

**Dimming actuator, 1-gang**

Order-No. : 2171 00

Dimming actuator, 2-gang

Order-No. : 2172 00

Dimming actuator, 4-gang

Order-No. : 2174 00

Operating instructions**1 Safety instructions**

Electrical equipment may only be installed and fitted by electrically skilled persons.

Failure to observe the instructions may cause damage to the device and result in fire and other hazards.

Danger of electric shock. Device is not suitable for disconnection from supply voltage. The load is not electrically isolated from the mains even when the output is switched off.

Danger of electric shock. Before working on the device or before exchanging light bulbs, disconnect mains voltage and switch off circuit breakers.

Do not connect any lights with integrated dimmers. Device can be damaged.

Do not connect any electronic lamps, e.g. switchable or dimmable compact fluorescent lamps or LED lamps. Device can be damaged.

Fire hazard. For operation with inductive transformers, each transformer must be fused on the primary side in accordance with the manufacturer's instructions. Only safety transformers according to EN 61558-2-6 may be used.

These instructions are an integral part of the product, and must remain with the end customer.

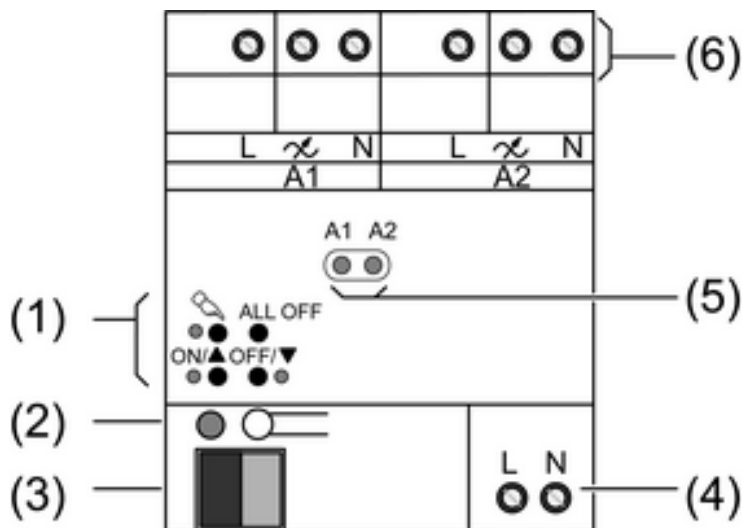
2 Device components

Figure 1: View of dimmer actuator 2gang

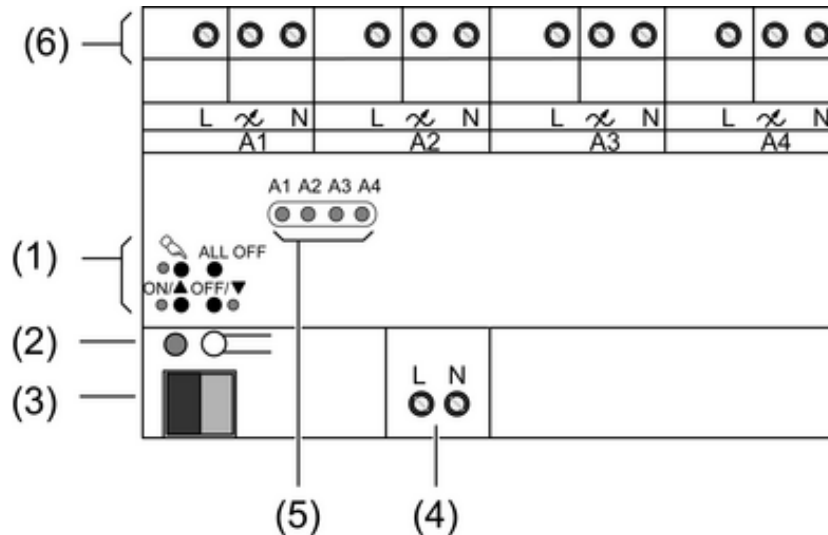


Figure 2: View of dimmer actuator 4gang

- (1) Button field for manual control
- (2) Programming button and LEDs
- (3) KNX connection
- (4) Connection of mains
- (5) Status LED
- (6) Terminal outputs

3 Function

System information

This device is a product of the KNX system and complies with the KNX directives. Detailed technical knowledge obtained in KNX training courses is a prerequisite to proper understanding.

The function of this device depends upon the software. Detailed information on loadable software and attainable functionality as well as the software itself can be obtained from the manufacturer's product database. Planning, installation and commissioning of the device are carried out with the aid of KNX-certified software. The latest versions of product database and the technical descriptions are available on our website.

Intended use

- Switching and dimming of HV incandescent lamps, HV halogen lamps and LV halogen lamps with inductive transformers or Tronic transformers
- Mounting on DIN rail according to EN 60715 in distribution boxes

Only dimmer actuator 1gang:

- Speed controller for regulating the speed of single-phase motors e.g. induction motors, shaded pole motors or universal motors

Product characteristics

- Automatic or manual selection of the dimming principle suitable for the load
- Protected against no-load, short-circuit and overheating
- Signal in the event of a short circuit
- Outputs can be operated manually
- Feedback of the switching position and the dimming value
- Parameterisable switch-on and dimming behaviour
- Time functions: switch-on delay, switch-off delay, staircase lighting timer with run-on time
- Light scene operation
- Disabling of individual outputs manually or via bus
- Status indicator of the outputs via LED

- Operating hours counter
- Mains failure longer than approx. 5 seconds leads to switch-off of the dimmer actuator. Depending on the parameter setting, the connected load is calibrated after resumption of power supply.

Only dimmer actuator 4gang:

- Increase in output power possible through parallel switching of multiple outputs
- i** Delivery state: Construction site mode, outputs can be operated using button field. Delivery state of the dimmer actuator 1gang: Dimming operation.
- i** Flickering of the connected lamps due to undershoot of the specified minimum load or through centralised pulses from the power stations. This does not represent any defect in the device.

4 Operation

Operating elements

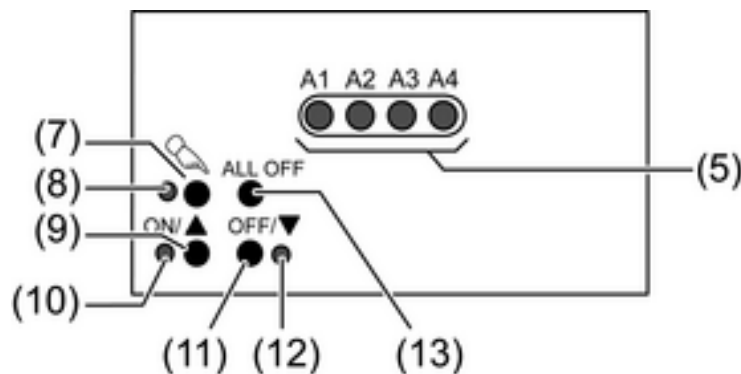


Figure 3: Operating elements

- (5) Status LEDs for outputs
- (7) Button – Manual control
- (8) LED – on: continuous manual mode
- (9) **ON/▲**Button: Switch on/Dimming brighter
- (10) LED **ON/▲** – on: selected output on, 1...100%
- (11) **OFF/▼**Button: Switch off/Dimming darker
- (12) LED **OFF/▼** – on: selected output off
- (13) **ALL OFF**Button: Switching off all outputs

Status indication

The status LED **A1...** (5) indicate the states of the outputs.

- Off: Output switched off
- On: Output switched on
- Flashes slowly: Output in manual mode
- Flashes quickly: Output disabled via continuous manual mode



Operating modes

- Bus operation: Operation via push-button sensors or other bus devices
- Short-term manual operation: Manual operation locally with button field, automatic return to bus operation.
- Continuous manual mode: Exclusively manual operation on the device
- i** No bus operation is possible in manual mode.
- i** No manual mode is possible in case of bus failure.
- i** After a bus failure and restoration the device switches to bus operation.
- i** After a power failure and restoration the device switches to bus operation.

- i** The manual mode can be disabled in ongoing operation via a bus telegram.

Switching on the temporary manual control


Operation using the button field is programmed and not disabled.

- Press the  button briefly.
LED **A1** flashes, LED  remains off.

- i** After 5 seconds without a button-press, the actuator returns automatically to bus operation.



Deactivating temporary manual control

The device is in short-term manual mode.

- No button-press for 5 seconds.
- or -
- Press  button briefly as many time as necessary until the actuator leaves the short-time manual mode.
LEDs **A1...** no longer flash, but rather indicate the output status.



Switching on permanent manual control

Operation using the button field is programmed and not disabled.

- Press the  button for at least 5 seconds.
LED  is illuminated, status LED **A1** flashes, continuous manual mode is switched on.


Deactivating permanent manual control

The device is in continuous manual mode.

- Press the  button for at least 5 seconds.
LED  is off, bus operation is switched on.

Operating the outputs

The device is in continuous or short-term manual mode.

- Press  button briefly as many times as necessary until the desired output is selected.
The LED of the selected output **A1...** flashes.
The LEDs **ON/▲** and **OFF/▼** indicate the status.
- Operate output with **ON/▲** or **OFF/▼** button.
Short: switch on/off.
Long: dim brighter/darker.
Release: Stop dimming.
The LEDs **ON/▲** and **OFF/▼** indicate the status.

- i** Short-term manual operation: After running through all of the outputs the device exits manual mode after another brief press.


Switching off all outputs

The device is in continuous manual mode.

- Press the **ALL OFF** button.
All outputs are shut off.

Disabling individual outputs


The device is in continuous manual mode.

- Press  button briefly as many times as necessary until the desired output is selected.
The status LED of the selected output **A1...** flashes.
- Press buttons **ON/▲** and **OFF/▼** simultaneously for at least 5 seconds.
Selected output is disabled.
The status LED of the selected output **A1...** flashes quickly.
- Activate bus mode (see section Deactivating permanent manual control).

- i** A disabled output can be operated in manual mode.
- i** When a disabled output is selected in manual mode, the corresponding status LED flashes twice briefly at intervals.

Re-enabling outputs

The device is in continuous manual mode.

- Press  button briefly as many times as necessary until the desired output is selected. The status LED of the selected output **A1...** flashes twice briefly at time intervals.
- Press buttons **ON/▲** and **OFF/▼** simultaneously for at least 5 seconds. Selected output is enabled. LED of the selected output flashes slowly.
- Activate bus mode (see section Deactivating permanent manual control).

5 Information for electrically skilled persons

5.1 Fitting and electrical connection



DANGER!

Electrical shock when live parts are touched.

Electrical shocks can be fatal.

Before working on the device, disconnect the power supply and cover up live parts in the working environment.

Fitting the device

Observe the temperature range. Ensure adequate cooling. Maintain a distance of 18 mm, 1 module when operating multiple dimmers or power units within the same control cabinet.

- Mount device on DIN rail. Output terminals must be at the top.

Connecting lamp load

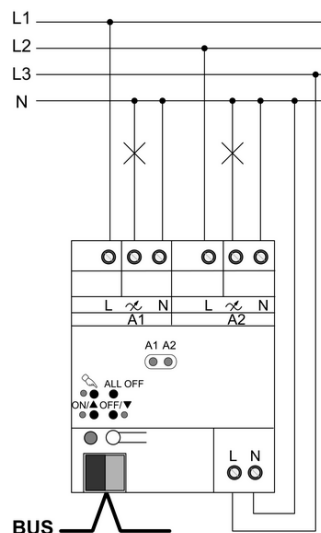


Figure 4: Dimmer actuator – Connection example

Do not exceed permissible total load including transformer power dissipation.

Operate inductive transformers with at least 85% nominal load.

Mixed loads with inductive transformers: ohmic load max. 50%.

Trouble-free operation is only ensured with electronic transformers manufactured by us or with inductive transformers.

- i** Maintain a distance of 1 module, approx. 18 mm, between the devices when operating multiple dimmers or power packs within a sub-division in order to avoid overheating.



CAUTION!

Danger of destruction from mixed loads.

The dimmer and load may be destroyed.

Do not connect capacitive loads, e.g. electronic transformers, and inductive loads, e.g. inductive transformers, together on the same dimmer output.

- Connect device as shown in the connection example (Figure 4).
- i** It is possible to increase power of the dimmer outputs by means of power packs. Make selection in accordance with the dimmer and load. When operating with power packs, set the maximum brightness to 90 %. For more information please see instructions of the respective power pack.

Changing connected load type

When changing the connected load, e. g. replacement of a connected luminaires. The dimmer actuator only calibrates itself again after disconnection of the mains voltage and load.



CAUTION!

Risk of destruction if the preset dimming principle and connected load do not match.

The dimmer and load may be destroyed.

Before changing the dimming principle, observe load type.

Before changing the load type, make sure that the dimming principle is correct.

- Disconnect load circuit.
- Disconnect mains voltage.
- Connect changed load.
- Put device into operation again.

Connecting lamp load up to 950 W

Only possible with dimmer actuator 4gang: Several dimmer outputs can be combined for dimming greater loads.

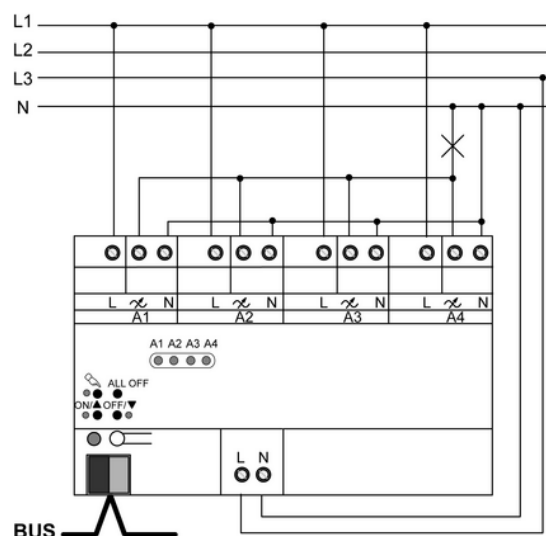


Figure 5: Parallel switching of dimmer outputs – connection example

Only utilize parallel-switched outputs up to 95 % each.

- i** Observe delivery state. Before connecting and switching on, program the dimmer actuator to the changed output configuration.



CAUTION!

400 V are shorted when outputs switched in parallel are connected to different outer conductors.

The device will be destroyed.

Always connect outputs switched in parallel to the same outer conductor.

- Connect device as shown in the connection example (Figure 5).
- i** Do not expand parallel-switched dimmer outputs with universal power packs.

Connecting the motors

Only possible with dimmer actuator 1gang: Usage as speed controller for electrical motors.

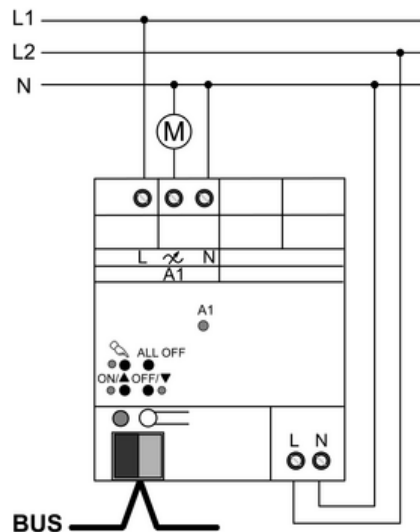


Figure 6: Dimmer actuator 1gang – connection for speed controller operation

Observe delivery state. Before connecting and switching on, program the dimmer actuator for operation as speed controller.

- Connect device as shown in the connection example (Figure 6).
- i** During the commissioning, the minimum speed of the connected motor must be determined and the actuator adapted to this.

Installing the cover

It is necessary to install a cover to protect the bus connection against hazardous voltages in the connection area.



Figure 7: Installing the cover

- Route the bus cable towards the rear.
- Install cover on top of the bus terminal so that it snaps into place (Figure 7).

Removing the cover

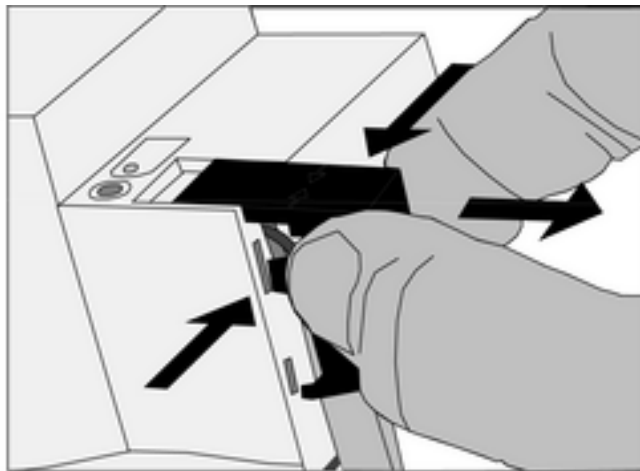


Figure 8: Removing the cover

- Press the cover to the side and pull it off (Figure 8).

5.2 Commissioning

Loading the physical address and application software



CAUTION!

Risk of destruction if the preset dimming principle and connected load do not match.

Dimmer actuator and load may be destroyed.

Before commissioning, make sure that the software setting matches the load.

- Switch on the bus voltage
- Press the programming button.
- Load physical address into the device.
- Load the application software.

- Switch on voltage supply on the outputs.
- Switch mains voltage on.
The device calibrates itself to the load and selects the appropriate dimming procedure phase cut-on or phase cut-off.
- ❗ The calibration procedure becomes noticeable during ohmic loads by a brief flicker and lasts between 1 to 10 seconds depending on the network conditions.
- ❗ During the calibration phase, received operations are executed after completion of the calibration procedure.
- ❗ The dimming procedure can also be predefined with the parameterization. In this case, the calibration procedure is not necessary.

Using speed controllers: Setting minimum speed

Only for dimmer actuator 1gang.

When deployed as a speed controller, the device must be adapted to the minimum speed of the connected motor.



CAUTION!

Connected motors must not stop.

Risk of destruction for motor and controlling device.

Set the minimum speed in such a way that the motor does not stop at a minimum setting.

The physical address and application software are loaded into the device. The device is programmed as a speed controller.

- Load the connected motor with the maximum load that occurs during operation.
- Switch on dimmer actuator.
The dimmer actuator switches on the connected motor to the cutting-in speed.
After the set resting time has elapsed, the dimmer actuator sets the currently required speed.
- Slowly reduce the speed setting, e. g. with manual control, until the connected motor has reached its minimum permitted speed. While doing so, take the motor follow-up into account.
- Determine the current setting, e. g. by reading the current value of the communication object "Feedback of speed".
- Enter the determined value as minimum speed in the parameter settings.
- Load changed application software into the device.
- ❗ The set cutting-in speed must remain active until the connected motor has started and has reached the cutting-in speed. Adapt and load the resting time into the device if necessary.
- ❗ The technical documentation contains detailed information on this.

6 Appendix

6.1 Technical data

Dimming actuator, 1-gang, Order-No. 2171 00

Rated voltage	AC 110 ... 230 V ~
Mains frequency	50 / 60 Hz
Power loss	max. 4 W
Standby power	max. 0.5 W
Ambient temperature	-5 ... +45 °C
Storage/transport temperature	-25 ... +70 °C
Contact type	ε, MOSFET
Switching current motors	2.3 A
Power consumption 230 V per output Incandescent lamps	20 ... 500 W

HV halogen lamps	20 ... 500 W
Inductive transformers	20 ... 500 VA
Tronic transformers	20 ... 500 W
Mixed load 230 V per output	
Ohmic-inductive	20 ... 500 VA
ohmic-capacitive	20 ... 500 W
Power consumption 110 V per output	
Incandescent lamps	20 ... 250 W
HV halogen lamps	20 ... 250 W
Inductive transformers	20 ... 250 VA
Tronic transformers	20 ... 250 W
Mixed load 110 V per output	
Ohmic-inductive	20 ... 250 VA
ohmic-capacitive	20 ... 250 W
Mixed loads	
capacitive-inductive	not permitted
Connection	
Single stranded	0.5 ... 4 mm ²
finely stranded without conductor sleeve	0.5 ... 4 mm ²
finely stranded with conductor sleeve	0.5 ... 2.5 mm ²
Fitting width	72 mm / 4 modules
Weight	approx. 100 g
KNX	
KNX medium	TP 1
Commissioning mode	S-mode
Rated voltage KNX	DC 21 ... 32 V SELV
Current consumption KNX	15 mA
Connection mode KNX	Connection terminal




The symbols used to label the dimmer load shows the load type that can be connected to a dimmer and the electric behaviour of a load:
R = ohmic, L = inductive, C = capacitive, M = Motors

Dimming actuator, 2-gang, Order-No. 2172 00

Rated voltage	AC 110 ... 230 V ~
Mains frequency	50 / 60 Hz
Power loss	max. 4 W
Standby power	max. 0.8 W
Ambient temperature	-5 ... +45 °C
Storage/transport temperature	-25 ... +70 °C
Contact type	ε, MOSFET
Power consumption per output at 230 V	
Incandescent lamps	20 ... 300 W
HV halogen lamps	20 ... 300 W
Inductive transformers	20 ... 300 VA
Tronic transformers	20 ... 300 W
Mixed load 230 V per output	
Ohmic-inductive	20 ... 300 VA
ohmic-capacitive	20 ... 300 W
Total power consumption at 230 V	max. 600 W/VA

i In the case of unbalanced load, an output may be loaded with a max of 350 W/VA (230 V) as long as the permissible total power consumption is not exceeded.

Power consumption per output at 110 V	
Incandescent lamps	20 ... 150 W
HV halogen lamps	20 ... 150 W
Inductive transformers	20 ... 150 VA
Tronic transformers	20 ... 150 W
Mixed load 110 V per output	

Ohmic-inductive	20 ... 150 VA
ohmic-capacitive	20 ... 150 W
Total power consumption at 110 V	max. 300 W/VA
 In the case of unbalanced load, an output may be loaded with a max of 175 W/VA (110 V) as long as the permissible total power consumption is not exceeded.	
Mixed loads capacitive-inductive	not permitted
Connection	
Single stranded	0.5 ... 4 mm ²
finely stranded without conductor sleeve	0.5 ... 4 mm ²
finely stranded with conductor sleeve	0.5 ... 2.5 mm ²
Fitting width	72 mm / 4 modules
Weight	approx. 100 g
KNX	
KNX medium	TP 1
Commissioning mode	S-mode
Rated voltage KNX	DC 21 ... 32 V SELV
Current consumption KNX	15 mA
Connection mode KNX	Connection terminal



The symbols used to label the dimmer load shows the load type that can be connected to a dimmer and the electric behaviour of a load:
R = ohmic, L = inductive, C = capacitive

Dimming actuator, 4-gang, Order-No. 2174 00

Rated voltage	AC 110 ... 230 V ~
Mains frequency	50 / 60 Hz
Power loss	max. 8 W
Standby power	max. 1.4 W
Ambient temperature	-5 ... +45 °C
Storage/transport temperature	-25 ... +70 °C
Contact type	ε, MOSFET
Power consumption 230 V per output	
Incandescent lamps	20 ... 250 W
HV halogen lamps	20 ... 250 W
Inductive transformers	20 ... 250 VA
Tronic transformers	20 ... 250 W
Mixed load 230 V per output	
Ohmic-inductive	20 ... 250 VA
ohmic-capacitive	20 ... 250 W
Power consumption 110 V per output	
Incandescent lamps	20 ... 120 W
HV halogen lamps	20 ... 120 W
Inductive transformers	20 ... 120 VA
Tronic transformers	20 ... 120 W
Mixed load 110 V per output	
Ohmic-inductive	20 ... 120 VA
ohmic-capacitive	20 ... 120 W
Mixed loads capacitive-inductive	not permitted
Connection	
Single stranded	0.5 ... 4 mm ²
finely stranded without conductor sleeve	0.5 ... 4 mm ²
finely stranded with conductor sleeve	0.5 ... 2.5 mm ²
Fitting width	144 mm / 8 modules
Weight	approx. 220 g
KNX	
KNX medium	TP 1

Commissioning mode
 Rated voltage KNX
 Current consumption KNX
 Connection mode KNX

S-mode
 DC 21 ... 32 V SELV
 15 mA
 Connection terminal



The symbols used to label the dimmer load shows the load type that can be connected to a dimmer and the electric behaviour of a load:
 R = ohmic, L = inductive, C = capacitive

6.2 Troubleshooting

Output has switched off.

Cause 1: short-circuit in output circuit

Disconnect mains voltage and affected output from the mains supply.

Eliminate short-circuit.

First switch on the output voltage again and then the mains supply.

Switch the affected output off and on again.

i When a short-circuit occurs the affected output switches off. Automatic restart when short-circuit is eliminated within 100 ms (inductive load) or 7 seconds (capacitive or ohmic load). After that lasting switch-off.

i When a short-circuit occurs during the calibration process, the load calibrates itself again after the short-circuit is eliminated.

Cause 2: load failure.

Check load, replace light bulb. For inductive transformers, check primary fuse and replace if necessary.

Cause 3: overheating protection has tripped due to overload or too high ambient temperature.

Disconnect mains supply and all outputs from the mains, switch-off corresponding circuit breakers.

Let device cool down for at least 15 minutes.

Check installation situation, ensure cooling, e.g. provide distance from surrounding devices.

In case of recurrence: Reduce connected load.

Manual control with button field not possible

Cause 1: Manual control has not been programmed.

Program manual control.

Cause 2: Manual control via bus disabled.

Enable manual control.

Output cannot be operated.

Cause 1: Manual control has not been programmed.

Reprogram device.

Cause 2: Manual control via bus disabled.

Enable manual control.

None of the outputs can be operated.

Cause 1: All of the outputs are disabled-

Cancel disabling.

Cause 2: Manual mode active.

Deactivate manual mode (switch off continuous manual mode).

Cause 3: Application software missing or faulty.

Check programming and correct.

Cause 4: Application software has been stopped, programming LED is flashing.

Disconnect device from the bus and mains, switch on again after 10 seconds.

Output has switched off, not possible to switch on.

Output faulty.

Disconnect from the mains supply.

Exchange device.

All outputs off and not possible to switch on

Cause 1: bus voltage failure.

Check bus voltage.

Cause 2: mains voltage failure.

Check mains voltage on outputs and mains power supply.

Luminaires flicker or buzz, proper dimming not possible, device buzzes

Cause: wrong dimming principle set

Installation or commissioning error. Disconnect device and luminaire, switch off circuit breaker.

Check installation and correct.

If the wrong dimming principle has been preselected: Set correct dimming principle.

If dimmer actuator calibrates itself incorrectly, e.g. with highly inductive mains or long load cables: preselect correct dimming principle with commissioning.

Luminaires flicker irregularly

Cause: Centralised pulses from the power station.

Use audio frequency suppressors.

Light switches on at maximum brightness and then dims to the target value.

Cause: Device is programmed as a speed controller.

Reprogram device.

When using as a speed controller: Motor does not start

Cause: Device is programmed as a dimmer.

Switch off device immediately.

Reprogram device.

When using as a speed controller: Motor stops at low speed.

Cause: Set base speed is too low.

Commissioning error. Switch off device.

Reprogram device. Readjust base speed (see chapter 5.2. Commissioning).

6.3 Warranty

The warranty is provided in accordance with statutory requirements via the specialist trade.

Please submit or send faulty devices postage paid together with an error description to your responsible salesperson (specialist trade/installation company/electrical specialist trade). They will forward the devices to the Gira Service Center.

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