Application program description
for KNX switching actuators

Contents

1. General information

1.1 Basic information about the KNX/EIB BUS

The B.E.G. KNX switching actuators receive their operating voltage from the 230V mains. At the same time, telegrams are transmitted and received through the KNX bus connection.

This means that the switching actuators' communication objects need to be linked to the desired communications objects of other sensors.

Settings are made using the ETS 3/4 programming software. A KNX commissioning and project planning course is required for these instructions to be understood.

Before you can work with them, B.E.G. applications need to be imported into the ETS software. The applications may be imported using the menu in the ETS software: File → Import, then select and import application.

Attention:

It is important to check the objects' data types. For instance, a one-bit object can only work with a one-bit object from another device.

1.2 Application versions

Switching actuator applications, Version 1.1:

90200 = Switch, staircase lighting 8f 90200

90201 = Switch, staircase lighting 16f 90201

90209 = Switch, staircase lighting 8f

Article number:

90200 KNX SA-8C-230V

90201 KNX SA-16C-230V

90209 KNX SA-8C-230V-CL

1.3 Symbols

The following different symbols have been used to provide a better overview in the following description of the application. The symbols are explained in brief below.

Attention:

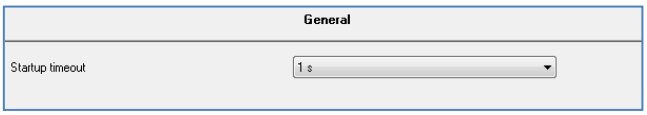
This symbol draws attention to passages of text that are required reading in order to prevent project planning and commissioning errors.

Recommendation:

This symbol points to parameter settings where experience has shown that the device may be used in the best way possible.

2. General channel parameters

2.1 General settings



This parameter affects all channels!

The unit-start-up time parameter allows the start-up time for the programmed unit after an ETS download to be set. The hardware used will thus only respond to an input command after the pre-set time has elapsed.

Parameter value: 1 – 60 seconds (default 1 second)

2.2 Channel mode

The channel selection sub item allows three modes to be selected for each channel when setting the parameters.
Additional possible parameter settings depend on the respectively selected condition. When the channel is deactivated, however, i.e. has been set as "Not active", no other settings can be made for the channel.

Parameter values:

- Not active
- Switch
- Staircase lighting

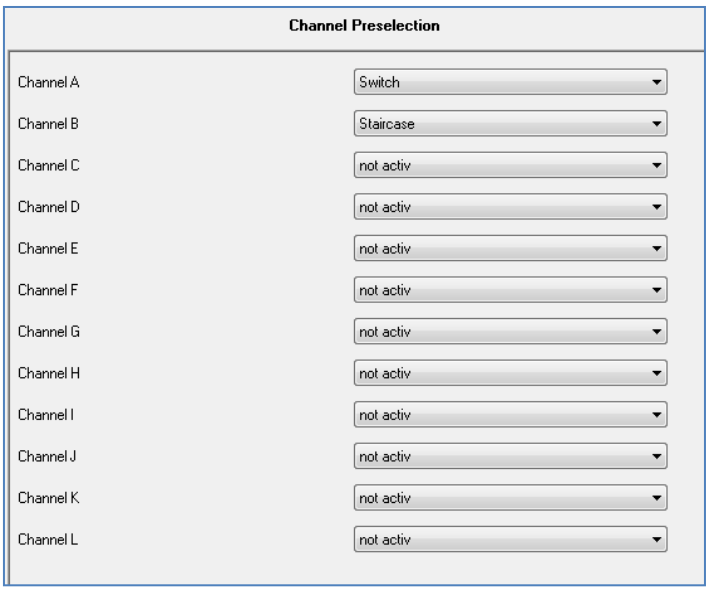
Function description

All channels possess identical functions. The number of channels depends on the type of hardware used, eight or 16 channels. The channels are always identified in consecutive alphabetical order.
Three different states may be selected for each channel:

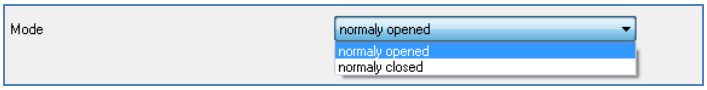
- **Not active**
  No function is assigned to the channel, it will therefore not be listed as a communications object.

- **Switching output**
  Various switching activities may be assigned to the channel when it is selected as a switching output.

- **Staircase lighting**
A staircase lighting function may now be assigned to the output. This will cause the lamps to switch off after a pre-set time.



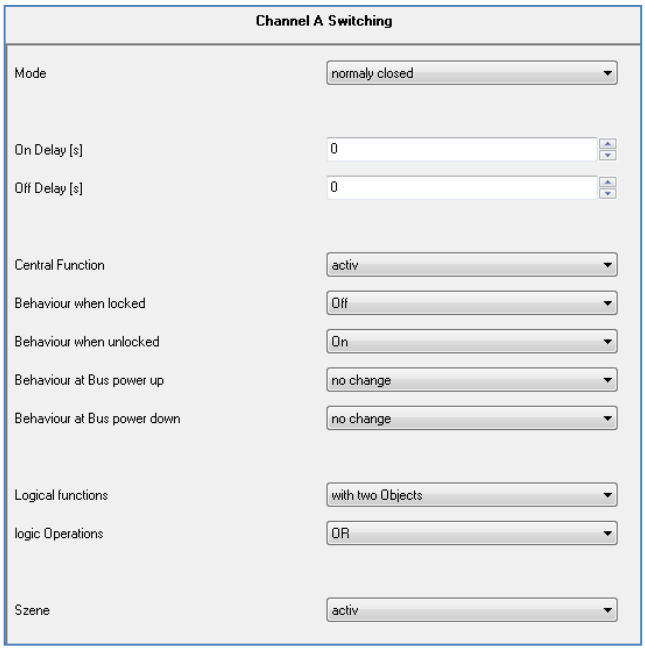
2.3 Relay mode



The relay mode may be set using the parameters. The relays may be used as closers or openers.

Parameter values:

- Closer (default)
- Opener



3. Channel parameter switch

Channel parameter overview for switching channel

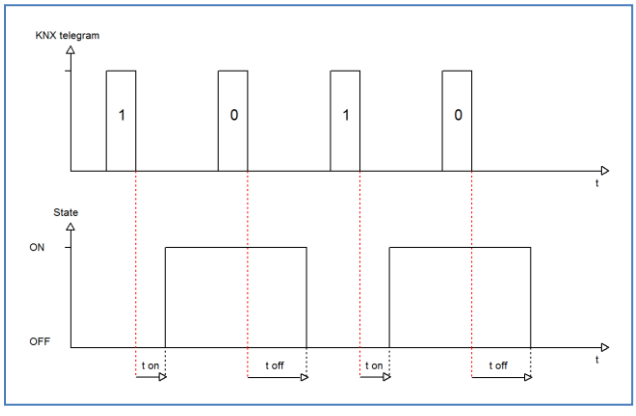
3.1 Activation / deactivation delay

The activation of the switching output is delayed by the activation delay. This means that the output will only switch at a certain point in time after the activation command has been given.
The deactivation delay uses the same principle as the activation delay. It causes deactivation to be delayed.
Activation and deactivation delays may be combined; it is possible to freely set the parameters from 0 to 30000 seconds.

Parameter values:

0 - 30000 seconds, may be freely parameterized (default 0 seconds)

The diagram below shows the activation and deactivation delay combined:



3.2 Logic function

The logic function allows a choice between a logic function with one object and a logic function with two objects to be made. The logic function may also be set as an AND or as an OR function. The corresponding logic function must be fulfilled for the respective channel to be switched.

The following table explains the two logic objects:

AND association				OR association		
Logic 1	**Logic 2**	**Channel switches**		**Logic 1**	**Logic 2**	**Channel switches**
0	0	No		0	0	No
0	1	No		0	1	Yes
1	0	No		1	0	Yes
1	1	Yes		1	1	Yes

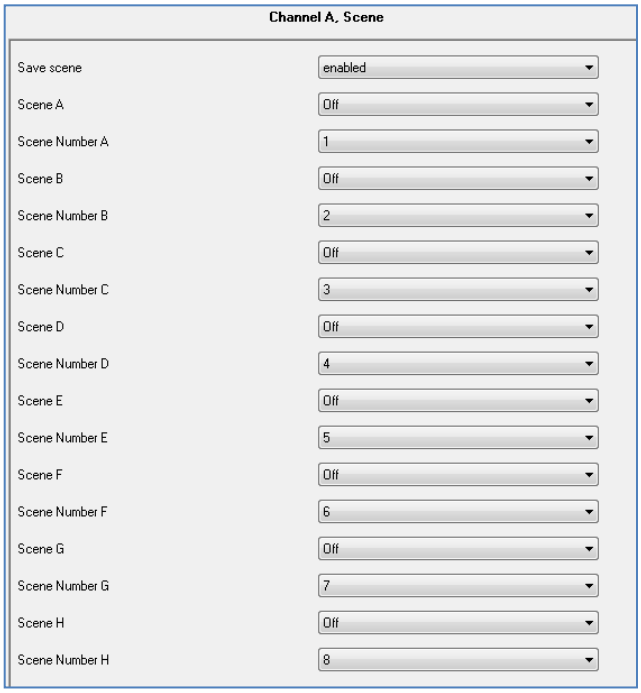
3.3 Scenes

This scene function is activated/deactivated with this tab! A scene function will appear on the application's scene side when the scene function has been activated for a channel.

Parameter values:

- Not active (default)
- Active

4. Scene side



The scene function must first be activated via the scene parameter!

The scene function is useful when room functions supplied by different systems (e.g. lighting, heating, shutters) need to be modified at the same time by a touch of a button or an operating command. Calling up a scene can, for example, switch the room lighting to a specific value, move the blinds into a desired position, turn the slats, set heating control to day mode and switch on the power supply to the electric plugs in a room.

These functions' telegrams cannot only possess different formats, they can also possess values with different meanings (e.g. "0" for lighting OFF and for blinds OPEN). Without the scene functions, a separate telegram would have to be sent to each actuator to achieve the same setting.

The switching actuator's scene function allows the channels to be integrated into a scene control. To this end, the value must be assigned to the corresponding storage space (Scene A...H). Up to eight scenes may be programmed for each switching output. When the scene function is activated in the switching output, the corresponding scene tab will appear for this switching output. This is where the individual scenes may be activated and values, scene numbers and memory functions may be set to ON/OFF.

Scenes are activated when the scene number on the scene object is received. The current channel values will be saved with the scene's object value when the memory function is activated in the scene. Scene communications objects always possess a size of one byte.

In order to call up a specific scene, the value for the respective scene must be sent to the scene function's communications object. The value for calling up the scene is, however, always one number lower than the set scene number. If, for example, Scene 1 is to be called up, a 0 must be sent. Scene numbers may range from 1 to 64, the values for calling up the scene, however, only range from 0 to 63.

When the scene call up is activated in a binary input, the same scene must be set in the binary input as that in the switching actuator. The binary input will then automatically send the correct value for calling up the scene.

A scene sub item will appear for a channel when it is selected as a scene.

This sub item will then allow a response, ON or OFF, to be assigned to the channel for when the respective scene (A-H) is called up. Each channel is able to respond to eight different scenes. Sending the response value for the respective scene calls up the scene and the channel assumes its set state. The individual parameter settings for the respective channel are also taken into account here. If, for example, the channel is to be switched on when Scene A is called up and an activation delay of five seconds has been set, the channel will activate after five seconds have elapsed.

For each channel, there are eight possible memory settings for the scenes.

These eight storage spaces may be assigned to one of the 64 possible scene numbers.

Save scene parameter values:

- Disabled
- Enabled (default)

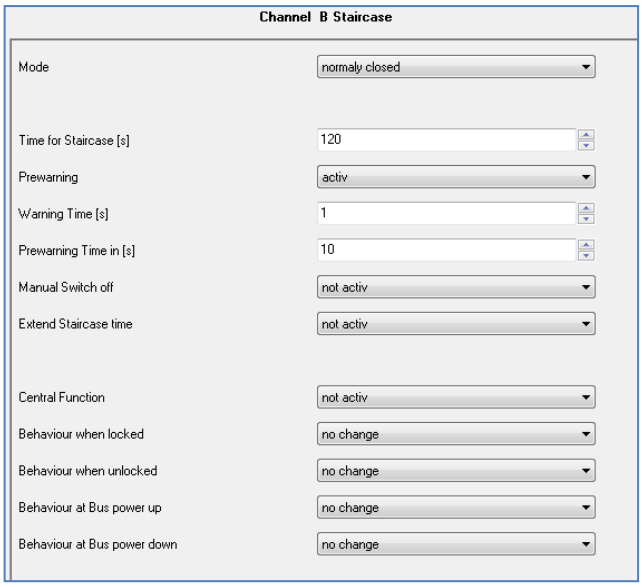
Scene parameter values (A to H):

- Off (default)
- On

Tip:

During programming, when two or more channels are to respond to the same scene number, it must be noted that the communications objects for the scenes need to be accommodated within the same group addresses. All channels will then be addressed when the address value for the scene is transmitted. When setting the parameters for the scene function, it is useful to create divisions according to scenes in order to create a tidy structure for the ETS project.

5. Staircase lighting



The staircase lighting function will be activated as soon as the staircase lighting state has been assigned to a channel in the channel selection. The staircase lighting function permits the switching output to be automatically deactivated after a certain period of time.

5.1 Staircase lighting

The staircase lighting parameters may be freely set. Additional possible functions follow the staircase lighting function; these are described below and can be individually activated or deactivated.

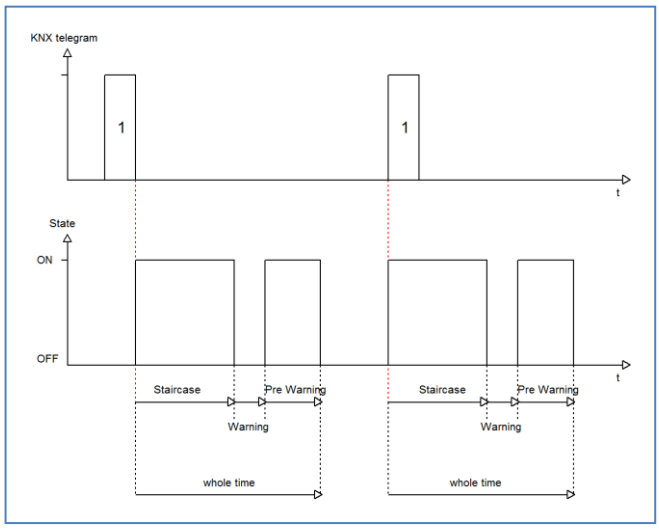
Parameter values

- 65535 seconds, may be freely parameterized (default 120 seconds)

5.2 Advance warning, warning duration and advance warning time

The warning function will be activated as soon as the advance-warning parameter is set to active in the channel activated for staircase lighting. The warning duration and the advance-warning time parameters may then be set. The warning function is for drawing people's attention to the fact that the lights in the respective area will be switched off soon. This is achieved by deactivating the output for the period set for the warning duration.

A relatively small value of between one and three seconds is recommended here. After this warning, has elapsed, the lights will be switched back on again for the period set for advance-warning time. This function provides the opportunity of extending the time for the staircase, e.g. by pressing a switch (if this function has been activated), or to exit the staircase. Dynamic programming based on the given circumstances is recommended here (next light switch, length of the stairwell, etc.). The switching procedure's total switching time therefore results from the addition of the three times as indicated in the diagram below:



Advance warning parameter values:

- Not active (default)
- Active

Warning duration parameter values:

- 0 – 65535 seconds (default 1 seconds)

Advance-warning time parameter values:

- 0 – 65535 seconds (default 10 seconds)

5.3 Manual deactivation

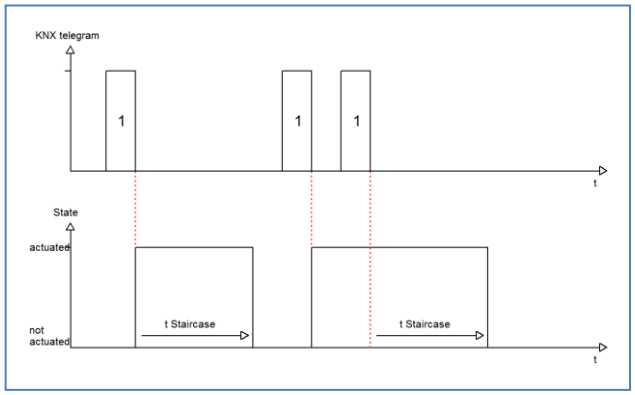
When this function has been activated, it is possible to deactivate the channel before the set staircase lighting time has elapsed. A logic 0 must be transmitted to the channel to this end. When this function has not been activated, the channel will only deactivate after the staircase lighting time has elapsed.

Parameter values:

- Not active (default)
- Active

5.4 Staircase lighting extension

Activating this function will allow the time for the staircase lighting to be extended. This means that as soon as the channel has been activated and up to two thirds of the staircase lighting time has elapsed, for example, the time for the staircase lighting will commence again from the start when the channel is triggered again.



Parameter values:

- Not active (default)
- Active

6. Explanation of other functions

6.1 Central function

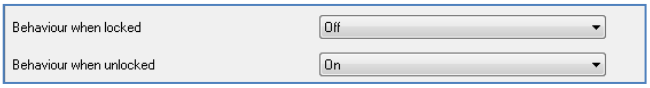
The central switching function must be activated on each channel. The central switching-function parameter is available to this end. The current state may be overridden using the "96/102 central switching function" communications object as soon as this function has been activated.

Parameter values:

- Not active (default)
- Active

6.2 Disable mode

Disable mode may be separately set for each channel.



Different enable / disable behaviour parameters may be set.

Attention:
Disabling is executed with a 1-telegram to the disable object! Enabling is executed with a 0-telegram.

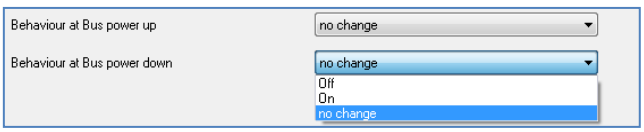
Parameter values:

- On
- Off
- No change (default)

Channels will not process any further activation/deactivation telegrams once they have been disabled.

6.3 Behaviour when bus power is restored

It is also possible to set the behaviour when bus power fails/is restored.



The parameter values are the same in both cases.

Parameter values:

- On
- Off
- No change (default)

The output may in the event of this power failure assume a specific state (on/off) or maintain the current state (no change). The same also applies to when bus power is restored.
Careful setting of the parameters is particularly important here as otherwise undesired actions may be carried out in the event of malfunctions.

7. Communications objects

The corresponding communications objects are displayed for each channel depending on the selected function. The group addresses may be later assigned using the communications objects.

Eight objects are reserved for each channel The numbers 0 to 7 for Channel 1, the numbers 8 to 15 for Channel 2 and so on. Which communications objects are shown for the respective channel depends on how the parameters have been set.

The central function communications object is unique and applies to all channels!

It is standard for the central switching function to always be displayed even if it has not been activated in any of the existing channels. If the individual channels are to respond to the central switching function, the channel parameters must be set accordingly. The central switching function's numbers depend on the number of available channels in the hardware used due to the fact that eight spaces are reserved for each channel.

7.1 Overview of communications objects

→ **Input object** | ← **Input object**

Object 0:	→	Switch on/off	1 bit
Object **1**:	→	**Staircase lighting**	1 bit
Object **2**:	→	**Disable**	1 bit
Object **3**:	→	**Disable object**	1 bit
Object **4**:	→	**Scene**	1 byte
Object **5**:	←	**Status**	1 bit
Object **6**:	→	**Logic 1**	1 bit
Object **7**:	→	**Logic 2**	1 bit
Object +**8**:		**Next channels**	1 bit
Object **96**:	→	**Central function**	1 bit

7.2 Description of the objects

1. Object 0: **Switch on/off**
Type: 1 bit Input object
Data point: DPT1.001

Association with: e.g. KNX presence sensor/button interface
This channel is for activating/deactivating the switching actuators.

2. Object 1: **Staircase lighting**
Type: 1 bit Input object
Data point: DPT1.001

Association with: e.g. KNX button interface

The staircase lighting is activated using this communications object.

3. Object 2: **Disable**
Type: 1 bit Input object
Data point: DPT1.001

Association with: e.g. External logic system/ interface/touch panel
The functioning of an actuator is disabled with this object.

4. Object 4: **Scene**
Type: 1 byte Input object
Data point: DPT18.001

Association with: e.g. touch panel/logic module
Saved scene values may be called up with this communications object.

5. Object 5: **Status**
Type: 1 bit Output object
Data point: DPT1.001

Association with: e.g. touch panel
The current switching state is displayed with this communications object. The status can, for example, be displayed via a touch panel.

6. Object 6: **Logic 1**
Type: 1 bit Input object
Data point: DPT1.001

Association with: e.g. button interface/presence sensor/touch panel
This communications object acts as a logic input.

7. Object 7: **Logic 2**
Type: 1 bit Input object
Data point: DPT1.001

See Object 6

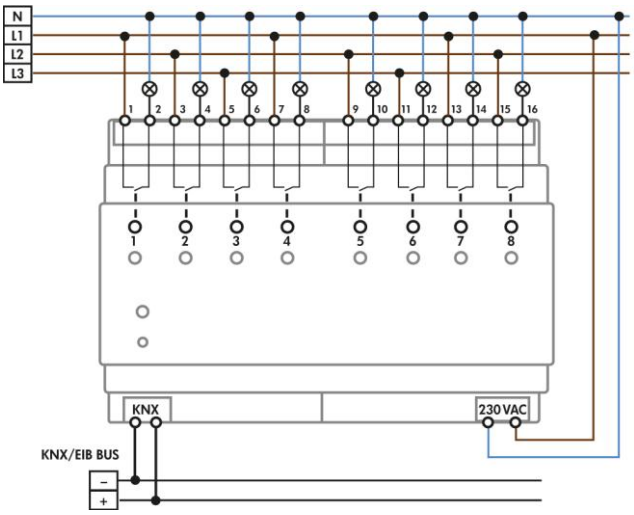
8. Object +8: **Additional objects**

9. Object 96/102: **Central function**
Type: 1 bit Input object
Data point: DPT1.001

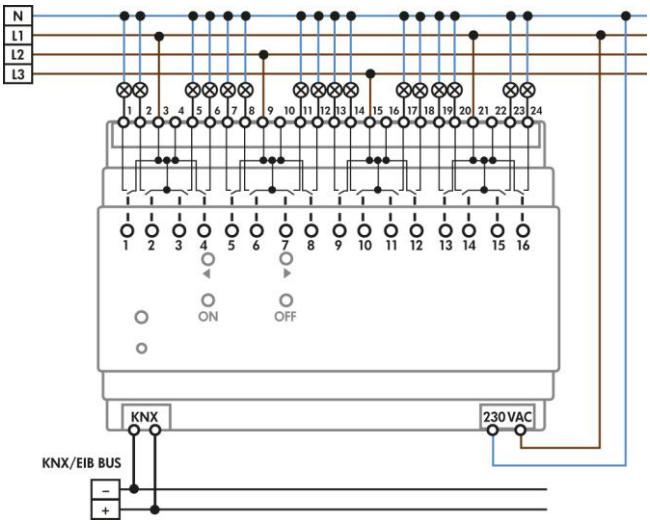
Association with: e.g. touch panel/button interface/logic module
If the actuator is to respond to a central function, this communications object must be connected with the central function.

8. Technical data

KNX SA-16C-230V



KNX SA-8C-230V-CL



Bistable relays are used with the KNX SA-8C-230V-CL 90209. The KNX SA-8C-230V 90200 and KNX SA-16C-230V 90201 units possess monostable relays.

The bistable relays will even maintain the current switching state with 230V auxiliary voltage and when the parameters are updated.

Configuration	**KNX-SA-8C-230V**	**KNX-SA-16C-230V**	**KNX-SA-8C-230V-CL**
Number of outputs	8	16	8
Nominal voltage			
Supply voltage	230VAC / 50Hz	230VAC / 50Hz	230VAC / 50Hz
Outputs	230VAC	230VAC	230VAC
Power consumption typ.	< 0.5W	< 0.5W	< 0.5W
Maximum switching power*			
Ohmic load	10A, cosφ=1**	10A, cosφ=1**	16A, cosφ=1
Capacitive load	max. 21µF	max. 21µF	max. 100µF
Maximum load			
Light bulbs	1900W	1900W	2700W
HV halogen lamps	1400W	1400W	2500W
LV halogen lamps	500W	500W	1000W
Fluorescent lamps uncompensated	500W	500W	1800W
Fluorescent lamps parallel compensated	120W	120W	1000W
Max. cable cross-section			
Screw terminals	2,5mm²	2,5mm²	2,5mm²
KNX bus terminal	0.8mm	0.8mm	0.8mm
Ambient temperature	0 to +45°C	0 to +45°C	0 to +45°C
Degree of protection	IP20	IP20	IP20
REG dimensions	4TE	8TE	8TE
Dimensions UP/AP (W x H x D)	72 x 60 x 86mm	144 x 60 x 86mm	144 x 60 x 86mm

*** The maximum total current for each L connection may not exceed the maximum switching power.**

**** Not for plug sockets**