Switch programmes and building control

Catalogue 2019/2020

Berker

Your reliable partner for intelligent solutions.

Berker stands for exceptional design.

Berker R.1

German Design Award NOMINEE 2013

German Design Award SPECIAL MENTION 2013

product design award 2013

GOOD DESIGN

reddot design award winner 2013

Berker R.3

German Design Award NOMINEE 2013

product design award 2013

GOOD DESIGN

reddot design award winner 2013

Berker R.8

GERMAN DESIGN AWARD GOLD 2019

GOOD DESIGN

Berker K.1

GOOD DESIGN

Berker K.5

DESIGNPREIS 2007 NOMINIERT

GOLD AWARD Product 2012

GOOD DESIGN

DESIGN PLUS

Berker Q.1

Designpreis Deutschland 2010 NOMINIERT

Designpreis Deutschland 2011 NOMINIERT

reddot design award winner 2009

DESIGN PLUS

Berker B.IQ

Designpreis der Bundesrepublik Deutschland Nominiert 2004

MATERIALICA DESIGN AWARD 2004

GOOD DESIGN

DESIGNPREIS 2006 NOMINIERT

DESIGNPREIS 2007 NOMINIERT

design award winner 2004

reddot design award winner 2004

Berker KNX room controller

24°C

DESIGN AWARD 2015

GOOD DESIGN

Berker touch control

DESIGN AWARD 2015

GERMAN DESIGN AWARD WINNER 2017

GOOD DESIGN

Berker's switches and systems make the difference. This is confirmed not just by our many customers, but also by the expert judging panels of a number of national and international prizes who honour Berker time and again.

Berker R.classic series

German Design Award NOMINEE 2013

product design award 2013

product design award 2013 GOLD

GOOD DESIGN

reddot design award winner 2013

Berker 1930 series Porcelain / Rosenthal

DESIGNPREIS 2009 NOMINIERT

Designpreis Deutschland 2010 NOMINIERT

GOOD DESIGN

DESIGN PLUS

Berker B.3

Design Award Winner 2000

Berker Q.7

DESIGN AWARD 2017

GERMAN DESIGN AWARD SPECIAL 2017

GOOD DESIGN

Berker S.1

Design Award Winner 2000

GOOD DESIGN

Berker W.1

German Design Award WINNER 2015

DESIGN AWARD 2015

DESIGN PLUS powered by: light+building

Berker Radio Touch

Designpreis Deutschland 2012 NOMINIERT

product design award 2011

reddot design award winner 2011

Berker R.1 / R.3 touch sensor

product design award 2013

GOOD DESIGN

reddot design award winner 2013

Berker TS sensor

DESIGNPREIS 2008 NOMINIERT

DESIGNPREIS 2009 NOMINIERT

product design award 2007

GOOD DESIGN

reddot design award winner 2007

Berker TS

reddot award

Touch sensors

GOOD DESIGN

Little details that make a big difference
Why Berker socket outlets are simply good

It's often the small details that make a big difference. Berker's sockets are a perfect example of this: we have been producing them for over 90 years, and specialist craftspeople use them every day. And there are always product details which can be improved - and, when taken together, can make a major difference.

- Compact housing with sturdy, closed base
- Rugged supporting ring without sharp edges
- New supporting ring contour for easy alignment and screwing in
- Easy-to-connect conductor
- Open claw geometry prevents damage to the conductors during assembly
- No parasitic voltage thanks to electrical isolation
- Flexolift claw vanishes completely into the base
- Release or screwing-in in just 4 to 5 rotations

We have even optimised the packaging, and thus handling on the building site: in a 10-pack, the centre plates are separated from the inserts and can be mounted according to your normal installation methods. In addition, the centre plates are well-protected by film - a sensible detail to save time and money.

- **High-quality supporting ring**
  sturdy, with no sharp edges, and additional screwing options for easy installation on soft surfaces

- **Optimal supporting ring contours**
  marked for precise alignment at the place of installation

- **Test marks on the base**
  for visibility in every mounting state

- **Easy-to-operate release buttons**
  for rapid release of conductors during disassembly

- **Cross-head claw screws**
  with optimised thread for 3x faster installation/disassembly

- **Labelling field on the supporting ring**
  for clear labelling of the electric circuit

- **Cross-head screw in centre plate**
  for perfect grip of tool during installation

- **Marking on base**
  for precise stripping of conductors

- **Sturdy, enclosed base**
  for safe, secure installation, installation depth 31.2 mm

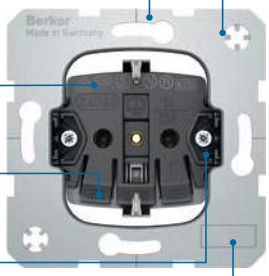
- **Galvanic separation of the supporting ring**
  for safe working with no parasitic voltage

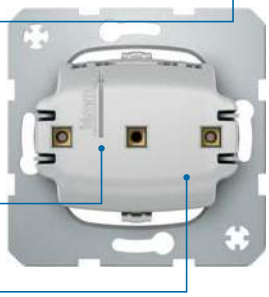
- **Open claw geometry**
  prevents damage to conductors during installation

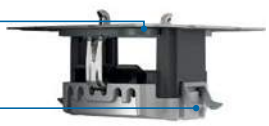
- **Claws are accomodated in base**
  when fully retracted, for easy insertion/positioning in the switch box and reduced risk of injury

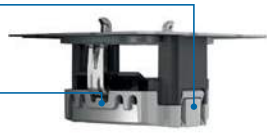
- **Optimised terminal design**
  for easier insertion of conductors

- **Screw-in lift terminals**[1]
  for rapid connection and secure positioning









[1] Only in socket outlets with screw-in lift terminals

Admittedly, we're still a bit proud. In the Modul system, we found a principle which has not lost any of its attraction. Using the Modul system, switches can still be replaced easily,
even after years have passed, and, for example, be adapted to a new room design, without any need to replace the switch insert. For your customers, this means less building mess, more flexibility in room planning and increased general satisfaction with their electrical equipment. Our Modul system can also offer you many advantages, such as less storage and lower mounting costs. As well savings in terms of time and money. In addition, we have designed the switches and inserts to be completely uncomplicated in mounting and handling.

Flat appearance of the mounted switch and pleasant feel during operation through the very small switching angle of 3.5°
High level of operating comfort through precise rocker guidance
Flexolift claws ensure a tight fit and forced return when released
Cable protection around the claw screws prevents conductor damage
Laser engraving of the circuit diagram, circuit symbols, article number and conductor insulation length on the rear side of each switch
Easy-to-operate lever release catches to free the conductors
Installation of neon lamp units at a later date possible without dismantling

- **High-quality supporting ring**
  sturdy, with no sharp edges, and additional screwing options for easy installation on soft surfaces

- **Optimal supporting ring design**
  marked for precise alignment at place of installation

- **3.5° Switching angle**
  for a flat profile and easy switching

- **Modular design**
  with accomodation of all rocker types

- **Large clearance around the claw screw**
  with combination cross-head screws for easy installation

- **Variable 4-pin mount**
  for precise seating of rockers

- **Clip-in neon/glow lamp unit**
  for exact positioning on the supporting ring, can be used as control or orientation light

- **Moulded lever release catches**
  for easy release of conductors

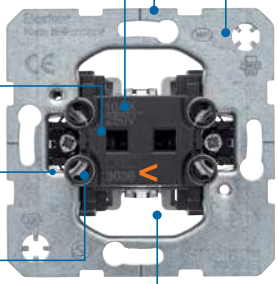
- **Labelling on reverse of switch**
  circuit diagram/graphical symbol, conductor stripping-guide, high contrast for good legibility
- **Article number**
  > on front side

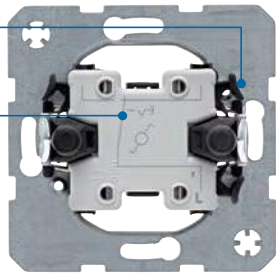
- **Voltage test from front side**
  for a voltage test in installed state

- **Cable protection**
  to prevent damage to the conductors by the claw screws

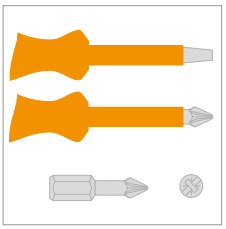
- **Flexolift claws®**
  flush-fitting positioning of claws and automatic reset upon release

- **Minimal installation depth** (special designs)
  for plenty of space for installation of an insert or hollow-wall mounting





Installation instructions



Tool size for processing BERKER products

The products have combination screws that can be processed with cross-head as well as flat-blade screwdrivers.

Tool sizes for contact screws:
- Cross-head bits: Pozi-Drive, size 2
- Cross-head screwdrivers: Pozi-Drive size 2
- Slot screwdrivers - Blade thickness 1 mm

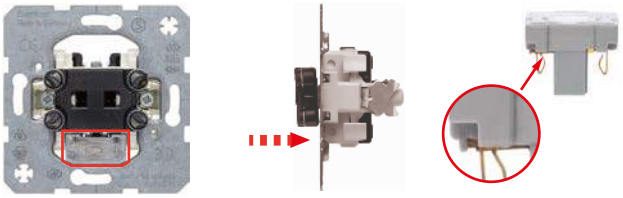
Tool sizes for fixing screws:
- Cross-head bits - Pozi-Drive, size 1
- Cross-head screwdrivers - Pozi-Drive size 1
- Slot screwdrivers - Blade thickness 0.8 mm

When using cordless screwdrivers a maximum torque of 0.5 Nm should be used.

Lighting of switches and push-buttons

The Work Place Regulation (ArbStättV) stipulates that light switches must be easily accessible and luminous. The switches and buttons of BERKER can be fitted with neon or incandescent lamp units (in the case of splash-protected surface-mounted devices, the lighting cannot always be retrofitted).

Neon lamp unit with N terminal [Order no. 1675..]



The neon lamp unit (without removing the switch) can be inserted or replaced from the front.
Depending on the application, the contact reed (s. figure on the right) must be removed

Applications

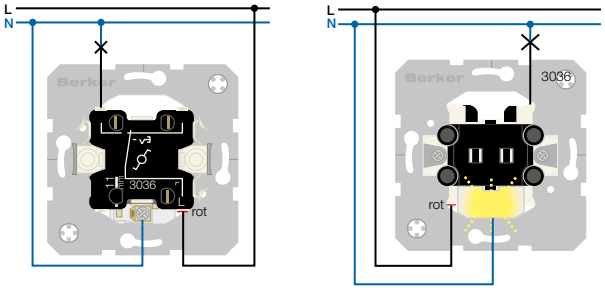


Figure 1: Constantly illuminated, switch-off with change-over switch (remove contact reed on the neon lamp unit)

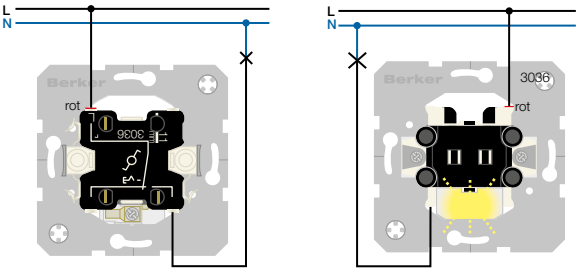


Figure 2: Illuminates when OFF, switch-off with change-over switch

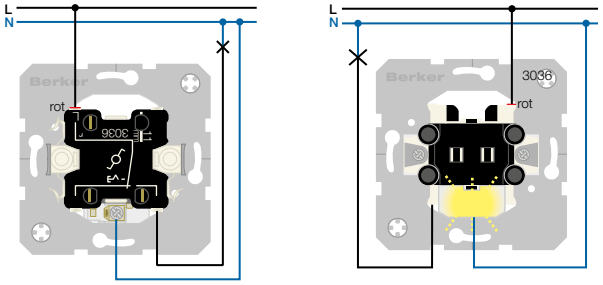


Figure 3: Illuminates when ON, switch-off with change-over switch (remove contact reed on the neon lamp unit)

LED neon lamp units and neon lamps connected in parallel to the switching contact cause the contact opening to be fallen short of.

LED unit with N terminal for series switch [Order no. 1680]

The LED unit with N terminal is available for lighting series switches in the standard and surface ranges from Berker. As a control switch, it displays the switched on loads per series.

Series control switch [Order no. 3035/303550 + 1680]

Figure 4: The LED unit has contact springs (s. figure in the middle), which ensure simple snapping-on from behind

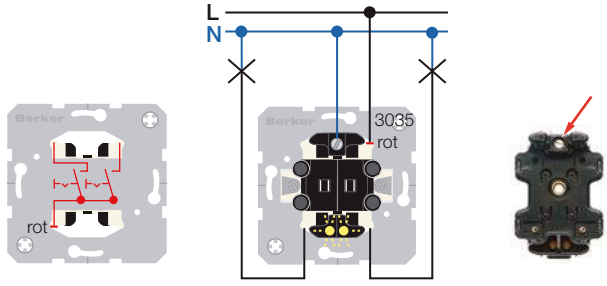


Figure 5: Series monitoring circuit (unit lights up per series when "On"), N terminal (s. figure on the right)

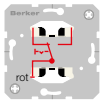
Switches

When connecting energy-saving lamps and electronic upstream devices (EB), the high switch-on currents must be observed. Check the suitability of the devices before use. Use making current limiters if necessary.

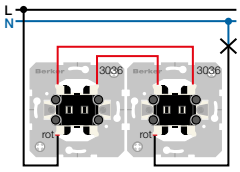
Switches	10 AX		16 AX	
	40 W	65 W	40 W	65 W
Uncompensated cos ϕ ≈ 0.5	23	15	33	21
Compensated cos ϕ = 0.8	29	18	46	28
Compensated cos ϕ ≈ 1	34	22	51	33
Lead-lag circuit	38	28	57	42
Parallel compensation	8	5	12	7

Tab. 1: Maximum number of fluorescent lamps to be switched

Change-over switches



3036, 3036 50 Change-over switch
3966 Pullcord switch off/change-over
e.g. 1675 Neon lamp unit with N terminal



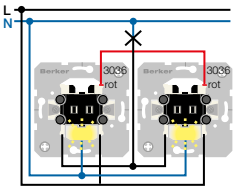
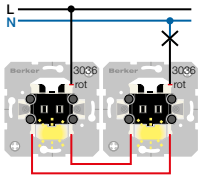


Figure 1: Change-over circuit / Control change-over switching*: neon lamp unit lights up if "On"



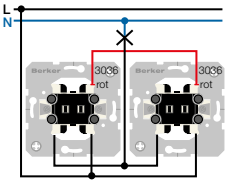
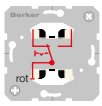


Figure 2: Change-over switching lights up: Neon lamp unit lights up if "Off" / economy change-over circuit: Phase and lamp wire are in each switch wall box

Switch off operations 1pole with change-over switch



3036, 3036 50 Change-over switch
3966 Pullcord switch off/change-over
e.g. 1675 Neon lamp unit with N terminal

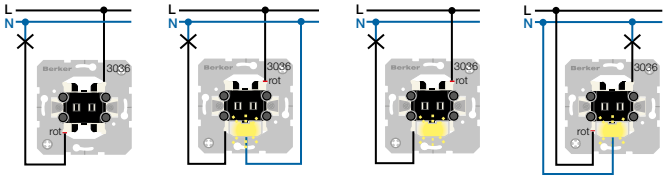
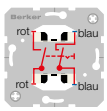


Figure 3: Switch-off / control switch-off*: Neon lamp unit lights up if "On / Switch-off lights up: Neon lamp unit lights up if "Off" / Switch off : Constantly illuminated*

Switch off operations 2pole, 10 AX



3032 On/off switch 2pole
e.g. 1675 Neon lamp unit

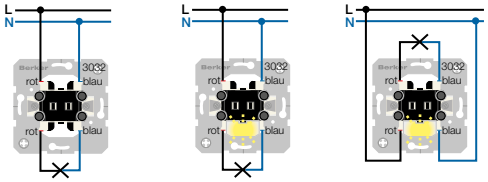
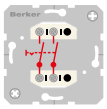


Figure 4: Switch-off 2pole / control switch-off 2pole: Neon lamp unit lights up if "On / Switch off 2pole: Constantly illuminated

* Remove detachable contact reed on the neon lamp unit

Switch off operations 2pole, 16 AX



3032 12 On/off switch 2pole
1600 02 Neon lamp unit for switches/push-buttons

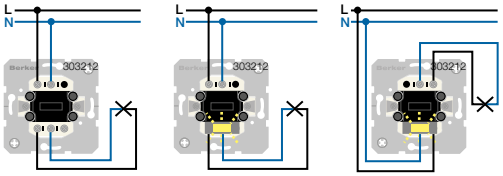
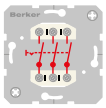


Figure 5: Switch-off 2pole / control switch-off 2pole: Neon lamp unit lights up if "On / Switch off 2pole: Constantly illuminated

Switch off operations 3pole



3033 03 On/off switch 3pole
1600 Neon lamp unit for on/off switch 3pole

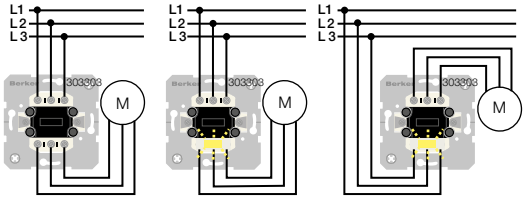
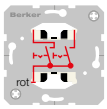


Figure 6: Switch-off 3pole / control switch-off 3pole: Neon lamp unit lights up if "On / Switch off 3pole: Constantly illuminated

Connections in series



3035, 3035 50 Series switch
1680 LED unit with N terminal
e.g. 1675 Neon lamp unit

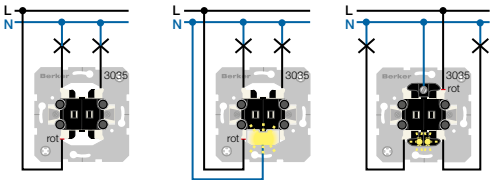


Figure 7: Connection in series / Control connection in series: LED unit lights up per series if "On" / connection in series: Constantly illuminated*

Mechanical timer [Order no. 2040, 2041]

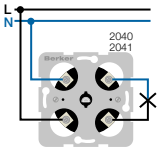
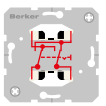


Figure 8: Off switching 2pole

Intermediate switching operations



3037 Intermediate switch
1675 Neon lamp unit with N terminal

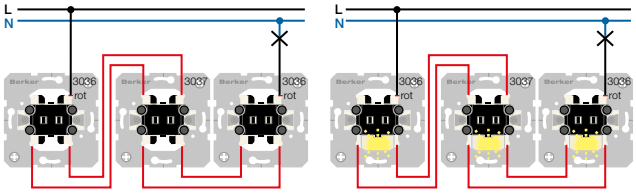
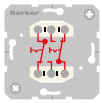


Figure 9: Intermediate switching / Intermediate switching lights up: Neon lamp unit lights up if "Off"

Applications with double change-over switch



3038 08 Double change-over switch
1600 02 Neon lamp unit for switches/push-buttons

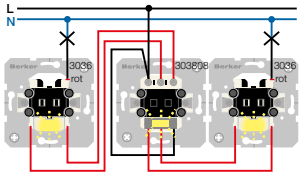


Figure 1: Change-over switching with double change-over switch: Neon lamp unit on the double change-over switch lights up if the right switch is "Off"

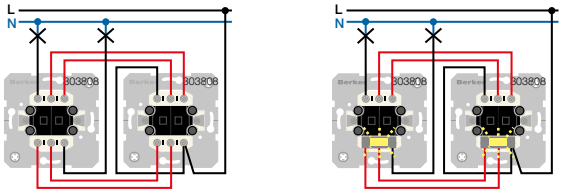
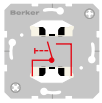


Figure 2: Double change-over switch/ Double change-over switch lights up: Neon lamp unit lights up if left switch is "Off"

Push-button

Applications push-button



5031, 5031 50 Push-button NO contact
1675 Neon lamp unit with N terminal

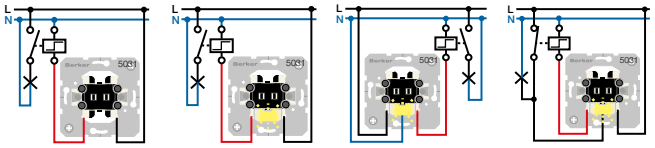


Figure 1: Push-button, NO contact / push-button lights up: Only a limited number of push-buttons are to be switched in parallel or the neutral conductor must be provided / push-button constantly illuminated*: any number of push-buttons switchable in parallel, the neutral conductor must be included / monitoring circuit*

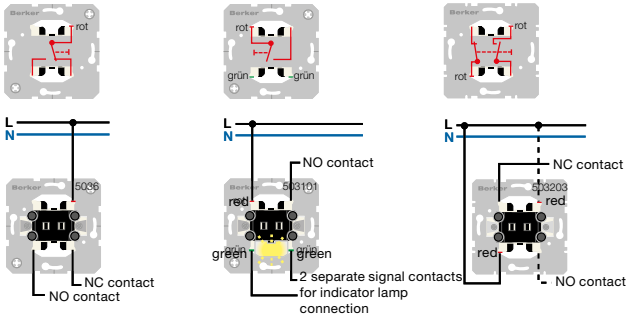


Figure 2: Push-button, change-over contact [Order no. 5036] / push-button, NO contact with 2 separate signalling contacts [Order no. 5031 01] / push-button, NC contact + NO contact, Isolated input terminal [Order no. 5032 03]

Applications series push-button

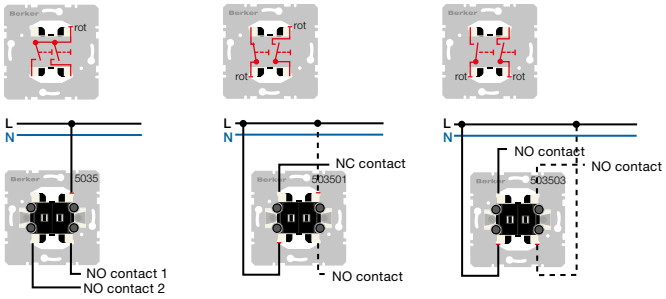


Figure 3: Series push-button, 2 NO contacts, common input terminal [Order no. 5035] / series push-button, NC contact + NO contact isolated input terminals [Order no. 5035 01] / series push-button, 2 NO contacts, isolated input terminals [Order no. 5035 03]

* Remove detachable contact reed on the neon lamp unit

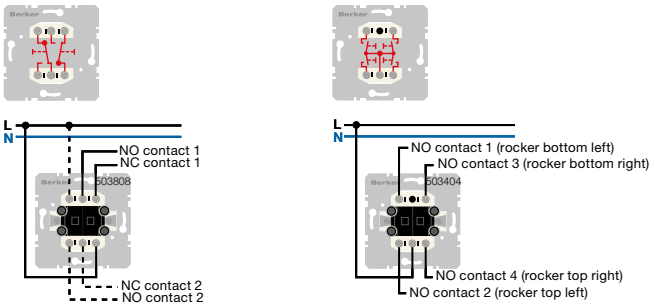
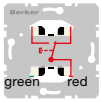


Figure 4: Series push-button, 2 change-over contacts, isolated input terminals
[Order no. 5038 08] / Group series push-button, 4 contacts, common input terminal [Order no. 5034 04]

Applications pullcord push-button



3956 19 Pullcord push-button, change-over contact with separate signal contact

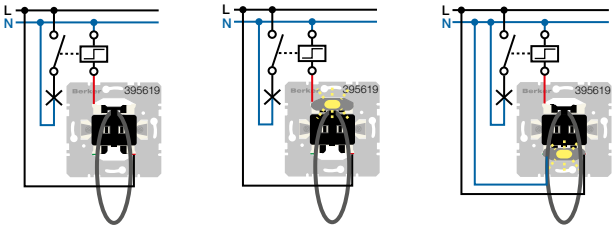


Figure 5: Pullcord push-button, change-over contact / pullcord push-button illuminated: Only a limited number of push-buttons are to be switched in parallel or the neutral conductor must be included / pullcord push-button constantly illuminated: Any number of push-buttons switchable in parallel, the neutral conductor must be included

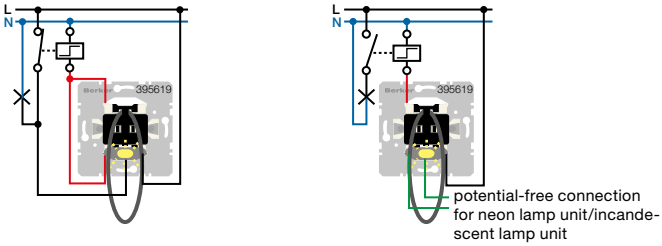


Figure 6: Control pullcord push-button*, change-over contact / control pullcord push-button*, change-over contact with separate signal contact

* Remove detachable contact reed on the neon lamp unit 1605 10

LED signal light

The LED signal light is used for signalling e.g. notices, information, messages or warnings. The operation is performed via a separate push-button or switch. Installation is possible in switch combinations or individual.

LED signal light, RGB [Order no. 2951 ..]

The colour is switchable via an external push-button. Foils with imprinted symbols must be inserted depending on the application and define its specific function. light colours cold white, warm white, blue, orange, red, green, purple (magenta) and colour sequence can be adjusted via a push-button. With each press of the push-button, the colour sequence is switched by one colour state. The colour sequence can be stopped at any position via the push-button. The brightness can be adjusted via a potentiometer.

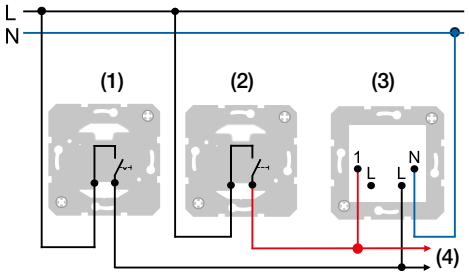


Figure 1: Connection example of colour switching via outer conductor, looped

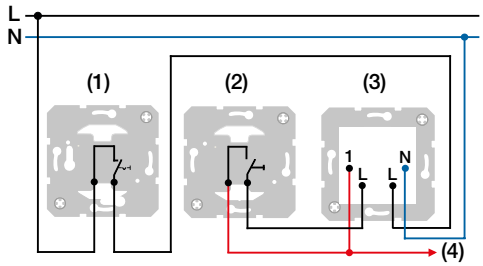


Figure 2: Connection example of colour switching via outer conductor, not looped

1 Off/change-over switch
2 Push-button
3 Insert of LED signal light, RGB
4 Connection possibility of additional LED signal lights, RGB

LED signal light, red/green lighting [Order no. 2952 ..]

Two-coloured signal light, e.g. for access control. Switchable between red and green via separate switches. The supplied foil bi-colour with imprinted symbols for Do not disturb / Make up room and Enter/ Wait are positioned under the cover.

Instead of the series switch (5) that should switch both colours separately, a change-over switch that merely enables a change-over of both colours can also be used

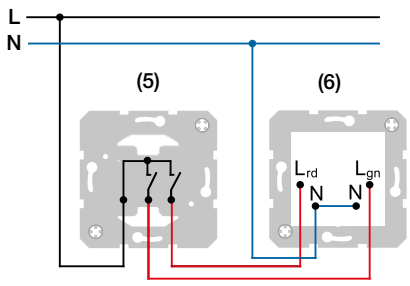


Figure 3: Connection example of LED signal light, red/green lighting

5 Series switch
6 Insert of LED signal light, red/green lighting, N terminals bridged

LED signal light, white lighting [Order no. 2953 ..]

Can be switched on/off via a separate switch. Foils with imprinted symbols insertable. light colour cold white. The brightness can be adjusted via a potentiometer.

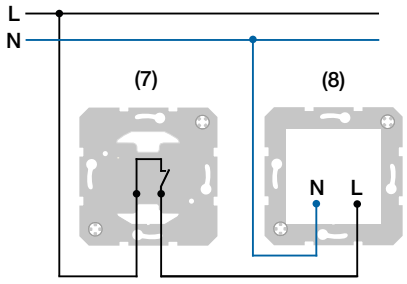


Figure 4: Connection example of LED signal light, white lighting

7 Off/change-over switch
8 Insert of LED signal light, white lighting

Brightness setting

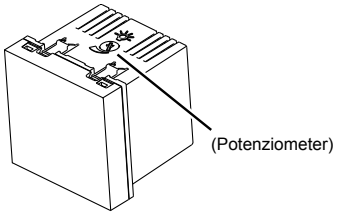


Figure 5: Brightness setting of LED signal light, RGB and LED signal light, white lighting

Technical data - performances

LED signal light	
Rated voltage	230 V~
Mains frequency	50 Hz
Number of LEDs	4
Connection single stranded	2.5 mm²
Operating temperature	-15 ... 40°C
LED signal light	**[Order no. 2951 ..]**
Power consumption	max. 2 W at 195 ... 265 V~, 50/60 Hz
Power factor	approx. 0.9
LED signal light	**[Order no. 2952 ..]**
Power consumption	per colour max. 0.5 W at 230 V~, 50 Hz
LED signal light	**[Order no. 2953 ..]**
Power consumption	max. 1 W at 230 V~, 50 Hz
Power factor	approx. 0.17

Push-button/pilot lamp E10 [Order no. 5101..]

Applications

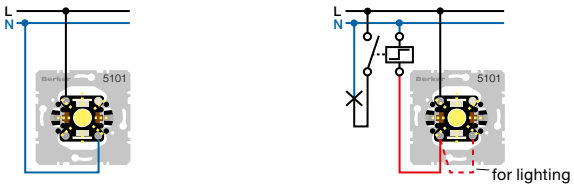


Figure 1: Pilot lamp E10
push-button illuminated, when using neon lamps only a limited number of push-buttons are to be switched in parallel

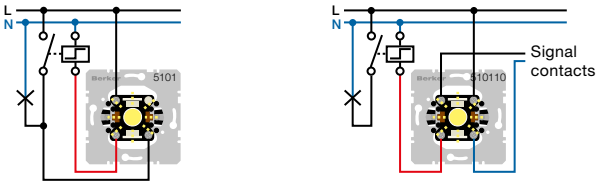


Figure 2: Control push-button
Push-button with separate signalling contacts, e.g. for connecting an indicator lamp

Operating conditions for electronic switches, dimmers and speed controllers

Specification of the rated load capacity when installing as a single device at:
- Ambient temperature up to 25° C
- Wall box in solid stone wall

When connecting transformers, the nominal load of the transformer is always assumed not just the nominal load of the connected lamps.

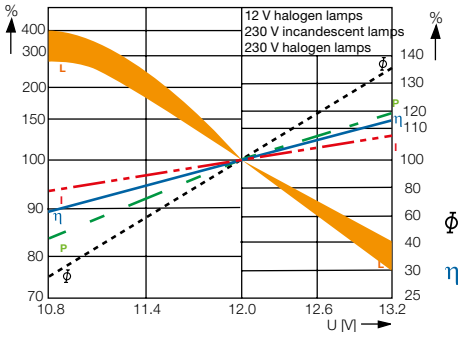
The maximum connected load must be reduced according to the installation conditions (see table).

Varying conditions:	
minus 10 %	- per 5° C above 25° C - external devices in multiple combinations
minus 15 %	in wood or plasterboard wall
minus 20 %	internal devices in multiple combinations

Figure 1: Reduction of the rated load capacity under varying installation conditions

Energy saving by dimming
Controlling the brightness levels of lights not only provides a pleasant ambience, it also prolongs the lives of the bulbs. Controlling the brightness levels of lights not only provides a pleasant ambience, it also prolongs the lives of the bulbs.

Bulb life depending on operating voltage



5 % lower voltage corresponds to 200 % service life

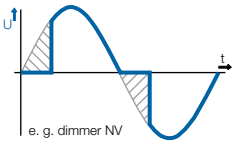
Identification
ℰ Identifiers for dimmers and electronic switches (with semiconductor switching element) to DIN EN 60669-1/A2 and VDE 0632 part 1/A2.

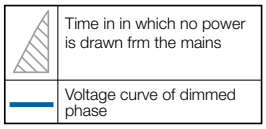
μ Identifiers for switchgear with relays with micro-contact opening width to DIN EN 60669-1/A2 and VDE 0632 part 1/A2

⚠ When using third-party transformers in conjunction with berker Tronic dimmers and universal dimmers, malfunctions may occur because the components are not optimally attuned to each other.

Universal dimmer
Universal dimmers detect the load type during commissioning and automatically set the correct dimming principle.

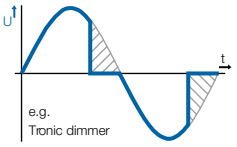
Dimming principles:
- Phase cut-on dimmer for brightness control of 230 V incandescent/halogen lamps and 12 V halogen lamps with conventional transformer

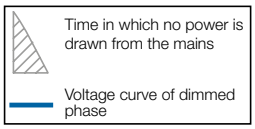




At the beginning of each half-wave the dimmer blocks the current flow to the lamp, it is non-conducting. Only at the end of the time set by the dimming does the dimmer cut in again, and current is re-applied to the connected lamps. At the next sine zero, the dimmer again blocks the current flow. This process is repeated with each sine half-wave - that is, 100 times per second (50 Hz). During the time in which the dimmer blocks the current, no power is drawn from the mains or metered.

- Phase cut-off dimmer for brightness control of 12 V halogen lamps with Tronic transformers, 230 V incandescent and halogen lamps





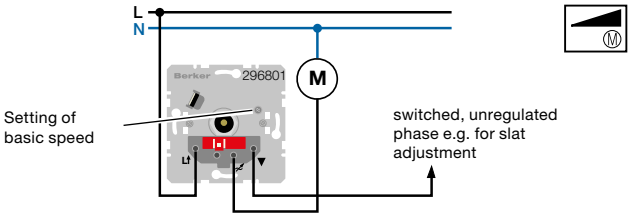
The Tronic dimmer is activated when the sine half-wave passes through zero and deactivated again after the time set by the dimming. At the next sine wave zero the Tronic dimmer releases the current flow again. This process is repeated with each sine half-wave - that is, 100 times per second (50 Hz). In the time during which the Tronic dimmer blocks the current, no power is drawn from the system, and none is metered.

Dimmer selection table

Load type: / Dimmer type:		Standard phase cut-on dimmer R	Low voltage phase cut-on dimmer R,L	Phase cut-off dimmer R,C	Universal-dimmer R,L,C	Speed controller Ⓜ
Standard 230 V incandescent lamps	R	R ✔	R ✔	R ✔	R ✔!	Combination unsuitable
230 V halogen and incandescent lamps	R	R ✔	R ✔	R ✔	R ✔	Combination unsuitable
12 V halogen lamps with conventional dimmable transformer	L	Combination unsuitable	L ✔	Combination unsuitable	L ✔	Combination unsuitable
12 V halogen lamps with electronic transformer with capacitive characteristics	C	Combination unsuitable	Combination unsuitable	C ✔	C ✔	Combination unsuitable
12 V halogen lamps with electronic transformer with inductive characteristic	L	Combination unsuitable	L ✔	Combination unsuitable	L ✔	Combination unsuitable
12 V halogen lamps with electronic transformer with inductive or capacitive characteristics	L,C	Combination unsuitable	L ✔	C ✔	L, C ✔	Combination unsuitable
Motors	Ⓜ	Combination unsuitable	Combination unsuitable	Combination unsuitable	Combination unsuitable	M ✔

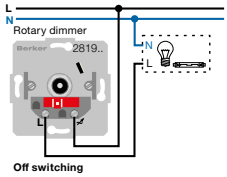
Speed controller [2968 01]

Off switching



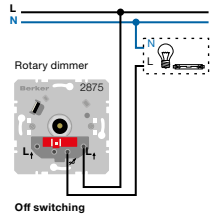
Technical data	Speed controller Order no. 2968 01
Motors	230/240 V~, 50/60 Hz single-phase motors such as induction, shaded pole or universal motors
Minimum load	0.1 A
Maximum load	2.7 A (2.3 A)
Motor current	max. 2.7 A (max. 2.3 A)
Slat current	Difference of maximum load and motor current
Control principle	phase cut-on
Noise	low noise
Overheating protection	switch off; auto. restart after cooling
Fine-wire fuse	T3.15H250
Radio interference suppression	acc. to EN 55015
Operating temperature	-20 ... 25 °C
Connecting terminals	Plug-in terminals for max. 2.5 mm² ... 2 x 1.5 mm²

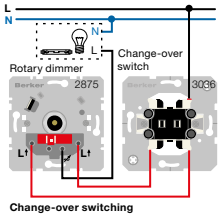
Rotary dimmer 400 W

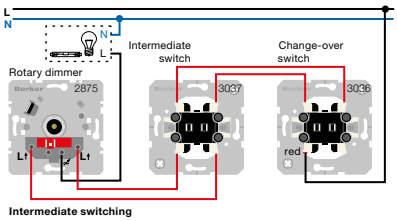


Technical data	Rotary dimmer 400 W, order no. 2819..
Rated voltage	230 V~, 50 Hz
Connected load	230 V incandescent lamps and halogen lamps 60 ... 400 W mixed loads of specified loads
Power boosters built-in (R, L)	max. 10
Control principle	phase cut-on
Noise	low noise
Fine-wire fuse	T 1.6 H 250
Radio interference suppression	acc. to EN 55015
Operating temperature	5 ... 25 °C (observe operating conditions)
connecting terminals	Screw terminals for max. 2.5 mm² or 2 x 1.5 mm²

Rotary dimmer 600 W



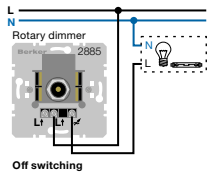


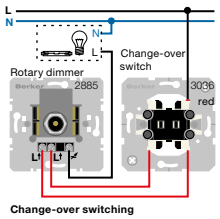


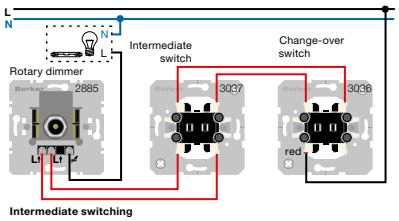
Technical data	Rotary dimmer 600 W Order no. 2875
Rated voltage	230 V~, 50 Hz
Connected load	230 V incandescent lamps and halogen lamps 60 ... 600 W, (60 ... 450W) mixed load of the specified load types
Power boosters built-in (R, L)	max. 10
Dimming principle	phase cut-on

Technical data	Rotary dimmer 600 W Order no. 2875
Noise	low noise
Fine-wire fuse	T 2.5 H 250
Radio interference suppression	acc. to EN 55015
Operating temperature	5 ... 25 °C (observe operating conditions)
Connecting terminals	Plug-in terminals for max. 2.5 mm² or 2 x 1.5 mm²

Rotary dimmer 1000 W



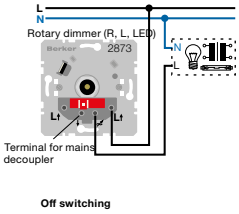


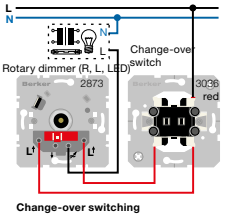


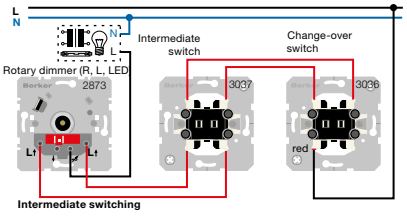
Technical data	Rotary dimmer 1000 W Order no. 2885..
Rated voltage	230/240 V~, 50 Hz
Connected load	230 V incandescent lamps and halogen lamps 100 ... 1000 W mixed loads of specified loads
Tronic- and power boosters built-in (R, L)	max. 10
Dimming principle	phase cut-off
Noise	very low noise

Technical data	Rotary dimmer 1000 W Order no. 2885..
Short-circuit proof	Switch off with autom. restart electron. Fuse (maintenance free)
Overload proof	by power reduction
Radio interference suppression	acc. to EN 55015
Operating temperature	5 ... 25 °C (observe operating conditions)
Connecting terminals	Screw terminals 0.75 ... 4 mm²

Rotary dimmer (R, L, LED)



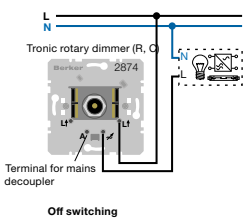


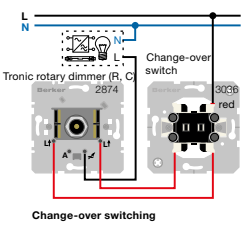


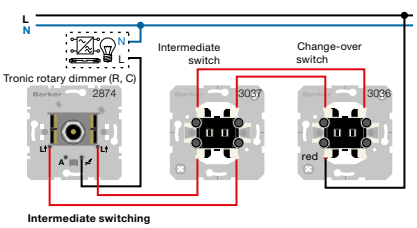
Technical data	Rotary dimmer (R, L, LED) Order no. 2873..
Rated voltage	230 V/240~, 50 Hz
Connected load	230 V incandescent lamps and halogen lamps 20 ... 500 W conv. transformers (subject to min. 85 % of rated load) incl. transformer power dissipation 20 ... 500 VA dimmable LED/compact fluorescent lamps (typ.) 3 ... 100 W mixed load of the specified load types
Power boosters built-in (R, L)	max. 10

Technical data	Rotary dimmer (R, L, LED) Order no. 2873..
Switching current for base load mains decoupler	max. 100 mA
Dimming principle	phase cut-on
Fine-wire fuse	T 3.15 H 250
Noise	very low noise
Radio interference suppression	acc. to EN 55015
Operating temperature	5 ... 25 °C (observe operating conditions)
Connecting terminals	Plug-in terminals for max. 2.5 mm² or 2 x 1.5 mm²

Tronic rotary dimmer (R, C)







Technical data	Tronic rotary dimmer (R, C) order no. 2874..
Rated voltage	230 V~, 50 Hz
Connected load	230 V incandescent lamps and halogen lamps 20 ... 525 W Tronic transformers 20-525 W
Universal-power boosters Plus RMD	max. 10 à 500 W
Tronic power boosters built-in	max. 10
Switching current mains decoupler	max. 100 mA

Technical data	Tronic rotary dimmer (R, C) order no. 2874..
Noise	very low noise
Short-circuit proof	Switch-off with autom. restart electronic fuse (maintenance-free)
Overload proof	by power reduction
Radio interference suppression	acc. to EN 55015
Operating temperature	5 ... 25 °C (observe operating conditions)
Connecting terminals	Plug-in terminals for max. 2.5 mm² or 2 x 1.5 mm²

Universal rotary dimmer (R, L, C), extension unit insert

Connection diagrams and technical data apply for
- Universal rotary dimmer (R, L, C) 2861 10
- Universal rotary dimmer with centre plate (R, L, C) 2834 ..
- Extension unit insert for universal rotary dimmer 2862 10, 2835 ..

Applications

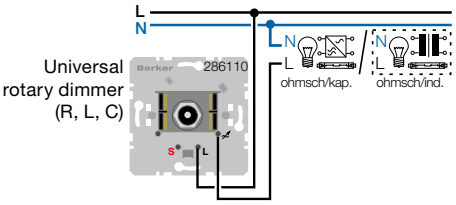


Figure 1: Off switching

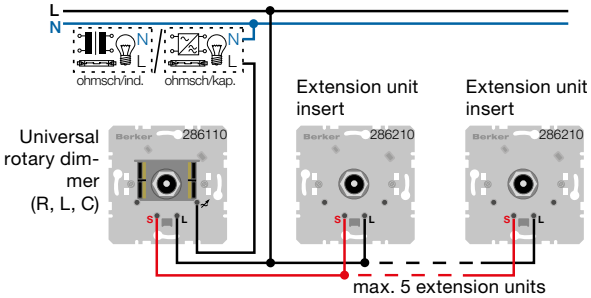


Figure 2: Operation with extension unit(s)

1-10 V control units

In lighting engineering, electronic ballasts and Tronic transformers fitted with a 1-10 V interface are being deployed to operate lamps (such as fluorescent lamps, LV halogen lamps).
If multiple devices are connected using a single control line with 1-10 V control inputs, the 1-10 V rotary potentiometer can be used to adjust the brightness from a remote location. In this way, extensive and complex light systems can be implemented. The 1-10 V control units (1-10 V rotary potentiometer, 1-10 V push-button rotary potentiometer, NO contact) are used to switch the electronic ballast mains voltage on and off as well as for problem-free adjustment of the control voltage at the 1-10 V interface of the devices. The 1-10 V rotary potentiometers are covered by a centre plate with setting knob and frame, in keeping with the familiar dimmer design.

Measurement of the control and load currents
The total of electronic ballast control currents with the 1-10 V rotary potentiometer may be max. 50 mA, and the sum total of electronic ballast load currents (consider making currents) may be max. 6 A. The electronic ballast and lighting manufacturers' specifications regarding the control and load currents (with making currents) must be observed.

Calculation example, type Osram electronic ballast 2 x 58 W:
- Control current IST = 0.6 mA
- Load current IL = 0.55 A per electronic ballast
- 83 electronic ballasts are to be connected
  IST = 83 x 0.6 mA = approx. 50 mA, IL = 83 x 0.55 A = 45.7 A

Result: The control contact is fully loaded.
Since electronic ballasts have an electrolytic capacitor in their input circuit, high making currents are to be expected. If the permissible number of electronic ballasts is exceeded (see table below), a contactor must be used to switch them, or a making current limiter.

1 - 10 V rotary potentiometer - maximum number of electronic ballasts that can be switched without additional fittings:
- 5 two-lamp or 10 one-lamp Osram electronic ballasts 58 W;
- 15 two-lamp or 30 one-lamp Insta electronic ballasts 42 W;
- 13 berker Tronic transformers 20-105 W

For a mixed load with inductive loads the proportion of the ohmic loads must not exceed 50 %!
Do not mix capacitive and inductive loads

Technical data - performances

Universal rotary dimmer (R, L, C)	Order no. 286110, 2834 ..
Rated voltage	230 V~, 50/60 Hz
Dimming principle	Phase cut-on or -cut-off depending on load type
Connected load - 230 V incandescent lamps and halogen lamps - Tronic transformers - conv. transformers - Mixed loads	ohmic: 50 .. 420 W capacitive: 50 .. 420 W (subject to min. 85 % of rated load) incl. transformer power dissipation, inductive: 50 .. 420 VA
Power consumption	approx. 0.5 Watt
Switch-on	bulb-preserving soft startup
Number of extension units	max. 5 extension unit inserts
Extension unit cable length	max. 100 m
Short-circuit protection	Switch off with autom. restart electron. fuse (maintenance free)
Overload protection	by power reduction
Radio interference suppression	acc. to EN 55015
Operating temperature	5 to 25 °C
Connecting terminals	Plug-in terminals for max. 2.5 mm² or 2 x 1.5 mm²

1 - 10 V rotary potentiometer [2891 10]

Max. 5 two-lamp electronic ballasts or 10 lamp electronic ballasts can be switched with no additional relay/ contactor or making current limiter.

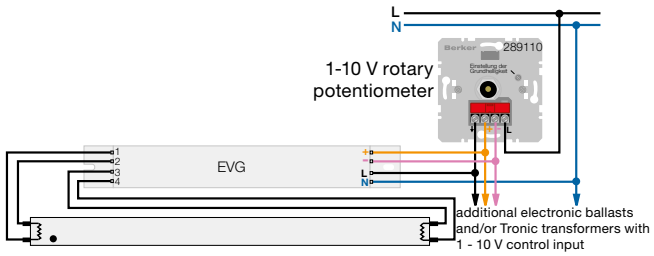


Figure 1: Off switching with 1-10 V rotary potentiometer

1 - 10 V push-button rotary potentiometer, NO contact [2896 10]

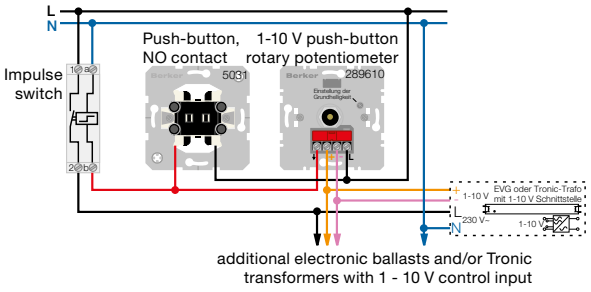


Figure 2: Change-over switching with impulse switch

1 - 10 V rotary potentiometer 1 - 10 V push-button rotary potentiometer	Order no. 2891 10 Order no. 2896 10
Max. control voltage UST	12 V
Min. control voltage UST	0.7 V
Max. control current IST	50 mA
max. switching capacity, mains switch	1380 VA resp. 6 A at 230/240 V~, 50/60 Hz
Fine-wire fuse	F 500 H 250
Operating temperature	5 .. 35°C
Screw terminals	max. 4 mm² or 2 x 2.5 mm²

DALI Protocol
DALI (**D**igital-**A**ddressable **L**ighting **I**nterface) is a protocol for controlling light technology operating devices, e.g. electronic transformers, electronic upstream devices etc.

Broadcast
Control information is sent in broadcast operation centrally to all users in the DALI network.

Typical broadcast commands

DALI command	Broadcast command
Light level (DAP)	Light value is called up
OFF	Switch off
STEP UP	Brighter dimming
STEP DOWN	Darker dimming
ON AND STEP UP	Switching on and darker dimming
STEP DOWN AND OFF	Darker dimming and switching off

Rotary potentiometer DALI
Not suitable for combining with other DALI systems.
The control line and load line can be laid in a common cable.
The brightness of the lighting in the absence of DALI telegrams (PowerON-Level) and in the event of failure of the DALI system voltage (SystemFailure-Level) is stored in the EB and cannot be changed using the DALI rotary potentiometer.

DALI rotary potentiometer with soft-lock [Order no. 2897]

The DALI rotary potentiometer can control up to 64 DALI devices in broadcast operation. In parallel operation the lighting applies the brightness value of the respective DALI rotary potentiometer actuated. This can cause a brightness jump.

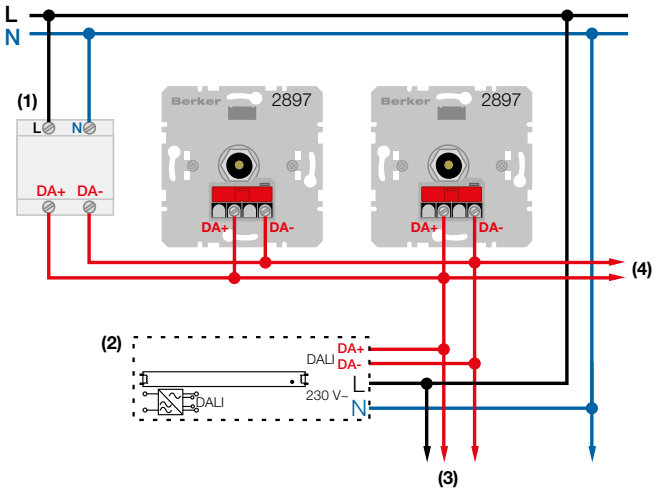


Figure 1: Connection of DALI rotary potentiometers as equally entitled control section
1 Power supply (according to DIN IEC 60929)
2 EB or Tronic transformer with DALI interface
3 Connection of additional devices with DALI interface
4 Connection of additional DALI potentiometers Order no. 2897

Rotary potentiometer DALI	Order no. 2897
DALI system voltage according to IEC 60929	16 V= (9.5 ... 22.5 V=)
Current consumption	< 2 mA
DALI devices	max. 64
DALI control line length at 0.5 mm² at 0.75 mm² at 1.5 mm²	 max. 100 m max. 100 ... 150 m max. 150 ... 200 m
Fine-wire fuse	F 0A 25 H 250
Operating temperature	5 ... 35°C
Connecting terminals	Screw terminals for max. 2 x 2.5 mm² or 1 x 4 mm²

DALI rotary potentiometer with power supply [Order no. 2898]

The DALI rotary potentiometer with an integrated power supply, when connected to the mains voltage (active operation), supplies the control current for the connected DALI devices. If the device is not connected to the mains voltage (passive operation), the power supply is supplied via the DALI voltage: the DALI rotary potentiometer works as an additional operating section (broadcast operation).

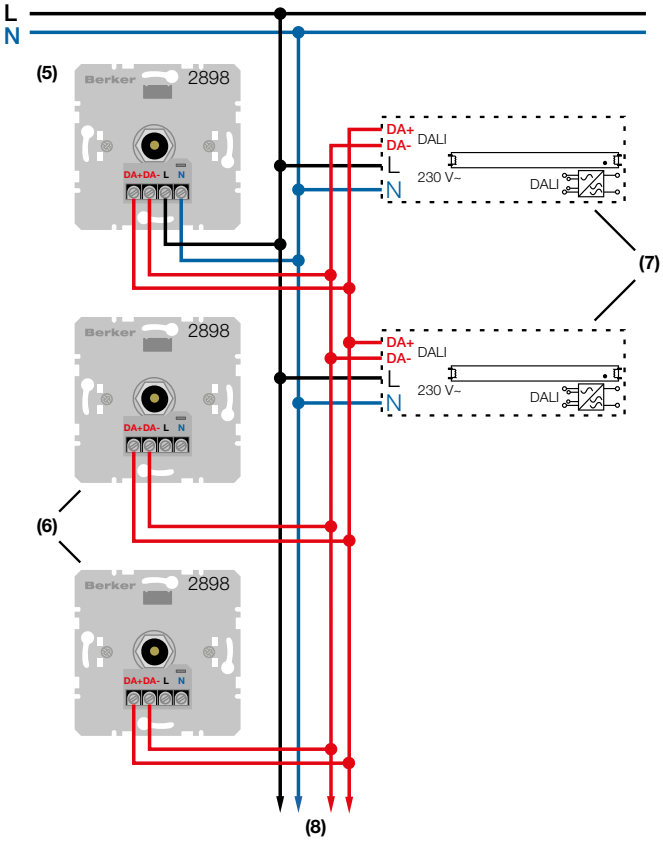


Figure 2: Connection of DALI rotary potentiometers as equally entitled control section
5 DALI potentiometer with power supply (active operation)
6 DALI potentiometer with power supply (passive operation)
7 EB or Tronic transformer with DALI interface
8 Connection of additional DALI potentiometers with power supply Order no. 2898 as well as additional devices with DALI interface

A maximum of 4 active DALI rotary potentiometers can be used within the DALI network.

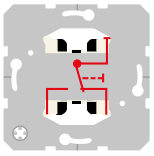
DALI rotary potentiometer with power supply	Order no. 2898
Rated voltage	230 V~
Frequency	50/60 Hz
Output current	max. 52 mA
DALI system voltage according to IEC 60929	16 V= (9.5 ... 22.5 V=)
Power consumption	max. 2 W
Quantity of DALI devices with 1 active DALI potentiometer	max. 26
Quantity of DALI devices with 4 active DALI potentiometers in parallel	max. 104
DALI control line length at 0.5 mm² at 0.75 mm² at 1.5 mm²	 max. 100 m max. 100 ... 150 m max. 150 ... 200 m
Operating temperature	5 ... 35°C
Connecting terminals	Screw terminals for max. 2 x 2.5 mm² or 1 x 4 mm²

Push-button for hotel card/ relay switch for hotel card

The push-button and relay switch for hotel card allow the central switching of electrical loads and additionally provide a storage possibility for the hotel card.
The operation is performed by inserting and removing the hotel card. The lighting of the operating section makes safe operation possible even in darkness.
Energy efficiency measures can be achieved by an additional feedback to the reception or by connection to the building automation e.g. for lowering the room temperature or for switching off ventilation/air conditioning systems.

Push-button, change-over contact for hotel card [Order no. 5056 01]

When the hotel card is inserted, the loads connected via a load contactor are switched on. After removing the hotel card, all electrical loads that are still active but no longer needed, such as lighting (possibly with time delay relay), socket outlet circuits (e.g. for television) are disconnected from the mains.



5056 01 Push-button, change-over contact for hotel card
1675 Neon lamp unit with N terminal

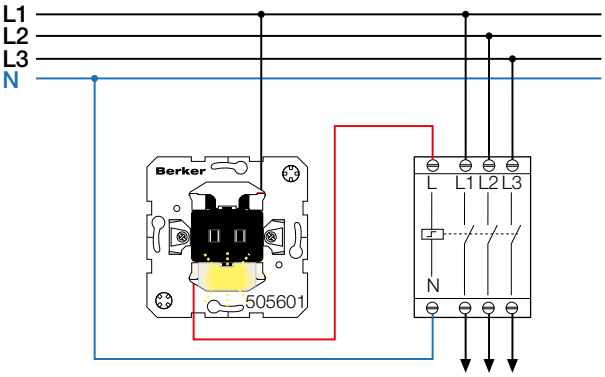


Figure 1: Push-button, change-over contact for hotel card: Neon lamp unit lights up only when the hotel card is not inserted.

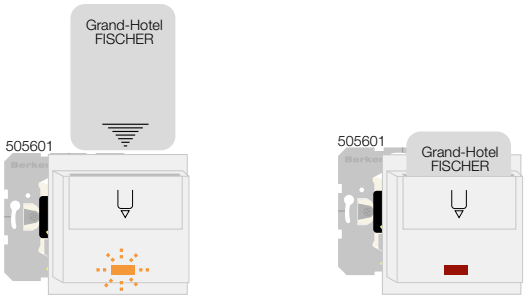


Figure 2: Orientation lighting for hotel card applications

Function if hotel card is inserted
- Contact closed
- Orientation light off

Function if hotel card is not inserted
- Contact open
- Orientation light on

Relay switch for hotel card [Order no. 1640 .., 1641 ..]

Loads are connected directly via the internal relay of via a downstream load contactor.
When the hotel card is inserted, the load is switched on and switched off again when removed.
Thanks to the adjustable delay time of the internal relay, the lighting still stays on for the duration of the delay time after removing the hotel card so you can leave the room safely.

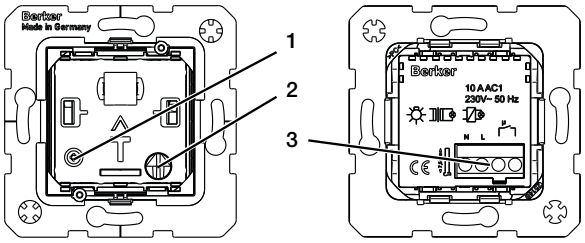


Figure 3: Relay switch for hotel hard: Front view (A) without design cover, hotel card mounting device, fixing element and rear view (B)
1 LED as orientation light
2 Potentiometer for adjustment of delay time
3 Terminal block

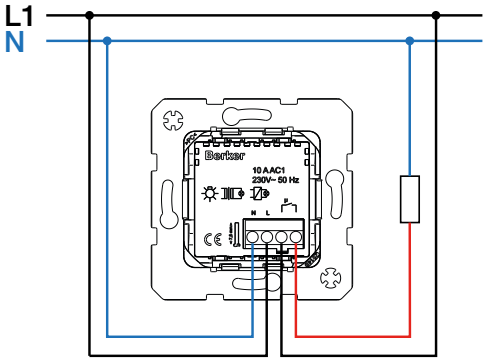


Figure 4: Connection of the load directly via the relay switch for hotel card

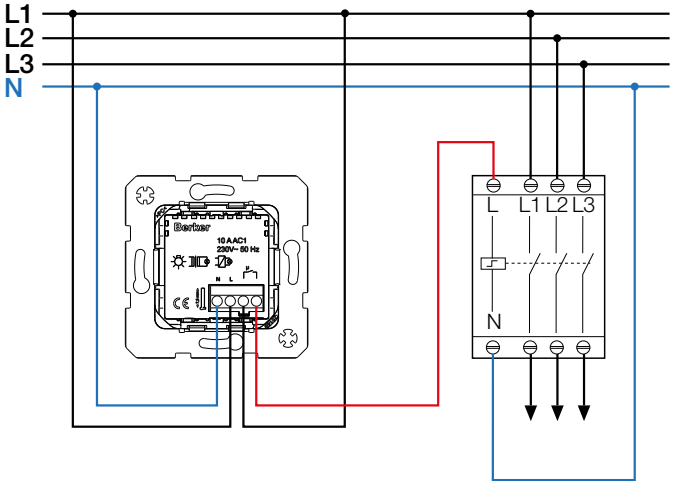
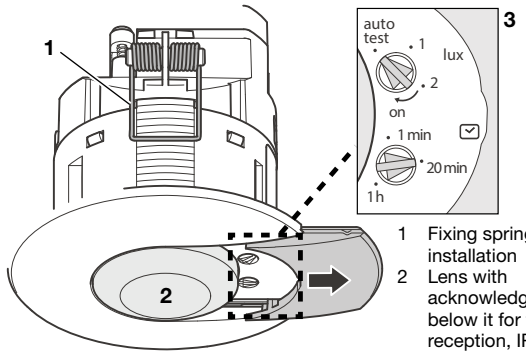


Figure 5: Connection of loads via a load contactor

IR presence detectors

Function elements and operating elements



1 Fixing springs for cavity installation
2 Lens with acknowledgement LED below it for test and IR reception, IR receiver for remote control
3 Adjustment potentiometer

Figure 1: Device overview

Installation modes

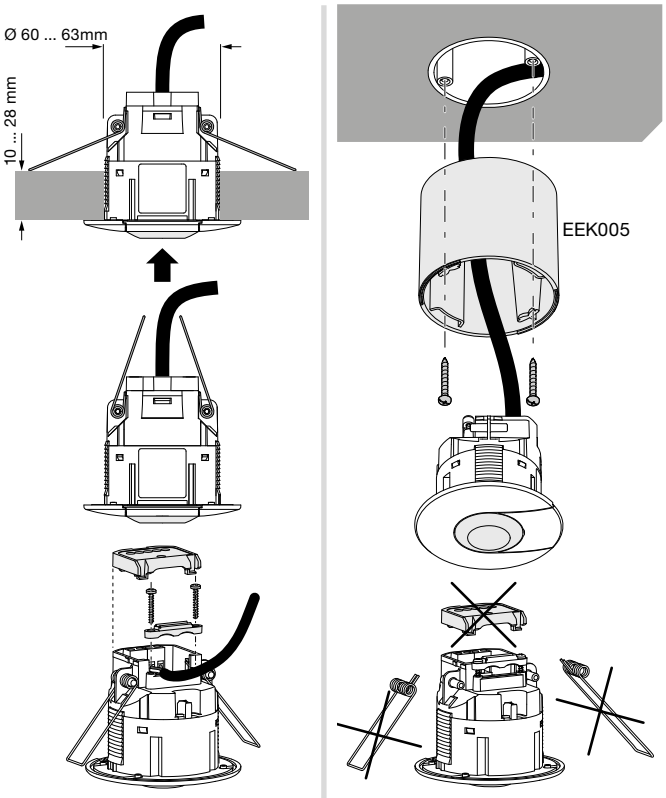
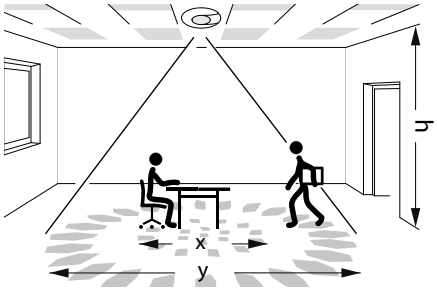


Figure 2: Installation in suspended ceiling / in wall-mounted housing EEK005

Installation location and detection area

- The detector in offices must be installed directly above the workplace so that small movements can be detected precisely.
- Sources of interference (heat sources, partition walls, green plants, ventilation outlets etc.) in the detection area of the presence detector that can impede the motion detection must be avoided.



h [m]	x [m]	y [m]
2.5	5	7
3	5	8
3.5	5	9

h Room/mounting height
x Area of precise motion detection
y Diameter of the detection field

Figure 3: Dependence of detection area on the mounting height

Device settings

The adjustment potentiometer (3) is used to configure the device.

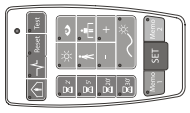
Potentiometer Lux: Setting of the response brightness.

Position	Brightness approx. [lux]	Application
auto test	-	Testing the adjusted brightness value and detection area Configuration via hand-held transmitter EE807
1	200	Stairs/hallways Setpoint to control the lighting in stairwells in accordance with DIN EN12464-1, 2003-3: min. 150 lux
2	400	Offices
on	1000	

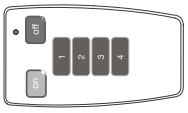
Potentiometer ⏲: setting of delay time.

Remote control

Two IR hand-held transmitters are available for remote control.



EE807



EE808

Settings/commissioning by electricians	Operation by user
- Setting response brightness - Setting switch on delay - Selecting operating mode - Resetting to factory setting - 2 Configuration memory for convenient multiple startups	- Switching controlled lighting - Only with EE 816 (DALI/DSI) - Dimming controlled lighting - Saving and opening 4 different brightness levels.

IR presence detector [EE815]

The presence detector has an integrated switching contact for direct connection of the lights to be controlled.
A push-button NO contact can be connected to the extension unit connection, which can be used to switch the lighting ON/OFF regardless of motion.

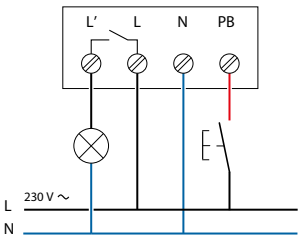


Figure 4: Connection of the IR presence detector

DALI IR presence detector [EE816]

The presence detector has an integrated DALI/DSI output for controlling the lighting with appropriate operating devices. The protocol setting (DALI or DSI) takes place automatically.
A push-button NO contact can be connected to the extension unit connection, which can be used to switch the lighting ON/OFF (short press) or to dim the lighting (long press) regardless of motion.

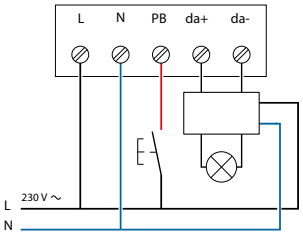
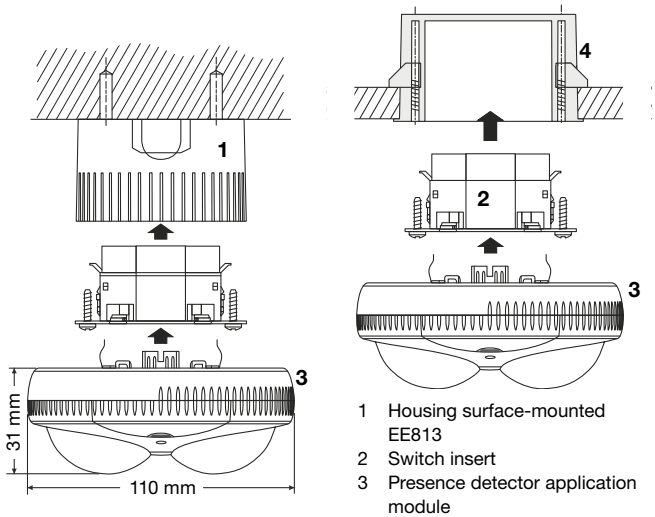


Figure 5: Connection of the DALI presence detector

Presence detector surface-mounted/flush-mounted

Installation modes



1 Housing surface-mounted EE813
2 Switch insert
3 Presence detector application module
4 Wall box

Figure 1: Installation in suspended ceiling or in wall-mounted housing EE813

Presence detector 1-channel surface-mounted/ surface-mounted [EE810]

Applications with 3-step switch

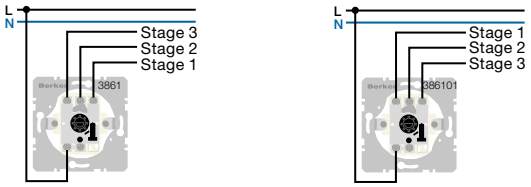


Figure 1: 3-step switch with zero position [Order no. 3861] / 3-step switch without zero position [Order no. 386101]

Switch/push-button in blind applications, key switch

Applications blind series switch/push-button

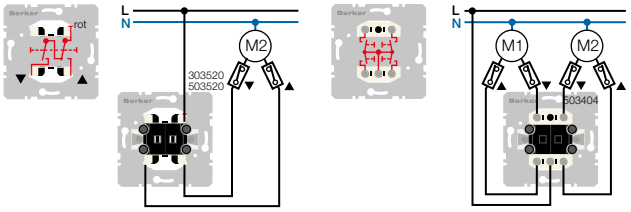


Figure 1: Blind series switch 1pole [Order no. 3035 20]; blind series push-button 1pole [Order no. 5035 20] / group series push-button, 4 NO contacts, common input terminal [Order no. 5034 04] as blind push-button

Applications switch/push-button for blinds

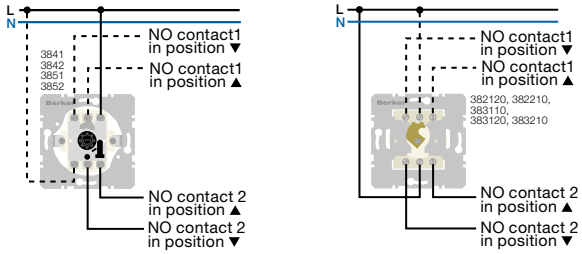


Figure 2: Rotary switch for blinds 1pole and 2pole [Order no. 3841, 3842]; switch for blinds 1pole and 2pole for centre plate with lock [Order no. 3851, 3852] / switch/push-button for blinds 1pole and 2pole for lock cylinder [Order no. 382.., 383..]

Connection

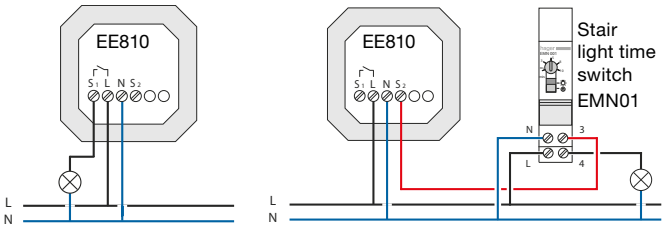


Figure 2: Direct connection of a light / control of a stair light time switch

Presence detector with constant light controller via 1-10 V interface surface-mounted/flush-mounted [EE812]

Connection

⚠ When connecting push-buttons for manual switching/dimming and in master-slave mode, use the same phase for all devices!

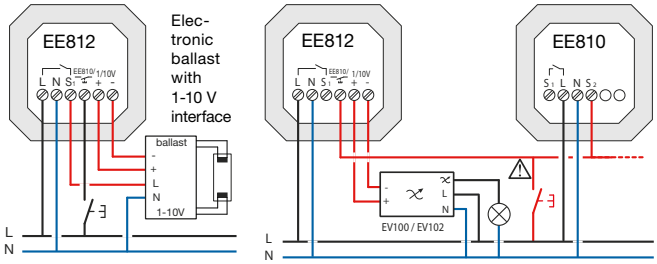


Figure 3: Connection to electronic ballast with 1 -10 V interface/ connection in master-slave mode with EE810

Applications key switch

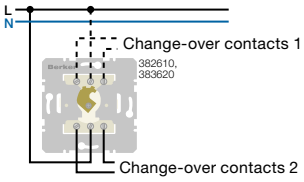


Figure 3: Change-over switch 1pole and 2pole for lock cylinder [Order no. 3826 10, 3836 20]

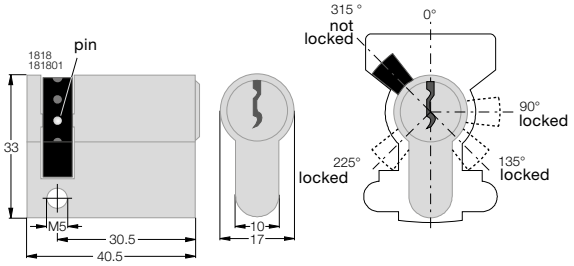


Figure 4: Lock cylinder [Order no. 1818, 1818 01]

The lock bit setting of the lock cylinder can be changed by pushing the bolt in 45°-steps.

- In lock bit setting 315°, the cover with the lock cylinder is removable without a key. The key is only removable in zero position (unswitched).
- The cover is secured against removal in the lock bit settings 90°, 135°, 225°. After activation, the key is turned back to the original position and can be removed with switches in any switching state.

Thermostats

The thermostat controls the temperature in enclosed spaces, such as homes, schools, workplaces etc.

Mounting

Extraneous heat affects the control accuracy.

- An inside wall opposite the heating source is the preferred installation location. Installation height approx. 1.5 m above the floor.
- Avoid installation on outside walls or draught from windows or doors.
- Do not install the controller within shelving units or behind curtains and similar coverings (except with remote sensor).
- Avoid direct sunlight and do not install near televisions, radios and heating appliances, lamps, chimneys and heating pipes.
- When installing in a 3, 4 or 5gang frame, the distance between the thermostat and a dimmer should be as big as possible. In the case of an arrangement one above the other, the controller should be below the dimmer.

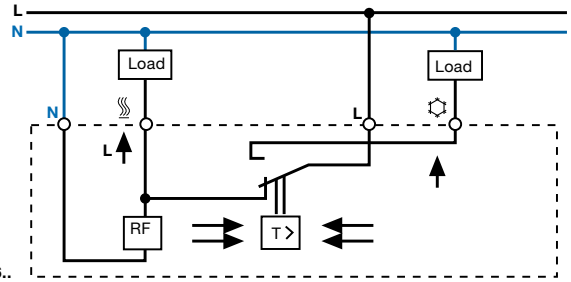
Electrical connection

Connect all the cables according to the corresponding circuit diagram. Connect the neutral conductor N to the N terminal. If this does not take place, then extreme temperature fluctuations will occur, as the controller does not work without thermal recirculation. The function is only dependent on the bimetal. No protective conductor is required, as the device is insulated.

Brief description in the circuit diagram

L	Outer conductor
N	Neutral conductor
⏚	Protective earth conductor
NTC	connection for temperature sensor
RF	Resistor for thermal re-circulation
TA	Resistor for night / temperature lowering
◷	external time switch or (switch) for night / lowering temperature
	Load connection
≋	Heating
✲	Cooling
T>	Bimetal contact (temperature evaluation)

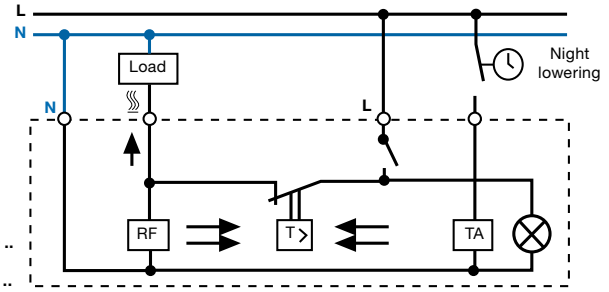
Thermostat, change-over contact with centre plate



2026..

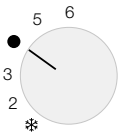
Technical data	Thermostat, change-over contact, with centre plate Order no. 2026..
Temperature range	5 ... 30 °C
Rated voltage	250 V~, 50/60 Hz
Rated current heating Rated current cooling	10 A, 4 A cos φ = 0.6 5 A, 2 A cos φ = 0.6
Switching capacity heating Switching capacity cooling	2.2 kW 1.1 kW
Power consumption	0.15 W
Switching temperature difference	approx. 0.5 °C

Thermostat, NC contact, with centre plate



2030 .. and 2031 ..

Technical data	Thermostat, NC contact, with centre plate, rocker switch Order no. 2030..
Temperature range	5 ... 30 °C
Rated voltage	250 V~, 50/60 Hz
Rated current	10 A, 4 A cos φ = 0.6
Switching capacity	2.2 kW
Power consumption	0.15 W, with night lowering 0.3 W
Switching temperature difference	approx. 0.5 °C
Temperature lowering	approx. 4 °C



The scaling on the thermostats at correct installation location corresponds to approx.:

❄ = approx. 5 °C
2 = approx. 10 °C
3 = approx. 15 °C
• = approx. 20 °C
5 = approx. 25°C
6 = approx. 30°C

Thermostat, NO contact, with centre plate, for underfloor heating

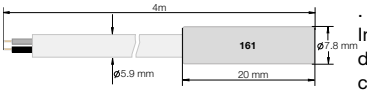
The required floor temperature is set using the adjusting knob. If the set floor temperature is not reached, the control device then requests heat and shows this through a red LED. The heating is switched on or off using the mains switch. Night lowering can be activated using an additional connection by means of an upstream timer or control switch. This is displayed by the green LED on the setting knob lighting up. The temperature is reduced by approx. 5 °C.
For temperature measurement, install the sensor in the floor in a protective pipe. The sensor cable can, if necessary, be extended using a 2-wire cable of 1.5 mm² cross section without influencing the precision of the controller. When laying the cable ducts or when close to high current conductors, a shielded cable should be used.

Sensor [Order no. 161]

Characteristic sensor values: Measuring device internal resistor Ri > 1 MOhm

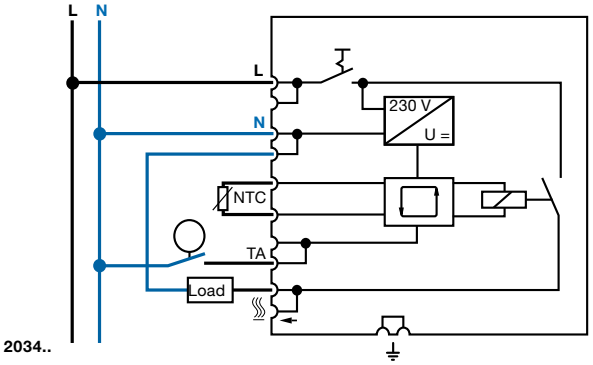
5 °C	85.279 kOhm	25°C	33.000 kOhm	45°C	13.846 kOhm
10°C	66.785 kOhm	30°C	26.281 kOhm	50°C	11.277 kOhm
15°C	52.330 kOhm	35°C	21.137 kOhm		
20°C	41.272 kOhm	40°C	17.085 kOhm		

Resistance values can only be measured when the sensor is disconnected.



Install the temperature sensor in the ductwork in the floor, so that it is located between 2 heating conductors.

Thermostat, NO contact, with centre plate, for underfloor heating



2034..

The terminal TA (temperature reduction) is activated via the neutral conductor N.

Technical data	Thermostat, NO contact, with centre plate, for underfloor heating Order no. 2034..
Temperature range	10 ... 50 °C
Rated voltage	230 V~, 50/60 Hz; 230 V=
Switching current	10 A cos φ = 1 ohmic load
Switching capacity	2.3 kW
Power consumption	0.14 W, with night lowering 0.28 W
Switch/one-pole	On/Off
Display LED	Heating on "red" / Night lowering on "green"
Contacts (relay)	1 NO contact (for heating) not potential-free
Temperature lowering	approx. 5 °C
Switching temperature difference	approx. 1 °C
Sensor lead	PVC 2 x 0.75 mm2
Cable length	4 m
Degree of protection	IP67 acc. to EN 60529

Thermostat; NO contact, with centre plate, time-controlled order no. 2044 ..

The time-controlled thermostat enables weekday and time-dependent control of the room temperature in automatic mode. The current temperature value is determined via the internal sensor and compared with the setpoint value. When the temperature falls below the setpoint value, the heating system is activated.

An external sensor for measuring the floor and room temperature can also be connected.

1 Button **Menu**/⬅
2 Button **–**
3 Button **+**
4 Button **Info/OK**
5 Indication current time/help text
6 Indication of heating mode
7 Display of the day of the week
8 Indication of room or floor temperature
9 Indication of function/ settings

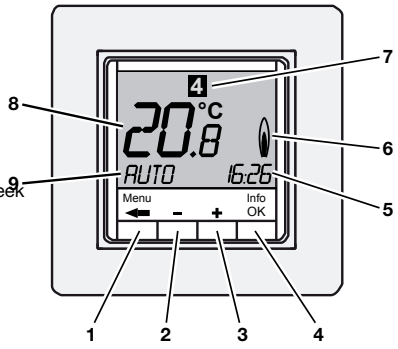


Figure 1: Overview of the operation and display elements

Product features

- can be used as room thermostat, floor thermostat or room thermostat with limiter
- type of actuator (currentless closed/open) adjustable
- control method: PWM (Pulse Width Modulation) or 2 point (On/Off)
- PWM cycle time and hysteresis (for two-point control) adjustable
- 3 preset time/temperature programmes, individually adjustable.
- max of 9 events per weekday adjustable
- frost and valve protection function
- self-learning heating curve, can be switched off
- timer for changing the temperature by the hour
- automatic summer-/winter time switching (can be switched off)
- programmable with operating unit removed
- operating hours meter or energy consumption display adjustable

Time/temperature diagrams

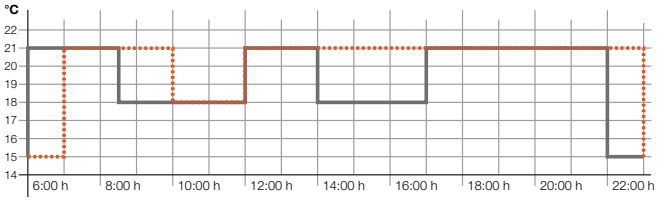


Figure 2: Day profile programme 1

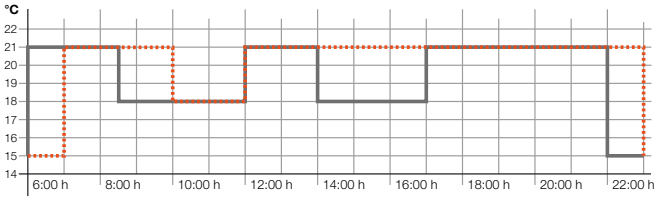


Figure 3: Day profile programme 2

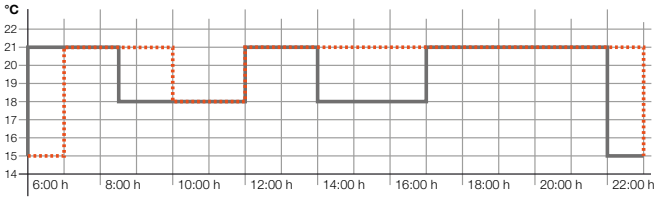


Figure 4: Day profile programme 3

The last temperature setback always takes place at 22:00 h in all preset day profiles.

Function Optimum Start

The device detects automatically when the heating cycle must start so that the set temperature is reached at the set time (self-learning heating curve).

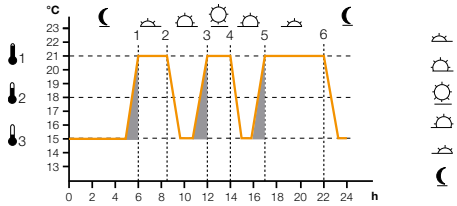


Figure 5: Self-learning heating curve based on the example of the weekday profile of programme 1

Installation and electrical connection

Extraneous heat affects the control accuracy.

- An inside wall opposite the heating source is the preferred installation location. Installation height approx. 1.5 m above the floor.
- Avoid installation on outside walls or draught from windows or doors.
- Do not install the controller within shelving units or behind curtains and similar coverings (except with remote sensor).
- Avoid direct sunlight and do not install near televisions, radios and heating appliances, lamps, chimneys and heating pipes.
- When installing in a 3, 4 or 5gang frame, the distance between thermostat time-controlled and a dimmer should be as big as possible. In the case of an arrangement one above the other, the controller should be below the dimmer.

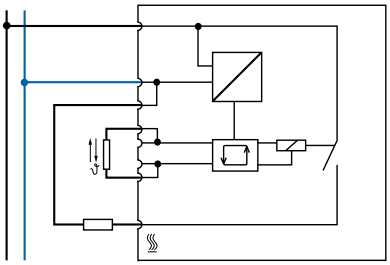


Figure 6: Connection diagram for thermostat, NO contact, with centre plate, time-controlled

Installation temperature sensor [order no. 161]

- The temperature sensor for floor heating systems must be installed in a ductwork between two heating conductors. If a floor temperature sensor is connected, the temperature measured there is displayed (for sensor values see floor temperature controller, NO contact, with centre plate on page **i820**).
- For controlling a room separated from the thermostat the floor temperature sensor can be installed with a sensor insert order no. 7594 10 01 at an appropriate installation location.

Technical data	Thermostat, NO contact, with centre plate, time-controlled Order no. 2044 ..
Operating voltage, rated frequency	AC 230 V~, 50 Hz
Output	Relay NO contact, non-isolated
Switching current	10 mA ... 10 (4) A
Power consumption	approx. 1.2 W
Operating temperature	0 ... 40 °C (without condensation)
Storage temperature	-20 ... 70 °C (without condensation)
Degree of protection	IP30
Protection class	II
Room thermostat (with limiter) Floor thermostat	5 ... 30 °C 10 ... 40°C
Output signal	Pulse width modulation (PWM) or Two-point control (On/Off)
Minimum event	10 min
Time deviation	< 4 min per year
Power reserve via lithium battery (permanently installed)	approx. 10 years

Multimedia technology

VGA module [1994]

The VGA module is used to connect display devices on a graphic card. Depending on the quality, VGA cables can be susceptible to interference at lengths of under 5m, or they can still transmit a good signal at lengths in excess of 30 m. Cables suited for high frequency with a coaxial structure for the colour channels are advantageous.

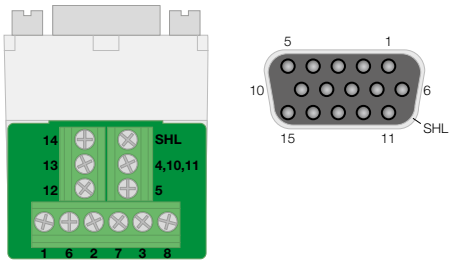


Figure 1: VGA module

PIN	Transmission signal	wire
1	Red	Coaxial wire
2	Green	Coaxial wire
3	Blue	Coaxial wire
4*	Monitor ID Bit 2	Twisted pair wire (optional connection)
5	Ground	Twisted pair wire
6	Red ground	Coaxial shielding
7	Green ground	Coaxial shielding
8	Blue ground	Coaxial shielding
9	Unassigned	Not contacted
10*	Synchronous ground	Twisted pair wire
11"	Monitor ID bit 0 or digital ground	Twisted pair wire (optional connection)
12	Monitor ID bit 1	Twisted pair wire (optional connection)
13	Horizontal synchronisation	Wire 1
14	Vertical synchronisation	Wire 2
15	Monitor ID bit 3	Not contacted
SHL	Housing shielding	External shielding

* are connected together on one terminal.

S-Video module [1993]

The S-Video (also known as Separate Video, Y/C) module is used for separate transmission of brightness (luminance) and colour (chrominance) information. Cable length should not exceed 10 m.

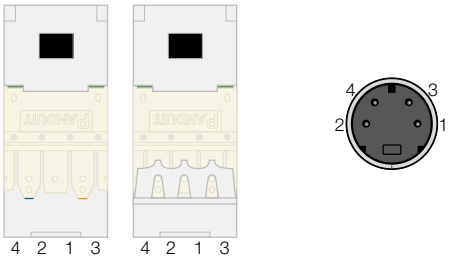


Figure 2: S-Video module

PIN	Transmission signal
1	Luminance (Y) earth
2	Chrominance (C) earth
3	Intensity (luminance) Y
4*	Colour (chrominance) C

Cinch module [1992]

Cinch (RCA) is the designation of standardised connectors for transmitting electrical signals, primarily via coaxial cables. Use of other cable types is not widespread, however it is possible.

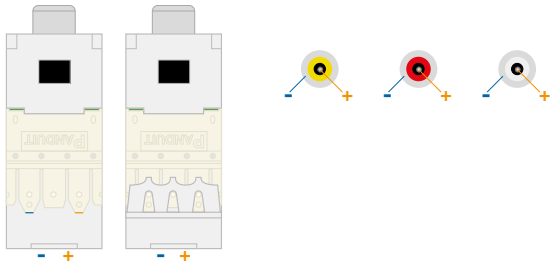


Figure 3: Cinch module

Telecommunications

Arrangement in cable in star 4 configuration

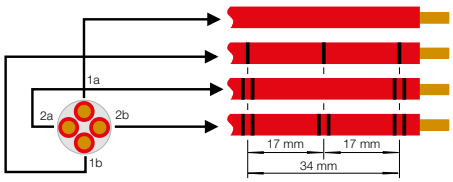


Figure 1: Star 4 configuration- marking with rings

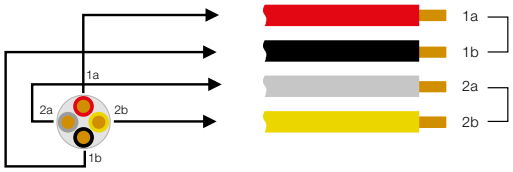
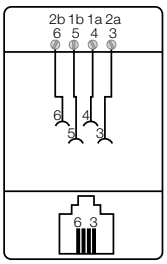


Figure 2: Star 4 configuration- marking with colours

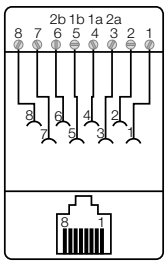
wire	Current colour code	Previous colour code
1a	rd = red	ye = yellow
1b	bl = black	rd = red
2a	ws = white	gn = green
2b	ye = yellow	bl = black

Pin assignment of FCC connector boxes

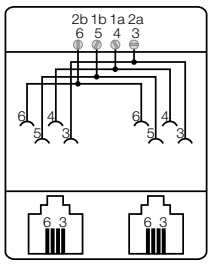
FCC 8(4)



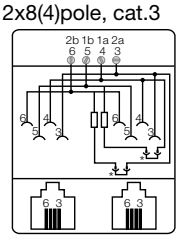
FCC 8



FCC 2x8 (4)

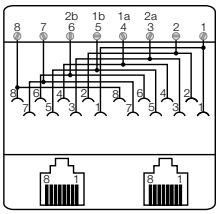


FCC connection socket outlet 2x8(4)pole, cat.3

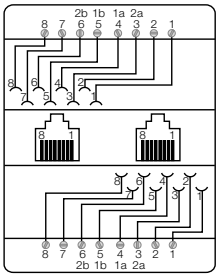


* Bridging can be plugged in

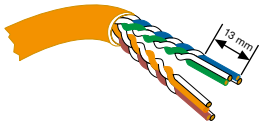
FCC 2x8



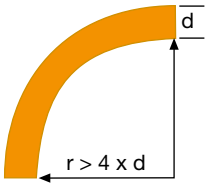
FCC 8/8



Notes to cat. 5 and 6 cables

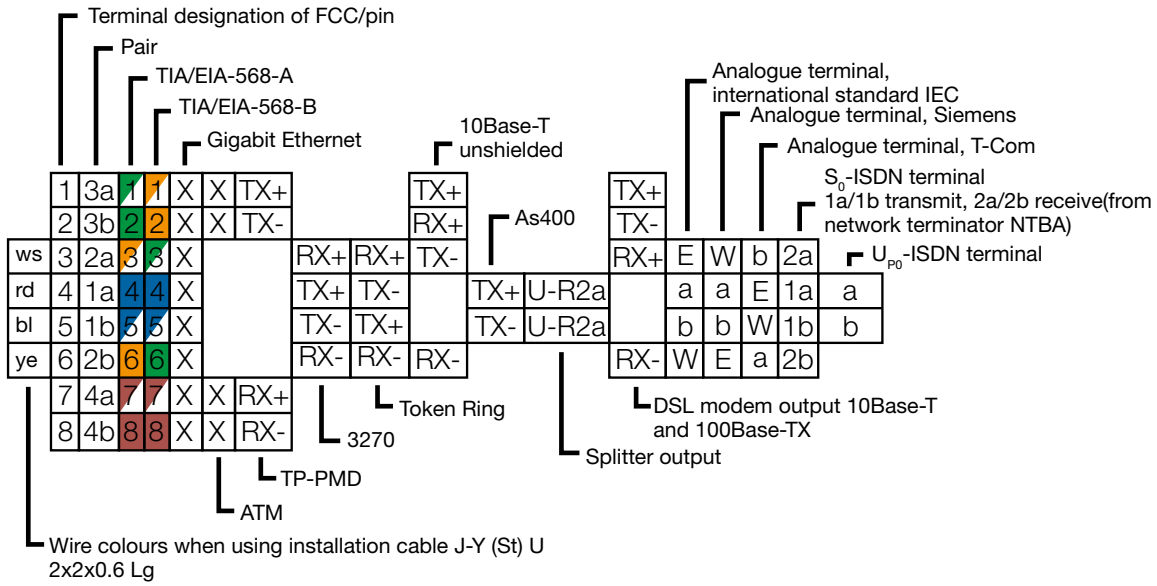


⚠ The twisted pair wires (twisted) must not be drilled more than 13 mm, as otherwise the transmission properties will change. In the case of shielded cables, apply the shield.



⚠ The bend radius " r " of the cable must not be less than 4 x the cable diameter "d" (r > 4 x d).

Contact assignment FCC RJ45



Aerial systems terms

ADR (Astra Digital Radio): digital audio radio programmes on a sub-carrier analogue TV transponder.

Azimuth: Azimuth means the alignment of the south-facing satellite aerial (horizontal angle).

SAT-band: (SAT-IF, Input-IF) intermediate frequency bands used by satellite receivers:
- 950 ... 2050 MHz (standard band)
- 950 ... 2400 MHz (extended band)

High-Band: frequency range 11.7 ... 12.75 GHz of a satellite. Here mostly only digital programmes are broadcast.

Low-Band: frequency range 10.7 ... 11.7 GHz of a satellite. Systems with older LNBs cannot receive the whole range of the band (typically only 10.950 to ... 11.7 GHz analogue).

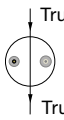
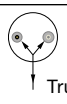
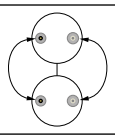
BK bands
- Reverse channel, frequency 5 ... 47 MHz
- Band I (VHF I), channel 2 - 4, frequency 47 ... 85 MHz
- Band II (UKW, VHF II), frequency 87.5 ... 108 MHz
- USB Band, Lower Special Channel Range (VHF), channel S2 - S10, frequency 108 ... 174 MHz
- Band III (VHF III), channel 5 - 12, frequency 174 ... 230 MHz
- OSB Band: Upper Special Channel Range (VHF), channel S11 - S20, frequency 230 ... 300 MHz
- Hyperband expanded special channel area (VHF), channels S21 - S38
- Band V (UHF), channel 21 - 37, frequency 470 ... 606 MHz
- Band V (UHF), channel 38 - 69, frequency 606 ... 862 MHz
- Sat-ZF (UHF), frequency 950 ... 2400 MHz

BER (Bit error rate): denotes the quality of a data signal after it has been received and demodulated. The lower the rate, the better the signal.

Conditional Access (CA) System: controls the access by users to services and programmes which are encrypted for copyright or commercial reasons.

Common Interface (CI): uniform interface for digital set-top boxes for PCMCIA modules with card readers for smart-card by practically all pay TV companies.

Attenuation types

Transmission loss: Attenuation for throughpass sockets between trunk input and trunk output	
Attenuation: for throughpass and single sockets. Attenuation between trunk input and the output sockets	
Decoupling internal: Attenuation between plug output and socket output.	
Directional attenuation: Attenuation between trunk output out and the output sockets.	
Decoupling: Attenuation between two aerial sockets.	

DiSEqCTM (Digital Satellite Equipment Control): switching signal generated by the satellite
receiver, for controlling and switching LNB and multi-switches. This allows several satellite positions for rotary and multi-feed systems to be controlled. DiSEqC is a trade mark of the European Satellite Organization (EUTELSAT) and arose out of cooperation between EUTELSAT and Phillips.

Elevation: elevation is understood to mean the vertical angle (inclination) of the aerial.

EPG (Electronic Programme Guide): electronic programme guide.

Free-to-Air: free-to-air receivers receive exclusively free (non-encrypted) programmes.

LNB (Low Noise Block Converter): a feed system also known as LNC. Reception unit at the focus of the parabolic mirror, which converts the high-frequency satellite downlink into a 1.Sat intermediate frequency suitable for the receiver.

Multi-feed: a technique that allows reception of multiple satellites using just one single fixed aerial.

Multi-switch (Multi-switch): electronic slide switch that enables each subscriber to switch between different reception levels, frequency ranges and satellites. When receiving from 2 or more satellites the DiSEqC switch is required, which controls multi-switches and also receivers.

Parabolic mirror: the most commonly used design for satellite (reception) aerials. Concentrates the electromagnetic waves in the feed system (LNB).

Signal Level Adjuster: for reducing levels that are too high (cable equalisation).

Polarisation: plane of the electrical components of an electromagnetic wave (direction of oscillation). For satellite transmission two different planes are used: the horizontal and the vertical (linear polarisation), the better to exploit the frequency spectrum. The system is based the bands for two adjacent channels being positioned so they partially overlap each other. The interference that could result is prevented by polarising the two channels in different planes.

QAM (Quadrature Amplitude Modulation): digital modulation process with phase shift keying, used for transmission in cable networks.

QPSK (Quadrature Phase Shift Keying): digital modulation process used for satellite transmission.

Set Top Box: standardised designation for a digitally suitable satellite or cable receiver.

SR (Symbol Rate): parameter that must be entered to allow manual searching of the receiver. (e.g. 22000, 27500).

Tone-Burst (also Simple DISEqC): a type of Mini-DiSEqC has been defined as an economical way of extending old systems to a wider circuit configuration (in addition to 14/18 Volt and 22 kHz). This merely modulates a sequence of bits "0" (satellite A) or "1" (satellite B) to the 22 kHz signal. The Tone-Burst signal was developed to permit simple changing over between two LNBs and is suitable for controlling relays (two inputs at one output) and for the new Monoblock LNB. For SAT position A the 22 kHz signal is sent continuously, for SAT position B it is pulsed. A Tone-Burst signal lasts for about 12.5 ms.

Transponder: frequency containing multiple channels. In analogue systems a TV programme and multiple sound channels can be transmitted for each transponder. In digital systems (QPSK) is the transmission capacity is 6-10 TV programmes with sound channels.

Wiring structures (also see Planning recommendations):

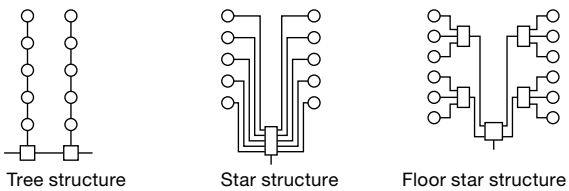


Figure 1: Wiring structures

Connection/transmission losses

Aerial socket 2-hole single socket [Order no. 4502 10]

Connection	Frequency range	Attenuation
IEC (male)	5 ... 47 MHz	1.5 dB
	47 ... 862 MHz	4 dB
	950 ... 2150 MHz	5 dB
	2150 ... 2400 MHz	6.5 dB
IEC (female)	5 ... 47 MHz	1.5 dB
	47 ... 862 MHz	4 dB
	950 ... 2150 MHz	5 dB
	2150 ... 2400 MHz	5 dB

Aerial socket, 2-hole with hinged cover surface-mounted, single socket [Order no. 1203 35 1.., 1203 35 4..]

Connection	Frequency range	Attenuation
IEC (male)	4 ... 862 MHz	type 5 dB
IEC (female)	4 ... 862 MHz	type 5 dB

Aerial socket 2-hole throughpass socket [Order no. 4515 10, 4515 15, 4515 20]

Design		10 dB	15 dB	20 dB
Connection	**Frequency range**			**Attenuation**
IEC (male)	5 ... 47 MHz	6 dB	10.5 dB	20 dB
	47 ... 862 MHz	7.5 dB	13 dB	20 dB
	950 ... 2150 MHz	10.5 dB	13.5 dB	23 dB
	2150 … 2400 MHz	13 dB	14 dB	23 dB
IEC (female)	5 ... 47 MHz	11 dB	10.5 dB	18 dB
	47 ... 862 MHz	8.5 dB	13 dB	21 dB
	950 ... 2150 MHz	9 dB	14 dB	23 dB
	2150 … 2400 MHz	10 dB	14.5 dB	24.5 dB

Connection	Frequency range	Transmission loss		
IN -> OUT	5 ... 862 MHz	4 dB	1.2 dB	0.6 dB
	950 … 2150 MHz	4 dB	2 dB	1 dB
	2150 … 2400 MHz	7 dB	2.2 dB	1.4 dB

Aerial socket, 2-hole with hinged cover surface-mounted, throughpass socket [Order no. 1203 35 2.., 1203 35 5..]

Connection	Frequency range	Attenuation
IEC (male)	4 ... 862 MHz	type 10 dB
IEC (female)	4 ... 862 MHz	type 10 dB

Connection	Frequency range	Transmission loss
IN -> OUT	4 ... 862 MHz	< 1 dB

Aerial socket 3-hole single socket [Order no. 452210]

Connection	Frequency range	Attenuation
IEC (male)	5 ... 862 MHz	5.5 dB
IEC (female)	5 ... 862 MHz	5.5 dB
F-jack	950 ... 2400 MHz	2 dB

Aerial socket, 3-hole with hinged cover surface-mounted, single socket [Order no. 1203 35 3.., 1203 35 6..]

Connection	Frequency range	Attenuation
IEC (male)	4 ... 862 MHz	type 5 dB
IEC (female)	4 ... 862 MHz	type 5 dB
F-jack	950 ... 2400 MHz	type 2 dB

Aerial socket 4-hole single socket [Order no. 459410]

Connection	Input	Frequency range	Attenuation
IEC (male)	IN 1	47 ... 68 MHz	2 dB
		254 ... 862 MHz	2 dB
IEC (female)	IN 1	87.5 ... 230 MHz	1.5 dB
F socket 1	IN 1	950 ... 2150 MHz	2 dB
F socket 2	IN 2	5 ... 2150 MHz	2 dB

Planning recommendations

Between the aerial sockets the decoupling attenuation must be a minimum of 40 dB. Terminal boxes have no decoupling, and are always branched with splitters. The connection at a branch is also called a spur, and only here a terminal box can be connected. At the through passage of a splitter, on the other hand, only through-sockets or other splitters may be connected Only throughpass sockets can be connected to distributors (too little decoupling) only , because only in this manner the decoupling will be sufficient The last throughpass socket must be terminated with a 75 ohm terminating resistor.

Signal-to-noise ratio and noise figure

The signal-to-noise ratio SNR is the ratio, expressed in decibels, of the signal power to the noise power. The noise figure NF is the logarithmic ratio [dB] between the the signal-to-noise ratio SNR_{in} at the input of an active module (e g amplifier) and the signal-to-noise ratio SNR_{out} at the output.

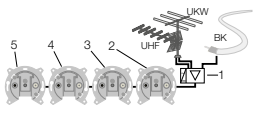
Signal-to-noise ratio	Noise	Picture quality
> 46 dB	not visible	very good
37 dB	visible, but not annoying	good
30 dB	clearly visible, annoying	unsatisfactory
< 26 dB	outweighs	unsatisfactory

Level recommendation at the aerial sockets based on EN 50083-7:

Frequency (measuring device setting)	Level in dBµV (unsensitive) min.	max.	Slope max.	Noise factor/quality bit error rate
UKW 87.5 ... 108 MHz (FM)	50	70	15	C/N: 38 dB Mono C/N: 48 dB Stereo
Terrestrial digital 47 ... 862 MHz (COFDM)	45	70	12	C/N: 25 dB; BER: < 2.0 E-4 (before Viterbi FEC 3/4) MER: 24 dB
CATV digital 47 ... 862 MHz (64-QAM)	47	67	12	BER: 2.0 E-7 MER: 30 dB
SAT-ZF digital 950 ... 2150 MHz (QPSK)	47 (53)	77 (70)	15 (7)	C/N: 11 dB; BER: 2.0 E-4 (before Viterbi FEC 3/4) MER: 15 dB

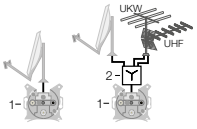
- LED, LCD and plasma televisions need larger signal-to-noise ratios for a visually less noisy picture (50 dB). The level should not exceed 74 dB.
- Execute the system as a star structure if possible
- Install splitters and distributors in accessible spaces
- Install coaxial cables in ductwork systems
- Observe bending radii of the coaxial cables
- Install amplifiers in dry spaces with their own power supply
- Provide a ductwork connection to basement storage
- Connect building distribution network to building equipotential bonding
- Frequency range broadband cable network BC: 47 ... 862 MHz
- Frequency range SAT-ZF: 950 ... 2400 MHz
- Dimension aerial sockets for broadband
- Shielding value building distribution network min. 75 dB better 90 dB according to Class A
- Use return path compatible components for connection to the backbone

Aerial system terrestrial and/or broadband cable BK in tree structure:



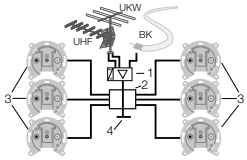
1 Multiband amplifier
2 Aerial socket 2-hole, 20 dB throughpass socket [order no.: 4515 20]
3 Aerial socket 2-hole, 15 dB throughpass socket [order no.: 4515 15]
4 Aerial socket 2-hole, 10 dB throughpass socket [order no.: 4515 10]
5 Aerial socket 2-hole single socket [order no.: 4502 10]

SAT aerial system with single universal LNB for digital reception of a satellite.



1 Aerial socket 3-hole single socket [order no.: 4522 10]
2 Switch for insertion of terrestrial signals e.g. for regional FM/TV reception (DVB-T)

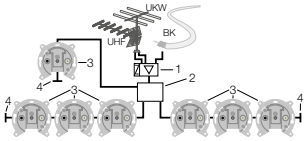
Aerial system terrestrial and/or broadband cable BK in radial structure:



1 Multiband amplifier
2 Branch
3 Aerial socket 2-hole single socket [order no.: 4502 10]
4 Terminating resistor 75 Ohm]

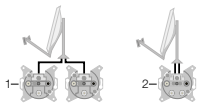
⚠ If only 1 aerial socket is available in a broadband cable system,a throughpass socket with terminating resistor must be used.

Aerial system terrestrial and/or broadband cable BK in tree structure/radial structure



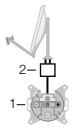
1 Amplifier
2 Distributor
3 Aerial socket 2-hole throughpass sockets [order no.: 4515 20, 4515 15, 4515 10]
4 Terminating resistor 75 Ohm

SAT aerial system with twin universal LNB for 2 receivers or twin receiver for viewing one channel and recording another, e.g. 2 x Astra:



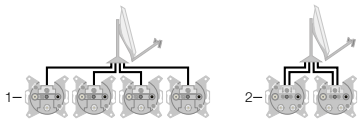
1 Aerial socket 3-hole single socket [order no.: 4522 10]
2 Aerial socket 4-hole single socket [order no.: 4594 10]

SAT aerial system with 2 squinting single universal LNBs for reception of two satellites e.g. Astra and Hotbird (Eutelsat):



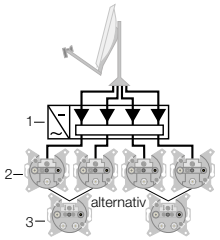
1 Aerial socket 3-hole single socket [order no.: 4522 10]
2 DiSEqC switch

SAT aerial system with Quad switch LNB, e.g. for 4 receivers, e.g. 4 x Astra:



1 Aerial socket 3-hole single socket [order no.: 4522 10]
2 Aerial socket 4-hole single socket [order no.: 4594 10]

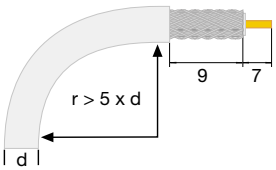
SAT aerial system with Quattro LNB and multi-switch with amplifier



1 Multi-switch with amplifier
2 Aerial socket 3-hole single socket [order no.: 4522 10]
3 Alternatively: aerial socket 4-hole single socket [order no. 4594 10] for viewing one channel and recording another.

ℹ By cascadable multi-switches and taps/distributors expandable to > 100 subscribers optionally with terrestrial input as an alternative.

Notes on coaxial cables



Stripping lengths for aerial sockets 4502 10, 4515 xx, 4522 10

⚠ The bending radius "r" of the cable for a one-time load must not be less than 5 x the cable diameter "d" (r > 5 x d).

Figure 1: Bending radii and stripping lengths

Definition of terms

Resolution: Measure of the size of a picture, measured by the number of pixels (pixel density) or in the number of rows and columns (width and height).

HDCP (High Bandwidth Digital Content Protection): Copy protection for high bandwidth digital programme contents in conjunction with DVI and HDMI.

MPEG (Moving Picture Expert Group): Reduction method for image and sound data. In contrast to analogue methods (here, 25 complete images with all the relevant information are transmitted per second), the MPEG method uses only actual image changes and calculates the full image to be displayed.

DVB (Digital Video Broadcasting): Standardised method to transmit compressed (MPEG-2, H.264) digital content (TV, radio, multi-channel sound, spatial sound, interactive services). DVB-S stands for satellite transmission, DVB-T for terrestrial and DVB-C for cable.

Interface standard

USB (Universal Serial Bus): [USB/3.5 mm audio socket, order no. 33 1539 ..] Serial bus system to connect computer systems and display devices to external devices or storage media. Connection is possible during operation. The properties of connected devices are detected automatically. (Plug&Play). For home cinemas, storage media such as USB sticks and hard drives help to expand the recording devices for connection to pure playback devices.

HDMI (High Definition Multimedia Interface): [High Definition socket, order no. 33 1542 ..] Interface for fully-digital transmission of audio and video data. HDMI video data are reverse-compatible to DVI-D.

DVI (Digital Video Interface): Standard interface for transmitting image data. This interface can be used to connect display devices such as LCD displays, projects, TFT monitors, plasma displays or video cameras to the graphics card of a computer.

Video transmission signals:
- DVI-I: analogue und digital
- DVI-D: digital
- DVI-A: analogue

Audio standards

Dolby® Digital (also termed 5.1 sound) Digital multi-channel audio system for cinemas and home cinemas. Successor system to Dolby Surround (orDolby 2.0 with activated Dolby Surround-Flag). Dolby® Digital supports up to 6 discreet channels (5 loudspeakers, 1 subwoofer) and uses imperfect data compression.

Dolby® TrueHD Loss-free audio codec, specially developed for use on disc media such as HD-DVD and Blu-ray.

Video standards

HD ready Technical specification for a device to play back high-definition television (HDTV):
- analogue component input (YPbPr / YUV)
- digital, copy-protection-capable (HDCP) input (DVI-D/-I or HDMI)
- Support of the HD video formats 720p and 1080i (for 50/60 Hz image repeat rate)

Full HD Ability of a HDTV-compatible device (receiver, TV, DVD player, video camera, games console, etc.), to output or record HD resolutions. Due to different manufacturer designs (1080p full images, 1080i half images), this is not an indication of the image quality, image dimension or the display output of the device.
HDTV (High Definition Television) Global digital recording, production and transmission standard for television with a usable image resolution of up to 1920 × 1080 pixels in a 16:9 format.

	PAL	HDTV	
		HD ready (720p)	Full HD (1080i/1080p)*
Vertical resolution (image lines)	576	720	1080
Horizontal resolution (image columns)	720	1280	1920
Pixels (max.)	414720	921600	> 2 million
Format	4:3	16:9	16:9
Frequency	50 Hz	50 ... 60 Hz	50 ... 60 Hz

Figure 1: TV standards and data

* *1080i (interlaced, half image method)
Advantage: Half transmission rate
Disadvantage: Half images must be recombined through a converter in the TV device

* *1080p (Progressive, full image method)
Advantage: No subsequent combination of the images requires, as all 1080 are shown simultaneously with full pixel accuracy within a frame
Disadvantage: Very high transmission rate

Digital video formats	
VCD	352 x 288 pixels
SVCD	576 x 480 pixels
DVD	max. 720 x 576 Pixel
Blu-ray Disc	max. 1920 x 1080 Pixel

Figure 2: Resolution of current PAL video formats

Video images with a low resolution of a 4:3 side ratio (SD, standard definition) must be scaled up for playback on HDTV devices. Detail losses lead to a poorer image quality.

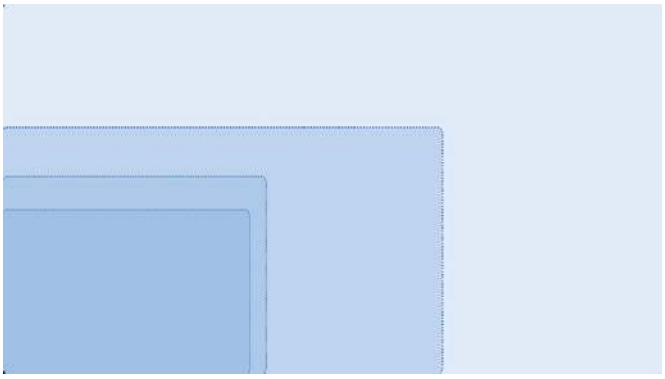


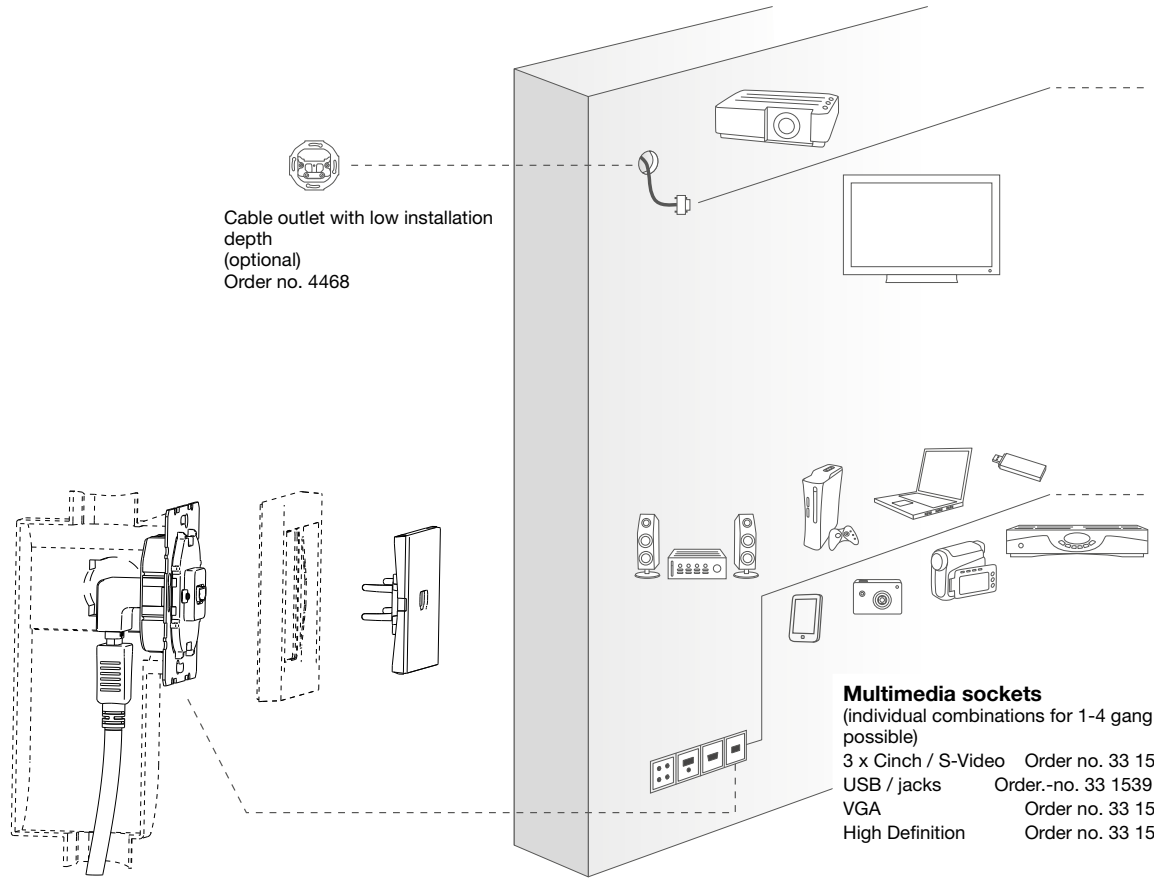
Figure 3: Format comparison

Connectors

Jack connector [USB/3.5 mm audio socket outlet, order no. 33 1539 ..]

(usually 2.5 or 3.5 mm Ø) to connect portable audio playback devices (e.g. iPod, CD/DVD or MP3 player) to AV receiver or amplifier.

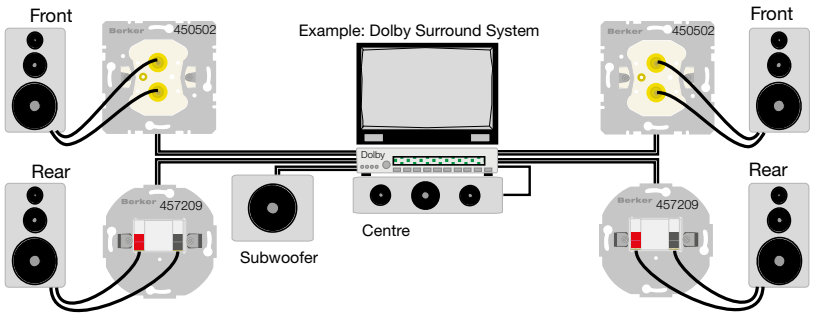
Application example for berker **multimedia socket outlets**
for flush-mounted or hollow-wall mounting



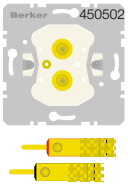
Multimedia sockets
(individual combinations for 1-4 gang frames possible)

3 x Cinch / S-Video	Order no. 33 1532 ..
USB / jacks	Order.-no. 33 1539 ..
VGA	Order no. 33 1540 .. / 33 1541 ..
High Definition	Order no. 33 1542 .. / 33 1543 ..

Application example loudspeaker socket outlet

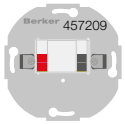


Loudspeaker socket outlet High End



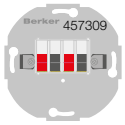
with 2 connectors, 2 banana plugs and 2 cable lugs, gold-plated metal design,
for cable cross-section of up to max. 10 mm² ,
for 1 loudspeaker

Loudspeaker connector box



with plug-in terminals,
for cable cross-section of up to max. 10 mm²,
for 1 loudspeaker

Stereo loudspeaker connector box



with plug-in terminals,
for cable cross-section of up to max. 10 mm²,
for 2 loudspeakers

Residual current safety devices

The use of residual current safety devices is regulated by the VDE 0100-410 (Germany). According to DIN VDE 0100-410: 2007-06, alternating current systems must be provided with additional protection by means of residual-current safety devices ≥ 30 mA. This applies to socket outlets with a rated current not greater than 20 A that are intended for use by non-experts and for general use. Exceptions are regulated in section 411.3.3. DIN VDE 0100-410: 2007-6.
The devices described here are used primarily when modifying and expanding existing systems if no higher-level residual current protection is present.
The test button "T" can be used to test the electrical and mechanical functioning The integrated switch lever can be used to switch on the SCHUKO socket outlet with residual current circuit-breaker and the residual current circuit-breaker again after triggering (when testing or after eliminating the fault).

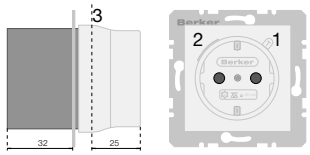
Installation instructions

Connection in TN-C networld only permissible in systems with existing inventory protection.

All devices connected to the outgoing conductors are protected.

Permissible earthing resistance for 30 mA residual current circuit-breaker for a highest permissible electric shock of:
- 25 V : 833 Ω
- 50 V : 1666 Ω

SCHUKO socket outlet with residual current circuit-breaker [4708 ..]



1 Test button
2 Switch for ON/OFF
3 Top edge when covered by frame

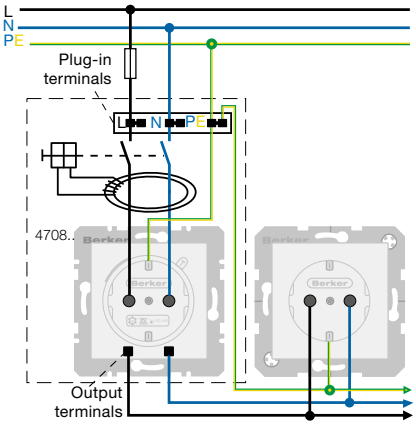


Figure 1: Connection in TN-S or TT network

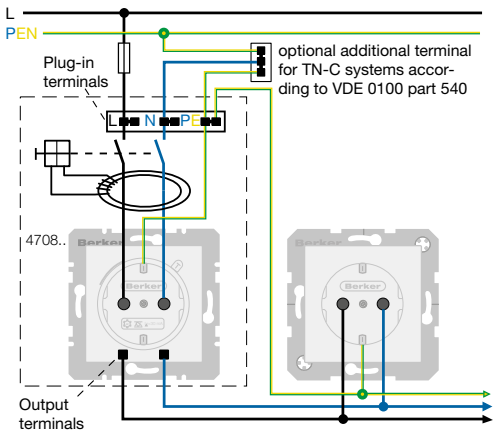
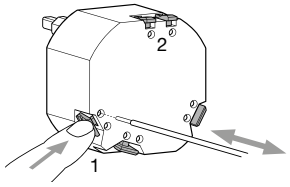


Figure 2: Connection in TN-C network

Residual current circuit-breaker [2844 01]



1 Connect conductor and release conductor with release button
2 Outgoing conductors

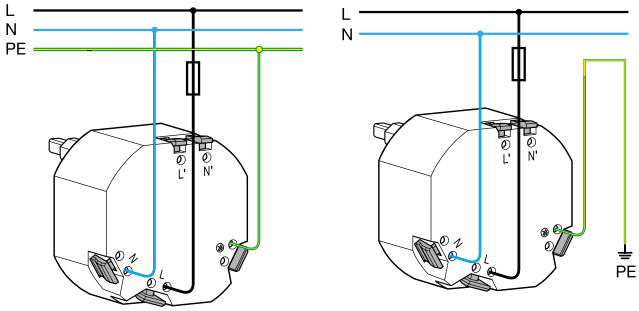


Figure 3: Connection in TN-S or TT network

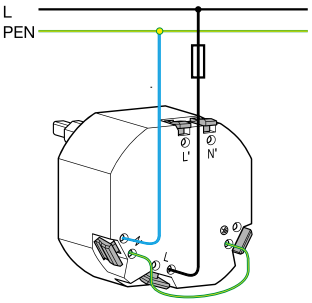


Figure 4: Connection in TN-C network

Technical data

Residual current safety devices	
Rated voltage	230 V~, 50/60 Hz
Rated current	16 A
Residual-current protected outgoing feeders	L, N
Rated fault current	30 mA alternating currents and pulsating direct currents
Trigger time	≤ 30 ms
Mounting orientation	any
Wall box	according to DIN 49073 part 1: 1990-02
Fastening	Claws and screw fastening
Operating temperature	-25 ... 40°C
Connecting terminals	Plug-in terminals for max. 2.5 mm² or 2 x 1.5 mm²
Installation depth	32 mm
SCHUKO socket outlet with residual current circuit-breaker	**Order no. 4708 ..**
Surge resistance	250 A (8/20) µs (DIN VDE 0432 T2)
Rated short circuit capacity	3 kA with back-up fuse 20 A filament lamp
Rated switching capacity I_m	500 A
I^2t proof	≥ 2.5 kA²s
Dynamic surge capacity I_P	≥ 1.7 kA
Definition	EN 61008 part 1 and 2-1: 1994
Degree of protection	IP20
Residual current circuit-breaker	**Order no. 2844 01**
Surge resistance	3000 A (8/20) µs (DIN VDE 0432 T2)
Short-circuit withstand strength	3 kA with back-up fuse 16 A gG
Definition	IEC/EN 61008-1, IEC/EN 60884-1
Degree of protection	IP20, IP44 (vertical installation)

Overvoltage protection

Overvoltages are extremely high voltages that impair or even destroy the insulation of electrical and electronic devices as well as their functions. The main causes for overvoltages are lightning discharges, switching operations (inductive loads), electronic discharges or faulty switching.

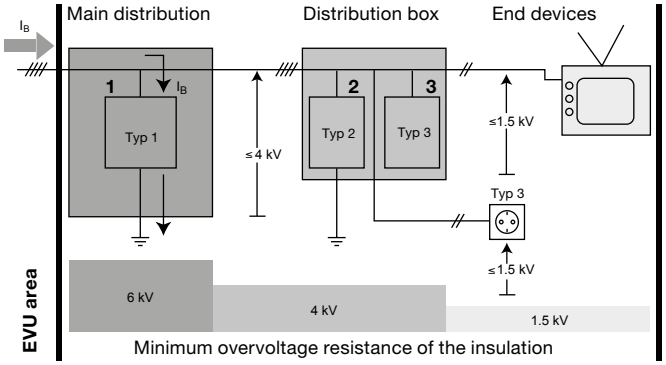
Overvoltage protectors are divided into three categories/types (Table 1).

Classification			Insert
old	VDE IEC 0675	37A	
Coarse protection	B surge arrester	Class I	Protection against lightning (power supply, main distributor, ...)
Medium-level protection	C surge arrester	Class II	Protection of the fixed installation (power distribution unit, ...)
Fine protection	D surge arrester	Class III	Protection of devices (house electronics, ...)

Figure 1: Classification of overvoltage protection devices

Sensible overvoltage protection consists of coarse, medium and fine protection.

The arrangement of the overvoltage protection devices in the electrical installation is illustrated in Figure 1 for the different types/classes.



I_B Lightning current

Figure 2: Arrangement of the overvoltage protection devices in the electrical installation

SCHUKO socket outlet with overvoltage protection [4108 .., 4152 ..]

The SCHUKO socket outlet with overvoltage protection is used for protecting power supply units e.g. for:
- Computer systems
- Medical devices
- Measuring, controlling and regulating devices
- TV, video and audio devices

The basic circuitry consists of a combination of varistors and gas-filled surge arresters (Figure 2). Varistors can be overloaded as a result of too high or too frequent overvoltage demand. The result is an increased leakage current through the components. This causes heat to build up. A thermal cut-off device monitors the varistors and disconnects these from the mains before they heat up too much. The mains voltage is still present.
If the cut-off triggers, the red indicator lamp lights up red regardless of whether or not a plug is connected to the socket outlet. If a device is plugged in, an acoustic fault signal (buzzer) sounds and falls silent again as soon as the connector plug is pulled out.

Active indicator lamps on the device indicate:
- **Green**: Mains voltage is present
- **Red (+ acoustic signal)**: Thermal cut-off device has responded, there is no protection against overvoltages anymore. The SCHUKO socket outlet with overvoltage protection must be replaced.

Installation instructions:
- Overvoltage protection according to EN 61643-11 and VDE 0675 Section 6-11 surge arrester type 3, One Port
- Requirement class for D surge arrester
- Installation in wall box according to DIN 49 073 Section 1
- Lay lines as short as possible between the load and socket outlet with overvoltage protection. Do not provide more than 4 m including leads of wired-through socket outlets (Figure 4).
- Do not lay protected cables parallel to unprotected cables (overvoltage coupling).

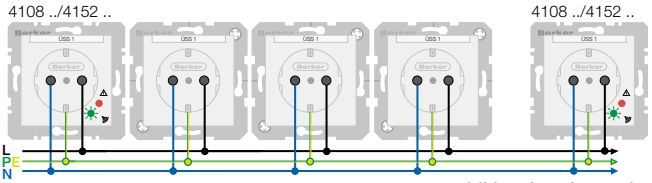


Figure 3: Installation in combination with SCHUKO socket outlets

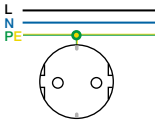
Discharge of overvoltages against ground by means of overvoltage protection can cause the triggering of residual current circuit-breakers. Use a surge resistant residual current circuit-breaker if necessary.

During insulation measurements, all overvoltage protection units must always be disconnected since the protection components limit the test voltage (erroneous measurements).

Technical data - performances

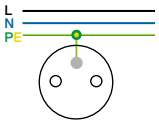
SCHUKO socket outlet with overvoltage protection	Order no. 4108 .., 4152 ..
Rated voltage	230 V~, 50/60 Hz
Rated current I_N	16 A
Operating current I_C at U_r	< 2.3 mA
Surge arrester rated voltage U_r	255 V~
Discharge current according to PE at U_r	< 1 µA
Rated discharge current of surge protection I_{sn} (8/20) µs: sym./asym.	1.5 kA (100x)
Discharge current i_s max (8/20) µs: sym./asym.	4.5 kA (1x)
Protection level: L/N (L/PE; N/PE)	< 1.2 kV (1.5 kV)
Response time t_a: sym./asym.	25 ns/100 ns
Screw terminals for rigid conductors	2.5 mm²
Temperature range	-5 … 40°C

International socket outlets



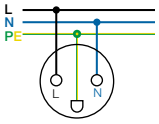
Use in:
AF/AM/AT/AZ/BA/BE/BF/BG/BI/BJ/BY/CF/CS/CZ/DE/EE/EG/ER/ES/FI/GE/GL/GR/HR/HU/ID/IR/IS/IT/KR/KZ/LB/LT/LU/LV/MD/MK/MR/MZ/NL/NO/PE/PT/PY/RO/RU/RW/SA/SE/SI/SM/SO/SR/SY/TJ/TR/UA/UY/UZ

Figure 1: SCHUKO socket outlet* - 2pole + earth, 250 V~, 16 A



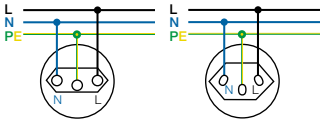
Use in:
AD/BE/CG/CI/CM/DJ/DZ/FR/GF/GN/GP/KH/KM/MA/MG/ML/PL/SK/SN/SY/TD/TG/TN/VN

Figure 2: Socket outlet with earthing pin FRANCE/BELGIUM* – 2pole + earth, 250 V~, 16 A



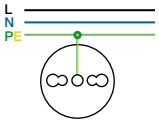
Use in:
DK/GL

Figure 3: Socket outlet with earthing contact DENMARK – 2pole + earth, 250 V~, 13 A



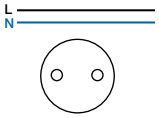
Use in:
CH, type 13 (links)
CH, type 23 (rechts)

Figure 4: Socket outlet with earthing contact SWITZERLAND – 2pole + earth,
type 13: 250 V~, 10 A; type 23: 250 V~, 16 A



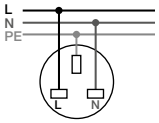
Use in:
AL/CL/ET/IT/LY/SY

Figure 5: Socket outlet with earthing contact ITALY* – 2pole + earth,
250 V~, 16 A



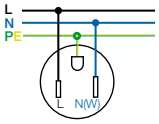
Use in:
AO/NL

Figure 6: Socket outlet without earthing contact NETHERLANDS* – 2pole,
250 V~, 16 A



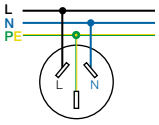
Use in:
AE/AG/BN/BW/CY/GB/GD/GH/GM/HK/IE/IQ/KE/KW/LR/MT/MW/MY/OM/SL/TZ/YE/ZA/ZW

Figure 7: Socket outlet with earthing contact BRITISH STANDARD, standard: BS 1363 Part 2 – 2pole + earth, 250 V~, 13 A



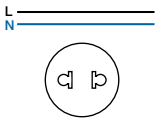
Use in:
CA/GT/GY/HN/HT/KP/LA/MX/PA/PH/PR/SV/TH/TW/US/VE

Figure 8: Socket outlet with earthing contact USA/CANADA NEMA 5–15 R – 2-pole + earth, 125 V~, 15 A (left Fig.); 5–20 R – 2pole + earth, 125 V~, 20 A (right Fig.)



Use in:
AR/AU/FJ/NZ

Figure 9: Socket outlet with earth contact AUSTRALIEN – 2pole + earth,
250 V~, 10 A (left Fig..); 250 V~, 15 A (right Fig.)



Use in:
CA/GT/GY/HN/HT/KP/LA/MX/PA/PH/PR/SV/TH/TW/US/VE

Figure 10: Socket outlet without earth contact EURO-AMERICAN STANDARD* – 2pole, 250 V~, 10 A

* Non-polarised system - without specification for the connection of the external wire and neutral conductor

Country abbreviations in accordance with ISO 3166
AD = Andorra; AE = United Arab Emirates; AF = Afghanistan; AG = Antigua; AL = Albania; AM = Armenia; AO = Angola; AR = Argentina; AT = Austria; AU = Australia; AZ = Azerbaijan; BA = Bosnia-Herzegovina; BE = Belgium; BF = Burkina Faso; BG = Bulgaria; BI = Burundi; BJ = Benin; BN = Brunei; BW = Botswana; BY = Belarus; CA = Canada; CF = Central African Republic; CG = Congo; CH = Switzerland; CI = Ivory Coast; CL = Chile; CM = Cameroon; CS = Republic of Serbia; CY = Cyprus; CZ = Czech Republic; DE = Germany; DJ = Djibouti; DK = Denmark; DZ = Algeria; EE = Estonia; EG = Egypt; ER = Eritrea; ES = Spain; ET = Ethiopia; FI = Finland; FJ = Fiji; FR = France; GB = Great Britain; GD = Grenada; GE = Georgia; GF = French Guiana; GH = Ghana; GL = Greenland; GM = Gambia; GN = Guinea; GP = Guadeloupe; GR = Greece; GT = Guatemala; GY = Guyana; HK = Hong Kong; HN = Honduras; HR = Croatia; HT = Haiti; HU = Hungary; ID = Indonesia; IE = Ireland; IQ = Iraq; IR = Iran; IS = Iceland; IT = Italy; KE = Kenya; KH = Cambodia; KM = Comoros; KP = North Korea; KR = South Korea; KW = Kuwait; KZ = Kazakhstan; LA = Laos; LB = Lebanon; LR = Liberia; LT = Lithuania; LU = Luxemburg; LV = Latvia; LY = Libya; MA = Morocco; MD = Moldavia; MG = Madagascar; MK = Macedonia; ML = Mali; MR = Mauretania; MT = Malta; MW = Malawi; MX = Mexico; MY = Malaysia; MZ = Mozambique; NL = Netherlands; NO = Norway; NZ = New Zeeland; OM = Oman; PA = Panama; PE = Peru; PH = Philippines; PL = Poland; PR = Puerto Rico; PT = Portugal; PY = Paraguay; RO = Romania; RU = Russia; RW = Ruanda; SA = Saudi Arabia; SE = Sweden; SI = Slovenia; SK = Slovakia; SL = Sierra Leone; SM = San Marino; SN = Senegal; SO = Somalia; SR = Surinam; SV = El Salvador; SY = Syria; TD = Chad; TG = Togo; TH = Thailand; TJ = Tadschikistan; TM = Turkmenistan; TN = Tunisia; TR = Turkey; TW = Taiwan; TZ = Tanzania; UA = Ukraine; US = USA; UY = Uruguay; UZ = Uzbekistan; VE = Venezuela; VN = Vietnam; YE = Yemen; ZA = Zambia; ZW = Zimbabwe

The System Concept

Networking in the system environments

The electronic flush-mounted inserts can be used equally for non-networked as well as for radio networkable modules. They are connected to the loads to be controlled by cable and form a functional unit with the cover.
With the conventional electronic modules the directly connected loads (lighting or shading) can be controlled with a wide range of functions. This takes place on the application module by means of local operation (buttons) or triggered/preset automatic functions (motion detectors, time switches) as well as by wired extension units.
The extension units are particularly suitable for implementing several control sections for a load to be controlled.
KNX radio application modules are available for cable connected solutions or for retrofitting/extending existing installations. They communicate with each other as transmitters and receivers via radio signals. The easiest way of teaching transmitters and receivers is via the quicklink principle whereby the devices are switched to the programming mode by pressing a button and the transmitters are also taught by pressing function buttons for the receivers. The modules with the combinations of plug-in KNX radio modules can work bidirectionally as receivers of radio signals for the directly connected load and can equally serve as transmitters that can control other receivers with additional connected loads.
Teaching by means of quicklink has been conceived for smaller applications so that a maximum of 20 devices should be assigned to each other in these systems.
In the configuration of the KNX radio solutions with ETS software, operation can be transferred even to a wired KNX installation and vice versa by means of a gateway, furthermore other functions are available.
The solution offer is supplemented by KNX radio standalone devices that can also be linked as transmitters (hand-held transmitters, wall-transmitters, motion detectors or physical sensors) or as receivers (surface-mounted or flush-mounted actuators) to the KNX modules on the flush-mounted inserts by quicklink or by ETS commissioning.

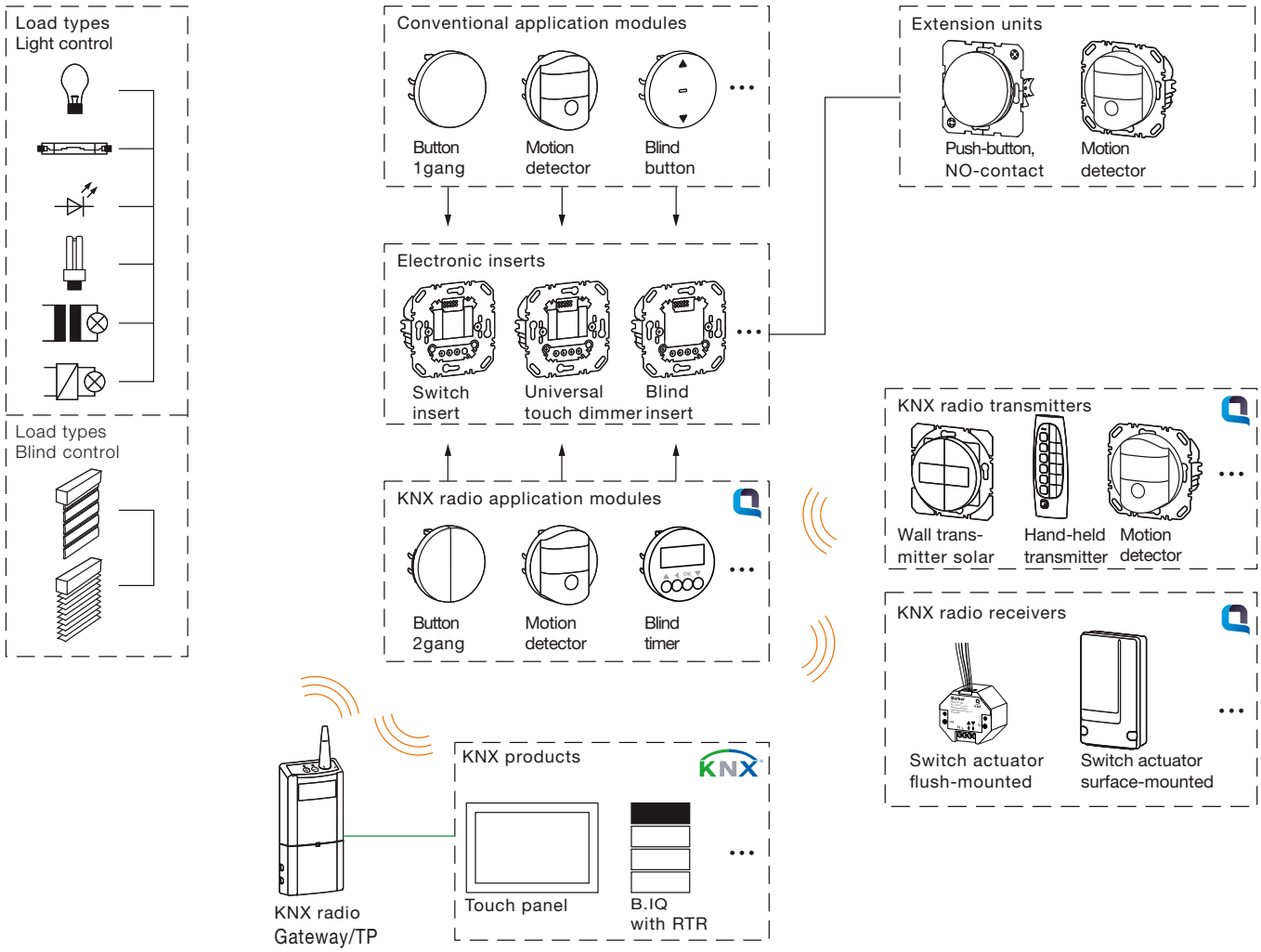


Figure 1: Universal system compatibility for almost all types of loads

Electronics inserts

Switch inserts	Technical data - performances
Operating voltage	230 V~, + 10 %/- 15 %
Frequency	50/60 Hz
Number of substations:	unlimited
Cable length, extension units	max. 50 m
Load cable length	max. 100 m
Relative humidity	0 ... 65 % (no condensation)
Operating temperature	- 5 ... + 45 °C observe operating conditions
Screw terminals	max. 1 x 2.5 / 2 x 1.5 mm²

- Illuminated mechanical push-buttons must be connected to a neutral conductor.
- Operation of extension units is only possible if a module is attached to the main unit.
- Conventional transformers should be operated with at least 25 % nominal load. Nonetheless, 75 % is recommended because in individual cases, depending on the transformer, unstable switching performance may occur.
- During operation with conventional transformers, fuse each transformer on the primary side according to manufacturer's data. Use safety transformers that comply with EN 61558-2-6 (VDE 0570 Part 2-6) only.
- No mixed load operation of capacitive and inductive loads at the output.

Switch inserts

Switch insert 1gang [order no. 8512 11 00]

Suitable modules: Button 1gang, motion detector, IR motion detector Comfort, KNX radio button 1gang and 4gang as well as KNX radio motion detector

- Extension units for motion detectors can only be used if the switch insert is operated with a motion detector module.
- Only connect dimmable lamps, their transformers or operating devices. Observe manufacturer's data.
- The switching performance for the connection of different loads or energy-saving lamps and 230 V LED lamps can only be optimized by means of a load setting mode.
- Install a circuit breaker of max. 16 A as device protection.

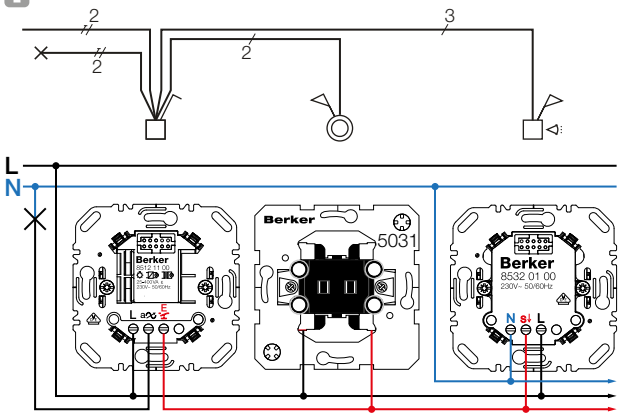


Figure 1: Switch insert with push-button (NO contact), and motion detector extension unit

Technical data - performances

Switch insert 1gang	Order no. 8512 11 00
230 V incandescent lamps and halogen lamps	25 ... 400 W
Dimmable 230 V retrofit LED lamps	5 ... 70 W
Dimmable energy-saving lamps	13 ... 80 W
Dimmable conventional transformers	25 ... 400 VA
Electronic transformers and dual-mode transformers	25 ... 400 W
Installation depth	32 mm

Relay insert [order no. 8512 12 00]

Suitable application modules: Button 1gang, motion detector, IR motion detector Comfort, KNX radio timer, KNX radio button 1gang and 4gang as well as KNX radio motion detector

- Extension units for motion detectors can only be used if the switch insert is operated with a motion detector module.
- Install a miniature circuit breaker of max. 10 A as device protection.

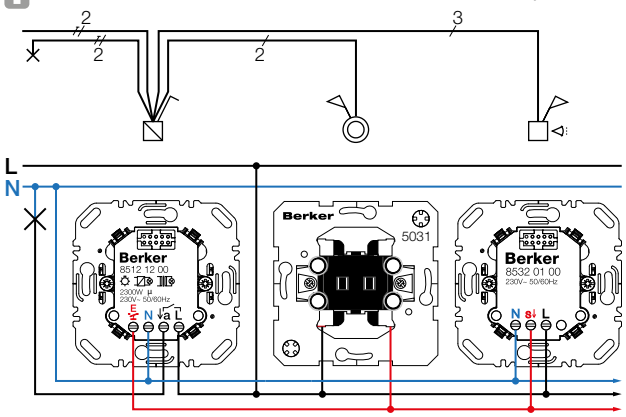


Figure 2: Relay insert with push-button (NO contact), and extension unit for motion detector

Technical data - performances

Relay insert	Order no. 8512 12 00
230 V incandescent lamps and halogen lamps	2300 W
230 V retrofit LED lamps	440 W
Dimmable energy-saving lamps	440 W
Dimmable conventional transformers	1500 VA
Electronic transformers and dual-mode transformers	1500 W
Fluorescent lamps: - uncompensated - parallel compensated - in lead-lag circuit - with electronic ballast	 1100 VA 1000 W / 130 µF 1000 W 1000 W
Minimum contact load	≈ 15 W
Housing installation depth	22 mm
Claw guidance installation depth	32 mm

Switch insert 2gang [Order number 8512 22 00]

Suitable application modules: Button 2gang and KNX radio button 2gang and 4gang

- Installation in deep wall box recommended.
- Only connect dimmable lamps, their transformers or operating devices. Observe manufacturer's data.
- The switching performance for the connection of different loads or energy-saving lamps and 230 V LED lamps can only be optimized by means of a load setting mode.
- Install a circuit breaker of max. 16 A as device protection.
- For power supply, a load must be connected to output 1 of the switch insert 2gang.
- Extension units for motion detectors are not suitable for the switch insert 2gang.
- Operating both outputs on a joint load will destroy the device.

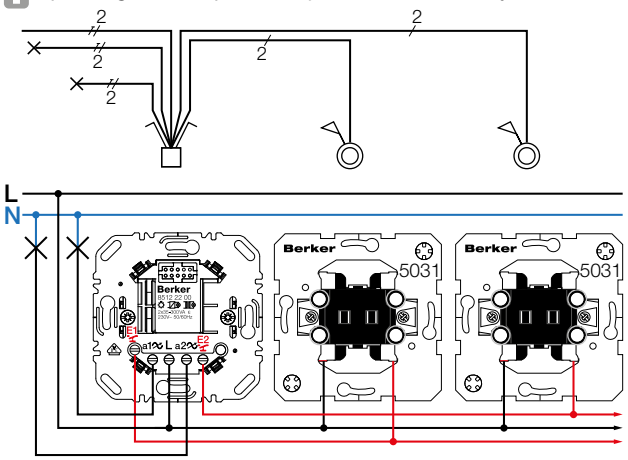


Figure 3: Switch insert 2gang with extension unit push-button (NO contact)

Technical data - performances

Switch insert 2gang	Order no. 8512 22 00
230 V incandescent lamps and halogen lamps	per channel 35 ... 300 W
Dimmable 230 V retrofit LED lamps	per channel 12 ... 54 W
Dimmable energy-saving lamps	per channel 15 ... 54 W
Dimmable conventional transformers	per channel 35 ... 300 VA
Electronic transformers and dual-mode transformers	per channel 35 ... 300 W
Installation depth	32 mm

Dimmer inserts

Only connect dimmable lamps, their transformers or operating devices. Observe manufacturer's data.
Install a circuit breaker of max. 16 A as device protection.

Touch dimmer (R, L) [Order no. 8542 11 00]

Suitable modules: Button 1gang, motion detector, IR motion detector Comfort, KNX radio button 1gang and 4gang as well as KNX radio motion detector

Extension units for motion detectors can only be used when the touch dimmer is operated with a motion detector application module.

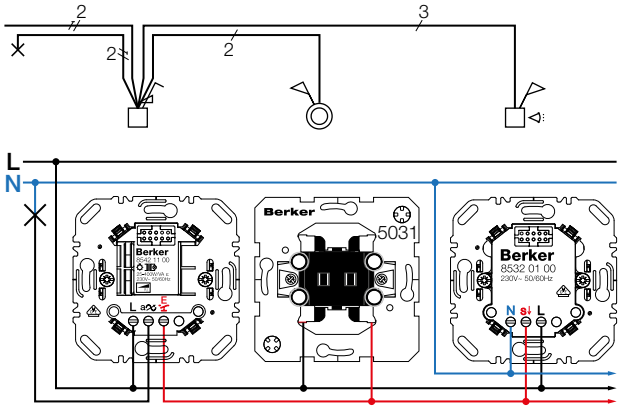


Figure 1: Touch dimmer (R, L) with push-button (NO contact) and extension unit for motion detector

Technical data - performances

Touch dimmer (R, L)	Order no. 8542 11 00
230 V incandescent lamps and halogen lamps	25 ... 400 W
Dimmable conventional transformers	25 ... 400 VA
Number of universal capacity enhancers	max. 2
Installation depth	32 mm

Universal touch dimmer 1gang [Best.-Nr. 8542 12 00]

Suitable modules: button 1gang, motion detector, IR motion detector Comfort, KNX radio button 1gang and 4gang as well as KNX radio motion detector

Extension units for motion detectors can only be used when the touch dimmer is operated with a motion detector application module.

When a load is connected, this is detected automatically and a suitable dimming performance is set. If different loads or energy-saving lamps and 230 V LED lamps are connected, the dimming performance can be further optimized by means of a load setting mode.

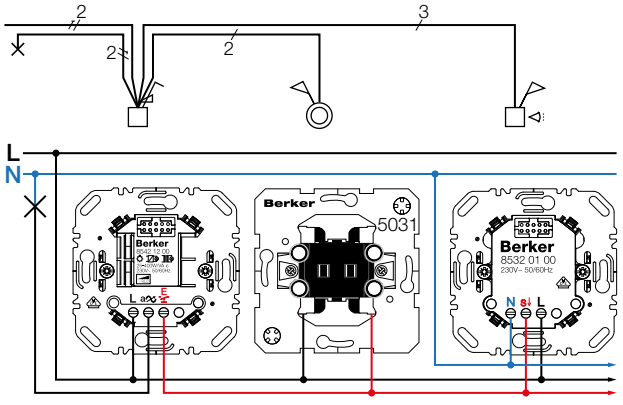


Figure 2: Universal touch dimmer 1gang with push-button (NO contact) and extension unit for motion detector

Technical data - performances

Universal touch dimmer 1gang	Order no. 8542 12 00
230 V incandescent lamps and halogen lamps	25 ... 400 W
Dimmable 230 V retrofit LED lamps	5 ... 70 W
Dimmable energy-saving lamps	13 ... 80 W
Dimmable conventional transformers	25 ... 400 VA
Electronic transformers and dual-mode transformers	25 ... 400 W
Installation depth	32 mm

Universal touch dimmer 2gang [Order no. 8542 21 00]

Suitable application modules: Button 2gang and KNX radio button 2gang and 4gang

Installation in deep wall box recommended.

Install a circuit breaker of max. 16 A as device protection.
When a load is connected, this is detected automatically and a suitable dimming performance is set. If different loads or energy-saving lamps and 230 V LED lamps are connected, the dimming performance can be further optimized by means of a load setting mode.

For power supply, a load must be connected to output 1 of the touch dimmer 2gang.

Extension units for motion detectors are not suitable for the switch insert 2gang.

Operating both outputs on a joint load will destroy the device.

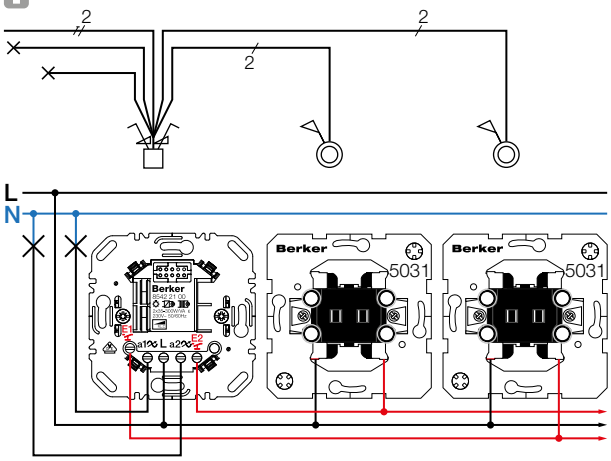


Figure 3: Universal touch dimmer 2gang with extension unit push-button (NO contact)

Technical data - performances

Universal touch dimmer 2gang	Order no. 8542 21 00
Power consumption (standby)	< 0.3 W channel 1 < 0.7 W channel 2
230 V incandescent lamps and halogen lamps	per channel 35 ... 300 W
Dimmable 230 V retrofit LED lamps	per channel 12 ... 40 W
Dimmable energy-saving lamps	per channel 15 ... 54 W
Dimmable conventional transformers	per channel 35 ... 300 VA
Electronic transformers and dual-mode transformers	per channel 35 ... 300 W
Installation depth	32 mm

Blind insert comfort [Order no. 8522 11 00]

Suitable application modules shutter button, shutter timer, KNX radio shutter button and KNX radio timer

Install a circuit breaker of max. 16 A as device protection.

Technical data - performances

Blind insert comfort	Order no. 8522 11 00
Operating voltage	230 V~, + 10 %/- 15 %
Frequency	50/60 Hz
Switching current (cos Φ 0.6)	3 A
Change-over time for change of direction	0.6 s
Number of substations:	unlimited
Cable length, extension units	max. 50 m
Load cable length	max. 100 m
Relative humidity	0 ... 65 % (no condensation)
Operating temperature	- 5 ... + 45 °C
Housing installation depth	22 mm
Claw guidance installation depth	32 mm
Screw terminals	max. 1 x 2.5 / 2 x 1.5 mm²

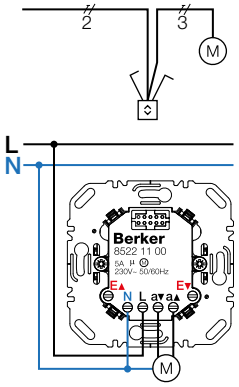


Figure 1: Single control

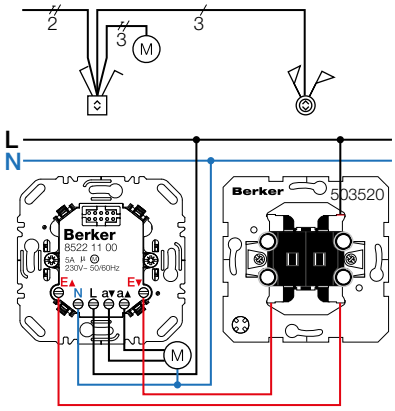


Figure 2: Individual control with key push-button for blind series push-button

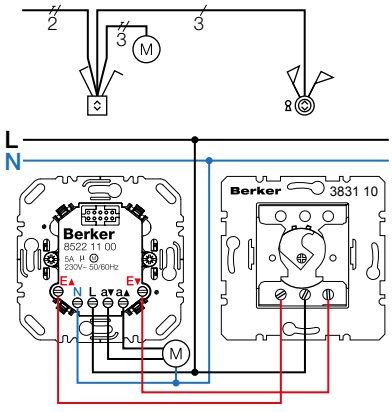


Figure 3: Individual control with extension unit push-button for blinds 1pole for lock cylinder

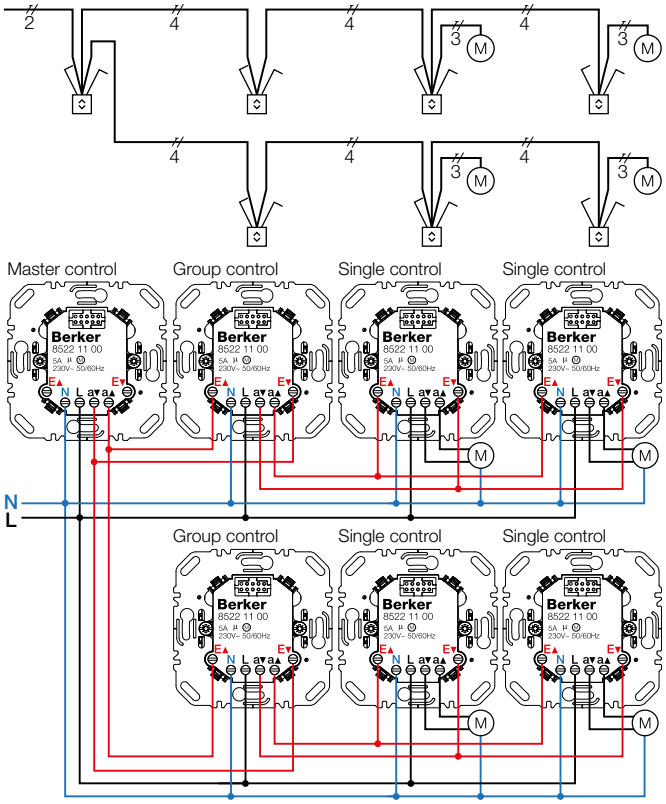


Figure 4: Master and group control

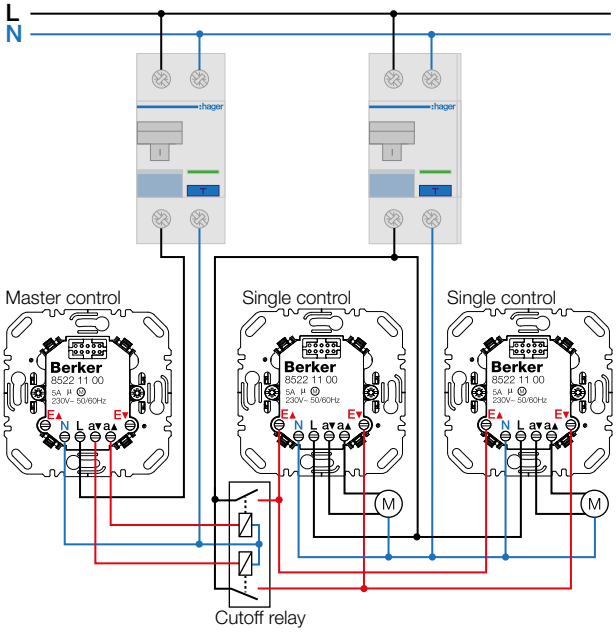
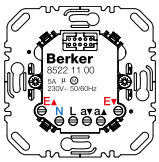


Figure 5: Operation with several residual current circuit-breakers

Sensors for extension unit connections

Connection of the sensors to the insert



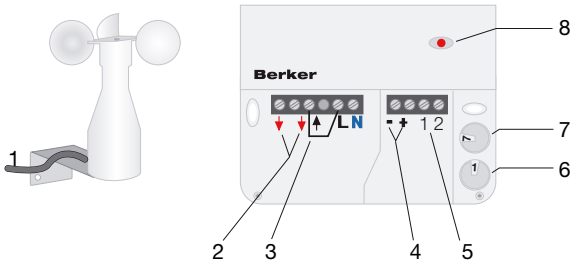
E▲ Input for extension unit UP
E▼ Input for extension unit DOWN

Figure 1: Extension unit inputs on blind insert comfort

Only covers with labelling symbol star next to QR code can be used for connected sensors. The operation of sensors without theses labellings will lead to functional errors.

The control command is present for the duration of the signal on the extension unit input.

Wind sensor [172 01], Interface surface-mounted for wind sensor [173]



1 Wind sensor connection cable
2 Output for wind alarm signal
3 Input terminal for potential-free contact
4 Connecting terminals for wind sensor
5 Connecting terminals for wind sensor heating
6 Rotary switch for wind sensor type
7 Rotary switch for limit value setting of the wind speed
8 Test-LED

Figure 2: Device overview

To protect awnings and outside blinds against damage from wind. The wind sensor detects the wind speed. If the set threshold value is exceeded for at least 15 seconds, the awning/blind is retracted.

The wind alarm has top priority, i.e. the hanging is always raised and locked in the event of a wind alarm. The unlocking takes place automatically if the threshold value is not reached for at least 15 minutes.

Installation and electrical connection

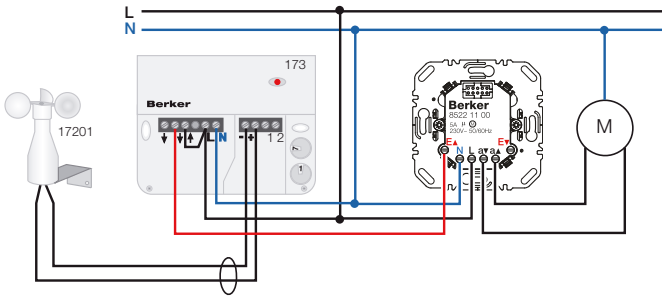


Figure 3: Connection of the wind sensors to the blind insert comfort

The material of the wind sensor is UV-resistant and can be exposed to direct sunlight.

Do not mount the wind sensor in wind shadow.
The device must be mounted upright with the overhead wind turbine.

Cable type recommendation: JY-St-Y 2 x 0.6 mm²
Connect shield to "negative" to prevent interference. Lay the sensor cable at least 10 cm away from 230 V cables.

Precipitation sensor [183 01]

The purpose of the sensor, for example, is to protect awnings from rain. If the precipitation sensor detects precipitation, the awning/blind is retracted. The changeover relay remains on until the sensor is dry again, or for at least 10 minutes. The integrated heating accelerates the drying process of the sensor surface and also thaws snow and ice.

Installation and electrical connection

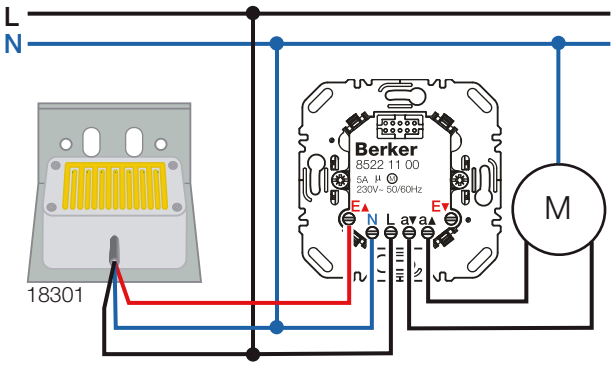


Figure 4: Connecting the precipitation sensor to the blind insert comfort

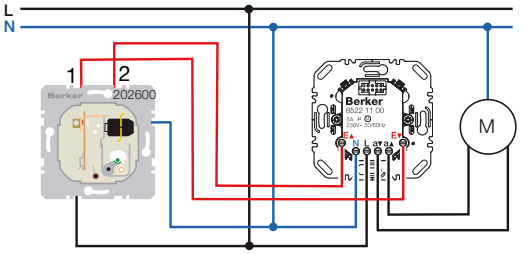
The mounting should be slightly inclined. Use the enclosed mounting bracket.

The change-over contact can be used for 230 V as well as for protective low voltage.

Room thermostat with change-over contact [2026 ..]

A room thermostat should be connected to the extension unit inputs for the temperature-dependant control of blinds and roller shutters in indoor areas, e.g. in winter gardens.

Electrical connection



1 Output cooling
2 Output heating

Figure 5: Connecting a room thermostat change-over contact to the blind insert comfort

Connect thermostat only to extension unit input 1 or 2 if necessary. The movement in the opposite direction is then done manually, time-controlled or centrally/group controlled.

Connection error on parallel switching of conventional tubular motors

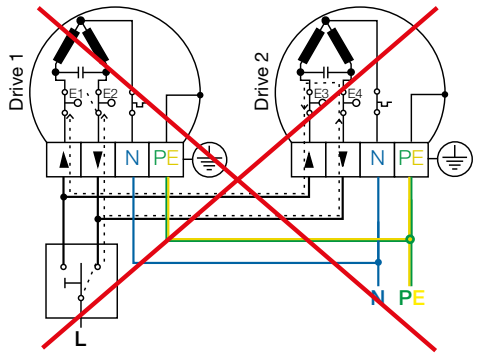


Figure 1: Parallel-switched conventional tubular motors

Cutoff relay

Cutoff relays are mounted in water-protected junction boxes or in deep flush-mounted wall boxes, e.g. behind a blind plug or ae electronic insert. Cutoff relays RMD are snapped onto the 35 mm DIN hat profile rail. The following variants are available, depending on the desired operating concept

- Cutoff relay surface-mounted/flush-mounted, order no. 2930 and cutoff relay RMD, order no. 2931 for simultaneous movement of two motors using one operating section.
- Cutoff relay surface-mounted/flush-mounted, order no. 2969 and cutoff relay RMD, order no. 2919: with extension unit outputs, for simultaneous movement of two motors using one operating section.

Connect a maximum of 6-8 motors to one miniature circuit-breaker (note current consumption). Additional miniature circuit-breakers should be planned for extensions.

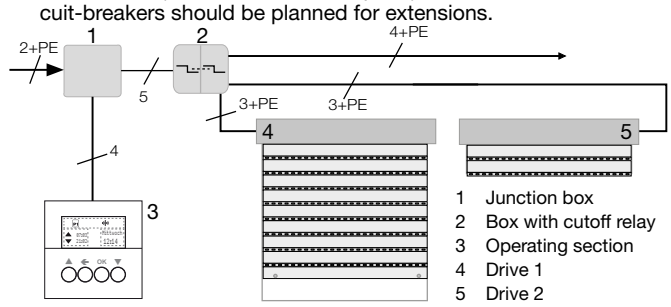


Figure 1: Installation plan for cutoff relay

Connection of motors with cutoff relay surface-mounted/flush-mounted [Order no. 2930, 2969]

Neutral conductor required at the terminal connection.

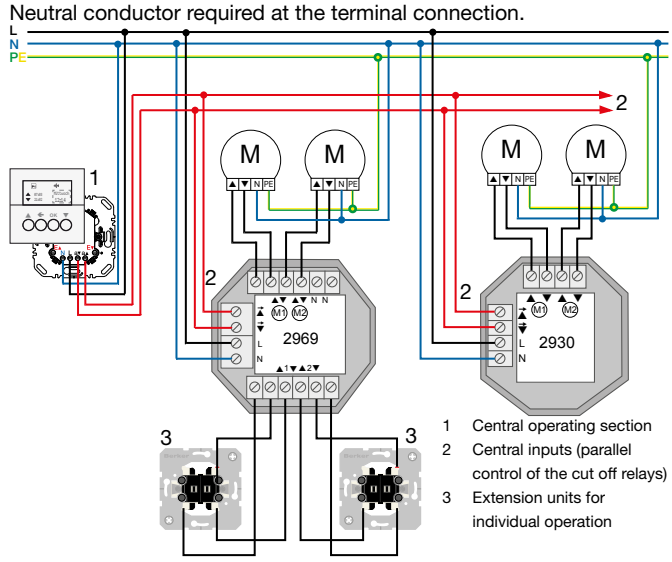


Figure 2: Connection diagram for cutoff relay surface-mounted/flush-mounted

When the switch is actuated, both drives are switched to the same direction of running. If drive 1 has reached the final position, the final position switch E2 opens. Drive 2 can still be functioning, however, and actuates drive 1 in the opposite running direction by means of a feedback voltage via its capacitor. Thus E2 is shut again after a short time. As a result, drive 1 runs in the original direction again until the contact L2 is reopened.
These switching operations can be seen as a pendulum motion of the hanging. Since the feedback voltage may be up to 1000 V and many switching position changes occur in a very short time, final position switch E2 is overloaded. This will inevitably cause the contacts to weld together. This deactivates the final switch-off in this running direction and the motors are destroyed.

Overload of the final position switches through parallel connection of conventional tubular motors. Motors or hangings may be destroyed. For joint control, use cutoff relays or electronic tubular motors, such as those from Elero or Selve.

Connection of motors with cutoff relay RMD [Order no. 2931, 2919]

Neutral conductor required at the terminal connection.

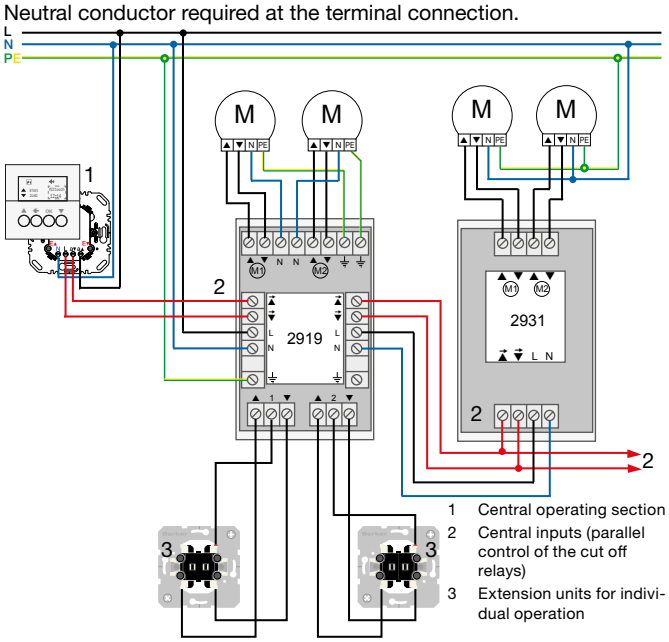


Figure 3: Connection diagram for cutoff relay RMD

Technical data - performances	Cutoff relay
Rated voltage	230 V~
Rated frequency	50/60 Hz
Control voltage	230 V~
Fuse	10 A
Circuit breaker	Characteristic A or B
Current consumption (operation)	approx. 10 mA
Switching current per output	
- ohmic	8 A
- inductive	3 A
Switch-on time (ED)	100 %
Change-over time for change of direction	at least 0.5 s
Operating temperature	0 ... 60°C
Degree of protection	IP20
Small screw terminal connections	
- single stranded	0.5 ... 2.5 mm²
- finely stranded with conductor sleeves	0.5 ... 1.5 mm²
Large screw terminal connections (mains and master input, only flush-mounted device with extension units)	
– single stranded	0.5 ... 4 mm²
– finely stranded with conductor sleeves	0.5 ... 2.5 mm²
Dimensions (W × H × D)	
– Order no. 2930	50 x 52 x 22 mm
– Order no. 2969	53 x 50 x 25 mm
– -Order no. 2919, 2931 (RMD)	45 × 71 × 42 mm
Assembling height as from DIN rail	
– Order no. 2919	39 mm
– Order no. 2931	38 mm

Planning instructions for radio installations

Radio transmission and range
Radio waves can be subject to a number of different influences that weaken the signals and thus shorten their range especially within buildings. That is why all manufacturers of radio products generally indicate the free-field range, which refers to the uninterrupted propagation of the radio waves and optimally oriented antennas. For berker KNX radio products this range is generally 100 m. Unless a building is specially shielded by means of certain measures, this means that there will be no problem implementing radio links through three walls and two ceilings. Nevertheless, in any building there may be advantageous and disadvantageous locations for installing radio bus components.

The free field is defined by damp, level ground. Transmitters and receivers are attached at a height of at least 2 m above the ground. The horizontal distance to interfering objects from each point of the transmitter - receiver connecting line is 20 m.

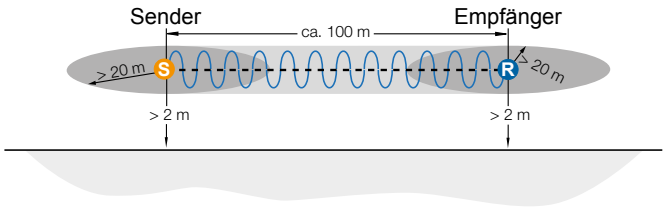


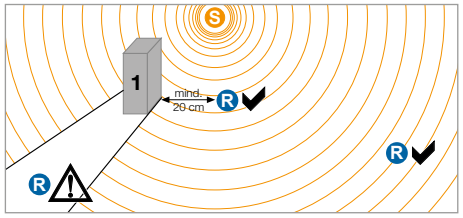
Figure 1: Distances to sources of interference in the free field

Reducing factors of the range of radio signal
- metallic or conductive surfaces such as anti-static floors, insulation with metal lamination, reinforced concrete, cable routes, metal grid ceilings, carbon fibre panels, hot water heating systems, electric underfloor heating systems etc.
- electronic devices exposed to high frequency signal emissions, such as computers, electronic transformers or microwave devices etc.
- Thermal insulation glazing with metalized glass that absorbs or reflects radio signals very strongly
- Moisture in plaster, masonry and screed
- Precipitation and fog outside

Material	Degree of material penetration
Wood, plaster, plasterboard, uncoated glass	approx. 90 %
Brick, press boards	approx. 70 %
Reinforced concrete, underfloor heating	approx. 30 %
Metal, metal grids, aluminium laminates, coated glass	approx. 10 %
Rain, snow	approx. 1 ... 40 %

Tab. 1: Material penetration

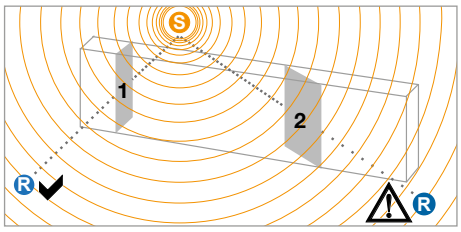
Selecting the installation location
The following installation instructions must be observed so that good radio transmission can be achieved:
- Do not position receivers in the radio shadow of metallic building elements if possible, do not install transmitters/receivers behind metallic surfaces or in metallic housings.
  The areas behind metallic building elements such as piers, ceiling beams and fire doors constitute radio shadows (see Figure 2). Receivers installed in such shadows cannot receive signals over a direct pathway, and have to depend on reflected radio waves.



S Transmitter
R Receiver
1 metallic building element

Figure 2: Radio shadow and distances from metallic objects

- Maintain a distance to large metal surfaces
  Metal surfaces act as a grounding surface, radio signals near the surface are diverted. Furthermore, metal surfaces strongly reflect radio waves, which can cause overlapping of the signals up to suppression.
- The connecting line between the radio transmitter and the radio receiver should be selected so that any path through masonry or other attenuating materials is as short as possible (see Figure 3). It is particularly important to avoid niches in walls, since they obstruct the propagation of radio waves.



S Transmitter
R Receiver
1 effective wall thickness = 24 cm
2 effective wall thickness = 55 cm

Figure 3: Effective wall thickness for radio propagation
- Maintain a distance to devices that emit high-frequency signals.
  At least 50 cm are recommended.
  With increasing distance the interference decreases sharply.
- Maintain a distance between transmitters and receivers. At least 30 cm are recommended.
  If the signal strength is too great, the receiver is overdriven.
- Maintain a distance to other radio services. At least 3 m are recommended.
  other radio services such as DECT-phones, babyphones, radio headphones etc. can severely impair the signal.
- Transmitters or receivers that perform master functions throughout the building (e.g. ALL OFF or master blind control) should be positioned as centrally as possible. Disadvantageous transmission paths that run diagonally through the entire building are prone to interference and can impair the function.

Reception interferences often occur due to sealing off, suppression or reflection of the radio signal, as in the case of car radios or mobile phones.
In the case of irregular reception, it is often sufficient to move the transmitter or receiver by a few cm to improve the quality of reception.

Operating tips for radio installations
- Only repeat radio telegrams within one "radio band" by means of a signal amplifier or repeater, since otherwise telegram overlaps can occur.
- A high number of automatically triggering radio transmitters, such as radio motion detectors, can result in telegram overlaps and communication problems within a system.

Impairment due to changed ambient conditions
A functioning radio connection can still be impaired even during operation. This can be attributed to:
- Opening and closing doors and shutters consisting of insulating materials
- Adding and moving furniture, particularly furniture consisting of metal
- Additionally erecting walls consisting of problematic materials, such as metallic steamed glass, metal laminated insulating materials etc.
- Temporary influences on the transmission circuit, such as fog and precipitation outside, as well as damp plaster or wallpaper inside

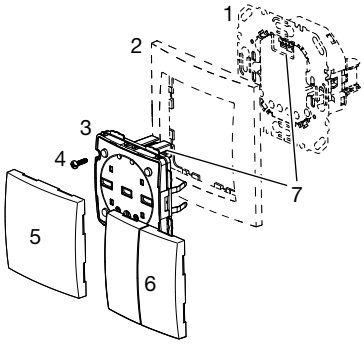
KNX radio

KNX radio properties	Technical data
Radio transmission frequency	868.3 MHz
Transmitter duty cycle *	1 %
Receiver category	2
Radio transmission power	< 10 mW
Radio transmission range (free field)	max. 100 m
Radio transmission range (building)	max. 30 m
Number of quicklink links	max 20 transmitters/receivers

* Work cycle: Proportionally active transmission operations within a duration of one hour at any point in time.

KNX radio application modules

The flush-mounted inserts are complemented with a KNX radio application module and design cover as well as a frame.
The electronic flush-mounted inserts can be used equally for the non-networked and radio networked application modules. For this purpose, the application module bottom part is attached together with the frame. Finally, the design covers are attached



1 Insert
2 Frames
3 Application module bottom part 1gang, 2gang, 4gang
4 Dismantling protection
5 Design cover– button 1gang
6 Design cover – Button 2/4gang
7 Plug interface for insert

Figure 1: Installation based on the example of the KNX radio buttons

As soon as voltage is supplied to the application module (7) via the plug interface, the cfg-LED indicates whether the application module and insert are compatible with each other:
Green flashing - compatible
Orange flashing - application module was configured with another insert.
Red flashing - incompatible

Under the design covers on the application module bottom part (3) are the operation and display elements needed for setting and configuring the operating section. The exception to this are the devices with display that must be configured menu-driven.

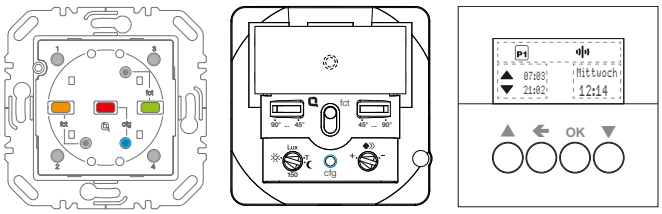


Figure 2: KNX radio application module with setting elements, buttons and LED / display

The application modules and flush-mounted inserts are only suitable for indoor areas.

KNX radio binary inputs flush-mounted

KNX radio binary inputs	Technical data
Number of radio channels	2
Number of quicklink links	max 20 transmitters/receivers
Pulse time	at least 50 ms
Operating temperature	- 5 ... + 45 °C
Binary cable length	≈ 20 cm
Input cable length extendable	max. 10 m

Illuminated mechanical push-buttons must be connected to a neutral conductor.
The binary inputs are only suitable for indoor areas.

KNX radio binary input 2gang flush-mounted [8587 62 10]

Binary input for potential-free contacts, e.g. of switches, buttons and magnetic contacts. Remote control of receivers via connected contacts.

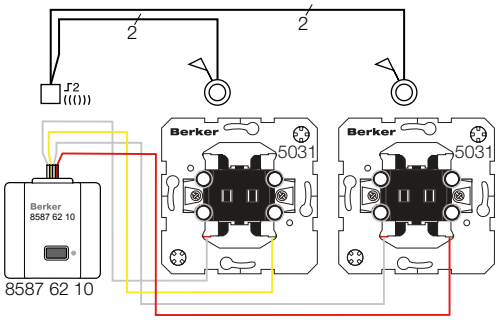


Figure 3: Operation with push-buttons (NO contact)

KNX radio binary input 2gang flush-mounted	Order no. 8587 62 10
Operating voltage via battery CR 2430	3 V=
Binary cable length	≈ 11 cm
Input cable length extendable	max. 10 m
Service life battery	≈ 5 Years
Dimensions (L x W x H)	41 x 39.5 x 11 mm

KNX radio binary input 2gang flush-mounted 230 V [8587 6200]

Binary input for potential-free contacts, e.g. for control by switches, push-buttons, precipitation sensors and wind sensors with wind sensor interface. For remote control of receivers by means of connected contacts.
Install a circuit breaker of max. 16 A as device protection.

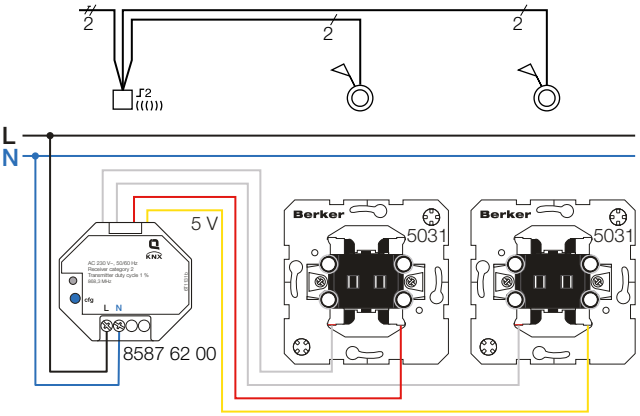


Figure 4: Operation with push-buttons (NO contact)

KNX radio binary input 2gang flush-mounted 230 V	Order no. 8587 62 00
Operating voltage, frequency	230 V~, 50/60 Hz
Input scanning voltage per channel	5 V
Screw-in lift terminals	max. 2.5 mm² or 2 x 1.5 mm²
Dimensions (Ø x H)	53 x 27 mm

KNX radio push-button actuator flush-mounted 230 V [8587 51 10]

Push-button actuator with electronic switching contact for activation of impulse switches. For remote control of the connected push-button switching, e. g. via wall-transmitter or radio motion detector.

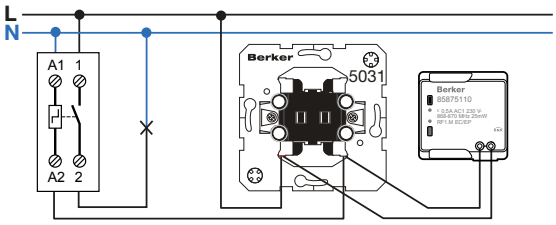


Figure 1: Activation of an impulse switch (Eltako)

KNX radio push-button actuator flush-mounted 230 V	Order no. 8587 51 10
Switching current	max. 0.5 A / 230 V AC
Contact switching duration	200 ms
Operating temperature	0 ... + 45 °C
Screw-in lift terminals	max. 1.5 mm²
Dimensions (L x W x H)	40 x 40 x 18 mm

The radio push-button actuator flush-mounted is only suitable for indoor areas.

KNX radio switch actuators

KNX radio switch actuators	Technical data
Operating voltage	230 V~
Frequency	50/60 Hz

Install a circuit breaker of max. 16 A as device protection.

KNX radio switch actuator 1gang surface-mounted [8516 51 00]

Switch actuator for switching of electrical loads 230 V~.

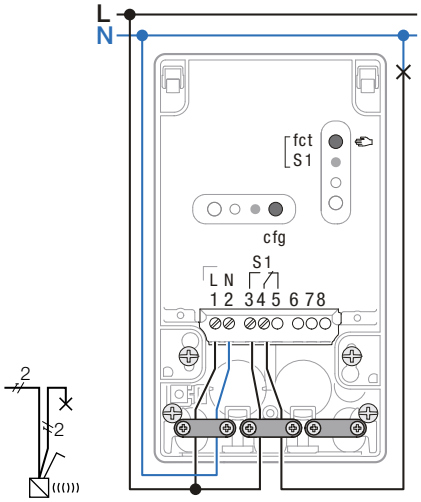


Figure 2: Switching a lamp

Technical data

KNX radio switch actuator 1gang surface-mounted	Order no. 8516 51 00
Switching current	10 A / 230 V AC1
230 V incandescent lamps and halogen lamps	1500 W
Fluorescent lamps - uncompensated - with electronic ballast	 600 VA 6 x 58 W
Conventional transformers	600 VA
Electronic transformers	600 W
Operating temperature	- 10 ... + 55 °C
Screw-in lift terminals	max. 2.5 mm² / 2 x 1.5 mm²
Dimensions (L x W x H)	150 x 85 x 35 mm

KNX radio switch actuator 2gang surface-mounted [8516 61 00]

Switch actuator for separate switching of 2 electrical loads 230 V~.

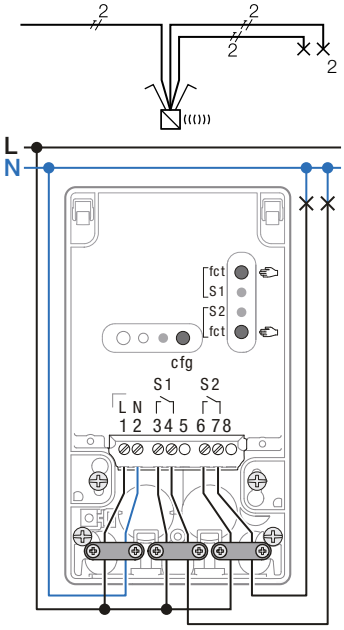
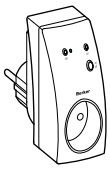


Figure 3: Switching of 2 lamps

KNX radio switch actuator 2gang surface-mounted	Order no. 8516 61 00
Switching current	2 x 10 A / 230 V AC1
230 V incandescent lamps and halogen lamps	per channel 1500 W
Fluorescent lamps - uncompensated - with electronic ballast	 per channel 600 VA per channel 6 x 58 W
Conventional transformers	per channel 600 VA
Electronic transformers	per channel 600 W
Operating temperature	- 10 ... + 55 °C
Screw-in lift terminals	max. 2.5 mm² / 2 x 1.5 mm²
Dimensions (L x W x H)	150 x 85 x 35 mm

KNX radio switch actuator for plugs [8510 51 00]



Switch actuator for switching electrical loads 230 V~ on socket outlets SCHUKO.

KNX radio switch actuator for plugs	Order no. 8510 51 00
230 V incandescent lamps and halogen lamps	2300 W
Fluorescent lamps	28 x 36 W / max. 120 µF
Conventional transformers	1600 VA
Electronic transformers and dual-mode transformers	1200 W
Operating temperature	0 ... + 45 °C
Screw-in lift terminals	max. 2.5 mm² / 2 x 1.5 mm²
Dimensions (L x W x H)	150 x 85 x 35 mm

KNX radio switch actuator 1gang/binary input 1gang surface-mounted [8586 51 00]

Switch actuator for switching of electrical loads 230 V~. Binary input for potential-free contacts, for activation e.g. by switch, push-buttons. For remote control of receivers by means of connected contact.

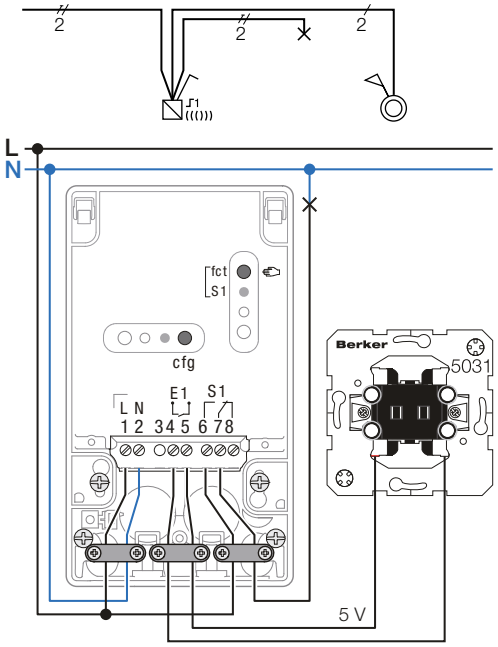


Figure 1: Switching a lamp, binary input with push-button

KNX radio switch actuator 1gang/ binary input 1gang surface-mounted	Order no.8586 51 00
Switching current	10 A / 230 V AC1
Input scanning voltage	5 V
230 V incandescent lamps and halogen lamps	1500 W
Fluorescent lamps - uncompensated - with electronic ballast	 600 VA 6 x 58 W
Compact fluorescent lamps	6 x 18 W
Conventional transformers	600 VA
Electronic transformers	600 W
Operating temperature	-10 ... + 55 °C
Screw-in lift terminals	max. 2.5 mm² / 2 x 1.5 mm²
Binary cable length	≈ 20 cm
Input cable length extendable	max. 10 m
Dimensions (L x W x H)	150 x 85 x 35 mm

Radio switch actuator 1gang flush-mounted [8587 52 00]

Switch actuator for switching of electrical loads 230 V~.

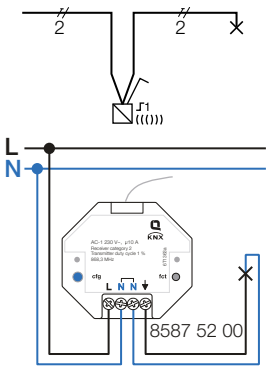


Figure 2: Switching a lamp

Radio switch actuator 1gang flush-mounted	Order no. 8587 52 00
Switching current	16 A / 230 V AC1
Input scanning voltage	5 V
230 V incandescent lamps and halogen lamps	2300 W
Fluorescent lamps parallel compensated	250 W
Conventional transformers	1500 VA
Electronic transformers	1500 W
Operating temperature	0 ... + 45 °C
Screw-in lift terminals	max. 2.5 mm² / 2 x 1.5 mm²
Binary cable length	≈ 20 cm
Input cable length extendable	max. 10 m
Dimensions (Ø x H)	53 x 30 mm

The radio switch actuator 1gang is only suitable for indoor areas.

KNX radio switch actuator 1gang/binary input 2gang flush-mounted, 230 V, 4 A (2-wire) [8587 51 20]

Switch actuator with electronic switching contact without neutral conductor connection for switching of electrical loads 230 V~. Binary inputs for potential-free contacts, for activation e.g. by switch, push-buttons. For remote control of receivers by means of connected contacts.

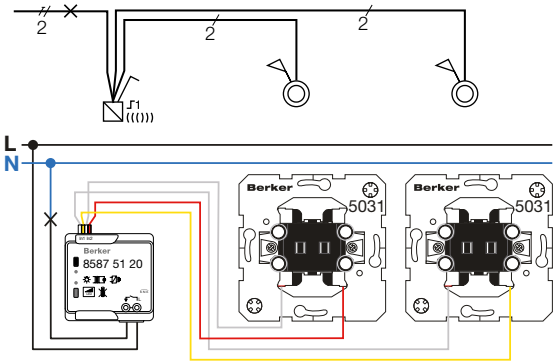


Figure 3: Switching a lamp, binary input with push-buttons

KNX radio switch actuator 1gang/ binary input 2gang flush-mounted 230 V, 4 A	Order no.8587 51 20
Switching current	4 A / 230 V AC1
Input scanning voltage	5 V
230 V incandescent lamps and halogen lamps	10 ... 200 W
Conventional transformers	10 ... 200 VA
Electronic transformers	10 ... 200 W
Dimmable LED lamps	3 ... 50 W
Operating temperature	0 ... + 45 °C
Screw-in lift terminals	max. 2.5 mm² / 2 x 1.5 mm²
Binary cable length	≈ 20 cm
Input cable length extendable	max. 10 m
Dimensions (L x W x H)	40 x 40 x 18 mm

The radio switch actuator 1gang is only suitable for indoor areas.

KNX radio switch actuator 1gang/binary input 2gang flush-mounted, 230 V, 3 A (3-wire) [8587 51 21]

Switch actuator for switching of electrical loads 230 V~. Binary inputs for potential-free contacts, for activation e.g. by switch, push-buttons. For remote control of receivers by means of connected contacts.

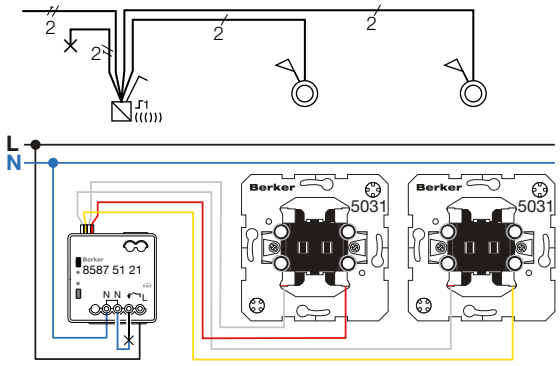


Figure 1: Switching a lamp, binary input with push-buttons

KNX radio switch actuator 1gang/ binary input 2gang flush-mounted 230 V, 4 A	Order no. 8587 51 21
Switching current	4 A / 230 V AC1
Input scanning voltage	5 V
230 V incandescent lamps and halogen lamps	500 W
Conventional transformers	250 VA
Electronic transformers	250 W
Fluorescent lamps with electronic ballast	150 W
LED and energy-saving lamps	150 W
inductive loads	3 A, cos φ 0.6
Operating temperature	0 ... + 45 °C
Screw-in lift terminals	max. 2.5 mm² / 2 x 1.5 mm²
Binary cable length	≈ 20 cm
Input cable length extendable	max. 10 m
Dimensions (L x W x H)	40 x 40 x 18 mm

The radio switch actuator 1gang is only suitable for indoor areas.

KNX radio switch actuator 1gang, potential-free/binary input 2gang flush-mounted, 12...230 V AC, 12...24 V DC [587 51 22]

Switch actuator with potential-free relay contact for switching of electrical loads 12 .. 230 V. Binary inputs for potential-free contacts, for activation e.g. by switch, push-buttons. For remote control of receivers by means of connected contacts.

Suitable for switching of safety extra low voltage (SELV).
Factory setting: closing the contact with a pulse duration of 0.4 s upon actuation (e.g. for impulse switch (Eltako)).

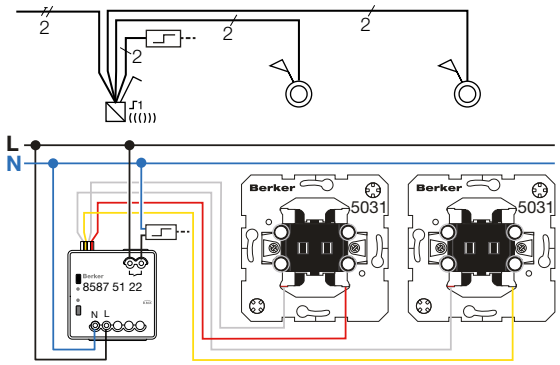


Figure 2: Switching an impulse switch, a lamp, binary input with push-buttons

KNX radio switch actuator 1gang, potential-free/binary input 2gang flush-mounted	Order no. 587 51 22
Switching current AC 1	4 A/12-24 V~, 230 V~
Switching current DC	4 A/12 V ⎓, 2 A/24 V ⎓
Input scanning voltage	5 V
230 V incandescent lamps and halogen lamps	600 W
Conventional transformers	600 VA
Electronic transformers	600 W
LED and energy-saving lamps	40 W
Operating temperature	0 ... + 45 °C
Screw-in lift terminals	max. 2.5 mm² / 2 x 1.5 mm²
Binary cable length	≈ 20 cm
Input cable length extendable	max. 10 m
Dimensions (L x W x H)	40 x 40 x 20 mm

The radio switch actuator 1gang is only suitable for indoor areas.

KNX radio dim actuators

KNX radio universal dim actuator 1gang/binary input 2gang flush-mounted [8547 51 20]

Universal dim actuator for dimming lighting. Binary inputs for potential-free contacts, for activation e.g. by switch, push-buttons. For remote control of receivers by means of connected contacts.

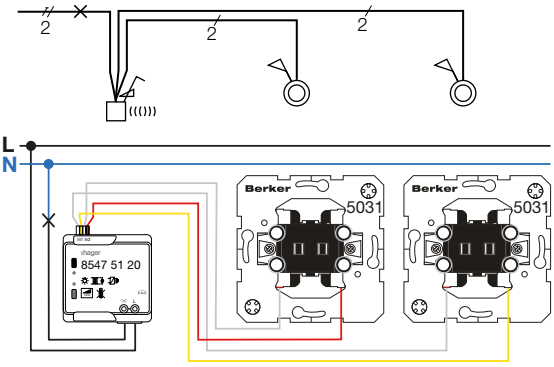


Figure 3: Dimming a lamp, binary input with push-buttons

Technical data

KNX radio universal dim actuator 1gang flush-mounted	Technical data Order no. 8547 51 20
Operating voltage, frequency	230 V~, 50 Hz
230 V incandescent lamps and halogen lamps	10 ... 200 W
Conventional transformers	10 ... 200 VA
Electronic transformers	10 ... 200 W
Operating temperature	-15 ... + 45 °C
Screw-in lift terminals	max. 2.5 mm² / 2 x 1.5 mm²
Dimensions (L x W x H)	40 x 40 x 18 mm

The KNX radio universal dim actuator 1gang flush-mounted is only suitable for indoor areas.

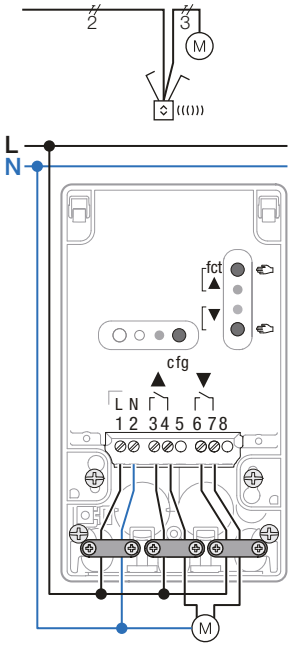
KNX radio blind actuators

KNX radio blind actuators	Technical data
Operating voltage, frequency	230 V~, 50 Hz
Slat adjustment on signal duration	< 1 s
Change-over time for change of direction	< 0.6 s
Operating temperature	+5 ... +45°C
Radio transmission/reception frequency	868.3 MHz
Radio protocol	KNX Radio
Transmitter duty cycle	1 %
Receiver category	2
Number of quicklink links	max 20 transmitters/receivers
Radio transmission power	< 10 mW
Radio transmission range (free field)	max. 100 m
Radio transmission range (building)	max. 30 m

Install a circuit breaker of max. 16 A as device protection.

KNX radio blind actuator 1gang surface-mounted [8526 51 00]

Blind actuator for controlling hangings.



Activation of a motor

KNX radio blind actuator 1gang surface-mounted	Order no. 8526 51 00
Switching current	10 A / 230 V AC1
Operating temperature	-10 ... +55°C
Dimensions (L x W x H)	150 x 85 x 35 mm

KNX radio blind actuator 1gang/binary input 2gang flush-mounted [8527 51 20]

Blind actuator for controlling hangings. Binary input for potential-free contacts, e.g. activation by switches, push-buttons. For remote control of receivers by means of connected contacts.

Factory setting - Operation via binary inputs: ▲ when closing contact In1, ▼ when closing contact In2

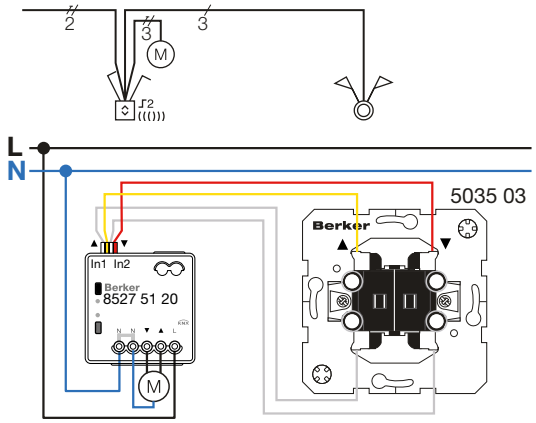


Figure 1: Activation of a motor

KNX radio blind actuator 1gang/ binary input 2gang flush-mounted	Order no. 8527 51 20
Switching current at cos φ 0.6	3 A
Change-over time for change of direction	0.6 s
Operating temperature	-10 ... +50 °C
Dimensions (L x W x H)	40 x 40 x 20 mm
Screw-in lift terminals	max. 2.5 mm²

The KNX radio blind actuator 1gang/binary input 2gang flush-mounted is only suitable for indoor areas.

KNX radio - Application example

Bi-directional radio technology makes it possible to control the connected load on the insert via radio signal by means of other transmitters. By contrast, the KNX radio application modules installed on this insert can also be configured as transmitters themselves in order to control other loads in the KNX radio system remotely. The following must therefore be configured:

- Functions executed on the directly connected load when radio commands are received (receiver)
- Radio commands for controlling other loads connected to the receivers (transmitters)
- Direct operation on the application module for the connected load on the insert (local operation)

The functions for local operation are preset in the factory, but can be changed.

By way of example, the application example in Figure 15 shows the universally usable and fully flexible modifiable configuration of two KNX radio application modules (here: KNX radio push-buttons 1gang) with flush-mounted devices (here: dimmer inserts), on which one lamp each is connected. The respective lamp can be switched/ dimmed locally using the push-button (grey symbol) and an additional load can also be remote-controlled (orange symbols) - lamp 2 using the bottom push-button operation area. Operating section 2 is configured in the same way, and in addition to its own connected lamp 2, can also activate lamp 1 using the bottom push-button operation area.

Both control sections thus control the wired loads and can also transmit radio signals as well as receive signals of other transmitters, such as hand-held transmitters. Both KNX radio buttons work as receivers and transmitters. Thus, all possible functions for lighting devices and blind controls can be configured and flexibly changed if required.

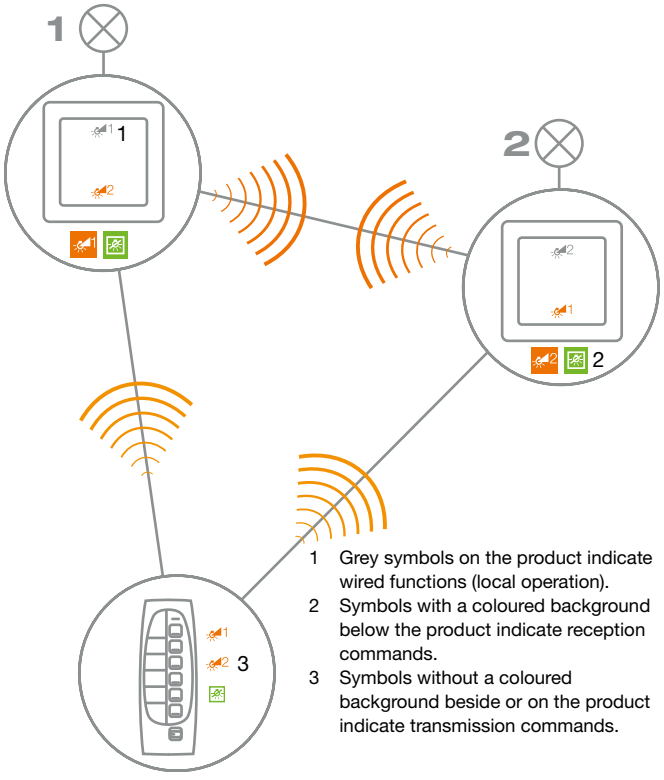


Figure 2: Application example transmitter/receiver configuration

TRANSMIT	RECEIVE	FUNCTIONAL DESCRIPTION
1	1	Lamp 1: Switch ON/OFF and dim BRIGHTER/DARKER
2	2	Lamp 2: Switch ON/OFF and dim BRIGHTER/DARKER
		Central function: Switch all lamps ON/OFF

Tab. 1: Configured transmitter/receiver functions

Technics

KNX radio - Commissioning concept

Configuration via quicklink
The KNX radio application modules follow a configuration concept whereby the function-related connection between a command giving transmitter and the function executing receivers is set by means of buttons and LED/displays without any further tools. Thus, wireless functions that are even more complex e.g. master, group, extension units, scenes and time controls can be implemented.
The insert wired to the load defines one set of configurable functions each (switching, dimming or control of the blind). The desired function is selected from this set and taught-in by means of quicklink.

Explanatory notes on the configurable functions following the configuration example.

The bottom part of application modules have a:
- Configuration button - **cfg** button
- Configuration LED - cfg LED
- Function button - **fct button**
- Function-LED - **fct**-LED

On application modules with display the configuration takes place menu-driven.

For a new configuration, the KNX radio application module must first be reset to factory setting.
All devices of a system configurable by quicklink can be operated together.

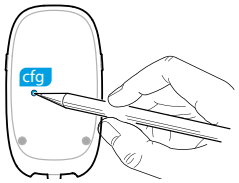
The simple configuration process is demonstrated below based on two examples.

Configuration of a lighting function with buttons and LED display

1. Switch the transmitter and receiver to configuration mode

- Activate the configuration with the **cfg** button of the transmitter.

  The **cfg** LED of the transmitter and all receivers within range light up.

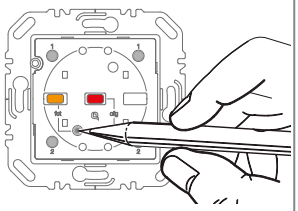


- On the transmitter, press the button/button area to which a function is to be assigned.

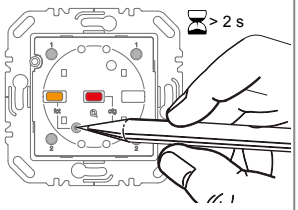
  The **cfg** LED of the transmitter flashes. The transmitter and receiver are in configuration mode.

2. Set function of the receiver

- Keep pressing the fct button on the receiver until the **fct** LED signals the desired function.



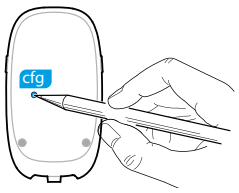
Save the selected function by slowly pressing (> 2 s) the **fct** button of the receiver.



3. Finish configuration

- End the configuration with the **cfg** button of the transmitter.

  The **cfg** LEDs on the transmitter and on all receivers go out..

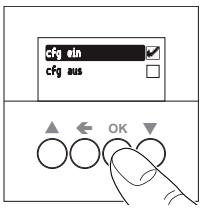


Configuration of a blind function with display, menu-driven (transmitter) + buttons and LED display (receiver)

1. Switch the transmitter and receiver to configuration mode

- In the configuration menu of the transmitter, activate the configuration with display.

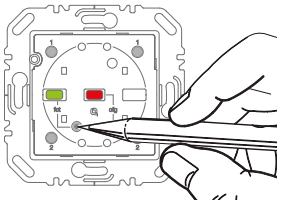
  The **cfg** LED and configuration display of all receivers within range light up.



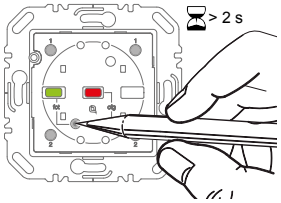
Since the display devices only have one transmission channel, it is not necessary to select the transmission button.

2. Set function of the receiver

- Keep pressing the fct button on the receiver until the **fct** LED signals the desired function.



- Save the selected function by slowly pressing (> 2 s) the **fct** button of the receiver.



3. Finish configuration

- End the configuration in the configuration menu of the transmitter.

  The **cfg** LED and configuration displays of all receivers in range go out.

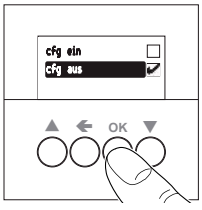


Figure 1: quicklink configuration of KNX radio application modules

Light control

Change-over Switch on/off Dimmer
LED: Display: Change-over
Change-over the operating state of the connected load on the receiver between ON and OFF per transmission command.
When dimming, a long button-press > 0.4 s induces dimming. The dimming direction is reversed each time the button is pressed.

Switch on Switch on Dimmer +
LED: Display: Switch-on
Switch ON the connected load on the receiver per transmission command.
When dimming, a long button-press > 0.4 s induces BRIGHTER dimming.

On/off switch off Dimmer –
LED: Display: Switch off
Switch OFF the connected load on the switching per transmission command.
When dimming, a long button-press > 0.4 s induces DARKER dimming.

Scene 1
LED: Display: Scene 1
Call the load and blind states stored in scene 1 on the assigned receivers per transmission command.

Scene 2
LED: Display: Scene 2
Call the load and blind states stored in scene 2 on the assigned receivers per transmission command.
After a long button-press on the transmitter > 5 s the stored scene is overwritten with the currently set load states of the assigned receiver.

Switching time
LED: Display: Switching time
Switch ON the load for the settable switch-on time on the receiver gradually between 1 s and 3 h per transmission command.

ON / OFF (switch)
LED: Display: On/off switch
Switch ON for the duration of the transmission command.
To facilitate this, transmission commands (ON and OFF switch) of the KNX radio timer in the receiver are configured simultaneously in one operation.

Forced mode ON
LED: Display: Forced ctr. On
Switch ON the connected load and lock against local operation and other transmission commands for the duration of the forced mode transmission command.

Forced mode OFF
LED: Display: Forced ctr. Off
Switch OFF the connected load and lock against local operation and other transmission commands for the duration of the forced mode transmission command.

Presence simulation
LED: Display: (function not available)
Activates/deactivates execution of presence simulation of the radio motion detector per transmission command. The recording frequency per hour is recorded over a 24 h period. In the 60 minutes with most recordings, the light will be switched on once for the duration of the delay time, even if no motion is detected.
During the presence simulation presence detection, extension unit and radio commands will continue to be executed normally.

Master-Slave
LED: Display: (function not available)
A motion detector configured as a slave transmits a command to the master motion detector for evaluation during detection of a movement.

Delete
LED: Display: Cancel
The assignment of the receiver to the transmitter is deleted.

Blind control

Move up
LED: Display: Move up
Adjustment of the slat position / stop.
After a long button-press > 0.4 s, blind moves to top final position (self-retaining).

Move down
LED: Display: Move down
Adjustment of the slat position / stop.
After a long button-press > 0.4 s, blind moves to bottom final position (self-retaining).

Scene 1
LED: Display: Scene 1
Call the load and blind states stored in scene 1 on the assigned receivers per transmission command.

Scene 2
LED: Display: Scene 2
Call the load and blind states stored in scene 2 on the assigned receivers per transmission command.
After a long button-press on the transmitter > 5 s the stored scene is overwritten with the currently set load states of the assigned receiver.

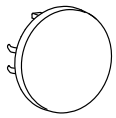
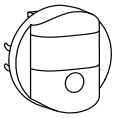
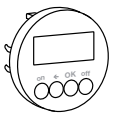
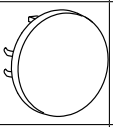
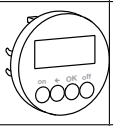
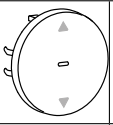
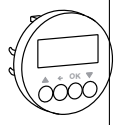
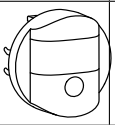
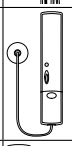
Up / Down (switch)
LED: Display: Up/down switch
Move blind UP for the duration of the transmission command. After the end of the transmission command, the blind moves DOWN for 2 minutes.
To facilitate this, transmission commands (move UP and DOWN) of the KNX radio shutter timer in the receiver are configured simultaneously in one operation.

Forced mode UP
LED: Display: Forced ctr. Up
Move the connected blind UP to the top final position and lock against local operation and other transmission commands for the duration of the forced mode transmission command.

Forced mode DOWN
LED: Display: Forced ctr. Down
Move the connected blind DOWN to the bottom final position and lock against local operation and other transmission commands for the duration of the forced mode transmission command.

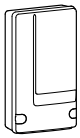
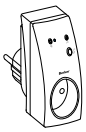
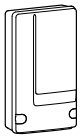
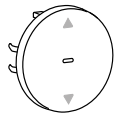
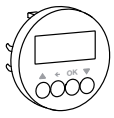
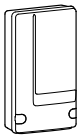
Presence simulation
LED: Display: (**function not available**)
Activates/deactivates execution of presence simulation of the KNX radio shutter button by means of transmission command.
The UP and DOWN switching commands of the last 24 hours are saved and executed automatically for the presence simulation.

Delete
LED: Display: Delete
The assignment of the receiver to the transmitter is deleted.

Transmitter function / Receiver function		Order no.	KNX radio button, quicklink 1gang, 2gang, 4gang ☐ on dimmer insert ☑ on switch insert ☐ on both inserts	KNX radio motion detector comfort 1.1 / 2.2 m quicklink ☐ on dimmer insert ☑ on switch insert ☐ on both inserts	Radio timer quicklink
					
			8514 51 xx /61 xx 8564 81 xx	8534 51 xx 8534 61 xx	8574 52 xx
KNX radio hand-held transmitter 2-channel; 4-channel; 6 -channel; 18-channel KNX radio wall-transmitter 1/2gang flat Solar quicklink KNX radio wall-transmitter 1/2gang flat quicklink		8565 51/61 xx 8565 52/62 xx	on/off, on, off, ☼, ▬, ⏾, +, −, ▲	on/off, on, off, ☼, ▬, ⏾, 24 h, +, −	on/off, on, off, ▬, ⏾, ▲
KNX radio button, quicklink 1gang, 2gang, 4gang		8514 51 xx 8514 61 xx 8564 81 xx	on/off, on, off, ☼, ▬, ⏾, ☼+, ⏾	on/off, on, off, ☼, ▬, ⏾, 24 h, ⏾	on/off, on, off, ▬, ⏾, ▲
KNX radio timer quicklink		8574 52 xx	on, off	on, off	on, off
KNX radio blind button quicklink		8524 51 xx			
KNX radio blind time switch quicklink		8574 51 xx			
KNX radio motion detector comfort 1.1 m quicklink KNX radio motion detector comfort 2.2 m quicklink KNX radio controller 220° surface-mounted KNX radio controller 220° surface-mounted Solar		8534 51/61 xx	on, off, ⏾	on, off, ⏾	on, off, ⏾
KNX radio motion detector comfort 1.1/2.2 m on power supply		8534 51 xx 8534 61 xx		▷	
KNX radio switch actuator, 1-gang/binary input, 1-gang, flush-mounted, surface-mounted KNX radio blind actuator 1gang/binary input 2gang flush-mounted KNX radio binary input 2gang flush-mounted KNX radio binary input, 2gang, 230 V, flush-mounted			on/off, on, off, ☼, ▬, ⏾, +, −, ▲	on/off, on, off, ☼, ▬, ⏾, on, off, 24 h, +, −	on/off, on, off, ▬, ⏾, ▲, on, off
KNX radio brightness sensor, surface-mounted					
KNX radio magnetic contact			on/off, on, off, ▬, ⏾	on/off, on, off, ▬, ⏾, on, off	on/off, on, off, ▬, ⏾, on, off

Functions through radio command

on/off	On/off, toggling	☼	On/off, dimming -	▬	Contact closed, on, contact open, off
on	On	+	On, dimming +	on	Forced on
off	Off	−	Off, dimming -	off	Forced off
☼	On/off, dimming +/-	▬	Scene 1 + 2	24 h	24 h repeat
☼+	On/off, dimming +	⏾	Switching time 1 s to 3 h	▲	Move up, stop

KNX radio switch actuator, 1 and 2gang, surface-mounted	KNX radio Switch actuator for plugs	KNX radio switch actuator, 1gang/binary input, 1gang, flush-mounted, surface-mounted	KNX radio universal dim actuator 1gang flush-mounted	KNX radio blind button quicklink	KNX radio blind time switch quicklink	KNX radio blind actuator 1gang/binary input 2gang flush-mounted	KNX radio blind actuator 1gang surface-mounted
							
				8524 51 xx	8574 51 xx		
on off on off	on off on off	on off on off	+ −	▲ ▼ 24	▲ ▼	▲ ▼	▲ ▼
on off on off	on off on off	on off on off		▲ ▼ 24	▲ ▼	▲ ▼	▲ ▼
on off	on off	on off	on off				
				▲ ▼	▲ ▼	▲ ▼	▲ ▼
				▲ ▼	▲ ▼	▲ ▼	▲ ▼
on off	on off	on off	on off				
on off on off	on off on off	on off on off	on off on off	▲ ▼ 24	▲ ▼	▲ ▼	▲ ▼
				▲ ▼	▲ ▼	▲ ▼	▲ ▼
on off on off	on off on off	on off on off	on off on off	▲ ▼	▲ ▼	▲ ▼	▲ ▼

▼ Move down, stop

Contact closed, Up for max. 2 min, contact open, Down for 2 min

Forced up

Forced down

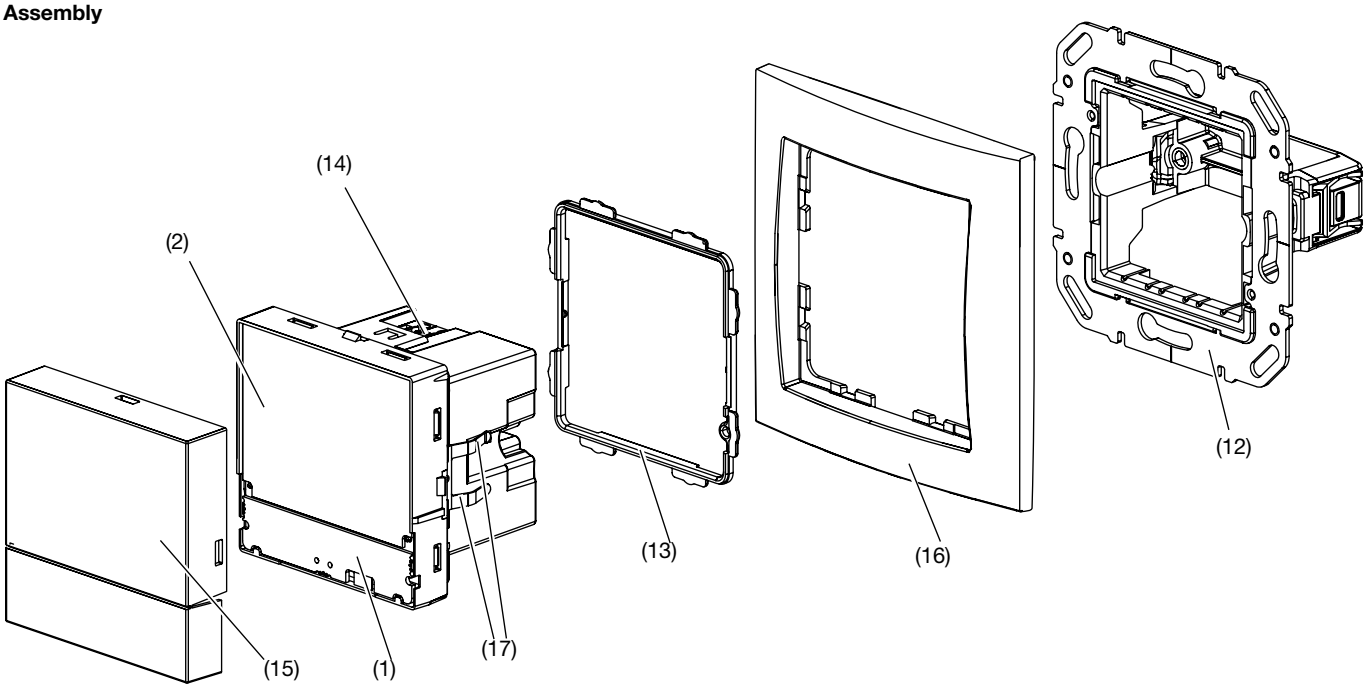
Slave motion detector extension unit

☒ Delete (All the devices have the function)

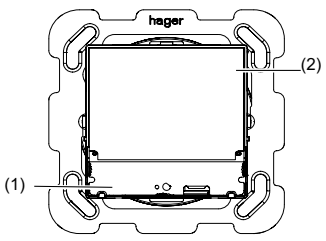
Technical properties

Order no.	80440100 / 80660100
Screen diagonal	1.93“
Screen size	38.28 mm x 30.26 mm
KNX system voltage	30 V DC
Auxiliary voltage	24 V DC
Current consumption KNX	max. 10 mA
Current consumption for 24 V auxiliary voltage	25 mA
Operating temperature	-5 °C to +45 °C
Storage temperature	-20 °C to +70 °C
Humidity	max. 60 %<45 °C, 90 % at 45 °C, no condensation
Bus line connection	TG008 plug-in terminals, 2-pole
Cable length for ext. temperature sensor	max. 10 m
Degree of protection	IP21
Impact protection	IK04
Protection class	III
Electric strength	4 kV
Standards	EN 60730-2-9, EN 50491-3, EN 50491-5-2

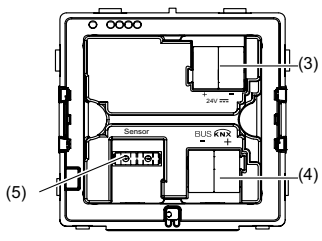
Assembly



Design and layout of the device



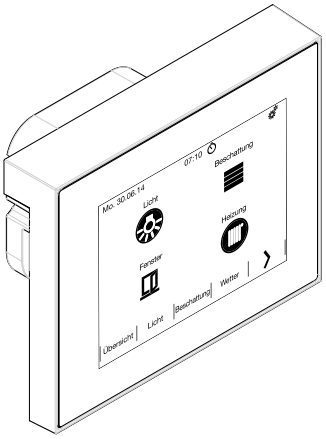
Front view



Rear view

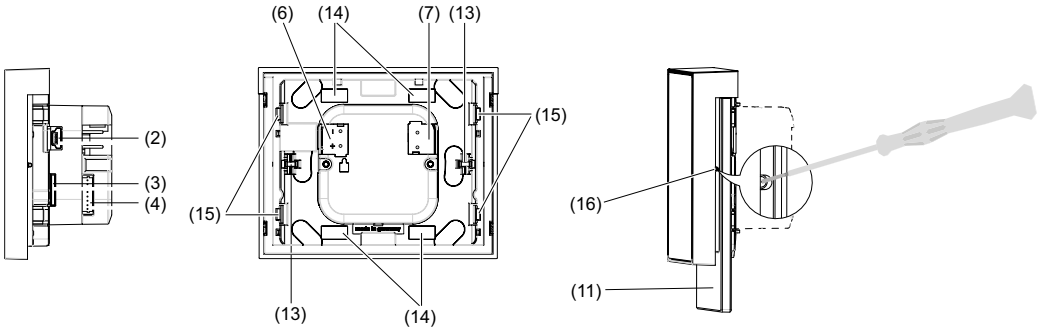
(1) Touch-sensitive control surface
(2) Display area
(3) Connecting terminal for auxiliary voltage 24 V ⎓ SELV
(4) KNX bus connection terminal
(5) Connecting terminal for external temperature sensor (not within scope of delivery, enclosed with the temperature sensor)

Technical properties



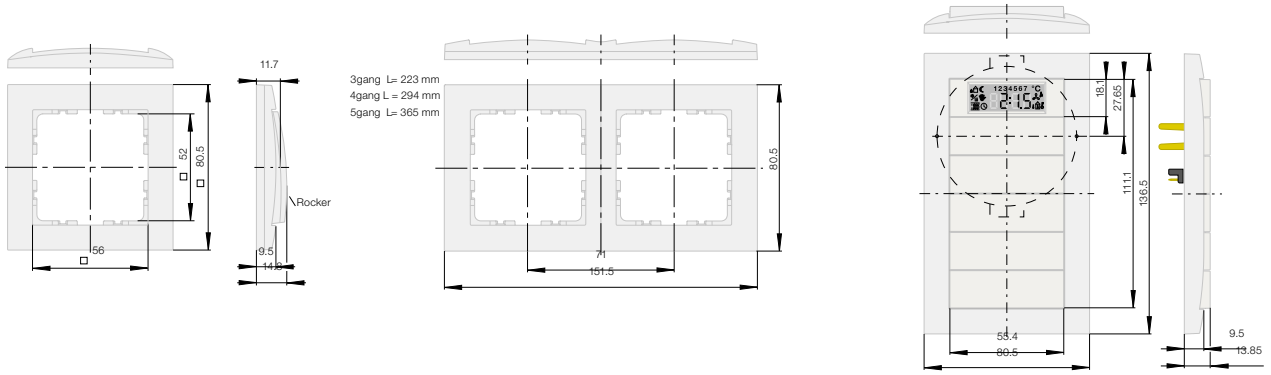
Order no.	**75740101**
KNX system voltage	30 V DC
Supply voltage	24 V DC
Current consumption KNX	10 mA
Display size	3.5“
Display format	16:9
Resolution	320 x 240 pixels
Dimensions (H x W x D) incl. design frame	93 x 95 x 44 mm
Assembling height on wall	18 mm
Protection class	IP20
Standards	EN 50491- 5 -1: 2010 EN 50491- 5 -2: 2011 EN 50491- 5 -3: 2011
Auxiliary voltage connection Rigid Flexible	 max. 1.5 mm² max. 0.75 mm²
Bus line connection	TG008 plug-in terminals, 2-pole
Supply voltage connection	TG025 plug-in terminals, 2-pole
External temperature sensor / binary contacts Connection mode Conductor cross-section (flexible, with conductor sleeves) Cable length	 4 x analogue/digital (prefabricated) 0.25 mm² max. 10 m
Operating temperature	+0 °C to +50 °C
Storage temperature	-10 °C to +50 °C

Design and layout of the device (75740101)

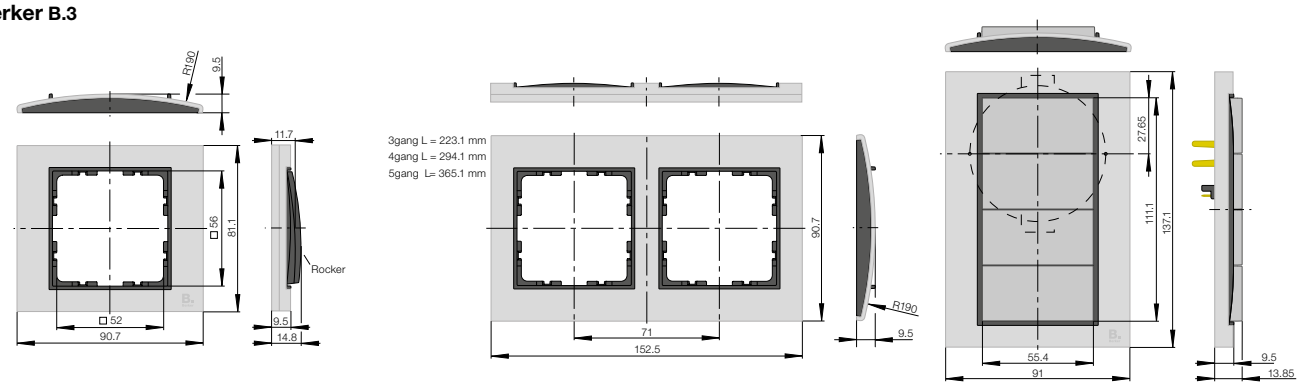


(2) USB connection – only for programming in the factory
(3) Slot for microSD card
(4) Jack for binary contacts or external temperature sensor - digital/analogue IN
(5) PRG programming button and LED
(6) KNX bus connection terminal
(7) Connecting terminal for auxiliary voltage – DC 12…40 V SELV
(11) Design frame (not included in scope of delivery)
(13) Mounting devices for supporting ring
(14) Magnetic holding points
(15) Fixings for design frame
(16) Dismantling opening

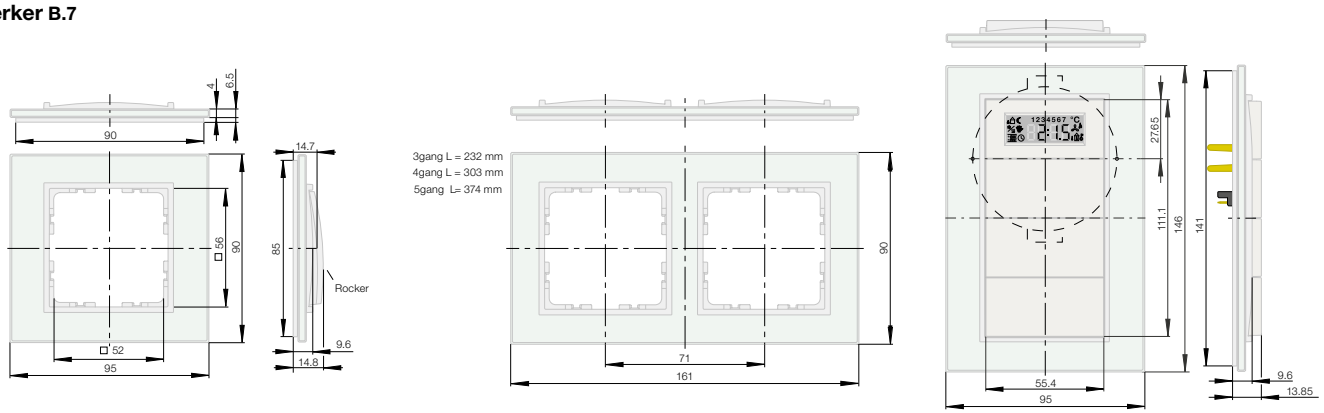
Berker S.1



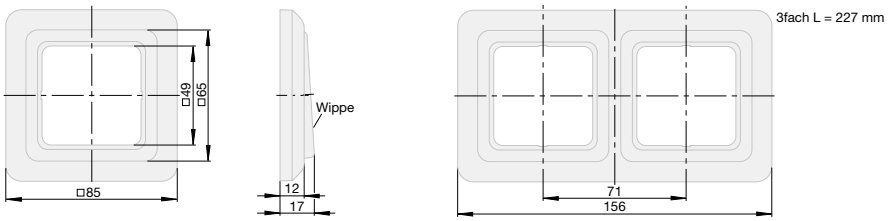
Berker B.3



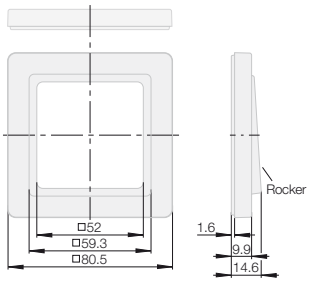
Berker B.7

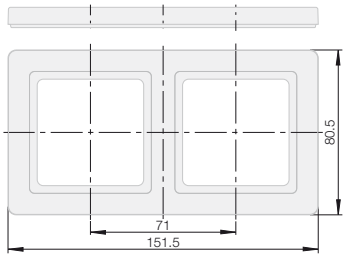


wg UP IP44

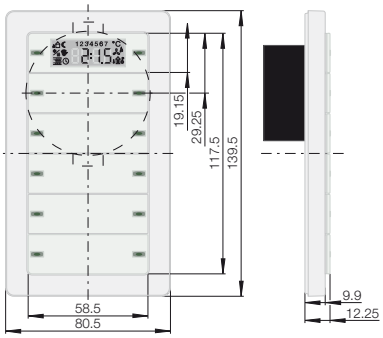


Berker Q.1

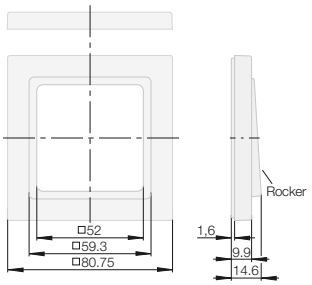


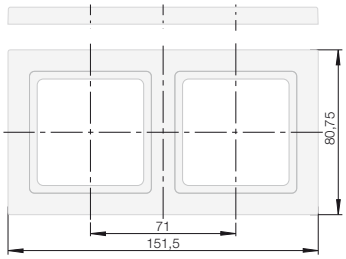


3gang L = 222.5 mm
4gang L = 293.5 mm
5gang L = 364.5 mm

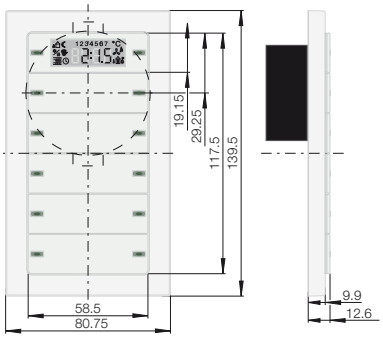


Berker Q.3

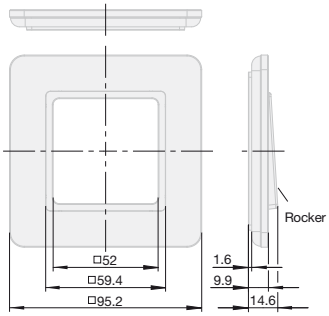


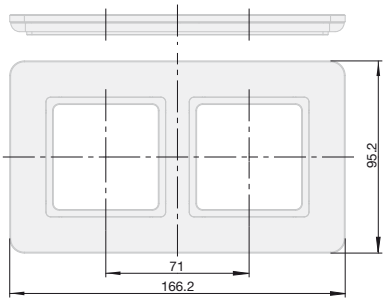


3gang L = 222.5 mm
4gang L = 293.5 mm
5gang L = 364.5 mm

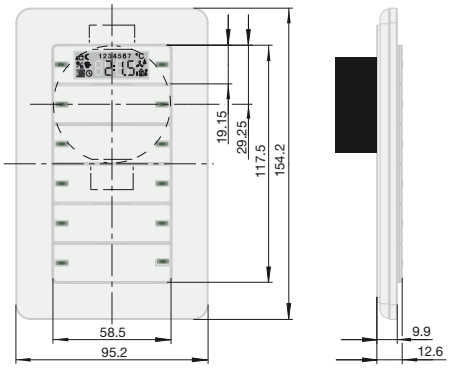


Berker Q.7

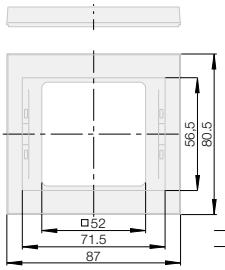


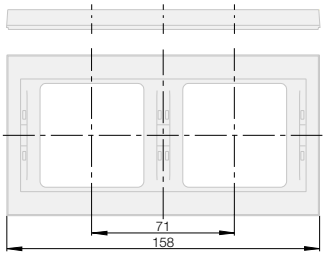


3gang L = 237.2 mm
4gang L = 308-2 mm
5gang L = 379.2 mm

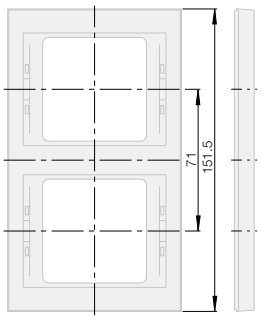


Berker K.1 | K.5

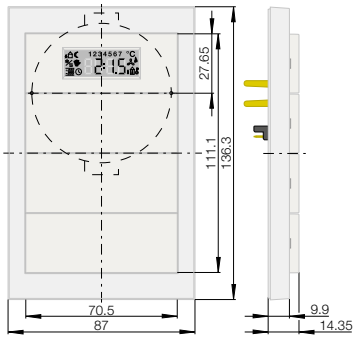




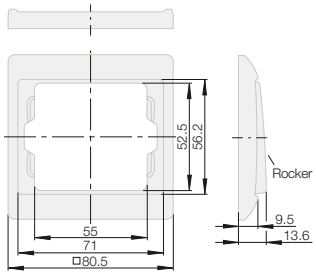
3gang horizontal L = 229 mm
4gang horizontal L = 300 mm
5gang horizontal L = 371 mm

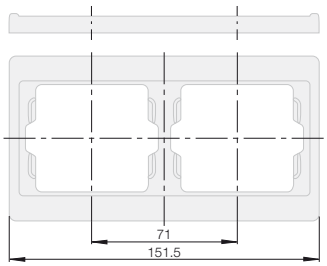


3gang vertical L = 222.5 mm
4gang vertical L = 293.5 mm
5gang vertical L = 364.5 mm

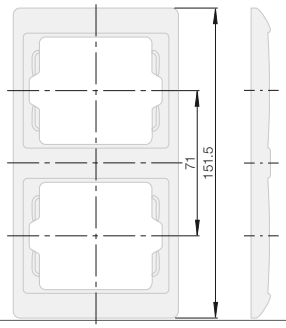


Berker arsys

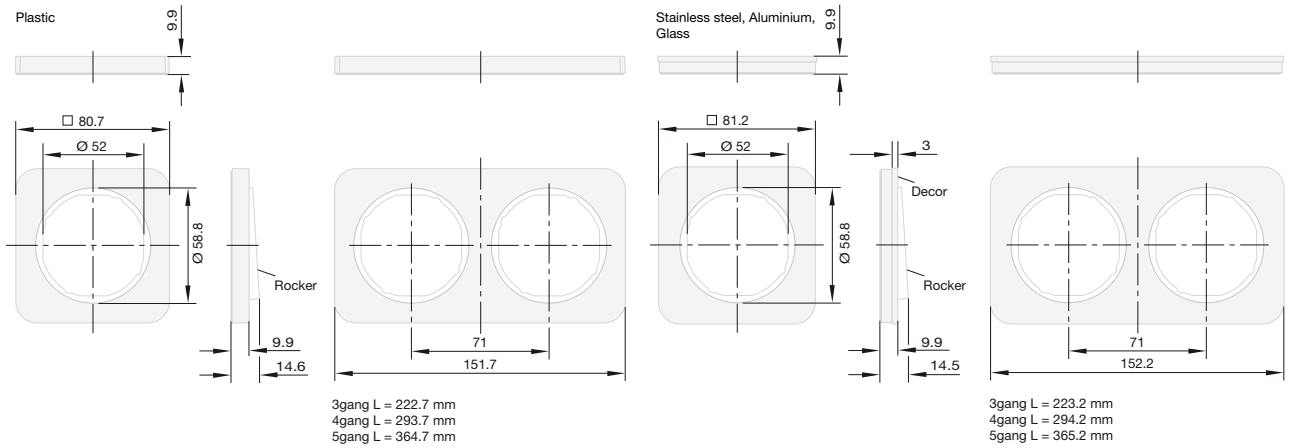




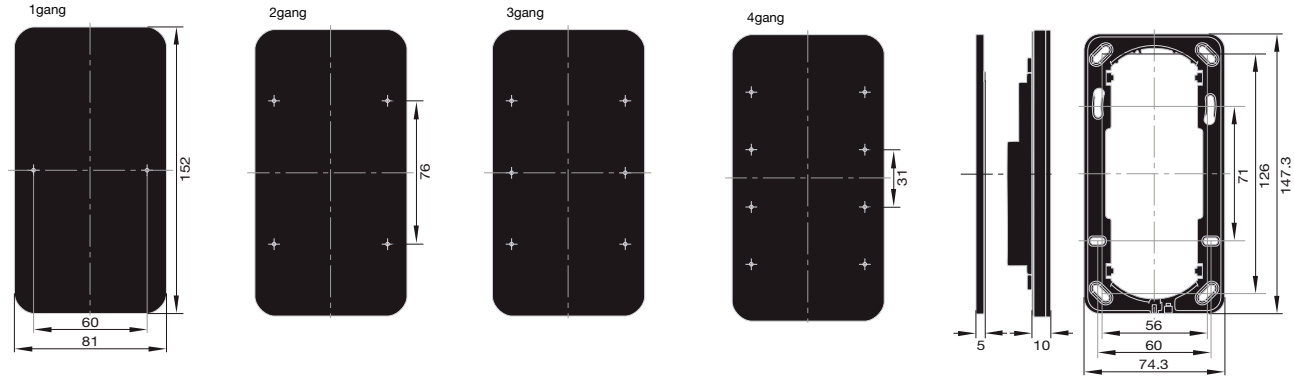
3gang L = 222.5 mm
4gang L = 293.5 mm
5gang L = 364.5 mm



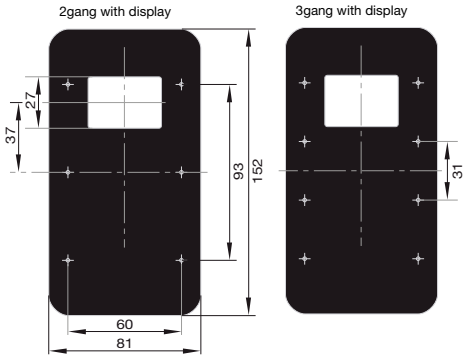
Berker R.1



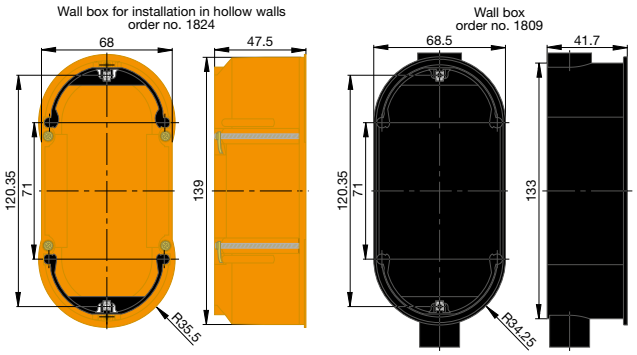
Berker R.1 - Touch sensor



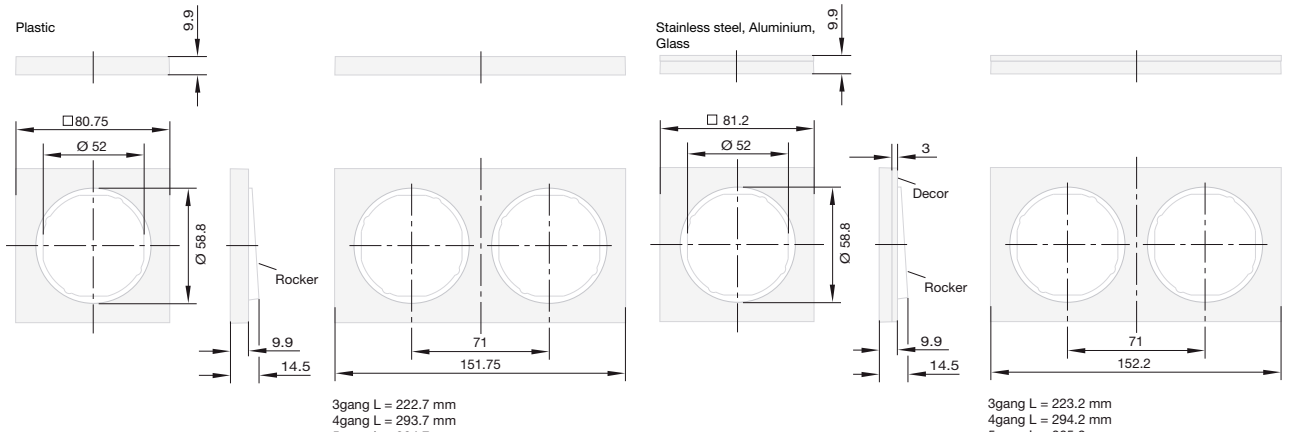
Berker R.1 - Touch sensor with thermostat



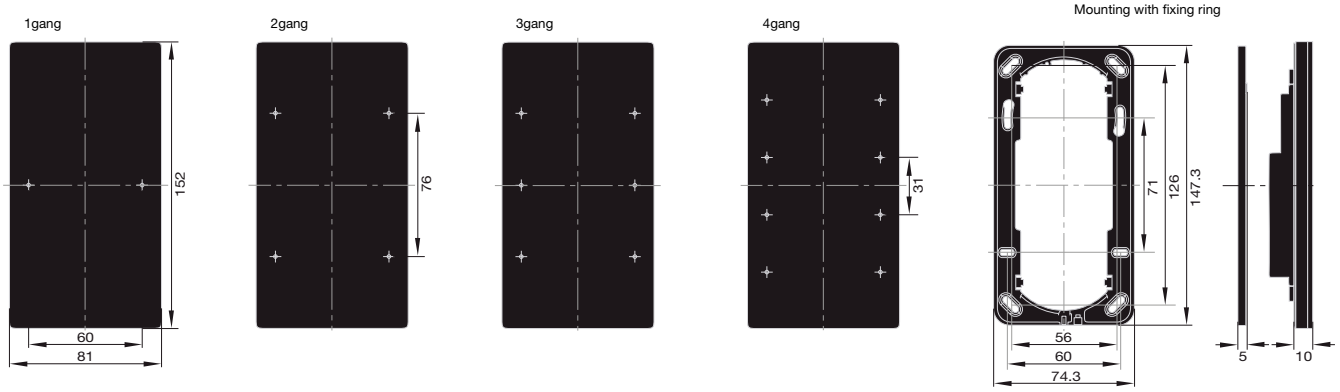
Wall boxes



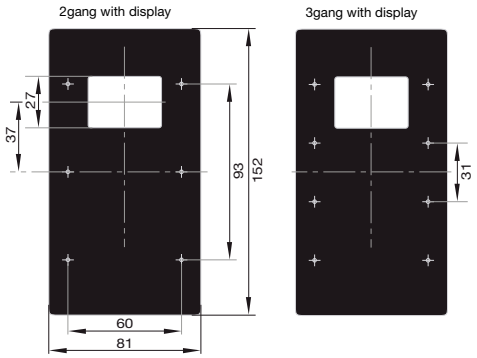
Berker R.3



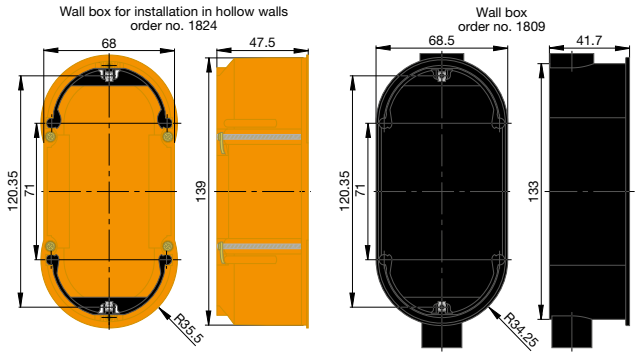
Berker R.3 - Touch sensor



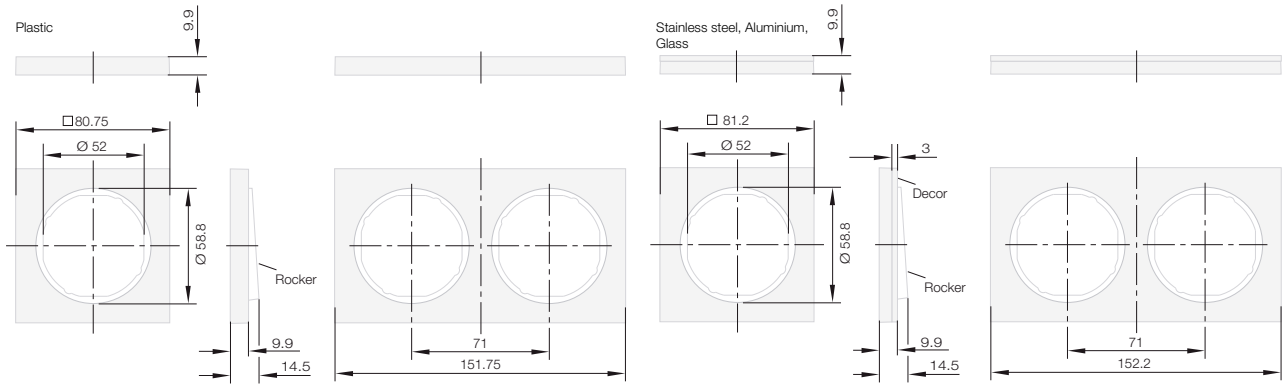
Berker R.3 - Touch sensor with thermostat



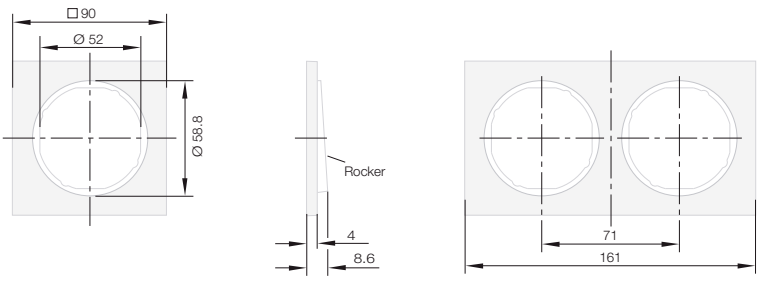
Wall boxes



Berker R.3

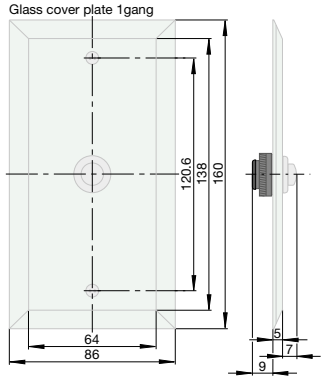


Berker R.8

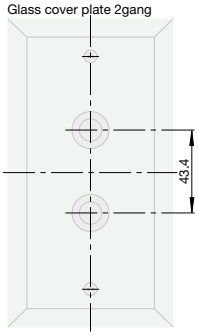


Berker TS

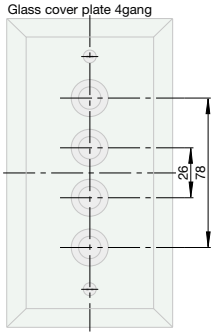
Glass cover plate 1gang



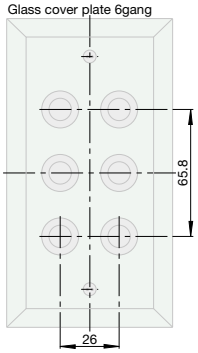
Glass cover plate 2gang



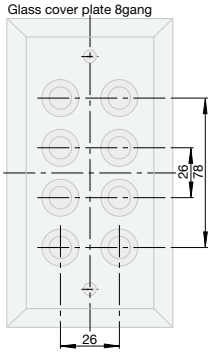
Glass cover plate 4gang



Glass cover plate 6gang

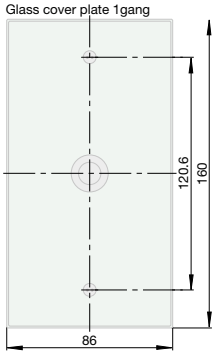


Glass cover plate 8gang

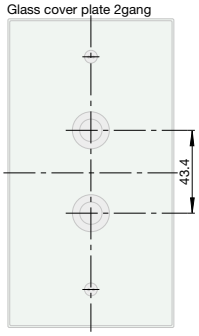


Wall boxes

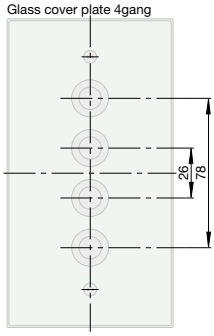
Glass cover plate 1gang



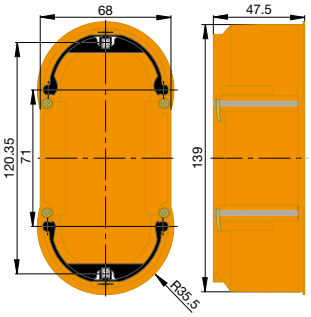
Glass cover plate 2gang



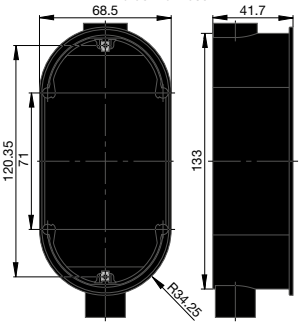
Glass cover plate 4gang



Wall box for installation in hollow walls
order no. 1824



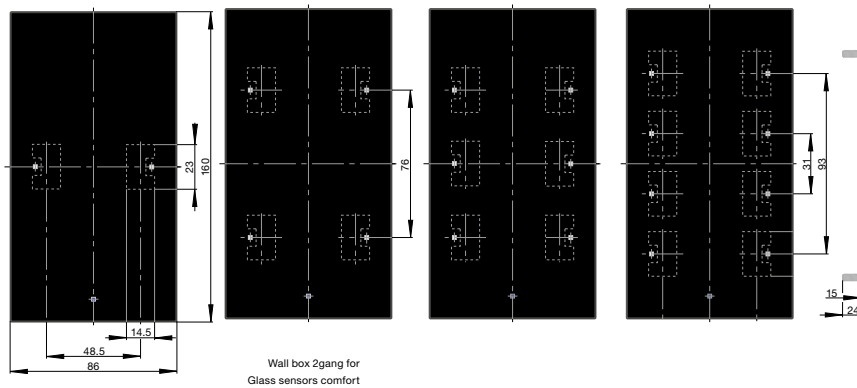
Wall box
order no. 1809



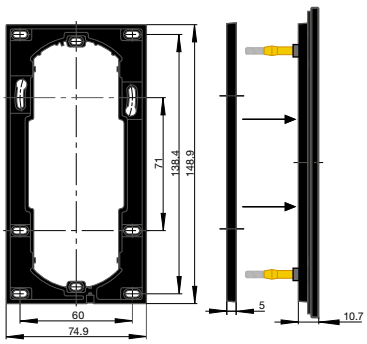
Technics

Berker TS sensor

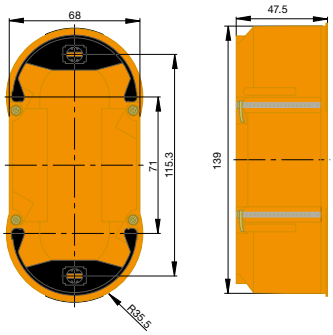
Glass sensor und glass sensor comfort with integrated bus coupling unit (without figure)



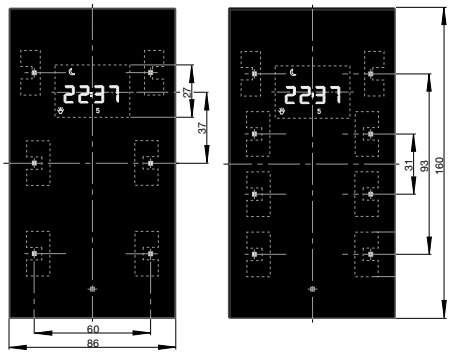
Glass sensor: Mounting with adapter ring



Wall box 2gang for Glass sensors comfort and glass sensors with thermostat, order no. 1871

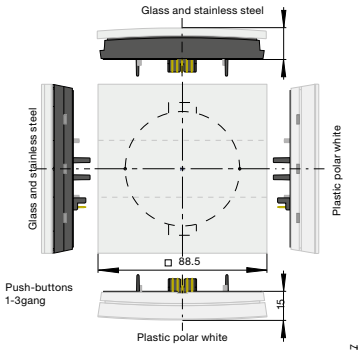


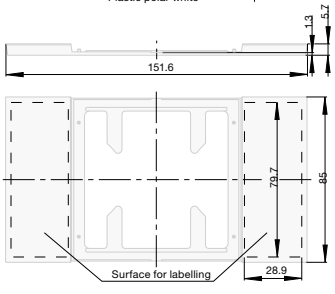
Glass sensor with thermostat



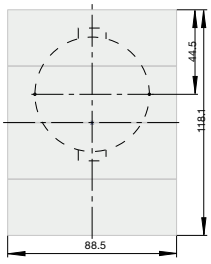
Mounting with adapter ring

B.IQ

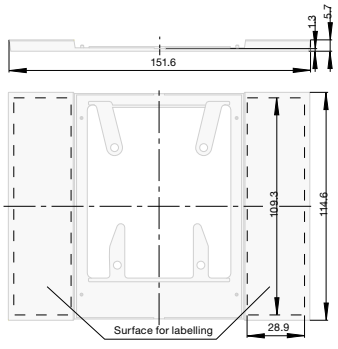




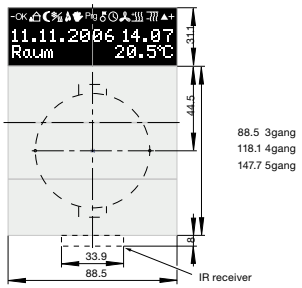
Labelling field for B.IQ push-buttons 1gang, 2gang, 3gang



Push-button 4gang and push-button for light scenes

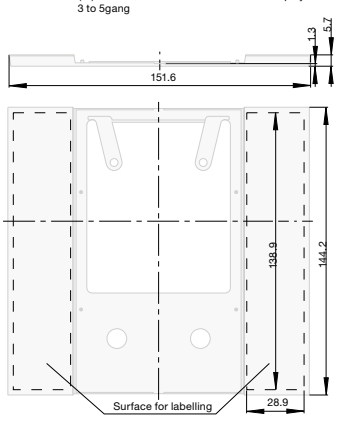


Labelling field for B.IQ push-buttons, 4gang



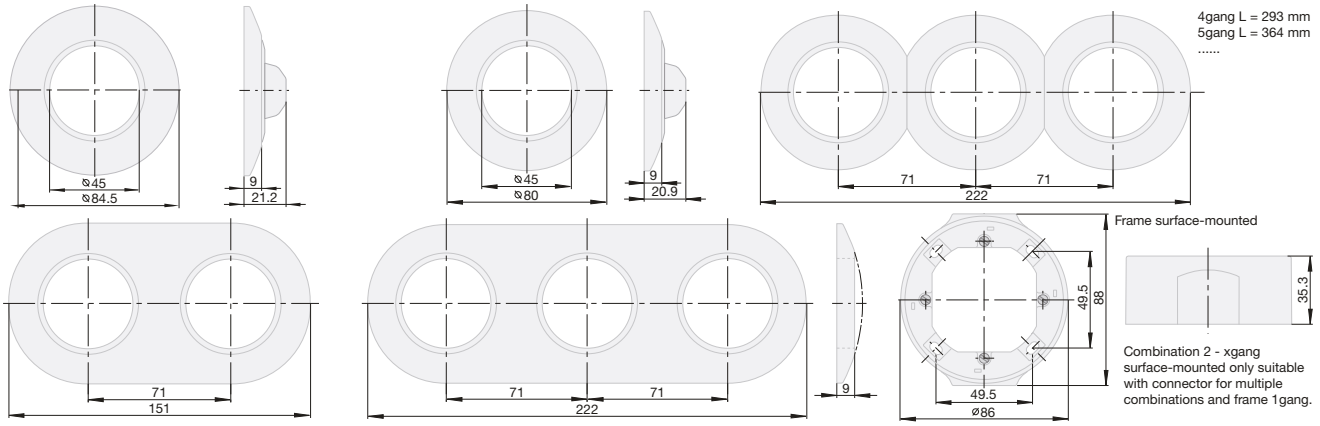
88.5 3gang
118.1 4gang
147.7 5gang

(IR) Push-buttons with thermostat and display 3 to 5gang

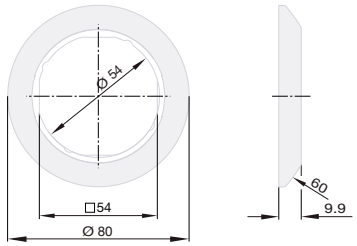


Labelling field for B.IQ push-buttons, 5gang

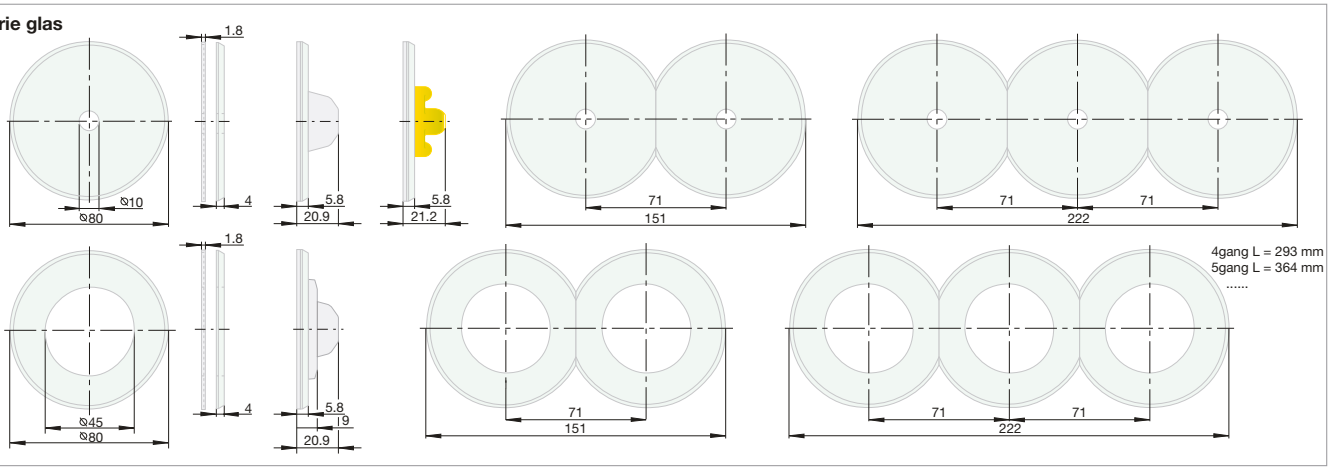
serie 1930 porzellan made by Rosenthal | serie 1930



Frame 1gang for centre plate Ø 58 mm

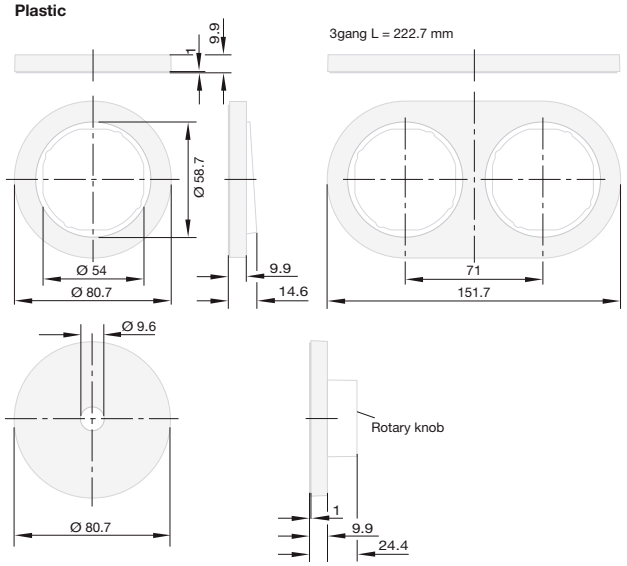


serie glas

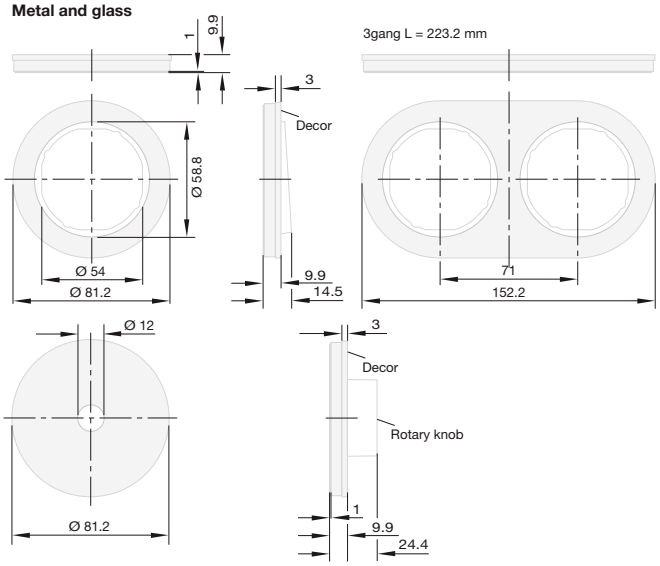


serie R.classic

Plastic

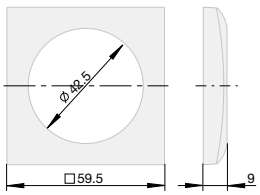


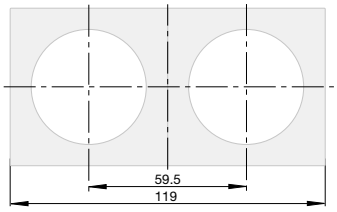
Metal and glass

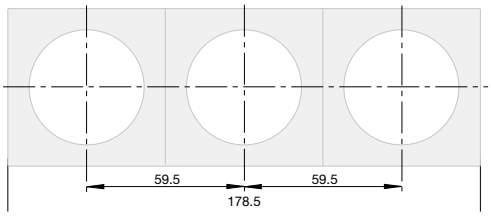


Technics

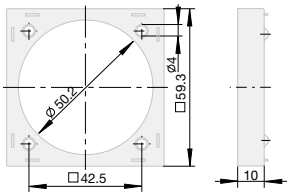
integro - design Flow



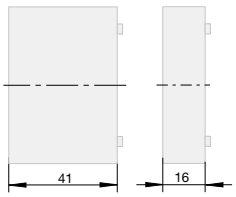




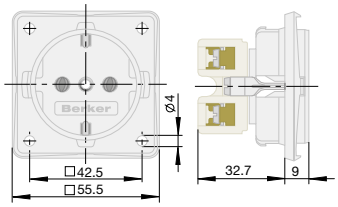
Surface-mounted spacer ring



Surface-mounted housing

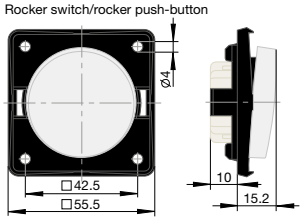


Socket outlets

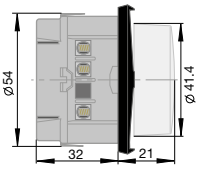


Caution!
Flat-head screws, size M3 or M3.5 must be used to fasten the inserts.

Rocker switch/rocker push-button



Rotary dimmer with setting knob

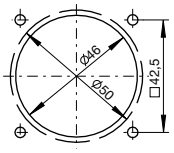


System	Installation depth
SCHUKO socket outlet	32.7 mm
Socket outlet with earthing pin	29.5 mm
Socket outlet without earth contact NETHERLANDS	29.6 mm
Socket outlet with earth contact DENEMARK	27.5 mm
Socket outlet with earth contact SWITZERLAND Type 13 / Type 23	28.0 mm
Socket outlet with earth contact USA/CANADA NEMA 5-15 R / 6-20 R	19.5 mm
Socket outlet with earth contact ITALIA	34.0 mm
Socket outlet with earth contact AUSTRALIA	16.5 mm
Socket outlet without earth contact EURO-AMERICAN STANDARD	21.3 mm
Socket outlet with earth contact BRITISH STANDARD	20.5 mm

integro - design Flow

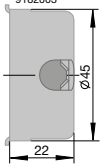
Installation cutout

Ø 46 mm or Ø 50 mm depending on wall box

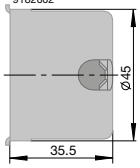


Contact protecion wall boxes

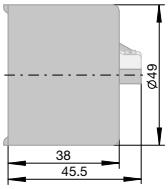
9182001
9182003



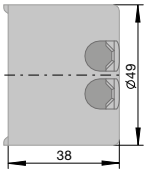
91820
9182002



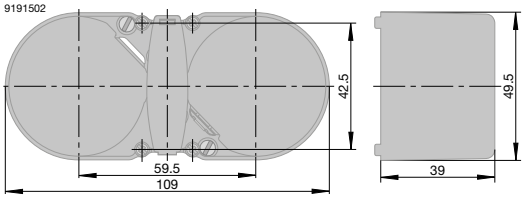
91883



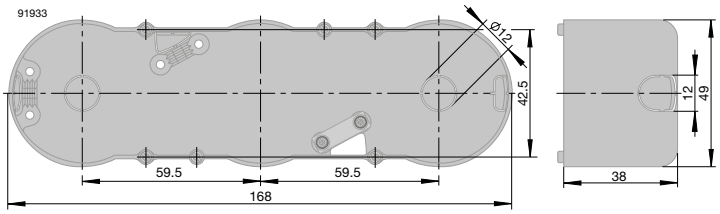
9188701



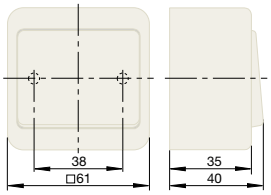
9191501
9191502

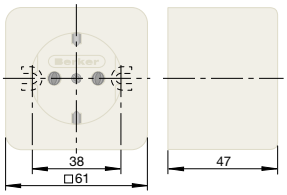


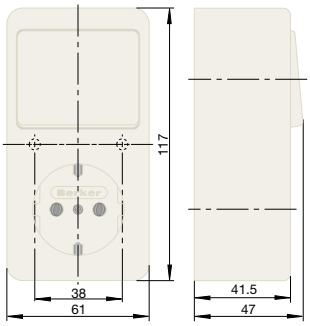
91933

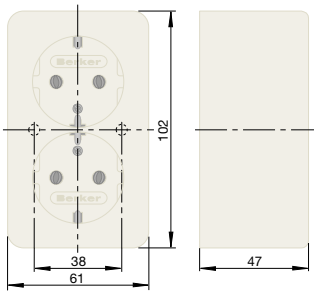


surface-mounted









Test marks and administrative marks

VDE test mark, all articles of the Berker range for which it is possible to issue the test mark, bear this mark.

Netherlands

Austria

Norway

France

Denmark

Italy

Sweden

Canada

Belgium

USA

Poland

Finland

Switzerland

ENEC stands for European Norms Electrical Certification. The number following the mark indicates the certifying body.
Example: 10 stands for VDE

Verification of increased voltage resistance capability for connecting devices to DIN 49400 and 49441, installation equipment made of shockproof impact material for greater mechanical stress conditioning.

SV Safety power supply (diesel unit VDE 0107: 1994-10), recognisable by the green centre plate

ZSV Additional safety power supply (battery supported VDE 0170: 1994-10), recognisable by the orange centre plate.

Furniture construction/installation. Devices can be mounted on surfaces with unknown flammability properties.

Flame retardant according to VDE 0606 T1:1984-11, meets the requirements of the Association of Property Insurers for mounting on wood.

All items in this catalogue which are subject to CE regulations bear the CE mark on their packaging.

RAL Determination of colour gradations of Deutsches Institut für Gütesicherung und Kennzeichnung e.V.

EDV Electronic data processing, designated for special circuits, designated by red centre plate.

Trademarks/brands

Registered trademark of the SCHUKO-Warenzeichenverband e.V (SCHUKO trademark association e. V.); identifies socket outlets according to DIN VDE 0620-1 and DIN 49440. The terminals are also suitable as connection terminals.

Registered trademark of Warenzeichen-Verbandes EDELSTAHL ROSTFREI (stainless steel trademark association).

Registered trademark of the KNX Association cvba, Brussels.

Registered trademark of PERILEX-Gemeinschaft e.V..

Protection classes/types

VDE radio suppression seal

Protective insulation protection class 2

IP (international protection)
According to DIN 40050,IEC 60529, designates the degree of protection of a device against ingress of foreign bodies and moisture.

IP44 Protection against contact of live parts with wires or similar, larger than 1 mm diameter and splash water from all directions. (contact-protected from 1 mm, splash-protected)

IP55 Protection against harmful dust deposits and against water jets from a nozzle directed towards the housing from all directions (protected against dust and water jets).)

IP66 Protection against dust deposits and strong water jets from all directions. (dustproof, waterproof)

Protection class III

Explosion protection, zone 11

Suitable for IP44, degree of protection IP44 is only available with the appropriate sealing set.

Application designations/symbols

Incandescent lamp

Fluorescent lamp

LV halogen lamp

Retrofit LED

Energy saving lamp

HV halogen lamp

Electronic transformer

Conventional transformer

Hollow-wall box

Identifiers for the temperature range -25°C to 40°C.

AX X = - Fluorescent lamp rated current

see technology - dimmer selection table

Flush-mounted controller, installation height 1.1 m

Flush-mounted controller installation height 2.2 m

Flush-mounted controller, installation height 2.5 m

μ Relay with micro contact
Opening diameter

ε Semiconductor circuit element

Earthing

Material characteristics

Berker products do not contain any materials made of PVC or halogen, with the exception of the sealing membrane and the contact protection boxes of the installation system.

General notes

The technical specifications given here are not
binding. The operating manual supplied with the products must be observed in all cases.

Illustrations are not binding, especially with regard to
colour, size, equipment, performance
of products and switch and
connection diagrams.

We reserve the right to make
technical and formal changes to our products in the interest of technical progress.

Switching symbols in unresolved display

To simplify the planning by means of switching symbols, we have additionally developed our own switching symbols based on the standard or we have used symbols already existing on the market.
Some of the new underlying details:


Electronic device


Scanning arm NO contact


Scanning arm NC contact


Scanning arm change-over


Scanning arms directed to each other or in each other corresponds to common input terminal


Scanning arms directed away from each other corresponds to Isolated input terminal


Hinged covers


KNX device

Radio bidirectional

Infrared IR

Passive infrared motion detector

Passive infrared presence detector


USB connector

Binary input


Sensors

Socket outlets without earthing contact


Socket outlet without earthing contact


2gang- / double socket outlet without earthing contact


Socket outlet without earthing contact with enhanced contact protection


USB charging socket

Socket outlets with earthing contact


SCHUKO plugs


SCHUKO socket outlet


2gang / double SCHUKO socket outlet


3gang SCHUKO socket outlet


SCHUKO socket outlet with enhanced contact protection


2gang SCHUKO socket outlet with enhanced contact protection


3gang SCHUKO socket outlet with enhanced contact protection


SCHUKO socket outlet with hinged cover


2gang SCHUKO socket outlet with hinged cover


3gang SCHUKO socket outlet with hinged cover


SCHUKO socket outlet with hinged cover and enhanced contact protection


SCHUKO socket outlet with hinged cover and lock


2gang SCHUKO socket outlet with hinged cover and lock


Illuminated SCHUKO socket outlet


Illuminated SCHUKO socket outlet with enhanced contact protection


Illuminated SCHUKO socket outlet with hinged cover


SCHUKO socket outlet that can be switched off with enhanced contact protection


SCHUKO socket outlet with overvoltage protection


SCHUKO socket outlet with residual current circuit-breaker (RCCB) and enhanced contact protection


Three-phase plug 3P + N + PE


Three-phase socket outlet with hinged cover 3P + N + PE

Switches


On/off switch


On/off switch, 2pole


On/off switch 2pole illuminated/control switching


On/off switch 3pole

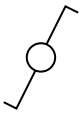

On/off switch 3pole illuminated/control switching

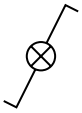

Series switch

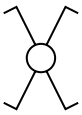

Series switch 1 x illuminated or 1 x control switching

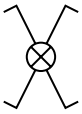

Series switch
2 x control switching

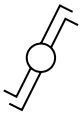

3gang On/off switch

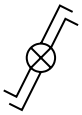

Change-over switch

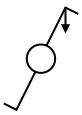

Change-over switch illuminated/control switching

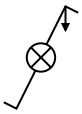

Intermediate switch


Intermediate switch illuminated

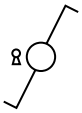

Double change-over switch

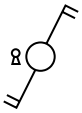

Double change-over switch illuminated

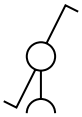

Pullcord switch change-over

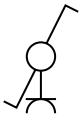

Pullcord switch change-over illuminated/control switching

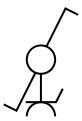
Mechanical timer 2pole Off

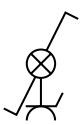

Key change-over switch

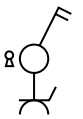

Key change-over switch, 2pole

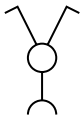

Change-over switch and socket outlet without earthing contact combination

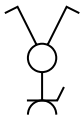

SCHUKO change-over switch and socket outlet combination


SCHUKO change-over switch and socket outlet with hinged cover combination


SCHUKO change-over switch and socket outlet with hinged cover combination illuminated/control switching


Key on/off switch 2pole and SCHUKO socket outlet with hinged cover combination


Series switch and socket outlet without earthing contact combination


Series switch and SCHUKO socket outlet with hinged cover combination

Push-button


Push-button, NO contact


Push-button, NO contact illuminated/control switching


Push-button, NO contact with 2 signal contacts


Push-button NO contact with 2 signal contacts illuminated


Push-button NC contact


Push-button NC contact illuminated


Push-button change-over contact illuminated


Push-button change-over contact illuminated


Push-button 2 NO contacts with 1 input and 1 rocker


Push-button 2 NO contacts with 1 input, 1 rocker illuminated


Push-button 2 NO contacts with 2 separate inputs and 1 rocker


Push-button 2 rockers with 2 separate inputs and 1 rocker illuminated


Push-button 1 NO contact and 1 NC contact with 2 separate inputs and 1 rocker


Push-button 1 NO contact and 1 NC contact with 2 separate inputs and 1 rocker illuminated


Push-button 2 NO contacts with 1 input and 2 rockers


Push-button 2 NO contacts with 1 input and 2 rockers


Push-button 2 NO contacts with 2 separate inputs and 2 rockers


Push-button 2 NO contacts with 2 separate inputs and 2 rockers illuminated


Push-button 1 NO contact and 1 NC contact with 2 separate inputs and 2 rockers


Push-button 1 NO contact and 1 NC contact with 2 separate inputs and 2 rockers illuminated


Push-button 2 change-over contacts with 2 separate inputs and 2 rockers


Push-button 2 change-over contacts with 2 separate inputs and 2 rockers illuminated


Push-button 4 NO contacts with 1 input and 2 rockers


Push-button 4 NO contacts with 1 input and 2 rockers


Key push-button NO contact


Key push-button change-over contact


Pullcord push-button change-over contact with signal contact

Switch / push-button for blinds


Switches for blinds


Switches for blinds 2pole


Key switches for blinds


Key switches for blinds, 2pole


Push-buttons for blinds


Push-buttons for blinds 2pole


Key push-buttons for blinds


Key push-buttons for blinds, 2pole

Switches for blinds electronic


Blind switch, electronic


Blind switch electronic with sensor connection


KNX radio blind switch electronic bidirectional / KNX radio blind actuator

KNX radio blind actuator with 2 binary inputs


Blind switch electronic with timer


Blind switch electronic with timer and sensor connection


KNX radio blind switch electronic with timer


KNX radio blind switch electronic with timer and sensor connection


Cutoff relay

Special switch/push-button


Hotel card switch NO contact


Hotel card switch NO contact illuminated


Hotel card switch change-over contact


Hotel card switch change-over contact illuminated


Hotel card switch 1 NO contact and 1 NC contact with 2 separate inputs


Hotel card switch 1 NO contact, 1 NC contact, 2 separate inputs illuminated


Hotel card switch NO contact with 2 signal contacts


Hotel card switch NO contact with 2 signal contacts illuminated

3-step switch with neutral position

3-step switch without neutral position

Electronic switches/components

Time relay for motion detector

Mains decouplers

Hotel card switch NO contact with delay time illuminated

Electronic switch

KNX radio electronic switch

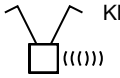
Electronic switch with motion detector

Electronic switch with IR motion detector

KNX radio electronic switch with motion detector

Electronic switch with presence detector

Electronic switch, 2gang



KNX radio electronic switch 2gang

Relay switch

Relay switch with delay time / controller power pack/stairwell switch

KN radio relay switch / KNX radio switch actuator

KNX radio switch actuator with binary input

KNX radio switch actuator with binary input 2gang

Relay switch with motion detector

Relay switch with IR motion detector

KNX radio relay switch with motion detector

Relay switch with presence detector

Relay switch with IR presence detector

Relay switch with timer/ Timer

Relay switch with timer and sensor connection

KNX radio relay switch with timer

Timer 2gang

Timer 4gang

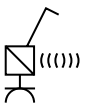
Relay switch 2gang

Relay switch 2gang with delay time / controller power pack 2gang

Relay switch 2gang with motion detector

Relay switch 2gang with IR motion detector

Relay switch 2gang with presence detector



KNX radio switch actuator for SCHUKO plugs

Extension unit, electronic

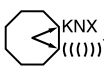
Motion detector extension unit

Presence detector extension unit

Electronic transformer

Switch power supply

Radio repeater, signal amplifier



KNX radio media coupler surface-mounted

Rotary dimmer rotary control units

Rotary dimmer with on/off switch

Rotary dimmer with change-over switch

1 - 10 V rotary potentiometer with on/off switch

1 - 10 V rotary potentiometer with NO contact push-button

DALI rotary potentiometer with on/off switch

DALI rotary potentiometer with on/off switch and power supply

Speed controller with on/off switch and additional contact

Touch dimmer touch control units

Touch dimmer

KNX radio touch dimmer bidirectional

Touch dimmer with motion detector

Touch dimmer with IR motion detector

KNX radio touch dimmer with motion detector

Touch dimmer with presence detector

1 - 10 V touch control unit

IR 1 - 10 V touch control unit

1 - 10 V touch control unit with motion detector

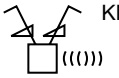
1 - 10 V touch control unit with PIR presence detector

1 - 10 V touch control unit with IR motion detector

DALI touch control unit

IR DALI touch control unit

Series touch dimmers



KNX radio series touch dimmer


KNX radio dim actuator dim 4gang


Dimmer power booster

General applications


Blind plug


Cable outlet


Pilot lamp


Pilot lamp 2gang

Wireless components


KNX radio hand-held transmitter 2-channel


KNX radio hand-held transmitter 4-channel


KNX radio hand-held transmitter 6-channel


KNX radio hand-held transmitter 18-channel


KNX radio wall-transmitter


KNX radio wall-transmitter, 2-gang


KNX radio motion detector


IR hand-held transmitter


KNX radio valve drive


coviva Smartbox

Data / Telecommunication


Loudspeaker socket outlet


Stereo loudspeaker socket outlet


TV aerial socket


TAE socket outlet


TDO socket outlet


FCC socket outlet


TAE/FCC socket outlet


HDMI socket outlet


VGA socket outlet


S-Video socket outlet


Cinch socket outlet


S-Video and Cinch socket outlet


USB and jack socket outlet

Security and safety systems


Key switches
Motion detectors general


Siren


Alarm siren with rotating light


Smoke detector


Radio smoke detector


Heat detector


Radio heat detector

Magnetic contact


KNX radio magnetic contact


alarm central unit


KNX alarm central unit

Strike plate contact
lock switch contact

Blocking element


Glass breakage detector


Alarm distribution terminal


Overvoltage protection module


Residual current circuit-breaker


Making current limiter

HVAC components


Electro-thermal valve drive


Thermostat NO contact with timer


Thermostat NO contact with sensor and timer


Thermostat NC contact with on/off switch and lamp


Thermostat NO contact with sensor on/off switch and lamp


Thermostat change-over contact


Thermostat, change-over contact with sensor


Temperature sensor

Consumer electronics door communication


VHF radio


Amplifier


Docking station


Loudspeaker


Antenna

Clinic installation


(Double pole) socket outlet for floating output

Sensors/inputs


Brightness sensor


Wind sensor

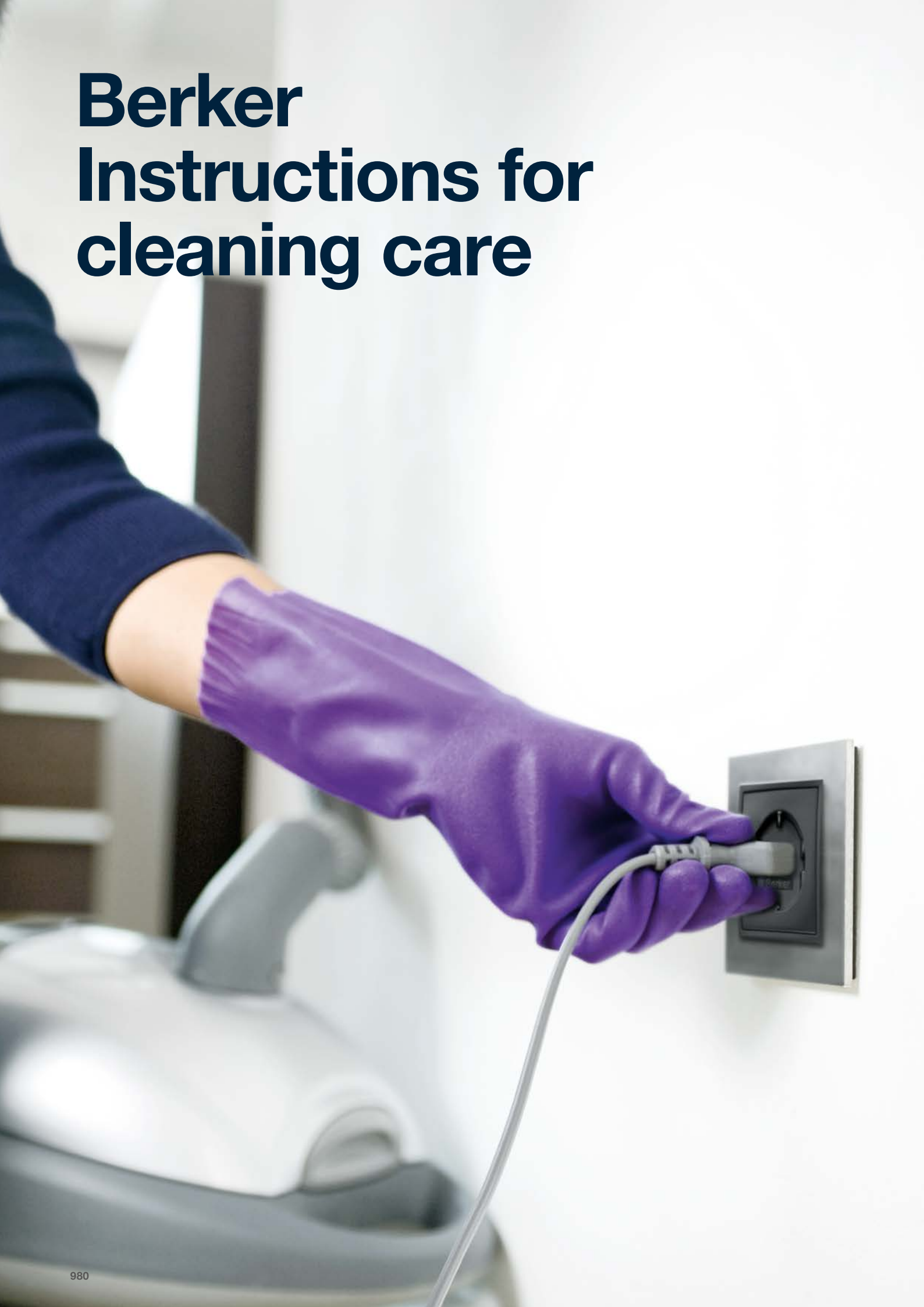

Precipitation sensor


KNX radio brightness sensor


KNX radio binary input 2gang


KNX radio binary input 2gang

Berker Instructions for cleaning care



For surfaces made of plastic, metal or glass:

Clean by wiping the surfaces with a moist, soft, lint-free cloth. Soap-based detergents are suitable for heavier dirt. Open-pored surfaces made from natural materials are sensitive to grease and dirt. They are to be cleaned with a dry, lint-free cloth only.

For surfaces of stainless steel:

Aggressive external ambient factors or direct treatment can damage the material. This can result in rust or discoloration. We recommend cleaning and impregnating stainless steel parts several times a year with special cleaning and care products intended for stainless steel products. Please observe the instructions for use of the cleaning material, as it may not be suitable for use with plastics or fine metallic surface finishes.

Applies to all surfaces:

Abrasives and polishes, acid-based (scale removing) detergents and detergents containing chlorine as well as alkaline-based detergents will generally damage all surfaces. Moreover, painted/lacquered surfaces must not come in contact with detergents that contain alcohol.

We,
Hager SE
Zum Gunterstal
66440 Blieskastel, Germany

declare under our sole responsibility that all products with the CE marking from the product offering segments

- Distribution boards and switch/protection devices
- Cable routing and room connection systems
- Switch ranges and building automation
- Door communication and security technology
- Energy distributions and switch/protection devices

meet the requirements of the following EU directives and regulations and their corresponding additions where applicable:

- Low-voltage directive 2014/35/EU
- Directive on electromagnetic compatibility 2014/30/EU
- Radio equipment directive 2014/53/EU
- Directive establishing a framework for the setting of ecodesign requirements for energy-related products 2009/125/EU
- Measuring instruments directive 2014/32/EU
- Construction Products Regulation (EU) No. 305/2011
- Directive on the restriction of hazardous substances 2011/65/EU

This declaration certifies that the products comply with the specified directives and regulations but does not guarantee their properties.

The electrical engineer is responsible for ensuring that our products are used as intended and for setting up the system so that it is ready to use in accordance with the relevant installation regulations.

The CE marking is displayed directly on the product, on the packaging or on the outer packaging.

Hager SE acts on behalf of all of its direct and indirect subsidiaries.

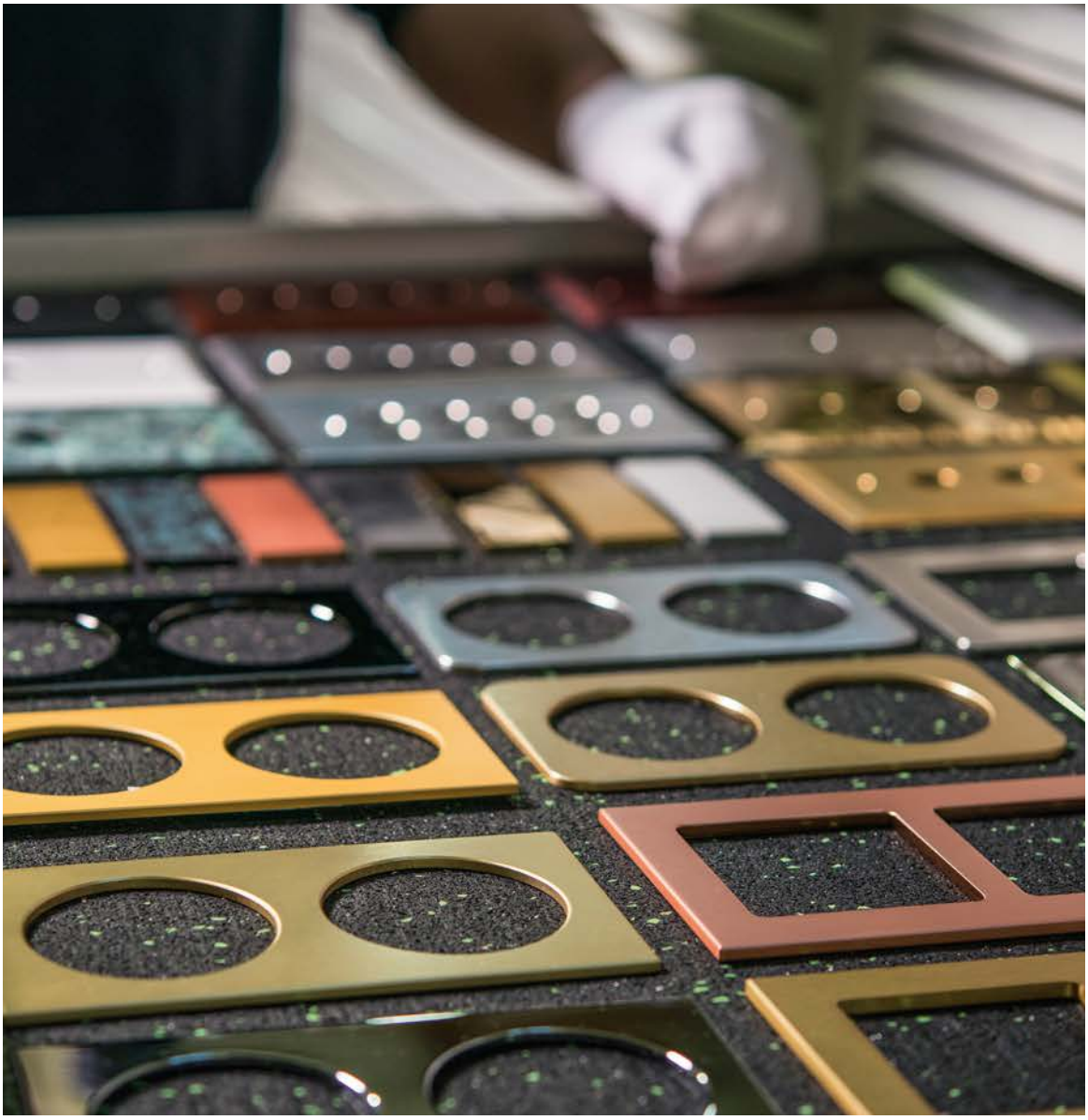
Blieskastel, 7 June 2017

Dr.-Ing. Dominique Beck
Corporate Standards and Business Environment Director – Hager Group

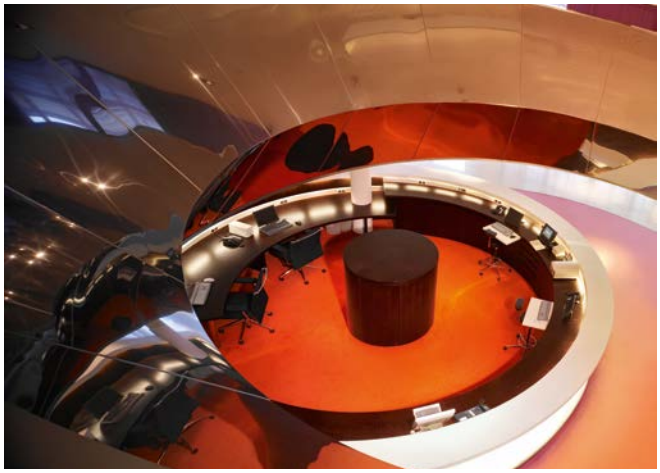
Manufaktur
Switch ranges and building-automation

Yes, one-off items are still available. Unique items, manufactured individually by master craftsmen. The engraved gold light switch required by a sheik in the emirates. Or also a short run, manufactured specifically for and based on the idea of a customer for a wellness hotel: hay switches that are not only actually made from hay, but also have the scent of hay. They all have a home: the Manufaktur. Limits to phantasy are set only by the reality of technology. However extravagant and unique an item may be, it will meet our technical and quality standards fully and completely.

Beyond the standard: Manufaktur



We have combined the ability, knowledge and experience of Hager, Berker and Elcom in the Manufaktur. This is where we manufacture and configure solutions to your very individual requirements. From custom-engineered trunking through one-of-a-kind switches to complete electrical solutions for residential and functional buildings. Everything comes from a single source.



01
Cable routing that makes its mark

There is hardly any customer request that we are unable to fulfil. After all, a wide range of colours, shapes and material choices is available. Even some that allow the wiring simply to disappear. In the wall, floor or ceiling.

02
Door communication – Details in decisive positions

This first thing a visitor see is the entryphone. Configure it exactly to meet your expectations. The modular system from Elcom makes it possible. Every element is manufactured with great care from high-quality materials. You see it and you sense it. As do your guests.

03
Preparatory work that simplies your task

Wha's done, is done: When the time window on the construction site is tight, preparatory work that was already handled during manufacturing helps. Trunking cut to length, custom-assembled meter cabinets or media columns pre-wired to customer specifications: set up, connect, finished.

04
Design in an individual overall concept

Hager, Berker, Elcom – all three brands adhere to the same technical guidelines, purchase their raw materials together and follow the Design Guidelines of the Hager Group. With this as a basis, you can create entire installations that harmonise not only technically, but aesthetically as well.

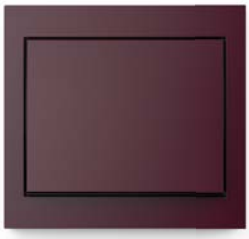
Berker K.1

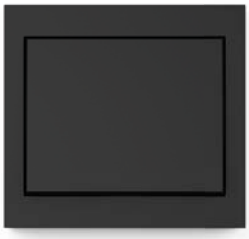
With its contoured, accentuated edged form, the Berker K.1 always sets its own accent. A central, modern classic in the Berker switch range that embodies quality and a sure sense of style.

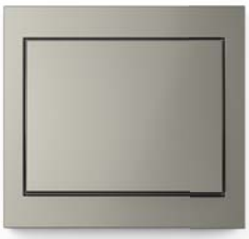

Private apartment

The surprising variety of qualified paint types allows customisation of the Berker K.1 in terms of colour and feel. Both classic colour variants with the special "touch" and unexpected colour combinations fit perfectly into a timeless-classic interior.


titanium grey


sanodal red


black softtouch


pearl mouse grey

Berker Q.3

Robust, distinct contours and an exceptionally pleasant surface. Its functional benefits are also worth noting: the Berker Q.3 is ideally suited for installation in wall ducts.

Special finish
Anodised gold tone

champagne

yellow brown

Ameron Hotel, Hamburg
Architect / Interior: Geplan Design GmbH

An effect finish for the Berker Q.3 in anodised colours allows great freedom for surface design. Anodised colours are characterised by high suitability for daily use in terms of cleaning and scratch resistance.

Endemol Shine Group Germany GmbH, Cologne
Interior: Werner Aisslinger

Berker R.1

Along with the dot and straight line, the circle is one of the oldest elements of geometry. But it can still be used in surprising ways. For instance, in the design line Berker R.1, which can then be just as pure and elegant as it is intense and conspicuous.

rosé gold

black chrome

Copper

Burnished brass

Copper, brass, high-gloss chrome draw attention and become stylish eyecatchers in the four walls. Whether as chandelier hanging above a table, as candelabra on the sideboard or in the form of the Berker R.1 – the metallic trend is found everywhere.

Private apartment
Interior: Arzu Kartal

Berker R.3

Continuously cornered frame, round centre piece – the Berker R.3 the power of contrast. Just like the Berker R.1, its product range also comprises all the properties of a contemporary surface switch. This means also that thanks to a sturdy plastic base it is just as robust and break-proof.

Kerlite® ceramic

with patina

Corten steel

Resysta®

When exceptional designs such as the Berker R.3 are combined with high-quality innovative materials, aesthetically unique products results. With exclusive ceramics from Italy to high-grade materials that develop an interesting patina through use of a special process – creativity has no limits.

Private apartment

Berker Q.7

The Berker Q.7 creates accents not only through its form, function and workmanship. With its variety of frame materials, it also sets a new standard for architectural individuality. Exciting design contrast: The transparent support frame makes the switch appear to float on the wall.

Wildspitze

Coffee

There are many different ways to create accents with the Berker Q.7 in an interior space. Aromatic decorative coatings from Organoid® now bring nature indoors. They provide a new experience of natural materials with all senses, since the surface is untreated and thus retains its aroma characteristics.

Berker TS Sensor

Two products that complement each other perfectly: The Berker TS sensor is an extremely flat glass sensor that, thanks to screwless mounting, has a remarkably inconspicuous exterior. The Berker B.7 design line offers socket outlets with matching aesthetics.

TS sensor in green

The elegant-purist exterior of the Berker TS sensor becomes an eyecatcher through use of the unexpected variety of colour variants. In this way, the Berker TS sensor and the Berker B.7 enhance every interior.

pearl mouse grey

manufactory white

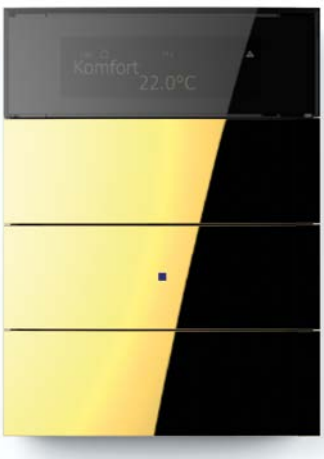
pearl gold

Berker B.IQ

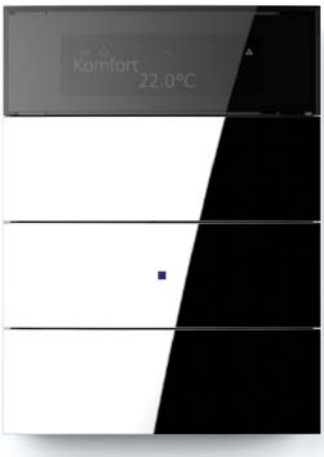
Perfectly matched surfaces ensure that our programmes can be combined with one another. Combining the Berker B.IQ with socket outlets from the Berker B.7 switch range is possible as well.

B.IQ black chrome

Fine-brushed brass



Gold



Chrome

With their high-quality metallic appearance, these design lines bring glamour in your own four walls and provide a modern touch. Gold and brass are characterised by a warm lustre that imparts comforting accents in an interior setting. In contrast, metals such as chrome and stainless steel create a decidedly cool atmosphere.

Berker‘s switches – Quality since 1919

B.
Berker

You will find Berker‘s switches in all the best houses.

Tradition

In 1919 the first rotary toggle left the "Special factory for electrotechnical installation units" owned by brothers Robert and Hugo Berker in Schalksmühle in the Sauerland. The black switch on its white surround was already as attractive and functional as Berker models are renowned for being today.

Standards

Since 2010, the traditional Berker brand has been part of Hager Group. Their shared technological expertise has further strengthened Berker. Today the brand combines established values with contemporary design and technology standards – and thereby continues to set standards again and again in form, function, operability and quality.

Cult

Berker's switches and systems can be found in the most beautiful and exciting buildings in the world. That is because our outstanding design has the same aspirations as good architecture: It is timeless, functional and durable. So architects will always be asking themselves not whether to choose Berker, but which Berker to choose.

Find out more at:
berker.com

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