ACVATIX™

Electromotoric actuators

For radiator valves, MiniCombiValves (MCV) and small valves

- SSA31.. operating voltage AC 230 V  3-position control signal
- SSA81.. operating voltage AC 24 V  3-position control signal
- SSA61.. operating voltage AC / DC 24 V  DC 0…10 V control signal
- SSA61EP.. equal-percentage valve characteristic
- Nominal force 100 N
- Automatic identification of valve stroke
- Direct mounting with coupling nut, no tools required
- Basic types complete with plug-in connecting cable, length 1.5 m
- Optional cable types
  - Cable length 2.5 m and 4.5 m
  - Halogen-free cables
- Manual override and position indication
- Parallel connection of multiple actuators possible
- Auxiliary switch integrated in SSA31.1 and SSA81.1 actuators
- Optional tamper-proof fitting to prevent dismantling

Use

- For radiator valves, VDN.., VEN.., VUN.., Combi valves VPP46.., VPI46.. and MiniCombiValves, VPD.., VPE..
- For small valves, VD1..CLC
- For radiator valves with M30 x 1.5 threaded fitting, nominal closing dimension 11.6 mm and a 2.5 mm nominal stroke (without adapter). Also for use with third-party valves in conjunction with AV-type adapter
- For modulating or 3-position control in heating systems, chilled ceilings and terminal units.

### Type summary

<table>
<thead>
<tr>
<th>Type reference</th>
<th>Operating voltage</th>
<th>Run time at 50 Hz</th>
<th>Control signal</th>
<th>Connecting cable</th>
<th>Auxiliary switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSA31</td>
<td>AC 230 V</td>
<td>150 s</td>
<td>3-position</td>
<td>1.5 m</td>
<td>Yes</td>
</tr>
<tr>
<td>SSA31/00</td>
<td></td>
<td></td>
<td></td>
<td>no cable</td>
<td></td>
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<tr>
<td>SSA31.1</td>
<td></td>
<td></td>
<td></td>
<td>1.5 m</td>
<td>Yes</td>
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<tr>
<td>SSA81</td>
<td>AC 24 V</td>
<td>34 s</td>
<td>DC 0...10 V</td>
<td>1.5 m</td>
<td>Yes</td>
</tr>
<tr>
<td>SSA81/00</td>
<td></td>
<td></td>
<td></td>
<td>no cable</td>
<td></td>
</tr>
<tr>
<td>SSA81.1</td>
<td></td>
<td></td>
<td></td>
<td>1.5 m</td>
<td>Yes</td>
</tr>
<tr>
<td>SSA61</td>
<td>AC / DC 24 V</td>
<td></td>
<td></td>
<td>1.5 m</td>
<td>Yes</td>
</tr>
<tr>
<td>SSA61/00</td>
<td></td>
<td></td>
<td></td>
<td>no cable</td>
<td></td>
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<tr>
<td>SSA61EP</td>
<td></td>
<td></td>
<td></td>
<td>1.5 m</td>
<td></td>
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<tr>
<td>SSA61EP/00</td>
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<td></td>
<td></td>
<td>no cable</td>
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</tr>
</tbody>
</table>

1) For available cable lengths or terminal block connectors refer to "Accessories", page 4
2) With equal-percentage valve characteristic

### Accessories

<table>
<thead>
<tr>
<th>Type reference</th>
<th>Description</th>
<th>Operating voltage</th>
<th>Control signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASY3L25</td>
<td>Connecting cable 2.5 m</td>
<td>AC 230 V</td>
<td>3-position</td>
</tr>
<tr>
<td>ASY3L45</td>
<td>Connecting cable 4.5 m</td>
<td>AC 24 V</td>
<td></td>
</tr>
<tr>
<td>ASY8L25</td>
<td>Connecting cable 2.5 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASY8L45</td>
<td>Connecting cable 4.5 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASY8L45HF</td>
<td>Connecting cable 4.5 m, halogen-free, VDE 0207-24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASY6L25</td>
<td>Connecting cable 2.5 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASY6L45</td>
<td>Connecting cable 4.5 m</td>
<td>AC / DC 24 V</td>
<td>DC 0...10 V</td>
</tr>
<tr>
<td>ASY6L45HF</td>
<td>Connecting cable 4.5 m, halogen-free, VDE 0207-24</td>
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</tr>
<tr>
<td>ASY98</td>
<td>Retaining screw for terminal block connectors. Included in ASY99 and ASY100.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASY99</td>
<td>Terminal block connector for 3-position actuators SSA81../00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASY100</td>
<td>Terminal block connector for DC 0...10 V modulating actuators SSA61/00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AL40</td>
<td>Tamper-proof fitting to prevent dismantling of actuators</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ordering

<table>
<thead>
<tr>
<th>Type reference</th>
<th>Stock no.</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSA81/00</td>
<td>SSA81/00</td>
<td>Electromotoric actuator</td>
<td>2</td>
</tr>
<tr>
<td>ASY8L45</td>
<td>ASY8L45</td>
<td>Connecting cable</td>
<td>2</td>
</tr>
</tbody>
</table>

### Delivery

Actuators, valves and accessories are packed separately. Items are supplied individually packed.

### Rev.-No.

Overview tables, see page 9.
**Equipment combinations**

<table>
<thead>
<tr>
<th>Type reference</th>
<th>Valve type</th>
<th>( k_{vs} ) [( \text{m}^3/\text{h} )]</th>
<th>( \dot{V} ) [( \text{l}/\text{h} )]</th>
<th>PN class</th>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDN.., VEN.., VUN..</td>
<td>Radiator valves</td>
<td>0.09...1.41</td>
<td></td>
<td>PN 10</td>
<td>N2105, N2106</td>
</tr>
<tr>
<td>VPD.., VPE..</td>
<td>MCV radiator valves</td>
<td>25...483</td>
<td></td>
<td></td>
<td>N2185</td>
</tr>
<tr>
<td>VD1..CLC</td>
<td>Small valves</td>
<td>0.25...2.60</td>
<td></td>
<td></td>
<td>N2103</td>
</tr>
<tr>
<td>VPP46.., VP46..</td>
<td>Combi valves</td>
<td>30...4001</td>
<td></td>
<td>PN 25</td>
<td>N4855</td>
</tr>
</tbody>
</table>

For other radiator valves with type AV.. adapters refer to "Type summary / accessories".

**Valves from other manufacturers**

To ensure trouble-free operation of third-party valves with the SSA.. actuator, the valves must satisfy the following requirements:

- Threaded connections with coupling nut M30 x 1.5
- Nominal force \( F \leq 100 \text{ N} \)
- Dimension \( x > 9.0 \text{ mm} \)
- Dimension \( y \leq 14.5 \text{ mm} \)

**Function / mechanical design**

When the actuator is driven by DC 0...10 V control voltage or by a 3-position signal, it produces a stroke which is transmitted to the valve stem.

The description of operation in this document applies to the valve versions which are fully open when de-energized (NO).

**3-position control signal**

- Voltage at Y1: Stem retracts Valve opens
- Voltage at Y2: Stem extends Valve opens
- No voltage at Y1 and Y2: Actuator maintains its current position

**DC 0...10 V control signal**

- The valve opens / closes in proportion to the control signal at \( Y \).
- At DC 0 V, the valve is fully closed (A \( \rightarrow \) AB).
- When power supply is removed, the actuator maintains its current position.

\[ \text{Actuator is calibrated to 2.5 mm stroke of VPI46.15.L06} \]

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\( k_{vs} \) = nominal flow rate of cold water (5...30 °C) through the fully open valve \( (H_{100}) \)

\( \dot{V} \) = Nominal volume flow at 0.5 mm stroke
DC 0...10 V control signal
SSA61EP, SSA61EP/00

Combi valves VPI46../VPP46.. in combination with SSA61EP.. have an equal-percentage characteristics.

- The valve opens / closes in equal percentage ratio to the control signal at Y.
- At DC 0 V, the valve is fully closed (A → AB).
- When power supply is removed, the actuator maintains its current position.

1) Actuator is calibrated to 2.5 mm stroke of VPI46.15L06

Features and advantages

- Plastic housing
- Locking-proof, maintenance-free gear train
- Manual override with hexagonal socket wrench 3 mm
- Reduced power consumption in the holding positions
- Load-dependent switch-off in the event of overload and in stroke end positions
- Parallel operation of 6 SSA31.., 24 SSA81.. and 10 SSA61.. possible, provided the controllers’ output is sufficient
- Terminal block connectors for customer made cables available (only for use with AC 24 V and AC / DC 24 V actuators)
- Connecting cables with AC 24 V and AC 230 V connectors cannot be mixed up
- Halogen-free cables available

Accessories

Adapter type AV.. for third-party valves

Adapter types AV51 to AV61 are available for mounting the SSA.. actuators on third-party radiator valves as shown under "Type summary/accessories", page 2.

Tamper-proof fitting
AL40

Retaining screw
ASY98

Type ASY98 to secure the cable connector. Included in ASY99 and ASY100.
Terminal block connectors
ASY99
ASY100

For special cable lengths of the AC / DC 24 V actuators.
- Type ASY99 for 3-position actuators SSA81../00
- Type ASY100 for DC 0…10 V modulating actuators SSA61/00

The terminal block connectors are supplied complete with mounting instructions (74 319 0385 0).

Notes

Engineering
The actuators must be electrically connected in accordance with local regulations (refer to "Connection diagrams", page 9).

⚠️ Caution
Regulations and requirements to ensure the safety of people and property must be observed at all times!

The permissible temperatures (refer to "Technical data", page 7) must be observed. The connecting cable of the actuator may come into contact with the hot valve body, provided the temperature of the valve body does not exceed 80 °C.

Actuator types SSA 31.1 and SSA81.1 have a built-in auxiliary switch. The switch cannot be fitted in other actuators later.

Mounting
Mounting instructions (Ref. 74 319 0497 0) are enclosed in the product packaging. The actuator and valve are assembled with the coupling nut; no tools or adjustments are required.

⚠️ Caution
- Position the actuator and tighten the coupling nut manually
- Do not use any tools such as wrenches
- Avoid lateral pressure or (cable) tension on the mounted actuator!

In the case of actuators without a connecting cable (SSA../00), the separately ordered terminal block connector and connecting cable must be fitted.

Orientation

Installation
4.5…5 mm Crimp ferrule on stripped wire of connecting cable.

4891Z33
6 mm
26 mm

Commissioning
When commissioning, check the wiring and the functioning of the actuator and auxiliary switch, if fitted.

- Actuator stem extends (from position 1 to 0): Valve closes
- Actuator stem retracts (from position 0 to 1): Valve opens

Self-calibration
⚠️ Caution
During commissioning and whenever the operating voltage is switched on, the SSA61.. runs a self-calibration routine. (Valve stroke 0 → Max. stroke → Setpoint). Never intervene manually in this process.
The second or third attempt at calibration occurs automatically after an 8-minute delay. After three failed calibration attempts the actuator stem remains in the extended position and the radiator valves are closed. For valves with strokes < 1.5 mm, the actuator/valve combination locks after three failed calibration attempts.

The new Siemens type VDN.., VEN.. and VUN.. radiator valves have in all 1.5 mm stroke.

**Operation**

A 3 mm hexagonal socket wrench can be used to move the actuator to any position. However, if a control signal from the controller is present, then this takes priority in determining the position.

**Note**

To retain the manually set position, unplug the connecting cable or switch off the operating voltage and the control signal.

**Manual override**

A 3 mm hexagonal socket wrench can be used to move the actuator to any position.

**Maintenance**

The actuators are maintenance-free. When carrying out service work on the plant, following must be noted:

- Turn power off (e.g. remove the plug)
- If necessary, disconnect electrical connections from the terminals
- The actuator must be commissioned only with a correctly mounted valve in place!

**Repair**

SSA.. actuators cannot be repaired; the complete unit must be replaced.

**Disposal**

The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

**Warranty**

The technical data given for these applications is valid only when the actuators are used with the Siemens valves listed under "Equipment combinations", page 2. The use of the SSA.. actuators in conjunction with third-party valves invalidates any warranty offered by Siemens Building Technologies / HVAC Products.
## Technical data

<table>
<thead>
<tr>
<th></th>
<th>SSA31..</th>
<th>SSA81..</th>
<th>SSA61../SSA61EP..</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power supply</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating voltage</td>
<td>AC 230 V</td>
<td>AC 24 V</td>
<td>AC 24 V or DC 24 V</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>± 15%</td>
<td>± 20%</td>
<td>± 20% ± 25%</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 / 60 Hz</td>
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<tr>
<td>Max. power consumption</td>
<td>6 VA</td>
<td>0.8 VA</td>
<td>2.5 VA</td>
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<tr>
<td>Fuse for incoming cable</td>
<td>2 A, quickblow</td>
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<td></td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control signal</td>
<td>3-position</td>
<td>DC 0...10 V</td>
<td></td>
</tr>
<tr>
<td>Input impedance for DC 0...10 V</td>
<td>&gt; 100 kOhm</td>
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<td></td>
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<tr>
<td>Parallel operation (number of actuators) 1)</td>
<td>max. 6</td>
<td>max. 24</td>
<td>max. 10</td>
</tr>
<tr>
<td><strong>Functional data</strong></td>
<td></td>
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</tr>
<tr>
<td>Run time for 2.5 mm stroke at 50 Hz</td>
<td>150 s</td>
<td>34 s</td>
<td></td>
</tr>
<tr>
<td>Positioning speed</td>
<td>60 s/mm</td>
<td>13.6 s/mm</td>
<td></td>
</tr>
<tr>
<td>Nominal stroke</td>
<td>2.5 mm (max. 5.5 mm)</td>
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<td></td>
</tr>
<tr>
<td>Nominal force</td>
<td>100 N</td>
<td></td>
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<tr>
<td>Perm. temperature of medium in the connected valve</td>
<td>1...110 °C</td>
<td></td>
<td>(1...90 °C for MCV-radiator valves)</td>
</tr>
<tr>
<td>Connecting cable of basic types</td>
<td>1.5 m 3-core to EN 60320 / IEC 60227</td>
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<tr>
<td>ASY99, ASY100</td>
<td>cable diameter</td>
<td>&lt; 5 mm</td>
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</tr>
<tr>
<td>ASY3L.., ASY6L.., ASY8L..</td>
<td>wire cross section</td>
<td>0.75 mm²</td>
<td></td>
</tr>
<tr>
<td>ASY99, ASY100</td>
<td></td>
<td>0.5 mm²</td>
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</tr>
<tr>
<td><strong>Electrical connections</strong></td>
<td></td>
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<tr>
<td>ASY3L.., ASY6L.., ASY8L..</td>
<td>wire cross section</td>
<td>0.75 mm²</td>
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</tr>
<tr>
<td><strong>Norms and directives</strong></td>
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</tr>
<tr>
<td>Electromagnetic compatibility (Application)</td>
<td>For residential, commercial and light-industrial environments</td>
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<tr>
<td>Product standard</td>
<td>EN60730-x</td>
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<tr>
<td>EU Conformity (CE)</td>
<td>A5W90000891 2)</td>
<td>A5W90000893 2)</td>
<td>A5W90000892 2)</td>
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<td>A5W90000908_A 2)</td>
<td>A5W90000907_A 2)</td>
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<td>Eurasia Conformity</td>
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<tr>
<td>Protection class to EN 60730</td>
<td>II</td>
<td>III</td>
<td></td>
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<tr>
<td>Contamination level</td>
<td>EN 60730, Class 2</td>
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<tr>
<td>Housing protection</td>
<td>Upright to horizontal</td>
<td>IP40 to EN 60529</td>
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<td>Environmental compatibility</td>
<td>The product environmental declaration CE1E4893en01 2) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).</td>
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<tr>
<td><strong>Dimensions / weight</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Dimensions</td>
<td>refer to &quot;Dimensions&quot;, page 10</td>
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<tr>
<td>Coupling thread to valve</td>
<td>Coupling nut M30 x 1.5</td>
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</tr>
<tr>
<td>Weight with / without auxiliary switch</td>
<td>0.4 kg / 0.35 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing colors</td>
<td>Base RAL 7035 light gray</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Cover RAL 9003 signal white</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Auxiliary switch</strong></td>
<td>Mounted in SSA31.1 and SSA81.1</td>
<td>1 change-over switch</td>
<td></td>
</tr>
<tr>
<td>Switching point adjustable</td>
<td>0...100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting 50 %</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Switching capacity 3)</td>
<td>max. AC 250 V, 1 A (0.5 A)</td>
<td></td>
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<tr>
<td>Connecting cable (recommended)</td>
<td>H03VV-F, 2x0.5...0.75 mm²</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Provided the controller output is sufficient
2) The documents can be downloaded from [http://siemens.com/bt/download](http://siemens.com/bt/download)
### General ambient conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Operation</th>
<th>Transport</th>
<th>Storage</th>
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<tbody>
<tr>
<td>Environmental</td>
<td>EN 60721-3-3</td>
<td>EN 60721-3-2</td>
<td>EN 60721-3-1</td>
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<tr>
<td>Class</td>
<td>3K3</td>
<td>2K3</td>
<td>1K3</td>
</tr>
<tr>
<td>Temperature</td>
<td>+1...+50 °C</td>
<td>+25...+70 °C</td>
<td>-5...+50 °C</td>
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<tr>
<td>Humidity</td>
<td>5...85 % r.h.</td>
<td>&lt; 95 % r.h.</td>
<td>5...95 % r.h.</td>
</tr>
</tbody>
</table>

### Connecting cable

**ASY3L.. with SSA31..**

- 1 Red
- 2 Black
- 3 Grey
- 4 Blue
- 5 White
- 6 Black
- 7 White

Control signal CLOSE (AC 230 V)
Control signal OPEN (AC 230 V)
Neutral
System potential AC 24 V

L = 2,5 m, or 4,5 m

**ASY8L.. with SSA81..**

- 1 Red
- 2 Black
- 3 Grey
- 4 Blue
- 5 White
- 6 Black
- 7 White

Control signal CLOSE (AC 24 V)
Control signal OPEN (AC 24 V)
System potential AC 24 V

L = 2,5 m, or 4,5 m

**ASY6L.. with SSA61..**

- 1 Red
- 2 Black
- 3 Grey
- 4 Blue
- 5 White
- 6 Black
- 7 White

Control signal DC 0...10 V
System neutral (+ DC 24 V)
System potential AC/DC 24 V

L = 2,5 m, or 4,5 m

### Connection terminals

**ASY99**

- for SSA81..
- Y2
- Y1
- G

Control signal CLOSE
Control signal OPEN
System potential AC 24 V

**ASY100**

- for SSA61..
- G0
- Y
- G

System neutral
Control signal DC 0...10 V
System potential AC/DC 24 V

### Terminals for auxiliary switches

**SSA31.1, SSA81.1**

Factory setting: 50 %
0...50 % Q11 → Q12
50...100 % Q11 → Q14

The switching point can be adjusted by turning the switching cam with a screwdriver (see Mounting Instructions).
Recommended connecting cable: H03VV-F, 2x0.5…0.75 mm².
Connection diagrams

SSA31..  
L  
2AF  
Q1  
N  
Q2  
(N)  
Y1  
(Y1)  
Y2  
(Y2)  
N

AC 230 V

Y

Controller

Actuator

System potential AC 230 V

System neutral

Control signal OPEN, CLOSE

Controller contacts

SSA81..  
SP  
2AF  
Q1  
(G)  
Q2  
(G0)  
Y1  
(Y1)  
Y2  
(Y2)  
N

AC 24 V

Y

Controller

Actuator

System potential AC 24 V

System neutral

Control signal OPEN, CLOSE

Controller contacts

SSA61..  
SP (-)  
2AF  
(G)  
(Y)  
(G0)  
N

AC 24 V (DC 24 V)

Y

Controller

Actuator

System potential AC 24 V

System neutral

Control signal
**Dimensions**

**Dimensions in mm**

**Actuator without auxiliary switch**
SSA31..
SSA81..
SSA61..

**Actuator with auxiliary switch**
SSA31.1..
SSA81.1..

<table>
<thead>
<tr>
<th>Type reference</th>
<th>Valid from Rev.-No.</th>
<th>Type reference</th>
<th>Valid from Rev.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSA31</td>
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