

Globe Valve Type 241

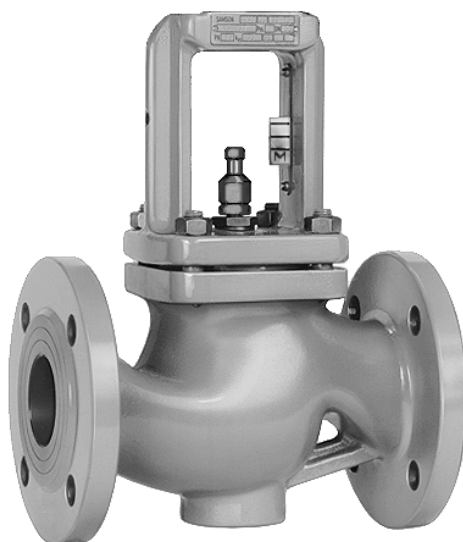


Fig. 1 · Type 241 Control Valve

Mounting and operating instructions

EB 8015-1EN

Edition August 2002

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General safety instructions

- ▶ *The control valve may only be mounted, started up or serviced by fully trained and qualified personnel, observing the accepted industry codes and practices. Make sure employees or third persons are not exposed to any danger. All safety instructions and warnings in these mounting and operating instructions, particularly those concerning assembly, start-up and maintenance, must be observed.*
- ▶ *The control valve fulfills the requirements of the European Pressure Equipment Directive 97/23/EC. Valves with a CE marking have a declaration of conformity that includes information about the applied conformity assessment procedure. The declaration can be found in the appendix of these instructions.*
- ▶ *For appropriate operation, make sure that the control valve is only used in areas where the operating pressure and temperatures do not exceed the operating values which are based on the valve sizing data submitted in the order. The manufacturer does not assume any responsibility for damage caused by external forces or any other external influence! Any hazards which could be caused in the control valve by the process medium, operating pressure, signal pressure or by moving parts are to be prevented by means of the appropriate measures.*
- ▶ *Proper shipping and appropriate storage are assumed.*

Caution!

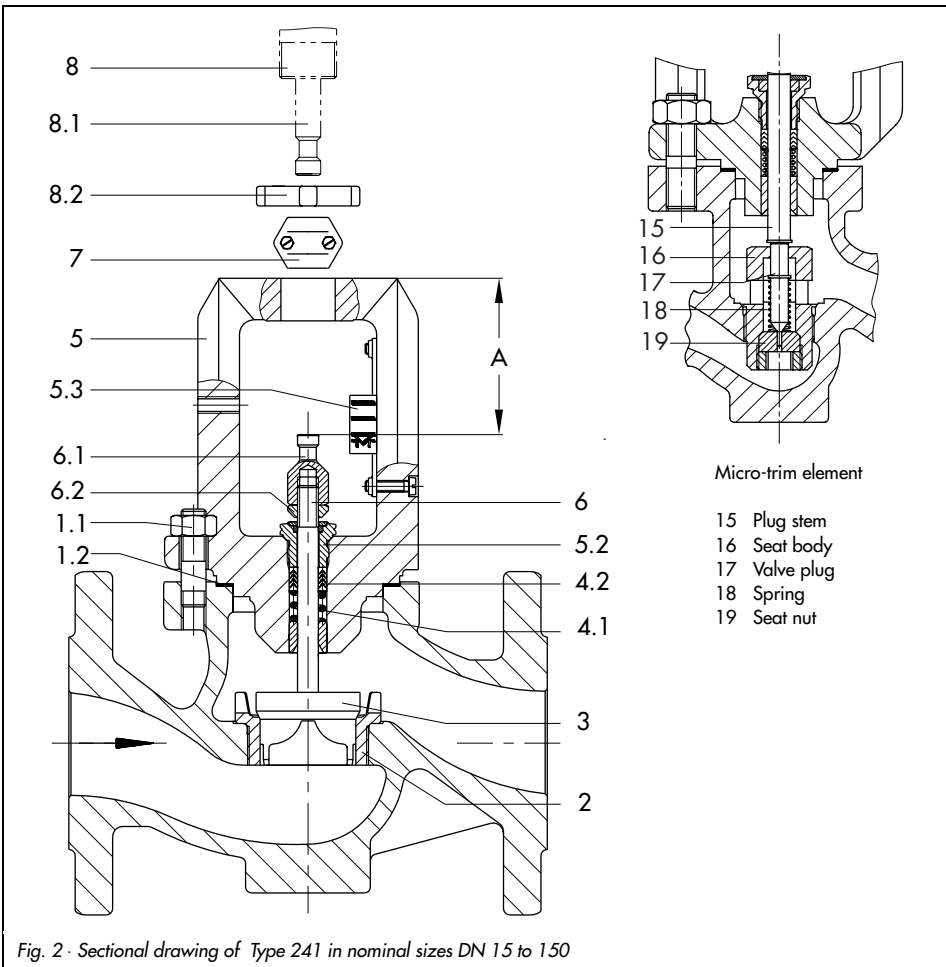
- ▶ *For installation and maintenance, make sure the relevant section of the pipeline is depressurized and, depending on the process medium, drained as well. Depending on the type of application, allow the control valve to cool down or heat up to ambient temperature before you start.*
- ▶ *When working on the valve, make sure the lines for the electrical or air supply as well as the control signal are disconnected to prevent any hazards that could be caused by moving parts.*

1. Design and principle of operation

The Type 241 Single-seated Globe Valve can be combined with different actuators to form either a pneumatic or an electric control valve. You also have the possibility of mounting a hand-operated actuator.

Thanks to the modular design, the actuators can be exchanged, and the standard version of the valve can be supplemented to form a version with insulating section or metal bellows.

In the **micro-flow valve version**, a micro-trim element is installed in the valve body in-



stead of the usual seat-plug assembly. The process medium flows through the valve in the direction indicated by the arrow. The position of the plug (3) is changed either by the pneumatic or electric control signal acting on the actuator.

The plug (3) and the actuator stem (8.1) are connected via the stem connector (7). They are sealed by a spring-loaded PTFE-ring packing or by packing rings in nominal sizes DN 200 and 250.

Travel adjustment (Valve closed)	
DN	Dimension A
15 to 80	75 ± 0.1
100 to 150	90 ± 0.1
200 and 250	165 (225)

Legend for Figs. 2 and 3

- 1.1 Nuts
- 1.2 Gasket
- 2 Seat
- 3 Plug
- 4.1 Spring
- 4.2 Packing
- 5 Valve bonnet
- 5.2 Threaded bushing
- 5.3 Travel indicator scale
- 6 Plug stem
- 6.1 Stem connector nut
- 6.2 Lock nut
- 6.3 Yoke (DN 200 and 250)
- 7 Stem connector
- 8 Actuator
- 8.1 Actuator stem
- 8.2 Nut

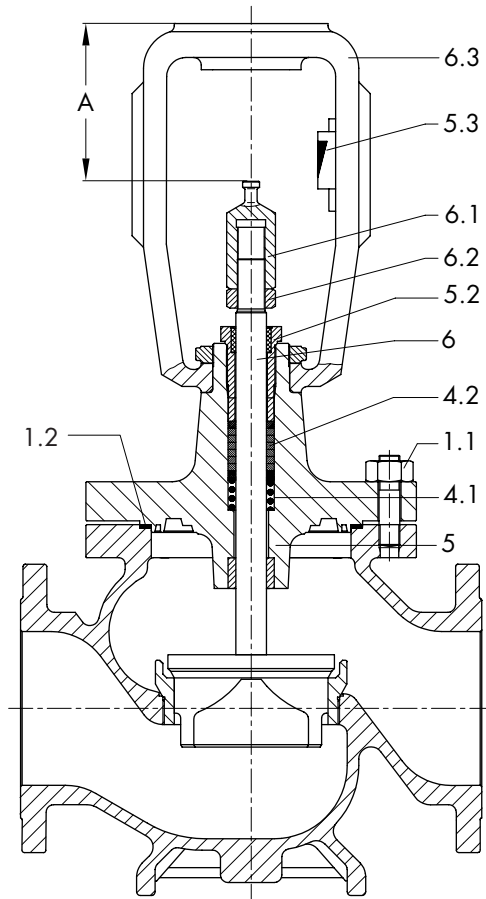


Fig. 3 · Sectional drawing of Type 241 in nominal sizes DN 200 and 250

2. Installation

2.1 Assembling valve and actuator

Note!

To assemble the valve and actuator, refer to the mounting and operating instructions of the actuator you are using.

2.1.1 Travel adjustment

When valve and actuator are shipped separately, dimension A, which extends from the upper edge of the stem connector nut (6.1) to the upper edge of the valve bonnet (yoke), is adjusted as illustrated in Figs. 2 and 3.

Check this dimension on assembly and, if necessary, readjusted it by turning the stem connector nut.

2.2 Mounting position

The valve can be mounted in any desired position. However, for valve sizes larger than DN 100, a vertical position with the actuator pointing upwards is preferable to facilitate maintenance. For valves with insulating section or metal bellows or for actuators weighing more than 50 kg, install a suitable support or suspension for the actuator.

Important!

The valve must be installed with as little vibration as possible and free of stress. Flush the pipeline thoroughly before installation.

Note!

Control valves applied in accordance with NACE MR 0175 must not be insulated!

2.3 Strainer, bypass

We recommend you to install a SAMSON Type 2 Strainer upstream of the valve body. It is also advisable to install a shut-off valve both upstream of the strainer and downstream of the valve as well as a bypass, so that the plant does not need to be shut down for maintenance.

2.4 Test connection

If there is a test connection (G 1/8) at the upper flange of a valve version with metal bellows seal (Fig. 7), you can check the tightness of the bellows there. Particularly for liquids and vapors, we recommend you to install a suitable leak indicator at the test connection, such as a contact pressure gauge, an outlet into an open vessel or an inspection window.

3. Operation

As operating instructions only apply when the valve is used in combination with an actuator, refer to the associated mounting and operating instructions of the actuator you are using.

4. Maintenance – Replacing parts

The control valve is subject to natural wear, especially at the seat, plug and stuffing box. Depending on the application, the valve needs to be checked regularly to prevent against possible failures.

If leakage occurs, this could be caused by a damaged stuffing box or a defective metal bellows.

If the valve does not seal properly, the tight shut-off may be impeded by dirt or other impurities caught between the seat and plug, or by damaged seat joints.

Remove the parts, clean them thoroughly and, if necessary, replace them.

Note!

*The seat and special tools required for installation as well as the appropriate tightening torques are to be found in the SAMSON special tools brochure **WA 029**.*

Important!

Remove the actuator from the valve before servicing the valve body!



Caution!

Before servicing or disassembling the control valve, depressurize the concerned section of the plant and drain it depending on the medium used.

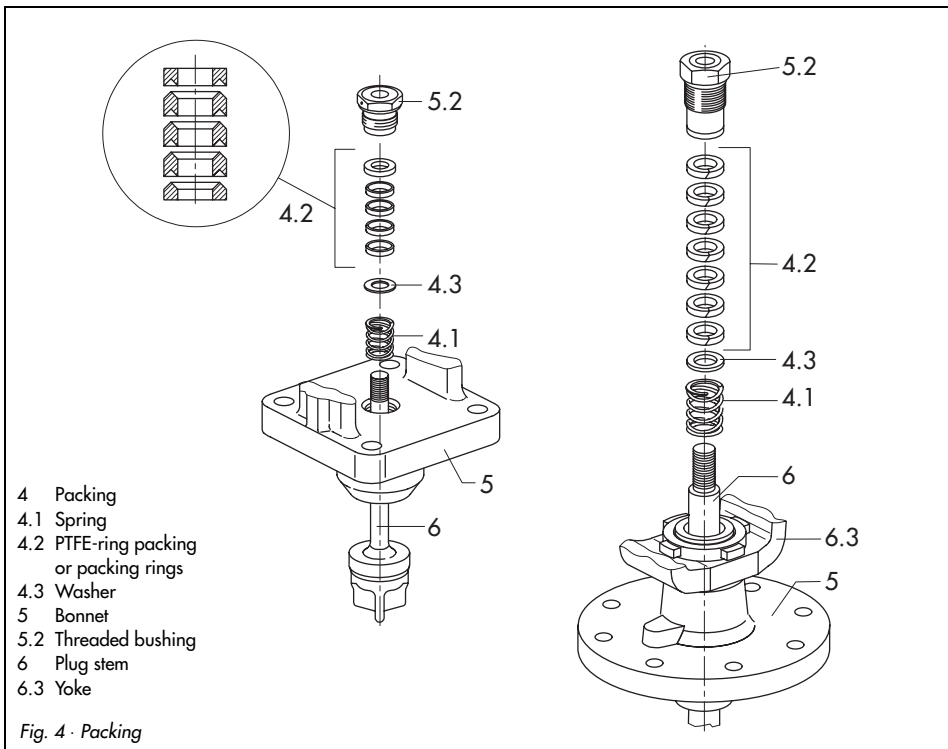
For high medium temperatures, allow the section of the pipeline to cool down to ambient temperature. Switch off and lock the pneumatic and electric supply energy, and interrupt the control signal to avoid dangers posed by moving parts at the control valve.

As valves are not free of dead space, there might still be residual medium in the valve. This applies, in particular, for valve versions with insulating section or metal bellows. It is recommended to remove the valve from the pipeline.

4.1 Standard valves

4.1.1 Packing

1. Remove the body nuts (1.1) as well as the valve bonnet (5) together with the plug stem and plug from the body.
2. Unscrew the stem connector nut and lock nut (6.1 and 6.2) from the plug stem.
3. Screw the threaded bushing (5.2) out of the stuffing box. Pull the plug stem and plug out of the valve bonnet.
4. Pull all the stuffing box parts out of the packing chamber using a suitable tool. Replace damaged parts. Clean the packing chamber thoroughly.
5. Check the gasket (1.2) in the valve body and, preferably, replace it.
6. Apply lubricant (order no. 8150-0111) to all the packing parts and the plug stem (6).
7. Slide the plug stem with plug into the valve bonnet.
8. Place the valve bonnet carefully on the valve body and secure with nuts (1.1).



9. Carefully slide the stuffing box parts over the plug stem into the packing chamber. Make sure to keep the proper order.
Screw in the threaded bushing (5.2) and tighten.
10. Loosely screw the lock nut (6.2) and stem connector nut (6.1) onto the plug stem.
11. Adjust the travel as described in section 2.1.1.
Mount the actuator.

4.1.2 Seat and/or plug

We recommend that you also replace the packing (4.2) when exchanging the seat and plug.

To exchange the packing, proceed as described in section 4.1.1.

Plug:

- ▶ Remove the old plug and replace it with a new plug with plug stem.
It is possible to use the old plug again, provided it has been reworked properly.
Apply lubricant (order no. 8150-0111) to the plug stem before installation.

Reworking the plug:

Slight damage at the sealing edges of the plug can be eliminated by re-turning it on a lathe.

Soft-sealing plugs can only be reworked until dimension x is reached, and if the seat bore exceeds 12 mm. For seat bores of 63 mm and larger, the entire sealing ring can be exchanged if necessary (the plug parts are screwed together).

Seat:

- ▶ Unscrew the seat (2) using the appropriate seat wrench (see WA 029).
Apply lubricant (order no. 8150-0119) to the thread and sealing cone of the new seat (or possibly the old seat when it has been reworked or thoroughly cleaned) and screw it in.

Micro-trim insert (Fig. 3)

In this version, the complete micro-trim element can be unscrewed from the valve body using a socket wrench (width across flats 27) and disassembled for cleaning.

If individual parts are damaged, exchange the entire micro-trim element.

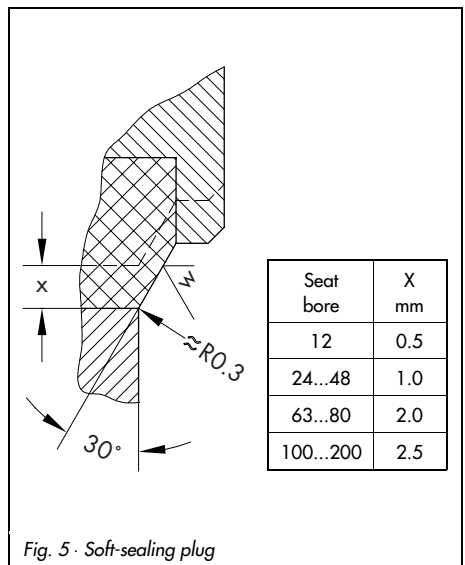


Fig. 5 · Soft-sealing plug

4.2 Valve with insulating section or metal bellows seal

4.2.1 Packing

1. Remove the stem connector nut and lock nut (6.1 and 6.2) from the plug stem extension (6.3). Screw the threaded bushing (5.2) out of the stuffing box.
2. Remove the nuts (5.4) and carefully lift the bonnet (5) over the plug stem extension.
3. Pull all the stuffing box parts out of the packing chamber using an appropriate tool. Replace damaged parts. Clean packing chamber thoroughly.
4. Replace the gasket (5.5) in the intermediate piece (12).
5. Apply lubricant to all the parts and the plug stem extension (order no. 8150-0111).
6. Carefully place the bonnet over the plug stem extension onto the intermediate piece and secure with nuts (5.4).
7. Carefully slide the stuffing box parts over the plug stem extension into the packing chamber. Make sure to keep the proper order. Screw in the threaded bushing (5.2) and tighten.
8. Loosely screw the lock nut (6.2) and stem connector nut (6.1) onto the plug stem.
9. Adjust the travel as described in section 2.1.1.
Mount the actuator.

4.2.2 Plug

When exchanging the plug, check the packing (4.2) or, preferably, replace it as described in section 4.2.1.

Nominal sizes DN 15 to 150: To unscrew the plug (6) from of the plug stem extension (6.3), screw two nuts onto the protruding thread of the extension, so that you can use them to hold the plug stem extension in place.

Caution!

To prevent damage in the metal bellows version (no bellows in the version with insulated section), make sure no torque is transmitted to the bellows, which is connected to the intermediate piece.

We recommend you to use a clamping tool (see WA 029).

1. Remove the nuts (1.1).
2. Remove the intermediate piece (12) together with the plug stem extension, plug stem and plug from the valve body.
3. Use an appropriate wrench to hold the nuts stationary, which are screwed onto the plug stem extension.
Clamp the plug stem using a suitable tool and screw it out of the plug stem extension.

Caution! Do not twist the plug stem extension and the welded-on bellows!

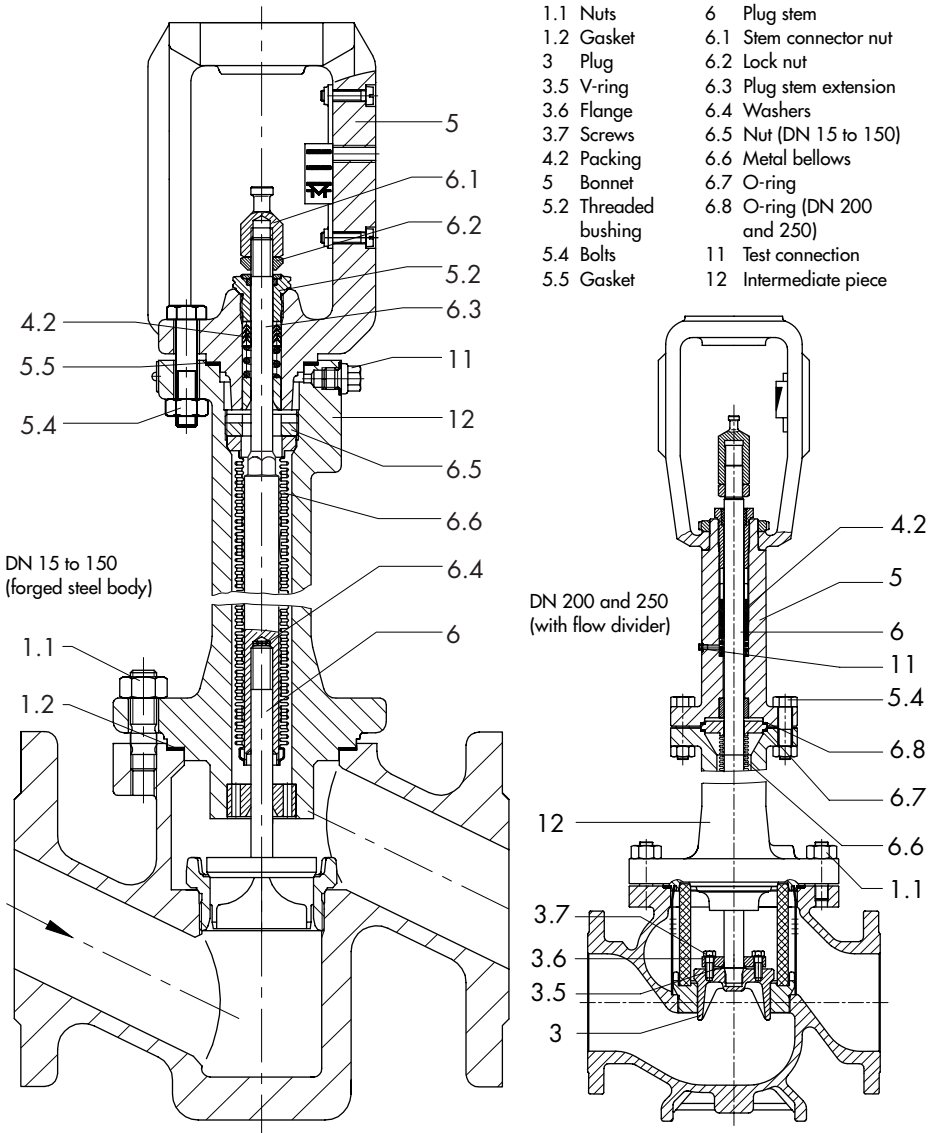


Fig. 6 · Version with metal bellows and insulating section

4. Apply lubricant (order no. 8150-0111) to the end of the plug stem (6) of the new or reworked plug (3). Check whether the two washers (6.4) are still in the plug stem extension (6.3). Screw the plug stem firmly into the plug stem extension; tightening torque is 50 Nm for \varnothing 10 mm and 80 Nm for \varnothing 16 mm.
- ▶ To complete assembly, refer to section 4.2.5.

Nominal sizes DN 200 and 250:

1. Remove the nuts (1.1).
 2. Remove the intermediate piece (12) together with the plug stem and plug from the valve body.
 3. Remove the hexagon head screws (3.7), the V-ring (3.5) and the flange (3.6).
 4. Unscrew the plug from the plug stem. To do so, use a suitable tool to hold the plug stem in place, so that the metal bellows, which is welded onto the plug stem, cannot be twisted.
 5. Screw a new plug with V-ring and flange to the plug stem.
- ▶ To complete assembly, refer to section 4.2.5.

In the version with insulating section, there are no parts 3.5, 3.6 and 3.7. Plug (3) and plug stem (6) form one piece.

4.2.3 Seat

Replace the seat (2) as described in section 4.1.2 on page 9.

4.2.4 Metal bellows

Nominal sizes DN 15 to 150:

1. Unscrew the plug (3) together with the plug stem (6) from the plug stem extension (6.3) as described for replacing the seat in section 4.2.2.
2. Unscrew the nut (6.5) using the SAMSON socket wrench (see WA 029).
3. Pull the plug stem extension with the welded-on metal bellows (6.6) out of the intermediate piece (12).
4. Clean the sealing edges on the intermediate piece.
5. Insert a new bellows into the intermediate piece and screw down the nut (6.5).



Caution!

Do not twist the metal bellows!

6. Check whether both washers (6.4) are still in the plug stem extension (6.3). Apply lubricant (order no. 8150-0111) to the thread of the plug stem and firmly screw the plug stem into the plug stem extension (6.3) with a tightening torque of 50 Nm for a plug stem diameter of 10 mm and 80 Nm for a diameter of 16 mm.

Nominal sizes DN 200 and 250:

1. Unscrew the plug (3) from the plug stem as described in section 4.2.2. Pull the plug stem (6) together with the metal bellows (6.6) upwards, out of the intermediate piece (12).
2. Replace the O-ring (6.7) and insert a new plug stem with metal bellows (6.6).
3. Screw on the plug and secure with the V-ring (3.5), flange (3.6) and screws (3.7).

4.2.5 Reassembly

1. Place the intermediate piece (12) onto the valve body (1) and secure with nuts (1.1).
2. Place the valve bonnet (5) onto the intermediate piece and secure with bolts (5.4) and nuts. Observe the tightening torques specified in WA 029.
3. Tighten the threaded bushing (5.2).
4. Loosely screw the lock nut and the nut onto the plug stem extension (6.3) or the plug stem.
5. Adjust the travel as described in section 2.1.1.
Mount the actuator.

4.3 Replacing the packing ring (or O-ring) in balanced plugs

1. Unscrew the stem connector nut and lock nut (6.1 and 6.2) from the plug stem.
2. Remove the body nuts (1.1) and carefully lift off the valve bonnet (5) with plug stem (6).
3. Screw the threaded bushing (5.2) out of the stuffing box. Pull plug stem and plug (3) out of the bonnet.
4. Check the gasket (1.2) in the valve body and, preferably, replace it.

Nominal size DN 40

5. Pull the packing (4.2), washer (4.3) and spring (4.1) out of the packing chamber using an appropriate tool. Replace damaged parts.
6. Push out the bushing (3.2) and replace the packing ring (3.1).
Clean the packing chamber thoroughly.
7. Apply lubricant (order no. 8150-0111) to the bushing (3.2) and push it in again.
8. Also apply lubricant to the packing parts, plug stem (6) and the contact surfaces of the packing ring (3.1).
9. Insert the plug stem and plug into the valve bonnet.

Completion of reassembly:

10. Carefully place the valve bonnet on the valve body and secure with nuts (1.1).
Observe the tightening torques specified in WA 029.

11. Slide the stuffing box parts over the plug stem into the packing chamber.
Make sure to keep the proper order.
12. Screw in the threaded bushing (5.2) and tighten.
13. Loosely screw the lock nut (6.2) and stem connector nut (6.1) onto the plug stem.
14. Mount the actuator as described in section 2.1. Adjust the upper and lower end of the travel range as specified in section 2.1.1.

Nominal sizes DN 50 to 150

5. Remove the screw (3.4) with its locking device and washer (3.3).
Replace the packing ring (3.1).
6. Insert washer (3.3). Thread down the screw (3.4) with its locking device.
7. Apply lubricant (order no. 8150-0111) to the packing parts, plug stem (6) and contact surfaces of the packing ring (3.1).
8. Insert the plug stem and plug into the valve bonnet.
▶ Complete reassembly as described for DN 40, steps 10 to 14.

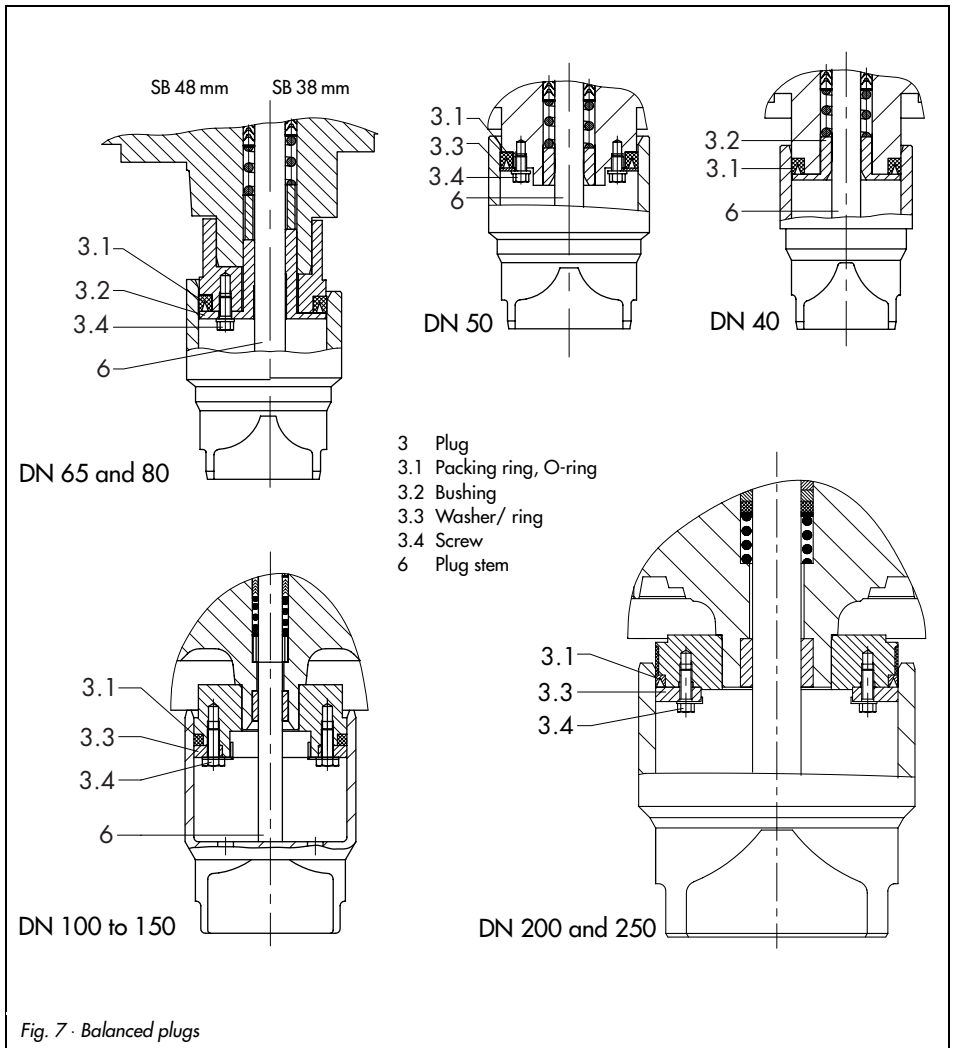
Nominal sizes DN 200 and 250:

5. Remove the screw (3.4) with its locking device.
6. Lift off the ring (3.3) and replace the packing ring or O-ring (3.1).
7. Insert ring (3.3). Thread down the screw (3.4) and its locking device.

8. Apply lubricant (order no. 8150-0111) to the packing parts, plug stem (6) and contact surfaces of the packing ring (3.1).

9. Insert the plug stem and plug into the valve bonnet.

► Complete reassembly as described for DN 40, steps 10 to 14.



5. Material identifying marks

Guide bushing, seat and plug are provided with the following identifying marks:

Guide bushing (groove on plane surface)

- ▶ No groove: WN 1.4305
- ▶ Sharp recessed groove: WN 1.4571
- ▶ Flat recessed groove: Hastelloy

Seat

The material number according to DIN is either stamped or engraved on the seat.

- ▶ Stellite seats are marked by a stamped-on "st".

Plug

Groove below the plug stem thread:

- ▶ No groove: WN 1.4006
- ▶ Sharp recessed groove: WN 1.4571
- ▶ Two sharp recessed grooves: WN 1.4301
- ▶ Flat recessed groove: Hastelloy
- ▶ When other materials are used, either the material number or its designation is engraved on the plug.

The **K_vs value and characteristic** are engraved on the plug.

- ▶ Stellite plugs are marked by a stamped-on "st".

6. Description of nameplate

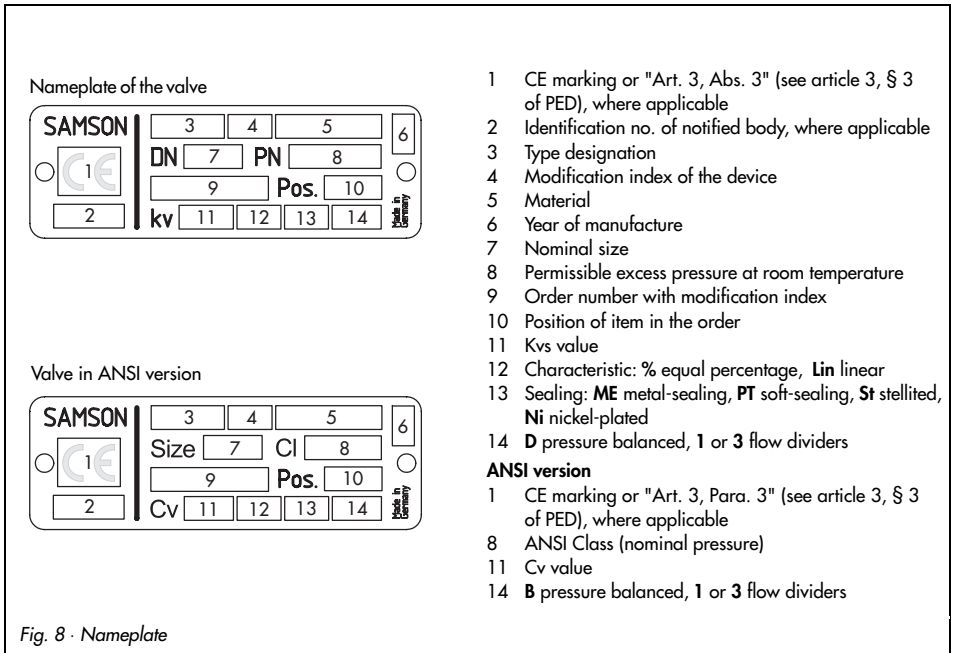


Fig. 8 - Nameplate

7. Customer inquiries

If you encounter any difficulties, please submit the following details (see nameplate):

- ▶ Order number
- ▶ Type, product number, nominal size and version of the valve
- ▶ Pressure and temperature of the process medium
- ▶ Flow rate in m³/h
- ▶ Bench range (e.g. 0.2 to 1 bar) of the actuator
- ▶ Has a strainer been installed?
- ▶ Installation drawing

Dimensions and weights

of the valve versions can be found in Data Sheet T 8015 EN.



Declaration of Conformity

(- PED - H - SAM001 - 01 - Deu
Number 5

For the following pressure equipment

Control-Valves Type 241 Product number 3241
DIN-Version
Cast-Iron-Body, from DN 150
or Ductile-Cast-Iron-Body, from DN 100

We declare conformity with the demands of the

Pressure Equipment Directive 97 / 23 / EC of May 1997
Applied Conformity Assessment Procedure
For fluids acc. to art.3 para.1
1.3.b and 1.3.a second line Module H by Bureau Veritas 0062

The Manufacturer's Quality Assurance System is monitored by following Notified Body:

Bureau Veritas S. A.

The Design is based on the methods of prEN 12 516-2 and -3
and DIN 3840

Manufacturer:

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Bearb.	24.10.01	Cp	3	34517	05.6.02	Cp	Wt	1 0 1 0 - 3 9 7 3	3	5	
Gep.	19.11.01	Kb	2	34256	22.2.02	Cp	Wt				
Norm	07.03.02	Wt	Zust.	Nr.							
Änderung								Declaration of Conformity	Änd.-Zust.		Blatt-Nr.



Declaration of Conformity

(– PED – H – SAM001 – 01 – Deu
Number 8

For the following pressure equipment

Control-Valves Type 241
Product number 3241
DIN-Version with Steel-Body

We declare conformity with the demands of the

Pressure Equipment Directive

97 / 23 / EC of May 1997

Applied Conformity Assessment Procedure
For all fluids acc. to art.3 para.1

Module H by Bureau Veritas 0062

The Manufacturer's Quality Assurance System is monitored by following Notified Body:

Bureau Veritas S. A.

The Design is based on the methods of
and

prEN 12 516 -2
DIN 3840

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Bearb.	24.10.01	Cp	3	34517	05.6.02	Cp	Wt	1 0 1 0 – 3 9 7 3	3	8
Gepr.	19.11.01	Kb	2	34256	22.2.02	Cp	Wt			
Norm	07.03.02	Wt	Zust.	Nr.						
						Änderung		Declaration of Conformity	Änd.-Zust.	Blatt-Nr.



Declaration of Conformity

(- PED - H - SAM001 - 01 - Deu
Number 9

For the following pressure equipment

Control-Valves Type 241
Product number 3241
ANSI-Version with Steel-Body

We declare conformity with the demands of the

Pressure Equipment Directive 97 / 23 / EC of May 1997
Applied Conformity Assessment Procedure
For all fluids acc. to art.3 para.1 Module H by Bureau Veritas 0062

The Manufacturer's Quality Assurance System is monitored by following Notified Body:

Bureau Veritas S. A.

The Design is based on the methods of prEN 12 516 -2
and ASME B 16.34

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Bearb.	24.10.01	Cp	3	34517	05.6.02	Cp	Wt	1 0 1 0 - 3 9 7 3	3	9
Gepr.	19.11.01	Kb	2	34256	22.2.02	Cp	Wt			
Norm	07.03.02	Wt	Zust.	Nr.						
Änderung								Declaration of Conformity	Änd.-Zust.	Blatt-Nr.



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