

# Electrical installation solutions for buildings

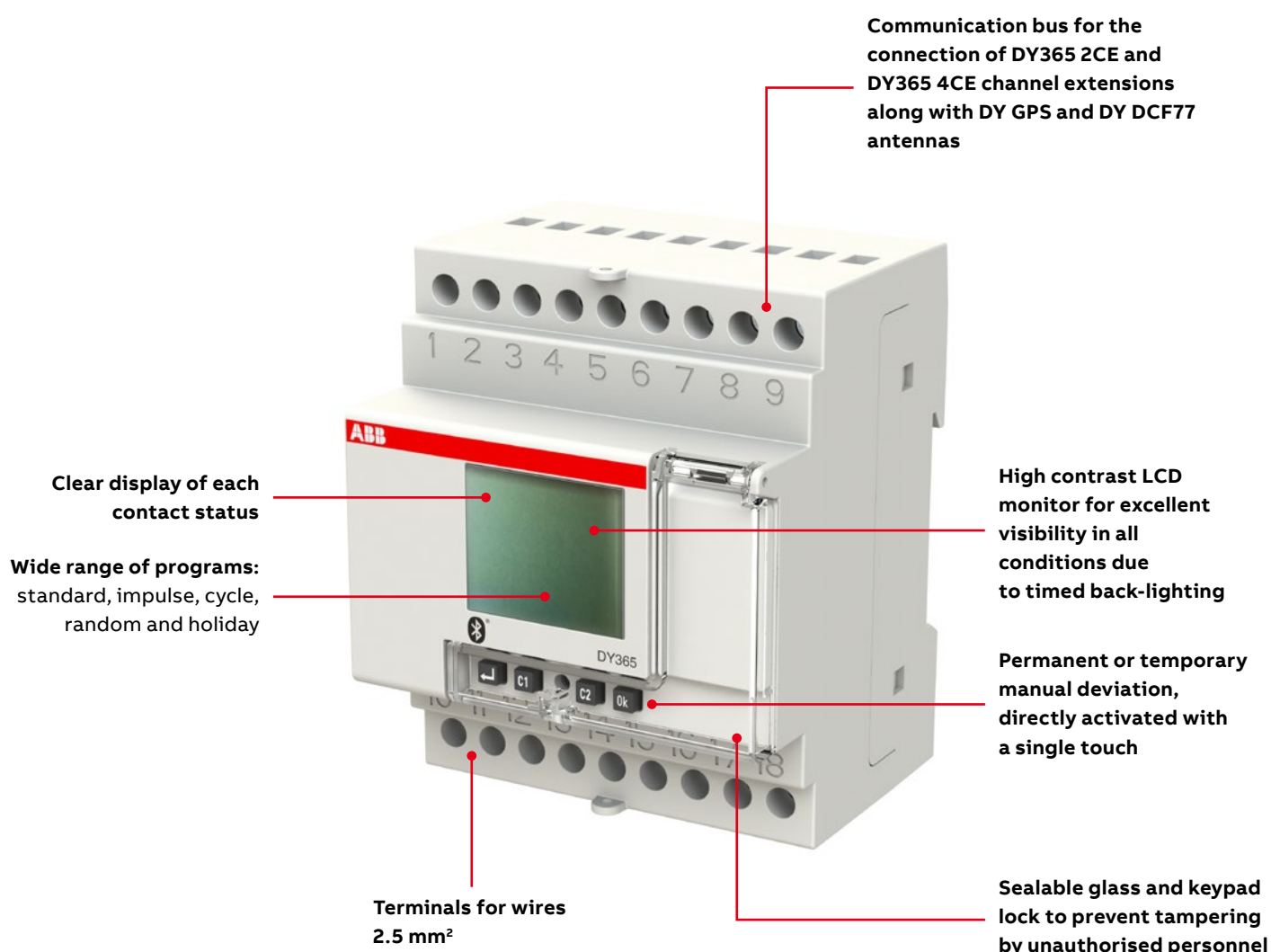
## Control and automation

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# DBT Timer digital time switches

An ideal range for automating the functions of the installation





Wide range of programs: standard, impulse, cycle, random and holiday

- Permanent or temporary manual deviation, directly activated with a single touch
- LCD Display with back-lighting
- Up to 900 storable events
- Up to 400 pre-defined cities coordinates
- Accuracy of  $\pm 0.5$  seconds/24h
- Switching solar time/daylight saving time



Bluetooth communication combined with the DBT Timer APP available for Android and iOS ensure smart configuration and quick visualization. This functionality also allows to transfer programs from one device to another simply using the Smartphone.



Time synchronization via DY DCF77 or DY GPS antennas. The DY DCF77 antenna receives scheduled messages transmitted by the atomic clock installed c/o Mainflingen (Germany), near Frankfurt. Thanks to this signal, the time switches are automatically set to: hour, date and proper daylight saving time. The DY GPS antenna receives time from the Global Positioning System, providing an accurate location and time information for an unlimited number of people in all weathers, day or night, anywhere in the world; time is derived from different sources simultaneously that allow the time switch to compensate for propagation delays.

## Control and automation

### DBT Timer digital time switches



DBT Timer

Technical features DBT Timer		DY365	DW1	DW2	DWA1	DWA2	DWTL1
Power supply	[V]	230 AC (-15 % ..+10 %)					
Rated pulsating voltage	[kV]	4					
Contact type		2NO/NC	1NO/NC	2NO/NC	1NO/NC	2NO/NC	1NO/NC
Channel extension		YES	NO	NO	NO	NO	NO
DY DCF77 antenna		YES	NO	NO	NO	NO	NO
DY GPS antenna		YES	NO	NO	NO	NO	NO
250 V contact capacity							
Resistive load	[A]	16					
Inductive load	[A]	10					
Rated frequency	[Hz]	50/60					
Minimum switching		1 min (1 s pulse program)					
Max number of events		900	120	120	120	120	120
Number of channels		2	1	2	1	2	1
Operating accuracy	[sec/ 24h]	± 0,5					
Power consumption	[W]	2.6	2	2	2	2	2
Max. switching power	[VA]	4000					
Switching capacity							
Incandescent	[W]	2000					
Fluorescent	[VA]	600					
Low voltage halogen	[W]	2000					
Halogen	[W]	2000					
Low consumption lamp	[VA]	600					
Led	[W]	500					
Protection degree	[IP]	20					
Max terminal cross-section	[mm²]	2.5					
Tightening torque	[Nm]	0.5					
Installation type		DIN rail					
operating temperature	[°C]	-20...+50					
Storage temperature	[°C]	-25...+70					
Modules	[n°]	4	2	2	2	2	2
Reference standards		EN 60730-1; EN 60730-2-7; ETSI EN 301 489-1; ETSI EN 301 489-17; ETSI EN 300 328					

## Control and automation

### DBT Timer digital time switches

Technical features Accessories for DBT Timer			
		DY DCF77	DY GPS
Rated voltage	[V]	12 DC	12 DC
Antenna sensitivity	[mV/m]	0.05	
Operating temperature	[°C]	0...+50	0...+50
Storage temperature	[°C]	-10...+60	-10...+70
Power consumption	[W]		0.5
Time of the signal		5 sending/min	every 30 min
Protection degree	[IP]	54	54
Max. number of connected devices	[No.]	31	31
Max. wiring length	[m]	100	100
Terminal size for cable	[mm <sup>2</sup> ]	1.5	0.75..1.5
Mounting		wall	wall

Technical features Accessories for DBT Timer		
	DY365 2CE	DY365 4CE
Rated voltage	12/24 V AC/DC	12/24 V AC/DC
Numbers of normally open relays 8A/250V	2	4
Operating temperature	0 - 50°C	0 - 50°C
Storage temperature	-25 - 70°C	-25 - 70°C
Protection degree	IP20	IP20
Mounting	Din rail	Din rail
Modules	2	4

Technical features Accessories for DBT Timer	
	DWS
Threshold	3 ÷ 500 lux
Hysteresis	1 ÷ 50 lux
Delay	1 second ÷ 30 minutes

#### Selection table

Digital time switches	DY365	DWA1	DWA1	DW1	DW2	DWTL1
Weekly	x	■	■	■	■	■
Yearly	■	x	x	x	x	x
Standard function	■	■	■	■	■	■
Astro function	■	■	■	x	x	■
Twilight sensor	x	x	x	x	x	■
Numbers of channels	2	1	2	1	2	1
DY GPS/DY DCF77	■	x	x	x	x	x
Bluetooth	■	■	■	■	■	■
2 or 4 channel extension	■	x	x	x	x	x

Standard function includes: standard, impulse, random cycle and holiday programs.

## Control and automation

### DBT Timer digital time switches



DY365

#### DBT Timer digital time switches

The unique design, with white backlight LCD display, and extreme ease of use with only four buttons, make DBT Timer ideal to automate the installation functions. The possibility to configure all digital devices via DBT Timer APP and Bluetooth connection makes the configuration and installation time even shorter. DBT Timer digital time switches are equipped with large capacity internal battery to maintain operation without power supply in order to avoid the risk of program loss and to maintain the time settings in case of power failure, respective of its duration. DBT Timer digital time switches are equipped with various functions such as the impulse, cycle, random and holiday function.

#### Digital yearly time switch - DY365

DY365 is the digital yearly time switch with 2 channels from DBT Timer range. Thanks to the two extension channel units DY365 4CE and DY365 2CE, DY365 is able to control up to 8 channels. DY365 can be coupled with DY GPS antenna to allow synchronization received from the Global Positioning System or with DY DCF77 antenna that allows an automatic synchronization of the digital time switch with the Frankfurt DCF77 time signal.



DW1

#### Digital weekly time switch - DW

DW1 and DW2 are weekly digital time switches with 1 and 2 channels, respectively. They allow exclusion of the normal weekly program in every week with the same mode.



DWA1

#### Digital weekly astronomical time switch - DWA

The astronomical switches DWA1 and DWA2, respectively, with 1 and 2 channels, automatically control lighting circuits depending on the time of sunrise and sunset, greatly increasing energy efficiency. The programming is in fact based on a mathematical algorithm able to calculate the time of the rising and setting of the sun in a certain location for each day of the year. Once powered the device, simply insert date, time, geographical coordinates and time zone so that it is ready to work. These settings can also be automatically defined using the DBT Timer APP. The installation of astronomical digital time switches is particularly useful when using a twilight switch with external sensor is not recommended because it may be subject to malfunctions caused by air pollution, excessive brightness or vandalism. DWA1 and DWA2 are also indicated for the control of public lighting, shop windows of shops, neon signs, monuments, facades, illuminated fountains, ...



DWTL1

#### Digital weekly twilight time switch - DWTL1

DWTL1 is digital time switch with astronomical function and external luminosity probe DWS indicated for the management of the lighting system, luminous signs.

Digital weekly twilight switch with 1 channel allows the exclusion of the weekly programming. DWTL1 can be configured as astronomical with probe switch which initial configuration requires the activation of the load from sunset to sunrise and during the daytime hours in case of low light. Also, it can be used as programmable twilight switch in which activation of the load occurs when the probe detects a low light condition in case that daily or weekly programming requires it.

Channels no.	Bbn 8012542	Order details		Price 1	Weight 1 piece	Pack unit
	EAN	Type code	Order code	piece	kg	pc.
2	212010	DY365	2CSM221201R1000		0.250	1
1	225317	DW1	2CSM222531R1000		0.129	1
2	225218	DW2	2CSM222521R1000		0.152	1
1	225119	DWA1	2CSM222511R1000		0.129	1
2	225010	DWA2	2CSM222501R1000		0.152	1
1	224914	DWTL1	2CSM222491R1000		0.160	1

Control and automation

DBT Timer digital time switches



DY DCF77



DY GPS



DY365 2CE



DY365 4CE



DWS

Accessories for DBT Timer digital time switches

The DY365 2CE and DY365 4CE are extension channel units with 2 and 4 outputs relays. They are respectively coupled to the DY365 in order to expand number of contacts managed from 2 to maximum 8.

DY DCF77 antenna, used in conjunction with the device, enables it to be automatically synchronized with the official DCF77 Frankfurt time signal, broadcast via long wave radio. DY GPS antenna is available to ensure good coverage around the world in any weather condition. This antenna uses the synchronization from the Global Positioning System and provides more precise values than terrestrial transmissions.

DWS is external probe for light intensity which is coupled with digital weekly twilight switch, DWTL1.

Version	Bbn 8012542	Order details		Price 1	Weight 1 piece	Pack unit
		EAN	Type code	Order code	piece	kg
DCF77 antenna	504214	DY DCF77	2CSM250421R1000		0.100	1
GPS antenna	504115	DY GPS	2CSM250411R1000		0.080	1
2 channel extension	211914	DY365 2CE	2CSM221191R1000		0,185	1
4 channel extension	211815	DY365 4CE	2CSM221181R1000		0,486	1
DWS external sensor	224815	DWS	2CSM222481R1000		0.021	1

## Control and automation

### AG Timer electro-mechanical time switches



AD1NO-R-15m



AD1CO-15m

Technical features									
		AD1NO-15m	AD1NO-R-15m	AD1CO-30m	AD1CO-R-30m	AW1CO-R-210m	AD1CO-15m	AD1CO-R-15m	AW1CO-R-120m
Rated voltage	[V]	230 AC							
Contact type		1NO	1NO	1NO/NC					
Resistive load	[A]	16							
Inductive load	[A]	4							
Rated frequency	[Hz]	50/60							
Setting step (tappet)	[min]	15	15	30	30	210	15	15	120
Number of tappets		96	96	48	48	48	96	96	84
Running reserve	[h]	-	100	-	150	150	-	150	150
Power consumption	[W]	0.5							
Max. switching power	[VA]	4000							
Incandescent	[W]	2500	2500	3000					
Fluorescent	[VA]	1200	1200	1200					
Low voltage halogen	[VA]	2000	2000	2000					
Halogen (230 V ~)	[W]	2500	2500	3000					
Low consumption lamp (CFL)	[VA]	900	900	900					
LED	[VA]	100	100	200					
Protection degree		IP20							
Max. terminal cross-section	[mm²]	4							
Tightening torque	[Nm]	0.3	0.3	0.5					
Terminals		with captive screws							
Installation type		on DIN rail							
Operating temperature	[°C]	-10...+45	-10...+45	-10...+50					
Storage temperature	[°C]	-20...+60	-20...+60	-20...+70					
Modules	[n°]	1	1	2	2	2	2.5	2.5	2.5
Reference standards		EN 60730-2-7							

#### AG Timer electro-mechanical time switches

These analog timers are designed for installation on DIN-rail. They control circuit opening and closing according to the scheduled program. Available both on daily and weekly versions and equipped with a 16 A contact. They can be set on the scheduled program or on the permanent ON-OFF function. The AD1NO-R-15m, AD1CO-R-15m, AW1CO-R-120m, AD1CO-R-30m, AW1CO-R-210m versions are equipped with a built-in battery, charged by the network voltage, which allows the devices to maintain the set time also in case of long (up to 150 h) power supply failures. The products fit applications such as control of lighting systems of shops or commercial buildings, heating and ventilation systems as well as control of automatic irrigation systems of private or external gardens.

Contacts	Version	Bbn 8012542	Order details		Price 1	Weight 1 piece	Pack unit
		EAN	Type code	Order code	piece	kg	pc.
1NO	Daily time switch without reserve	224716	AD1NO-15m	2CSM222471R1000		0.072	1
1NO	Daily time switch, running reserve	224617	AD1NO-R-15m	2CSM222461R1000		0.075	1
1NO/1NC	Daily time switch without reserve	224518	AD1CO-30m	2CSM222451R1000		0.105	1
1NO/1NC	Daily time switch, running reserve	224419	AD1CO-R-30m	2CSM222441R1000		0.109	1
1NO/1NC	Weekly time switch, running reserve	224310	AW1CO-R-210m	2CSM222431R1000		0.109	1
1NO/1NC	Daily time switch without reserve	224211	AD1CO-15m	2CSM222421R1000		0.112	1
1NO/1NC	Daily time switch, running reserve	081517	AD1CO-R-15m	2CSM208151R1000		0.116	1
1NO/1NC	Weekly time switch, running reserve	081418	AW1CO-R-120m	2CSM208141R1000		0.116	1

## Control and automation

### AG Timer electro-mechanical time switches



AD1-R-15m-72

Technical features		
AD1-R-15m-72		
Rated voltage	[V]	230 AC
Contact type		1NO/NC
Ohmic loads	[A]	16
Inductive loads	[A]	4
Rated frequency	[Hz]	50/60
Setting step (tappet)	[Min]	15
Number of tappets		96
Running reserve	[h]	100
Power loss	[W]	1.8
Max. switching power	[VA]	4000
Incandescent	[W]	3000
Fluorescent (VA)	[VA]	1200
Low voltage halogen	[VA]	2000
Halogen (230 V ~)	[W]	3000
Low consumption lamp (CFL)	[VA]	900
LED	[VA]	200
Max. terminal cross-section	[mm <sup>2</sup> ]	4
Tightening torque	[Nm]	0.3
Installation type		wall/panel
Protection degree		IP20
Operating temperature	[°C]	-10 ...+45
Storage temperature	[°C]	-20 ...+60
Reference standards		EN60730-2-7

#### AD1-R-15m-72 electro-mechanical time switch

AD1-R-15m-72 is designed for installation on panel/wall. It is used to control circuit opening and closing according to a preset program. Available in daily version, with running reserve, it is characterized by the settings on the front, which during the holding time of the load, allows for the contact status in ON/OFF to be forced until the next switching time. The AD1-R-15m-72 is the perfect solution for controlling lighting systems in shops and public buildings, heating and irrigation systems, etc.

Contacts	Version	Bbn 8012542	Order details		Price 1	Weight 1 piece	Pack unit
		EAN	Type code	Order code	piece	kg	pc.
1NO/NC	Daily time switch running reserve	081319	AD1-R-15m-72	2CSM208131R1000		0.181	1

#### Selection table

Analog time switches	AD1NO-15m	AD1NO-R-15m	AD1CO-15m	AD1CO-R-15m	AW1CO-R-120m	AD1CO-30m	AD1CO-R-30m	AW1CO-R-210m	AD1-R-15m-72
Daily	■	■	■	■	x	■	■	x	■
Weekly	x	x	x	x	■	x	x	■	x
Power reserve	x	■*	x	■	■	x	■	■	■*
Min. time switching	15 min	15 min	15 min	15 min	120 min	30 min	30 min	210 min	15 min
DIN rail mounting	■	■	■	■	■	■	■	■	x
Panel/wall mounting	x	x	x	x	x	x	x	x	■
Type of contacts	NO	NO	CO	CO	CO	CO	CO	CO	CO

\*non-removable battery

## Control and automation

### E 232 staircase lighting time-delay switches

Technical features					
	E 232-230	E 232E-230N	E 232E-8/230N	E 232E-230 Multi 10	E 232E-8/230 Multi 10
Time range (stepless)	1 – 7 min. in 15 sec. increments	0.5 – 20 min. stepless	0.5 – 20 min. stepless	0.5 – 20 min. stepless	0.5 – 20 min. stepless
Control voltage 230 V AC	■	■	■	■	■
Universal voltage in addition			8 ... 240 V AC/DC		8...240 V AC/DC
Glow lamp load	50 mA	150 mA	150 mA	150 mA	150 mA
3/4 conductor operated	switches	automatically	automatically	automatically	automatically
Resettable	■	■	■	■	■
Steady-light switch	■	■	■	■	■
Advance warning acc. DIN 18015-2				■	■
Long-time range of 60 min.				■	■
Multi-functional (10 functions)				■	■
Rated voltage	230 V AC	240 V AC	240 V AC	240 V AC	240 V AC
Rated Frequency	50Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Control voltage range	0.9 ... 1.1 Un	0.85 ... 1.1 Un	0.85 ... 1.1 Un	0.85 ... 1.1 Un	0.85 ... 1.1 Un
Power loss	1 VA	6 VA	6 VA	6 VA	6 VA
Rated switching capacity	16 A, 230 V AC	16 A, 230 V AC	16 A, 230 V AC	16 A, 230 V AC	16 A, 230 V AC
Filament lamps	2,300 W	2,300 W	2,300 W	3,600 W	3,600 W
Halogen lamps	2,300 W	2,300 W	2,300 W	3,600 W	3,600 W
Fluorescent lamps series compensated / uncorrected	2,300 VA	2,300 VA	2,300 VA	3,600 VA *	3,600 VA *
Fluorescent lamps inductive or capacitive	2,300 VA	2,300 VA	2,300 VA	3,600 VA *	3,600 VA *
Fluorescent lamps shunt compensated	1,300 VA (70 µF)	400 VA (42 µF)	400 VA (42 µF)	1,200 VA (120 µF) *	1,200 VA (120 µF) *
Electronic controlgear	9x7 W, 6x11 W	9x7 W, 7x11 W,	9x7 W, 7x11 W,	34x7 W, 27x11 W,	34x7 W, 27x11 W,
	5x15 W, 5x20 W	7x20 W, 7x23 W	7x20 W, 7x23 W	24x15 W, 22x23 W	24x15 W, 22x23 W
Inductive load (cos φ = 0.6/230 V AC)	2,300	2,300	2,300	2,300	2,300
Contact material	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2
Contact gap	≥ 3 mm	< 3 mm	< 3 mm	< 3 mm	< 3 mm
Mech. serviceable life	> 106	> 107	> 107	> 107	> 107
Serviceable life at rated load, cos φ =1	> 105	> 2x105	> 2x105	> 2x105	> 2x105
Serviceable life at rated load, cos φ =0.6	> 104	> 4x104	> 4x104	> 4x104	> 4x104
Max. terminal cross-section	10.7 mm <sup>2</sup>	13 mm <sup>2</sup>	13 mm <sup>2</sup>	13 mm <sup>2</sup>	13 mm <sup>2</sup>
Max. conductor cross-section	6 mm <sup>2</sup>	4 mm <sup>2</sup>	4 mm <sup>2</sup>	4 mm <sup>2</sup>	4 mm <sup>2</sup>
ON duration	Resettable after 30 sec.	100 %	100 %	100 %	100 %
Ambient temperature	– 10 °C to + 50 °C	– 25 °C to + 50 °C	– 25 °C to + 50 °C	– 25 °C to + 50 °C	– 25 °C to + 50 °C
Housing and insulation material	heat resistant, self-extinguishing thermoplast	heat resistant, self-extinguishing thermoplast	heat resistant, self-extinguishing thermoplast	heat resistant, self-extinguishing thermoplast	heat resistant, self-extinguishing thermoplast
Control current at 230 V AC	4.5 mA	26 mA	26 mA	26 mA (min. 8 mA at 8 V AC)	26 mA (min. 8 mA at 8 V AC)
Minimum command duration	10 ms	20 ms	20 ms	20 ms / 50 ms for multi voltage input	20 ms / 50 ms for multi voltage input

\* no disconnection advance warning possible for this application.

Control and automation

E 232 staircase lighting time-delay switches



E 232-230



E 232 E-230N

E 232 staircase lighting time-delay switches

Staircase lighting time-delay switches are usually operated by pushbuttons, often fitted with a glow lamp. Switches are designed for a glow lamp current of up to 150 mA and thus perfectly suitable for installations in multi-storey buildings.

The E 232-230 staircase lighting time-delay switch includes an electro-mechanical timer with a synchronous motor drive to ensure high operational safety in whatever mounting position. The time range is adjustable in increments of 15 seconds from 1 to seven minutes. Resettable after 30 seconds.

E 232E-230N and E 232E-8/230N devices feature electronic time delays. A high switching capacity, 150 mA glow lamp current parallel to the pushbuttons, steplessly adjustable time range from 0.5 to 20 min, as well as low switching noise make these devices so special. Devices of the E 232E-230 Multi 10 and E 232E-8/230 Multi 10 series are multi-functional products with 10 functions to choose from that can be adjusted from the front. Through an electronically controlled connection of the load at voltage zero, a very high switching capacity of 3,600 W (load of filament lamp) is reached.

The devices include an integrated warning feature (warning by blinking) according to DIN 18015-2 as well as a 60 minute long-time function.

The E 232E-8/230N and E 232E-8/230 Multi 10 staircase lighting time-delay switches offer an additional metallically separated control input for 8...240 V AC/DC.

Time range	Power loss	Bbn 4013614	Order details		Price 1	Weight 1 piece	Pack unit
			Type code	Order code			
	W	EAN			piece	kg	pc.
1 ... 7 min.	1 V A	54824 3	E 232-230	2CDE110000R0501		0.081	10
20 min	6 V A	65416 6	E 232 E-230N	2CDE110003R0511		0.095	10
20 min	6 V A	65417 3	E 232 E-8/230N	2CDE010003R0511		0.1	10
20 min	6 V A	65418 0	E 232 E-230 Multi 10	"		0.095	10
20 min	6 V A	65419 7	E 232 E-8/230 Multi 10	2CDE010013R0511		0.1	10

## Control and automation

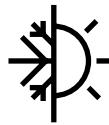
### CT-D range

#### Applications

The CT-D range is designed in a modular housing, making it well suited for building and residential applications. In just 12 order codes the CT-D range covers all the main timing functions needed for building automation, safely and reliably.



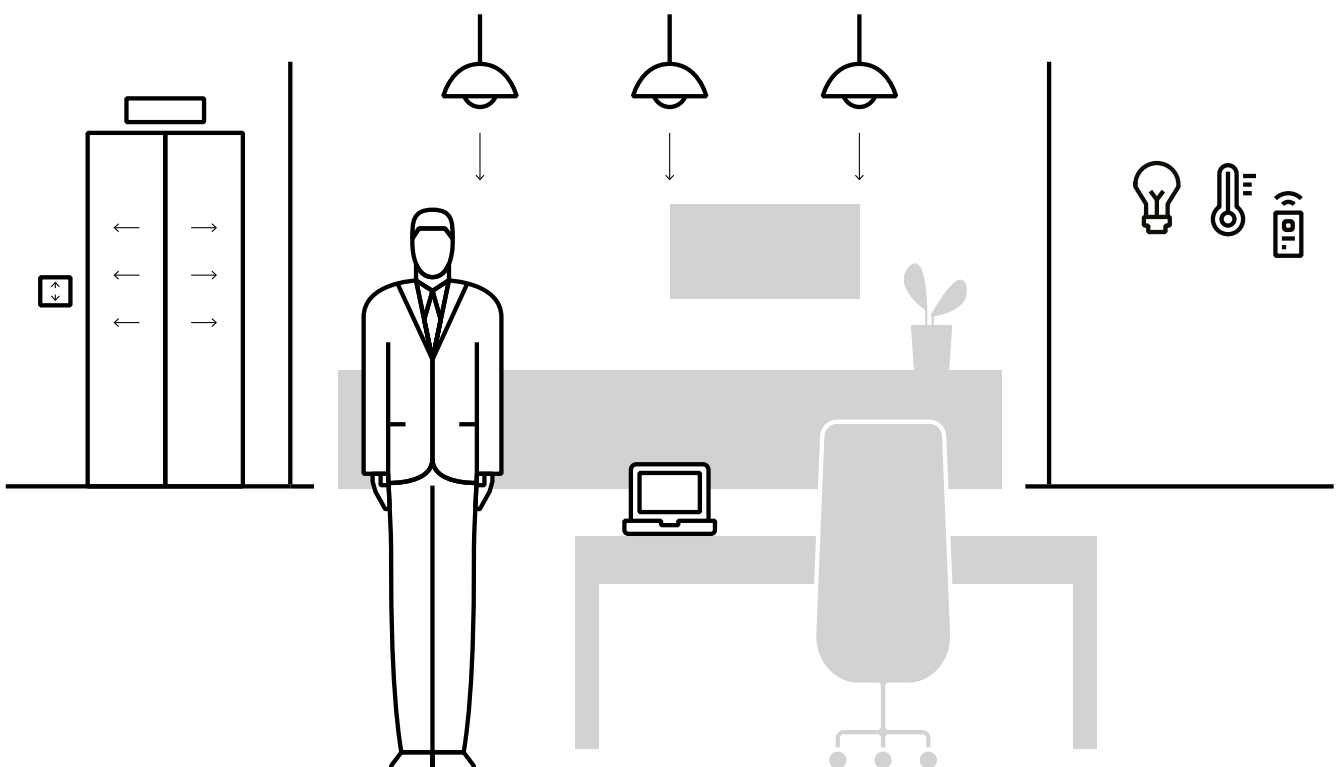
A typical application for timers is delayed switching. Switching several rows of lamps on and off in corridors, stairwells, staircases, etc, is a widespread application in which the excellent functionality of the CT-D timers is undisputed.



Air conditioning systems, heaters and fans can be found everywhere in buildings - just like the CT-D timers long used to switch them. On-delay, off-delay and a range of other functions cover all requirements.



Elevators, escalators, gates, compressors and doors - here too ABB timers ensure optimum and time-delayed opening as required. ABB's CT-D timers cover most functions with just 12 order codes.



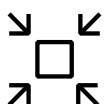
## Control and automation

### CT-D range

#### Benefits and advantages



The CT-D range is ideal for building applications and installation panels, due to its compact modular housing. For maximum flexibility in operation, nine single-function as well as two multifunction devices with seven timing functions are available. The devices offer four or seven time ranges from 0.05 seconds up to 100 hours. Their wide supply voltage range allows their use in applications worldwide.



#### Space savings

The CT-D range is ideal for installation panels thanks to its compact modular housing. The housing's design helps make the status and configuration more clearly visible. The CT-D range also offers a higher output current than standard industrial types. As well as the 1 c/o contacts, ABB offers devices with 2 c/o contacts for maximum flexibility.



#### Easy to install

Direct reading scales help make time setting quick and easy. A pre-selection for the time range together with an additional scale for fine adjustments help improve installation efficiency. For more flexibility, the delay time can even be changed when processes are running, making optimization to fit the application even simpler. All devices can be mounted and demounted tool-free.



#### Global availability

The CT-D range fulfills various global standards and approvals, supporting business worldwide. Additionally, all devices from the CT-D range have a wide supply voltage from 24-48 V DC and 24-240 V AC, making it ideal for the use in installation panels around the world.

## Control and automation

CT-D range

Operating controls



### Connection terminals

Wide terminal spacing makes connection of wires simpler: 2 x 1.5 mm<sup>2</sup> (2 x 16 AWG) with wire end ferrules or 2 x 2.5 mm<sup>2</sup> (2 x 14 AWG) without ferrules.



### Preselection of the time range



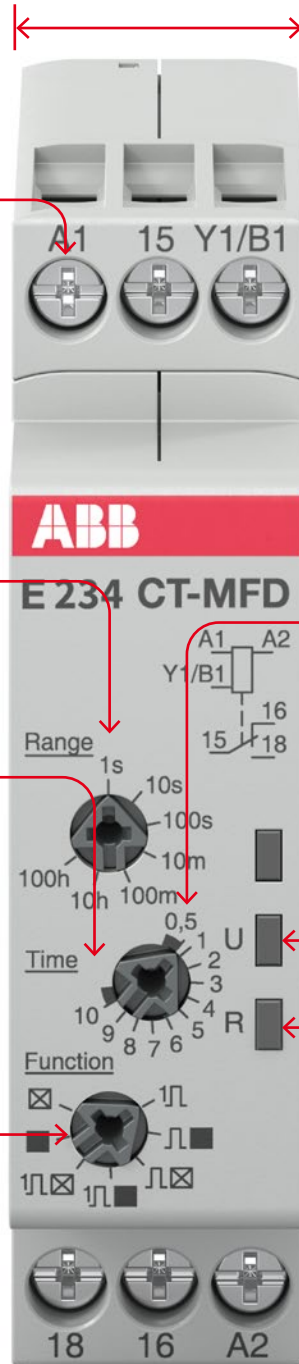
### Direct reading scales

Direct setting of the time delay without any additional calculation provides accurate time delay adjustment.



### Selection of the timing function

- ON-delay
- OFF-delay with aux. voltage
- Impulse-ON
- Impulse-OFF with aux. voltage
- Flasher starting with ON
- Flasher starting with OFF
- Pulse former



### Width 17.5 mm

With a width of just 17.5 mm, the CT-D range timers are ideally suited for installation in distribution panels.



### Fine adjustment of the time delay



### LEDs for status indication

All actual operational states are displayed by front-facing LEDs, thus simplifying commissioning and troubleshooting.

- U - green LED:
  - control supply voltage applied /
  - timing
- R, R1, R2 - yellow LED:
  - output relay energized

## Control and automation

CT-D range

Selection table

	Type	Order number	1SVR500020R0000	1SVR500020R1100	1SVR500100R0000	1SVR500100R0100	1SVR500110R0000	1SVR500110R0100	1SVR500130R0000	1SVR500150R0000	1SVR500160R0000	1SVR500160R0100	1SVR500210R0100	1SVR500211R0100
<b>Timing function</b>														
ON-delay			■	■	■	■								
OFF-delay with aux. voltage			■	■			■	■						
Impulse-ON			■	■					■					
Impulse-OFF with aux. voltage			■	■										
Flasher starting with ON			■	■						■				
Flasher starting with OFF			■	■										
Pulse generator starting with ON or OFF											■	■		
Pulse former			■	■										
Star-delta change-over													■	■
<b>Features</b>														
Control input, voltage-related triggering			■	■			■	■			■	■		
<b>Time range</b>														
0.05 s - 100 h			■	■	■	■	■	■	■	■	2	2		
0.05 s - 10 min													■	■
<b>Supply voltage</b>														
12-240 V AC/DC				■										
24-48 V DC			■		■	■	■	■	■	■	■	■	■	■
24-240 V AC			■		■	■	■	■	■	■	■	■	■	■
<b>Output</b>														
c/o contact			1	2	1	2	1	2	1	1	1	2		
n/o contact													2	2

## Control and automation

### E 234 electronic timers



E 234 CT-MFD



E 234 CT-ERD

#### Description

The CT-D range with its modular design is a perfect solution for installation panels. For maximum flexibility in operation, 10 single-function as well as two multifunction devices with seven timing functions are available. The devices offer four or seven time ranges from 0.05 seconds up to 100 hours. Their wide input range allows their use in applications worldwide.

Timing function	Rated control supply voltage	Time ranges	Control input	Output	Bbn	Type	Order code	Price 1 piece	Weight 1 piece kg (lb)
EAN									
Multifunctional <sup>1)</sup>	24-240 V AC 24-48 V DC	7 (0.05 s - 100 h)	■	1 c/o		CT-MFD.12	1SVR500020R0000		0.060 (0.132)
Multifunctional <sup>1)</sup>	12-240 V AC/DC	7 (0.05 s - 100 h)	■	2 c/o		CT-MFD.21	1SVR500020R1100		0.065 (0.143)
ON-delay			-	1 c/o		CT-ERD.12	1SVR500100R0000		0.060 (0.132)
			-	2 c/o		CT-ERD.22	1SVR500100R0100		0.065 (0.143)
OFF-delay		7 (0.05 s - 100 h)	■	1 c/o		CT-AHD.12	1SVR500110R0000		0.060 (0.132)
			■	2 c/o		CT-AHD.22	1SVR500110R0100		0.065 (0.143)
Impulse-ON	24-240 V AC 24-48 V DC		-			CT-VWD.12	1SVR500130R0000		0.060 (0.132)
Flasher starting with ON			-	1 c/o		CT-EBD.12	1SVR500150R0000		
Pulse generator		2x7 (0.05 s - 100 h)	■			CT-TGD.12 <sup>2)</sup>	1SVR500160R0000		0.060 (0.132)
			■	2 c/o		CT-TGD.22 <sup>2)</sup>	1SVR500160R0100		0.065 (0.143)
Star-delta change-over		4 (0.05 s - 10 min)	-	2 n/o		CT-SDD.22 <sup>3)</sup>	1SVR500211R0100		0.065 (0.143)
			-			CT-SAD.22 <sup>4)</sup>	1SVR500210R0100		

1) Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Flasher starting with ON, Flasher starting with OFF, Pulse former

2) ON and OFF times adjustable independently: 2 x 7 time ranges 0.05 s - 100 h

3) Transition time 50 ms fixed

4) Transition time adjustable

■ Control input with voltage-related triggering  
- no triggering

Control and automation

TL Line twilight switches



TL1

Technical features			
		TL1	
Rated supply voltage	[V]	110 ÷ 230 AC	
Contact type		1NO	
Incandescent lamps cosφ 1	[W]	1000	
Fluorescent lamps cosφ 0.8	[W]	300	
Fluorescent- duo/electronic lamps	[W]	300	
Rated frequency	[Hz]	50/60	
Switching delay ON	[s]	23±10%	
Switching delay OFF	[s]	23±10%	
Brightness range (with tolerance of +-20%)	[lx]	2...200	
Protection degree twilight switch		IP20	
Protection degree sensor		IP54	
Operating temperature twilight switch	[°C]	-25...+55	
Operating temperature sensor	[°C]	-40...+70	
Storage temperature twilight switch	[°C]	-40...+70	
Storage temperature sensor	[°C]	-50...+80	
Power consumption	[W]	0.4 W cosφ 0.4 (idle) 0.9 W cosφ 0.42 (active)	
Max terminal cross section	[mm²]	6	
Terminals		loss-proof screw	
Screw Type		PZ1	
Tightening torque	terminals	[Nm]	1.2
	sensor screw	[Nm]	1.2
Mounting		on DIN rail	
Switching status indication/ brightness range		red/green LEDs	
Max wiring length	[m]	100	
Modules	[n°]	1	
Reference standards		EN 60669-1 EN 60662-2-1 EN60730-1	

## Control and automation

### TL Line twilight switches



TL1

#### TL Line modular twilight switches

TL1 twilight switch allows to switch ON and switch OFF lighting devices according to a scheduled level of the ambient light. It is used in combination with an external sensor to detect if the ambient light is higher or lower than the set level . A switching delay prevents them from operating unnecessarily when the light intensity suddenly changes (e.g. lightning, moving vehicles, etc.). The TL1 twilight switch 1 channel is preset with a 10 LUX from factory and it is equipped with 2 signalling LEDs that indicate the setpoint value and display the status of the contact . The operating instructions are printed on the side of the product.

Brightness range	Bbn 8012542	Order details		Price 1	Weight 1 piece	Pack unit
lx	EAN	Type code	Order code	piece	kg	pc.
2:200	299219	TL1	2CSM229921R1341		0,155	1

#### Accessories for TL Line modular twilight switches

The external sensor TLs is supplied in the same package of the switch, TL1, but it's also available separately as spare part. The upper part of the external case (with screw locking), made up of thermoplastic material, bears up against ultraviolet rays to guarantee an homogeneous diffusion of the daylight internally. The sensor is also equipped with a cable gland.



TLs

	Bbn 8012542	Order details		Price 1	Weight 1 piece	Pack unit
	EAN	Type code	Order code	piece	kg	pc.
External sensor	299318	TLs	2CSM229931R1341		0,008	1

## Control and automation

### TL Line twilight switch



TL1 Pole

Technical features		
		TL1 POLE
Rated supply voltage	[V]	110 ÷ 230 AC
Contact type		1NO polarized
Incandescent lamps cosφ 1	[W]	1000
Fluorescent lamps cosφ 0.8	[W]	300
Fluorescent- duo/electronic lamps	[W]	300
Rated frequency	[Hz]	50/60
Switching delay ON	[s]	25+·10%
Switching delay OFF	[s]	35+·10%
Brightness range (with tolerance of ±20%)	[lx]	2...200
Protection degree twilight switch		IP54
Protection degree sensor		IP54
Operating temperature twilight switch	[°C]	-40...+70
Operating temperature sensor	[°C]	-40...+70
Storage temperature twilight switch	[°C]	-50...+80
Storage temperature sensor	[°C]	-50...+80
Power consumption	[W]	0.25 W cosφ 0.35 (idle) 0.8 W cosφ 0.4 (active)
Max terminal cross section	[mm²]	6
Terminals		loss-proof screw
Screw Type		PZ1
Tightening torque: terminals	[Nm]	1.2
screw sensor	[Nm]	1.2
Mounting		Pole/wall mounted
Switching status indication/ brightness range		red/green LEDs
Max wiring length		100
Modules		
Reference standards		EN 60669-1 EN 60662-2-1 EN60730-1

#### TL1 Pole mounting twilight switch

The TL1 Pole version is designed for installation on the pole/wall, with photocell inputs and integrated cabling including cable gland seals to ensure a high protection degree. Thanks also to the high quality, TL1 Pole provides excellent resistance to atmospheric agents and a long service life. TL1 Pole is also internally equipped with a preset sensor of 10 LUX. The sensor is extractable from the base and allows an easy and efficient maintenance without needing further wiring. TL1 Pole is the ideal solution to manage the external light systems such as the public ones, more precisely, in cases where there is a need of controlling the lighting of public or private roads, gardens, courtyards at the decline of solar radiation during twilight.

Brightness range	Bbn 8012542	Order details		Price 1	Weight 1 piece	Pack unit
lx	EAN	Type code	Order code	piece	kg	pc.
2:200	299110	TL1 Pole	2CSM229911R1341		0.135	1

## Control and automation

### E 450 priority switches



E 450

Technical characteristics		
	E 451-5.7	E 452-5.7
Operating coil		
Range of rated current equivalent to	6.7 ... 39 A correlates 1.5 ... 9 kW at 230 V, 4.6 ... 27 kW at 230/400 V	
Threshold current	3.1 ... 5.3 A	
OFF delay (max.)	0 main half waves	2 main half waves
Max. continuous current	43 A	
Therm. continuous capacity at 40 °C/104 °F	5 W	
Contact assembly		
Control contact	1 NC contact	
Rated contact current at 250 V	1 A	
Contact material	solid silver	
Max. switching voltage	400 V	
Max. switching capacity	230 VA	
Max. switched current	1 A	
Max. inrush current peak	5 A	
Electr. service life	> 10 <sup>5</sup> operations	
Mechanical service life	app. 2 x 10 <sup>6</sup> operations	
Max. electrical switching rate	app. 1800 operations/hour	
ON duration	100 %	
Ambient temperature	– 20 °C/– 4 °F to + 40 °C/104 °F	
Response time	10 ... 20 ms	
Release time	5 ... 20 ms	≥ 20 ms
Test voltage contact/coil	2.5 kV	
Clearance and creepage distance	C/250 V AC cording to IEC 669-1-23	
Protection degree	IP 40	
Protection against electric shock	according to DIN VDE 0106 Part 100 (BGV A2)	
Terminal contact	series coil up to 16 mm <sup>2</sup> , control contact up to 2.5 mm <sup>2</sup>	

#### E 450 priority switches

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

The priority switch disconnects the long-term load (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 load. When this load is switched on, the NC contact of the priority switch disconnects e.g. the heating system contactor.

For pneumatically controlled flow-type heaters							
Rated current range	Power loss	Bbn 4016779	Order details		Price 1	Weight 1 piece	Pack unit
	W	EAN	Type code	Order code	piece	kg	pc.
6,7 ... 39 A	2.4	41590 3	E 451- 5.7 A	2CDE160000R0901		0.1	10

For electronically controlled flow-type heaters							
Rated current range	Power loss	Bbn 4016779	Order details		Price 1	Weight 1 piece	Pack unit
	W	EAN	Type code	Order code	piece	kg	pc.
6.7 ... 39 A	2.4	20950 2	E 452-5.7 A	2CDE160010R0901		0.1	10

## Control and automation

### Load management relay



LCR

Technical characteristics		
<b>Input</b>		
Rated voltage Un	[Vac]	230 (-15%/+10%)
Rated frequency	[Hz]	50/60
Rated capacity In	[A]	32
Power consumption	[VA]	4
<b>Display</b>		
Type of display		backlit LCD
Resolution	[kW]	0.01
Display dimensions	[mm]	27 × 23
<b>Non-priority load</b>		
Regulating thresholds	[kW]	0.8..7
Resolution of threshold	[kW]	0.1
Delay of loads disconnection	[sec]	0..9999
Delay between one connection and the next one	[sec]	0..9999
Alarm notification		LED // buzzer
<b>Relay output</b>		
Rated current	[A]	16
Rated voltage	[Vac]	250
<b>Climatic conditions</b>		
Storage temperature		-10°C to +65°C
Operating temperature		-10°C to +45°C
Relative humidity		max. 90% (non-condensing)
<b>Protection degree</b>		
At terminals		IP20
On the front panel		IP51
<b>Max cable cross-section</b>		
rigid	[mm <sup>2</sup> ]	4
flexible	[mm <sup>2</sup> ]	6
Modules (18mm)	[No.]	2

#### Load management relay - LCR

Installed downstream of the main circuit-breaker, it compares the actual power consumption of the system to a preset maximum permitted value. Additionally, the load management relay prevents tripping of the main circuit-breaker by sequentially switching off one non-priority load when the preset threshold is exceeded. One red LED and an integrated buzzer indicate the load OFF conditions. At preset time intervals, the device automatically attempts to reconnect the previously disabled load.

Note: In unbalanced three phase systems same function of LCR can be implemented via DM-TME multimeters. Digital outputs of the multimeter can be set to trip with an user defined delay to switch off - by means of external contactors - non priority loads of arbitrary consumption. See for details in Chapter 8 of Electrical installation solutions for buildings.

Rated current	Bbn			Price	Weight	Pack
	8012542			1 piece	1 piece	unit
A	EAN	Type code	Order code		kg	pc.
32	299011	LCR	2CSM229901R1311		0.135	1

Control and automation

E 235 mains disconnection relays



E 235

Technical features	
Short circuit rupturing capacity	16 A/230 AC
Rated frequency	50/60 Hz
Range of control voltage	0.9 to 1.1 Un
Filament lamps	2300 W
Fluorescent lamps:	
twin lamp circuit	100 W
shunt compensated	56 W
electronic ballast	max. 36 W, dependent on manufacturer
Inductive load cosφ 0.6	6 A
Max. switching capacity (cosφ 0.5)	3500 VA
Intrinsic consumption ca.	1 W
Control voltage	5 V a.c.
Adjustable making capacity	2 - 15 VA
Breaking capacity	0.66 x making capacity
ON delay	50 ms
OFF delay	ca. 3 sec.
Contact assembly	1 NO contact
Service life at rated load	> 100000 switching cycles
Ambient temperature	- 10 °C/14 °F to +45 °C/113 °F
Max terminal cross-section	2.5 mm²

## Control and automation

### E 235 mains disconnection relays



E 235-NFS



E 235-GLE

#### E 235 Mains disconnection relay

##### Application and method of operation

According to building biologists, electrical interference fields emitted from live cables can impair well-being when the human organism is exposed to them for longer periods, e.g. in the bedroom. The E 235 demand switch automatically cuts off the mains voltage of an electric circuit when the last consumer in that circuit has been switched off. When the first consumer is switched on, the device switches the mains voltage back on with almost no delay. A low voltage of approx. 3 V is used to monitor whether consumers are switched on. As alternating voltage is used for this, it is virtually certain that even small consumer units with a capacitor and transformer power pack - e.g. charging stations for rechargeable devices, standard lamps, etc. - will be reliably detected and switched. Interference fields emitted by the monitoring voltage are so small that they cannot be registered. The mains is switched on when the consumer load exceeds the making capacity set in the demand switch. It is cut off when the consumer load falls to 2/3 of the set making capacity. The ON state is indicated by the integrated LED. You can choose between „Automatic monitoring“ and „Permanent ON“ using a rotary switch on the E 235.

##### Accessories

The E 235-GLA base load adapter is also available, and is used for switching the demand switch on manually. The adapter is plugged into a socket that is monitored by the demand switch. The toggle switch switches the base load, which is used to switch on the demand switch.

Some consumers require an initial voltage equal to the mains voltage in order to be switched on. These include brightness controllers, and fluorescent and energy-saving lamps. The PTC base load element E 235-GLE and base load adapter E 235-GLA are available for ensuring reliable switch-on of the mains field relay. The indicator light on the adapter displays the switched on mains voltage, irrespective of the position of the toggle switch. It tells you whether the mains voltage has been cut off or whether other consumers are still switched on. If you wish to connect a dimmer to the output of the demand switch, this must feature an additional switching contact. A base load element is also switched in parallel.

Description	Bbn 4016779	Order details		Price 1	Weight 1 piece	Pack unit
		EAN	Type code	Order code	piece	kg
mains disconnection relay	571821	E 235-NFS		2CDE110000R1701		0.065
base load element	571814	E 235-GLE		2CDE100500R1711		0.001
base load adapter	571869	E 235-GLA		2CDE100510R1711		0.070

