

# Flow and Differential Pressure Regulators Type 42-36E, Type 42-37E, and Type 42-39E

**SAMSON**

with Additional Electric Actuator  
Type 5824/25, Type 3374, and Type 3274



Type 42-36E/5824



Regulator with Type 3374 Actuator



Type 42-37E/3274

## Mounting and Operating Instructions

**EB 3018 EN**

Edition October 2006



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### **General safety instructions**

- ▶ *The flow regulators as well as the flow and differential pressure regulators must be installed, started up, and serviced only by skilled or semi-skilled staff so that employees and third persons are not exposed to danger.*
- ▶ *The regulators comply with the requirements of the European Pressure Equipment Directive 97/23/EC. The declaration of conformity issued for a valve bearing the CE marking includes information on the applied conformity assessment procedure and will be provided on request.*
- ▶ *To ensure appropriate use, only use the regulator in applications where the operating pressure and temperatures do not exceed the operating values specified in the order.  
Note that the manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.  
Take appropriate safety precautions to prevent hazards that may be caused in the regulator by the process medium, operating pressure, or moving parts.*
- ▶ *Make sure the regulator is shipped and stored properly.*

**Important!**

- ▶ Always assemble all components, including the valve, actuator, and control lines, prior to starting up the flow regulator or the flow and differential pressure regulator.  
Make sure that the control lines are open and check them for correct connection prior to start-up.
- ▶ Depressurize the sections of the plant that are connected to the control lines prior to removing the regulator from the pipeline. If this is not possible, shut off the control lines.
- ▶ Protect the regulator against frost if it is used to control freezing media.

**Notes on start-up**

- ▶ Fill the plant slowly on start-up. Make sure the orifice (2.7) is open. If necessary, cause the electric actuator to move accordingly.  
Note that actuators with fail-safe action "actuator stem extends" must be removed if there is no voltage supply.
- ▶ When carrying out a pressure test on the section of the plant equipped with a pressure regulator, prevent the diaphragm actuator from being damaged by the test pressure by using a test pressure which does not exceed the maximum permissible pressure  $\Delta p$  of the actuator. Shut off any control lines connected externally to the actuator.
- ▶ The electric actuator has been designed for use in electrical power installations. Strictly observe the relevant safety regulations for wiring and maintenance work.
- ▶ Only use disconnect devices that are protected against accidental or inadvertent reconnection.
- ▶ Take special care when making adjustments on live parts.  
Do not remove the covers under any circumstances.

**Typetest**

The Type 5825 Electric Actuator with fail-safe action has been typetested in combination with the Type 2423 Valve by the German Technical Inspectorate TÜV according to DIN 32730. Register number available on request.

## 1 Design and principle of operation

The device combinations consist of a flow regulator or a flow and differential pressure regulator and the appropriate electric actuator for the nominal valve size:

for DN 15 to 50: Type 5824 or 5825,  
for DN 65 to 100: Type 3374,  
for DN 125 to 250: Type 3274.

The valves are equipped with an adapter for connection to the electric actuator. This allows the control signal from an electric control device to be applied to change the position of the orifice plate in order to attain additional temperature control.

### Note!

For the installation and operation of the device combinations, refer to the mounting and operating instructions of the basic devices as listed in the following table.

Electric Actuator Type	Associated M & O instructions
3274	EB 8340 EN
5824/25	EB 5824 EN
3374	EB 8331-1 EN
Regulator Type	Associated M & O instructions
42-36	EB 3015 EN
42-37	EB 3017 EN
42-39	EB 3017 EN

## 2 Set point adjustment

The set point for the flow rate can be adjusted both with and without the electric actuator installed. In addition to the descriptions in the mounting and operating instructions of the basic devices, observe the following instructions to adjust the flow rate.

### 2.1 DN 15 to 50 with Type 5824/25 Actuator

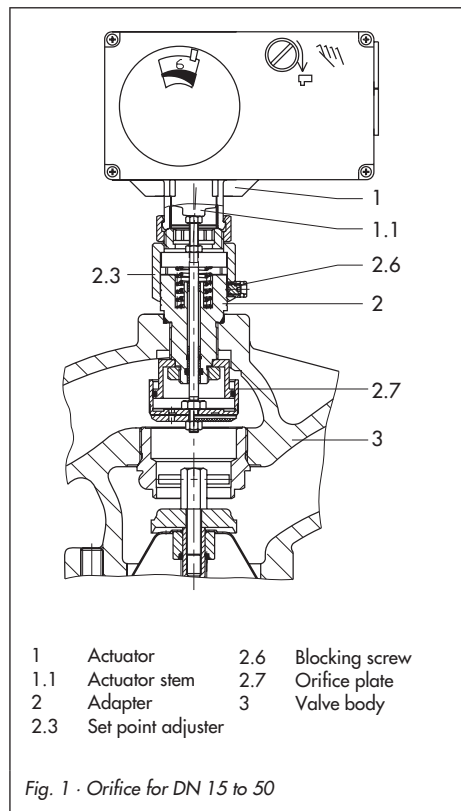


Fig. 1 · Orifice for DN 15 to 50

### Adjustment without actuator

1. Turn the set point adjuster (2.3) clockwise as far as it will go to close the orifice (2.7).
2. Determine the turns required to attain the desired flow rate from the adjustment diagrams below.
3. First, completely close the orifice. Then adjust the flow set point by turning the set point adjuster counterclockwise.
4. Check the flow rate and correct it if necessary. Secure the adjustment using the blocking screw (2.6).
5. Place the actuator on the orifice connection and fasten it using the coupling nut (tightening torque: 20 Nm).

Set point ranges in m <sup>3</sup> /h	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
Upper diff. pressure 0.2 bar	0.5 to 2	0.5 to 3	0.8 to 3.5	2 to 7	3 to 11	3 to 16
Upper diff. pressure 0.5 bar	0.8 to 3	0.8 to 4.5	1.2 to 5.3	3 to 9.5	4.5 to 16	4.5 to 24

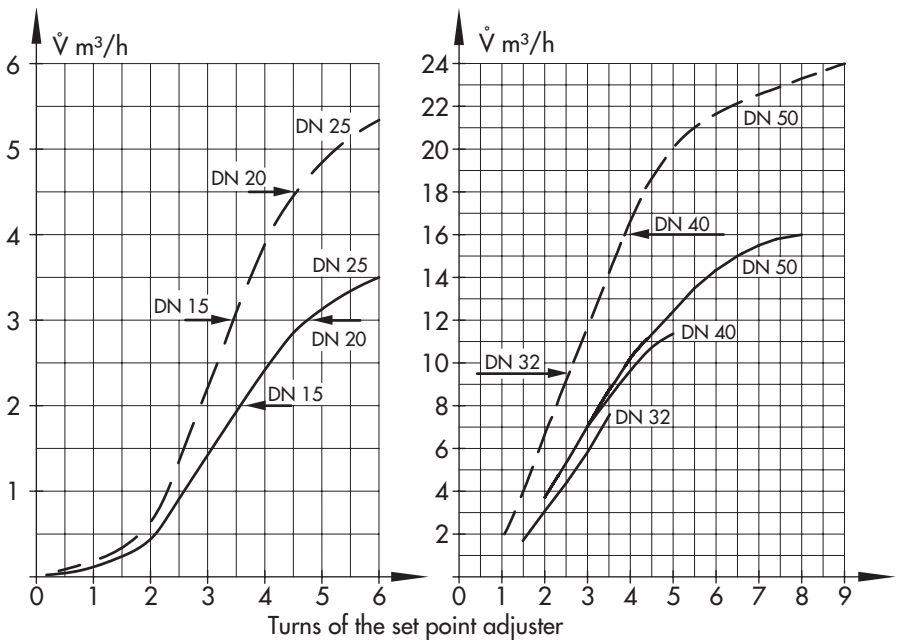


Fig. 2 · Adjustment diagrams for upper differential pressures of 0.2 bar (standard curves) and 0.5 bar (dash-line curves)

## Adjustment with actuator installed

### Type 5824 Actuator

1. Retract the actuator stem by turning the handwheel counterclockwise or by applying the appropriate control signal from the control device.
2. Continue as described for adjustment without actuator in steps 1 to 5 on page 5.

### Type 5825 Actuator

1. Switch the control device to manual operating mode. Adjust the control signal so that the actuator stem retracts all the way and the spring mechanism is compressed.

If there is no control signal, the actuator can be adjusted using the handwheel. For manual adjustment, remove the front cover. Then insert a 4 mm hexagonal wrench into the red actuating shaft and turn it counterclockwise.

Turn it only counterclockwise and only up to the point where the torque switch in the actuator is activated.

Once the solenoid has been released, the spring mechanism pushes the actuator stem back into its fail-safe position.

2. Continue as described for adjustment without actuator in steps 1 to 5 on page 5.

For more details on Types 5824 and 5825 Electric Actuators, refer to EB 5824 EN.

## 2.2 DN 65 to 100 with Type 3374 Actuator

### Adjustment without actuator

1. Loosen the lock nut (2.2) and thread it upward on the threaded rod (2.1).

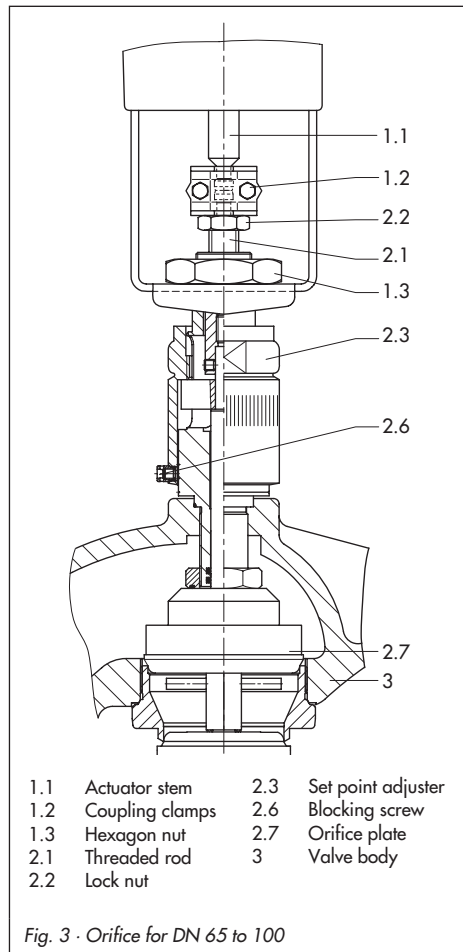


Fig. 3 · Orifice for DN 65 to 100

2. Loosen the blocking screw (2.6). Turn the set point adjuster (2.3) clockwise all the way to close the orifice (2.7).
3. Determine the turns required to attain the desired flow rate from the adjustment diagrams below.
4. Turn the set point adjuster (2.3) counter-clockwise the required number of turns.
5. Adjust the lock nut (2.2) on the threaded rod (2.1) by turning it clockwise all the way (orifice will open up to the adjusted set point).
6. Check the flow rate and correct it if necessary. Then secure the adjustment using the blocking screw (2.6).
7. Retract the actuator stem (1.1) using the manual override. Place the actuator on

Set point ranges in m <sup>3</sup> /h	DN 65	DN 80	DN 100
Upper diff. pressure 0.2 bar	5 to 28	7 to 35, 40 for 320 cm <sup>2</sup>	10 to 63
Upper diff. pressure 0.5 bar	7.5 to 40	10 to 55	15 to 90

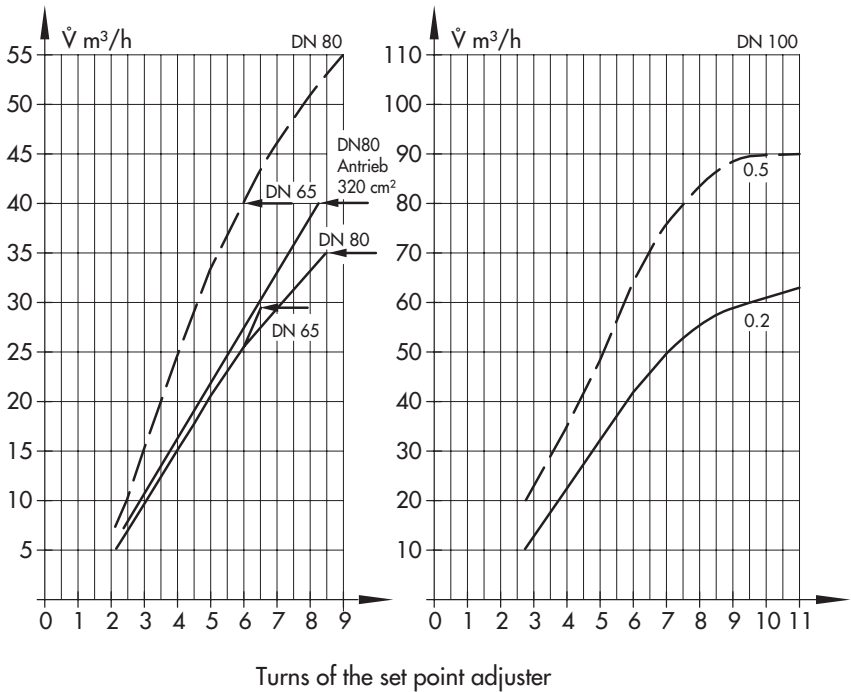


Fig. 4 · Adjustment diagrams for upper differential pressures of 0.2 bar (standard curves) and 0.5 bar (dash-line curves)

the orifice connection. Secure it by tightening the hexagon nut (1.3) to 150 Nm.

8. Extend the actuator stem all the way to the threaded rod (2.1) using the manual override.
9. Position the coupling clamps (1.2) and screw tight.
10. Thread the lock nut (2.2) all the way to the top toward the coupling clamps (1.2) and screw tight or fix it using an appropriate adhesive.

For more details on the Type 3274 Actuator, refer to EB 8331-1 EN.

### Adjustment with actuator installed

1. Extend the actuator stem (1.1) using the manual override (4-mm hexagon crank) or by means of an electric control signal all the way to close the orifice (2.7).  
The lock nut (2.2) must be screwed toward the top against the coupling clamps (1.2).
2. Turn the set point adjuster (2.3) clockwise all the way.
3. Determine the turns required to attain the desired flow rate from the adjustment diagrams, and turn the set point adjuster (2.3) counterclockwise the required number of turns.
4. Secure the adjustment using the blocking screw (2.6).

Manual changes or changes of the control signal in the direction "actuator stem retracts" will now open the orifice up to the adjusted set point.

## 2.3 DN 125 to 250 with Type 3274 Actuator

For detailed information on the Type 3274 Electric Actuator, refer to EB 8340 EN.

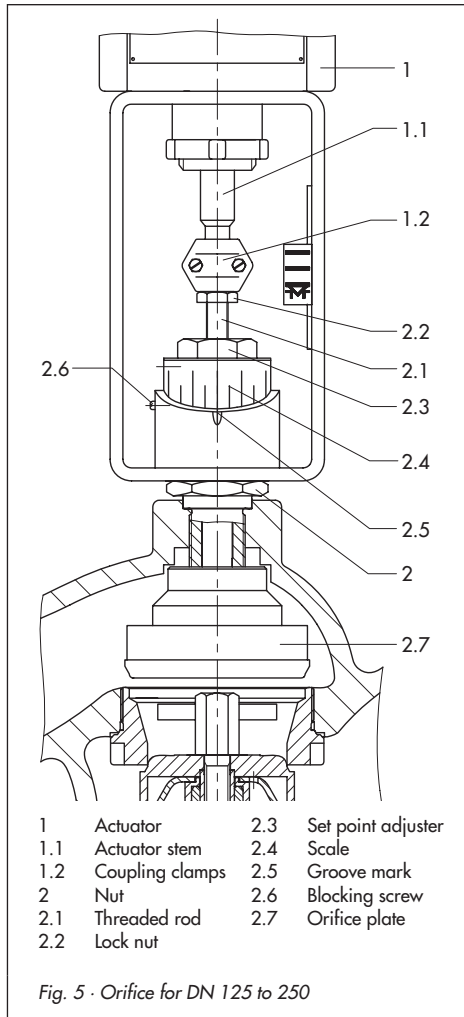


Fig. 5 : Orifice for DN 125 to 250

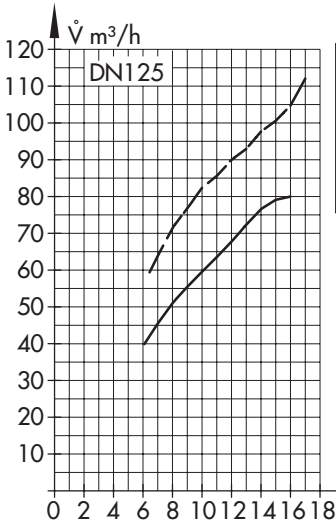


### Adjustment without actuator

1. Screw the lock nut (2.2) toward the top to the head of the threaded rod (2.1).
2. Press the threaded rod (2.1) downward to close the orifice.
3. Turn the set point adjuster (2.3) until the scale value 0 matches the red groove mark (2.5).
4. Screw the lock nut (2.2) downward against the set point adjuster (2.3).  
**Caution!** Do not twist the threaded rod. Hold the threaded rod (2.1) stationary at the flattened spot using a wrench.
5. Determine the required scale value for the desired flow rate using the adjustment diagrams on page 10.
6. Turn the hexagon nut on the set point adjuster (2.3) until the previously determined scale value matches the red groove mark (2.5) on the reference ring.
7. Check the flow rate using a water meter (heat meter) and readjust it if necessary.
8. Secure the adjustment by tightening and leading the blocking screw (2.6).
9. Screw the lock nut (2.2) on the threaded rod (2.1) upward toward the head.
10. First extend the actuator stem (1.1) manually. Then place the actuator on the yoke and screw tight.
11. Position the coupling clamps (1.2) and screw tight.
12. Screw the lock nut all the way to the top toward the coupling clamps and screw tight or fix it using an appropriate adhesive.

### Adjustment with actuator installed

1. Extend the actuator stem (1.1) of the actuator (1) by pressing the release button of the electric override (or of the control device, if set to manual position) all the way to close the orifice (2.7).
2. Remove the coupling clamps (1.2) and retract the actuator stem all the way using the override function.
3. Screw the lock nut (2.2) downward against the set point adjuster (2.3).  
**Caution!** Do not twist the threaded rod. Hold the threaded rod (2.1) stationary at the flattened spot using a wrench.
4. Determine the required scale value for the desired flow rate using the adjustment diagrams on page 10.
5. Turn the hexagon nut on the set point adjuster (2.3) until the previously determined scale value matches the red groove mark (2.5) on the reference ring.
6. Check the flow rate using a water meter (heat meter) and readjust it if necessary.
7. Secure the adjustment by tightening and leading the blocking screw (2.6).
8. Extend the actuator stem (1.1) all the way using the override function.
9. Position the coupling clamps (1.2) and screw tight.
10. Slightly retract the actuator stem so that the lock nut (2.2) remains movable. Turn the lock nut upward in the direction of the coupling clamps and screw tight or fix it using an appropriate adhesive.



Set point ranges in m <sup>3</sup> /h	DN 125	DN 150	DN 200	DN 250
Upper diff. pressure 0.2 bar	40...80	50... 120	70...180	90...220
Upper diff. pressure 0.5 bar	60...120	75... 180	100...260	120...300

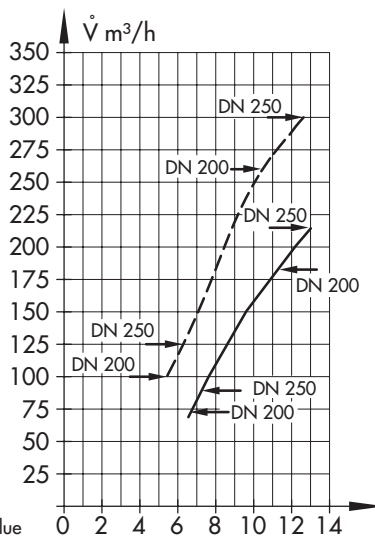
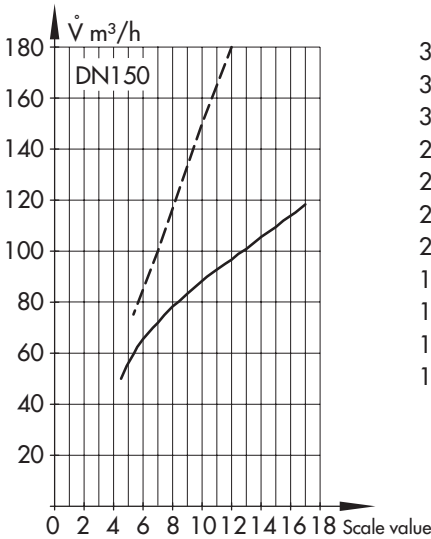


Fig. 6 - Adjustment diagrams for upper differential pressures of 0.2 bar (standard curves) and 0.5 bar (dash-line curves)





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