Electric Control Valves
Types 3214/3374, 3214/3274

Type 3214 Globe Valve balanced by a diaphragm

Type 3214/3374
Type 3214 Globe Valve balanced by a diaphragm

Mounting and Operating Instructions

EB 5868-1 EN

Edition September 2006

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General safety instructions

- *The control valve is to be mounted, started up or serviced by fully trained and qualified personnel only, 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 fulfils 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 is available on request.*
- *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 that 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 that could be caused in the control valve by the process medium, the operating pressure or by moving parts are to be prevented by means of the appropriate measures.
- *Proper shipping and appropriate storage are assumed.*

Note!

- *For installation and maintenance work on the control valve, make sure the relevant section of the plant has been depressurized and, depending on the process medium, drained as well. If necessary, allow the control valve to cool down or heat up to reach ambient temperature prior to starting any work on it.*

- *The electric actuators have been designed for use in electrical power systems. Observe the relevant safety regulations for wiring and maintenance.*
- *Only use power interruption devices that are protected against unintentional reconnection of the power supply.*
- *Take special care when making adjustments on live parts. Do not remove covers!*

1 Design and principle of operation

Fig. 1

The control valves consist of a Type 3214 Globe Valve balanced by a diaphragm and an electric or electrohydraulic actuator.

The medium flows through the globe valves in the direction indicated by the arrow on the valve body. The cross-sectional area of flow between the seat (2) and plug (3) is determined by the position of the plug stem.

The downstream pressure p_2 is applied to the inside of the Type 3214 Valve; the upstream pressure p_1 acts on the outside. The forces acting on the valve plug due to the upstream and downstream pressures are balanced by the diaphragm (4).

The plug is moved by changing the control signal applied to the actuator. For the Type 3374 Electric Actuator as well as the Type 3274 Electrohydraulic Actuator, this signal is a three-step signal or, when an additional electric positioner is used, a continuous 0 to 20 mA, 4 to 20 mA or 0 (2) to 10 V– signal.

The electric actuators can be equipped with additional accessories.

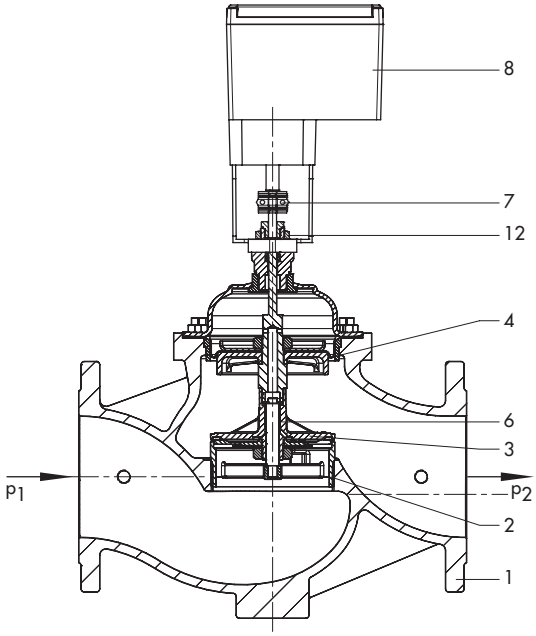
1.1 Versions

Electric control valve with **Type 3214** Globe Valve balanced by a diaphragm

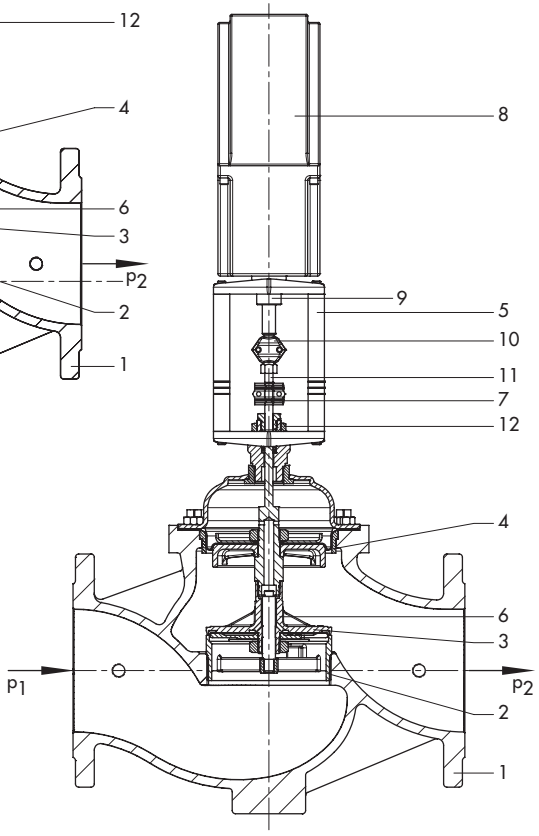
Type	PN	DN	EB*
3214/3374-10	16 to 40	125 to 250	8331-1
3214/3274-12			8340
3214/3274-16			
3214/3274-23 **			

* For details on the actuators refer to the listed mounting and operating instructions (EB).

** Type 3274-23 Actuator with fail-safe function: typetesting available on request



Type 3214/3374



Type 3214/3274

1 Valve body
2 Seat
3 Plug
4 Balancing diaphragm
5 Rod-type yoke
6 Plug stem
7 Coupling nut
8 Actuator
9 Hex nut
10 Coupling nut
11 Adapter
12 Hex nut

Fig. 1 · Principle of operation: Type 3214/3374 (top) · Type 3214/3274 (bottom)

1.2 Technical data

1. Type 3214 Globe Valve balanced by a diaphragm					
Nominal size	DN	**125**	**150**	**200**	**250**
Rated travel	mm	30	30	30	30
K_{VS}		230	340	620	750
Max. perm. diff. pressure Δp	bar	12	12	10	10
Max. perm. temperature	°C	150 (version for water) · 80 (version for non-flammable gases)			

Materials · Material numbers according to DIN EN			
Nominal pressure	**PN 16**	**PN 25**	**PN 40**
Body	EN-JL1040 or EN-JS1049 or 1.0619	EN-JS1049 or 1.0619	1.0619
Valve seat	Red brass		
Plug	Red brass with EPDM soft seal or PTFE soft seal		
Pressure balancing	EPDM balancing diaphragm		
Gasket	Graphite on metal core		

2. Actuators					
Type		**3374-10**	**3274-12**	**3274-16**	**3274-23** [1]
Safety function		Without	Without	Without	With
Rated travel	mm	30	30	30	30
Transit time at rated travel	s	240 [2]	120	120	120 [2]
Transit time for fail-safe action	s	–	–	–	43 [2]
Fail-safe action, actuator stem		–	–	–	Extends
Thrust	kN	2.5	3.0	3.0	3.0
Power consumption	VA	Max. 18	Approx. 90	Approx. 90	Approx. 90
Manual override		Mechanical	Electrical	Mechanical	Electrical
Electrical connection		24 V, 50 Hz 230 V, 50 Hz 110 V, 60 Hz	230/110/24 V, 50/60 Hz		
Perm. ambient temperature		5 to 60 °C	–10 to 60 °C		
Type of protection		IP 54 [3]	IP 65		

[1] Typetesting on request [2] Shorter transit times on request [3] IP 65 with cable gland

2 Installation

2.1 Mounting position

Install the valve in upright position into a horizontal pipeline. Make sure the direction of flow corresponds to the arrow on the valve body.

Make sure you choose a place of installation that allows you to freely access the valve even after the entire plant has been completed.
Install a strainer upstream of the valve to prevent that any sealing parts, weld spatter, and other impurities carried along by the process medium impair the proper functioning of the valve, above all the tight shut-off.

Note!
Make sure the valve body is mounted free of stress and not exposed to excessive vibration. If necessary, support the piping near the connections.
Flush the pipeline thoroughly before installation.

2.2 Strainer

Install the strainer upstream of the control valve. Make sure the direction of flow corresponds to the arrow on the valve body.
The filter element must be vertically suspended. Remember to leave enough space to remove it.

2.3 Additional mounting instructions

We recommend to install a hand-operated shut-off valve both upstream of the strainer and downstream of the valve to be able to shut down the plant for cleaning and maintenance, and when the plant is not used for longer periods of time.

3 Assembling valve and actuator

If the valve and actuator have not already been assembled by the manufacturer, or if the original actuator of a control valve is to be replaced by a different type or size, remove the transport protection and proceed as described below.

Type 3374 Actuator (Fig. 1, top)

1. Use the manual override (see section 5) to slightly retract the actuator stem into the actuator.
2. Place the actuator onto the valve body and tighten the hex nut (12) using a tightening torque of at least 100 Nm (width across flats SW 36).
3. Place the coupling nut (7) over the ends of the actuator stem and the plug stem and tighten using the two hex nuts.

Type 3274 Actuator (Fig. 1, bottom)

Required rod-type yoke: order no. 1400-8822

1. Place the rod-type yoke (5) onto the valve body and tighten the hex nut (12) using a tightening torque of at least 100 Nm.
2. Attach the adapter (11) to the plug stem (∅ 10 mm) using the coupling nut (7).
3. Place the actuator onto the rod-type yoke (5) and tighten using the hex nut (9).
4. Pull the adapter up to the actuator stem. Mount the coupling nut (10) and tighten using the hex nuts.

4 Electrical connections

Upon installation of the electrical connections, observe the regulations concerning electrical power plant systems according to DIN VDE 0100 as well as the regulations of your local power supplier.
Use a suitable power supply, which guarantees that no dangerous voltages are applied to the device in standard operation or when the plant or parts of the plant fail.

Caution!
Only connect the device to the main power network when the power is switched off.
Only use power interruption devices that are protected against unintentional reconnection of the power supply.
Particularly for 24 V, 50 Hz actuators, use wires with a sufficiently large cross-section to guarantee that the permissible voltage tolerances of ±10 % are not exceeded.

Additional electrical equipment
The actuators can be equipped with limit switches, potentiometers or positioners for input signals from 4 or 0 to 20 mA, or 2 or 0 to 10 V.

For details refer to mounting and operating instructions EB …	
Type 3374	–> EB 8331-1 EN
Type 3274	–> EB 8340 EN

Type 3374 Actuator

1. Remove the housing cover.
2. Route the connecting cables through the cable entries onto the terminals and fasten them.

   Connect the control signals of the controller to the connections **eL** and **aL**:
   - If voltage is applied to **eL**, the actuator motor retracts the actuator stem into the actuator ("Actuator stem retracts").
   - If voltage is applied to **aL**, the actuator stem is extended ("Actuator stem extends").

   Actuators operated in parallel must be controlled using separate contacts as using one common on/off contact can cause the actuators to oscillate in the end positions.
3. Remount the housing cover.

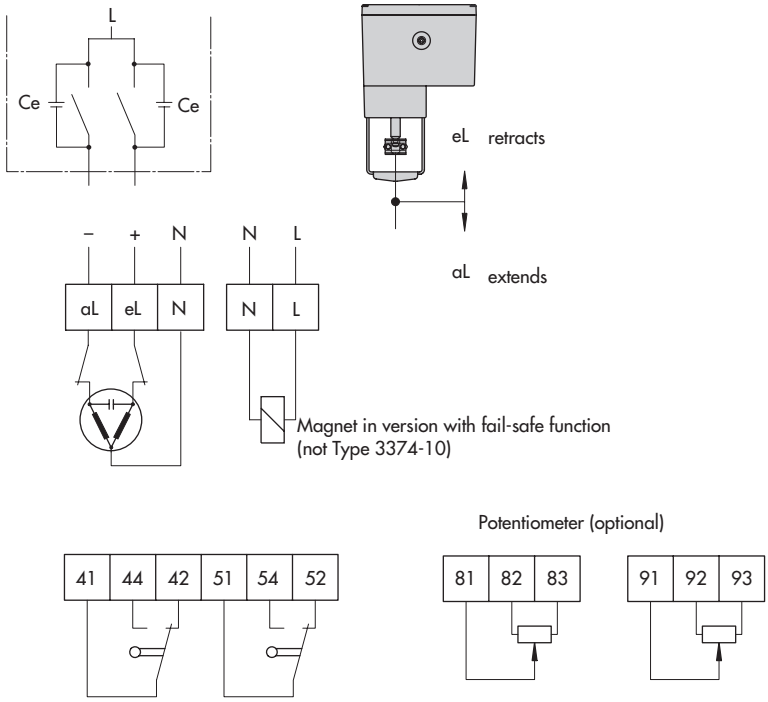


Fig. 2 · Electrical connection of Type 3374-10 with three-step signal

Type 3274 Actuator

1. Remove the housing cover on the side.
2. Route the connecting cables through the cable entries on the housing onto the terminals and fasten them.
   Voltage must always be applied to terminals N and L. If no supply voltage is applied, the actuators will remain in their last position. Actuators with fail-safe function will move to their fail-safe position.
3. Connect grounding conductors to the separate grounding conductor terminals on the inside of the housing.
4. Remount the housing cover.

Fuse:
The PCB of the motor's electronics includes a bracket with a 5 x 20 mm glass tube fuse:
for 230 V, 50 Hz = T 1 (1 A, time-lag)
for 110 V, 50 Hz = T 1.25 (1.25 A, time lag)
for 24 V, 50 Hz = T 6.3 (6.3 A, time-lag)

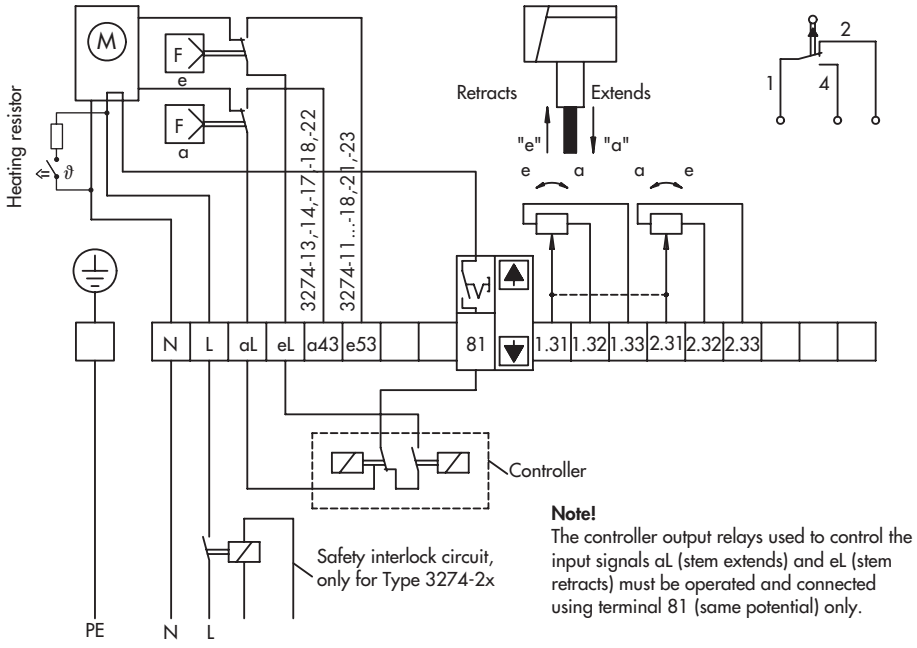


Fig. 3 · Electrical connection of Type 3274 with three-step signal

5 Operation – manual override

Type 3374 Actuator

The travel is adjusted on the red trunnion at the side of the housing using a 4 mm hexagon crank handle. Upon delivery, the crank handle is mounted on the bottom of the housing.

Type 3274 Actuator

Version with mechanical override – Types 3274-12 / -16
Press the black release button at the top of the housing. Move the rack-and-pinion gear to the desired travel position by turning the end of the shaft protruding from the housing with a hex wrench (width across flats SW 24).

The actuator returns to following the controller signal as soon as the black button is released.
If you wish the valve to remain in the manually adjusted position, open isolating terminal 81 as described in section 5.1.

Note!
Due to inner leakage, even the position of a switched-off hydraulic actuator may be changed by external or internal forces (springs). Observe this if you wish the valve to remain in OPEN position.

Version with electrical override – Type 3274-23
The two pushbuttons on the side of the housing cover can be used to retract or extend the actuator stem and thus move the control valve to the desired travel position.
The actuator returns to following the controller signal as soon as the button is released.
If you wish to deactivate the priority of the controller signal, e.g. when starting up the plant, and the valve is to remain in a certain position, open isolating terminal 81 as described in section 5.1.

5.1 Opening isolating terminal 81 (Type 3274)

1. **Switch off the voltage supply!**
2. Remove both screws and the housing cover on the side.
3. Position the screwdriver at isolating terminal 81 below the white release button. Lever up the button until it locks. The red marker pin is retracted.
   Remount the cover and switch on the voltage supply.

   The controller signal is now disconnected, allowing the valve to be moved to the desired position by pressing the **On** or **Off** key; the valve remains in the adjusted position.

To re-establish the priority of the controller signal, proceed as follows:

- Switch off the voltage supply and remove the cover.
- Firmly press the release button until it locks, so that the red marker pin becomes visible.
- Remount the cover and switch on the voltage supply.

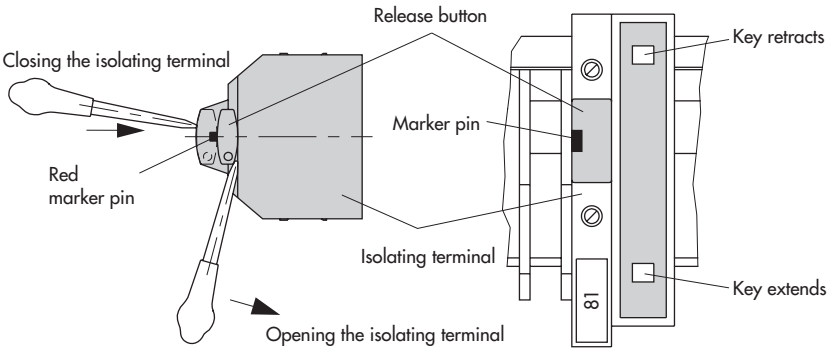


Fig. 4 · Isolating terminal (81) and key for manual override

6 Maintenance

The control valves are maintenance free. Nevertheless, they are subject to natural wear, particularly at the seat, plug, and packing. Depending on the operating conditions, the valves need to be checked at regular intervals to avoid possible malfunctions.

If external leaks occur, check the packing or balancing diaphragm and, if necessary, replace them.

If the tight shut-off of the valve is impaired, this may be due to dirt or other foreign particles being caught between the seat and plug or due to damaged facings.
We recommend to remove the affected components, clean them thoroughly, and replace them, if necessary.

Caution!
When performing any maintenance work on the valve, make sure the relevant section of the plant has been depressurized and, depending on the process medium, drained as well. If necessary, allow the control valve to cool down to reach ambient temperature. Disconnect and lock the electrical supply as well as any control signals to prevent any danger posed by moving parts.
As valves are not free of cavities, remember that residual process medium might still be contained in the valve. This applies in particular to valve versions with a balancing bellows.
We recommend to remove the valve from the pipeline.

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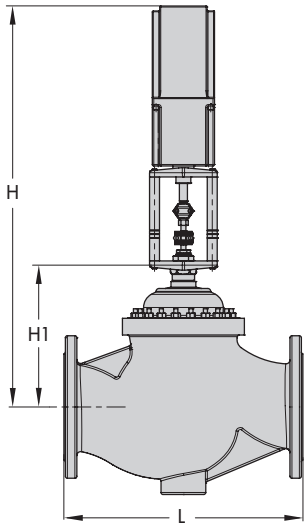
7 Dimensions in mm and weights

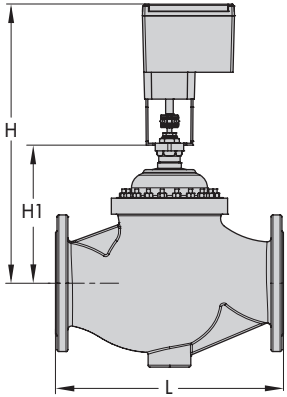
Nominal size	DN	125	150	200	250
Length L	mm	400	480	600	730
Height H1	mm	264	298	358	358
Height H	mm				
Type 3214/3274-12		774	808	868	868
Type 3214/3274-16		866	900	960	960
Type 3214/3274-23		774	808	868	868
Type 3214/3374-10		558	592	652	652
Weight (approx.) [1]	kg				
Type 3214/3274 [2]		61	81	223	233
Type 3214/3374		52	72	214	224

[1] Valves in PN 16; add 15 % for PN 25 and PN 40

[2] Add 3 kg with Type 3274-16



Type 3214/3274



Type 3214/3374

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