| 40/50           | 1402-1343               | On request         | 1400-8873             | 1400-8874           | 1400-8875           |
| 65/80           | 1402-1090               | 1402-1482          | 1400-8879             | 1400-8880           | 1400-8881           |
| 100             | 1402-1344               | On request         | 1400-8885             | 1400-8886           | 1400-8887           |

<sup>1)</sup> Control line kits for direct pressure tapping at a DIN cast body without compensation chamber, only suitable for standard regulator versions. Other kits available on request (e.g. for actuators with two diaphragms, ANSI valves etc.).

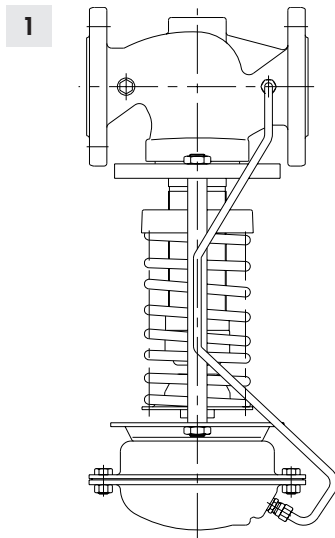


- 1 Control line · 6 x 1 mm pipe · Material 1.4571
- 2 Screw joint with restriction · Material 1.4571
- 3 Compression-type fitting · Material 1.4571

### Control line with accessories · Arrangement according to drawing 1120-2257- x

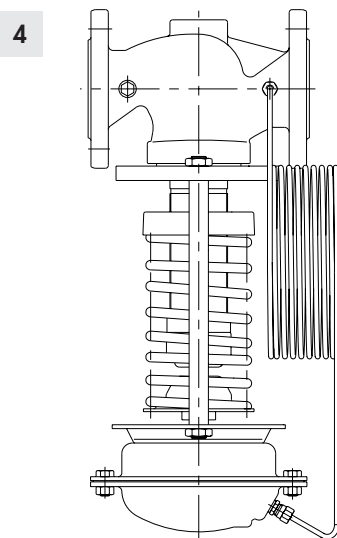
Control line kit for liquids and gases (standard)

Type 41-23 →  
Type 41-73 ←



Control line kit for high or low temperatures (not for steam!) <sup>1)</sup>

Type 41-23 →  
Type 41-73 ←



**Fig. 2:** Control line kit without compensation chamber

<sup>1)</sup> We recommend not to deliver the regulator with the control line kit ready mounted to avoid damage during transport.

## Control line kit with compensation chamber for Type 41-23 or Type 41-73

**Table 4:** Control line kit <sup>1)</sup> with **steel** compensation chamber with order number

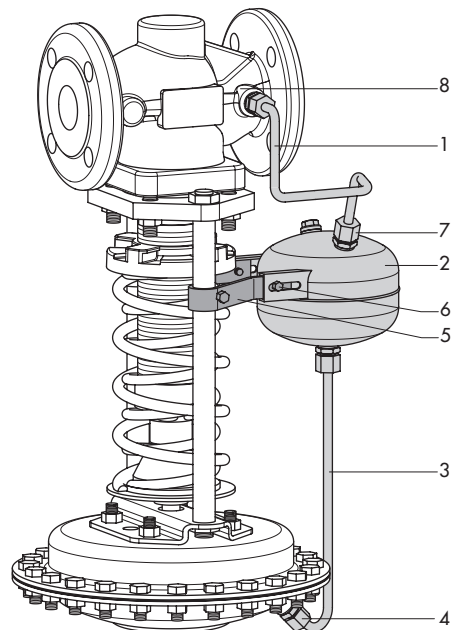
| Nominal size DN | Order no. Actuator area |                     |                     |
|-----------------|-------------------------|---------------------|---------------------|
|                 | 40/80 cm <sup>2</sup>   | 160 cm <sup>2</sup> | 320 cm <sup>2</sup> |
| 15              | 1400-8890               | 1400-8891           | 1400-8892           |
| 20              | 1402-1411               | 1402-1413           | 1402-1408           |
| 25              | 1402-1391               | 1402-1414           | 1402-1416           |
| 32              | 1400-8895               | 1400-8896           | 1400-8897           |
| 40/50           | 1400-8900               | 1400-8901           | 1400-8902           |
| 65/80           | 1400-8905               | 1400-8906           | 1400-8907           |
| 100             | 1400-8910               | 1400-8911           | 1400-8912           |

<sup>1)</sup> Control line kits for direct pressure tapping at a DIN cast body with compensation chamber, only suitable for standard regulator versions. Other kits available on request (e.g. for actuators with two diaphragms, ANSI valves etc.).

**Table 5:** Control line kit <sup>1)</sup> with **stainless steel** compensation chamber with order number

| Nominal size DN | Order no. Actuator area |                     |                     |
|-----------------|-------------------------|---------------------|---------------------|
|                 | 40/80 cm <sup>2</sup>   | 160 cm <sup>2</sup> | 320 cm <sup>2</sup> |
| 15              | 1400-8915               | 1400-8916           | 1400-8917           |
| 20              | On request              | On request          | On request          |
| 25              | On request              | On request          | On request          |
| 32              | 1400-8920               | 1400-8921           | 1400-8922           |
| 40/50           | 1400-8925               | 1400-8926           | 1400-8927           |
| 65/80           | 1400-8930               | 1400-8931           | 1400-8932           |
| 100             | 1400-8935               | 1400-8936           | 1400-8937           |

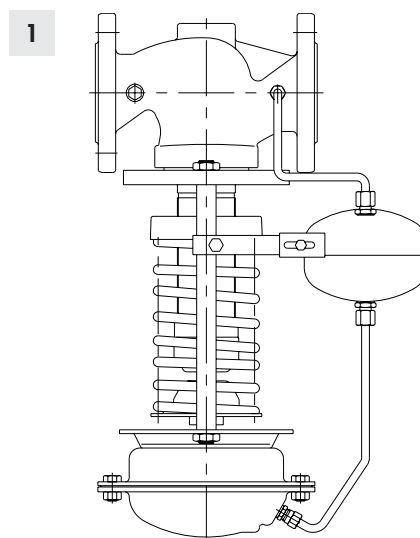
<sup>1)</sup> Control line kits for direct pressure tapping at a DIN cast body with compensation chamber, only suitable for standard regulator versions. Other kits available on request (e.g. for actuators with two diaphragms, ANSI valves etc.).



- 1 Control line between valve body and compensation chamber · 8 x 1 mm pipe · Material 1.4571
- 2 Compensation chamber 0.7 l · Material 1.4301/S235JR (St 37-2)
- 3 Control line between actuator and compensation chamber · 6 x 1 mm pipe · Material 1.4571
- 4 Screw joint with restriction · Material 1.4571
- 5 Fastening bracket
- 6 Screw M6 x 10, SK 8.8 · A4-70
- 7 Welding nipple to connect compensation chamber with control line to the valve
- 8 Compression-type fitting · Material 1.4571

**Control line with accessories** · Arrangement according to drawing 1120-2258- x

Type 41-23 →  
Type 41-73 ←



**Fig. 3:** Control line kit with compensation chamber for steam

**Compensation chamber** (see Fig. 4) for welding for Type 41-23, Type 41-73, Type 2422/2424 or Type 2422/2425

If the operating conditions make a compensation chamber necessary, the necessary dimensions and the associated order number must be selected from Table 6 according to the nominal size and dimensions of the actuator (diaphragm area).

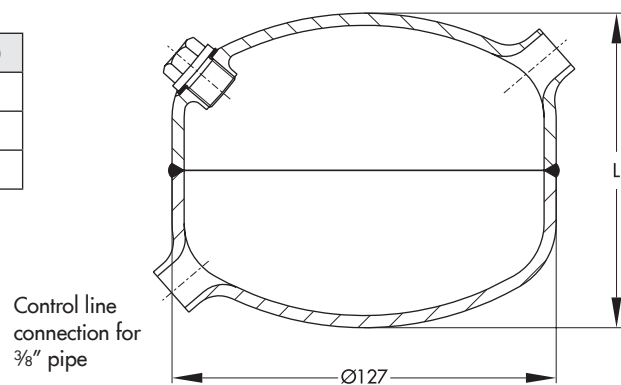
The control line and the connection pipe are welded to the weld connections of the compensation chamber. They must be provided on site.

**Table 6:** Compensation chambers with welding connections

| Accessories  | Nominal size DN | Actuator area in cm <sup>2</sup> | Order no.         |
|--|-----------------|----------------------------------|-------------------|
| Standard version · Screw joint with restriction (3/8" thread), compensation chamber and funnel tube            | 15 to 250       | 40 to 160                        | 1059489           |
|  | 15 to 50        | 320                              | 5482511           |
|  | 65 to 250       | 320                              | 1059490           |
|  | 15 to 50        | 640                              | 5482538           |
|  | 65 to 250       | 640                              | 1059491           |
| Stainless steel version · Ermeto screw joint with restriction (6 x 1 mm), compensation chamber and funnel tube | 15 to 250       | 40 to 160                        | 1059493           |
|  | 15 to 50        | 320                              | 5482540           |
|  | 65 to 250       | 320                              | 1059494           |
|  | 15 to 50        | 640                              | 5482542           |
|  | 65 to 250       | 640                              | 1059495           |
| Standard version · Compensation chamber (see Fig. 4)   | 15 to 250       | 40 to 160                        | 1190-8788 (0.7 l) |
|  | 15 to 50        | 320                              | 1190-8788 (0.7 l) |
|  | 65 to 250       | 320                              | 1190-8789 (1.5 l) |
|  | 15 to 50        | 640                              | 1190-8789 (1.5 l) |
|  | 65 to 250       | 640                              | 1190-8790 (2.4 l) |

**Table 7:** Dimensions · Compensation chambers

| Order no. | 1190-8788                    | 1190-8789 | 1190-8790 |
|-----------|------------------------------|-----------|-----------|
| Content   | 0.7 l                        | 1.5 l     | 2.4 l     |
| Length L  | 105 mm                       | 195 mm    | 285 mm    |
| Material  | Sheet steel S235JR (St 37-2) |           |           |



**Fig. 4:** Compensation chamber with welding connections

## Screw joints with restriction for Types 2413, 2424 and 2425 Actuators

**Table 8:** Screw joints with restriction for Type 2413 · Standard version and version for oxygen

| Accessories   | Nominal size DN | Actuator area in cm <sup>2</sup> | Order no.      |         |
|---|-----------------|----------------------------------|----------------|---------|
|   |                 |                                  | Standard (air) | Oxygen  |
| Standard version · Screw joint with restriction (3/8" thread) only            | 15 to 250       | 33 to 160                        | 1059488        | 1059498 |
| Stainless steel version · Ermeto screw joint with restriction (6 x 1 mm) only | 15 to 250       | 33 to 160                        | 1059492        | 1059492 |

### Overview

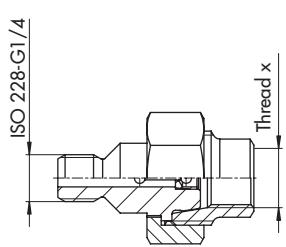
**K** = Small orifice cross-section, **G** = Large orifice cross-section

**Table 9:** Assignment of nominal size, actuator size and orifice cross-section

| Nominal size DN       | 15 to 250                 | 15 to 50            | 65 to 250           | 15 to 50            | 65 to 250           |
|-----------------------|---------------------------|---------------------|---------------------|---------------------|---------------------|
| Actuator area         | 33 to 160 cm <sup>2</sup> | 320 cm <sup>2</sup> | 320 cm <sup>2</sup> | 640 cm <sup>2</sup> | 640 cm <sup>2</sup> |
| Orifice cross-section | <b>K</b>                  |                     |                     | <b>G</b>            |                     |

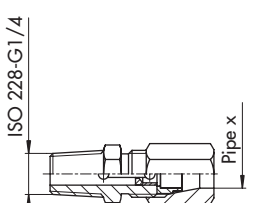
**Table 10:** Orifice versions for Types 2413, 2424 and 2425 (with connecting thread)

| Orifice cross-section | Connecting thread x | Order no. |                 |
|-----------------------|---------------------|-----------|-----------------|
|                       |                     | Steel     | Stainless steel |
| <b>K</b>              | G 3/8               | 1490-2175 | –               |
| <b>G</b>              |                     | 1990-3815 | –               |
| <b>K</b>              | 1/2 NPT             | –         | 1992-2708       |
| <b>G</b>              |                     | 1990-4831 | –               |
| <b>K</b>              | 1/4 NPT             | –         | 1992-3178       |



**Table 11:** Restriction versions for Types 2413, 2424 and 2425 with pipe connection

| Orifice cross-section | Type     | Pipe x         | Order no. |                 |
|-----------------------|----------|----------------|-----------|-----------------|
|                       |          |                | Steel     | Stainless steel |
| <b>K</b>              | Ermeto   | 6 x 1 mm pipe  | –         | 1890-8577       |
| <b>G</b>              |          |                | –         | 1890-8578       |
| <b>K</b>              |          | 8 x 1 mm pipe  | 1790-4681 | 1991-1723       |
| <b>G</b>              |          |                | –         | –               |
| <b>K</b>              |          | 10 x 1 mm pipe | 1790-5596 | 1991-1724       |
| <b>G</b>              |          |                | –         | –               |
| <b>K</b>              | Serto    | 8 x 1 mm pipe  | 1990-4834 | –               |
| <b>K</b>              |          | 10 x 1 mm pipe | 1990-8554 | –               |
| <b>K</b>              | Swagelok | Ø12            | –         | 1990-5751       |
| <b>K</b>              |          | 1/2"           | –         | 1990-5752       |
| <b>G</b>              |          | Ø12            | –         | 1990-5928       |
| <b>G</b>              |          | 1/2"           | –         | 1990-5929       |



**Ordering text**

- Compensation chamber, order no. 1190 - ... (see Table 6)
- Screw joint with restriction, order no. ... (see Table 8, Table 9, Table 10, Table 11)
- Funnel tube
- Control line kit for Type 41-23 and Type 41-73 (for pressure set point  $\geq 0.8$  bar)  
For liquids up to 150 °C, air and gases up to 80 °C, without compensation chamber (see Table 3)  
For vapors and liquids up to 350 °C, pressure tapping at the valve body, with compensation chamber (see Table 4 and Table 5)

