

SK 6



When connecting aluminium conductors ensure that the contact surfaces of the conductors are cleaned, brushed and treated with grease. Re-tighten contact terminals after 6 to 8 weeks' time.

We recommend that connector sleeves be used when working with flexible conductors.

Conditions for Delivery and Sale

For domestic business, the Standard Terms for Delivery of Products and Services of the Electrical Industry (ABB Form 2292) shall apply in connection with the Standard Sale Terms (ABB Form 2327) in their then applicable version. For foreign business, the Standard Terms for Delivery of Products and Services of the Electrical Industry (ABB Form 2293 German-English, or ABB-Form 2294 German- French) shall apply in connection with the Standard Sale Terms (ABB-Form 2381 English) in their then applicable version.

Warranty

We assume warranty in accordance with the Standard Sale and Delivery Terms. Complaints shall be made in writing within eight days following receipt of the goods.

Technical information and illustrations are not binding and subject to change without notice.

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Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: single, two, three and four-pole switches = 17.5 mm = 1 module
 colour: grey, RAL 7035

Technical data

switching capacity: 1.25 I_n; 1.1 U_n; cos φ = 0.6 to DIN VDE 0632, AC 22 to VDE 0660 Part 107, IEC 947-3
 short-circuit withstand capacity: 3 kA; 400 V; cos φ = 0.8
 sealable: in the ON / OFF position
 climatic resistance: constant climate 40/92 DIN 50 015
 alternating climate SFW DIN 50017
 connection cross section: from 1 x 6 mm² or 2 x 2.5 mm² massive; to 2 x 1.5 mm² flexible with connector sleeve or pin-end connector
 positive opening: according to DIN VDE 0113
 rated voltage: 250/400 V ~

Special features

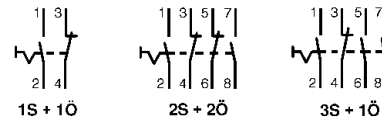
- safe connection ensured by box terminals
- captive screws of the recessed/slotted head type system Pozidriv size 1
- labels snap-on (see page 50)
- quick fastening easily accessible, detachable from below
- protection against electric shock according to DIN VDE 0106 Part 100 (BGV A2)

Terminal assignment

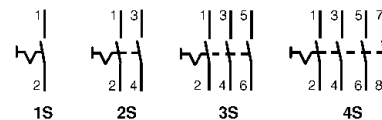


SK 0170 Z 91

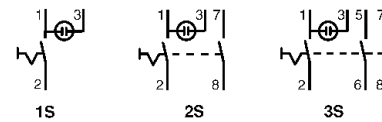
control switch



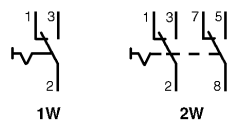
one-way switch



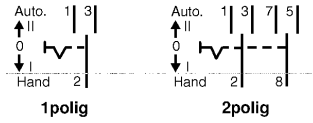
one-way switch with pilot lamp



Two-way switch



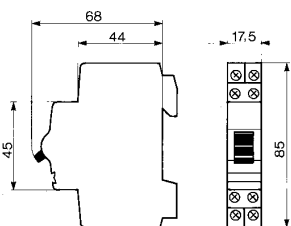
Two-way switch with two off positions



SK 0090 Z 96

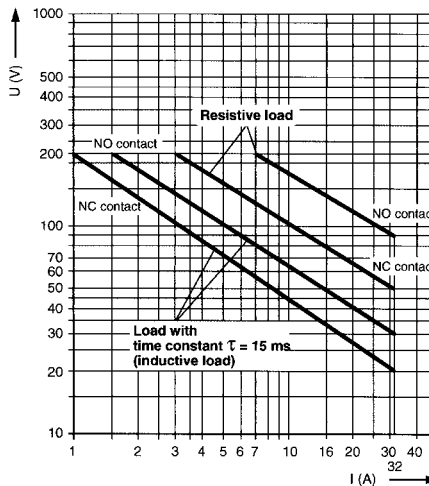
dimension drawing

in mm



SK 0164 Z 91

**E 220
DC switching capacity**



SK 0079 Z 00



E 221-11

SK 0122 B 99



E 221-10 x

SK 0057 B 98



E 221-4

SK 0058 B 98

Selection table

type	rated voltage V ~	power loss W	order details		bbn 40 12233 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
			type code	order code					

Controlswitch

rated current = 16 A

2 NO + 2 NC	250	1.92	E 221-22	GH E221 1001 R0006	00270 2			0.070	10
3 NO + 1 NC	400	1.92	E 221-31	GH E221 1001 R0007	00280 1			0.070	
1 NO + 1 NC	250	0.96	E 221-11	GH E221 1001 R0005	00260 3			0.070	10

rated current = 25 A

1 NO + 1 NC	250	2.26	E 222-11	GH E222 1001 R0005	00400 3			0.070	10
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One-wayswitch

rated current = 16 A

1 NO	250	0.48	E 221-10	GH E221 1001 R0001	00220 7			0.055	10
2 NO	250	0.96	E 221-20	GH E221 1001 R0002	00230 6			0.060	
3 NO	400	1.44	E 221-30	GH E221 1001 R0003	00240 5			0.065	
4 NO	400	1.92	E 221-40	GH E221 1001 R0004	00250 4			0.070	

rated current = 25 A

1 NO	250	1.13	E 222-10	GH E222 1001 R0001	00360 0			0.055	10
2 NO	250	2.26	E 222-20	GH E222 1001 R0002	00370 9			0.060	
3 NO	400	3.39	E 222-30	GH E222 1001 R0003	00380 8			0.065	
4 NO	400	4.52	E 222-40	GH E222 1001 R0004	00390 7			0.070	

rated current = 32 A

1 NO	250	2.2	E 223-10	GH E223 1001 R0001	96570 0			0.055	10
2 NO	250	4.4	E 223-20	GH E223 1001 R0002	96580 9			0.060	
3 NO	400	6.6	E 223-30	GH E223 1001 R0003	96590 8			0.065	
4 NO	400	8.8	E 223-40	GH E223 1001 R0004	96600 4			0.070	

One-way switch with built-in pilot lamp for 230 V ~

rated current = 16 A

1 NO	250	0.5	E 221-10 x	GH E221 1001 R0011	00310 5			0.060	10
2 NO	250	1.0	E 221-20 x	GH E221 1001 R0012	00320 4			0.065	
3 NO	400	1.5	E 221-30 x	GH E221 1001 R0013	00330 3			0.087	

rated current = 25 A

1 NO	250	1.15	E 222-10 x	GH E222 1001 R0011	00420 1			0.060	10
2 NO	250	2.30	E 222-20 x	GH E222 1001 R0012	00430 0			0.065	
3 NO	400	3.45	E 222-30 x	GH E222 1001 R0013	00440 9			0.087	

Two-wayswitch

rated current = 16 A

1 W	250	0.48	E 221-6	GH E221 1001 R0008	00290 0			0.060	10
2 W	250	0.96	E 221-6/2	GH E221 1001 R0009	00300 6			0.070	10

rated current = 25 A

1 W	250	1.13	E 222-6	GH E222 1001 R0008	00410 2			0.060	10
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Two-way switch with two off positions (I-O-II, Manual-off-automatic)

rated current = 16 A

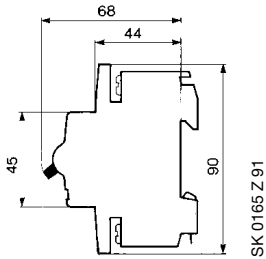
single-pole	250	0.48	E 221-4	GH E221 1001 R0014	00340 2			0.060	10
two-pole	250	0.96	E 221-4/2	GH E221 1001 R0015	00350 1			0.070	10

rated current = 25 A

single-pole	250	1.13	E 222-4	GH E222 1001 R0014	00450 8			0.060	10
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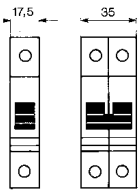
dimension drawing

in mm

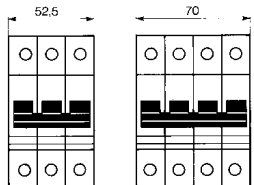


E 240 ...
E 270 ...

SK 0165 Z 91



E 241 E 242
E 271 E 272



E 243 E 244
E 273 E 274

SK 0166 Z 91

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
mounting width: per pole = 17.5 mm = 1 module
colour: casing: grey, RAL 7035
operating lever: rt = red, RAL 3000; gr = dark grey, RAL 7000

Technical Data

switching capacity: 1.25 I_n; 1.1 U_n; cos φ = 0.3 according to VDE 0632
E 240: AC 21 A to VDE 0660 Part 107, DIN EN 60 947-3 and IEC 947-3
E 270: AC 22 A to VDE 0660 Part 107, DIN EN 60 947-3 and IEC 947-3

min. contact rating: 6 V; 0.5 mA; 0.03 VA
positive opening: according to DIN VDE 0113

short-circuit withstand capacity: E 240 = 10 KA_{r.m.s.}, E 270 = 25 KA_{r.m.s.} in cascade connection with NH 00 100 A gL, as well as main circuit breaker S 700

rated voltage: 240/400/415 V ~, 50 Hz (E 240 not for DC use!)

connection cross sections: E 240 to 25 mm², E 270 to 50 mm²

climatic resistance according to DIN IEC 68-2-30: constant climate 23/83, 40/93, 55/20 [-C/RH] ①
alternating climate 25/95 – 40/93 [-C/RH]

storage temperature: T_{max} + 70 °C /180 °F, T_{min} – 40 °C/-40°F

ambient temperature range: T_{max} + 55 °C/131°F, T_{min} – 25 °C/-13°F

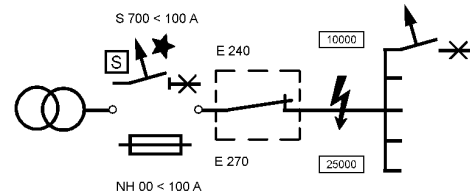
at daily average: ≤ + 35 °C/95 °F

shock safety: 30 g, two impacts at least
impact time 13 ms

vibration resistance to DIN IEC 68-2-6: 5 g, 20 sweep cycles
5 ... 150 ... 5 Hz at 0.9 · I_n

Special features

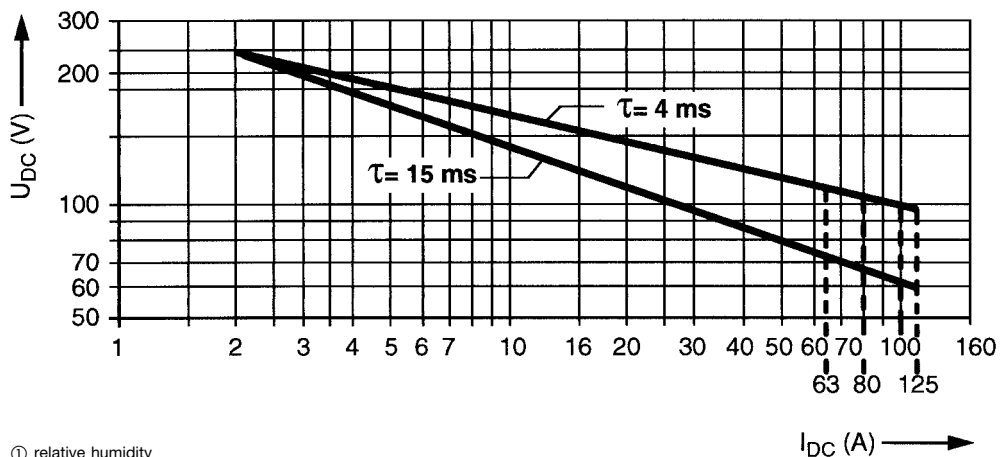
- **combined box terminals** allows for simultaneous connection of strands and busbars
- **captive screws** of the recessed head type Pozidriv system size 2
- **labels** snap-on (see accessories, page 50)
- **quick fastening** easily accessible, detachable from below
- **protection against electric shock** according to DIN VDE 0106 Part 100 (BGV A2)



SK 0046 Z 97

DC switching capacity per pole
(2000 switchovers)

E 271-63 A, E 271-80 A, E 271-100 A; E 271-125 A




① relative humidity

SK 0064 Z 00

Selection table

poles	rated voltage V ~	power loss W	order details type code	order code	bbn 40 12233 EAN	price 1 pc. DM	price group pe	weight 1 pc. kg	pack. unit pc.
rated current = 45 A									
1 NO	240	1.92	E 241/45 rt	GJ F152 1150 R0015	59020 9			0.080	10
2 NO	415	3.83	E 242/45 rt	GJ F152 2150 R0015	59050 6			0.175	5
3 NO	415	5.76	E 243/45 rt	GJ F152 3150 R0015	59070 4			0.270	3
4 NO	415	7.68	E 244/45 rt	GJ F152 4150 R0015	59080 3			0.365	2
rated current = 63 A									
1 NO	240	2.5	E 271/63 rt	GJ F151 1170 R0015	58810 7			0.100	10
2 NO	415	5.0	E 272/63 rt	GJ F151 2170 R0015	58840 4			0.215	5
3 NO	415	7.5	E 273/63 rt	GJ F151 3170 R0015	58870 1			0.330	3
3 NO	400	7.5	E 273/63 gr ①	GJ F151 3370 R0001	58810 4			0.330	3
4 NO	415	10	E 274/63 rt	GJ F151 4170 R0015	58870 8			0.440	2
4 NO	400	10	E 274/63 gr ①	GJ F151 4370 R0001	59000 1			0.440	2
rated current = 80 A									
1 NO	240	4	E 271/80 rt	GJ F151 1180 R0015	58820 6			0.105	10
2 NO	415	8	E 272/80 rt	GJ F151 2180 R0015	58850 3			0.220	5
3 NO	415	12	E 273/80 rt	GJ F151 3180 R0015	58880 0			0.335	3
3 NO	400	12	E 273/80 gr	GJ F151 3380 R0001	58930 2			0.335	3
4 NO	415	16	E 274/80 rt	GJ F151 4180 R0015	58980 7			0.450	2
rated current = 100 A									
1 NO	240	6.5	E 271/100 rt	GJ F151 1190 R0015	58830 5			0.105	10
2 NO	415	13	E 272/100 rt	GJ F151 2190 R0015	58860 2			0.220	5
3 NO	415	19.5	E 273/100 rt	GJ F151 3190 R0015	58890 9			0.335	3
3 NO	400	19.5	E 273/100 gr	GJ F151 3390 R0001	58950 0			0.335	3
4 NO	415	26	E 274/100 rt	GJ F151 4190 R0015	58990 6			0.450	2
rated current = 125 A									
1 NO	240	9	E 271/125 rt	GJ F151 1191 R0015	83670 3			0.105	10
2 NO	415	18	E 272/125 rt	GJ F151 2191 R0015	83680 2			0.220	5
3 NO	415	27	E 273/125 rt	GJ F151 3191 R0015	83690 1			0.335	3
4 NO	415	36	E 274/125 rt	GJ F151 4191 R0015	83700 7			0.450	2

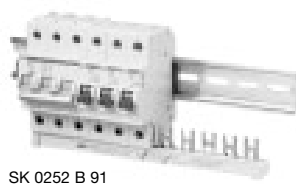
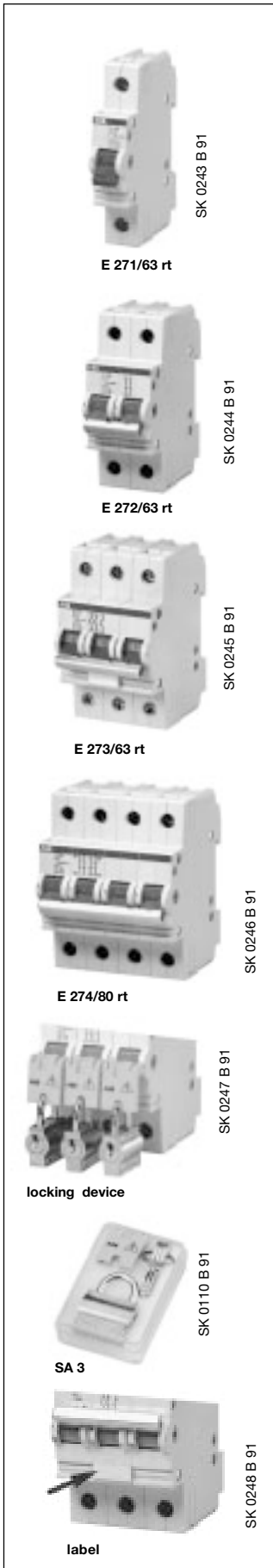
① Switches E 273/63 gr, E 274/63 gr, marked ★ and  comply with the so-called "Technical Power Supply Regulations TAB 7.2" as well as VDE 0632 and fulfil the short-circuit withstand capacity required therein for use in 10 kA supply systems for equipment located in between the last overcurrent protective device in front of the meter and the sub-circuit distribution board.

Locking device for MBC's and one-way switches

providing protection against unauthorised or unsafe actuation of switching levers (VDE 0113/6.2.1.c). By using the adaptor, switching levers can be locked in either the on or the off position by means of a padlock with a shackles diameter of 4mm max.. In the case of multi-pole devices, it is possible to fit each pole with an individual lock. The lock adaptor is suitable for one-way switches of series E 220 and E 270 .

lock adaptor	SA 1	GJF110 1903 R0001	58760 5		0.004	10
padlock with two keys	SA 2	GJF110 1903 R0002	58770 4		0.020	10
lock adaptor incl. padlock with three keys in a transparent box	SA 3	GJF110 1903 R0003	58780 3		0.050	10
padlock with identical locking	SA 2i	GJF110 9999 R0001	96940 1		0.020	10

Series E 240 and E 270 switches may be cross-wired by using KS busbars or PSB-N busbar blocks with series S 2 MBC's and series F 3 residual current circuit-breakers (RCCB).



Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

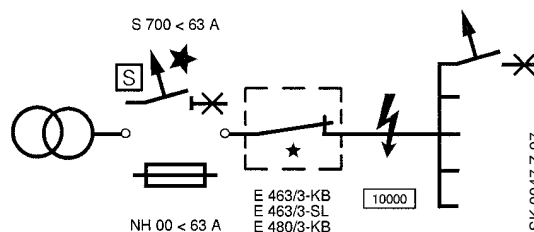
mounting depth: 68 mm
mounting width: 44 mm = 2.5 modules
colour: grey, RAL 7035

Technical data

switching capacity: 1.25 I_n; 1.1 U_n; cos φ = 0.6 according to VDE 0632
connection cross section: up to 25 mm²
positive opening: according to DIN VDE 0113
protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
rated voltage: 250/400 V ~

Special features

- **short-circuit withstand capacity:**
10 kA, 400 V ~




Switches E 463/3-KB and E 463-SL marked by ★ and ⚡ comply with the so-called "Technical Power Supply Regulations TAB 7.2" as well as VDE 0632 and fulfil the short-circuit withstand capacity required therein for use in 10 kA supply systems for equipment located in between the last overcurrent protective device in front of the meter of the sub-circuit distribution board.


Selection table

poles	rated voltage V ~	power loss W	order details typecode	order code	bbn 40 12233 EAN	price 1 pc. DM	price group pe	weight 1 pc. kg	pack. unit pc.
rated current = 63 A									
3 NO	400	5.4	E 463/3-KB	GH V021 0864 R0001	52980 3			0.190	1/50
rated current = 63 A (can be locked with key provided by utility company and is sealbale and lockable with padlock)									
3 NO	400	5.5	E 463/3-SL	GH V021 0864 R0005	06240 4 ①			0.195	4
rated current = 80 A									
3 NO	400	9.9	E 480/3-KB	GH V021 0864 R0002	52990 2			0.210	1/50
Supplementary terminal allows connecting of a supplementary wire of up to 2.5 mm ²									
for E 463/3 and E 480/3-KB			E 480 ZK	GH V021 1425 R0004	53400 5			0.005	1
for E 463/3-SL			SA 2	GJ F110 1903 R0002	58770 4			0.020	10


① **bbn no. 4016779**



SK 0249 B 91



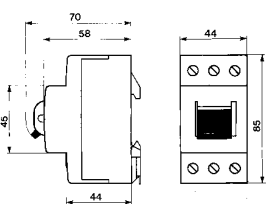
SK 0072 B 94



SK 0251 B 91

dimension drawing

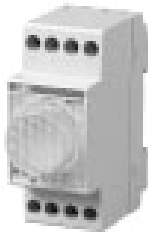
in mm



SK 0167 Z 91

E 463/3-KB
E 463/3-SL
E 480/3-KB

Modular installation equipment Emergency light for distribution boards



SK 0208 B 93

LE-230

Equipment for panel installation on mounting rail (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 35 mm = 2 modules
 colour: grey, RAL 7035

Application

In the event of a power failure, the light is switched on automatically. The relevant area in the distribution board is illuminated to facilitate locating failed circuits. The light goes off when the system recovers.

Technical data

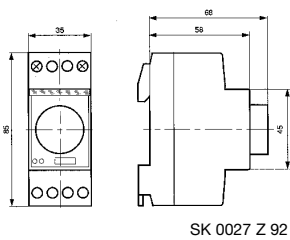
rated input voltage: 230 V ~; 40 – 60 Hz
 charging time: 12 hours
 illumination time: 45 minutes
 filament lamp: 2.5 V – 0.25 A
 LED display: green = standard condition (power available)
 red = a few minutes burning life left
 protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
 connection cross section: up to 10 mm²

Selection table

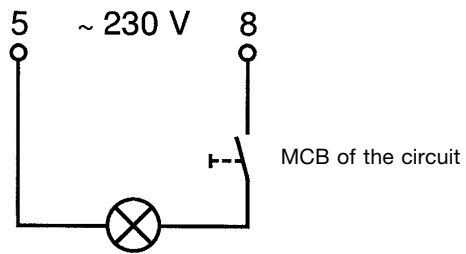
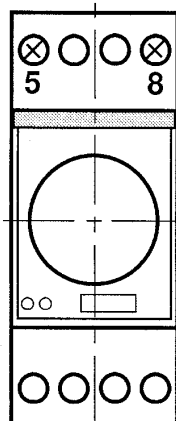
type code	order details		bbn 80 12542 DM	price 1 pc.	price group kg	weight 1 pc. pc.	pack. unit
	order code	EAN					
Emergency light	LE-230	GH V021 2966 R0001	023401			0.130	1

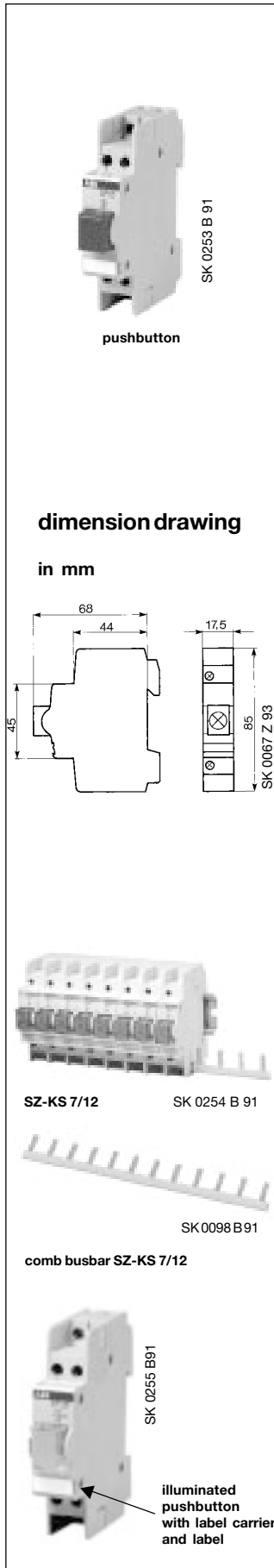
dimension drawing

in mm



wiring diagram





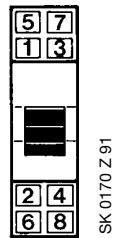
Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 17.5 mm = 1 module
 colour: grey, RAL 7035
 connection cross section: up to 1 x 6 mm² or 2 x 2.5 mm² massive wire;
 up to 2 x 1.5 mm² flexible wire with connector sleeve or pin-end connector

Special features

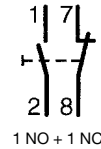
- **safe connection** ensured by box terminals
- **captive screws** of the recessed/slotted head type system Pozidriv size 1
- **labels** snap-on (see page 50)
- **protection against electric shock** according to DIN VDE 0106 Part 100 (BGV A2)
- **collars available in 5 colours and buttons in 6 colours**

terminal assignment

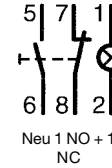


pushbutton indicator lights

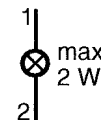
pushbutton



illuminated pushbutton



indicator lights



SK 0186 Z 99

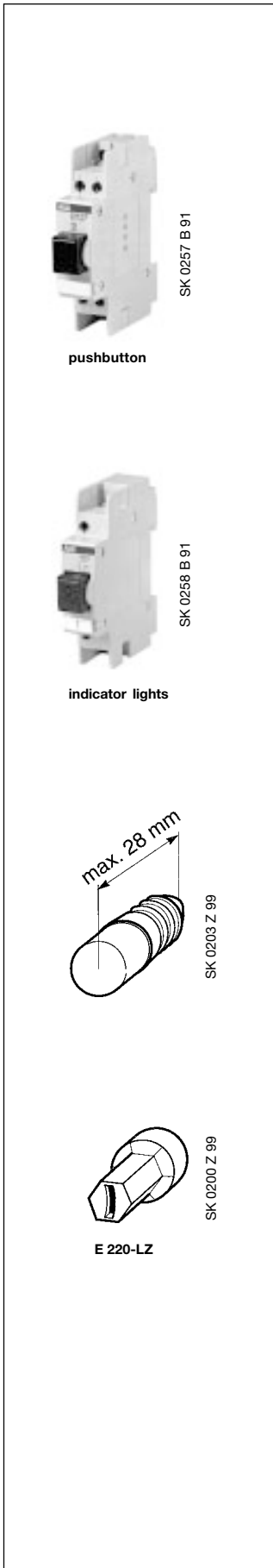
Comb busbars and labels

lengths supplied mm	no. of poles	order details		bbn 4012233 EAN	Cu number	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
		type code	order code						

Comb busbars, single-phase, for cross-wiring, providing protection against electric shock cross section 6 mm²

200 mm	12 x 1	SZ-KS 7/12	GH V036 0875 R0003	55340 2	0.038			0.025	100
990 mm	56 x 1	SZ-KS 7/56	GH V036 0875 R0004	55350 1	0.187			0.110	50

Labelling material for System pro M equipment, see page 50.



Selection table

style	power loss W	order details type code	order code	bbn 40 12233 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
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rated current for pushbutton and illuminated pushbutton = 16 A, rated voltage = 250 V ~

Pushbutton 1 NO + 1 NC

grey	0.96	E 225 – 11 B	GH E225 1001 R0001	00460 7			0.055	10
red		E 225 – 11 C	GH E225 1001 R0002	00470 6				
green		E 225 – 11 D	GH E225 1001 R0003	00480 5				
yellow		E 225 – 11 E	GH E225 1001 R0004	00490 4				
black		E 225 – 11 F	GH E225 1001 R0005	00500 0				
blue		E 225 – 11 G	GH E225 1001 R0006	00510 9				

Pushbutton 1 NO + 1 NC, without button

-	0.96	E 225 – 11 Z	GH E225 1001 R0007	00520 8			0.053	10
---	------	---------------------	--------------------	----------------	--	--	-------	----

Illuminated pushbutton 1 NO + 1 NC, with glow lamp E 10/230 V ~

transpar.	1.5	E 227 – 11 B	GH E227 1001 R0011	49650 6 ③			0.055	10
red		E 227 – 11 C	GH E227 1001 R0012	03350 3 ③				
green		E 227 – 11 D	GH E227 1001 R0013	49651 3 ③				
yellow		E 227 – 11 E	GH E227 1001 R0014	49653 7 ③				
blue		E 227 – 11 G	GH E227 1001 R0016	49654 4 ③				

Illuminated pushbutton 1 NO + NC, without collar, with E 10 holder for pilot lamp max. 2 W

-	0.96 ②	E 227 – 11 Z	GH E227 1001 R0027	03360 2 ③			0.045	10
---	--------	---------------------	--------------------	------------------	--	--	-------	----

Indicator lights with glow lamp E 10/230 V ~

transpar.	1.03	E 229 – B	GH E229 1001 R0001	00590 1			0.045	10
red		E 229 – C	GH E229 1001 R0002	00600 7				
green		E 229 – D	GH E229 1001 R0003	00610 6				
yellow		E 229 – E	GH E229 1001 R0004	00620 5				
blue		E 229 – G	GH E229 1001 R0006	00630 4				

Indicator lights without collar, with E 10 holder for pilot lamp max. 2 W

-	0.48 ②	E 229 – Z	GH E229 1001 R0007	00640 3			0.040	10
---	--------	------------------	--------------------	----------------	--	--	-------	----

Buttons, not transparent, for pushbutton E 225

grey	-	E 220 – B 1	GH E220 0002 R0001	00100 2			0.002	100
red		E 220 – C 1	GH E220 0002 R0002	00110 1				
green		E 220 – D 1	GH E220 0002 R0003	00120 0				
yellow		E 220 – E 1	GH E220 0002 R0004	00130 9				
black		E 220 – F 1	GH E220 0002 R0005	00140 8				
blue		E 220 – G 1	GH E220 0002 R0006	00150 7				

Collars, transparent, for illuminated pushbutton E 227

transpar.	-	E 220 – B	GH E220 0001 R0001	00050 0			0.002	100
red		E 220 – C	GH E220 0001 R0002	00060 9				
green		E 220 – D	GH E220 0001 R0003	00070 8				
yellow		E 220 – E	GH E220 0001 R0004	00080 7				
blue		E 220 – G	GH E220 0001 R0006	00090 6				

Collars, transparent, with lamp symbol for indicator lights E 229

transpar.	-	E 220 – B 3	GH E220 0003 R0001	00160 6			0.002	100
red		E 220 – C 3	GH E220 0003 R0002	00170 5				
green		E 220 – D 3	GH E220 0003 R0003	00180 4				
yellow		E 220 – E 3	GH E220 0003 R0004	00190 3				
blue		E 220 – G 3	GH E220 0003 R0006	00200 9				

Lamps with E 10 holder for illuminated pushbuttons and indicator lights

Filament lamps for AC operation

12 V		E 10/12 ①	GJ N97 6167 P0113	63160 5			0.004	1
24 V		E 10/24 ①	GJ N97 6167 P0114	63180 3				
48 V		E 10/48 ①	GH N97 6123 P0005	63200 8				
60 V		E 10/60 ①	GJ N97 6167 P0115	63210 7				

Glow lamps for AC and DC operation

110 V AC	0.77	E 10/110	GM N48 5346 P0411	63220 6			0.003	1 230
VAC	0.35	E 10/230	GM N48 5346 P0410	98370 4				220
VDC	0.35	E 10/220	GJ N97 6359 P0004	66730 7				
Lamp driver		E 220-LZ	GH E220 0004 R0001	00210 8			0.002	10

① Filament lamps must not be used above 2 W max.

② When calculating the power loss, add the wattage of the filament lamp/glow lamp used

③ bbn no. 4016779

Modular installation equipment

Pushbutton and indicator lights

Colours and what they mean

table 2: What colour codes mean - General Aspects
 (extract from VDE 0113 Part 101/DIN EN 61310-1 1996 Safety of machinery Indication, marking and actuation)
 Part 1: Requirements for visual, auditory and tactile signals

colour	meaning		position of equipment
	safety of persons	machinery/ process status	
red	danger, prohibition	emergency	no general meaning
yellow	caution	abnormal	
green	safety	normal	
blue		action	
white grey black	no specific meaning assigned		

table 2: What colour codes mean - General Aspects
 (extract from VDE 0199/DIN EN 60073 1997 Basic and safety principles for man-machine interface, marking)

colour	meaning		position of equipment
	safety of persons or environmental safety	process status	
red	danger	emergency	defective
yellow	warning / caution	abnormal	abnormal
green	safety	normal	normal
blue	prescription		
white grey black	no specific meaning assigned		

Modular installation equipment

Alarm indicators

Socket outlets

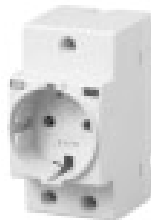
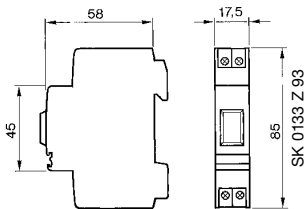


SK 0124 B 99

E 228-WM

dimension drawing

in mm



SK 0155 B 92

socket outlet E 1175

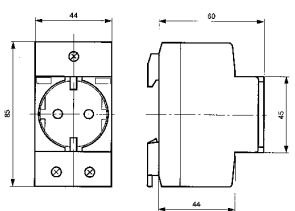


SK 0066 B 98

socket outlet E 1175 c with hinged lid IP3X in distribution board

dimension drawing

in mm



SK 0024 Z 92

Alarm indicator

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 17.5 mm = 1 module
 colour: grey, RAL 7035

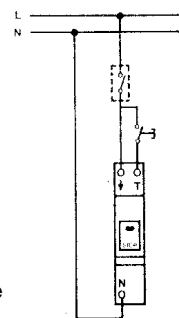
Application

The alarm indicator transmits optical and acoustic signals. Malfunctioning is indicated by a flashing and short beeping signal. After the indication is detected, press the acknowledgement switch or an external pushbutton to turn off the acoustic signal, the optical signal will then turn into a steady light. The device is actuated by external contacts of alarm, malfunctioning or warning indicators and via limit switches or auxiliary contacts.

Technical data

rated voltage: 230 V ~ 50 Hz (120 V ~ 60 Hz)
 power loss: < 4 W
 cycle time: on/off 1s/.° 10%
 operating frequency: typ. 3.3 kHz
 sound level: typ. 60 dB
 temperature range: -20 °C/- 4°F to + 50 °C/122°F
 protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
 connection cross section: up to 1 x 6 mm² or 2 x 2.5 mm² massive; up to 2 x 1.5 mm² flexible with connector sleeve or pin-end connector

wiring diagram



SK 0171 Z 91

Function

As soon as the alarm indicator is connected to rated voltage via a malfunction indication contact (1), the acoustic signal and the lamp (3) of the alarm indicator go on and off in one-second intervals to indicate malfunctioning. Press the STOP button of the device (2a) or the external button (2b) (acknowledgement) to cause the alarm indicator to switch off the acoustic signal indicator. The lamp (3) then turns into a steady light until the malfunctioning is eliminated and, as a consequence, the malfunction indication contact reopens.

Selection table

description	order details		bbn 4012233 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
	type code	order code					
alarm indicator	E 228-WM *	GH E228 1001 R0001	63030 1			0.070	1/10

* UL approval

SCHUKO-style socket outlet according to DIN VDE 0620

equipment for panel installation on mounting rail (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 44 mm = 2.5 modules
 colour: grey, RAL 7035

casing material: self-extinguishing plastic, halogen/dioxine-free

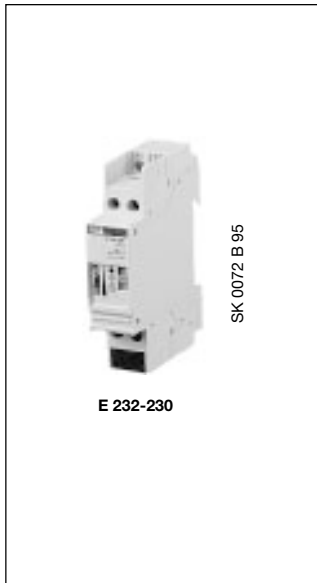
Technical data

rated voltage: 250 V ~
 rated current: 10/16 A
 protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
 connection cross section: up to 10 mm²
 ambient temperature: -35°C/- 31°F ... + 55°C/131°F

Selection table

power loss		order details		bbn 80 12542 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
W	style	type code	order code					
0.6	SCHUKO	E 1175	GH E211 1175 R0001	33470 5			0.120	4
0.6	SCHUKO	E 1175 c	GH E211 1175 R0002	34250 2			0.120	4
0.6	Italy	E 1173 *	GH E211 1173 R0001	00410 3			0.105	4
0.6	France	E 1174 *	GH E211 1174 R0001	00660 2			0.105	4

* tamper-proof



Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 17.5 mm = 1 module
 colour: grey, RAL 7035

Application

As a rule, staircase lighting time-delay switches (t.d.s.) are controlled by pushbuttons fitted with glow lamps. The switches are designed for a continuous load of up to 50 glow lamps and can therefore be used in multi-storey buildings.

T.d.s. E 232 is equipped with an electromechanical timer wound electromechanically ensuring a high level of operational reliability in any desired mounting position. The time range is infinitely adjustable up to five minutes.

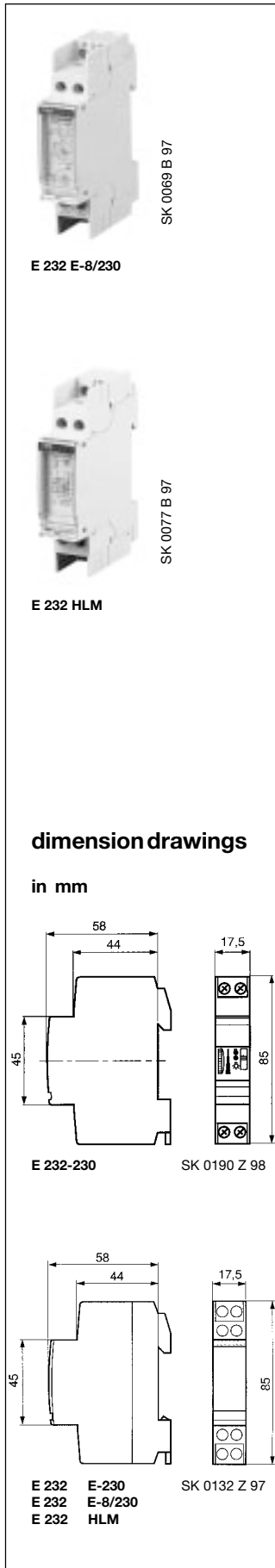
T.d.s. E 232 E is electronically controlled. Noteworthy features of this device include: high switching capacity, 150 mA (50 mA E 232 E – 8/230) glow lamp current parallel to the pushbuttons, infinitely adjustable time range of up to 12 minutes (10 minutes E 232 E – 8/230) and a low switching noise. The devices can be connected in series and are designed for 3-wire and 4-wire circuits. Automatically recognises method of connection. Style E 232 E-8/230 can be used for any control voltages of 8 to 230 V DC/AC so that it can be controlled with extra-low voltage (bell transformer) or system voltage.

The electronic semi-light module HLM is a supplementary device for any t.d.s. semi-light control according to DIN 18015. The device switches **filament lamp lighting** to half the normal intensity when the time expires. This early indication period is infinitely adjustable from 10 – 100 seconds. Positions are indicated by led. No influence on glow lamp current which is determined by the t.d.s..

Technical data

	E 232	E 232 E –	HLM
rated voltage:	230 V ~, 50 Hz	230 V ~, 50 Hz	
rated switching capacity:	16 A, 250 V ~	16 A, 250 V ~	10 A, 250 V ~
filament lamp load:	2300 W	2000 W	2300 W
glow lamps parallel to the 230 V-control buttons:	50 mA	150 mA (E 232 E-230) 50 mA ¹ (E 232 E-8/230)	–
fluorescent lamp load twin-lamp circuit: inductive or capacitive:	3500 W 1300 W	1000 W 1000 W	–
fluorescent lamp load shunt-compensated:	1000 W	500 W	–
electronic control gear:	2300 W ($I_n \leq 140 \text{ A}/10 \text{ ms}$)	700 W ($I_n \leq 70 \text{ A}/10 \text{ ms}$)	–
inductive load $\cos \varphi = 0.6/230 \text{ V AC}$:	1300 W	650 W	–
contact rating at DC:	100 W	100 W	–
minimum contact rating:	6 V AC/50 mA	4 V AC/10 mA	–
contact gap / contact material	3 mm / AgSnO ₂	0.5 mm / AgSnO ₂	–
distance of gate terminals A1 - A2/contact:	3 mm	3 mm	–
distance of gate terminals C1 - C2/contact:	8 mm	8 mm	–
ON duration:	100%	100%	100%
switching safety at rated voltage:	99.9%	99.9%	99.9%
ambient temperature at mounting position:	–5 °C/+23 °F to 60 °C/140 °F	–20 °C/-4 °F to 50 °C/122 °F	–20 °C/-4 °F to 50 °C/122 °F
control voltage range:	0.9 to 1.1 x U _n	0.9 to 1.1 x U _n	0.9 to 1.1 x U _n
control current at 230 V (after 1 sec.):	10 - 15 ms, 1 A ± 20%	100 (20) mA ± 20%	–
control current at 8 V:	–	40 mA ± 20%	–
minimum command time:	50 ms	50 ms	–
max. induced voltage at the control inputs (230 V):	120 V	120 V	–
terminal (strain relief clamps):	12 mm ²	12 mm ²	12 mm ²
max. connection cross section of a conductor:	6 mm ²	2.5 mm ²	2.5 mm ²
protection against electric shock:	to DIN VDE 0106 Part 100 & BGV A2	to DIN VDE 0106 Part 100 & BGV A2	to DIN VDE 0106 Part 100 & BGV A2
serviceable life if rated load, $\cos \varphi = 1$ or filament lamps 1000 W and 10 ³ /h:	> 5 x 10 ⁴	> 10 ⁷	–
serviceable life if nominal stress, $\cos \varphi = 0.6$ and 10 ³ /h:	> 2 x 10 ⁴	> 10 ⁴	–
mechanical serviceable life, Switchover at 10 ³ /h:	> 5 x 10 ⁴	> 10 ⁷	–
position indicator/control indicator:	–	LED	LED

¹ Applies to glow lamps with starting voltage > 170 V, for glow lamps with starting voltage < 90 V, ca. ½ glow lamp current

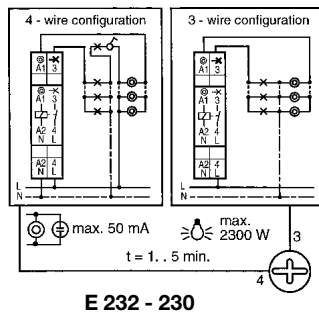


Selection table

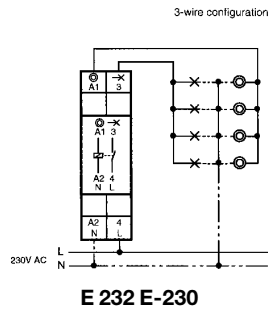
power loss		order details		bbn	price	price	weight	pack.
W	time range	type code	order code	40 12233	1 pc.	group	1 pc.	unit
				EAN	DM		kg	pc.
4.5	1 ... 5 min	E 232-230	GH E232 1301 R0006	97120 6			0.080	10
3.5	0 ... 12 min	E 232 E-230	GH E232 1302 R0006	15130 6 ①			0.080	10
3.5	0 ... 10 min	E 232 E-8/230	GH E232 1303 R0006	15140 5 ①			0.080	10
6.25	10 ... 100 s	E 232 HLM	GH E232 0868 R0001	36040 1 ①			0.080	10

① bbn no. 4016779

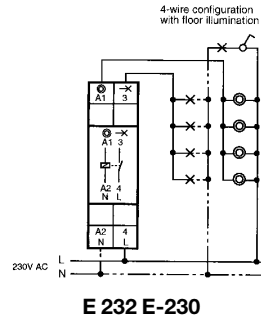
wiring diagrams



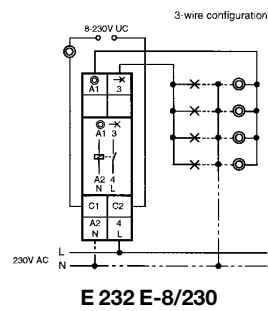
SK0205Z98



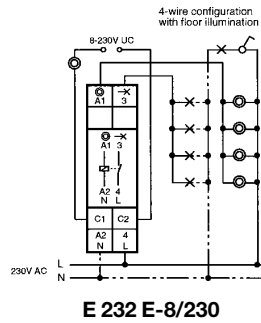
SK 0088Z00



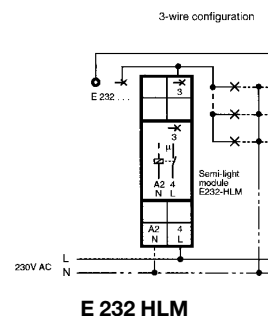
SK 0089Z00



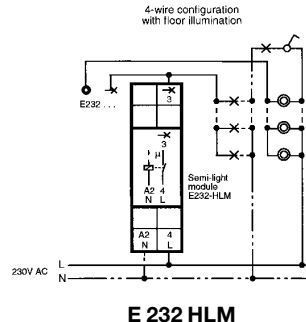
SK 0090Z00



SK 0091Z00



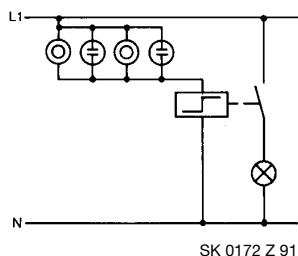
SK 0092Z00



SK 0093Z00

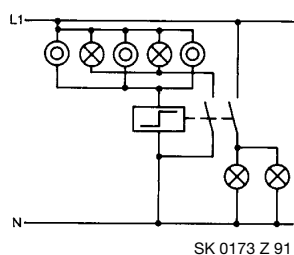
examples connection

E251-230



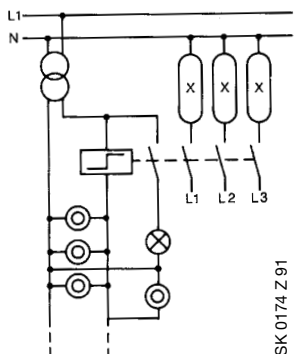
Latching relay control with any desired number of parallel pushbuttons; glow lamp current max. 5 mA.

E252-230



Latching relay control with any desired number of parallel pushbuttons; acknowledgement of „ON“ position.

E254-8



3-phase switching of fluorescent lamps (shunt-compensated) with light-current pushbuttons; acknowledgement of position to the control centre.

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: single-pole and two-pole switches: 17.5 mm = 1 module
 three and four-pole switches: 35 mm = 2 modules
 colour: grey, RAL 7035

Special features

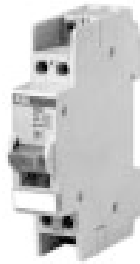
- hand operation
- position indicator per contact
- long serviceable life
- labels snap-on (see page 50)
- quick fastening snap-on clip easily accessible, detachable from below
- compact design
- captive screws of the recessed/slotted head type system Pozidriv size 1
- cross-wiring of coils and main connections
- safe connection ensured by box terminals
- protection against electric shock according to DIN VDE 0106 Part 100 (BGV A2)

Technical data E 250

rated switching capacity:	16 A/250 V ~; 10 A/400 V ~	
filament lamp load:	10 A (2300 W)	
fluorescent lamp load (twin-lamp circuit):	16 A (3500 W)	
fluorescent lamp load (shunt-compensated):	4 A (500 W)	
fluorescent lamp load inductive or capacitive:	10 A (1300 W)	
electronic control gear:	10 A (2300 W); $I_{in} \leq 140$ A/10 ms	
inductive load $\cos \varphi = 0.6/230$ V ~:	10 A (1300 W)	
contact rating at DC:	100 W	
minimum contact rating:	6 V AC/50 mA	
power consumption:	hold	single, two-pole
	pick-up	three, four-pole
		5 VA
		10 VA
		6.5 VA
		13 VA
contact gap / contact material:	3 mm / Ag Cd0 15	
mechanical serviceable life, switchover at 10^3 /h:	$> 10^6$	
serviceable life if rated load $\cos \varphi = 1$ and 10^3 /h:	$> 10^6$	
serviceable life if filament lamps 1000 W and 10^3 /h:	$> 10^6$	
serviceable life if rated load $\cos \varphi = 0.6$ and 10^3 /h:	$> 2 \times 10^4$	
bounce time:	3 ms	
connections	switching circuit:	strain-relief clamp 12 mm ²
	control circuit:	clamping screw M 3.5; 2 x 2.5 mm ²
ON duration at rated voltage single and two-pole ED:	100% ①	
ON duration at rated voltage three and four-pole ED:	60% ①	
max. permanent excitation of the coil	1 h	
coil voltage range:	0.9 to 1.1 x U_n	
switching safety ^② :	99%	
minimum command time:	50 ms	
permissible ambient temperature:	- 5 °C /+23°F to + 50 °C/122°F	
power loss of coils at AC and DC:	single-pole: 5 W \pm 20%	
	two-pole: 6 W \pm 20%	
	three and four-pole: 12 W \pm 20%	
max. parallel capacitance of individual control lead at 230 V~:	0.06 μ F (ca. 200 m)	
max. glow lamp current		
- parallel to 230 V control buttons:	5 mA	
- with capacitor 1 μ F/250 V ~ parallel to coil:	10 mA	
- with capacitor 2.2 μ F/250 V ~ parallel to coil:	15 mA	
max. induced voltage at control inputs:	0.2 x U_n	

① If, due to switching requirements, the coil remains energised for a prolonged period of time, e.g. in control units, we recommend to maintain a distance of some 9 mm to neighbouring units (by means of packing block SZ-FST2).

② No shunt connection of contacts due to closed time.



E 251-

SK 0261 B 91

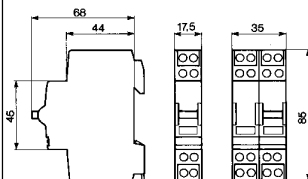


E 254-

SK 0117 B 99

dimension drawings

in mm



SK 0175 Z 91

- E 251- E 254-
- E 252- E 257-
- E 255- E 258-
- E 256- E 257-C10
- E 257-C10

Selection table

contacts	power loss W ^①	order details type code	order code	bln 40 12233 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
coil voltage U _c = 8 V/50 Hz								
1 NO	2 (6)	E 251 - 8	GH E251 1001 R1101	00680 9			0.104	10
2 NO	4 (8)	E 252 - 8	GH E252 1001 R1201	00720 2			0.111	10
1 NO + 1 NC	2 (6)	E 256 - 8	GH E256 1001 R1111	00840 7			0.111	10
4 NO	6 (16)	E 254 - 8	GH E254 1001 R1401	00760 8			0.210	5
series connect. 2 NO	4 (8)	E 255 - 8	GH E255 1001 R1201	00800 1			0.111	10
coil voltage U _c = 12 V/50 Hz								
1 NO	2 (6)	E 251 - 12	GH E251 1001 R1104	00690 8			0.104	10
2 NO	4 (8)	E 252 - 12	GH E252 1001 R1204	00730 1			0.111	10
1 NO + 1 NC	2 (6)	E 256 - 12	GH E256 1001 R1114	00850 6			0.111	10
4 NO	6 (16)	E 254 - 12	GH E254 1001 R1404	00770 7			0.210	5
series connect. NO	4 (8)	E 255 - 12	GH E255 1001 R1204	00810 0			0.111	10 ²
coil voltage U _c = 24 V/50 Hz								
1 NO	2 (6)	E 251 - 24	GH E251 1001 R0101	00660 1			0.104	10
2 NO	4 (8)	E 252 - 24	GH E252 1001 R0201	00700 4			0.111	10
1 NO + 1 NC	2 (6)	E 256 - 24	GH E256 1001 R0111	00820 9			0.111	10
4 NO	6 (16)	E 254 - 24	GH E254 1001 R0401	00740 0			0.210	5
series connect. 2 NO	4 (8)	E 255 - 24	GH E255 1001 R0201	00780 6			0.111	10
coil voltage U _c = 230 V/50 Hz								
1 NO	2 (6)	E 251 - 230	GH E251 1001 R0106	00670 0			0.104	10
2 NO	4 (8)	E 252 - 230	GH E252 1001 R0206	00710 3			0.109	10
1 NO + 1 NC	2 (6)	E 256 - 230	GH E256 1001 R0116	00830 8			0.109	10
4 NO	6 (16)	E 254 - 230	GH E254 1001 R0406	00750 9			0.210	5
series connect. 2 NO	4 (8)	E 255 - 230	GH E255 1001 R0206	00790 5			0.109	10

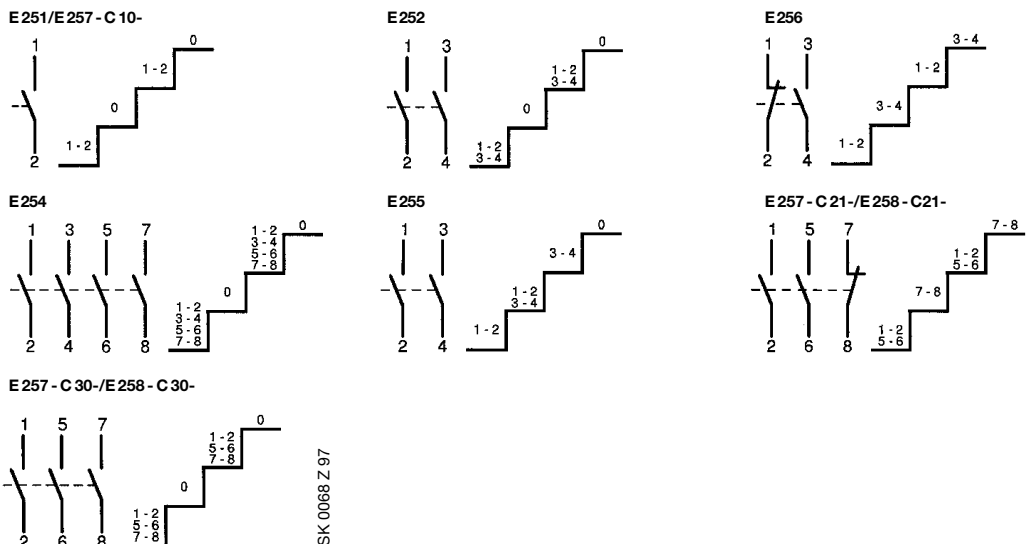
special voltages: 4, 6, 36, 42, 48, 60, 110, 127, 180, 240 and 400 V/50 Hz
as well as 8, 24, 42, 110, 115, 127, 220, 240 and 380 V/60 Hz
or 6, 8, 12, 24, 36, 42, 48, 60, 110 and 220 V DC

For special voltages and frequencies the following surcharges apply:

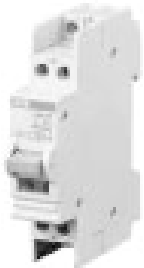
	surcharge 1 - 9 pc.	10 - 49 pc.	50 - 99 pc.	100 pc. plus
up to 400 V AC 40 ... 60 Hz and up to 220 V DC				
	+ 80%	+ 45%	+ 25%	+ 10%

① values in brackets indicate power loss at permanent excitation

wiring diagram



SK 0068 Z 97



SK 0066 B 97

E 257 C 10-



SK 0068 B 97

E 258-

Selection table

contacts	power loss W ^①	order details		bbn 40 16779 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
		typecode	order code					

Same potential for local and central control.
Control voltages of 12, 24 and 230 V AC as well as any special voltages upon request.

coil voltage $U_c = 12$ V/50 Hz

1 NO	5 (7)	E 257 C 10-12	GH E257 1001 R1104	34760 0			0.100	10
3 NO	12 (18)	E 257 C 30-12*	GH E257 1001 R1304	34770 9			0.200	5
2 NO + 1 NC	12 (18)	E 257 C 21-12*	GH E257 1001 R1214	34780 8			0.200	5

coil voltage $U_c = 24$ V/50 Hz

1 NO	5 (7)	E 257 C 10-24	GH E257 1001 R0101	34790 7			0.100	10
3 NO	12 (18)	E 257 C 30-24	GH E257 1001 R0301	34800 3			0.200	5
2 NO + 1 NC	12 (18)	E 257 C 21-24	GH E257 1001 R0211	34680 1			0.200	5

coil voltage $U_c = 230$ V/50 Hz

1 NO	5 (7)	E 257 C 10-230	GH E257 1001 R0106	34690 0			0.100	10
3 NO	12 (18)	E 257 C 30-230	GH E257 1001 R0306	34700 6			0.200	5
2 NO + 1 NC	12 (18)	E 257 C 21-230	GH E257 1001 R0216	34710 5			0.200	5

Metallically separated control inputs for local and central control with different potentials.
Control voltages 12/230 V AC; 24/230 V AC and 230/230 V AC as well as any special voltages upon request.

coil voltage $U_c = 12$ V/50 Hz, 230 V/50 Hz

3 NO	12 (18)	E 258 C 30-12/230*	GH E258 1014 R0306	34660 3			0.200	10
2 NO + 1 NC	12 (18)	E 258 C 21-12/230*	GH E258 1014 R0216	34570 2			0.200	10

coil voltage $U_c = 24$ V/50 Hz, 230 V/50 Hz

3 NO	12 (18)	E 258 C 30-24/230	GH E258 1001 R0306	34600 9			0.200	5
2 NO + 1 NC	12 (18)	E 258 C 21-24/230	GH E258 1001 R0216	34610 8			0.200	5

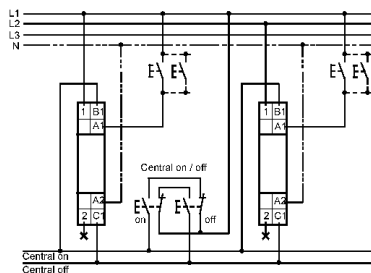
coil voltage $U_c = 230$ V/50 Hz, 230 V/50 Hz

3 NO	12 (18)	E 258 C 30-230/230	GH E258 1006 R0306	34620 7			0.200	5
2 NO + 1 NC	12 (18)	E 258 C 21-230/230	GH E258 1006 R0216	34630 6			0.200	5

① values in brackets indicate power loss at permanent excitation

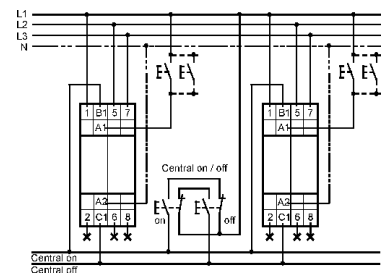
* latching relay with 3 contacts in 12 V style only central OFF!

connection examples



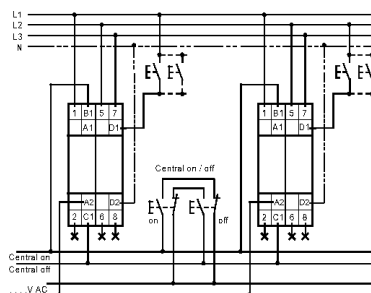
SK 0070 Z 97

E 257 C 10



SK 0071 Z 97

E 257 C 21/C 30



SK 0069 Z 97

E 258 C 21/C 30

Switching lamp loads

The following table indicates the number of lamps that can be connected per phase at 230 V/50 Hz. Note:

- a) increased current consumption of 1.1 x the rated voltage has been taken into account.
- b) failure of approx. 5% of the lamps has been taken into account to allow for additional load caused by preheating current generated by non-igniting lamps.

For mechanical latching relays and installation relays of series E 250 and E 259

type of lamp	lamp data		permissible number of lamps (230 V, 50 Hz)
	Watt	I _n / A	
incandescent lamps and halogen lamps for 230 V * P _{per.} = 2300 W	15	0.065	153
	25	0.108	92
	40	0.174	57
	60	0.26	38
	75	0.33	30
	100	0.43	23
	150	0.65	15
	200	0.87	11
	300	1.30	7
500	2.17	4	
fluorescent lamps ● uncorrected * P _{per.} = 1300 W	4	0.17	31
	6	0.16	33
	8	0.145	37
	10	0.17	31
	13	0.165	32
	15	0.33	16
	16	0.20	26
	18	0.37	14
	20	0.37	14
	30	0.365	14
	36	0.43	12
	40	0.43	12
	58	0.67	8
	65	0.67	8
● twin-lamp circuit * P _{per.} = 3500 W	18	0.37	39
	20	0.37	39
	30	0.365	39
	36	0.43	33
	40	0.43	33
	58	0.67	21
	65	0.67	21
● shunt compensation * P _{per.} = 500 W	4	0.09	22
	6	0.08	25
	8	0.07	29
	10	0.09	22
	13	0.08	25
	15	0.17	12
	16	0.10	20
	18	0.19	10
	20	0.19	10
	30	0.18	11
	36	0.22	9
	40	0.22	9
	58	0.34	6
	65	0.34	6
metal halide lamps ● uncorrected (type: HQL) * P _{per.} = 1300 W	35	0.5	10
	70	1.0	5
	150	1.8	2
	250	3.0	1
	400	3.5	1
	1000	9.5	-
2000	10.3	-	

type of lamp	lamp data		permissible number of lamps (230 V, 50 Hz)
	Watt	I _n / A	
high pressure sodium vapour lamps ● uncorrected (type: NAV) * P _{per.} = 1300 W	50	0.77	6
	70	1.0	5
	150	1.8	2
	250	3.0	1
	400	4.4	(1)
	1000	10.3	-
	low pressure sodium vapour lamps ● uncorrected (type: Sox) * P _{per.} = 1300 W	18	0.35
37	0.6	8	
56	0.59	9	
91	0.94	5	
135	0.95	5	
185	0.9	5	
high pressure mercury vapour lamps ● uncorrected (type: HQL) * P _{per.} = 1300 W	50	0.6	8
	80	0.8	6
	125	1.15	4
	250	2.15	2
	400	3.25	1
	700	5.4	(1)
	1000	7.5	-
high pressure mercury vapour lamps e.g. HQL, HPL ● compensated	50	0.61	20
	80	0.81	13
	125	1.15	8
	250	2.15	4
	400	3.25	2
lamps with electronic control gear * P _{per.} = 2800 W	1 x 18		121
	2 x 18		60
	1 x 36		60
	2 x 36		30
	1 x 58		37
	2 x 58		18
transformers for halogen low-volt lamps	20		39
	50		15
	75		10
	100		7
	150		5
	200		3
300		2	

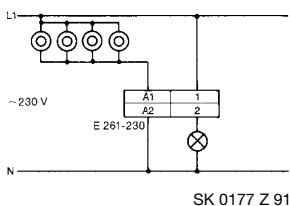
* for max. loads see pages 16, 20 and 22

For electronically-controlled latching relays of series E 260

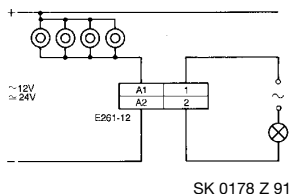
type of lamp	lamp data		permissible number of lamps (230 V, 50 Hz)
	Watt	I _n / A	
incandescent lamps * P _{per.} = 1000 W	60	0.27	16
	75	0.33	13
	100	0.45	10
	150	0.65	6
	200	0.91	5
	300	1.36	3
	500	2.27	2
1000	4.50	1	
fluorescent lamps ● uncorrected * P _{per.} = 1000 W	15	0.35	25
	18	0.37	11
	20	0.37	11
	30	0.36	11
	40	0.43	9
	65	0.67	6
115	1.50	3	
140	1.50	2	
fluorescent lamps ● twin-lamp circuit * P _{per.} = 1000 W	2 x 18	0,37	11
	2 x 20	0,37	11
	2 x 30	0,365	11
	2 x 36	0,43	9
	2 x 40	0,43	9
	2 x 58	0,67	6
	2 x 65	0,67	6
fluorescent lamps shunt compensated			not permissible
high pressure mercury lamps e.g. HQL, HPL ● uncorrected	50	0,61	3
	80	0,81	2
	125	1,15	1
	250	2,15	(1)
	400	3,25	(1)
	700	5,40	-
	1000	7,50	-
	2000/380 V	8,00	-
lamps with electr. control gear * P _{per.} = 700 W	18		36
	36		18
	58		11
transformers for halogen low-volt lamps	20		39
	50		15
	75		10
	100		7
	150		5
	200		3
300		2	

wiring examples

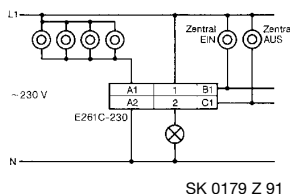
E261-230



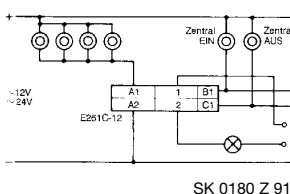
E261-12



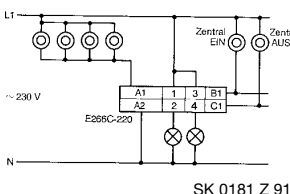
E261 C-230



E261 C-12



E266 C-230



E260C

Important!
The same potential must be present at terminals A1, B1 and C1.

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
mounting width: single and two-pole switches: 17.5 mm = 1 module
colour: grey, RAL 7035

Installation instruction: do not install the device in the immediate vicinity of inductive loads.

Special features

- low switching noise
- long serviceable life
- labels snap-on (see page 50)
- quick fastening as snap-on clip easily accessible, detachable from below
- compact design
- captive screws of the recessed/slotted head type system Pozidriv size 1
- cross-wiring, coils and main connections
- safe connection ensured by box terminals
- protection against electric shock according to DIN VDE 0106 Part 100 (BGV A2)
- control indicator with LED
- position is maintained in the case of a voltage drop

Technical data

rated switching capacity:
filament lamp load:
fluorescent lamp load (twin-lamp circuit):
fluorescent lamp load shunt-compensated:
fluorescent lamp load inductive or capacitive:
electronic control gear:
inductive load $\cos \varphi = 0.6/230 \text{ V} \sim$:
contact rating at DC:
minimum contact rating:
contact gap / contact material:
mechanical serviceable life, switchover at $10^3/\text{h}$:
serviceable life if rated load $\cos \varphi = 1$ and $10^3/\text{h}$:
serviceable life with filament lamps 1000 W and $10^3/\text{h}$:
serviceable life if rated load $\cos \varphi = 0.6$ and $10^3/\text{h}$:
max. switching rate:
bounce time:
terminals circuit, control circuit:
ON duration at rated voltage ED:
switching safety (no parallel control):
coil voltage range:
minimum command time/interval between commands:
permissible ambient temperature:
control current during local control:
control current during central control:
max. parallel capacitance of the individual control lead at 230 V \sim :
max. parallel capacitance of the control lead at 230 V \sim :
max. glow lamp current
- parallel to 230 V control buttons:
max. induced voltage at the 230 V control inputs:

	E 260/E 260 C	E 261 SRV-230
rated switching capacity:	10 A/250 V \sim	10 A/250 V \sim
filament lamp load:	1000 W	1600 W
fluorescent lamp load (twin-lamp circuit):	1000 W	1600 W
fluorescent lamp load shunt-compensated:	500 W	500 W
fluorescent lamp load inductive or capacitive:	1000 W	1600 W
electronic control gear:	700 W ($I_{on} \leq 70 \text{ A}/10 \text{ ms}$)	700 W ($I_{on} \leq 70 \text{ A}/10 \text{ ms}$)
inductive load $\cos \varphi = 0.6/230 \text{ V} \sim$:	650 W	650 W
contact rating at DC:	100 W	100 W
minimum contact rating:	4 V AC / 10 mA	4 V AC / 10 mA
contact gap / contact material:	0.5 mm / Ag SnO ₂	0.5 mm / Ag SnO ₂
mechanical serviceable life, switchover at $10^3/\text{h}$:	> 10^7	> 10^7
serviceable life if rated load $\cos \varphi = 1$ and $10^3/\text{h}$:	> 10^5	> 10^5
serviceable life with filament lamps 1000 W and $10^3/\text{h}$:	> 10^5	> 10^5
serviceable life if rated load $\cos \varphi = 0.6$ and $10^3/\text{h}$:	> 10^4	> 10^4
max. switching rate:	$10^3/\text{h}$	$10^3/\text{h}$
bounce time:	3 ms	
terminals circuit, control circuit:	strain-relief clamp 12 mm ²	strain-relief clamp 12 mm ²
ON duration at rated voltage ED:	100%	100%
switching safety (no parallel control):	99%	
coil voltage range:	0.9 to 1.1 U _n	0.9 to 1.1 U _n
minimum command time/interval between commands:	50/800 ms	50 ms
permissible ambient temperature:	- 20 °C/-4°F to + 50 °C/122°F -20 °C/-4°F to + 50 °C/122°F	
control current during local control:	230 V \sim 115 mA, after 10s 8 mA \pm 20% 24 V UC 140 mA, after 10s 80 mA \pm 20%	
control current during central control:	230 V \sim 8 mA, after 10s 3 mA \pm 20% 24 V UC 17 mA (26 mA 2 contacts) \pm 20%	
max. parallel capacitance of the individual control lead at 230 V \sim :	2 μF (ca. 6000 m)	
max. parallel capacitance of the control lead at 230 V \sim :	0.33 μF (ca. 1000 m)	
max. glow lamp current - parallel to 230 V control buttons:	10 mA/30 mA (E 260 C) 50 mA	
max. induced voltage at the 230 V control inputs:	0.2 U _n 0.2 U _n	

table "lamp load" page19



SK 0115 B 99

E 261-230



SK 0107 B 99

E 261 SRV-230

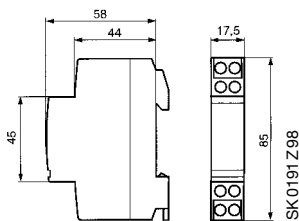


SK 0073 B 98

E 262 C-230

dimension drawing

in mm



E 261-
E 266-
E 262-

SK 0191 Z 98

Selection table

Latching relays with electronic control

contacts	power loss W ^①	order details type code	order code	bbn 40 12233 EAN	price 1 pc. DM	price	weight 1 pc. kg	pack. unit pc.
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coil voltage U_c = 24 V AC/DC

1 NO	2.4 (3.0)	E 261-24	GHE 261 5001 R0101	01000 4			0.085	10
1 NO+ 1 NC	2.4 (3.5)	E 266-24	GHE 266 5001 R0111	01120 9			0.096	10
2 NO	2.4 (3.5)	E 262-24	GHE 262 5001 R0201	01060 8			0.096	10

coil voltage U_c = 230 V AC

1 NO	1.5 (2.0)	E 261-230	GHE 261 1001 R0106	00980 0			0.085	10
1 NO+ 1 NC	1.7 (3.0)	E 266-230	GHE 266 1001 R0116	01100 1			0.096	10
2 NO	1.7 (3.6)	E 262-230	GHE 262 1001 R0206	01040 0			0.096	10

Latching relay with returning time

Switches off automatically after expiry of variable delay time (up to 60 min. max.) if manual OFF command has not been received. Glow lamp current 50 mA. With rotary switch for permanent OFF position and interruption of automatic timing (then: simple latching relay).

coil voltage U_c = 230 V AC

1 NO	1.5 (2.0)	E 261 SRV-230	GHE 261 5001 R0106	48570 8*			0.07	10
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Latching relay with electronic control for central switch-on / switch-off

The central commands switch on/off any given number of devices connected in parallel, irrespective of their prior position. Central commands always enjoy priority, local control inputs are deactivated during central commands. Local / central control inputs are not metallically separated. Permissible glow lamp current at local control inputs is 30 mA.

coil voltage U_c = 24 V AC/DC

1 NO	2.4 (3.0)	E 261 C-24	GHE 261 5011 R0101	01020 2			0.085	10
1 NO+ 1 NC	2.4 (3.5)	E 266 C-24	GHE 266 5011 R0111	01140 7			0.096	10
2 NO	2.4 (3.5)	E 262 C-24	GHE 262 5011 R0201	01080 6			0.096	10

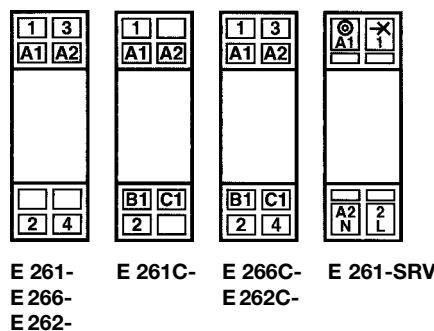
coil voltage U_c = 230 V AC

1 NO	1.5 (2.0)	E 261 C-230	GHE 261 1011 R0106	00990 9			0.085	10
1 NO+ 1 NC	1.7 (2.0)	E 266 C-230	GHE 266 1011 R0116	01110 0			0.096	10
2 NO	1.7 (3.0)	E 262 C-230	GHE 262 1011 R0206	01050 9			0.096	10

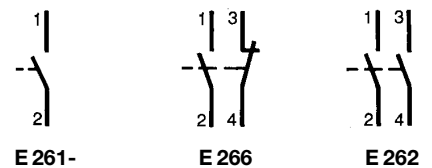
12 V AC/DC coil voltage upon request

values in brackets indicate power loss at permanent excitation, rated voltage and rated contact loading

terminal assignment



SK 0187 Z 99



SK 0018 Z 92

* bbn no. : 40 16779



SK 0123 B 99

E 259

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 17.5 mm = 1 module
 colour: grey, RAL 7035

Special features

- **position indicator per contact**
- **long serviceable life**
- **labels** snap-on (see page 50)
- **quick fastening** easily accessible, detachable from below
- **compact design**
- **captive screws** of the recessed/slotted head type system Pozidriv size 1
- **cross-wiring** coils and main connections
- **safe connection** ensured by box terminals
- **protection against electric shock** according to DIN VDE 0106 Part 100 (BGV A2)

Technical data

rated switching capacity:	16 A/250 V ~, 10 A/400 V ~
rated insulation voltage according to DIN VDE 0110:	400 V ~
filament lamp load:	10 A (2300 W)
fluorescent lamp load (twin-lamp circuit):	16 A (3500 W)
fluorescent lamp load inductive or capacitive:	10 A (1300 W)
electronic control gear:	10 A (2300 W) max. inrush current ≤ 140 A/10 ms
fluorescent lamp load (shunt-compensated):	4 A (500 W)
inductive load, $\cos \varphi = 0.6/230 V$:	10 A (1300 W)
contact rating at DC:	100 W
minimum contact rating:	6 V AC/50 mA
power consumption:	hold: 2 W/3.5 VA pickup: 3.2 W/6 VA
power loss of coils AC + DC:	single and two-pole 1.9 W
ON duration (ED):	100% ①
coil voltage range:	0.9 to 1.1 x U_n
switching safety at rated voltage:	99%
contact gap / contact material:	3 mm / Ag SnO ₂
closed time:	10 - 20 ms
time to contact:	5 - 15 ms
bounce time:	3 ms
mechanical serviceable life:	> 10 ⁶ switchovers
serviceable life if rated load $\cos \varphi = 1$ and 10 ³ /h:	> 10 ⁵ switchovers
$\cos \varphi = 0.6$ and 10 ³ /h:	> 2 x 10 ⁴ switchovers
serviceable life if filament lamps 1000 W and 10 ³ /h:	> 10 ⁵ switchovers
max. switchovers:	10 ³ /h
permis. temperatur at mounting position:	- 5 °C /+23°F to + 50 °C/122°F
glow lamps parallel to control buttons:	5 mA
with capacitor 1 µF/250 V ~, parallel to coil:	10 mA
with capacitor 2.2 µF/250 V ~, parallel to coil:	15 mA
max. induced voltage at the control inputs:	0.2 x U_n
max. parallel capacitance of control lead (length):	0.06 µF (ca. 200 m)
connections – switching circuit: M 3.5	strain-relief clamp 12 mm ²
– control circuit: M 3.5	strain-relief clamp 12 mm ²

① In the case of permanent excitation of several series-connected installation relays, provide for adequate ventilation according to power loss calculation DIN VDE 0660 Part 500. We recommend to maintain a distance of some 9 mm to neighbouring units (by means of packing block SZ-FST2).

table "lamp load" page 19



SK 0123 B 99

E 259 R20-230

Selection table

contacts	power loss	order details		bbn	price	price group	weight	pack.
W	type code	order code	EAN	4012233 DM	1 pc.	kg	1 pc.	unit
coil voltage $U_c = 8\text{ V}/50\text{ Hz}$								
1 NO	4	E 259 R10-8	GHE 259 1001 R1101	00920 6			0.107	10
1 NO + 1 NC	4	E 259 R11-8	GHE 259 1001 R1111	00940 4			0.114	10
2 NO	6	E 259 R20-8	GHE 259 1001 R1201	00960 2			0.114	10
coil voltage $U_c = 12\text{ V}/50\text{ Hz}$								
1 NO	4	E 259 R10-12	GHE 259 1001 R1104	00930 5			0.107	10
1 NO + 1 NC	4	E 259 R11-12	GHE 259 1001 R1114	00950 3			0.114	10
2 NO	6	E 259 R20-12	GHE 259 1001 R1204	00970 1			0.114	10
coil voltage $U_c = 24\text{ V}/50\text{ Hz}$								
1 NO	4	E 259 R10-24	GHE 259 1001 R0101	00860 5			0.107	10
1 NO + 1 NC	4	E 259 R11-24	GHE 259 1001 R0111	00880 3			0.114	10
2 NO	6	E 259 R20-24	GHE 259 1001 R0201	00900 8			0.114	10
coil voltage $U_c = 230\text{ V}/50\text{ Hz}$								
1 NO	4	E 259 R10-230	GHE 259 1001 R0106	00870 4			0.099	10
1 NO + 1 NC	4	E 259 R11-230	GHE 259 1001 R0116	00890 2			0.105	10
2 NO	6	E 259 R20-230	GHE 259 1001 R0206	00910 7			0.105	10
coil voltage DC								
1 NO + 1 NC	1.9 (4)	E 259 R11- 24 DC	GHE 259 1002 R0111	40340 5			0.118	10
	1.9 (4)	E 259 R11- 48 DC	GHE 259 1002 R0113	40360 3			0.118	10
	1.9 (4)	E 259 R11- 60 DC	GHE 259 1002 R2112	47040 7			0.118	10
	1.9 (4)	E 259 R11-110 DC	GHE 259 1002 R0114	40370 2			0.118	10
	1.9 (4)	E 259 R11-220 DC	GHE 259 1002 R0116	40380 1			0.118	10

special voltages: 4, 6, 36, 42, 48, 60, 110, 127, 180, 240 and 400 V/50 Hz
as well as 8, 24, 42, 110, 115, 127, 220, 240 and 380 V/60 Hz
or 4, 6, 8, 12, 24, 36, 42, 48, 60, 110 and 220 V DC

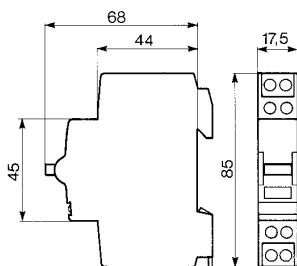
For special voltages and frequencies, the following surcharges apply:

up to 400 V AC 40 ... 60 Hz and up to 220 V DC	surcharge 1 - 9 pc.	10 - 49 pc.	50 - 99 pc.	100 pc. plus
	+80%	+45%	+25%	+10%

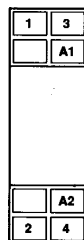
terminal assignment

dimension drawing

in mm

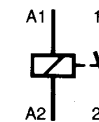


E 259 R10 SK 0184 Z 91
E 259 R11
E 259 R20

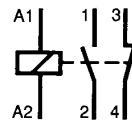


SK 0019 Z 92

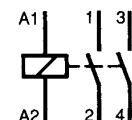
E 259 R 10-



E 259 R11-

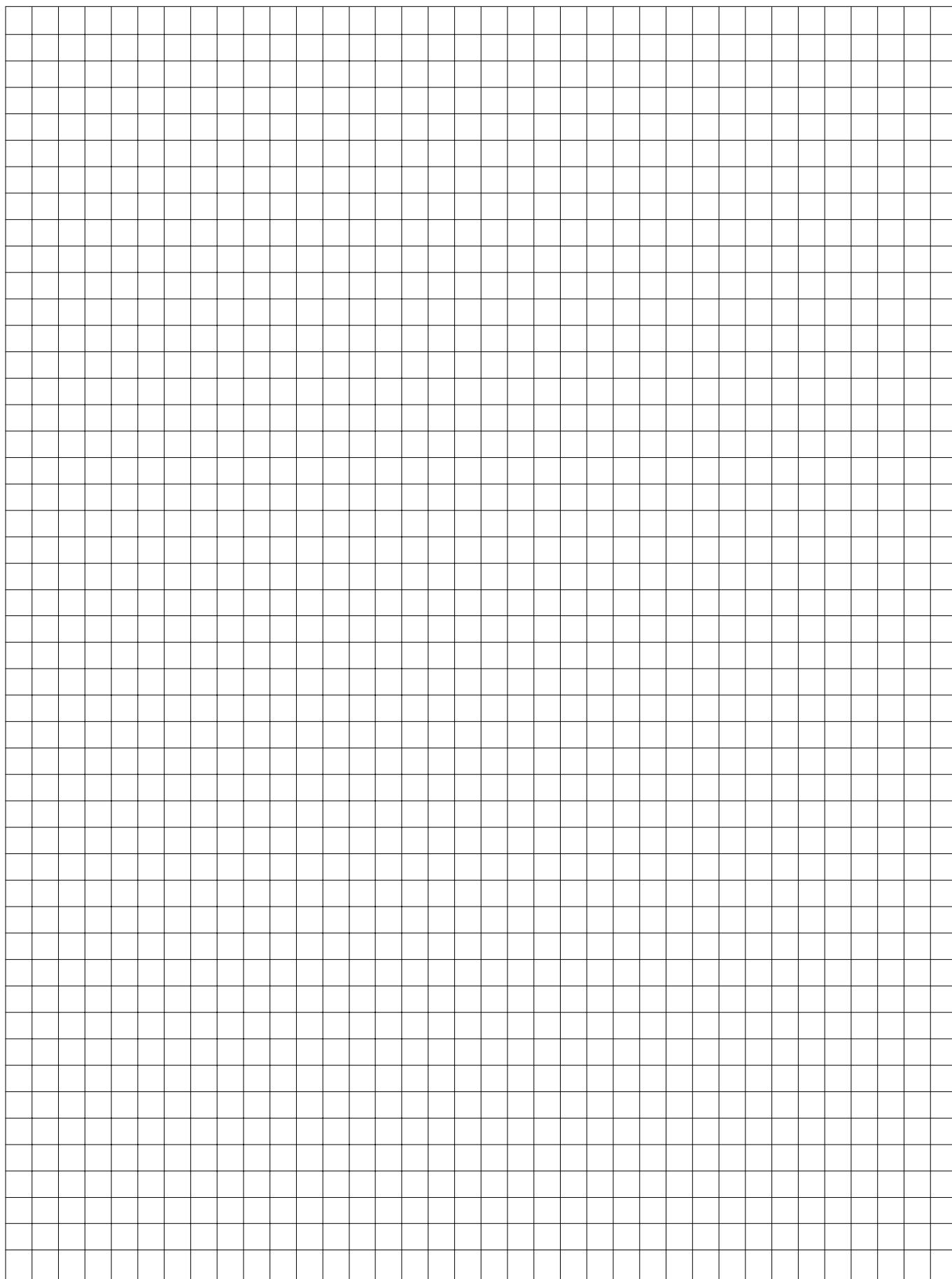


E 259 R20-

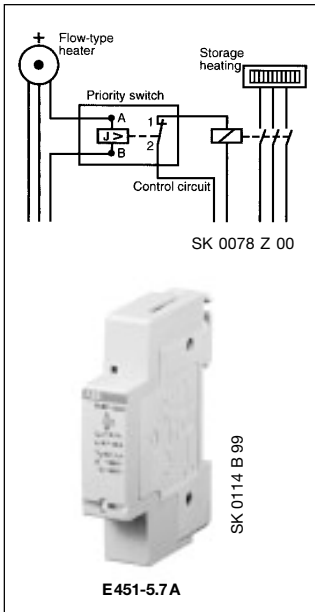


SK 0020 Z 92

Notes



Priority switch E 450 (Load shedding relays)



Equipment for panel installation on mounting rail (35 mm) according to DIN EN 50 022, or on a flat surface with screws.

mounting depth: 68 mm
 mounting width: 17.5 mm = 1 module
 colour: grey, RAL 7035

Application

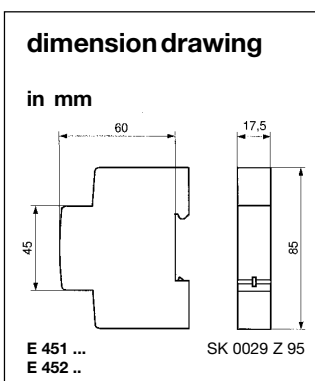
The priority switch is used in wiring systems where existing lead cross-sections or the design of the service connection do not allow for simultaneous operation of two powerful consumers (e.g. storage heating and flow-type heater).

The priority switch disconnects the long-term consumer (storage heating) for as long as the short-term consumer (flow-type heater) is switched on.

The coil of the priority switch is connected in series to the short-term consumer. When switching on this consumer, the NC contact disconnects the heating system contactor.

Technical data

type	E 451-5,7	E 452-5,7	E 451-15
operating coil:			
rated current range:	6.7 ... 39 A		18 ... 55 A
- is	1.5 ... 9 kW at 230 V		4.1 ... 12.6 kW at 230 V
threshold current:	4.6 ... 27 kW at 230/400 V		7.2 ... 22 kW at 230/400 V
OFF delay (max.):	3.1 ... 5.3 A		≤ 15 A
max. continuous current:	0 mains half waves	2 mains half waves	0 mains half waves
thermal continuous capacity at 40 °C/104°F:	43 A		60 A
	5 W		2.5 W
contact assembly:			
control contact:	1 NC contact		1 NC contact
rated contact current at 250 V:	1 A		1 A
contact material:	solid silver		solid silver
max. switching voltage:	400 V		400 V
max. switching capacity:	230 VA		230 VA
max. switched current:	1 A		1 A
max. inrush peak current:	5 A		5 A
electr. serviceable life:	> 10 ⁵ switchovers		> 10 ⁵ switchovers
mechanical serviceable life:	ca. 2 x 10 ⁶ switchovers		ca. 2 x 10 ⁶ switchovers
max. electric switching rate:	ca. 1800 switchovers/hour		ca. 1800 switchovers/hour
ON duration ED:	100%		100%
ambient temperature:	- 20 °C/-4°F ... + 40 °C/104°F		- 20 °C/-4°F ... + 40 °C/104°F
response time:	10 ... 20 ms		10 ... 20 ms
release time:	5 ... 20 ms	≥ 20 ms	5 ... 10 ms
test voltage contact / coil:	2.5 kV		2.5 kV
clearances in air /creepage distances:	C/250 V to IEC 669-1-23		C/250 V to IEC 669-1-23
degree of protection:	IP 40		IP 40
protection against electric shock:	to DIN VDE 0106 Part 100 (BGV A2)		to DIN VDE 0106 Part 100 (BGV A2)
terminal contact:	series coil up to 16 mm ² control contact up to 2.5 mm ²		series coil up to 16 mm ² control contact up to 2.5 mm ²



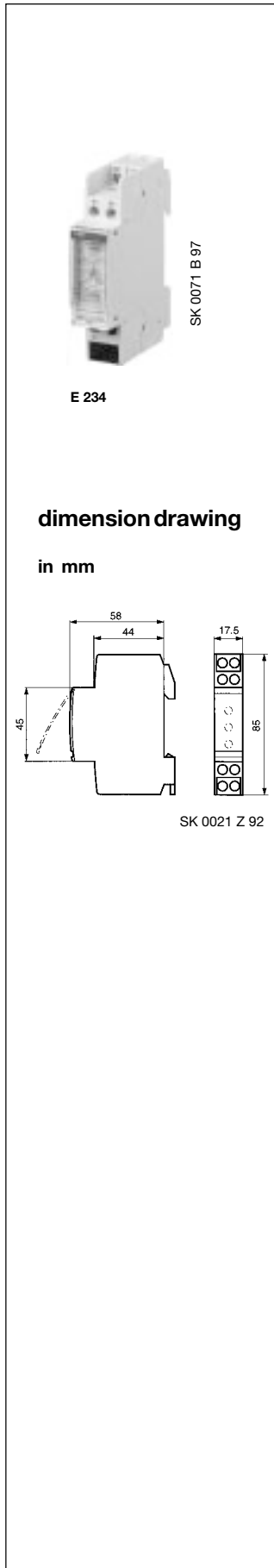
Selection table

for pneumatically controlled flow-type heaters

rated current range	power loss W	order details type code	order code	bbn 40 16779 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
6.7 ... 39 A	2.4	E 451- 5.7 A	GH V021 0451 R0013	41590 3			0.1	10
18 ... 55 A	2.4	E 451-15 A	GH V021 0451 R0012	15030 9			0.1	10

for electronically controlled flow-type heaters

6.7 ... 39 A	2.4	E 452-5.7 A	GH V021 0452 R0012	20950 2			0.1	10
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Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: system 68 mm
mounting width: 17.5 mm = 1 module
colour: grey, RAL 7035

Application

In commercial and industrial electrical installations, in schools, hospitals and public buildings to control automatic time schedules of machinery, lighting, heating, air-conditioning, turnstiles, gates, and tools.

Special features

- control voltages of 12 to 230 V DC and AC; 50/60 Hz time periods of 0.1 seconds up to 40 hours in one device.
- latching rotary switch to select time base, multiplier and operating mode of the multi-function time-delay relay (TDR).
- E 234-MFR offers full operational functionality:

functions: ON delay	AV passing make contact	EW
returning time	RV ON delay and returning time	ARV
clock generator pulse-starting	TI permanent ON	ON
clock generator starting with space	TP permanent OFF	OFF
passing break contact	AW impulse-controlled pick-up delay	IA
- protection against electric shock according to DIN VDE 0106 Part 100 (BGV A2).
- floating changeover contact 1 W.
- sealable cover.

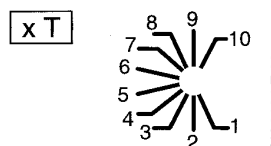
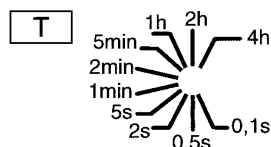
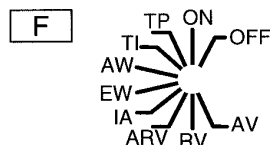
Technical data

rated switching capacity:	10 A/250 V AC
filament and fluorescent lamps inductive and capacitive:	1000 W
fluorescent lamps (twin-lamp circuit):	1000 W
fluorescent lamps shunt-compensated:	500 W
electronic control gear:	700 W ($I_{on} \leq 70$ A/10 ms)
inductive load $\cos \varphi = 0.6/230$ V AC:	650 W
contact rating at DC:	100 W
minimum contact rating:	4 V AC/10 mA
supply voltage:	12 ... 230 V DC/AC 50/60 Hz
control voltage:	12 ... 230 V DC/AC 50/60 Hz
voltage tolerance:	$\pm 10\%$
ON duration ED:	100%
ambient temperature:	$-20^{\circ}\text{C}/-4^{\circ}\text{F} \dots +50^{\circ}\text{C}/122^{\circ}\text{F}$
mechanical serviceable life, switchover at $10^3/\text{h}$:	$> 10^7$
serviceable life if rated load, $\cos \varphi = 1$ and filament lamps 1000 W bei $10^3/\text{h}$:	$> 10^5$
serviceable life if rated load, $\cos \varphi = 0.6$ bei $10^3/\text{h}$:	$> 10^4$
repeat accuracy at $25^{\circ}\text{C}/77^{\circ}\text{F}$:	$\pm 0.1\%$
setting accuracy (after one minute):	$\pm 0.2\%$
control voltage dependency between 0.8 to $1.1 \times U_n$:	none
power failure bridging time (followed by overall reset):	≥ 0.2 s
control current:	6 - 25 mA $\pm 20\%$ ①
power consumption:	0.2 - 2.5 W
glow lamps & shunt-compensated fluorescent lamps parallel to control pushbuttons:	not permissible
max. parallel capacitance (length) of control lead:	0.2 μF (ca. 200 m)
connections – switching circuit:	M 3.5 strain-relief clamp 12 mm ²
– control circuit:	M 3.5 strain-relief clamp 12 mm ²

① Time-delay relays (TDR) are clocked internally at the supply circuit. For a few seconds currents of up to 1A will ensue.

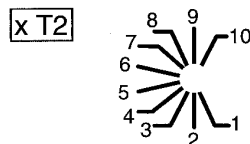
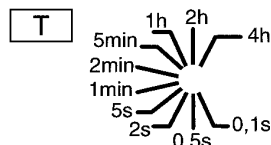
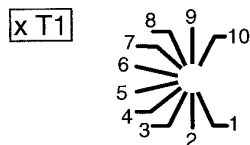


SK 0072 B 97



E 234-MFR

SK 0194 Z 99



E 234-ARV
E 234-TI 2

SK 0195 Z 99

contact	power loss W	order details type code	order code	bbn 40 12233 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
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Multifunction time-delay relay (TDR) selectable functions by rotary switch T:
AV, RV, ARV, TI, TP, EW, AW, IA, as well as ON = permanent ON and OFF = permanent OFF

1 W	2.5	E 234-MFR	GH E234 5001 R0007	74820 4			0.090	1/10
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Time-delay relay (TDR) pick-up delayed

1 W	2.5	E 234-AV	GH E234 5001 R0001	74830 3			0.085	1/10
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Time-delay relay (TDR) time-delayed after deenergization

1 W	2.5	E 234-RV	GH E234 5001 R0002	74840 2			0.085	1/10
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Clock-pulse generator pulse-starting (2 non-related time settings can be selected, same time base, different multipliers)

1 W	2.5	E 234-TI 2	GH E234 5001 R0009	41770 9			0.085	1/10
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Time-delay relay (TDR) passing break contact

1 W	2.5	E 234-AW	GH E234 5001 R0004	74850 1			0.085	1/10
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Time-delay relay (TDR) passing make contact

1 W	2.5	E 234-EW	GH E234 5001 R0005	74790 0			0.085	1/10
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Time-delay relay (TDR) pick-up delayed and time-delayed after deenergization
(2 non-related time settings can be selected, same time base, different multipliers)

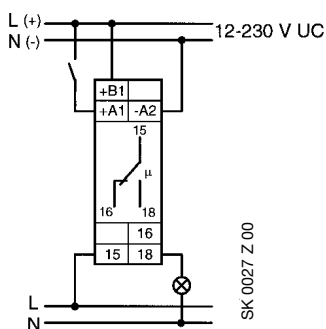
1 W	2.5	E 234-ARV	GH E234 5001 R0008	41760 0			0.085	1/10
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time base: set by T switch
basic values 0.1 s; 0.5 s; 2 s; 5 s; 1 min.; 5 min.; 1 h; 2 h; 4 h.

multiplier: set by xT switch in the range between 1 and 10.
time base x multiplier is the time set.

LED: flashes when the time is running if the make contact is in its normal position (15-16 closed), and is constantly lit if the make contact 15-18 is closed.

wiring diagram



SK 0027 Z 00

terminal assignment:

- B1 - A2 (N) = supply voltage
12 ... 230 V DC/AC (50/60 Hz)
- A1 - A2 (N) = control input 12 ... 230 V
DC/AC (50/60 Hz)
A1/B1 = DC + and L, A2 = DC - and N

- 15 = make contact input
- 16 = make contact output NC contact
- 18 = make contact output NO contact

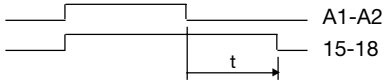
The control input is isolated so that parallel operation is possible. The make contacts are potential-free. The rated insulation voltage with respect to the power supply and the control input is 250 V.

Glow lamps parallel to the control buttons and shunt-compensated fluorescent lamps are not permitted.

Caution: Different control and supply voltages may only be drawn from **one single** voltage source.

Individual functions of time-delay relay (TDR) E 234

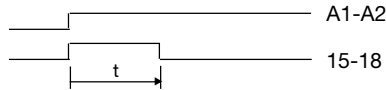
RV = returning time (OFF delay)



When applying the control voltage, the make contact changes from 15-16 to 15-18. When interrupting the control voltage, the time sequence commences, and when it ends it returns to its normal position 15-16.

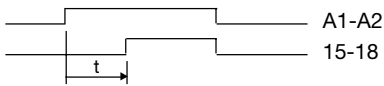
Can be connected in series during a time sequence.

EW = passing make relay



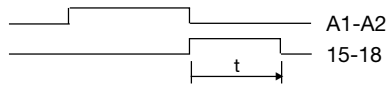
When applying the control voltage, the make contact switches from 15-16 to 15-18 and returns to its normal position after the impulse time has expired. When interrupting the control voltage during the impulse time, the contact returns to 15-16 immediately and the remaining time is reset.

AV = ON delay



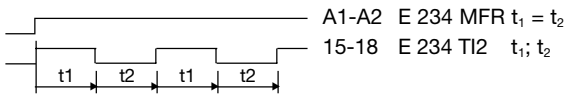
When applying the control voltage, the time sequence commences and when it ends the make contact switches from 15-16 to 15-18. The time sequence starts again after a break.

AW = passing break relay



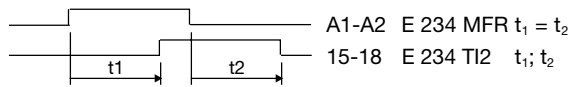
When the control voltage is interrupted, the make contact switches from 15-16 to 15-18 and, after the impulse time, returns to its normal position. When applying control voltage during the impulse time, the make contact returns to 15-16 immediately and the remaining time is reset.

TI = clock-pulse generator with pulse starting (flasher relay)



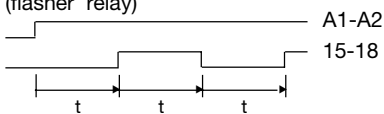
For as long as the control voltage is applied, the make contact switches from 15-16 to 15-18 and back. In the case of E 234 MFR, the switch-over time is the same for both directions and conforms to the time set. In the case of E 234-TI2 both timings can be set independently (same time base, but additional multiplier). When applying the control voltage, the make contact switches immediately to 15-18.

ARV = ON delay and returning time



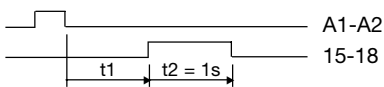
When applying the control voltage, the time sequence commences, and when it ends the make contact switches from 15-16 to 15-18. If the control voltage is subsequently interrupted, a new time sequence commences, and when it ends, the make contact returns to its normal position 15-16. The returning time of E 234-MFR lasts for as long as the ON delay does, separate settings are possible in the case of E 234-ARV (same time base, but additional multiplier). The time sequence starts again after the pickup delay has been interrupted.

TP = clock-pulse generator starting with clock-pulse space (flasher relay)



Offers same functions as TI, except that, when applying the control voltage, the contact does not switch to 15-18, but remains at 15-16 for the time being.

IA = impulse-controlled pickup delay



As from a control pulse of 20 ms, time sequence t1 commences, when it ends, the make contact switches for 1 second from 15-16 to 15-18 (e.g. for an automatic door opener).



E 233-230

SK 0120 B 99

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 17.5 mm = 1 module
 colour: grey, RAL 7035

Application

Elapsed-time meters are used to record operating times as well as to determine idle times and off times of commercial, industrial and household plant and equipment.

Technical data

	AC equipment	DC equipment
rated voltage:	50 Hz: 24 V, 230 V 60 Hz: 24 V, 120 V, 240 V	DC 12 V ... 48 V
voltage tolerance:	+ 6% – 10%	± 10%
power consumption:	1.5 VA	ca. 20 mW
ambient temperature:	– 15 °C/+5°F ... + 50 °C/122°F	– 10 °C/+23°F ... + 50 °C/122°F
counting capacity:	100 000 h	100 000 h
reading accuracy:	0.01 h	0.1 h
operation display:	fast running	LED display
protection against electric shock:	according to DIN VDE 0106 Part 100 (BGV A2)	according to DIN VDE 0106 Part 100 (BGV A2)
connection cross section:	up to 10 mm ²	up to 10 mm ²

Selection table

rated voltage	order details		bbn 4012233 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
	type code	order code					
AC 230 V / 50 Hz	E 233-230	GH E233 1001 R0006	63000 4			0.050	10
AC 24 V / 50 Hz	E 233-24	GH E233 1001 R0001	63010 3			0.050	10
DC 12 V ... 48 V	E 233-12/48	GH E233 1001 R0004	63020 2			0.050	10

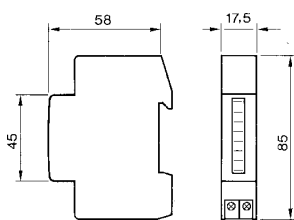
other rated voltages on request

rated voltage	order details		bbn 4016779 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
	type code	order code					
AC 240 V / 60 Hz	E 233-240/60 Hz *	GH E233 1001 R6005	36590 1			0.050	10
AC 120 V / 60 Hz	E 233-120/60 Hz *	GH E233 1001 R5005	36600 7			0.050	10
AC 24 V / 60 Hz	E 233- 24/60 Hz *	GH E233 1001 R5001	36610 6			0.050	10

* UL approval

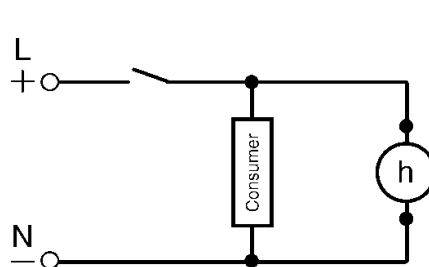
dimension drawing

in mm



SK 0203 Z 91

wiring diagram



SK 0011 Z 96



SK 0129 Z 96

E 233-12/48 DC

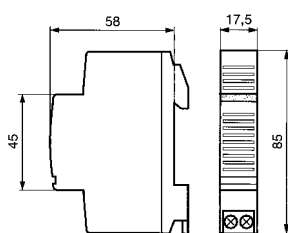


SM 1/230

SK 0072 B 98

dimension drawing

in mm



SM1

SK 0186 Z 99

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 17.5 mm = 1 module
 colour: grey, RAL 7035

Application

The modular bell gives acoustic signals in building installations.

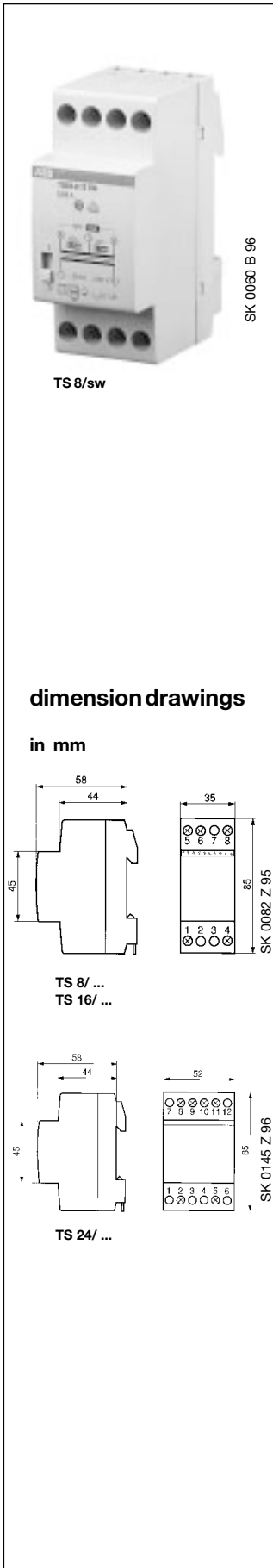
Technical data

rated voltage: 12 V ~ and 230 V ~ 50 Hz
 sound level: ca. 80 dB A
 protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
 connection cross section: up to 1 x 6 mm² or 2 x 2.5 mm²

Selection table

description	power loss W	order details		bn 80 12542 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
		type code	order code					
modular bell 230 V *	5.5	SM 1/230	GH V021 4166 R0001	00710 4			0.125	6
modular bell 12 V *	3.6	SM 1/12	GH V021 4158 R0001	00720 3			0.125	6

* not suitable for permanent operation




Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 8/16 VA: 35 mm = 2 modules
 24 VA: 52 mm = 3 modules
 colour: grey, RAL 7035

Application

For the supply of bell, chime, intercom, buzzer and door opener systems as well as for alarm and signalling systems with protective extra-low voltage. Bell transformers are designed for short-term loads.

Technical data

rated input voltage: 230 V ~ 50 Hz
 rated output voltage: 8. 12 or 24 V ~ and 4-6-8 V ~, 4-8-12 V ~, 8-12-24 V ~
 rated output power: 8 VA, 16 VA, 24 VA
 rated output current: 0.33; 0.67; 1; 1.33; 2 A
 class of protection: total insulation 
 degree of protection: IP 20
 protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
 rated / ambient temperature: t_a 40/E (+ 40 °C /104 °F at place of installation)
 t_a 25/E (+ 25 °C /77 °F at place of installation): TS 8/8, TS 8/12, TS 8/24
 connection cross section: up to 10 mm²
 power loss: 1 ... 4 W

Selection table

rated voltage/current		order details		bbn	price	price	weight	pack.	
input	output	type code	order code	80 12542	1 pc.	group	1 pc.	unit	
				EAN	DM		kg	pc.	
Bell transformer ①									
230 V	8 V/1 A	TS 8/8 ④	GH V023 2699 R0001	36800 7			0.355	5	
230 V	8 V/1 A	TS 8/8 sw * ③	GH V023 2723 R0001	36830 4			0.277	5	
230 V	12 V/0.67 A	TS 8/12 ④	GH V023 2707 R0001	36810 6			0.355	5	
230 V	12 V/0.67 A	TS 8/12 sw * ③	GH V023 2731 R0001	36840 3			0.277	5	
230 V	4-6-8 V/1 A	TS 8/4-6-8 sw * ③	GH V023 2756 R0001	36860 1			0.280	5	
230 V	4-8-12 V/0.67 A	TS 8/4-8-12 sw * ③	GH V023 2764 R0001	36870 0			0.280	5	
230 V	24 V/0.33 A	TS 8/24 sw * ③	GH V023 2749 R0001	36850 2			0.277	5	
230 V	8/2 A	TS 16/8 ③	GH V023 2772 R0001	36880 9			0.355	5	
230 V	12 V/1.33 A	TS 16/12 ③	GH V023 2780 R0001	36890 8			0.355	5	
230 V	24 V/0.67 A	TS 16/24 ③	GH V023 2798 R0001	36900 4			0.330	5	
230 V	4-6-8/2 A	TS 16/4-6-8 ③	GH V023 2806 R0001	36910 3			0.333	5	
230 V	4-8-12 V/1.33 A	TS 16/4-8-12 ③	GH V023 2814 R0001	36920 2			0.333	5	
230 V	4-8-12 V/2 A	TS 24/4-8-12 ③	GH V023 2822 R0001	36930 1			0.465	3	
230 V	8-12-24 V/1 A	TS 24/8-12-24 ③	GH V023 2830 R0001	36940 0			0.465	3	

* sw = with ON/OFF switch

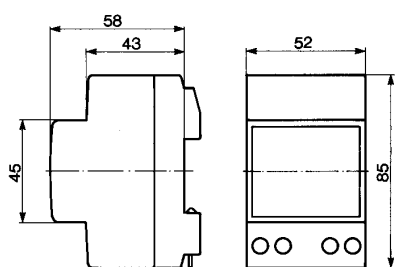
Safety transformer

230 V	24 V/0.33 A	TS 8/24 ④	GH V023 2715 R0001	36820 5	46.50	12	0.355	5
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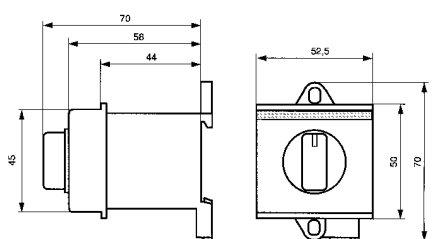
- ① no-load output voltage max. 33 V (difference of output voltages between no-load operation and 50% rated power)
- ② no-load output voltage max. 50 V (difference of output voltages between no-load operation and 100% rated power)
- ③ inherently short-circuit-proof (due to design) overloads cause the voltage to collapse. Upon removal of overloads, the transformer continues to operate normally. Output power is limited.
- ④ non-inherently short-circuit proof integral PTC thermistor. Fully operational after interruption caused by overload and short disconnection of primary voltage.

Technical data	measuring instruments with analog display VLM and AMT	measuring instruments with digital display VLM-D1, AMT-D1 and FRZ-D1
measuring element :	moving iron	electronic
accuracy:	class 1.5	class 0.5
overrange:	20% in relation to rated current and rated voltage	-
power consumption:	voltmeter 300 V: 1.5 VA 500 V: 4 VA ammeter 5 A: 0.3 VA 10 A: 0.6 VA 25 A: 1.0 VA 30 A: 1.2 VA	< 2 VA
supply voltage:	50 ... 60 Hz	230 V ~
frequency response range:	2000 V	50 ... 60 Hz
test voltage:	within the accuracy class: 20 °C/68 °F ± 10 °C otherwise : - 25 °C /- 13°F to + 75 °C / 167 °F	2000 V
operating temperature:	IP 20	- 10°C/ +14°F to + 55 °C/131°F
degree of protection:	according to DIN VDE 0106 Part 100 (BGV A2)	IP 20
protection against electric shock:	plastic, self-extinguishing (class V0 according to UL 94)	according to DIN VDE 0106 Part 100 (BGV A2)
casing material :	grey, RAL 7035	plastic, self-extinguishing (class V0 according to UL 94)
colour:	vertical	grey, RAL 7035
mounting position:	box terminals up to 10 mm ²	vertical or horizontal
terminals:	300 V, 500 V ~ (direct measurement) 5-10-15-20-25 and 30 A (direct measurement)	box terminals up to 10 mm ²
effective ranges: voltage	... / 5 A	VLM-D1: 600 V AC (direct measurement)
current	5-10-20-30-50-75-80-100-150-200-250-300- 400-500-600-800-1000-1250 and 1500 A	FRZ-D1: 40 ... 80 Hz
frequency	upper range values according to DIN 43 701	... / 5 A, codable:
for transformer connection	according to DIN 43 802	AMT-D1: 15-20-25-40-60-99, 9-150-200-250- 400-600 and 999 A
scales:		
division and needle:		

dimension drawings, in mm

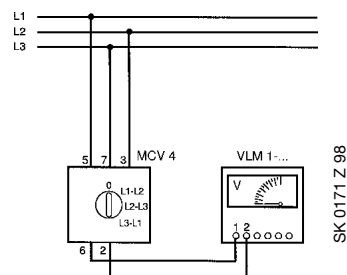


built-in measuring instruments SK0191 Z 91

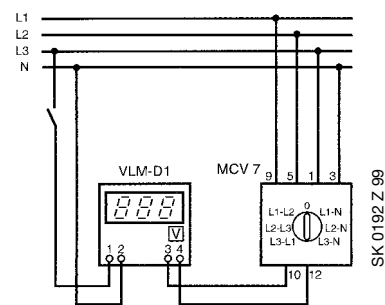


changeover switch SK0176 Z 96

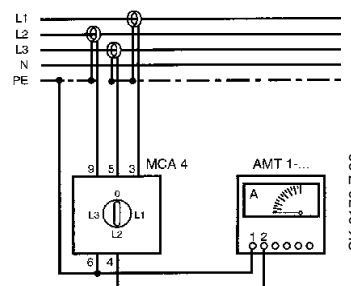
wiring diagrams



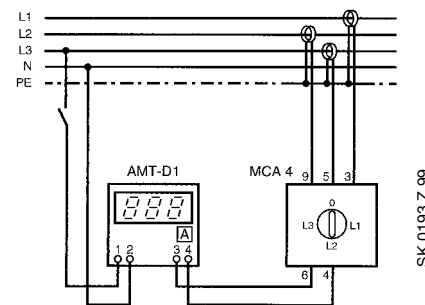
electric connection of analog voltmeter VLM with changeover switch MCV 4



electric connection of digital voltmeter VLM-D1 with changeover switch MCV 7



electric connection of analog ammeter AMT for transformer measurement with changeover switch MCA 4



electric connection of digital ammeter AMT-D1 for transformer measurement with changeover switch MCA 4



VLM 1-300

SK 0277 B 91



AMT 1/

SK 0116 B 99



AMT-D 1

SK 0105 B 99



MCV 7

SK 0009 B 94

Selection table

effective range	power loss	order details		bbn	price	price	weight	pack.
0 - ...	W	type code	order code	80 12542 EAN	1 pc. DM	group	1 pc. kg	unit pc.

Measuring instruments with analog display, class 1.5

moving-iron measuring instruments for alternating voltages (direct measurement)

300 V ~	4	VLM 1/300	GH V022 0515 R0001	00790 6			0.125	1
500 V ~		VLM 1/500	GH V022 0523 R0001	00000 6				1

moving-iron measuring instruments for alternating currents (direct measurement)

5 A	1.2	AMT 1/ 5	GH V022 0598 R0001	00070 9			0.110	1
10 A		AMT 1/10	GH V022 0531 R0001	00010 5				
15 A		AMT 1/15	GH V022 0549 R0001	00020 4				
20 A		AMT 1/20	GH V022 0556 R0001	00030 3				
25 A		AMT 1/25	GH V022 0564 R0001	00040 2				
30 A		AMT 1/30	GH V022 0572 R0001	00050 1				

moving-iron measuring instruments for alternating currents (transformer measurement)

transformer connection		AMT 1/A1	GH V022 0580 R0001	00060 8			0.100	1
5 A								

exchangeable scales for ammeter AMT 1/A 1

5/5 A	-	SCL 1/5	GH V022 0614 R0001	00120 1				10
10/5 A		SCL 1/10	GH V022 0622 R0001	00130 0				10
20/5 A		SCL 1/20	GH V022 0630 R0001	00140 9				10
30/5 A		SCL 1/30	GH V022 0648 R0001	00150 8				10
50/5 A		SCL 1/50	GH V022 0655 R0001	00160 7				10
75/5 A		SCL 1/75	GH V022 1067 R0001	03100 0				10
80/5 A		SCL 1/80	GH V022 0663 R0001	00170 6				10
100/5 A		SCL 1/100	GH V022 0671 R0001	00180 5				10
150/5 A		SCL 1/150	GH V022 0689 R0001	00190 4				10
200/5 A		SCL 1/200	GH V022 0697 R0001	00200 0				10
250/5 A		SCL 1/250	GH V022 0481 R0001	03110 9				10
300/5 A		SCL 1/300	GH V022 0705 R0001	00210 9				10
400/5 A		SCL 1/400	GH V022 0838 R0001	00220 8				10
500/5 A		SCL 1/500	GH V022 0846 R0001	00230 7				10
600/5 A		SCL 1/600	GH V022 1745 R0001	03120 8				10
800/5 A		SCL 1/800	GH V022 0853 R0001	00240 6				10
1000/5 A		SCL 1/1000	GH V022 0861 R0001	00250 5				10
1250/5 A		SCL 1/1250	GH V022 5738 R0001	07060 3				10
1500/5 A		SCL 1/1500	GH V022 5746 R0001	07070 2				10

Measuring instruments with digital display, class 0.5

measuring instrument for alternating voltage (direct measurement)

600 V	2.0	VLM-D1	GH V022 4087 R0001	35870 1			0.300	10
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measuring instrument for alternating current with coding switch to select effective ranges (transformer measurement)

15-20-25-40-60-99.9-150-200-250-400-600-999 A	2.0	AMT-D1	GH V022 4061 R0001	35850 3			0.300	1
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measuring instrument for frequencies (direct measurement)

40...80 Hz	2.0	FRZ-D1	GH V022 4103 R0001	35890 9			0.300	1
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Changeover switches

voltmeter changeover switch

L1, L2, L3	0.5	MCV 4	GH V022 5902 R0001	06280 6			0.095	1
L1, L2, L3, N	0.5	MCV 7	GH V022 5910 R0002	06290 5			0.110	1

ammeter -changeover switch

0-1-2-3	0.5	MCA 4	GH V022 5928 R0003	06300 1			0.110	1
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① bbn no. 40 12233

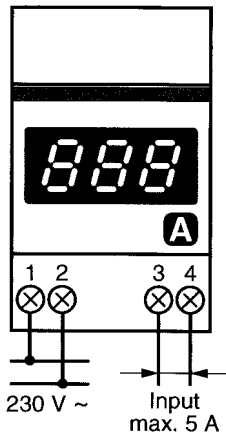
code AMT - D1

	1	2	3	4	5	6	7	8	OFF	ON		1	2	3	4	5	6	7	8	OFF	ON	
150	█	█	█	█	█	█	█	█	OFF	ON		█	█	█	█	█	█	█	█	OFF	ON	15
200	█	█	█	█	█	█	█	█	OFF	ON		█	█	█	█	█	█	█	█	OFF	ON	20
250	█	█	█	█	█	█	█	█	OFF	ON		█	█	█	█	█	█	█	█	OFF	ON	25
400	█	█	█	█	█	█	█	█	OFF	ON		█	█	█	█	█	█	█	█	OFF	ON	40
600	█	█	█	█	█	█	█	█	OFF	ON		█	█	█	█	█	█	█	█	OFF	ON	60
999	█	█	█	█	█	█	█	█	OFF	ON		█	█	█	█	█	█	█	█	OFF	ON	99,9

SK 0197 Z 99

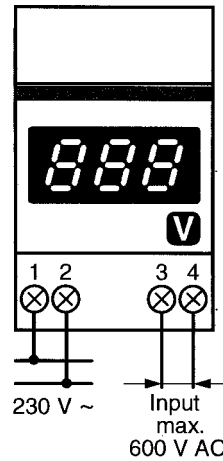
Before using the measuring instrument, adapt device to actual transformation ratio of the transformer by using the coding switch.

wiring diagrams



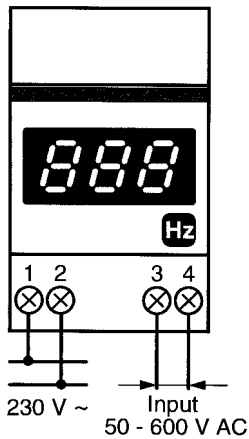
SK 0104 Z 00

AMT - D1



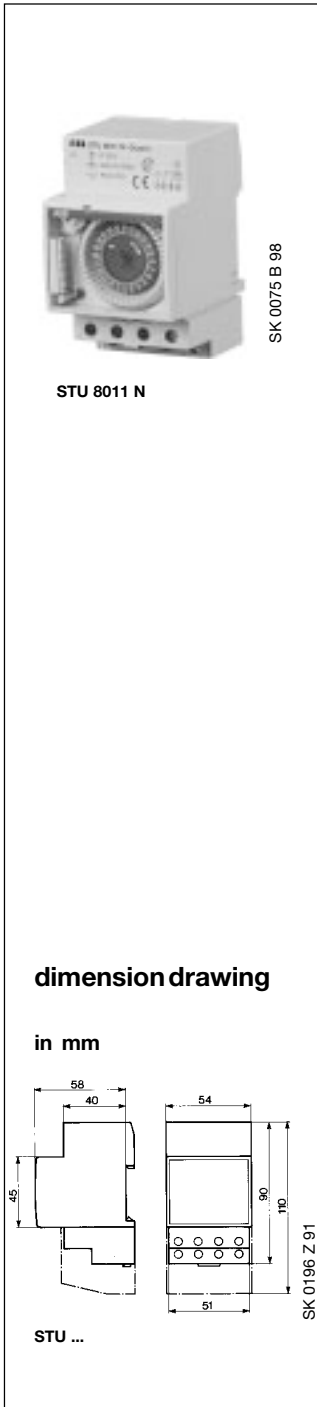
SK 0105 Z 00

VLM - D1



SK 0106 Z 00

FRZ - D1



Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 54 mm = 3 modules
 colour: grey, RAL 7035

Special features

- visible operation check
- position indicator
- preselection of ON or OFF position
- permanent ON / OFF switch
- summer time and winter time changeover through bi-directional precision positioning
- transparent cover sealable
- protection against electric shock according to DIN VDE 0106 Part 100 (BGV A2)

Joint technical data

rated voltage: 230 V ~ ± 10%
 switching capacity: 16 (4) A/250 V p, cos j = 1 (cos j = 0.6)
 power consumption: max. 2.5 VA
 permissible ambient temperature: - 20 °C/-4°F ... + 50 °C/122°F
 switching position: with control segment
 contact: potential-free, maximum opening less than 3 mm (μ)
 casing and insulation material: heat resistant, self-extinguishing thermoplastic
 electric connection : box terminals
 degree of protection: IP 20 according to DIN 60 529
 class of protection: II according to EN 60 335-1 if installed as prescribed

Selection table

contacts	switching capacity	power loss W	order details	bbn	price	price group	weight 1 pc. kg	pack. unit pc.
			type code	order code	EAN	DM		

Synchronous time switches without running reserve

drive: self-starting synchronous motor
 rated voltage: 230 V ~, 50 Hz ①

time dial: 24 h (48 segments)

1 W	μ 16 A	5	STU 6011 N	GH V021 6011 R0003	42890 3		0.240	1
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Quartz time switches with approx. 150 h running reserve at 20 °C/68°F

drive: quartz-controlled stepping motor
 rated voltage: 230 V ~, 45 - 60 Hz ①
 accuracy: ≤ 1 s/day at 20 °C/68°F

start-up after running reserve is exhausted: after a few minutes
 full running reserve is available: approx. 3 days after connection to operating voltage

Time dial: 24 h (48 segments)

1 W	μ 16 A	5	STU 8011 N	GH V021 8011 R0003	42900 9		0.275	1
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Cover for terminals to be mounted on rails, sealable

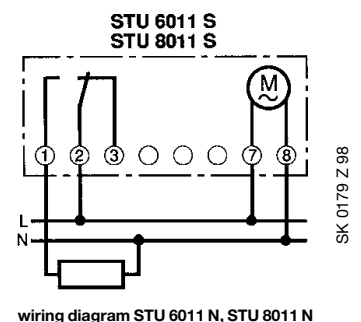
for STU ...			STU-AB 3	GH V021 0895 P0007	63270 1②		0.080	1
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① special voltages on request

② bbn no. : 40 12233

switching intervals

time switch type	switching intervals on 24 h dial	segments
STU 6011 N	30 min	48 segments
STU 8011 N	30 min	48 segments



wiring diagram STU 6011 N, STU 8011 N



STT-111 N

SK 0182 Z 98



STT-117 N

SK 0071 B 98

Timer – programmable time switches, microprocessor-controlled

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022
flange frame installation in doors and cover

mounting depth: 68 mm
 mounting width: STT-111, -117, -127, -227 35 mm = 2 modules
 STT-467, -467F 105 mm = 6 modules
 colour: grey, RAL 7035

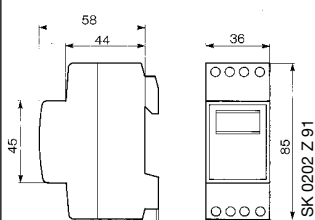
The initial setting of STT digital time switches is according to CET and includes automatic adjustment to summer time and winter time.

Technical data

	STT-111 N, STT-117 N STT-127 N, STT-227 N	STT-467 STT-467F
rated voltage:	230/240 V ~ + 6% – 10%	230 V/240 V ~ + 6% – 10%
frequency:	50 ... 60 Hz	50 ... 60 Hz
switching capacity at 250 V ~:	μ 16 A, cos ϕ = 1 μ 10 A, cos ϕ = 0.6	μ 10 A, cos ϕ = 1 μ 6 A, cos ϕ = 0.6
contact complement:	STT-111: 1 NO, STT-117: 1S STT-127: 1 W, STT-227: 2 W	4 W
contacts:	potential-free	potential-free
contact opening:	< 3 mm (μ)	< 3 mm (μ)
contact material:	Ag SnO ₂	Ag CdO
power consumption:	max. 10 VA	7 VA
running reserve at 20 °C/68°F:	ca. 3 years	3 years; data save in OFF position 10 years
accuracy:	≤ 1s/day at 20°C/68°F	≤ 1s/day at 20°C/68°F STT-467F DCF 77 synchronous
minimum switching interval:	1 minute	1 minute/1 second pulse programme 1-59 sec.
switching accuracy:	to the second	to the second
time base:	quartz	quartz STT-467F Quartz, DCF 77 time
permissible ambient temperature:	– 10°C/+14 °F ... + 50 °C/122 °F	timer – 10°C/+14°F ... + 45°C/113°F aerial – 20°C/-4°F ... + 70°C/158°F
class of protection:	II according to EN 60 335-1	II according to EN 60 335-1
degree of protection:	IP 20 according to EN 60 529	IP 20 according to EN 60 529
protection against electric shock:	according to DIN VDE 0106 Part 100 (BGV A2)	according to DIN VDE 0106 Part 100 (BGV A2)
channels/memory locations:	STT-111: 1/14, STT-117: 1/14 STT-127: 1/36, STT-227: 2/36	STT-467: 4/128 STT-467F: 4/128
battery:	environmentally friendly lithium	environmentally friendly lithium
casing- and insulation material:	heat-resistant, self-extinguishing thermoplast	heat-resistant, self-extinguishing thermoplast

dimension drawing

in mm



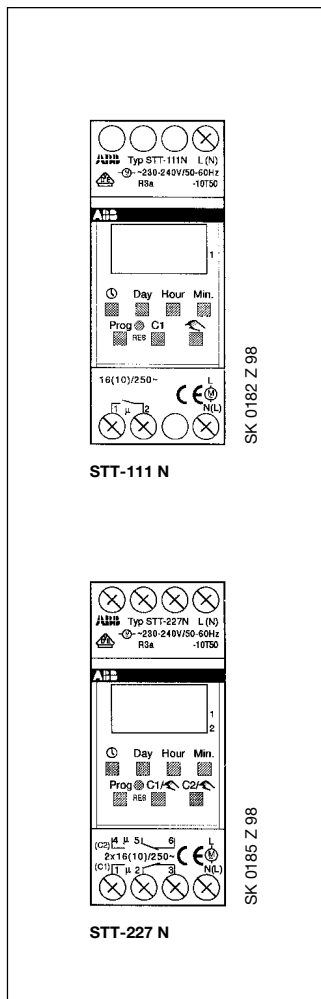
STT-111/117/127/227 N

SK 0202 Z 91

Timer programmable time switches with microprocessor-controlled electronics

Special features STT-111 N, STT-117 N, STT-127 N, STT-227 N

- daily and weekly programme
- easy to operate
- holiday option interrupting the automatic programme for 1 to 99 days
- random switching (only STT-127 N)
- transparent cover sealable
- pre-selectable switching (manual) does not change programme
- pre-selectable switching
- permanent ON/OFF
- adjusts automatically to summer time/winter time
- assignment of own blocks for one, certain or all days of the week (STT-117 N, STT-127 N and STT-227 N) possible



contact comple-ment	memory locations	power loss W	order details type code	order code	bbn 40 16779 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
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1 channel one-day switch with 24 h programme

for 7 switch-on 7 switch-off times (14 memory locations)

1 NO	14	6	STT-111 N	GH V021 0859 R0021	42930 6			0.17	1
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1 channel one day / one week time switch with 24 h / 7 d programme

for 7 switch-on 7 switch-off times (14 memory locations) freely assignable

1 NO	14	6	STT-117 N	GH V021 0859 R0022	42940 5			0.13	1
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1 channel one day / one week time switch with 24 h / 7 d programme and random switching

36 memory locations. Individualised blocks.

1 W	36	6	STT-127 N	GH V021 0859 R0023	42950 4			0.13	1
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2 channel one day / one week time switch with 24 h / 7 d programme

36 memory locations freely assignable to channel 1 or 2. Individualised blocks.

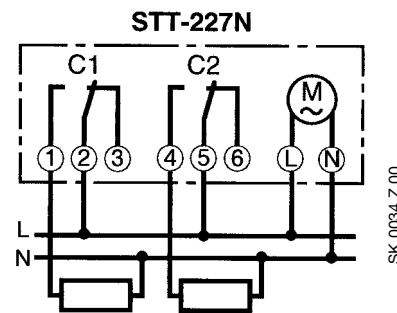
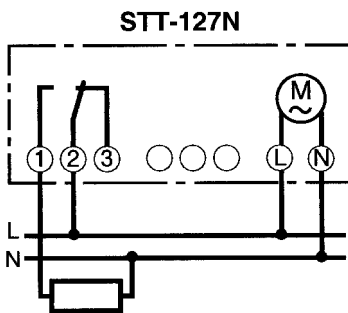
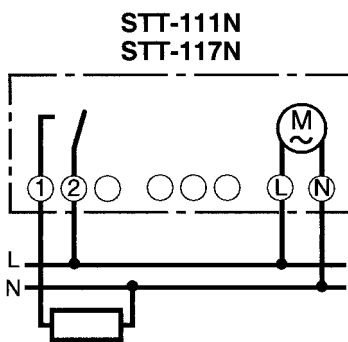
2 W	36	5	STT-227 N	GH V021 0859 R0024	42960 3			0.16	1
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Accessories

flange frame for 2 modules	NO 500-ME1	GH S500 1008 R0001	48450 8 ①					0.083	1
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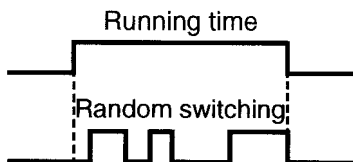
① bbn no. : 40 12233

dimension drawings



Random programme of STT-127 N:

is activated by pushing the "RND pushbutton" and runs during the assigned periods. The ON duration varies from 10 to 120 minutes.



Assignment of blocks for STT-117 N, STT-127 N, STT-127 N, STT-467 and STT-467 F:

Assigning individualised blocks of several days multiplies the number of available switching possibilities, e.g. Tuesday – Saturday 9 a.m. ON (block command = only 1 memory location) Tuesday 6 p.m. OFF (1 memory location) Wednesday to Friday 8 p.m. OFF (block command = only 1 memory location)

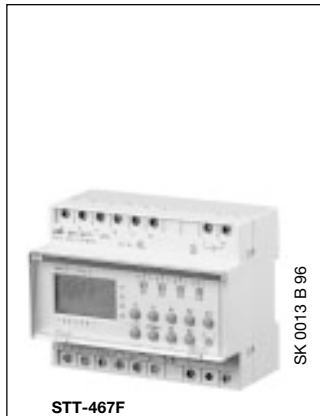
Voltage drop:

The contact is released, relay picks up when voltage has recovered, if no switching time occurs.

programmable time switches with microprocessor-controlled electronics and radio control

Special features STT-467, STT-467 F

- daily, weekly and pulse programme (1-59 s)
- large LCD display
- operator is guided by flashing symbols
- daily, weekly and pulse programme can be combined
- any holiday programmes up to 7 days' duration are possible as 1 x switching. Is deleted automatically upon completion.
- holiday option interrupting the automatic programme 1-45 days
- permanent ON/OFF/automatic individual configuration for each channel
- pre-selectable switching (manual) without changing existing programme
- programmed from outside the distribution board independently of supply system, ends with data save
- summer time / winter time changeover can be activated one week in advance
- transparent cover sealable



STT-467F

contact complement	memory locations	power loss W	order details	bbn	price	price group	weight	pack. unit
			type code	order code	40 16779	DM	1 pc. kg	1 pc.
					EAN			

4 channel one-day / one week time switch with 24 h/7 d and pulse programme

for 64 switch-on and 64 switch-off times, freely assignable to channel 1, 2, 3 or 4. Individualised blocks.

4 W	128	10	STT-467	GH V021 0859 R0008	17820 4		0.450	1
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Radio-controlled 4 channel one-day / one week time switch with 24 h/7 d and pulse programme

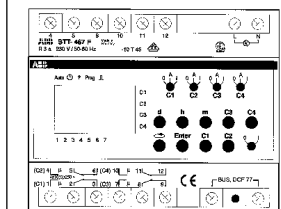
for 64 switch-on and 64 switch-off times, freely assignable to channel 1, 2, 3 or 4. Individualised blocks. Automatic setting of time and weekdays, and: summer times / winter time changeover radio-controlled by DCF 77 radio signal (aerial FA/A 1.1 required).

4 W	128	10	STT-467 F	GH V021 0859 R0009	17830 3		0.450	1
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Aerial for DCF 77 signal reception

in surface mounting casing IP 54 with LED display. Connection of up to 10 timers to the 2-core aerial bus.

			FA/A 1.1	GH Q605 0031 R0011	15260 0		0.100	1
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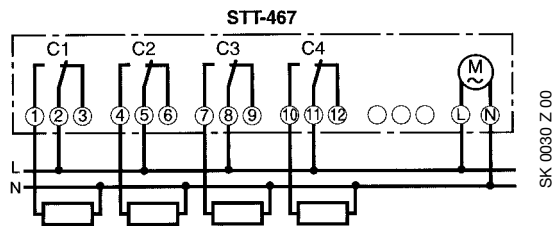
SK 0221 Z 95



FA/A 1.1

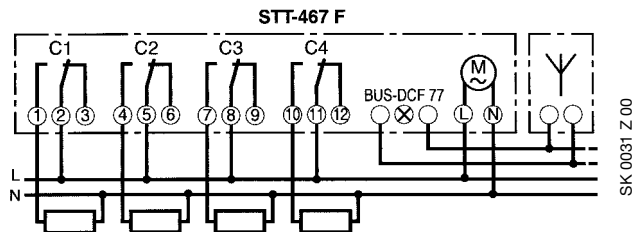
4 changeover switches

STT-467 (4 channels)



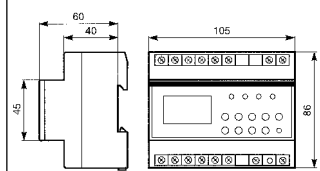
4 changeover switches

STT-467F (4 channels) radio-controlled via aerial DCF 77



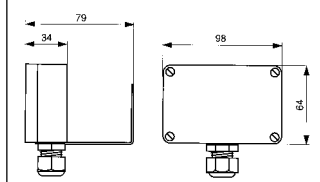
dimension drawings

in mm



STT-467 ...

SK 0201 Z 99



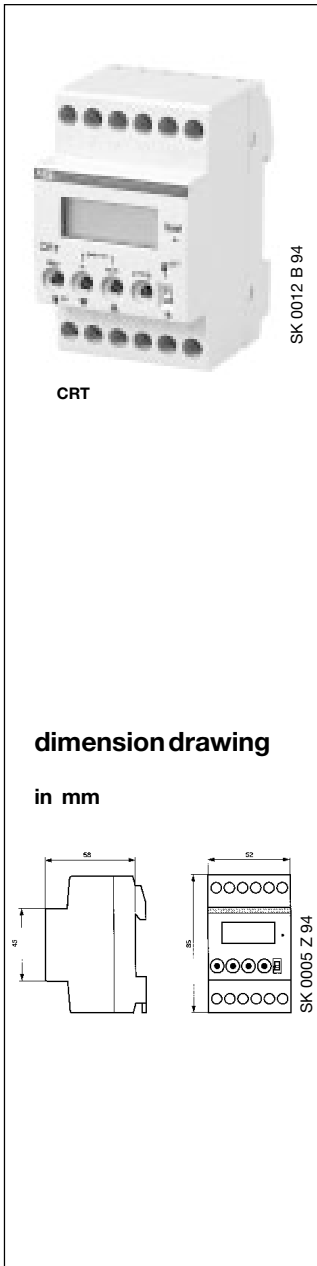
FA/A 1.1

SK 0074 Z 95

Radio control of STT-467F with aerial FA/A 1.1

The radio timer adapts fully automatically to the standard time transmitted via radio control, thus using the most precise timing method available. The long-wave receiver integrated into the aerial receives the time frames that are transmitted by the official DCF 77 time transmitter. The timer is synchronised after approx. 2 to 3 minutes, upon receipt of two identically coded signals. Then, synchronisation is permanent. Transmitter DCF 77 is based in Mainflingen near Frankfurt /Main and has a reach of some 1,000 km (For best results, aerials should not be installed in the basement or inside the distribution board). The connection is implemented via a 2 strand, non-shielded power cable (max. 600 m) to which up to 10 radio timers may be connected. Optical indication of polarity, short circuit and break of the aerial facilitates the installation process.

Modular installation equipment Modular clock thermostat



SK 0012 B 94

CRT

dimension drawing

in mm

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
 mounting width: 53 mm = 3 modules
 colour: grey, RAL 7035

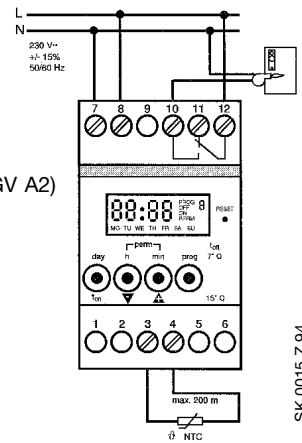
Application

CRT modular clock thermostat is used for the individual time-related control of room temperatures in private, commercial or industrial buildings. Thanks to the modularity of the equipment and the externally fitted probe, CRT thermostats allow for graded temperature control of various rooms in a building to be carried out from one single location. E.g. by individualised controlling of radiator valves, blowers, air heaters, mixing valves with actuator or circulating pumps.

Technical data

rated voltage: 230 V ~ ± 15%, 50 ... 60 Hz
 switching capacity (relays): μ 8 A, 250 V ~
 operating temperature: -10 °C/+14°F... 55 °C/131°F
 running reserve: 48 h
 battery charging time: 72 h
 memory locations: 16 (8 on, 8 off)
 protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
 connection cross section: up to 10 mm²
 temperature adjustment range: 2 °C / 35 ° F ... 49.9 °C / 122 ° F
 graduation of temperature scale: 0.1 °C / 32.2 ° F
 temperature accuracy: ±1 °C
 updating of temperature indication: every 60 sec.
 max. cable length of probe: 200 m
 degree of protection of probe: IP 65

wiring diagram



SK 0015 Z 94

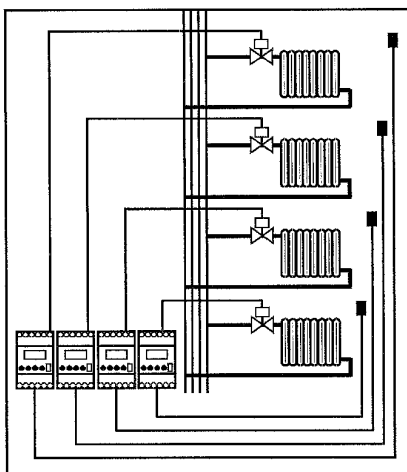
Selection table

modular clock thermostat with probe

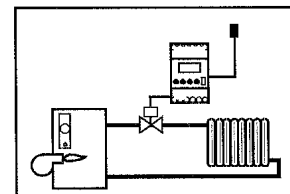
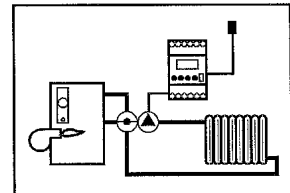
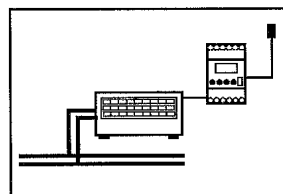
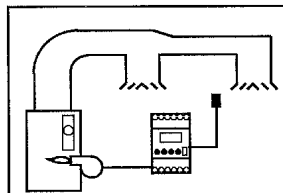
contacts	switching capacity	power loss W	order details	bn	price	price group	weight	pack. unit
			type code	order code	80 12542 EAN	1 pc. DM	1 pc. kg	pc.
1 W	μ 8 A	5	CRT*	GH V021 5761 R0001	02410 1		0.316	1

* discontinued type

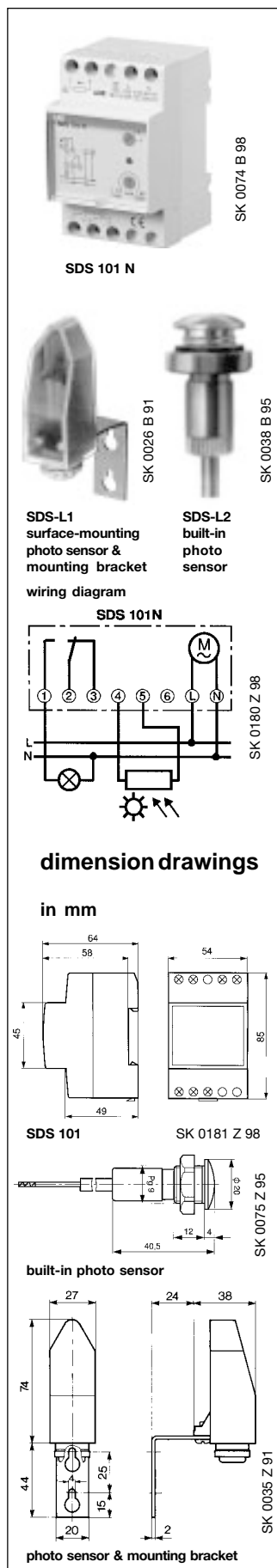
application examples



SK 0013Z 94



SK 0014 Z 94



Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
mounting width: 54 mm = 3 modules
colour: grey, RAL 7035

Application

Series SDS 101 twilight switch is used to automatically switch on / off lighting systems in relation to daylight. A photo sensor measures the brightness of the light and transmits the value thus obtained to the switch. The operation of the twilight switch can be interrupted by a time switch as is required (e.g. at a specific time, on a particular day of the week). SDS 101 is predominantly used to control the lighting of streets, shop windows and staircases.

Technical data

rated voltage: 230 V ~ ± 10%
rated voltage photo sensor: 10 V, 1 mA
contact: potential-free: opening less than 3 mm (µ)
contact material: Ag CdO
switching capacity: 10 A/250 V ~; cos φ = 1; 6 A/250 V ~; cos φ = 0.6
filament lamp load: 1000 W
halogen lamps (230 V ~): 1000 W
fluorescent lamps uncorrected/series compensated: 800 W
shunt compensated: 200 W
twin-lamp circuit: 800 W
high pressure vapour lamps: use contactor
power consumption: ca. 2.2 VA
indication of switching position: instantaneously by LED
ON/OFF delay: ca. 80 s, to avoid maloperation caused by lightning, car headlights, etc.
setting: range 1: ca. 3 – 40 Lux stepless adjustment
range 2: ca. 40 – 2500 Lux stepless adjustment
degree of protection: switching device: IP 20
surface-mounting photo sensor: IP 54 with cable from below
built-in photo sensor: IP 65
permissible ambient temperature: switching device: - 10 °C/+14 °F ... + 50 °C/122 °F
photo sensor: - 40 °C/- 40 °F ... + 70 °C/158 °F
cable for photo sensor: 2 wire, max. 100 m
protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
radio interference suppression: according to VDE 0875/6.77
radio interference suppression level: "N" according to EC Directive 76/889/EEC

Selection table

name	power loss W	order details		bbn 40 16779 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.	
		type code	order code						
Twilight switch									
incl. photo sensor and mounting bracket	4	SDS 101 N	GH V021 0879 R0003	42910 8			0.270	1 set	
incl. built-in photo sensor	4	SDS 101-L2 N	GH V021 0879 R0004	42920 7			0.270	1 set	
surface-mounting photo sensor incl. mounting bracket for SDS 101	-	SDS-L 1	GH V021 0895 R0004	53020 5①			0.050	1	
built-in photo sensor incl. 1.5 m connection cable for SDS 101	-	SDS-L 2	GH V021 0895 R0005	16210 4			0.150	1	

① bbn no. : 40 12233

Modular installation equipment

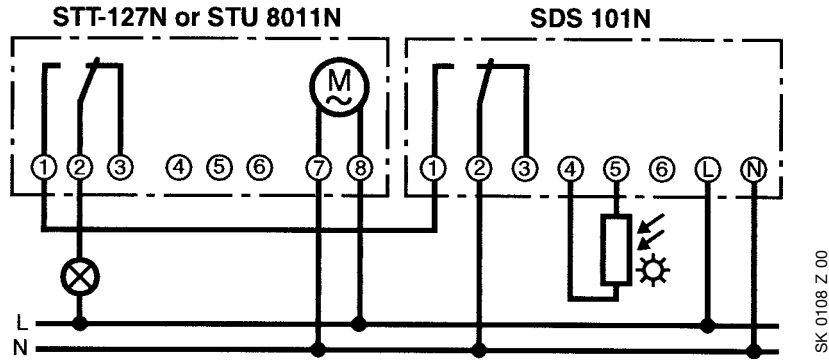
Twilight switch SDS 101

Application in practice

example no. 1:

twilight switch and time switch

The operation of twilight switch SDS 101 N is interrupted by time switch STT 127 N/8011 N every day at the same selected time, e.g. at night from 11 p.m. to 5 a.m..

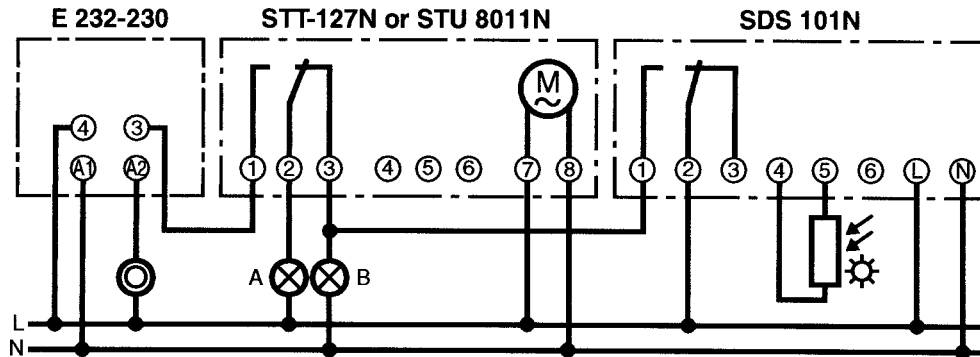


SK 0108 Z 00

example no. 2:

twilight switch, time switch and staircase lighting time-delay switch (t.d.s.)

automatic "day-evening-night sequence" with SDS 101 N / STT 127 N or STT 8011 N that is brightness-dependent and staircase lighting time-delay switch (t.d.s.) E 232-230. Staircase lighting (A) and house number illumination (B) are switched to brightness-dependent mode in the morning and in the evening . At night, a time switch switches the staircase lighting to a minute mode with E 232.



SK 0109 Z 00



STL-101

SK 0085 B 97



STL-103

SK 0086 B 97

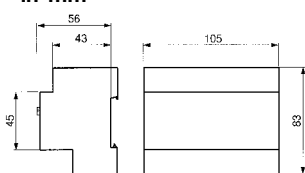


photo sensor mit
mounting bracket

SK 0026 B 91

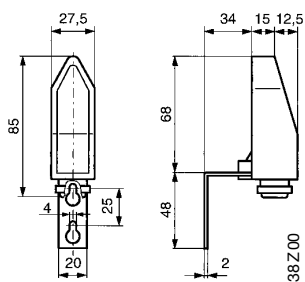
dimension
drawing

in mm



STL-101
STL-103

SK 0134 Z 97



STL-LF 103

SK 0038 Z 00

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
mounting width: 105 mm = 6 modules
colour: grey, RAL 7035

Application

The light level switch is used to switch on and off automatically lighting installations depending on the daylight. A photo sensor fitted at the window measures the daylight intensity and forwards the value measured to the connected light level switch(es). The light level switches switch the lighting fittings on or off as is determined by the disconnection and reconnection values.

One photo sensor can be connected to up to seven light level switches. To suit the individual requirements, the relevant disconnection and reconnection values can be preset for each light level switch. This makes independent switching of various lighting groups and lighting trunkings possible.

The switching hysteresis prevents excessive switching. Additional time-delay functions prevent spurious switching caused by external influences such as transient clouds, strokes of lightning, etc.

STL 101/103 is predominantly used to control lighting in offices, factories, etc.

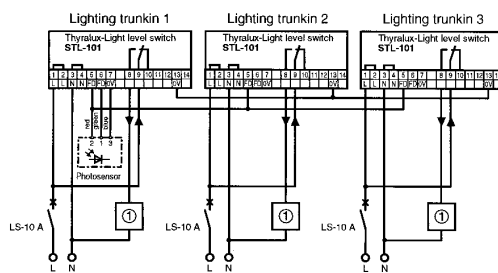
Technical data

operational voltage: 230 V ~ 50/60 Hz, DC not allowed (will destroy gear)
power consumption: ca. 2 W (ca. 3 W at STL 103)
fusing: external 10 A / for each load circuit
operating temperature: 0 °C / 32 °F ... + 45 °C / 113 °F, supply air in horizontal service position
photo sensor input: one photo sensor
pushbutton input: 1 pushbutton (NO contact), shunt connection of any given number of pushbuttons possible
control voltage range: 0 - 5 V DC (light sensor, pushbutton and switch), basic insulation according to IEC 664 (10/92) no safety extra low voltage (SELV)
contact load: max. 10 A/250 V ~ or 10 A/30 V - (μ)
switching values: adjustable between ca. 10 - 1000 Lux and 200 to 20 000 Lux
delay time: adjustable in the range of 5 seconds to 20 minutes
class & degree of protection: II (total insulation), IP 20
terminals: 0.5 mm² - 2.5 mm² for one-wire conductor or with connector sleeve
max. cable length: 100 m, control leads 0.5 mm², load and supply lines 1.5 mm²
pollution degree: 2 (dry, non-conductive, according to IEC 664, 10/92)
protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
terminal assignment: see wiring examples, faulty installation may lead to malfunctioning or destruction
CE requirements: EMC fulfilled according to EN 61547 (04/96), low voltage according to IEC 669-2-1 (11/94)

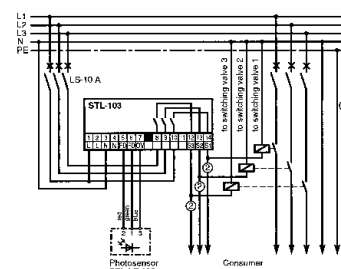
Selection table

name/ application	power loss W	order details type code	bbn 40 12233 order code	price 1 pc. EAN	price group DM	weight 1 pc.	pack. unit kg pc.
light level switch for one lighting group	6	STL-101 GJ V501 0000 R0011	60440 1			0.400	1
light level switch for three lighting groups	8	STL-103 GJ V501 0000 R0012	12700 4①			0.450	1
photo sensor (IP 54) and mounting bracket		STL-LF 103 GH V021 1370 R0171	53210 0			0.100	1

① bbn no. 40 16779



SK 0007 Z 00



SK 0009 Z 00

① lamp contactor to be designed to fit flexible cord loads up to 2 kVA switchable without contactor

① designed to fit the individual connected load
② loads up to 2 kVA switchable without contactor

Calculation of profitability

Determination of the daylight factor

The daylight factor indicates the percentage of outside illuminance measured at a specified point inside a building. To determine the average daylight factor, the measured inside illuminance E_i is divided by the measured outside illuminance E_a and then multiplied with 100:

$$T = \frac{E_i}{E_a} \times 100 \text{ [%]}$$

Measurements should be made when skies are cloudy, because the daylight curves used for further calculations were made under these conditions, too.

Practical application

An open-plan office is lit by two lighting trunkings mounted in parallel to the windows. The results of the measurements made are as follows :

outside daylight $E_a = 17,000 \text{ Lux}$

inside daylight E_i (with lighting switched off)

E_{i1} = lighting trunking 1 (distance from window = 1.5 m) = 3,000 Lux

E_{i2} = lighting trunking 2 (distance from window = 4.5 m) = 1,000 Lux

results in the following daylight factor:

$$T = \frac{E_i}{E_a} \times 100 \text{ [%]}$$

$$T_1 = \frac{3000}{17000} \times 100 = 17.6\%$$

$$T_2 = \frac{1000}{17000} \times 100 = 5.9\%$$

Required brightness value for workplaces according to DIN 5035 = 750 Lux. Working hours from 7 a.m. to 5 p.m. = 10 hours, results in a lighting operation time of 2,400 hours a year for 240 working days.

Calculation of the daylight value

value at which the lighting system can be switched off, because the specified light value of 750 Lux is obtained through daylight alone.

$$\frac{E_{\text{schedule}}}{T} \times 100 = \text{outside brightness [Lux]}$$

$$\text{lighting trunking 1} = \frac{750 \text{ Lux}}{17.6} \times 100 = 4,260 \text{ Lux,}$$

$$\text{lighting trunking 2} = \frac{750 \text{ Lux}}{5.9} \times 100 = 12,700 \text{ Lux}$$

Savings:

according to the following calculation

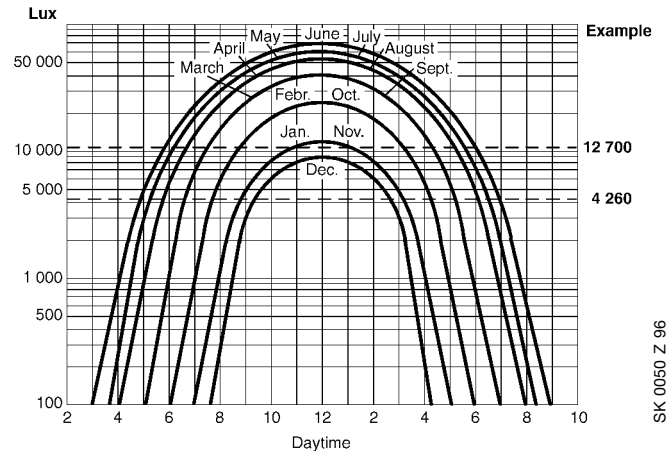
lighting trunking 1 = 2,080 non-operation hours

lighting trunking 2 = 1,680 non-operation hours

expressed as percentages:

lighting trunking 1 = 87.5% of previous operation time

lighting trunking 2 = 70.0% of 2,400 hours p.a.



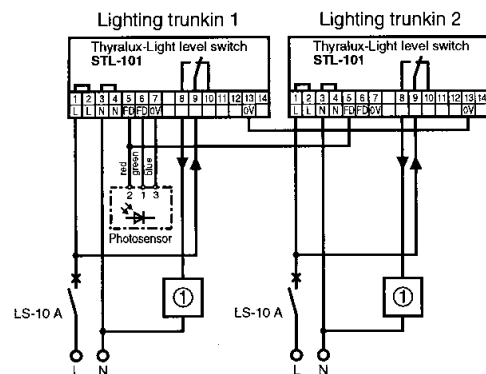
SK 0050 Z 96

Calculation of non-operation times by using daylight curves

lighting trunking	months	time		no. of non-operation hours (average 20 working days per month)	
		from	to	per day	per month
No. 1 4 260 Lux	December	9:30	14:30	5	100
	Jan + Nov	8:45	15:15	6:30	130
	Feb + Oct	8:00	16:00	8	160
	Mar to Sep (7 months)	7:00	17:00	10	200
				annual non-operation hours = 2 080	
No. 2 12 700 Lux	December	-	-	-	-
	Jan + Nov	11:00	13:00	2	40
	Feb + Oct	9:00	15:00	6	120
	Mar + Sep	7:30	16:30	9	180
	Apr to Aug (5 months)	7:00	17:00	10	200
				annual non-operation hours = 1 680	

In the above example, the lighting remained constantly switched on throughout the working hours. To assess profitability in other cases, operation times must be established first.

The serviceable life of fluorescent and metal vapour lamps is reduced by frequent switching. The operation breaks, however, make good for this disadvantage or may even prolong the serviceable life of the lamps used.



① lamp contactor

SK 0003 Z 00

Modular installation equipment Dimmer STD 50 incandescent and low-volt halogen lamp control equipment

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
mounting width: 52.5 mm = 3 modules
colour: grey, RAL 7035

Dimmer for brightness control STD 50-3

Application:

Brightness control of incandescent lamps and 230 V halogen lamps and low-volt halogen lamps with conventional transformers.

Technical data:

rated voltage: 230 V AC \pm 10% / 50 Hz
rated current: max. 2.3 A
max. switching capacity: 500 W/VA
min. switching capacity: 20 W/VA (dependent on ambient temperature, see diagram)
power consumption: 5 W
degree of protection / protection against electric shock: IP 20 / according to DIN VDE 0106 Part 100 (BGV A2)
radio interference suppression: interference level N according to VDE 0875/11.84
ambient temperature: 0°C/32°F ... 35°C/95°F

Conventional transformers:

When operating conventional transformers, each transformer must be primarily protected against short circuits according to the instructions of the manufacturer. Safety isolating transformers according to DIN VDE 0551 must be used.

It is not allowed to switch loads via a serial switching contact, because overcurrents and overvoltages may occur during the resetting process which may lead to a destruction of the dimmer. Secondary no-load operation of conventional transformers is neither allowed when putting the equipment into operation nor during operation.

Always operate conventional transformers at rated load. To achieve identical brightness of the halogen lamps throughout the full operating range from bright to dark, transformers should be used that have the same secondary voltage and rating.

Dimmer for brightness control STD 50-4

Application:

Brightness control of incandescent lamps and 230 V halogen lamps and low-volt halogen lamps with electronic transformers.

Technical data:

rated voltage: 230 V AC \pm 10% / 50 Hz
rated current: max. 2.3 A
max. switching capacity: 420 W/VA
min. switching capacity: 40 W/VA (dependent on ambient temperature, see diagram)
power consumption: 5 W
degree of protection / protection against electric shock: IP 20 / according to DIN VDE 0106 Part 100 (BGV A2)
radio interference suppression: interference level N according to VDE 0875/11.84
ambient temperature: 0°C/32°F ... 35 °C/95 °F

Note:

To achieve identical brightness of the halogen lamps throughout the full operating range from bright to dark, electric transformers should be used that have the same secondary voltage and the same rating.

Conventional transformers must not be connected to this dimmer (loss of warranty).

The electronics protect the dimmer from load-related short circuits. Where a fault occurs by reason of temperature-related overloads, the dimmer self-adjusts the brightness set to a non-critical brightness level; in this case, connected loads may flicker. To restore normal functioning, check the load of the dimmer and reduce it if appropriate. Allow the dimmer sufficient time to cool down before putting it back into operation.

Influence of ambient temperature on control power

The dimmer carries an indication as to the certified rated power.

Where higher ambient temperatures occur, reduce them as is specified in the diagram.

At 50 °C/122°F ambient temperature, the rated power drops to 57%.


Selection table

name/ application	power loss	order details type	code	bbn 40 16779 order code	price 1 pc. EAN	price group DM	weight 1 pc.	pack. unit kg pc.
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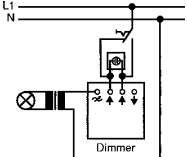
Dimmer for brightness control

incandescent lamps, 230 V ~ halogen lamps, low-volt halogen lamps with conventional transformers (phase crossover)	5 ①	STD 50-3	GH V021 1370 R0074	02790 8			0.155	1
incandescent lamps, 230 V ~ halogen lamps, low-volt halogen lamps with electronic transformers	5 ①	STD 50-4	GH V021 1370 R0075	03300 8			0.105	1

① power loss = 1% of connected power (5 W max.)

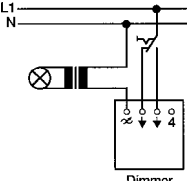


STD 50 SK 0078 B 97



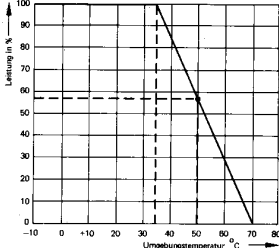
SK 0025 Z 00

dimmer STD-50-3 in two-way circuit, IV halogen lamps via transformer(DIN VDE 0551)



SK 0146 Z 98

dimmer STD-50-4 in two-way circuit, IV halogen lamps via electronic transformer



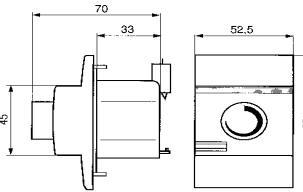
SK 0044 Z 91

Leistung in %

Umgebungstemperatur °C

dimension drawing

in mm



STD-MTS SK 0129 Z 97



SK 0087 B 96

STD-MTS

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
mounting width: 35 mm = 2 modules
colour: grey, RAL 7035

Memory touch controller STD-MTS

Application:

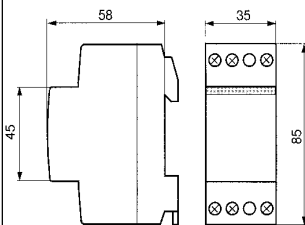
Brightness control of fluorescent lamps through electronic control gear units with 1-10 V DC control input.

Technical data:

rated voltage: 230 V AC \pm 10% / 50 Hz
rated current: 4 A $\cos \varphi 0.9$ (approx. 10 electronic control gear units, follow indications of manufacturer)
3 A $\cos \varphi 0.5$
max. switching capacity: 700 VA
power consumption: \leq 1 W
control voltage: < 1 ... 10 V DC
control current: max. 50 mA DC
degree of protection: IP 20
protection against electric shock: according to DIN VDE 0106 Part 100 (BGVA2)
ambient temperature: 0°C/32°F ... 35°C/95°F

dimension drawing

in mm



STD-MTS

SK 0150 Z 96

operation via extensions (parallel operation)

max. cable length: 100 m
The phase of the power supply input "L" must be the phase of the control phase for extension input "1" (see below).

Setting of background brightness

Press control element (e.g. pushbutton) for approx. 30 sec. to switch into programming mode, which STD-MTS indicates by adjusting to a minimum brightness level. Select desired brightness level and release the pushbutton. Approx. 30 sec. after having released the pushbutton, STD-MTS returns automatically to maximum, thus signalling that the setting has been completed successfully.

Note

The previous brightness value is maintained even after switching off the device (memory function). If a voltage failure occurs, STD-MTS loses this value and will subsequently switch on at maximum brightness. When STD-MTS is used for the first time, it goes from bright to dark, and every stop will result in a change of the dimming direction. The dimmer stops at maximum brightness, and changes its dimming direction after having arrived at the minimum value.

Parallel operation

Activate control element and all STD-MTS's will be switched on and dimmed simultaneously via the Nebenstelle. Lighting systems may also be operated by using a uniform brightness value, to do so, press the control element for approx. 10 sec. The lighting system will be switched to maximum brightness and may then be operated synchronously (below).

Selection table

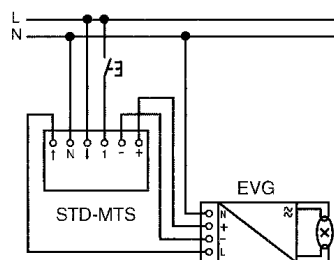
name	power loss W	order details type code	product code	bbn 40 16779 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
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Memory touch controller for electronic control gear units

rated current/control output 4 A $\cos \varphi 0.9$; 3 A $\cos \varphi 0.5$, switching capacity 700 VA

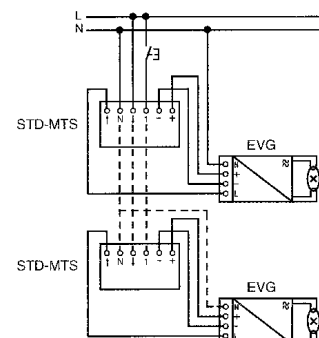
for electronic control gear with control input 1-10 V DC control current 50 mA DC	\leq 1 W	STD-MTS	GH V021 0881 R0004	27070 0			0,110	1
-----------------------------------------------------------------------------------	------------	---------	--------------------	---------	--	--	-------	---

brightness control of fluorescent lamp with 1 - 10 V DC control input with memory touch controller STD-MTS with external pushbutton, e.g. E 225



SK 0190 Z 99

brightness control of fluorescent lamps with 1 - 10 V DC control input. Two or more STD-MTS memory touch controllers are controlled by a pushbutton.



SK 0189 Z 99

Modular installation equipment

Universal high-performance dimmer for phase control and reverse phase control

DIN EN 60 669-1,
DIN EN 50 081-1,
DIN EN 50 082-2

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
mounting width: 70 mm = 4 modules
colour: grey, RAL 7035

Application

STD-1000 U universal high-performance dimmer is used to control the brightness of:

- incandescent lamps
- 230 V halogen incandescent lamps
- low-volt halogen lamps with wound transformers, e.g. **ABB**: Si-TR 20 ... 500
- electronic transformers for low-volt halogen lamps e.g.: **ABB**: ETR-NO, ETR-NA, ETR-NE

The universal high-performance dimmer can be optionally operated from an electronic potentiometer (STD-EP), one or more pushbuttons or directly at the device itself. Press the MEMO pushbutton to save the desired minimum brightness level.

Use actuator drivers SB/NO 2.2 or PSB/NO 1.1 to implement EIB solutions.

Universal high-performance dimmers STD-1000 U are operative in the range of up to 18 kVA/kW, and parallel use of a maximum of 18 devices via pushbuttons is possible.

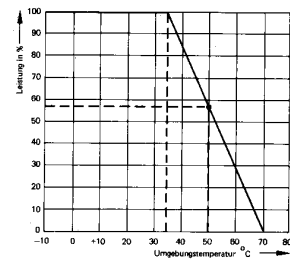
Shunt connection is not possible in the case of potentiometer extension.

Not suitable for electric control gear with 0 - 10 VDC control (for 0 - 10 VDC control, see memory touch controller, page 45).

Technical data

rated voltage: 230 V; 50 Hz + 5% - 10%
rated current: 4.78 A
max. connected load: 1 kW/kVA
min. connected load: 100 W/VA
pushbutton input cl. 1: 230 V ~ ± 10%, 50 Hz
switch input cl. 5: 230 V ~ ± 10%, 50 Hz
max. cable length: 100 m
capacity increase by pushbutton operation : 18 kW/kVA
radio interference suppression: EN 55 014 interference level N
protection against electric shock: according to DIN VDE 0106 Part 100 (BGV A2)
ambient temperature: - 10 °C/+14 °F to + 35 °C/95 °F, higher temperatures reduce capacity (see diagram)
electronic protection against short circuit, overloads and overtemperatures

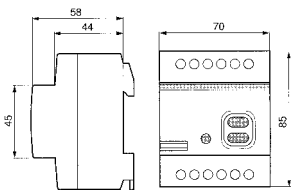
connected loads ambient temperature diagram



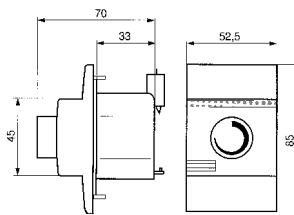
STD-1000 U

dimension drawings

in mm



STD-EP



Selection table

name	power loss W	order details type code	product code	bbn 40 16779 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
High-performance dimmer	10 ①	STD-1000 U *	GH V021 0881 R0003	25940 8			0.325	1

① power loss = 2% of connected load

Note: load and control lead must never run in a single cable. No switching of loads in the dimming circuit allowed.

* discontinued type → replaced by STD 500 MA and STD 420 SL

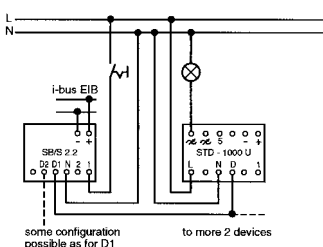
Electronic potentiometer

rated current/control output 4 A cos φ 0.9; 3 A cos φ 0.5 ②, switching capacity 700 VA

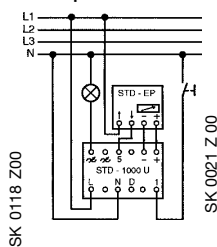
for electronic control gear with control input 10 VDC control current 50 mA DC	power loss W	order details type code	product code	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
	5 ①	STD-EP	GH V021 1370 R0076	27050 2			1

① power loss = 1% of connected load (5 W max.)

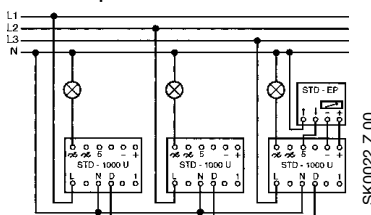
EIB-operation



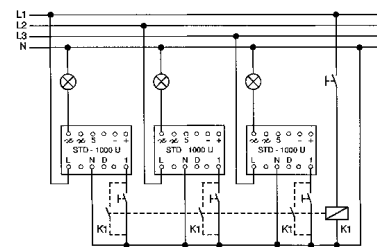
stand-alone with pushbutton or EP



group with electronic potentiometer

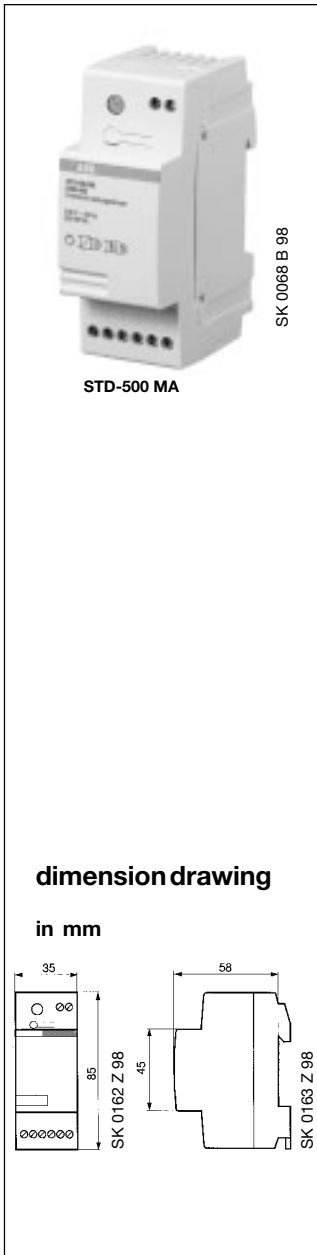


stand-alone or in a group via contactor controls



Modular installation equipment Universal high-performance dimmer for phase control and reverse phase control

DIN EN 60 669-1,
DIN EN 50 081-1,
DIN EN 50 082-2



STD-500 MA

SK 0068 B 98

dimension drawing

in mm

Equipment for panel installation on DIN rails (35 mm) according to DIN EN 50 022

mounting depth: 68 mm
mounting width: 35 mm = 2 modules
colour: grey, RAL 7035

Universal high-performance dimmer STD-500 MA power extension with STD-420 SL

Application/loads

- incandescent lamps
- 230 V halogen lamps
- low-volt halogen lamps via electronic transformers
- low-volt halogen lamps via conventional transformers

Combined dimming with conventional and electronic transformers is not allowed!

Calculation of rated power

rated power = transformer loss* + lamp wattage

* for electronic transformers 5% of rated power of transformer

* for conventional transformers 20% of rated power of transformer

Conventional transformers

When operating conventional transformers, each transformer must be primarily protected against short circuits according to the instructions of the manufacturer. Safety isolating transformers according to DIN VDE 0551 must be used. It is not allowed to switch loads via a serial switching contact, because overcurrents and overvoltages may occur during the resetting process which may lead to a destruction of the dimmer. Secondary no-load operation of conventional transformers is neither allowed when putting the equipment into operation nor during operation. Always operate conventional transformers at rated load. To achieve identical brightness of the halogen lamps throughout the full operating range from bright to dark, transformers should be used that have the same secondary voltage and rating.

Technical data

rated voltage:	230 V AC ± 10% / 50 Hz
rated current:	STD-500 MA: 2.17 VA STD-420 SL: 1.83 A
max. switching capacity:	STD-500 MA: 500 W/VA STD-420 SL: 420 W/VA
	depends on ambient temperature, see diagram on page 46
min. switching capacity:	STD-500 MA: 60 W/VA STD-420 SL: 200 W/VA
power extension:	up to max. 3 kVA, max. 6 power elements
power consumption:	≤ 6 W
pushbutton input:	230 V AC ± 10% / 50 Hz
max. cable length:	100 m
max. cable length	
- in between data outputs (D1, D2 and D):	2 m
- in between control outputs (NO-NO, G-G):	2 m
degree of protection / protection against electric shock:	IP 20 / according to DIN VDE 0106 Part 100 (BGV A2)
ambient temperature:	0 °C/32 °F ... 35 °C/95 °F

Supply connection and load connection

Supply connection is made via terminals "L" and "N". The load is connected to any of terminals ~ (controlled outputs).

Operation with pushbuttons

The phase of the extension and the phase of the supply voltage must be identical (see 1 and 2).

In the case of switch extensions, the lighting glow lamp must not be connected in parallel (use pushbutton with neutral connection).

When installing the leads make sure that there is an adequate distance between the supply connection and the load connection (min. 5 cm).

For switching and dimming via the data line connected to the D terminal, the dimmer may be operated via EIB control elements SB/NO 2.2 or PSB/NO 1.1 (see 3 and 4).

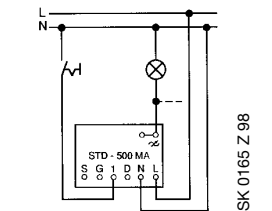
Power extension

For synchronous switching and dimming of a lighting system in excess of 500 W/VA connected load, connect dimmers STD-500 MA and STD-420 SL via the "S" and "G" terminals. Controlled outputs must be connected in parallel (see 2).

Selection table

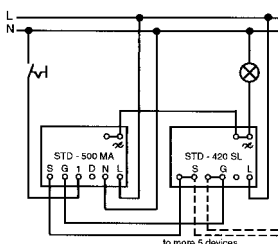
name	power loss W	order details type code	order code	bbn 4016779 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
high performance dimmer	6 W ①	STD-500 MA	GH V021 0881 R0005	42010 5			0.105	1
extension	6 W ①	STD-420 SL	GH V021 0881 R0006	42020 4			0.135	1

① heat dissipation = approx. 2% of the connected load



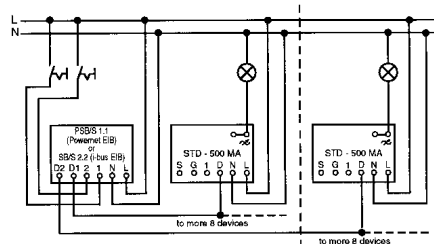
SK 0165 Z 98

1. STD-500 MA



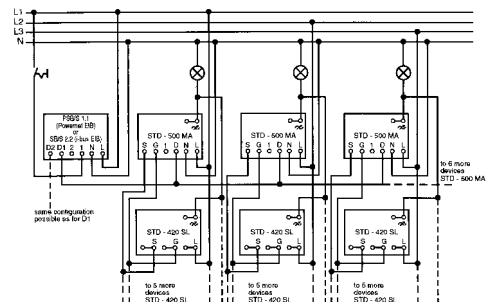
SK 0117 Z 00

2. STD-500 MA, STD-420 SL



SK 0116 Z 00

3. STD-500 MA, SB/NO 2.2 or PSB/NO 1.1



SK 0115 Z 00

4. STD-500 MA, SB/NO 2.2 or PSB/1.1, STD-420 SL

Putting into operation

After connecting the system voltage, the microprocessor integrated in the dimmer analyses the properties of the connected operable load and decides whether phase control or reverse phase control will be used.

During this calibration process, the lighting system can be switched on for up to 6 seconds.

During this period, the malfunction LED is lit, and the device is disabled.

As a rule, the central dimmer may be operated with a pushbutton or the D data line. Where the data line is connected, the central dimmer will not accept operation via the pushbutton line.

Overload

If the electronic overload protection is activated (overload or overtemperature because of improper installation or insufficient cooling) the preset brightness value of the lighting system is reduced, and the malfunction LED is lit. The dimmer is switched off and the malfunction LED switches to permanent ON if overloads or overtemperatures persist for more than 10 minutes.

Switch off system voltage during fault removal. Test load of the dimmer and reduce it if appropriate.

After removal of the overload and a sufficient cooling-down period, the dimmer can be put into operation again.

Short circuit

Short-term short circuits will make the dimmer first switch off the connected loads and subsequently switch them on again. Permanent short circuits will result in a disconnection from the system and the malfunction LED is lit.

Switch off system voltage during fault removal. If the short circuit is removed, the dimmer can be put to operation again.

Pushbutton operation

Press the pushbutton extension momentarily to switch on and off. The last preset brightness value (memory value) is restored automatically.

Switch on at no-light level

Keep the pushbutton extension pressed, and the dimmer will start at background brightness and brightness increases for as long as the pushbutton is pressed.

Dimming

Keep the pushbutton extension pressed. The dimmer changes the brightness of the connected lighting system. Stop to change the dimming direction. At maximum brightness, the dimmer stops, and at its minimum, the dimming direction changes and brightness increases again.

Switch off with soft OFF functionality (see programming functions)

Press the pushbutton extension momentarily. The current value is saved as memory value. The dimmer slowly goes down from the selected brightness to its minimum and is then switched off.

Programming functions (only for pushbutton operation)

The following dimming functions are activated by pressing the MEMO pushbutton for specific periods of time. The flashing rate of the LED indicates the respective function.

Programming of background brightness

Choose the desired background brightness. To save the setting of the background brightness, press the MEMO pushbutton, and release it when the LED has flashed once.

Delete background brightness

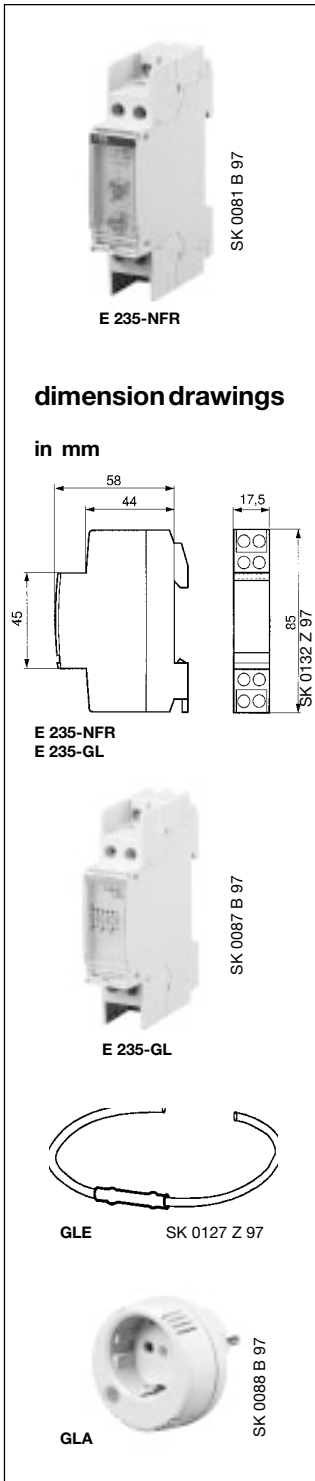
To delete the background brightness saved (reset to minimum background brightness) press the MEMO pushbutton, and release it when the LED has flashed twice.

Programming of soft OFF

Press the MEMO pushbutton, release after LED has flashed three times. The dimmer activates the soft OFF function.

Delete soft OFF

Press MEMO pushbuttons, release after LED has flashed three times.



Application

The mains disconnection relay E 235-NFR disconnects the circuit from the power supply after having interrupted any downstream loads, thus avoiding disturbing electromechanical fields. As long as no load is switched on, the monitored circuit remains one-pole disconnected from the power supply. The neutral conductor and earthing are permanently connected. For monitoring purposes, there is a direct voltage of 4 V. When a load is switched on, the mains disconnection relay switches the phase. The switched current threshold is infinitely adjustable from 5 to 200 mA.

For the purpose of testing or transitory operation of devices with insufficient power consumption, use the integrated rotary switch or the GLA base load adaptor for the socket outlet to suspend the automatic disconnection feature.

For the operation of loads with a current consumption < 5 mA, you can use base load device E 235-GL that is capable of servicing up to three circuits. If, in the case of flush mounting or subsequent installation, there is no extra line available for the base load device, use base load element GLE.

Loads with extremely low current consumption are, e.g., starting fluorescent lamps, electronic control gear of energy-saving lamps, transformers of radio clocks or low-volt halogen lamps, equipment including electronic components e.g. vacuum cleaners, hair-dryers, drilling machines and lighting with electronic dimmers.

If the monitored circuit contains rotary-button dimmers, use the rotary switch to set the mains disconnection relay to "mech. Dimmer auto". This will increase the monitoring direct voltage and the dimmers will be recognised as loads.

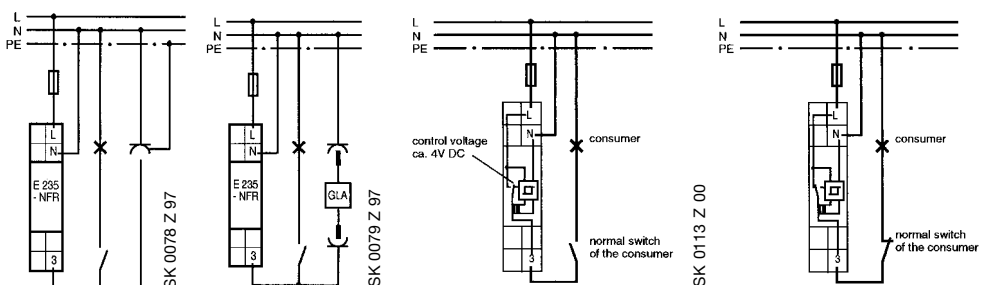
Technical data

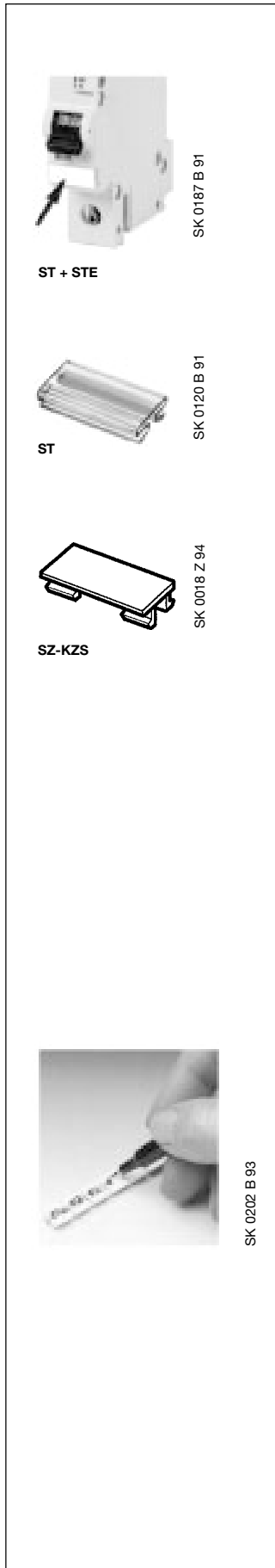
rated switching capacity:	16 A/250 V ~
filament lamp load:	1600 W
fluorescent lamp load (twin-lamp circuit):	1600 W
fluorescent lamp load shunt-compensated:	4 A (500 W)
fluorescent lamp load inductive or capacitive:	1000 W
electronic control gear:	700 W; $I_{in} \leq 70$ A/10 ms
inductive load $\cos \varphi = 0.6/230$ V ~:	5 A (650 W)
contact rating at DC:	100 W
minimum contact rating:	4 V ~ / 10 mA
contact gap:	0.5 mm
mechanical serviceable life, switchover:	$> 10^7$
serviceable life if nominal stress $\cos \varphi = 1$ and 10^3 /h:	$> 10^5$
serviceable life if filament lamps 1000 W and 10^3 /h:	$> 10^5$
serviceable life if nominal stress $\cos \varphi = 0.6$ and 10^3 /h:	$> 10^4$
max. switching rate:	10^4 /h
closed time:	10 - 20 ms
time to contact:	5 - 15 ms
position indicator:	LED
ON duration at rated voltage:	100%
permissible ambient temperature:	- 20 °C/-4°F to + 50°C/122°F
control voltage range:	0.9 to 1.1 x U_n
power consumption of coils AC + DC:	0.5 W
overall power loss at permanent excitation, rated voltage and nominal contact rating:	1 W
max. parallel capacitance of individual control lead at 230 V ~:	0.06 μ F (ca. 200 m)
max. induced voltage at control inputs:	0.2 x U_n
protection against electric shock:	according to DIN VDE 0106 Part 100 (BGV A2)
connection cross section (strain-relief clamp):	6 mm ²

Selection table

description	order details		bbn 40 16779 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
	type code	order code					
mains disconnection relay	E 235-NFR	GH E235 1001 R0001	36890 2			0.080	10
base load	E 235-GL	GH E235 1001 R0002	36900 8			0.070	1
base load element	GLE	GH V022 0868 R0001	36910 7			0.010	1
base load adaptor	GLA	GH V022 0868 R0002	36920 6			0.070	1

connection diagrams





description	order details		bbn 40 12233 EAN	price 1 pc. DM	price group	weight 1 pc. kg	pack. unit pc.
	type code	order code					

Individual labelling

consisting of a transparent label carrier and insertable printed or blank paper labels. Can be used for switches, pushbuttons, indicator lights, latching relays, installation relays as well as MBC's, RCCB's and ABB i-Bus EIB components.

label carrier snap-on	ST	GH S210 1945 R0002	13820 3				100
blank label (1 set = 300 pc.)	ST-E	GH S210 1946 R0002	13820 2				1 set
labels numbered 1 - 100 (1 set = 5 x 1-100)	ST-EN	GH S210 1946 R0003	64530 5				1 set

Label mats

40 labels each, printed or blank. Use wipe-resistant and water-resistant pen or plotter to write/print on the blank paper labels.

labels blank	SZ-KZS	GH S210 1946 R0004	00850 1 ^①				30
labels printed 1-40	SZ-KZS/1	GH S210 1946 R0005	00860 0 ^①				30
labels printed 41-80	SZ-KZS/2	GH S210 1946 R0006	00870 9 ^①				30
labels printed 81-120	SZ-KZS/3	GH S210 1946 R0007	00880 8 ^①				30
labels printed 121-160	SZ-KZS/4	GH S210 1946 R0008	00890 7 ^①				30
labels with pictograms	SZ-KZS/5	GH S210 1946 R0009	00900 3 ^①				30
labels printed 2x1-20	SZ-KZS/6	GH S210 1946 R0010	05080 7 ^①				30
labels printed 4x1-10	SZ-KZS/9	GH S210 1946 R0013	39050 7 ^①				30
labels printed 4x11-40	SZ-KZS/10	GH S210 1946 R0014	39060 6 ^①				30

① bbn no. : 4016779

customised printed labels upon request: minimum order 50 mats, otherwise there will be a low-quantity surcharge.

2	1	1	2
4	3	3	4
6	5	5	6
8	7	7	8
10	9	9	10
12	11	11	12
14	13	13	14
16	15	15	16
18	17	17	18
20	19	19	20

SK 0004 Z 94

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40

SK 0162 Z 93

41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80

SK 0163 Z 93

81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100
101	102	103	104
105	106	107	108
109	110	111	112
113	114	115	116
117	118	119	120














SK 0164 Z 93

121	122	123	124
125	126	127	128
129	130	131	132
133	134	135	136
137	138	139	140
141	142	143	144
145	146	147	148
149	140	141	142
153	154	155	156
157	158	159	160

SK 0165 Z 93

SK 0166 Z 93

Modular installation equipment

		Germany	Denmark	Finland	Norway	Austria	Sweden	Switzerland	US/Canada	Italy	Poland	classification societies			
															
		VDE	DEMKO	EL. Insp.	NEMKO	ÖVE	SEMKO	SEV	UL/CSA	IMQ	BBJ	BV/F	GL/D	LRS/GB	
switches	E 221	■							■		□				
	E 222	■							■		□				
	E 223	■													
	E 271-	■ 63 A						■			□				
	E 272-	■ 63 A						■			□				
	E 273-	■ 63 A	■	■	■			■			□				
	E 274-	■ 63 A						■			□				
	E 463/3 KB	■													
	E 480/3 KB	■													
	E 463/3 SP	■													
bell transformers	TS 8-16-, 24-	■								■					
pushbuttons and indicator lights	E 225	■							■		□				
	E 227	■							■		□				
	E 229	■							■		□				
latching relays	E 250	○									□				
	E 260	○									□				
	E 260 C	○									□				
alarm indicators	E 228-WM	○						■							
time-delay relays (TDR)	E 234	○									□				
installation relays	E 259-	○									□				
elapsed-time meters	E 233 60 Hz	○ 50 Hz							■						
priority switch (Load shedding relay)	E 451-	○						■			□				
	E 452-	○									□				
mains disconnection relays	E 235	○													
t.d.s.	E 232-230	■				■					□				
socket-outlets	E 1175 (C)	■									□				
time switches	STU 6011 N	■				■					□				
	STU 8011 N	■				■					□				
timers	STT 111 N	■				■					□				
	STT 117 N	■				■					□				
	STT 127 N	■				■					□				
	STT 227 N	■				■		■			□				
	STT 467	■													
	STT 467 F	■													
dimmers	SDS 101 N	■													
	STL 101/103	○													
	STD 50-3-4	○													
	STD 500 MA	○													
	STD 420 SL	○													
	STD 1000 U	○		■	■	■		■							

- approved
- submission for approval / approval pending
- ▲ conditionally approved
- no approval required

ABB STOTZ-KONTAKT, the Heidelberg-based company, develops, manufactures and sells highly modern, modular systems for electrical building installations.

It offers complete installation ranges for a wide variety of applications:

System pro M

For classic installation applications

The modular **System pro M** for installation on DIN rails incorporates Europe's best-selling miniature circuit-breakers and residual-current-operated circuit-breakers as well as a complete range of built-in devices.

The system components have been designed with various functions and performance capabilities and are therefore able to optimally cover the complete range of applications in building installation:

- conventional domestic electrical installations
- industrial and commercial installations
- protection and switch functions
- checking and monitoring tasks
- control and time-dependent tasks etc.

System pro M compact[®]

The extension of **System pro M** for targeted use in domestic electrical installations stands out due to its compact and easily comprehensible range of miniature circuit-breakers, residual-current-operated circuit-breakers and cross wiring tools as well as an optimised installation technology taking into account the special circumstances and requirements of domestic electrical installations.

System Connect

This pioneering system concept contains seamlessly integrated system units – consisting of miniature circuit-breakers and residual-current-operated circuit-breakers as well as apparatus racks and flush-mounted wall boxes – was designed to suit the special requirements of domestic electrical installations.

The new plug-in connection technology for the devices and apparatus rack ensures quick and reliable installations: assembly, connection of the devices and cross wiring are carried out time-effectively in one single step.

If need be, component sets may still be changed quickly and flexibly right until transfer takes place; devices may also be exchanged easily at some later date, and economically in terms of both money and time, at that.

The entire **System Connect** was developed by ABB STOTZ-KONTAKT and Striebel & John, within the framework of their successful system partnership.

EIB Installation Systems

For intelligent Building Installation

Highly modern, programmable installation systems with bus technology based on the European EIB standard.

ABB i-bus[®] EIB

System with special 2-core bus cable, primarily for new buildings.

ABB Powernet EIB

System for retrofitting in existing buildings. Transfer of information via the existing network.

Security Systems

All-in-one Protection

Wide range of security systems and components: intruder and fire alarm systems, radio-controlled alarm systems, door locking system and signalling components.

During the century-long experience of the company, it has always contributed pioneering solutions to the safe application of electricity.

Today, ABB STOTZ-KONTAKT GmbH is an integral part of the ABB Group, a major player on the electrical and electronic markets.



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