Modular Installation Equipment

System pro M
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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Schalter 16, 25 and 32 A
Series E 220

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: $1.25 I_n; 1.1 U_n; \cos \phi = 0.6$ to DIN VDE 0632, AC 22 to VDE 0660 Part 107, IEC 947-3
- short-circuit withstand capacity: $3 \text{kA}; 400 \text{V}; \cos \phi = 0.8$
- seable: in the ON / OFF position
- climatic resistance: constant climate 40/92 DIN 50 015
- alternating climate SFW DIN 50017
- connection cross section: from $1 \times 6 \text{mm}^2$ or $2 \times 2.5 \text{mm}^2$ massive; to $2 \times 1.5 \text{mm}^2$ flexible with connector
- positive opening: according to DIN VDE 0113
- rated voltage: $250/400 \text{V}$

**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**

- control switch
- one-way switch
- one-way switch with pilot lamp
- Two-way switch

**DC switching capacity**

- E 220
- Resitive load
- Load with time constant $T \leq 15 \text{ms}$
- Inductive load

**Dimension drawing**

- in mm
- SK 0164 Z 91
Switches 16, 25 and 32 A
Series E 220

**Selection table**

<table>
<thead>
<tr>
<th>Type</th>
<th>Rated Voltage (V)</th>
<th>Power Loss (W)</th>
<th>Order Details</th>
<th>Cene</th>
<th>Price 1 Pc. (DM)</th>
<th>Price 1 Pk. (DM)</th>
<th>Weight (kg)</th>
<th>Pack. Unit (pc.)</th>
</tr>
</thead>
</table>

### Control Switch
- **Rated Current = 16 A**
  - 2 NO + 2 NC
    - 250 V: 1.92 E 221-22 GHE221 1001 R0006 00270 2 0.070 10
  - 3 NO + 1 NC
    - 400 V: 1.92 E 221-31 GHE221 1001 R0007 00280 1 0.070 10
  - 1 NO + 1 NC
    - 250 V: 0.96 E 221-11 GHE221 1001 R0005 00260 3 0.070 10

### One-way Switch
- **Rated Current = 16 A**
  - 1 NO
    - 250 V: 0.48 E 221-10 GHE221 1001 R0001 00220 7 0.055 10
  - 2 NO
    - 250 V: 0.96 E 221-20 GHE221 1001 R0002 00230 6 0.060 10
  - 3 NO
    - 400 V: 1.44 E 221-30 GHE221 1001 R0003 00240 5 0.065 10
  - 4 NO
    - 400 V: 1.92 E 221-40 GHE221 1001 R0004 00250 4 0.070 10

### One-way Switch with Built-in Pilot Lamp for 230 V
- **Rated Current = 16 A**
  - 1 NO
    - 250 V: 0.5 E 221-10 x GHE221 1001 R0011 00310 5 0.060 10
  - 2 NO
    - 250 V: 1.0 E 221-20 x GHE221 1001 R0012 00320 4 0.065 10
  - 3 NO
    - 400 V: 1.5 E 221-30 x GHE221 1001 R0013 00330 3 0.087 10

### Two-way Switch
- **Rated Current = 16 A**
  - 1 W
    - 250 V: 0.48 E 221-6 GHE221 1001 R0008 00290 0 0.060 10
  - 2 W
    - 250 V: 0.96 E 221-6/2 GHE221 1001 R0009 00300 6 0.070 10

### Two-way Switch with Two Off Positions (I-O-II, Manual-off-automatic)
- **Rated Current = 16 A**
  - Single-pole
    - 250 V: 0.48 E 221-4 GHE221 1001 R0014 00340 2 0.060 10
  - Two-pole
    - 250 V: 0.96 E 221-4/2 GHE221 1001 R0015 00350 1 0.070 10

### One-way Switch
- **Rated Current = 25 A**
  - 1 NO
    - 250 V: 1.13 E 222-10 GHE222 1001 R0001 00360 0 0.055 10
  - 2 NO
    - 250 V: 2.26 E 222-20 GHE222 1001 R0002 00370 9 0.060 10
  - 3 NO
    - 400 V: 3.39 E 222-30 GHE222 1001 R0003 00380 8 0.065 10
  - 4 NO
    - 400 V: 4.4 E 222-40 GHE222 1001 R0004 00390 7 0.070 10

### Two-way Switch
- **Rated Current = 25 A**
  - 1 NO
    - 250 V: 1.15 E 222-10 x GHE222 1001 R0011 00420 1 0.060 10
  - 2 NO
    - 250 V: 2.3 E 222-20 x GHE222 1001 R0012 00430 0 0.065 10
  - 3 NO
    - 400 V: 3.45 E 222-30 x GHE222 1001 R0013 00440 9 0.087 10

### Two-way Switch with Two Off Positions (I-O-II, Manual-off-automatic)
- **Rated Current = 25 A**
  - Single-pole
    - 250 V: 1.13 E 222-4 GHE222 1001 R0014 00450 2 0.060 10
  - Two-pole
    - 250 V: 1.92 E 222-4/2 GHE222 1001 R0015 00460 3 0.070 10
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 \( U_n \); \( \cos \varphi = 0.3 \) 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:** \( \min \) \( K_{\text{m}} \) = 10 \( K_{\text{m}} \) = 25 \( K_{\text{m}} \) in cascade connection with
- **Withstand capacity:** 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 mm\(^2\), E 270 to 50 mm\(^2\)
- **Climatic resistance according to DIN IEC 68-2-30:** alternating climate 25/95 – 40/93 [-C/RH] \( \ominus \)
- **Storage temperature:** \( T_{\text{min}} + 70 \degree C / 180 \degree F, T_{\text{max}} - 40 \degree C / -40 \degree F \)
- **Ambient temperature range:** \( T_{\text{max}} + 55 \degree C / 131 \degree F, T_{\text{min}} - 25 \degree C / -13 \degree F \)
- **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
- **Shake time at 0.9 \( I_n \):** 5 ... 150 ... 5 Hz

### 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)

### DC Switching Capacity

- **Per Pole**
- **Series E 240 and E 270**

![DC Switching Capacity Graph]
Modular installation equipment

Switches 45, 63, 80, 100 and 125 A
Series E 240 and E 270

Selection table

<table>
<thead>
<tr>
<th>poles</th>
<th>rated current (A)</th>
<th>voltage loss (V)</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>isbn</th>
<th>price (DM)</th>
<th>price (1 pc. group)</th>
<th>price (1 pc. unit)</th>
<th>weight (kg)</th>
<th>pack. (unit pc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NO</td>
<td>45</td>
<td>1.92</td>
<td>E 241/45 rt</td>
<td>GJF152 1150 R0015</td>
<td>59020 9</td>
<td>0.080</td>
<td>10</td>
<td></td>
<td></td>
<td>0.270</td>
<td>3</td>
</tr>
<tr>
<td>2 NO</td>
<td>45</td>
<td>3.83</td>
<td>E 242/45 rt</td>
<td>GJF152 2150 R0015</td>
<td>59050 6</td>
<td>0.175</td>
<td>5</td>
<td></td>
<td></td>
<td>0.365</td>
<td>2</td>
</tr>
<tr>
<td>3 NO</td>
<td>45</td>
<td>5.76</td>
<td>E 243/45 rt</td>
<td>GJF152 3150 R0015</td>
<td>59070 4</td>
<td>0.270</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 NO</td>
<td>45</td>
<td>7.68</td>
<td>E 244/45 rt</td>
<td>GJF152 4150 R0015</td>
<td>59080 3</td>
<td>0.365</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

rated current = 63 A

<table>
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<tr>
<th>poles</th>
<th>rated current (A)</th>
<th>voltage loss (V)</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>isbn</th>
<th>price (DM)</th>
<th>price (1 pc. group)</th>
<th>price (1 pc. unit)</th>
<th>weight (kg)</th>
<th>pack. (unit pc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NO</td>
<td>63</td>
<td>2.5</td>
<td>E 271/63 rt</td>
<td>GJF151 1170 R0015</td>
<td>58810 7</td>
<td>0.100</td>
<td>10</td>
<td></td>
<td></td>
<td>0.215</td>
<td>5</td>
</tr>
<tr>
<td>2 NO</td>
<td>63</td>
<td>5.0</td>
<td>E 272/63 rt</td>
<td>GJF151 2170 R0015</td>
<td>58840 4</td>
<td>0.330</td>
<td>3</td>
<td></td>
<td></td>
<td>0.330</td>
<td>3</td>
</tr>
<tr>
<td>3 NO</td>
<td>63</td>
<td>7.5</td>
<td>E 273/63 rt</td>
<td>GJF151 3170 R0015</td>
<td>58870 1</td>
<td>0.330</td>
<td>3</td>
<td></td>
<td></td>
<td>0.440</td>
<td>2</td>
</tr>
<tr>
<td>4 NO</td>
<td>63</td>
<td>10.0</td>
<td>E 274/63 rt</td>
<td>GJF151 4170 R0015</td>
<td>58900 1</td>
<td>0.440</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
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</table>

rated current = 80 A

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<th>rated current (A)</th>
<th>voltage loss (V)</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>isbn</th>
<th>price (DM)</th>
<th>price (1 pc. group)</th>
<th>price (1 pc. unit)</th>
<th>weight (kg)</th>
<th>pack. (unit pc.)</th>
</tr>
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<tbody>
<tr>
<td>1 NO</td>
<td>80</td>
<td>4.0</td>
<td>E 271/80 rt</td>
<td>GJF151 1180 R0015</td>
<td>58820 6</td>
<td>0.105</td>
<td>10</td>
<td></td>
<td></td>
<td>0.220</td>
<td>5</td>
</tr>
<tr>
<td>2 NO</td>
<td>80</td>
<td>8.0</td>
<td>E 272/80 rt</td>
<td>GJF151 2180 R0015</td>
<td>58850 3</td>
<td>0.220</td>
<td>5</td>
<td></td>
<td></td>
<td>0.335</td>
<td>3</td>
</tr>
<tr>
<td>3 NO</td>
<td>80</td>
<td>12.0</td>
<td>E 273/80 gr</td>
<td>GJF151 3180 R0015</td>
<td>58880 0</td>
<td>0.335</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 NO</td>
<td>80</td>
<td>16.0</td>
<td>E 274/80 gr</td>
<td>GJF151 4180 R0015</td>
<td>58900 7</td>
<td>0.450</td>
<td>2</td>
<td></td>
<td></td>
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</table>

rated current = 100 A

<table>
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<th>rated current (A)</th>
<th>voltage loss (V)</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>isbn</th>
<th>price (DM)</th>
<th>price (1 pc. group)</th>
<th>price (1 pc. unit)</th>
<th>weight (kg)</th>
<th>pack. (unit pc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NO</td>
<td>100</td>
<td>6.5</td>
<td>E 271/100 rt</td>
<td>GJF151 1190 R0015</td>
<td>58830 5</td>
<td>0.105</td>
<td>10</td>
<td></td>
<td></td>
<td>0.220</td>
<td>5</td>
</tr>
<tr>
<td>2 NO</td>
<td>100</td>
<td>13.0</td>
<td>E 272/100 rt</td>
<td>GJF151 2190 R0015</td>
<td>58860 2</td>
<td>0.335</td>
<td>3</td>
<td></td>
<td></td>
<td>0.335</td>
<td>3</td>
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<tr>
<td>3 NO</td>
<td>100</td>
<td>19.5</td>
<td>E 273/100 rt</td>
<td>GJF151 3190 R0015</td>
<td>58890 9</td>
<td>0.335</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 NO</td>
<td>100</td>
<td>26.0</td>
<td>E 274/100 rt</td>
<td>GJF151 4190 R0015</td>
<td>58900 6</td>
<td>0.450</td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

rated current = 125 A

<table>
<thead>
<tr>
<th>poles</th>
<th>rated current (A)</th>
<th>voltage loss (V)</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>isbn</th>
<th>price (DM)</th>
<th>price (1 pc. group)</th>
<th>price (1 pc. unit)</th>
<th>weight (kg)</th>
<th>pack. (unit pc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NO</td>
<td>125</td>
<td>9.0</td>
<td>E 271/125 rt</td>
<td>GJF151 1191 R0015</td>
<td>83670 3</td>
<td>0.105</td>
<td>10</td>
<td></td>
<td></td>
<td>0.220</td>
<td>5</td>
</tr>
<tr>
<td>2 NO</td>
<td>125</td>
<td>18.0</td>
<td>E 272/125 rt</td>
<td>GJF151 2191 R0015</td>
<td>83880 2</td>
<td>0.220</td>
<td>5</td>
<td></td>
<td></td>
<td>0.335</td>
<td>3</td>
</tr>
<tr>
<td>3 NO</td>
<td>125</td>
<td>27.0</td>
<td>E 273/125 rt</td>
<td>GJF151 3191 R0015</td>
<td>83890 1</td>
<td>0.335</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4 NO</td>
<td>125</td>
<td>36.0</td>
<td>E 274/125 rt</td>
<td>GJF151 4191 R0015</td>
<td>83700 7</td>
<td>0.450</td>
<td>2</td>
<td></td>
<td></td>
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</tbody>
</table>

Switches E 273/63 gr, E 274/63 gr, marked (1) and (2) comply with the so-called "Technical Power Supply Regulations TAB 7.2" as well as VDE 0632 and fulfils 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.

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).
Modular installation equipment

Switches 63 and 80 A
E 463/3-KB, E 480/3-KB, E 463/3-SL

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

<table>
<thead>
<tr>
<th>poles</th>
<th>rated current</th>
<th>power loss</th>
<th>type code</th>
<th>order code</th>
<th>bbn no.</th>
<th>price 1 pc. DM</th>
<th>price 1 pc. unit</th>
<th>weight 1 pc. kg</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 NO</td>
<td>63 A</td>
<td>V ~ W</td>
<td>E 463/3-KB</td>
<td>GH V021 0864 R0001</td>
<td>52980 3</td>
<td>0.190 1/50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 NO</td>
<td>63 A (can be locked with key provided by utility company and is sealable and lockable with padlock)</td>
<td>V ~ W</td>
<td>E 463/3-SL</td>
<td>GH V021 0864 R0005</td>
<td>06240 4</td>
<td>0.195 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 NO</td>
<td>80 A</td>
<td>V ~ W</td>
<td>E 480/3-KB</td>
<td>GH V021 1425 R000</td>
<td>52990 2</td>
<td>0.210 1/50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Supplementary terminal allows connecting of a supplementary wire of up to 2.5 mm² for E 480/3-KB

<table>
<thead>
<tr>
<th>price 1 pc. DM</th>
<th>price 1 pc. unit</th>
<th>weight 1 pc. kg</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>52980 3</td>
<td>0.190 1/50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E 480 ZK</td>
<td>GH V021 1425</td>
<td>53400 5</td>
<td>0.005 1</td>
</tr>
</tbody>
</table>

Padlock

for E 463/3-SL

<table>
<thead>
<tr>
<th>price 1 pc. DM</th>
<th>price 1 pc. unit</th>
<th>weight 1 pc. kg</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA 2</td>
<td>GJ F110 1903</td>
<td>58770 4</td>
<td>0.020 10</td>
</tr>
</tbody>
</table>

bbn no. 4016779

Technical drawing in mm

Dimensions for E 463/3-KB, E 463/3-SL, E 480/3-KB

References:
DIN EN 60 669-1,
VDE 0632 Part 1
DIN EN 50 022
DIN VDE 0106 Part 100 (BGV A2)
Modular installation equipment
Emergency light for distribution boards

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

<table>
<thead>
<tr>
<th>type code</th>
<th>order details</th>
<th>order code</th>
<th>EAN</th>
<th>bbn 80</th>
<th>12542</th>
<th>price 1 pc.</th>
<th>price group</th>
<th>weight 1 pc.</th>
<th>pack. unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency light</td>
<td>LE-230</td>
<td>GH V021 2966 R0001</td>
<td>023401</td>
<td>0.130</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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:
- Emergency light: LE-230, order code: GH V021 2966 R0001, EAN: 023401, price 1 pc.: 0.130

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:
- Emergency light: LE-230, order code: GH V021 2966 R0001, EAN: 023401, price 1 pc.: 0.130
Modular installation equipment

Pushbutton and indicator lights

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: up to 1 x 6 mm² or 2 x 2.5 mm² massive wire;
- section: 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

<table>
<thead>
<tr>
<th>Pushbutton</th>
<th>Illuminated pushbutton</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NO + 1 NC</td>
<td>1 NO + 1 NC</td>
</tr>
</tbody>
</table>

Comb busbars and labels

<table>
<thead>
<tr>
<th>Lengths supplied</th>
<th>No. of poles</th>
<th>Order details</th>
<th>bbn type code</th>
<th>order code</th>
<th>Cu number</th>
<th>price 1 pc.</th>
<th>price group</th>
<th>weight 1 pc.</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 mm</td>
<td>12 x 1</td>
<td>SZ-KS 7/12</td>
<td>GH-03-0875</td>
<td>R0003</td>
<td>55340</td>
<td>0.038</td>
<td>0.025</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>990 mm</td>
<td>56 x 1</td>
<td>SZ-KS 7/56</td>
<td>GH-03-0875</td>
<td>R0004</td>
<td>55350</td>
<td>0.187</td>
<td>0.110</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Style</th>
<th>Power Loss (W)</th>
<th>Order Details</th>
<th>Order Code</th>
<th>BBN Code</th>
<th>Price (DM)</th>
<th>Price (1 pc.)</th>
<th>Weight (kg)</th>
<th>Pack. Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pushbutton 1 NO + 1 NC</td>
<td>0.96</td>
<td>E 225 – 11 B</td>
<td>GH E225 1001 R0001</td>
<td>00460 7</td>
<td>0.055</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pushbutton 1 NO + 1 NC, without button</td>
<td>0.96</td>
<td>E 225 – 11 Z</td>
<td>GH E225 1001 R0007</td>
<td>00520 8</td>
<td>0.053</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator lights with glow lamp E 10/230 V</td>
<td>1.03</td>
<td>E 229 – B</td>
<td>GH E229 1001 R0001</td>
<td>00590 1</td>
<td>0.045</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator lights without collar, with E 10 holder for pilot lamp max. 2 W</td>
<td>0.48</td>
<td>E 229 – Z</td>
<td>GH E229 1001 R0007</td>
<td>00640 3</td>
<td>0.040</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buttons, not transparent, for pushbutton E 225</td>
<td>0.96</td>
<td>E 220 – B 1</td>
<td>GH E220 0002 R0001</td>
<td>00100 2</td>
<td>0.002</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collars, transparent, for illuminated pushbutton E 227</td>
<td>0.20</td>
<td>E 220 – C 1</td>
<td>GH E220 0002 R0002</td>
<td>00110 1</td>
<td>0.002</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collars, transparent, with lamp symbol for indicator lights E 229</td>
<td>0.20</td>
<td>E 220 – D 3</td>
<td>GH E220 0003 R0003</td>
<td>00150 7</td>
<td>0.002</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lamps with E 10 holder for illuminated pushbuttons and indicator lights</td>
<td>0.77</td>
<td>E 220-LZ</td>
<td>GH E220 0004 R0001</td>
<td>00210 8</td>
<td>0.002</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
**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

<table>
<thead>
<tr>
<th>colour</th>
<th>meaning</th>
<th>safety of persons</th>
<th>machinery/ process status</th>
<th>position of equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>red</td>
<td>danger, prohibition</td>
<td>emergency</td>
<td></td>
<td>no general meaning</td>
</tr>
<tr>
<td>yellow</td>
<td>caution</td>
<td>abnormal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>green</td>
<td>safety</td>
<td>normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>blue</td>
<td>action</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>white</td>
<td></td>
<td></td>
<td></td>
<td>no specific meaning assigned</td>
</tr>
<tr>
<td>grey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>black</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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)

<table>
<thead>
<tr>
<th>colour</th>
<th>meaning</th>
<th>safety of persons or environmental safety</th>
<th>process status</th>
<th>position of equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>red</td>
<td>danger</td>
<td>emergency</td>
<td>defective</td>
<td></td>
</tr>
<tr>
<td>yellow</td>
<td>warning / caution</td>
<td>abnormal</td>
<td>abnormal</td>
<td></td>
</tr>
<tr>
<td>green</td>
<td>safety</td>
<td>normal</td>
<td>normal</td>
<td></td>
</tr>
<tr>
<td>blue</td>
<td></td>
<td>prescription</td>
<td></td>
<td></td>
</tr>
<tr>
<td>white</td>
<td></td>
<td></td>
<td>no specific meaning assigned</td>
<td></td>
</tr>
<tr>
<td>grey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>black</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Modular installation equipment
Alarm indicators
Socket outlets

**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

**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**

<table>
<thead>
<tr>
<th>description</th>
<th>order details</th>
<th>price</th>
<th>weight</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>alarm indicator</td>
<td>E 228-WM *</td>
<td>63030</td>
<td>1/10</td>
<td></td>
</tr>
</tbody>
</table>

* 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

**Technical data**
- Rated Voltage: 250 V ~
- Casing material: self-extinguishing plastic, halogen/dioxine-free
- 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**

<table>
<thead>
<tr>
<th>power loss</th>
<th>order details</th>
<th>price</th>
<th>weight</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6 SCHUKO</td>
<td>E 1175</td>
<td>33470</td>
<td>0.120</td>
<td>4</td>
</tr>
<tr>
<td>0.6 SCHUKO</td>
<td>E 1175 c</td>
<td>34250</td>
<td>0.120</td>
<td>4</td>
</tr>
<tr>
<td>0.6 Italy</td>
<td>E 1173 *</td>
<td>00410</td>
<td>0.105</td>
<td>4</td>
</tr>
<tr>
<td>0.6 France</td>
<td>E 1174 *</td>
<td>00660</td>
<td>0.105</td>
<td>4</td>
</tr>
</tbody>
</table>

* tamper-proof
Modular installation equipment

Staircase lighting time-delay switch (t.d.s.)

Semi-light module for t.d.s.

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

<table>
<thead>
<tr>
<th></th>
<th>E 232</th>
<th>E 232 E – 8/230</th>
<th>HLM</th>
</tr>
</thead>
<tbody>
<tr>
<td>rated voltage</td>
<td>230 V ~, 50 Hz</td>
<td>230 V ~, 50 Hz</td>
<td></td>
</tr>
<tr>
<td>rated switching capacity</td>
<td>16 A, 250 V ~</td>
<td>16 A, 250 V ~</td>
<td>10 A, 250 V ~</td>
</tr>
<tr>
<td>filament lamp load</td>
<td>2300 W</td>
<td>2000 W</td>
<td>2300 W</td>
</tr>
<tr>
<td>glow lamps parallel to the 230 V-control buttons</td>
<td>50 mA</td>
<td>150 mA (E 232 E-230)</td>
<td>–</td>
</tr>
<tr>
<td>fluorescent lamp load twin-lamp circuit</td>
<td>3500 W</td>
<td>1000 W</td>
<td>–</td>
</tr>
<tr>
<td>electronic control gear</td>
<td>2300 W</td>
<td>700 W</td>
<td>–</td>
</tr>
<tr>
<td>inductive or capacitive</td>
<td>100 W</td>
<td>650 W</td>
<td>–</td>
</tr>
<tr>
<td>fluorescent lamp load shunt-compensated</td>
<td>1000 W</td>
<td>500 W</td>
<td>–</td>
</tr>
<tr>
<td>contact rating at DC</td>
<td>1300 W</td>
<td>100 W</td>
<td>–</td>
</tr>
<tr>
<td>minimum contact rating</td>
<td>6 V AC/50 mA</td>
<td>4 V AC/10 mA</td>
<td>–</td>
</tr>
<tr>
<td>contact gap / contact material</td>
<td>3 mm / AgSnO₂</td>
<td>0.5 mm / AgSnO₂</td>
<td>–</td>
</tr>
<tr>
<td>distance of gate terminals A1 - A2/contact</td>
<td>3 mm</td>
<td>3 mm</td>
<td>–</td>
</tr>
<tr>
<td>distance of gate terminals C1 - C2/contact</td>
<td>8 mm</td>
<td>8 mm</td>
<td>–</td>
</tr>
<tr>
<td>ON duration</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>switching safety at rated voltage</td>
<td>99.9%</td>
<td>99.9%</td>
<td>99.9%</td>
</tr>
<tr>
<td>ambient temperature at mounting position</td>
<td>–5°C/+23 °C to 60 °C/+140 °C</td>
<td>–20°C/-4°F to 50 °C/122°F</td>
<td>–20°C/-4°F to 50 °C/122°F</td>
</tr>
<tr>
<td>control voltage range</td>
<td>0.9 to 1.1 x U₀</td>
<td>0.9 to 1.1 x U₀</td>
<td>0.9 to 1.1 x U₀</td>
</tr>
<tr>
<td>control current at 230 V (after 1 sec.)</td>
<td>10 - 15 ms, 1 A ± 20%</td>
<td>100 (20) mA ± 20%</td>
<td>–</td>
</tr>
<tr>
<td>control current at 8 V</td>
<td>–</td>
<td>40 mA ± 20%</td>
<td>–</td>
</tr>
<tr>
<td>minimum command time</td>
<td>50 ms</td>
<td>50 ms</td>
<td>–</td>
</tr>
<tr>
<td>max. induced voltage at the control inputs (230 V)</td>
<td>120 V</td>
<td>120 V</td>
<td>–</td>
</tr>
<tr>
<td>termal (strain relief clamps)</td>
<td>12 mm²</td>
<td>12 mm²</td>
<td>12 mm²</td>
</tr>
<tr>
<td>max. connection cross section of a conductor</td>
<td>6 mm²</td>
<td>2.5 mm²</td>
<td>2.5 mm²</td>
</tr>
<tr>
<td>protection against electric shock</td>
<td>to DIN VDE 0106 Part 100 &amp; BGV A2</td>
<td>to DIN VDE 0106 Part 100 &amp; BGV A2</td>
<td>to DIN VDE 0106 Part 100 &amp; BGV A2</td>
</tr>
<tr>
<td>serviceable life if rated load, cos φ = 1 or filament lamps 1000 W and 10³/h</td>
<td>&gt; 5 x 10⁴</td>
<td>&gt; 10⁷</td>
<td>–</td>
</tr>
<tr>
<td>serviceable life if nominal stress, cos φ = 0.6 and 10³/h</td>
<td>&gt; 2 x 10⁴</td>
<td>&gt; 10⁵</td>
<td>–</td>
</tr>
<tr>
<td>mechanical serviceable life, Switchover at 10³/h</td>
<td>&gt; 5 x 10⁴</td>
<td>&gt; 10⁵</td>
<td>–</td>
</tr>
<tr>
<td>position indicator/control indicator</td>
<td>LED</td>
<td>LED</td>
<td>–</td>
</tr>
</tbody>
</table>

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

Staircase lighting time-delay switches (t.d.s.)

Semi-light module for t.d.s.

### Selection Table

<table>
<thead>
<tr>
<th>Power Loss</th>
<th>Type Code</th>
<th>Order Code</th>
<th>EAN</th>
<th>Price</th>
<th>Weight</th>
<th>Pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 W</td>
<td>E232-230</td>
<td>GH E232 1301 R0006</td>
<td>97120 6</td>
<td>0.080</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3.5 W</td>
<td>E232 E-230</td>
<td>GH E232 1302 R0006</td>
<td>15130 6</td>
<td>0.080</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3.5 W</td>
<td>E232 E-8/230</td>
<td>GH E232 1303 R0006</td>
<td>15140 5</td>
<td>0.080</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6.25 W</td>
<td>E232 HLM</td>
<td>GH E232 0866 R0001</td>
<td>36040 1</td>
<td>0.080</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

1  bbn no. 4016779

### Wiring Diagrams

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### Dimension Drawings

- **SK 0077 Z 97**
- **SK 0190 Z 98**
- **SK 0205 Z 98**

-DIN VDE 0632
examples connection

**E251-230**

![Diagram E251-230](sk0172z91)

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

**E252-230**

![Diagram E252-230](sk0173z91)

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

**E254-8**

![Diagram E254-8](sk0174z91)

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

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**Modular installation equipment**

**Latching relays**

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 (1300 W)
- **Minimum contact rating:** 6 V AC/50 mA
- **Power consumption:**
  - **Hold:** single, two-pole 5 VA; three, four-pole 6.5 VA
  - **Pick-up:** three, four-pole 10 VA; 13 VA
- **Contact gap/contact material:** 3 mm / Ag Cd 0.15
- **Mechanical serviceable life, switchover at 10⁹/h:** > 10⁶
- **Serviceable life if rated load cos φ = 1 and 10³/h:** > 10⁶
- **Serviceable life if rated load cos φ = 0.6 and 10⁹/h:** > 2 x 10⁶
- **Bounce time:** 3 ms
- **Connections**
  - **Switching circuit:** strain-relief clamp 12 mm²
  - **Control circuit:** clamping screw M 3.5; 2 x 2.5 mm²
- **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 Uₙ
- **Switching safety:** 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 ± 20%
  - Two-pole: 6 W ± 20%
  - Three and four-pole: 12 W ± 20%
- **Max. parallel capacitance of individual control lead at 230 V ~:** 0.06 μF (ca. 200 m)
- **Max. glow lamp current:**
  - Parallel to 230 V 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 control inputs:** 0.2 x Uₙ

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.

---

"Table "lamp load" page 19"
Modular installation equipment
Latching relays

DIN EN 60 669-1,
VDE 0632 Part 1

Selection table

<table>
<thead>
<tr>
<th>contacts</th>
<th>power loss W⁻</th>
<th>type code</th>
<th>order code</th>
<th>bbn 40 12233</th>
<th>price 1 pc. DM</th>
<th>price group</th>
<th>weight pack. kg</th>
<th>pack. unit pc.</th>
</tr>
</thead>
</table>

**coil voltage Uᵢ = 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 Uᵢ = 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. | 2 NO | 4 (8)     | E 255 - 12 | GH E255 1001 R1204 | 00810 0 | 0.111 | 10 |

**coil voltage Uᵢ = 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 Uᵢ = 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 6, 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:

<table>
<thead>
<tr>
<th>up to 400 V AC</th>
<th>surcharge</th>
<th>1 – 9 pc.</th>
<th>10 – 49 pc.</th>
<th>50 – 99 pc.</th>
<th>100 pc. plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 ... 60 Hz</td>
<td>up to 220 V DC</td>
<td>+ 80%</td>
<td>+ 45%</td>
<td>+ 25%</td>
<td>+ 10%</td>
</tr>
</tbody>
</table>

lock values in brackets indicate power loss at permanent excitation

**wiring diagram**

- E 251/E 257 - C 10-
- E 252
- E 256
- E 254
- E 255
- E 257 - C 30/-E 258 - C 30-
## Selection table

<table>
<thead>
<tr>
<th>contacts</th>
<th>power loss W</th>
<th>order details</th>
<th>bbn</th>
<th>price 1 pc. DM</th>
<th>price 1 pc. unit</th>
<th>weight</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>type code</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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 Uc = 12 V/50 Hz**

1 NO 5 (7) | E 257 C 10-12 | GHE257 1001 R1104 | 34760 0 | 0.100 | 10 |
3 NO 12(18) | E 257 C 30-12' | GHE257 1001 R1304 | 34770 9 | 0.200 | 5 |
2 NO + 1 NC 12(18) | E 257 C 21-12' | GHE257 1001 R1214 | 34780 8 | 0.200 | 5 |

**Coil voltage Uc = 24 V/50 Hz**

1 NO 5 (7) | E 257 C 10-24 | GHE257 1001 R0101 | 34790 7 | 0.100 | 10 |
3 NO 12(18) | E 257 C 30-24 | GHE257 1001 R0304 | 34800 3 | 0.200 | 5 |
2 NO + 1 NC 12(18) | E 257 C 21-24 | GHE257 1001 R0214 | 34810 1 | 0.200 | 5 |

**Coil voltage Uc = 230 V/50 Hz**

1 NO 5 (7) | E 257 C 10-230 | GHE257 1001 R0105 | 34690 0 | 0.100 | 10 |
3 NO 12(18) | E 257 C 30-230 | GHE257 1001 R0306 | 34700 6 | 0.200 | 5 |
2 NO + 1 NC 12(18) | E 257 C 21-230 | GHE257 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 Uc = 12 V/50 Hz, 230 V/50 Hz**

3 NO 12(18) | E 258 C 30-12/230* | GHE258 1014 R0306 | 34660 3 | 0.200 | 10 |
2 NO + 1 NC 12(18) | E 258 C 21-12/230* | GHE258 1014 R0216 | 34570 2 | 0.200 | 10 |

**Coil voltage Uc = 24 V/50 Hz, 230 V/50 Hz**

3 NO 12(18) | E 258 C 30-24/230 | GHE258 1001 R0306 | 34600 9 | 0.200 | 5 |
2 NO + 1 NC 12(18) | E 258 C 21-24/230 | GHE258 1001 R0216 | 34610 8 | 0.200 | 5 |

**Coil voltage Uc = 230 V/50 Hz, 230 V/50 Hz**

3 NO 12(18) | E 258 C 30-230/230 | GHE258 1006 R0306 | 34620 7 | 0.200 | 5 |
2 NO + 1 NC 12(18) | E 258 C 21-230/230 | GHE258 1006 R0216 | 34630 6 | 0.200 | 5 |

* Values in brackets indicate power loss at permanent excitation
* Latching relay with 3 contacts in 12 V style only central OFF!

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### Connection examples

- **E 257 C 10**
- **E 257 C 21/C 30**
- **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 mechanically latching relays and installation relays of series E 250 and E 259

<table>
<thead>
<tr>
<th>Type of Lamp</th>
<th>Lamp Data</th>
<th>Permissible Number of Lamps (230 V, 50 Hz)</th>
<th>Type of Lamp</th>
<th>Lamp Data</th>
<th>Permissible Number of Lamps (230 V, 50 Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Incandescent lamps and halogen lamps</strong>&lt;br&gt;for 230 V&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 2300 W</td>
<td>Watt</td>
<td>L / A</td>
<td>Watt</td>
<td>L / A</td>
<td>Watt</td>
</tr>
<tr>
<td>15</td>
<td>0.065</td>
<td>153</td>
<td>high pressure lamps</td>
<td>50</td>
<td>0.77</td>
</tr>
<tr>
<td>25</td>
<td>0.108</td>
<td>92</td>
<td>sodium vapour lamps</td>
<td>30</td>
<td>0.47</td>
</tr>
<tr>
<td>40</td>
<td>0.174</td>
<td>57</td>
<td>lamps&lt;br&gt;● Uncorrected</td>
<td>250</td>
<td>3.0</td>
</tr>
<tr>
<td>60</td>
<td>0.26</td>
<td>38</td>
<td>(type: HQL)&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 1300 W</td>
<td>400</td>
<td>4.4</td>
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<tr>
<td>75</td>
<td>0.33</td>
<td>30</td>
<td>1000</td>
<td>10.3</td>
<td>–</td>
</tr>
<tr>
<td>100</td>
<td>0.43</td>
<td>23</td>
<td>low pressure lamps</td>
<td>18</td>
<td>0.35</td>
</tr>
<tr>
<td>150</td>
<td>0.65</td>
<td>15</td>
<td>sodium vapour lamps</td>
<td>37</td>
<td>0.6</td>
</tr>
<tr>
<td>200</td>
<td>0.87</td>
<td>11</td>
<td>lamps&lt;br&gt;● Uncorrected</td>
<td>59</td>
<td>0.94</td>
</tr>
<tr>
<td>300</td>
<td>1.30</td>
<td>7</td>
<td>(type: HQL)&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 1300 W</td>
<td>135</td>
<td>0.95</td>
</tr>
<tr>
<td>500</td>
<td>2.17</td>
<td>4</td>
<td>1000</td>
<td>10.3</td>
<td>–</td>
</tr>
<tr>
<td><strong>Fluorescent lamps</strong>&lt;br&gt;● Uncorrected&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 1300 W</td>
<td>8</td>
<td>0.145</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.17</td>
<td>31</td>
<td>high pressure lamps</td>
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<td>0.6</td>
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<tr>
<td>13</td>
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<td>32</td>
<td>mercury vapour lamps</td>
<td>80</td>
<td>0.8</td>
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<tr>
<td>15</td>
<td>0.16</td>
<td>33</td>
<td>lamps</td>
<td>125</td>
<td>1.5</td>
</tr>
<tr>
<td>16</td>
<td>0.17</td>
<td>33</td>
<td>(type: HQL)&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 1300 W</td>
<td>400</td>
<td>3.25</td>
</tr>
<tr>
<td>18</td>
<td>0.37</td>
<td>14</td>
<td>700</td>
<td>5.4</td>
<td>(1)</td>
</tr>
<tr>
<td>20</td>
<td>0.37</td>
<td>14</td>
<td>1000</td>
<td>7.5</td>
<td>–</td>
</tr>
<tr>
<td>30</td>
<td>0.365</td>
<td>14</td>
<td>low pressure lamps&lt;br&gt;● Uncorrected</td>
<td>59</td>
<td>0.94</td>
</tr>
<tr>
<td>36</td>
<td>0.43</td>
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<td>sodium vapour lamps</td>
<td>37</td>
<td>0.6</td>
</tr>
<tr>
<td>40</td>
<td>0.43</td>
<td>12</td>
<td>lamps&lt;br&gt;● Uncorrected</td>
<td>59</td>
<td>0.94</td>
</tr>
<tr>
<td>58</td>
<td>0.67</td>
<td>8</td>
<td>(type: HQL)&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 1300 W</td>
<td>135</td>
<td>0.95</td>
</tr>
<tr>
<td>65</td>
<td>0.67</td>
<td>8</td>
<td>400</td>
<td>3.25</td>
<td>1</td>
</tr>
<tr>
<td><em><em>Fluorescent lamps&lt;br&gt;● Twin-lamp circuit&lt;br&gt;</em> P&lt;sub&gt;par&lt;/sub&gt; = 3500 W</em>*</td>
<td>18</td>
<td>0.37</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>0.37</td>
<td>39</td>
<td>high pressure lamps</td>
<td>50</td>
<td>0.61</td>
</tr>
<tr>
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<td>mercury vapour lamps</td>
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<td>33</td>
<td>lamps</td>
<td>125</td>
<td>1.5</td>
</tr>
<tr>
<td>40</td>
<td>0.43</td>
<td>33</td>
<td>(type: HQL)&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 1300 W</td>
<td>400</td>
<td>3.25</td>
</tr>
<tr>
<td>58</td>
<td>0.67</td>
<td>21</td>
<td>250</td>
<td>2.15</td>
<td>4</td>
</tr>
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<td>65</td>
<td>0.67</td>
<td>21</td>
<td>e.g. HQL, HPL&lt;br&gt;● Compensated</td>
<td>400</td>
<td>3.25</td>
</tr>
<tr>
<td><em><em>Fluorescent lamps&lt;br&gt;● Shunt&lt;br&gt;● Compensation&lt;br&gt;</em> P&lt;sub&gt;par&lt;/sub&gt; = 500 W</em>*</td>
<td>4</td>
<td>0.09</td>
<td>22</td>
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<tr>
<td>6</td>
<td>0.08</td>
<td>25</td>
<td>lamps with electronic control gear&lt;br&gt;● Compensated</td>
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<tr>
<td>8</td>
<td>0.07</td>
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<td>0.09</td>
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<td>2 x 18</td>
<td>60</td>
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</tr>
<tr>
<td>13</td>
<td>0.08</td>
<td>25</td>
<td>control gear&lt;br&gt;● Uncorrected&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 2800 W</td>
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<td>2 x 58</td>
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<td>0.34</td>
<td>6</td>
<td>1 x 58</td>
<td>37</td>
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</tr>
</tbody>
</table>

For electronically-controlled latching relays of series E 260:

<table>
<thead>
<tr>
<th>Type of Lamp</th>
<th>Lamp Data</th>
<th>Permissible Number of Lamps (230 V, 50 Hz)</th>
<th>Type of Lamp</th>
<th>Lamp Data</th>
<th>Permissible Number of Lamps (230 V, 50 Hz)</th>
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<tr>
<td>incandescent lamps&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 1000 W</td>
<td>60</td>
<td>0.27</td>
<td>16</td>
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<tr>
<td>fluorescent lamps&lt;br&gt;● Uncorrected&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 1000 W</td>
<td>15</td>
<td>0.35</td>
<td>25</td>
<td></td>
<td></td>
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<tr>
<td>18</td>
<td>0.37</td>
<td>11</td>
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<td>1.50</td>
<td>2</td>
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<tr>
<td>fluorescent lamps&lt;br&gt;● Twin-lamp circuit&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 1000 W</td>
<td>2 x 18</td>
<td>0.37</td>
<td>11</td>
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<td>9</td>
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<tr>
<td>2 x 58</td>
<td>0.67</td>
<td>6</td>
<td></td>
<td></td>
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<tr>
<td>2 x 65</td>
<td>0.67</td>
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<tr>
<td><strong>Fluorescent lamps&lt;br&gt;● Shunt&lt;br&gt;● Compensation</strong></td>
<td>4</td>
<td>0.09</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.08</td>
<td>25</td>
<td>lamps with electronic control gear&lt;br&gt;● Compensated</td>
<td>2 x 18</td>
<td>0.37</td>
</tr>
<tr>
<td>8</td>
<td>0.07</td>
<td>29</td>
<td>1 x 18</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.09</td>
<td>22</td>
<td>2 x 18</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>0.08</td>
<td>25</td>
<td>control gear&lt;br&gt;● Uncorrected&lt;br&gt;* P&lt;sub&gt;par&lt;/sub&gt; = 2800 W</td>
<td>2 x 36</td>
<td>0.36</td>
</tr>
<tr>
<td>15</td>
<td>0.17</td>
<td>12</td>
<td>1 x 36</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>0.10</td>
<td>20</td>
<td>1 x 36</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>0.19</td>
<td>10</td>
<td>1 x 36</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>0.19</td>
<td>10</td>
<td>2 x 36</td>
<td>0.36</td>
<td>11</td>
</tr>
<tr>
<td>30</td>
<td>0.18</td>
<td>11</td>
<td>1 x 58</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>0.22</td>
<td>9</td>
<td>2 x 58</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>0.22</td>
<td>9</td>
<td>1 x 58</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>0.34</td>
<td>6</td>
<td>2 x 58</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>0.34</td>
<td>6</td>
<td>1 x 58</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>

For transformers permissible for x Watt:<n>...
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: 10 A/250 V
  - Fluorescent lamp load (twin-lamp circuit): 1000 W
  - Fluorescent lamp load shunt-compensated: 500 W
  - Electronic control gear: 650 W
  - Contact rating at DC: 100 W
- Minimum contact rating:
  - 4 V AC / 10 mA
  - 0.5 mm / Ag Sn0 2
- Mechanical serviceable life, switchover at 10³/h:
  - > 10³
  - > 10³
- Serviceable life if rated load cos ϕ = 1 and 10³/h:
  - > 10³
  - > 10³
- Serviceable life if rated load cos ϕ = 0.6 and 10³/h:
  - > 10³
  - > 10³
- Maximum switching rate: 10³/h
- Bounce time: 3 ms
- Terminals circuit, control circuit:
  - 12 mm² strain-relief clamp
- ON duration at rated voltage ED:
  - 100% 100%
- Switching safety (no parallel control):
  - 99% 99%
- Coil voltage range:
  - 0.9 to 1.1 Uₐ 0.9 to 1.1 Uₐ
- 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 ~ 115 mA, after 10s 8 mA ± 20%
  - 24 V UC 140 mA, after 10s 80 mA ± 20%
- Control current during central control:
  - 230 V ~ 8 mA, after 10s 3 mA ± 20%
  - 24 V UC 17 mA (26 mA 2 contacts) ± 20%
- Max. parallel capacitance of the individual control lead at 230 V ~:
  - 2 µF (ca. 6000 m)
- Max. parallel capacitance of the control lead at 230 V ~:
  - 0.33 µF (ca. 1000 m)
- Max. glow lamp current
  - 24 V 10 mA/30 mA (E 260 C) 50 mA
- Max. induced voltage at the 230 V control inputs:
  - 0.2 Uₐ 0.2 Uₐ

Table “lamp load” page 19
Latching relay
with electronic control

Selection table
Latching relays with electronic control

<table>
<thead>
<tr>
<th>contacts</th>
<th>coil voltage</th>
<th>power loss W</th>
<th>order details</th>
<th>bbn price</th>
<th>price</th>
<th>weight pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uc = 24 V AC/DC</td>
<td></td>
<td>type code</td>
<td>EAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 NO</td>
<td>2.4 (3.0)</td>
<td>E 261-24</td>
<td>GHE 261 5001 R0101</td>
<td>01000 4</td>
<td>0.085</td>
<td>10</td>
</tr>
<tr>
<td>2 NO</td>
<td>2.4 (3.5)</td>
<td>E 262-24</td>
<td>GHE 262 5001 R0201</td>
<td>01060 8</td>
<td>0.096</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Uc = 230 V AC</td>
<td></td>
<td>type code</td>
<td>EAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 NO</td>
<td>1.5 (2.0)</td>
<td>E 261-230</td>
<td>GHE 261 1001 R0106</td>
<td>00980 0</td>
<td>0.085</td>
<td>10</td>
</tr>
<tr>
<td>1 NO + 1 NC</td>
<td>1.7 (3.0)</td>
<td>E 266-230</td>
<td>GHE 266 1001 R0116</td>
<td>01100 1</td>
<td>0.096</td>
<td>10</td>
</tr>
<tr>
<td>2 NO</td>
<td>1.7 (3.6)</td>
<td>E 262-230</td>
<td>GHE 262 1001 R0206</td>
<td>01040 0</td>
<td>0.096</td>
<td>10</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>contacts</th>
<th>coil voltage</th>
<th>power loss W</th>
<th>order details</th>
<th>bbn price</th>
<th>price</th>
<th>weight pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uc = 230 V AC</td>
<td></td>
<td>type code</td>
<td>EAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 NO</td>
<td>1.5 (2.0)</td>
<td>E 261 SRV-230</td>
<td>GHE 261 5001 R0106</td>
<td>48570 8*</td>
<td>0.07</td>
<td>10</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>contacts</th>
<th>coil voltage</th>
<th>power loss W</th>
<th>order details</th>
<th>bbn price</th>
<th>price</th>
<th>weight pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uc = 24 V AC/DC</td>
<td></td>
<td>type code</td>
<td>EAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 NO</td>
<td>2.4 (3.0)</td>
<td>E 261 C-24</td>
<td>GHE 261 5011 R0101</td>
<td>01020 2</td>
<td>0.085</td>
<td>10</td>
</tr>
<tr>
<td>1 NO + 1 NC</td>
<td>2.4 (3.5)</td>
<td>E 266 C-24</td>
<td>GHE 266 5011 R0111</td>
<td>01140 7</td>
<td>0.096</td>
<td>10</td>
</tr>
<tr>
<td>2 NO</td>
<td>2.4 (3.5)</td>
<td>E 262 C-24</td>
<td>GHE 262 5011 R0201</td>
<td>01080 6</td>
<td>0.096</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Uc = 230 V AC</td>
<td></td>
<td>type code</td>
<td>EAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 NO</td>
<td>1.5 (2.0)</td>
<td>E 261 C-230</td>
<td>GHE 261 1011 R0106</td>
<td>00990 9</td>
<td>0.085</td>
<td>10</td>
</tr>
<tr>
<td>1 NO + 1 NC</td>
<td>1.7 (2.0)</td>
<td>E 266 C-230</td>
<td>GHE 266 1011 R0116</td>
<td>01110 0</td>
<td>0.096</td>
<td>10</td>
</tr>
<tr>
<td>2 NO</td>
<td>1.7 (3.0)</td>
<td>E 262 C-230</td>
<td>GHE 262 1011 R0206</td>
<td>01050 9</td>
<td>0.096</td>
<td>10</td>
</tr>
</tbody>
</table>

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

* bbn no.: 40 16779
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 ϕ = 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% ©
- coil voltage range: 0.9 to 1.1 x Uₙ
- switching safety at rated voltage: 99%
- contact gap / contact material: 3 mm / Ag SnO₂
- closed time: 10 - 20 ms
- time to contact: 5 - 15 ms
- bounce time: 3 ms
- mechanical serviceable life: > 10⁶ switchovers
- serviceable life if rated load cos ϕ = 1 and 10³/h;
  - cos ϕ = 0.6 and 10³/h: > 2 x 10⁴ switchovers
- serviceable life if filament lamps 1000 W and 10³/h:
  - max. switchovers: 10⁹/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 Uₙ
- max. parallel capacitance of control lead (length): 0.06 µF (ca. 200 m)
- connections – switching circuit: M 3.5 strain-relief clamp 12 mm²
- – control circuit: M 3.5 strain-relief clamp 12 mm²

(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).
System pro M

Modular installation equipment

Installation relays

DIN EN 60 669-1,
VDE 0632 Part 1

Selection table

<table>
<thead>
<tr>
<th>contacts</th>
<th>power type code</th>
<th>W</th>
<th>loss code</th>
<th>order details</th>
<th>price 1 pc.</th>
<th>weight 1 pc.</th>
<th>pack. unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>order code</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>401233 DM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

coil voltage $U_c = 8\,V$:

- 1 NO: 4
  - E 259 R10-8
    - GHE 259 1001 R1101
    - 00929 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 $U_c = 12\,V$:

- 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 $U_c = 24\,V$:

- 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 DC:

- 1 NO + 1 NC: 1.9 (4)
  - E 259 R11-24 DC
    - GHE 259 1002 R0111
    - 40340 5
    - 0.118
    - 10

  - E 259 R11-48 DC
    - GHE 259 1002 R0113
    - 40360 3
    - 0.118
    - 10

  - E 259 R11-60 DC
    - GHE 259 1002 R2112
    - 47040 7
    - 0.118
    - 10

  - E 259 R11-110 DC
    - GHE 259 1002 R0114
    - 40370 2
    - 0.118
    - 10

  - E 259 R11-220 DC
    - GHE 259 1002 R0116
    - 40380 1
    - 0.118
    - 10

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

For special voltages and frequencies, the following surcharges apply:

<table>
<thead>
<tr>
<th>Voltage and Frequency</th>
<th>1 – 9 pc.</th>
<th>10 – 49 pc.</th>
<th>50 – 99 pc.</th>
<th>100 pc. plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 400 V AC 40 ... 60 Hz</td>
<td>+80%</td>
<td>+45%</td>
<td>+25%</td>
<td>+10%</td>
</tr>
<tr>
<td>up to 220 V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Terminal assignment

<table>
<thead>
<tr>
<th>Terminal number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1</td>
</tr>
<tr>
<td>2</td>
<td>A2</td>
</tr>
<tr>
<td>3</td>
<td>A3</td>
</tr>
</tbody>
</table>

Dimension drawing

in mm

E 259 R10
E 259 R11
E 259 R20

SK 0184 2.91

SK 0002 2.92
Priority switch E 450
(System pro M)

Equipment for panel installation on mounting rail (35 mm) according to DIN EN 50022, 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
- 6 ... 27 kW at 230/400 V 7.2 ... 22 kW at 230/400 V
threshold current: 3.1 ... 5.3 A ≤ 15 A
OFF delay (max.): 0 mains half waves 2 mains half waves 0 mains half waves
max. continuous current: 43 A 60 A
thermal continuous capacity at 40 °C/104 °F: 2 mains half waves 5 W 2.5 W
contact assembly:
control contact:
rated 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. inrush peak current: 5 A 5 A
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:
ambient temperature: – 20 °C/-4 °F ... + 40 °C/104 °F
response time:
release time: 5 ... 20 ms
max. inrush peak current: 5 A 5 A

test voltage contact / coil:
clearances in air / creepage distances:
degree of protection:
protection against electric shock:
terminal contact:

Selection table

for pneumatically controlled flow-type heaters

<table>
<thead>
<tr>
<th>rated current range</th>
<th>power loss W</th>
<th>type code</th>
<th>order code</th>
<th>bbtn EAN</th>
<th>price 1 pc. DM</th>
<th>price group</th>
<th>weight 1 pc. kg</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.7 ... 39 A</td>
<td>2.4</td>
<td>E 451-5.7 A</td>
<td>GHV021 0451 R0013</td>
<td>41590 3</td>
<td>0.1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 ... 55 A</td>
<td>2.4</td>
<td>E 451-15 A</td>
<td>GHV021 0451 R0012</td>
<td>15030 9</td>
<td>0.1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

for electronically controlled flow-type heaters

<table>
<thead>
<tr>
<th>rated current range</th>
<th>power loss W</th>
<th>type code</th>
<th>order code</th>
<th>bbtn EAN</th>
<th>price 1 pc. DM</th>
<th>price group</th>
<th>weight 1 pc. kg</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.7 ... 39 A</td>
<td>2.4</td>
<td>E 452-5.7 A</td>
<td>GHV021 0452 R0012</td>
<td>20950 2</td>
<td>0.1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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<sub>on</sub> ≤ 70 A/10 ms)
inductive load cos ϕ = 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: ± 10%
ON duration ED: 100%
ambient temperature: – 20°C/- 4°F ... + 50 °C/122°F
mechanical serviceable life, switchover at 10³/h: > 10<sup>7</sup>
and filament lamps 1000 W bei 10³/h: > 10<sup>4</sup>
serviceable life if rated load, cos ϕ = 0.6 bei 10³/h: > 10<sup>4</sup>
repeat accuracy at 25°C/77°F: ± 0.1%
setting accuracy (after one minute): ± 0.2%
control voltage dependency between 0.8 to 1.1 x U<sub>n</sub>: none
power failure bridging time (followed by overall reset): ≥ 0.2 s
control current: 6 - 25 mA ± 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 mm²
- control circuit: M 3.5 strain-relief clamp 12 mm²

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

**Contact 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.

**Terminal Assignment:**

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

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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

**Order Details**

<table>
<thead>
<tr>
<th>Typecode</th>
<th>Order Code</th>
<th>EAN</th>
<th>Weight</th>
<th>Pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td>E 234-MFR</td>
<td>GH E234 5001 R0007</td>
<td>74820</td>
<td>0.090</td>
<td>1/10</td>
</tr>
<tr>
<td>E 234-AV</td>
<td>GH E234 5001 R0001</td>
<td>74830</td>
<td>0.085</td>
<td>1/10</td>
</tr>
<tr>
<td>E 234-RV</td>
<td>GH E234 5001 R0002</td>
<td>74840</td>
<td>0.085</td>
<td>1/10</td>
</tr>
<tr>
<td>E 234-TI 2</td>
<td>GH E234 5001 R0009</td>
<td>41770</td>
<td>0.085</td>
<td>1/10</td>
</tr>
<tr>
<td>E 234-AW</td>
<td>GH E234 5001 R0004</td>
<td>74850</td>
<td>0.085</td>
<td>1/10</td>
</tr>
<tr>
<td>E 234-EW</td>
<td>GH E234 5001 R0005</td>
<td>74790</td>
<td>0.085</td>
<td>1/10</td>
</tr>
<tr>
<td>E 234-ARV</td>
<td>GH E234 5001 R0008</td>
<td>41760</td>
<td>0.085</td>
<td>1/10</td>
</tr>
</tbody>
</table>

**DIN VDE 0435 Part 2021**
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.

**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.

**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.

**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).
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

<table>
<thead>
<tr>
<th></th>
<th>AC equipment</th>
<th>DC equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>rated voltage:</td>
<td>50 Hz: 24 V, 230 V</td>
<td>DC 12 V ... 48 V</td>
</tr>
<tr>
<td></td>
<td>60 Hz: 24 V, 120 V, 240 V</td>
<td></td>
</tr>
<tr>
<td>voltage tolerance:</td>
<td>+ 6% – 10%</td>
<td>± 10%</td>
</tr>
<tr>
<td>power consumption:</td>
<td>1.5 VA</td>
<td>ca. 20 mW</td>
</tr>
<tr>
<td>ambient temperature:</td>
<td>– 15 °C/+5°F ... + 50 °C/122°F</td>
<td>– 10 °C/+23°F ... + 50 °C/122°F</td>
</tr>
<tr>
<td>counting capacity:</td>
<td>100 000h</td>
<td>100 000h</td>
</tr>
<tr>
<td>reading accuracy:</td>
<td>0.01 h</td>
<td>0.1 h</td>
</tr>
<tr>
<td>operation display:</td>
<td>fast running</td>
<td>LED display</td>
</tr>
<tr>
<td>protection against:</td>
<td>according to DIN VDE 0106</td>
<td>according to DIN VDE 0106</td>
</tr>
<tr>
<td>electric shock:</td>
<td>Part 100 (BGV A2)</td>
<td>Part 100 (BGV A2)</td>
</tr>
<tr>
<td>connection cross section:</td>
<td>up to 10 mm²</td>
<td>up to 10 mm²</td>
</tr>
</tbody>
</table>

Selection table

<table>
<thead>
<tr>
<th>rated voltage</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>price 1 pc. DM</th>
<th>price group</th>
<th>weight 1 pc.</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC 230 V / 50 Hz</td>
<td>E 233-230</td>
<td>GH E233 1001 R0006 63000 4</td>
<td>0.050</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC 24 V / 50 Hz</td>
<td>E 233-24</td>
<td>GH E233 1001 R0001 63010 3</td>
<td>0.050</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC 12 V ... 48 V</td>
<td>E 233-12/48</td>
<td>GH E233 1001 R0004 63020 2</td>
<td>0.050</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

other rated voltages on request

<table>
<thead>
<tr>
<th>rated voltage</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>price 1 pc. DM</th>
<th>price group</th>
<th>weight 1 pc.</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC 240 V / 60 Hz *</td>
<td>E 233-240/60 Hz</td>
<td>GH E233 1001 R6005 36590 1</td>
<td>0.050</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC 120 V / 60 Hz *</td>
<td>E 233-120/60 Hz</td>
<td>GH E233 1001 R5005 36600 7</td>
<td>0.050</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC 24 V / 60 Hz *</td>
<td>E 233-24/60 Hz</td>
<td>GH E233 1001 R5001 36610 6</td>
<td>0.050</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* UL approval

wiring diagram

[Diagram of wiring connections]
Modular installation equipment

Modular bell

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Power loss W</th>
<th>Type code</th>
<th>Order code</th>
<th>BBN 80 12542</th>
<th>Price 1 pc.</th>
<th>Price group</th>
<th>Weight 1 pc.</th>
<th>Pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular bell 230 V *</td>
<td>5.5</td>
<td>SM 1/230</td>
<td>GH V021 4166 R0001</td>
<td>00710 4</td>
<td>0.125</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modular bell 12 V *</td>
<td>3.6</td>
<td>SM 1/12</td>
<td>GH V021 4158 R0001</td>
<td>00720 3</td>
<td>0.125</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* not suitable for permanent operation
Modular installation equipment
Bell transformer
Safety isolating transformer

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: t₀, 40/E (+ 40 °C /104 °F at place of installation)
t₀, 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

<table>
<thead>
<tr>
<th>rated voltage/current</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>bbn price</th>
<th>weight</th>
<th>pack. pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bell transformer</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>230 V 8 V/1 A</td>
<td>TS 8/8</td>
<td>GH V023 2699 R0001</td>
<td>36800 7</td>
<td>0.355</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 8 V/1 A</td>
<td>TS 8/8 sw</td>
<td>GH V023 2723 R0001</td>
<td>36830 4</td>
<td>0.277</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 12 V/0.67 A</td>
<td>TS 8/12</td>
<td>GH V023 2707 R0001</td>
<td>36810 6</td>
<td>0.355</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 12 V/0.67 A</td>
<td>TS 8/12 sw</td>
<td>GH V023 2731 R0001</td>
<td>36840 3</td>
<td>0.277</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 4-6-8 V/1 A</td>
<td>TS 8/4-6-8 sw</td>
<td>GH V023 2756 R0001</td>
<td>36860 1</td>
<td>0.280</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 4-8-12 V/0.67 A</td>
<td>TS 8/4-8-12 sw</td>
<td>GH V023 2764 R0001</td>
<td>36870 0</td>
<td>0.280</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 24 V/0.33 A</td>
<td>TS 8/24 sw</td>
<td>GH V023 2749 R0001</td>
<td>36850 2</td>
<td>0.277</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 8/2 A</td>
<td>TS 16/8</td>
<td>GH V023 2772 R0001</td>
<td>36880 9</td>
<td>0.355</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 12 V/1.33 A</td>
<td>TS 16/12</td>
<td>GH V023 2780 R0001</td>
<td>36890 8</td>
<td>0.355</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 24 V/0.67 A</td>
<td>TS 16/24</td>
<td>GH V023 2798 R0001</td>
<td>36900 4</td>
<td>0.330</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 4-6-8/2 A</td>
<td>TS 16/4-6-8</td>
<td>GH V023 2806 R0001</td>
<td>36910 3</td>
<td>0.333</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 4-8-12 V/1.33 A</td>
<td>TS 16/4-8-12</td>
<td>GH V023 2814 R0001</td>
<td>36920 2</td>
<td>0.333</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>230 V 4-8-12 V/2 A</td>
<td>TS 24/4-8-12</td>
<td>GH V023 2822 R0001</td>
<td>36930 1</td>
<td>0.465</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>230 V 8-12-24 V/1 A</td>
<td>TS 24/8-12-24</td>
<td>GH V023 2830 R0001</td>
<td>36940 0</td>
<td>0.465</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

* sw = with ON/OFF switch

<table>
<thead>
<tr>
<th>Safety transformer</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 V 24 V/0.33 A</td>
</tr>
</tbody>
</table>

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)
4. non-inherently short-circuit proof (integral PTC thermistor. Fully operational after interruption caused by overload and short disconnection of primary voltage.)
**Technical data**

<table>
<thead>
<tr>
<th>Measuring Instruments with Analog Display (VLM and AMT)</th>
<th>Measuring Instruments with Digital Display (VLM-D1, AMT-D1 and FRZ-D1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring Element: Moving Iron</td>
<td>Electronic</td>
</tr>
<tr>
<td>Accuracy: Class 1.5</td>
<td>Class 0.5</td>
</tr>
<tr>
<td>Overrange: 20% in relation to rated current and rated voltage</td>
<td>-</td>
</tr>
<tr>
<td>Power Consumption:</td>
<td>Power Consumption:</td>
</tr>
<tr>
<td>Voltmeter: 300 V: 1.5 VA</td>
<td>230 V (~)</td>
</tr>
<tr>
<td>500 V: 4 VA</td>
<td>50 ... 60 Hz</td>
</tr>
<tr>
<td>Ammeter: 5 A: 0.3 VA</td>
<td>2000 V</td>
</tr>
<tr>
<td>10 A: 0.6 VA</td>
<td>—</td>
</tr>
<tr>
<td>25 A: 1.0 VA</td>
<td>—</td>
</tr>
<tr>
<td>30 A: 1.2 VA</td>
<td>—</td>
</tr>
<tr>
<td>Supply Voltage: 230 V ~</td>
<td>Operating temperature:</td>
</tr>
<tr>
<td>Frequency Response Range: 50 ... 60 Hz</td>
<td>Within the accuracy class: 20 °C/68 °F ± 10 °C</td>
</tr>
<tr>
<td>Test Voltage: 2000 V</td>
<td>Otherwise: − 25 °C / − 13 °F to + 75 °C / 167 °F</td>
</tr>
<tr>
<td>Operating Temperature:</td>
<td>Degree of Protection:</td>
</tr>
<tr>
<td>IP 20</td>
<td>IP 20</td>
</tr>
<tr>
<td>Protection Against Electric Shock: According to DIN VDE 0106 Part 100 (BGV A2)</td>
<td>according to DIN VDE 0106 Part 100 (BGV A2)</td>
</tr>
<tr>
<td>Casing Material: Plastic, Self-Extinguishing (class V0 according to UL 94)</td>
<td>Plastic, self-extinguishing (class V0 according to UL 94)</td>
</tr>
<tr>
<td>Colour: Grey, RAL 7035</td>
<td>Grey, RAL 7035</td>
</tr>
<tr>
<td>Mounting Position: Vertical</td>
<td>Vertical or Horizontal</td>
</tr>
<tr>
<td>Terminals: Box Terminals up to 10 mm²</td>
<td>Box Terminals up to 10 mm²</td>
</tr>
<tr>
<td>Effective Ranges: Voltage:</td>
<td>VLM-D1: 600 V AC (direct measurement)</td>
</tr>
<tr>
<td>Current Frequency for Transformer Connection</td>
<td>FRZ-D1: 40 ... 80 Hz</td>
</tr>
<tr>
<td>5-10-15-20-25 and 30 A (direct measurement)</td>
<td>… / 5 A</td>
</tr>
<tr>
<td>... / 10-20-30-50-75-80-100-150-200-250-300-400-500-600-800-1000-1250 and 1500 A</td>
<td>... / 5 A, codable:</td>
</tr>
<tr>
<td>Scales: Upper Range Values According to DIN 43 701</td>
<td>AMT-D1: 15-20-25-40-60-99, 9-150-200-250-400-600 and 999 A</td>
</tr>
<tr>
<td>Division and Needle:</td>
<td>According to DIN 43 802</td>
</tr>
</tbody>
</table>

**Dimension Drawings, in mm**

- **Built-in Measuring Instruments**: SK0191 Z91
- **Changeover Switch**: SK0176 Z96
- **Built-in Installation**: SK0171 Z98
- **Built-in Measuring Instruments**: SK0191 Z91
- **Electric Connection of Analog Voltmeter VLM with Changeover Switch MCV 4**: SK0171 Z98
- **Electric Connection of Digital Voltmeter VLM 1-D1 with Changeover Switch MCV 7**: SK0192 Z99
- **Electric Connection of Analog Ammeter AMT for Transformer Measurement with Changeover Switch MCA4**: SK0193 Z99
- **Electric Connection of Digital Ammeter AMT-D1 for Transformer Measurement with Changeover Switch MCA4**: SK0193 Z99

**Wiring Diagrams**
**System pro M**

**Built-in installation measuring instruments**

**Selection table**

<table>
<thead>
<tr>
<th>effective range</th>
<th>power loss W</th>
<th>order details</th>
<th>bbn</th>
<th>price 1 pc.</th>
<th>price group</th>
<th>weight 1 pc.</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – ...</td>
<td></td>
<td></td>
<td></td>
<td>80 12542</td>
<td>EAN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Measuring instruments with analog display, class 1.5**

**Moving-iron measuring instruments for alternating voltages (direct measurement)**

<table>
<thead>
<tr>
<th>voltage</th>
<th>type code</th>
<th>order code</th>
<th>EAN</th>
<th>price weight pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 V</td>
<td>VLM 1/300</td>
<td>GHV022 0515 R0001</td>
<td>00070 6</td>
<td>0.125 1</td>
</tr>
<tr>
<td>500 V</td>
<td>VLM 1/500</td>
<td>GHV022 0523 R0001</td>
<td>00000 6</td>
<td>0.125 1</td>
</tr>
</tbody>
</table>

**Moving-iron measuring instruments for alternating currents (direct measurement)**

<table>
<thead>
<tr>
<th>current</th>
<th>type code</th>
<th>order code</th>
<th>EAN</th>
<th>price weight pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 A</td>
<td>AMT 1/10</td>
<td>GHV022 0531 R0001</td>
<td>00010 5</td>
<td>0.110 1</td>
</tr>
<tr>
<td>10 A</td>
<td>AMT 1/15</td>
<td>GHV022 0549 R0001</td>
<td>00020 4</td>
<td>0.110 1</td>
</tr>
<tr>
<td>15 A</td>
<td>AMT 1/20</td>
<td>GHV022 0556 R0001</td>
<td>00030 3</td>
<td>0.110 1</td>
</tr>
<tr>
<td>20 A</td>
<td>AMT 1/25</td>
<td>GHV022 0564 R0001</td>
<td>00040 2</td>
<td>0.110 1</td>
</tr>
<tr>
<td>25 A</td>
<td>AMT 1/30</td>
<td>GHV022 0572 R0001</td>
<td>00050 1</td>
<td>0.110 1</td>
</tr>
</tbody>
</table>

**Moving-iron measuring instruments for alternating currents (transformer measurement)**

<table>
<thead>
<tr>
<th>transformer connection</th>
<th>type code</th>
<th>order code</th>
<th>EAN</th>
<th>price weight pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 A</td>
<td>AMT 1/A1</td>
<td>GHV022 0580 R0001</td>
<td>00060 8</td>
<td>0.100 1</td>
</tr>
</tbody>
</table>

**Exchangeable scales for ammeter AMT 1/A 1**

<table>
<thead>
<tr>
<th>current</th>
<th>type code</th>
<th>order code</th>
<th>EAN</th>
<th>price weight pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/5 A</td>
<td>SCL 1/5</td>
<td>GHV022 0614 R0001</td>
<td>00120 1</td>
<td>10</td>
</tr>
<tr>
<td>10/5 A</td>
<td>SCL 1/10</td>
<td>GHV022 0622 R0001</td>
<td>00130 0</td>
<td>10</td>
</tr>
<tr>
<td>20/5 A</td>
<td>SCL 1/20</td>
<td>GHV022 0630 R0001</td>
<td>00140 9</td>
<td>10</td>
</tr>
<tr>
<td>30/5 A</td>
<td>SCL 1/30</td>
<td>GHV022 0648 R0001</td>
<td>00150 8</td>
<td>10</td>
</tr>
<tr>
<td>50/5 A</td>
<td>SCL 1/50</td>
<td>GHV022 0655 R0001</td>
<td>00160 7</td>
<td>10</td>
</tr>
<tr>
<td>75/5 A</td>
<td>SCL 1/75</td>
<td>GHV022 1067 R0001</td>
<td>03100 0</td>
<td>10</td>
</tr>
<tr>
<td>80/5 A</td>
<td>SCL 1/80</td>
<td>GHV022 0663 R0001</td>
<td>00170 6</td>
<td>10</td>
</tr>
<tr>
<td>100/5 A</td>
<td>SCL 1/100</td>
<td>GHV022 0671 R0001</td>
<td>00180 5</td>
<td>10</td>
</tr>
<tr>
<td>150/5 A</td>
<td>SCL 1/150</td>
<td>GHV022 0689 R0001</td>
<td>00190 4</td>
<td>10</td>
</tr>
<tr>
<td>200/5 A</td>
<td>SCL 1/200</td>
<td>GHV022 0697 R0001</td>
<td>00200 0</td>
<td>10</td>
</tr>
<tr>
<td>250/5 A</td>
<td>SCL 1/250</td>
<td>GHV022 0841 R0001</td>
<td>03110 9</td>
<td>10</td>
</tr>
<tr>
<td>300/5 A</td>
<td>SCL 1/300</td>
<td>GHV022 0705 R0001</td>
<td>00210 9</td>
<td>10</td>
</tr>
<tr>
<td>400/5 A</td>
<td>SCL 1/400</td>
<td>GHV022 0838 R0001</td>
<td>00220 8</td>
<td>10</td>
</tr>
<tr>
<td>500/5 A</td>
<td>SCL 1/500</td>
<td>GHV022 0846 R0001</td>
<td>00230 7</td>
<td>10</td>
</tr>
<tr>
<td>600/5 A</td>
<td>SCL 1/600</td>
<td>GHV022 1745 R0001</td>
<td>03120 8</td>
<td>10</td>
</tr>
<tr>
<td>800/5 A</td>
<td>SCL 1/800</td>
<td>GHV022 0853 R0001</td>
<td>00240 6</td>
<td>10</td>
</tr>
<tr>
<td>1000/5 A</td>
<td>SCL 1/1000</td>
<td>GHV022 0861 R0001</td>
<td>00250 5</td>
<td>10</td>
</tr>
<tr>
<td>1250/5 A</td>
<td>SCL 1/1250</td>
<td>GHV022 5738 R0001</td>
<td>07060 3</td>
<td>10</td>
</tr>
<tr>
<td>1500/5 A</td>
<td>SCL 1/1500</td>
<td>GHV022 5746 R0001</td>
<td>07070 2</td>
<td>10</td>
</tr>
</tbody>
</table>

**Measuring instruments with digital display, class 0.5**

**Measuring instrument for alternating voltage (direct measurement)**

<table>
<thead>
<tr>
<th>voltage</th>
<th>type code</th>
<th>order code</th>
<th>EAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>600 V</td>
<td>VLM-D1</td>
<td>GHV022 4087 R0001</td>
<td>35870 1</td>
</tr>
</tbody>
</table>

**Measuring instrument for alternating current with coding switch to select effective ranges (transformer measurement)**

<table>
<thead>
<tr>
<th>current</th>
<th>type code</th>
<th>order code</th>
<th>EAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-20-25-40-60-99.9-150-200-250-400-600-999 A</td>
<td>AMT-D1</td>
<td>GHV022 4061 R0001</td>
<td>35850 3</td>
</tr>
</tbody>
</table>

**Measuring instrument for frequencies (direct measurement)**

<table>
<thead>
<tr>
<th>frequency</th>
<th>type code</th>
<th>order code</th>
<th>EAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>40...80 Hz</td>
<td>FRZ-D1</td>
<td>GHV022 4103 R0001</td>
<td>35890 9</td>
</tr>
</tbody>
</table>

**Changeover switches**

<table>
<thead>
<tr>
<th>switch type</th>
<th>type code</th>
<th>order code</th>
<th>EAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltmeter changeover switch</td>
<td>MCV 4</td>
<td>GHV022 5902 R0001</td>
<td>06280 6</td>
</tr>
<tr>
<td>Ammeter changeover switch</td>
<td>MCV 7</td>
<td>GHV022 5910 R0002</td>
<td>06290 5</td>
</tr>
</tbody>
</table>

* bbn no. 40 12233
Before using the measuring instrument, adapt device to actual transformation ratio of the transformer by using the coding switch.

**wiring diagrams**

**AMT - D1**

![AMT - D1 Wiring Diagram](image)

**VLM - D1**

![VLM - D1 Wiring Diagram](image)

**FRZ - D1**

![FRZ - D1 Wiring Diagram](image)
Time switches
(synchronous or quartz-controlled)

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

<table>
<thead>
<tr>
<th>contacts</th>
<th>switching capacity</th>
<th>power loss</th>
<th>order details</th>
<th>bbn</th>
<th>price</th>
<th>price group</th>
<th>weight</th>
<th>pack. unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>W</td>
<td></td>
<td></td>
<td>1 pc.</td>
<td>1 pc. unit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Synchronous time switches without running reserve

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

time dial: 24 h (48 segments)

1 W μ 16 A 5 STU 6011 N GH V021 6011 R0003 42890 3 0.240 1

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
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

Cover for terminals to be mounted on rails, sealable
for STU ...

Cover for terminals to be mounted on rails, sealable
for STU ...

Cover for terminals to be mounted on rails, sealable
for STU ...

Switching intervals

<table>
<thead>
<tr>
<th>time switch type</th>
<th>switching intervals on 24 h dial</th>
<th>segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>STU 6011 N</td>
<td>30 min</td>
<td>48 segments</td>
</tr>
<tr>
<td>STU 8011 N</td>
<td>30 min</td>
<td>48 segments</td>
</tr>
</tbody>
</table>

Switching intervals

<table>
<thead>
<tr>
<th>time switch type</th>
<th>switching intervals on 24 h dial</th>
<th>segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>STU 6011 N</td>
<td>30 min</td>
<td>48 segments</td>
</tr>
<tr>
<td>STU 8011 N</td>
<td>30 min</td>
<td>48 segments</td>
</tr>
</tbody>
</table>
Timer, programmable time switches with microprocessor-controlled electronics

System pro M

DIN EN 60 730

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

<table>
<thead>
<tr>
<th>Model</th>
<th>STT-111 N, STT-117 N</th>
<th>STT-127 N, STT-227 N</th>
<th>STT-467</th>
<th>STT-467F</th>
</tr>
</thead>
<tbody>
<tr>
<td>rated voltage:</td>
<td>230/240 V ~ + 6% – 10%</td>
<td>230 V/240 V ~ + 6% – 10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>frequency:</td>
<td>50 ... 60 Hz</td>
<td>50 ... 60 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>switching capacity at 250 V ~:</td>
<td>µ 16 A, cos φ = 1</td>
<td>µ 10 A, cos φ = 1</td>
<td>µ 10 A, cos φ = 0.6</td>
<td>4 W</td>
</tr>
<tr>
<td>contact complement:</td>
<td>STT-111: 1 NO, STT-117: 1S</td>
<td>STT-127: 1 W, STT-227: 2 W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contacts:</td>
<td>potential-free</td>
<td>potential-free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contact opening:</td>
<td>&lt; 3 mm (µ)</td>
<td>&lt; 3 mm (µ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contact material:</td>
<td>AgSnO₂</td>
<td>AgCdO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>power consumption:</td>
<td>max. 10 VA</td>
<td>7 VA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>running reserve at 20°C/68°F:</td>
<td>ca. 3 years</td>
<td>3 years; data save in OFF position 10 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>accuracy:</td>
<td>≤ 1s/day at 20°C/68°F</td>
<td>≤ 1s/day at 20°C/68°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>minimum switching interval:</td>
<td>1 minute</td>
<td>1 minute/1 second pulse programme 1-59 sec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>switching accuracy:</td>
<td>to the second</td>
<td>to the second</td>
<td></td>
<td></td>
</tr>
<tr>
<td>time base:</td>
<td>quartz</td>
<td>quartz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>permissible ambient temperature:</td>
<td>−10°C/+14 °F ... + 50 °C/122 °F</td>
<td>STT-467F Quartz, DCF 77 time timer – 10°C/+14°F ... + 45°C/113°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>class of protection:</td>
<td>II according to EN 60 335-1</td>
<td>II according to EN 60 335-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>degree of protection:</td>
<td>IP 20 according to EN 60 529</td>
<td>IP 20 according to EN 60 529</td>
<td></td>
<td></td>
</tr>
<tr>
<td>protection against electric shock:</td>
<td>according to DIN VDE 0106 Part 100 (BGV A2)</td>
<td>according to DIN VDE 0106 Part 100 (BGV A2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>battery:</td>
<td>environmentally friendly lithium</td>
<td>environmentally friendly lithium</td>
<td>environmentally friendly lithium</td>
<td></td>
</tr>
<tr>
<td>casing- and insulation material:</td>
<td>heat-resistant, self-extinguishing thermostoplast</td>
<td>heat-resistant, self-extinguishing thermostoplast</td>
<td>heat-resistant, self-extinguishing thermostoplast</td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>contact complement</th>
<th>memory locations</th>
<th>power loss W</th>
<th>order details</th>
<th>bbn</th>
<th>price 1 pc.</th>
<th>price group</th>
<th>weight 1 pc.</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EAN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 channel one-day switch with 24 h programme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for 7 switch-on 7 switch-off times (14 memory locations)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1 NO | 14 | 6 | STT-111 N | GH V021 0859 R0021 | 42930 | 6 | 0.17 | 1 |

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 |

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 |

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 |

Accessories

flange frame for 2 modules

NO 500-ME1 | GH S500 1008 R0001 | 48450 | 8 | 0.083 | 1 |

bbn no.: 40 12233

Dimension drawings

Random programme of STT-127 N:

- 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)
- Wednesday 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.
Timer
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.
- 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

<table>
<thead>
<tr>
<th>channel complement</th>
<th>memory locations</th>
<th>power lost W</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>tbn</th>
<th>price 1 pc. DM</th>
<th>price group</th>
<th>weight 1 pc.</th>
<th>pack. pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>4 W</td>
<td>128</td>
<td>10</td>
<td>STT-467</td>
<td>GHV021 0859 R0008</td>
<td>17820 4</td>
<td>0.450</td>
<td>1</td>
</tr>
<tr>
<td>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.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 W</td>
<td>128</td>
<td>10</td>
<td>STT-467 F</td>
<td>GHV021 0859 R0009</td>
<td>17830 3</td>
<td>0.450</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FA/A 1.1</td>
<td>GH Q605 0031 R0011</td>
<td>15260 0</td>
<td>0.100</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Radio control of STT-467 F 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

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

Selection table
modular clock thermostat with probe

<table>
<thead>
<tr>
<th>contacts</th>
<th>switching capacity</th>
<th>power loss W</th>
<th>order details</th>
<th>type code</th>
<th>order code</th>
<th>EAN</th>
<th>price 1 pc.</th>
<th>price unit</th>
<th>weight 1 pc.</th>
<th>pack. pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 W</td>
<td>µ 8 A</td>
<td>5</td>
<td>CRT*</td>
<td>GH V021 5761 R0001</td>
<td>02410 1</td>
<td>02410 1</td>
<td>0.316</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* discontinued type
Modular installation equipment
Twilight switch SDS 101

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**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type Code</th>
<th>Order Code</th>
<th>Power Loss</th>
<th>Price 1 pc. (DM)</th>
<th>Weight unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twilight switch incl. photo sensor and mounting bracket</td>
<td>4</td>
<td>SDS 101 N</td>
<td>GH V021 0879 R0003</td>
<td>42910 B</td>
<td>0.270</td>
</tr>
<tr>
<td>Twilight switch incl. built-in photo sensor</td>
<td>4</td>
<td>SDS 101-L2 N</td>
<td>GH V021 0879 R0004</td>
<td>42920 T</td>
<td>0.270</td>
</tr>
<tr>
<td>Surface-mounting photo sensor incl. mounting bracket for SDS 101</td>
<td>–</td>
<td>SDS-L 1</td>
<td>GH V021 0895 R0004</td>
<td>53020 S</td>
<td>0.050</td>
</tr>
<tr>
<td>Built-in photo sensor incl. 1.5 m connection cable for SDS 101</td>
<td>–</td>
<td>SDS-L 2</td>
<td>GH V021 0895 R0005</td>
<td>16210 A</td>
<td>0.150</td>
</tr>
</tbody>
</table>

bbn no.: 40 12233
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..

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.
Modular installation equipment
Light level switch STL

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)
- 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

<table>
<thead>
<tr>
<th>Name/ Application</th>
<th>Power Loss</th>
<th>Order Details</th>
<th>BBN</th>
<th>Price 1 pc. EAN</th>
<th>Price 1 pc. DM</th>
<th>Weight</th>
<th>Pack. Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light level switch for one lighting group</td>
<td>6</td>
<td>STL-101</td>
<td>60440 1</td>
<td>0.400 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light level switch for three lighting groups</td>
<td>8</td>
<td>STL-103</td>
<td>12700 4</td>
<td>0.450 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photo sensor (IP 54)</td>
<td></td>
<td>STL-LF 103</td>
<td>53210 0</td>
<td>0.100 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CE requirements:
- EMC fulfilled according to EN 61547 (04/96), low voltage according to IEC 669-2-1 (11/94)
- Faulty installation may lead to malfunctioning or destruction

Related information:
- Lamp contactor to be designed to fit flexible cord loads up to 2 kVA switchable without contactor
- Designed to fit the individual connected load
- 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:

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

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 $E_a = 17,000$ Lux
- Inside daylight $E_i$ (with lighting switched off)
  - Lighting trunking 1 (distance from window = 1.5 m) = 3,000 Lux
  - Lighting trunking 2 (distance from window = 4.5 m) = 1,000 Lux

The daylight factor results in the following:

\[ T_1 = \frac{3000}{17000} \times 100 = 17.6\% \]
\[ T_2 = \frac{1000}{17000} \times 100 = 5.9\% \]

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 non-operation times by using daylight curves**

<table>
<thead>
<tr>
<th>lighting trunking</th>
<th>months</th>
<th>time</th>
<th>no. of non-operation hours (average 20 working days per month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>from</td>
<td>to</td>
<td>per day</td>
</tr>
<tr>
<td>1</td>
<td>December</td>
<td>9:30 to 14:30</td>
<td>5</td>
</tr>
<tr>
<td>4 260 Lux</td>
<td>Jan + Nov</td>
<td>8:45 to 15:15</td>
<td>6:30</td>
</tr>
<tr>
<td></td>
<td>Feb + Oct</td>
<td>8:00 to 16:00</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Mar to Sep</td>
<td>7:00 to 17:00</td>
<td>10</td>
</tr>
</tbody>
</table>

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.

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.
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 ± 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
- 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 ± 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
- 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

<table>
<thead>
<tr>
<th>name/ application</th>
<th>power loss</th>
<th>order details bbn price</th>
<th>price</th>
<th>weight</th>
<th>pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimmer for brightness control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>incandescent lamps, 230 V – halogen lamps, low-volt halogen lamps with conventional transformers (phase crossover)</td>
<td>5</td>
<td>02790 8</td>
<td>0.155</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>incandescent lamps, 230 V – halogen lamps, low-volt halogen lamps with electronic transformers</td>
<td>5</td>
<td>03300 8</td>
<td>0.105</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

(1) power loss = 1% of connected power (5 W max.)
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 ± 10% / 50 Hz
- rated current: 4 A cos ϕ 0.9 (approx. 10 electronic control gear units, follow indications of manufacturer)
- 3 A cos ϕ 0.5
- max. switching capacity: 700 VA
- power consumption: ≤ 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 (BGV A2)
- ambient temperature: 0°C/32°F ... 35°C/95°F
- operation via extensions (parallel operation)
  - max. cable length: 100 m
- 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 looses 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

Memory touch controller for electronic control gear units

<table>
<thead>
<tr>
<th>name</th>
<th>loss</th>
<th>W</th>
<th>power order details</th>
<th>product code</th>
<th>bbn type</th>
<th>code</th>
<th>price</th>
<th>price</th>
<th>weight</th>
<th>pack.</th>
<th>unit</th>
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<td>Memory touch controller</td>
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<tr>
<td>input 1-10 V DC</td>
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<tr>
<td>control current 50 mA DC</td>
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<tr>
<td>≤ 1 W</td>
<td>STD-MTS</td>
<td></td>
<td>GH V021 0881 R0004</td>
<td>27070 0</td>
<td>0,110</td>
<td>1</td>
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<tr>
<td>of fluorescent lamp with</td>
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<td></td>
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<tr>
<td>1 - 10 V DC control input</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>with memory touch controller STD-MTS with external pushbutton, e.g. E 225</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

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

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 V DC control (for 0 - 10 V DC 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/kVA
- 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

Selection table

<table>
<thead>
<tr>
<th>name</th>
<th>power loss W</th>
<th>order details type code</th>
<th>product code</th>
<th>bbn</th>
<th>price 1 pc. DM</th>
<th>price group</th>
<th>weight kg</th>
<th>pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-performance dimmer</td>
<td>10</td>
<td>STD-1000 U *</td>
<td>GH V021 0881 R0003</td>
<td>25940 8</td>
<td>0.325</td>
<td>1</td>
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<td></td>
</tr>
</tbody>
</table>

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

Electronic potentiometer
- rated current/control output 4 A cos 0.9; 3 A cos 0.5, switching capacity 700 VA

| S | STD-EP | GH V021 1370 R0076 | 27050 2 | 1 |

Electronic potentiometer

- 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.

Electronic control gear with control input 10 V DC

- power loss = 1% of connected load (5 W max.)
**Modular installation equipment**

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

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
- **Min. switching capacity:**
  - STD-500 MA: 60 W/VA
  - STD-420 SL: 200 W/VA
- **Power consumption:** 6 W
- **Pushbutton input:** 230 V AC ± 10% / 50 Hz
- **Max. cable length:** 100 m
- **Degree of protection:** 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

<table>
<thead>
<tr>
<th>Name</th>
<th>Power loss W</th>
<th>Order details</th>
<th>Order code</th>
<th>bin code</th>
<th>Price 1 pc. DM</th>
<th>Price of 1 pc. kg</th>
<th>Weight 1 pc. kg</th>
<th>Pack. unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>High performance dimmer</td>
<td>6 W</td>
<td>STD-500 MA</td>
<td>GHV021 0881 R0005</td>
<td>4016779</td>
<td>42010 5</td>
<td>0.105</td>
<td>1</td>
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</tr>
<tr>
<td>Extension</td>
<td>6 W</td>
<td>STD-420 SL</td>
<td>GHV021 0881 R0006</td>
<td>42020 4</td>
<td>0.135</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

\[1\] heat dissipation = approx. 2% of the connected load
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.
Module installation equipment
Mains disconnection relay and accessories

Application
The mains disconnection relay E 235-NFR disconnects the circuit from the power supply after having interrupted any downstream loads, thus avoiding disturbing electromagnetic 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 adapter 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} ≤ 70 A/10 ms
inductive load cos ϕ = 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: 
serviceable life if nominal stress cos ϕ = 1 and 10³/h: > 10⁴
serviceable life if filament lamps 1000 W and 10³/h: > 10⁴
serviceable life if nominal stress cos ϕ = 0.6 and 10³/h: > 10⁴
max. switching rate: 10³/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 µF (ca. 200 m)
max. induced voltage at control inputs:
0.2 x U_{n} according to DIN VDE 0106 Part 100 (BGV A2)
protection against electric shock:
connection cross section (strain-relief clamp):
6 mm²

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<th>price group</th>
<th>weight 1 pc.</th>
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Connection diagrams

load switched OFF

load switched ON
### 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.

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### 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.

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| Customised printed labels upon request: minimum order 50 mats, otherwise there will be a low-quantity surcharge. |
## Approvals and certifications of classification societies

### Modular installation equipment

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<th>Finland</th>
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<th>Sweden</th>
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- ■ approved
- ▲ conditionally approved
- ○ no approval required
- □ submission for approval / approval pending
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 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.

### 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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