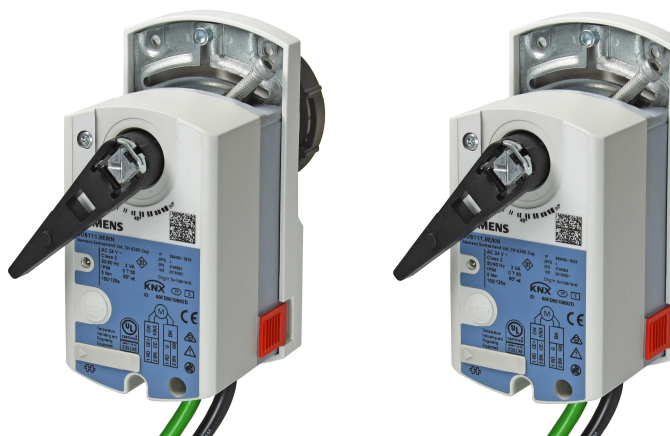


ACVATIX™

Rotary actuator for ball valves KNX / PL-Link

G..B111.9E/KN



Rotary actuator 5 / 10 Nm with KNX communication for 6-port control ball valves and ball valves

- GDB111.9E/KN with 5 Nm nominal torque
- GLB111.9E/KN with 10 Nm nominal torque
- Operating voltage AC 24 V
- Supports KNX S-Mode and PL-Link
- For use with VWG41.. 6-port control ball valves and with 2-port and 3-port ball valves up to DN 25 / DN 50

| Feature | Description |
|----------------------|---|
| Communication | <ul style="list-style-type: none"> - KNX-TP, galvanically separated - Max. 256 nodes per line (with repeaters) - Busload 5 mA |
| Functions | <ul style="list-style-type: none"> - Setpoint and actual value for actuator position 0..100% - Operating mode "heating / cooling control" for 6-port control ball valve or operating mode "position control" for 2-/3-port control ball valves - Override control with binary communication objects - Setpoint monitoring and backup mode |

| Product no. | Ordering no. | Operating voltage | Control signal | Power consumption | Running time | Manual override | Position feedback |
|---------------------|--------------|-------------------|----------------|--|--------------|-----------------|-------------------|
| GDB111.9E/KN | S55499-D203 | AC 24 V | KNX-TP | 1 VA / 0.5 W 3 VA / 2.5 W ¹⁾ | 150 s | Yes | Yes |
| GLB111.9E/KN | S55499-D207 | | | | | | |

¹⁾ Actuator rotates

Ordering information (example)

| Product no. | Ordering no. | Description | Volume |
|--------------|--------------|--|--------|
| GDB111.9E/KN | S55499-D203 | Rotary actuator KNX for 6-port ball valve or control ball valves | 1 |

Equipment combinations

| 6-port control ball valves PN16 | | | | GDB..9E.. | |
|---------------------------------|-------|-------------------------------------|----|-------------------------|--|
| Medium: 5...90 °C | G..B | k _{vs} [m ³ /h] | DN | Δp _{max} [kPa] | |
| VWG41.10.. | G ½ B | 0.25 ..1.9 | 10 | 200 | |
| VWG41.20.. | G 1 B | 0.25 ..4.25 | 20 | 200 | |

| 2- and 3-port control ball valves PN40 | | | | | | GDB..9E | | GLB..9E | |
|--|--------|---------------------|---------|------------------------------|----|------------------|--------------|------------------|--------------|
| internally threaded | Rp | externally threaded | G..B | k_{vs} [m ³ /h] | DN | Δp_{max} | Δp_s | Δp_{max} | Δp_s |
| 2-port control ball valves | | | | | | | | | |
| – | – | VAG61.15.. | G 1 B | 1...6.3 | 15 | 350 | 1400 | - | - |
| VAI61.15.. | Rp ½" | – | – | 1...10 | 15 | | | | |
| VAI61.20.. | Rp ¾" | VAG61.20.. | G 1 ¼ B | 4...10 | 20 | | | | |
| VAI61.25.. | Rp 1" | VAG61.25.. | G 1 ½ B | 6.3...16 | 25 | - | - | 350 | 1000 |
| VAI61.32.. | Rp 1¼" | VAG61.32.. | G 2 B | 10...25 | 32 | | | | |
| VAI61.40.. | Rp 1½" | VAG61.40.. | G 2 ¼ B | 16...40 | 40 | | | | |
| VAI61.50.. | Rp 2" | VAG61.50.. | G 2 ¾ B | 25...63 | 50 | | | | 600 |
| 3-port control ball valves | | | | | | | | | |
| VBI61.15.. | Rp ½" | VBG61.15.. | G 1 B | 1.6...6.3 | 15 | 350 | - | - | - |
| VBI61.20.. | Rp ¾" | VBG61.20.. | G 1 ¼ B | 4...6.3 | 20 | | | | |
| VBI61.25-10 | Rp 1" | VBG61.25-10 | G 1 ½ B | 10 | 25 | | | | |
| VBI61.32-16 | Rp 1¼" | VBG61.32-16 | G 2 B | 16 | 32 | - | - | 350 | - |
| VBI61.40-25 | Rp 1½" | VBG61.40-25 | G 2 ¼ B | 25 | 40 | | | | |
| – | – | VBG61.50-40 | G 2 ¾ B | 40 | 50 | | | | |
| VBI61.50.. | Rp 2" | – | – | 40...63 | 50 | | | | |

Cf. section "product documentation" for datasheet numbers

| Open/close 2-port and changeover ball valves 3-port PN 40 | | | | | | GDB..9E | | GLB..9E | |
|---|--------|---------------------|---------|------------------------------|----|------------------|--------------|------------------|--------------|
| internally threaded | Rp | externally threaded | G..B | k_{vs} [m ³ /h] | DN | Δp_{max} | Δp_s | Δp_{max} | Δp_s |
| Open/close 2-port ball valves | | | | | | | | | |
| – | – | VAI60.15-9 | G 1 B | 9 | 15 | 350 | 1400 | - | - |
| VAI60.15-15 | Rp ½" | – | – | 15 | 15 | | | | |
| – | – | VAG60.20-17 | G 1 ¼ B | 17 | 20 | | | | |
| VAI60.20-22 | Rp 1" | – | – | 22 | 20 | - | - | 350 | 1000 |
| VAI60.25-22 | Rp 1" | VAG60.25-22 | G 1 ½ B | 22 | 25 | | | | |
| VAI60.32-35 | Rp 1¼" | VAG60.32-35 | G 2 B | 35 | 32 | | | | |
| VAI60.40-68 | Rp 1½" | VAG60.40-68 | G 2 ¼ B | 68 | 40 | - | - | 350 | 800 |
| VAI60.50-96 | Rp 2" | VAG60.50-96 | G 2 ¾ B | 96 | 50 | | | | 600 |
| Changeover ball valves 3-port | | | | | | | | | |
| VBI60.15-5L | Rp ½" | – | – | 5 | 15 | 350 | - | - | - |
| VBI60.20-9L | Rp 1" | – | – | 9 | 20 | | | | |
| VBI60.25-9L | Rp 1" | – | – | 9 | 25 | | | | |
| VBI60.32-13L | Rp 1¼" | – | – | 13 | 32 | - | - | 350 | - |
| VBI60.40-25L | Rp 1½" | – | – | 25 | 40 | | | | |
| VBI60.50-37L | Rp 2" | – | – | 37 | 50 | | | | |
| – | – | VBG60.15-8T | G 1 B | 8 | 15 | 350 | - | - | - |
| VBI60.15-12T | Rp ½" | – | – | 12 | 15 | | | | |
| – | – | VBG60.20-13T | G 1 ¼ B | 13 | 20 | | | | |
| VBI60.20-16T | Rp 1" | – | – | 16 | 20 | - | - | 350 | - |
| – | – | VBG60.25-13T | G 1 ½ B | 13 | 25 | | | | |
| VBI60.25-16T | Rp 1" | – | – | 16 | 25 | | | | |
| VBI60.32-25T | Rp 1¼" | VBG60.32-25T | G 2 B | 25 | 32 | - | - | 350 | - |
| VBI60.40-49T | Rp 1½" | VBG60.40-49T | G 2 ¼ B | 49 | 40 | | | | |
| VBI60.50-73T | Rp 2" | VBG60.50-73T | G 2 ¾ B | 73 | 50 | | | | |

Cf. section "product documentation" for datasheet numbers

| Controllers and room units | Product no. | Ordering no. | Documentation |
|-----------------------------|--|---|------------------------|
| Room thermostat KNX | RDG160KN | S55770-T297 | A6V10629627 (N3191) |
| Flush-mount room sensor KNX | AQR2532NNW with AQR2570NF or AQR2576NF | S55720-S136 S55720-S203 S55720-S207 | A6V10389050 (N1411) |
| Room control unit | UP227/11 | 5WG1227-2AB11 | A6V10387579 |

Software versions

G..B111.9E/KN series B are designed for using ETS device profile v2.x. ETS device profile v1.x is supported for backward compatibility reasons.

| Series information | Series A | Series B |
|-------------------------|-------------------|-----------|
| Production period | 12/2015 – 01/2017 | 01/2017 |
| ETS device profile v1.x | supported | supported |
| ETS device profile v2.x | not supported | supported |

Note: The Software-Tools ACS931 / 941 and the handheld tool AST20 are not supported by the GDB111.9E/KN and GLB111.9E/KN.

| Title | Topic | Document ID |
|---|--|---------------------------------------|
| Communication via the KNX bus | Communication via the KNX bus | A6V10075840 (P3127) |
| Mounting instruction | Mounting instructions rotary actuator | A6V10523083 (M4657) or A6V10636144 |
| Datasheet 6-port control ball valve | Technical information on 6-port control ball valves VWG41.. | A6V10564480 |
| Datasheet 2-port and 3-port control ball valves, PN 40, with internally threaded connection | Technical information on 2-port and 3-port control ball valves VAI61... and VBI61.. | N4211 |
| Datasheet 2-port and 3-port control ball valves, PN 40, with externally threaded connection | Technical information on 2-port and 3-port control ball valves VAG61... and VBG61.. | N4212 |
| Datasheet 2-port shutoff valves and 3-port changeover ball valves, PN 40, with internally threaded connection | Technical information on 2-port shutoff and 3-port changeover ball valves VAI60... and VBI60.. | N4213 |
| Datasheet 2-port shutoff valves and 3-port changeover ball valves, PN 40, with externally threaded connection | Technical information on 2-port shutoff and 3-port changeover ball valves VAG60... and VBG60.. | N4114 |

How to obtain documentation and product-related software

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:

<http://siemens.com/bt/download>

The ETS device profile can be downloaded at the following Internet address:

<http://siemens.com/hvac-td>

Push-button operation

| Activity | Push-button operation | Confirmation |
|---------------------------------------|--------------------------|--|
| Enter / leave addressing mode | Press button <1 s | LED turns red or gets off |
| Reset to factory settings | Press button >20 s | LED flashes orange until device restarts |
| PL-Link connection test ¹⁾ | Press key >2 s and <20 s | LED flashes 1x orange |

¹⁾ Function or part of the function available in PL-Link operation only

LED colors and patterns

| Color | Pattern | Description |
|--------|----------|--|
| Off | --- | Fault free operation or device not powered |
| Green | steady | Connection test successful ¹⁾ |
| Orange | flashing | a) Factory reset in progress b) When a connection test was triggered: wait ¹⁾ |
| Red | steady | a) Device is in programming/addressing mode b) When a connection test was triggered: Connection test failed ¹⁾ |

¹⁾ Function or part of the function available in PL-Link operation only

Addressing and bus test with push button

The rotary actuators can be set into addressing/programming mode by push-button:

- Press push button (<1 s)
- KNX bus wiring OK → LED turns red until addressing/programming is finished
- KNX bus wiring not OK → LED stays dark

Reset with push button

The rotary actuators can be reset by push-button:

- Press push button >20 s
- LED flashes orange
- Device restarts

All parameters are reset to the default values.

The following operating modes are available:

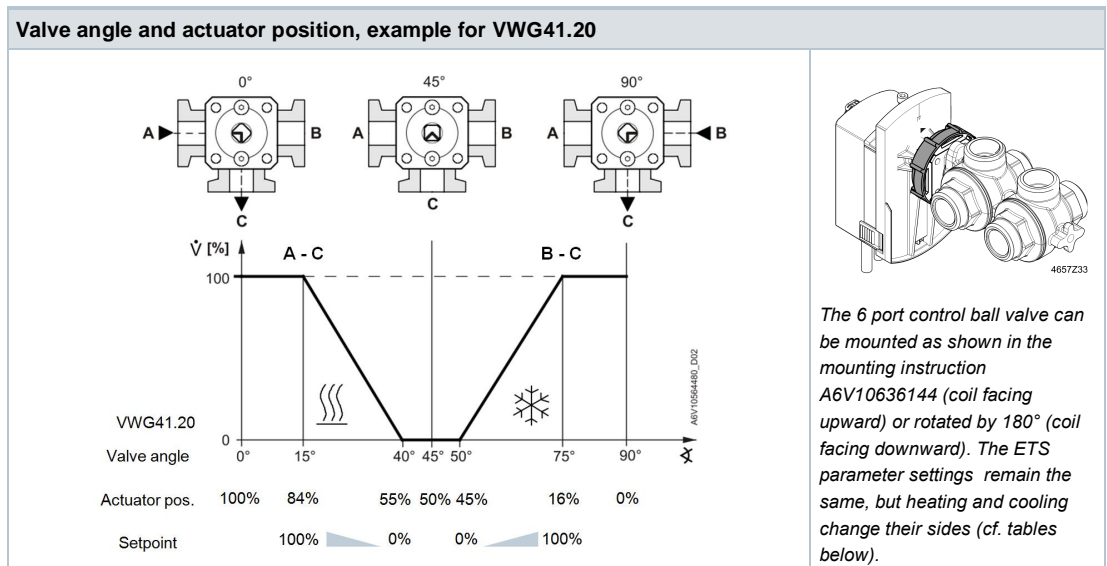
- Heating / cooling control: The actuator uses two separate setpoints for heating and cooling each with a range 0...100%.
- Position control: The actuator is controlled with a 0...100% position setpoint.

Operating mode “Heating / cooling control”

When using “heating / cooling control” the parameters as listed below are available. Parameter sets for 6-port control ball valves DN 10 and DN 20 can be selected. Details on the characteristic curves of these two valves can be found in the datasheet A6V10564480.

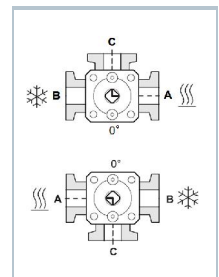
Note that the valve angle [°] moves counter-clockwise, whereas the actuator position [%] moves clockwise. Therefore valve angle 15° is achieved by an actuator position of 84% etc.

One of the two setpoints (heating or cooling) needs to be “0%” in order for the actuator to be able to move. Are both setpoints not equal to “0%”, the actuator doesn’t move until the setpoint conflict is resolved.



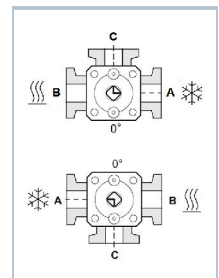
Parameters for standard piping of heating / cooling:

| Parameter | VWG41.10 | | VWG41.20 | |
|-----------------------|-------------|-------------------|-------------|-------------------|
| | Valve angle | Actuator position | Valve angle | Actuator position |
| Max. position heating | 15° | 84% | 15° | 84% |
| Min. position heating | 30° | 67% | 40° | 55% |
| Closed position | 45° | 50% | 45° | 50% |
| Min. position cooling | 60° | 33% | 50° | 45% |
| Max. position cooling | 75° | 16% | 75° | 16% |



By parameter inversion, heating and cooling are swapped:

| Parameter | VWG41.10 | | VWG41.20 | |
|-----------------------|-------------|-------------------|-------------|-------------------|
| | Valve angle | Actuator position | Valve angle | Actuator position |
| Max. position heating | 15° | 16% | 15° | 16% |
| Min. position heating | 30° | 33% | 40° | 45% |
| Closed position | 45° | 50% | 45° | 50% |
| Min. position cooling | 60° | 67% | 50° | 55% |
| Max. position cooling | 75° | 84% | 75° | 84% |



Operating mode “Position control”

Parameters available in “position control”:

| Parameter | Range | Description | Factory setting |
|-------------------|------------------|--------------------------------------|-----------------|
| Opening direction | CW (R) / CCW (L) | Opening direction of the actuator | CW (R) |
| Max. position | 0...100% | Setting for the upper position limit | 100% |
| Min. position | 0...100% | Setting for the lower position limit | 0% |

Parameterization of the KNX bus integration

The following parameters are usually checked and set by the systems integrator to achieve the right level of bus traffic generated by the actuator or to define the behavior in case of communication interruption. Parameters in the group “advanced” can be left unchanged unless a special configuration is required.

Parameter group “Standard”:

| Parameter | Range | Description | Factory setting |
|----------------|---------------------------------------|--|-----------------|
| Backup timeout | 0...60 min 0 min = disabled | Time interval to detect communication interruption. If disabled, the actuator controls to the last received setpoint until a new setpoint is received. | 30 min. |
| Backup mode | Backup position Keep last position | Actuator behavior when the communication timeout has been exceeded (no setpoint received within the defined time interval). <ul style="list-style-type: none">• Backup position: Actuator drives to defined position• Keep last position: Actuator keeps position | Backup position |
| Backup value | 0...100% | Position the actuator drives to in case of communication interruption | 50% |

Parameter group “Advanced”:

| Parameter | Range | Description | Factory setting |
|--|------------|---|-----------------|
| Hysteresis (COV) actuator position ¹⁾ | 1...20% | Threshold for the actuator position. COV below this value are not sent over the bus | 1% |
| Min. repetition time actuator position | 10...900 s | Minimum waiting time until a COV above the hysteresis threshold is sent over the bus | 10 s |
| Override position 1 | 0...100% | Position to which the actuator drives if the associated group object is triggered (override priority) | 0% |
| Override position 2 | 0...100% | Position to which the actuator drives if the associated group object is triggered (override priority) | 100% |

¹⁾ COV = Change of value

Safety

Caution

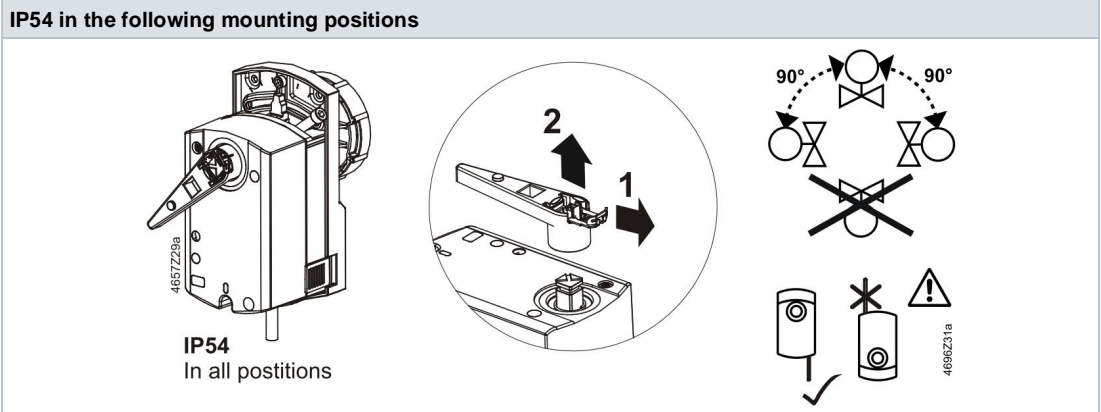
National safety regulations

Failure to comply with national safety regulations may result in personal injury and property damage.

- Observe national provisions and comply with the appropriate safety regulations.

Mounting

Mounting positions



Maintenance

The rotary actuators are maintenance-free.

Disconnect the electrical connections from the terminals if you want to work at the device.

Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive 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.

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Note

When using the actuators in connection with components of other manufacturers, correct functioning must be ensured by the user, and Siemens will assume no responsibility.

| Nr. | Name in ETS | Object function | Flags | | | | | Data point type KNX | | | | Range |
|-----|--|-----------------|-------|---|---|---|---|---------------------|------------|--------|------|--|
| | | | C | R | W | T | U | ID | DPT_Name | Format | Unit | |
| 1 | Fault information | Transmit | 1 | 1 | 0 | 1 | 0 | 219.001 | _AlarmInfo | 6 Byte | --- | [0...255] = Log Nr. [0...2] = Alarm priority [0...14] = Application area [0...4] = Error class [0...7] = Attributes [0...7] = Alarm status |
| 2 | Fault state | Transmit | 1 | 1 | 0 | 1 | 0 | 1.005 | _Alarm | 1 bit | --- | 0 = No alarm 1 = Alarm |
| 3 | Fault transmission | Receive | 1 | 0 | 1 | 0 | 1 | 1.003 | _Enable | 1 bit | --- | 0 = Disable 1 = Enable |
| 4 | Setpoint position / Setpoint pos. heating ¹⁾ | Receive | 1 | 1 | 1 | 0 | 1 | 5.001 | _Scaling | 1 Byte | % | 0..100% |
| 5 | Actual position / Actual position heating ¹⁾ | Transmit | 1 | 1 | 0 | 1 | 0 | 5.001 | _Scaling | 1 Byte | % | 0..100% |
| 6 | Setpoint pos. cooling ¹⁾ | Receive | 1 | 1 | 1 | 0 | 1 | 5.001 | _Scaling | 1 Byte | % | 0..100% |
| 7 | Actual position cooling ¹⁾ | Transmit | 1 | 1 | 0 | 1 | 0 | 5.001 | _Scaling | 1 Byte | % | 0..100% |
| 8 | Fault | Transmit | 1 | 1 | 0 | 1 | 0 | 1.005 | _Alarm | 1 bit | --- | 0 = No alarm 1 = Alarm |
| 9 | Override position 1 | Receive | 1 | 1 | 1 | 0 | 1 | 1.003 | _Enable | 1 bit | --- | 0 = Disable 1 = Enable |
| 10 | Override position 2 | Receive | 1 | 1 | 1 | 0 | 1 | 1.003 | _Enable | 1 bit | --- | 0 = Disable 1 = Enable |

¹⁾ For operating mode "heating / cooling control"

| Power supply | | |
|--|--|---|
| Operating voltage | G..B111.9E/KN | AC 24 V ± 20% (SELV) or AC 24 V class 2 (US) |
| Frequency | | 50/60 Hz |
| Power consumption | at 50 Hz | |
| | Actuator holds | 1 VA / 0.5 W |
| | Actuator rotates | 3 VA / 2.5 W |
| Function data | | |
| Positioning time for nominal rotation angle | G..B111.9E/.. | 150 s (50 Hz) 120 s (60 Hz) |
| Nominal torque | GDB.. | 5 Nm |
| Maximum torque | GDB.. | < 7 Nm |
| Nominal / maximum rotation angle | | 90° / 95° ± 2° |
| Direction of rotation | Adjustable over bus (operating mode "position control") | Clockwise (CW) / Counter-clockwise (CCW) |
| Connection cables | | |
| Cable length | | 0.9 m |
| Power supply | Number of cores and cross-sectional area | 2 x 0.75 mm ² |
| Communication | Number of cores and cross-sectional area | 2 x 0.75 mm ² |

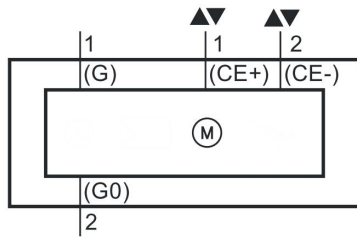
| Communication | | |
|--|--|---|
| Communication protocol | Connection type | KNX-TP (el. isolated) |
| | Bus load | 5 mA |
| Degree of protection | | |
| Degree of protection | Degree of protection acc. to EN 60529 (see mounting instruction) | IP54 |
| Safety class | Safety class acc. to EN 60730 | III |
| Environmental conditions | | |
| Applicable standard | | IEC 60721-3-x |
| Operation | Climatic conditions | Class 3K5 |
| | Mounting location | Indoors |
| | Temperature general | 0...50 °C |
| | Humidity (noncondensing) | 5...95 % r. F. |
| Transport | Climatic conditions | Class 2K3 |
| | Temperature | -25...70 °C |
| | Humidity | 5...95 % r. h. |
| Storage | Climatic conditions | Class 1K3 |
| | Temperature | -5...45 °C |
| | Humidity | 5...95 % r. h. |
| Directives and Standards | | |
| Product standard | | EN 60730-x |
| Product family standard | | EN 50491-2, EN 50491-3, EN 50491-5 General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) |
| Electromagnetic compatibility (Application) | | For residential, commercial and industrial environments |
| EU Conformity (CE) | | A5W00003842 ¹⁾ |
| RCM Conformity | | A5W00003843 ¹⁾ |
| UL, cUL | AC 24 V | UL 873 http://ul.com/database |
| Environmental compatibility | | |
| The product environmental declaration A6V10209938 ¹⁾ contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal). | | |
| Dimensions / Weight | | |
| Weight | Without packaging | 0.6 kg |
| Dimensions | | 71 x 158 x 61 mm |

¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>

Internal diagram / Power supply and communication cables

The KNX rotary actuator is supplied with two prewired power supply and communication cables.

G..B111.9E/KN



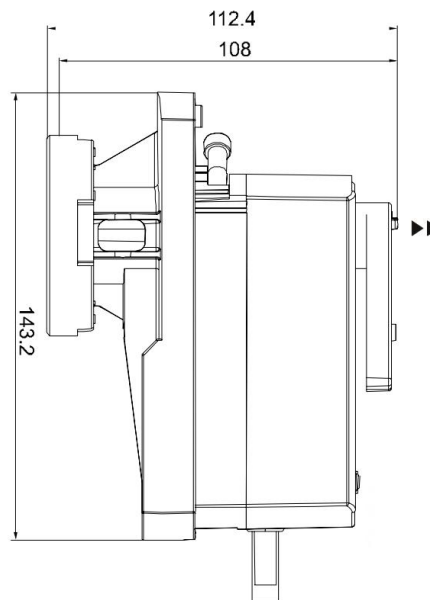
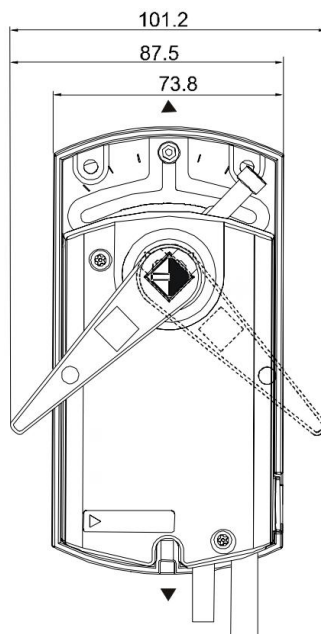
| Core desig. | Core color | Terminal code | Description |
|----------------------------------|------------|---------------|------------------------|
| Cable 1: Power / black sheathing | | | |
| 1 | red (RD) | G | System voltage AC 24 V |
| 2 | black (BK) | G0 | System neutral AC 24 V |
| Cable 2: KNX / green sheathing | | | |
| 1 | red (RD) | CE+ | KNX CE+ |
| 2 | black (BK) | CE- | KNX CE- |

Note

The operating voltage at terminals G and G0 must comply with the requirements under SELV or PELV.

Safety transformers with twofold insulation as per EN 61558 required; they must be designed to be on 100 % of the time.

G..B111.9E/KN



Minimum distance from walls or ceilings during mounting, wiring, operation, etc.

▶ = > 100 mm

▶▶ = > 200 mm

Dimensions in mm

Issued by
Siemens Switzerland Ltd
Building Technologies Division
International Headquarters
Theilerstrasse 1a
6300 Zug
Switzerland
Tel. +41 58-724 24 24
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