

Railway Applications











Relays for railway Timer modules Monitoring relay Relay module with forcibly guided contacts Modular timers Modular Light dependent relay



and much, much more...





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Relays used for railway rolling stock are subject to increasingly higher technical demands – such as the need for wider operating ranges; higher resistance to shock and vibration; operation over a wider range of temperature and humidity; and above all, the fire resistance properties of the relay's constituent parts.

Fire and smoke characteristics of the materials

The relays and their sockets and accessories are manufactured using specific insulating materials, which satisfy the requirement **R26** of fire protection prescribed by the standard **EN 45545-2:2013** for product category **EL10**.

The requirement **R26**, for Hazardous levels **HL1** to **HL3**, is the conformity to VO class following vertical small flame test according to **EN 60695-11-10**.

Mechanical and climatic characteristics

The resistance against random vibrations and shock of the relays and their sockets and accessories is in compliance with the prescription of **EN 61373** standard for Category 1, **Class B** products.

Their resistance to temperature and humidity is in compliance with the prescription of **EN 50155** standard, **TX class** (for relay and sockets) or **T1 class** (for timers and control relays).



- Air Conditioning
- Door control systems
- Train Light Control
- Signal control
- Control Board
- Traffic management



Overview

| | Features | Rated current | No. of contacts | Sockets | Page |
|---------------|--|---------------------|--|----------------|------|
| | 46 Series - Relays for railway Plug-in mounting AC coils or DC coils with extended range Complies with EN 45545-2:2013 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, TX class) Coil EMC suppression modules | 8 A 16 A | 2 CO 1 CO | 97 Series | 1 |
| | 56 Series - Relays for railway Plug-in mounting DC coils with extended range Complies with EN 45545-2:2013 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, TX class) Coil EMC suppression modules | 12 A | 2 CO 4 CO | 96 Series | 7 |
| | 86 Series - Timer modules - Multi-functions or Bi-functions - Multi-voltage - Time scale from 0.05s to 100h - Wide supply range in AC or DC coils - Timer for 96, 97 series sockets | - | - | 96 - 97 Series | 11 |
| | 70 Series - Monitoring relay - Universal voltage monitoring (208480 V AC) - Phase rotation - Phase loss - 17.5 mm wide | 6 A | 1 CO | | 17 |
| | 7S Series - Relay module with forcibly guided contacts Extended operating range (0.71.25) U_N For safety applications, with class A forcibly guided contact relays (EN 50205) For railway applications; materials compliant with fire and smoke characteristics EN 45545-2:2013; mechanical and climatic characteristics compliant with EN 61373 and EN 50155 Coil status visual indication with LED | ^{;)} 6A | 1 NO + 1 NC 2 NO + 2 NC 3 NO + 1 NC 4 NO + 1 NC | | 19 |
| | 80 Series - Modular timers Six time scale from 0.1s to 24h Multi-voltage / Multi-functions / Mono-functions High input /output isolation 1 pole Relay output, 16 A 17.5 mm wide | 8 A 16 A | 1 CO | | 25 |
| درسه الله و د | 81 Series - Modular timers - Multi-function and multi-voltage timer - Seven functions (4 with supply start and 3 with signal start with Reset function) - Six time ranges from 0.1s to 10h - 1 pole - Relay output, 16 A - 17.5 mm wide | 16 A | 1 CO | | 31 |
| | 83 Series - Modular timers Six time scale from 0.1s to 10 days Multi-voltage / Multi-functions / Mono-functions 1 pole Special version: 2 timed contacts or 1 timed + 1 instantaneous contact 22.5 mm wide | 8 A 12 A 16 A | 2 CO 1 CO | | 35 |
| | 11 Series - Modular Light dependent relay - 1 contact NO - Sensitivity adjustment from 1 to 100 lux - 24 V AC/DC - 17.5 mm wide - 35 mm rail (EN 60715) mount | 16 A | 1 NO | | 41 |
| | 22 Series - Modular contactors - AC/DC silent coils - 2 or 4 contacts - 17.5 and 35 mm wide - 35 mm roil (EN 60715) mount | 25 A | 2 NO 4 NO | | 45 |

- 35 mm rail (EN 60715) mount

46 Series - Relays for railway applications 8 - 16 A

| Features | 46.52T | 46.61T | |
|--|--|---|-----|
| Plug-in power relays: 8 A, 2 pole 16 A, 1 pole Complies with EN 45545-2:2013 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, TX class) DC coils with extended range Cadmium Free contacts (standard version) Contact material options | | | |
| 97 series sockets Coil EMC suppression modules Accessories (Sockets and Timer modules) | • 2 Pole CO, 8 A • Plug-in | • 1 Pole CO, 16 A • Plug-in | |
| 29 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 46.52T 12.4 | $\begin{array}{c} 8 & 2 & 3 & 4 \\ A1 & 12 & 11 & 14 \\ \hline 0 & 0 & 9 & 9 \\ \hline 0 & 6 & 6 & 6 \\ \hline 1 & 7 & 6 & 5 \\ \hline 2 & 2 & 21 & 24 \\ 1 & 7 & 6 & 5 \\ \hline 2 & 2 & 14 & 4 & 5 & 5 \\ \hline 2 & 14 & 4 & 5 & 5 \\ \hline \end{array}$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | |
| Contrast specification | | | |
| | | | |
| Pated current/Maximum pack current | 8/15 | 16/25* | * \ |
| Rated voltage / Maximum switching voltage V AC | 250/400 | 250/400 | t |
| Rated load AC1 VA | 2 000 | 4 000 | 8 |
| Rated load AC15 (230 V AC) VA | 350 | 750 | C |
| Single phase motor rating (230 V AC) kW | 0.37 | 0.55 | |
| Breaking capacity DC1: 30/110/220 V A | 6/0.5/0.15 | 12/0.5/0.25 | |
| Minimum switching load mW (V/mA) | 300 (5/5) | 300 (10/5) | |
| Standard contact material | AgNi | AgNi | |
| Coil specification | | | |
| Nominal voltage (U _N) V AC (50/60 Hz) | 230 | 230 | |
| V DC | 24 - 72 - 110 | 24 - 72 - 110 | |
| Rated power W | 0.5 | 0.5 | |
| Operating range @ 23 °C AC | (0.801.1)U _N | (0.801.1)U _N | |
| DC | (0.701.6) U _N | (0.701.6) U _N | |
| Holding voltage | 0.4 U _N | 0.4 U _N | |
| Must drop-out voltage | 0.1 U _N | 0.1 U _N | |
| Technical data | | | |
| Mechanical life DC cycles | 10 · 106 | 10 · 10° | |
| Electrical lite at rated load AC1 cycles | 100 · 103 | 100 · 103 | |
| Operate/release time ms | 10/3 | 15/5 | |
| Insulation between coll and contacts $(1.2/50 \text{ µs})$ kV | ο (ö mm) | 4 | |
| Dielectric strength between open contacts VAC | 1,000 | 1,000 | |
| Environmental protection | | -40+/0 | |
| Approvals (according to type) | | | |
| Approvals (according to type) | | | |

With the AgSnO₂ material the maximum peak current is 80 A - 5 ms on normally open contact.

Ordering information

Example: 46 series plug-in relay, 2 poles, 24 V DC coil, AgNi contacts.



Technical data

| Insulation according to EN 61810-1 | | 46.61T | | 46.52T | |
|--|---------------------------|----------------------|------|------------------|-----|
| Nominal voltage of supply system | V AC | 230/400 | | 230/400 | |
| Rated insulation voltage | V AC | 250 | 400 | 250 | 400 |
| Pollution degree | | 3 | 2 | 3 | 2 |
| Insulation between coil and contact | set | | | | |
| Type of insulation | | Reinforced (8 mr | m) | Reinforced (8 mm | ר) |
| Overvoltage category | | III | | III | |
| Rated impulse voltage | kV (1.2/50 μs) | 6 | | 6 | |
| Dielectric strength | V AC | 4,000 | | 4,000 | |
| Insulation between adjacent contac | ts | | | | |
| Type of insulation | | _ | | Basic | |
| Overvoltage category | | - | | III | |
| Rated impulse voltage | kV (1.2/50 μs) | _ | | 4 | |
| Dielectric strength V AC | | _ | | 2,000 | |
| Insulation between open contacts | | | | | |
| Type of disconnection | | Micro-disconnec | tion | Micro-disconnect | ion |
| Dielectric strength | V AC/kV (1.2/50 µs) | 1,000/1.5 | | 1,000/1.5 | |
| Conducted disturbance immunity | | | | | |
| Burst (550)ns, 5 kHz, on A1 - A2 | 2 | EN 61000-4-4 | | level 4 (4 kV) | |
| Surge (1.2/50 µs) on A1 - A2 (differential mode) | | EN 61000-4-5 level 3 | | level 3 (2 kV) | |
| Other data | | | | 1 | |
| Bounce time: NO/NC | ms | 2/6 | | 1/4 | |
| Power lost to the environment | without contact current W | 0.6 | | 0.6 | |
| | with rated current W | 1.6 | | 2 | |

Contact specification

F 46 - Electrical life (AC) v contact current Type 46.52T



H 46 - Maximum DC1 breaking capacity



F 46 - Electrical life (AC) v contact current Type 46.61T



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of ≥ 100.10³ can be expected.
- In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load. Note: the release time for the load will be increased.

Coil specifications

DC coil data

| Nominal | Coil | Operating range | | Resistance | Rated coil |
|----------------|---------------|------------------|------------------|------------|---------------------|
| voltage | code | | | | consumption |
| U _N | | U _{min} | U _{max} | R | I at U _N |
| V | | V | V | Ω | mA |
| 24 | 9 .024 | 16.8 | 38 | 1,200 | 20 |
| 72 | 9 .072 | 50.4 | 115 | 3,400 | 7 |
| 110 | 9 .110 | 77 | 176 | 23,500 | 4.7 |

Other types of coil version are available on request.





1 - Max. permitted coil voltage.

2 - Min. pick-up voltage with coil at ambient temperature.

AC coil data

| Nominal | Coil | Operating range | | Resistance | Rated coil |
|----------------|---------------|------------------|------------------|------------|---------------------|
| voltage | code | | | | consumption |
| U _N | | U _{min} | U _{max} | R | I at U _N |
| V | | V | V | Ω | mA |
| 230 | 8 .230 | 184 | 253 | 28,000 | 5 |

97 Series - Sockets and accessories for 46 series relays



Approvals (according to type):



| Screw terminal socket panel or 35 mm rail (EN 60715) n | nount | 97.01.7 SMA* | 97.02.7 SMA* | |
|---|------------|--|----------------|--|
| For relay type | | 46.61T | 46.52T | |
| Accessories | | | | |
| Netal retaining clip (supplied with socket - packaging code | SMA) | 097 | .71 | |
| dentification tag | | 095. | 00.4 | |
| 3-way jumper link | | 095 | 5.18 | |
| Nodules (see table below) | | 99. | .02 | |
| Timer modules (see table below) | | 86. | 30T | |
| Technical data | | | | |
| Rated current | | 16 A - 250 V AC | 8 A - 250 V AC | |
| Dielectric strength | | 6 kV (1.2/50 µs) between coil and contacts | | |
| Protection category | | IP 20 | | |
| Ambient temperature | °C | -40+70 | | |
| Screw torque | Nm | 0.8 | | |
| Wire strip length | mm | 8 | | |
| Max. wire size for 97.01.7 and 97.02.7 sockets | | solid wire | stranded wire | |
| | $\rm mm^2$ | 1x6 / 2x2.5 | 1x4 / 2x2.5 | |
| Ă | AWG | 1x10 / 2x14 | 1x12 / 2x14 | |
| | | | | |

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* Complies with **EN 45545-2:2013** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)





| 8-way jumper link | 095.18 |
|--|--------------|
| Rated values | 10 A - 250 V |
| 110.5 110.5 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5 | |



| 86 series timer module | |
|--|------------------------------|
| (1224)V AC/DC; Bi-function: AI, DI; (0.05s100h) | 86.30.0.024.0000T |
| Approvals (according to type): CE [fill @ c73"us | Al: ON-delay Dl: Interval |



| 99.02 coil indication and EMC suppression modules | | |
|---|----------------|----------------|
| Diode (+A1, standard polarity) | (6220)V DC | 99.02.3.000.00 |
| LED + Diode (+A1, standard polarity) | (624)V DC | 99.02.9.024.99 |
| LED + Diode (+A1, standard polarity) | (2872)V DC | 99.02.9.060.99 |
| LED + Diode (+A1, standard polarity) | (110220)V DC | 99.02.9.220.99 |
| LED + Varistor | (624)V DC/AC | 99.02.0.024.98 |
| LED + Varistor | (2872)V DC/AC | 99.02.0.060.98 |
| LED + Varistor (| 110240)V DC/AC | 99.02.0.230.98 |

Approvals (according to type):

DC Modules with non-standard polarity (+A2) on request.

97 Series - Sockets and accessories for 46 series relays



Approvals (according to type):









* Complies with **EN 45545-2:2013** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)





| 86 series timer module | |
|---|------------------------------|
| (1224)V AC/DC; Bi-function: AI, DI; (0.05s100h) | 86.30.0.024.0000T |
| Approvals (according to type): CEEEE Cording to type) | Al: ON-delay Dl: Interval |



| 99.02 coil indication and EMC suppression modules | i | |
|---|-----------------|----------------|
| Diode (+A1, standard polarity) | (6220)V DC | 99.02.3.000.00 |
| LED + Diode (+A1, standard polarity) | (624)V DC | 99.02.9.024.99 |
| LED + Diode (+A1, standard polarity) | (2872)V DC | 99.02.9.060.99 |
| LED + Diode (+A1, standard polarity) | (110220)V DC | 99.02.9.220.99 |
| LED + Varistor | (624)V DC/AC | 99.02.0.024.98 |
| LED + Varistor | (2872)V DC/AC | 99.02.0.060.98 |
| LED + Varistor | (110240)V DC/AC | 99.02.0.230.98 |
| | | |

Approvals (according to type):

DC Modules with non-standard polarity (+A2) on request.

SERIES

56 Series - Relays for railway applications 12 A

| Features | 56.32T | 56.34T |
|---|--|---|
| Plug-in power relays: | | |
| 12 A, 2 and 4 pole Complies with EN 45545-2:2013 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, TX class) DC coils with extended range Cadmium Free contacts (standard version) Contact material options 96 series sockets Coil EMC suppression modules Accessories (Sockets and Timer modules) | • 2 Pole CO, 12 A • Plug-in/Faston 187 | 4 Pole CO, 12 A Plug-in/Faston 187 |
| 20.7 20.7 27.7 56.32T 4.8 40.8 27.7 56.32T 56.32T | 12 14 22 24 1 3 2 4 1 3 2 4 1 5 6 6 11 21 7 8 A1 A2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | $12 14 22 24 32 34 42 44 1 5 2 6 3 7 4 8 9 10 11 12 11 21 31 41 13 14 A1 A2 0 \frac{10}{10} 10$ |
| 0 0 0 0 0 0 0 0 0 0 56.34T 4.8 0.5 ► 56.34T | r a | , r r |
| | | |
| | 2 CO (DPDT) | 4 CO (4PDI) |
| Reted voltage (Maximum switching voltage V AC | 250/400 | 250/400 |
| Rated load AC1 | 3 000 | 3 000 |
| Rated load AC15 (230 V AC) VA | 700 | 700 |
| Single phase motor rating (230 V AC) kW | 0.55 | 0.55 |
| Breaking capacity DC1: 30/110/220 V A | 12/0.5/0.25 | 12/0.5/0.25 |
| Minimum switching logd mW (V/mA) | 500 (10/5) | 500 (10/5) |
| Standard contact material | AgNi | AgNi |
| Coil specification | Ŭ | |
| Nominal voltage (U _N) V AC (50/60 Hz) | - | _ |
| V DC | 24 - 72 - 110 | 24 - 72 - 110 |
| Rated power W | 1 | 1.3 |
| Operating range @ 23 °C AC | _ | _ |
| DC | (0.701.6) U _N | (0.701.6) U _N |
| Holding voltage | 0.6 U _N | 0.6 U _N |
| Must drop-out voltage | 0.1 U _N | 0.1 U _N |
| Technical data | | |
| Mechanical life DC cycles | 10 · 10 ⁶ | 10 · 10 ⁶ |
| Electrical life at rated load AC1 cycles | 100 · 10 ³ | 100 · 10 ³ |
| Operate/release time ms | 8/8 | 8/8 |
| Insulation between coil and contacts (1.2/50 $\mu s)$ kV | 4 | 4 |
| Dielectric strength between open contacts VAC | 1,000 | 1,000 |
| Ambient temperature range °C | -40+70 | -40+70 |
| Environmental protection | RT I | RT I |
| Approvals (according to type) | CE | CE |



Ordering information

Example: 56 series plug-in relay, 4 poles, 24 V DC coil, AgCdO contacts.



Technical data

| Insulation according to EN 61810-1 | l | | | |
|-------------------------------------|-----------------------------|------------------|-------------|--|
| Nominal voltage of supply system | V AC | 230/400 | | |
| Rated insulation voltage | V AC | 250 | 400 | |
| Pollution degree | | 3 | 2 | |
| Insulation between coil and contact | set | | | |
| Type of insulation | | Basic | | |
| Overvoltage category | | III | | |
| Rated impulse voltage | kV (1.2/50 μs) | 4 | | |
| Dielectric strength | V AC | 2,500 | | |
| Insulation between adjacent contac | ts | | | |
| Type of insulation | | Basic | | |
| Overvoltage category | | III | | |
| Rated impulse voltage | kV (1.2/50 μs) | 4 | | |
| Dielectric strength | V AC | 2,500 | | |
| Insulation between open contacts | | | | |
| Type of disconnection | | Micro-disconnect | ion | |
| Dielectric strength | V AC/(1.2/50 µs) | 1,000/1.5 | | |
| Conducted disturbance immunity | | | | |
| Burst (550)ns, 5 kHz, on A1 - A2 | EN 61000-4-4 | level 4 (4 kV) | | |
| Surge (1.2/50 µs) on A1 - A2 (diff | erential mode) EN 61000-4-5 | i level 4 (4 kV) | | |
| Other data | | | | |
| Bounce time: NO/NC | ms | 1/3 | | |
| Power lost to the environment | without contact current W | 1 (56.32T) / 1.3 | (56.34T) | |
| | with rated current W | 3.8 (56.32T) / 6 | .9 (56.34T) | |

Contact specification

F 56 - Electrical life (AC) v contact current



H 56 - Maximum DC1 breaking capacity



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of ≥ 100.10³ can be expected.
- In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load. Note: the release time for the load will be increased.

Coil specifications

DC coil data, 2 CO - Type 56.32T @ 23 °C

| Nominal | Coil | Operating range | | Resistance | Rated coil |
|----------------|---------------|------------------|------------------|------------|---------------------|
| voltage | code | | | | consumption |
| U _N | | U _{min} | U _{max} | R | I at U _N |
| V | | V | V | Ω | mA |
| 24 | 9 .024 | 16.8 | 38 | 600 | 40 |
| 72 | 9 .072 | 50.4 | 115 | 5,100 | 14 |
| 110 | 9 .110 | 77 | 176 | 12,500 | 8.8 |

DC coil data, 4 CO - Type 56.34T @ 23 °C

| Nominal | Coil | Operating range | | Resistance | Rated coil |
|----------------|---------------|------------------|------------------|------------|---------------------|
| voltage | code | | | | consumption |
| U _N | | U _{min} | U _{max} | R | I at U _N |
| V | | V | V | Ω | mA |
| 24 | 9 .024 | 16.8 | 38 | 490 | 49 |
| 72 | 9 .072 | 50.4 | 115 | 4,000 | 18 |
| 110 | 9 .110 | 77 | 176 | 10,400 | 10.5 |

RT 56T - DC coil operating range v ambient temperature



1 - Max. permitted coil voltage.

2 - Min. pick-up voltage with coil at ambient temperature.

96 Series - Sockets and accessories for 56 series relays



96.02.7 Approvals (according to type):



Approvals (according to type):

CE

| Screw terminal (Box clamp) socket panel or 35 mm | | 96.02.7 SMA* | 96.04.7 SMA* | |
|---|------|--------------------------|----------------|--|
| (EN 60715) rail mount | | | | |
| For relay type | | 56.32T | 56.34T | |
| Accessories | | | | |
| Metal retaining clip (supplied with socket - packaging code S | SMA) | 094.71 | 096.71 | |
| Identification tag | | 095.00.4 | 090.00.2 | |
| 6-way jumper link | | 094.06 | - | |
| Modules (see table below) | | 99.02 | 99.02 | |
| Timer modules (see table below) | | 86.30T | 86.00T, 86.30T | |
| Technical data | | | | |
| Rated values | | 12 A - 250 V | | |
| Dielectric strength | | 2 kV AC | | |
| Protection category | | IP 20 | | |
| Ambient temperature | °C | -40+70 (see diagram L96) | | |
| Screw torque | Nm | 0.8 | | |
| Wire strip length | mm | 8 | | |
| Max. wire size for 96.02 and 96.04 socket | | solid wire | stranded wire | |
| r | nm² | 1x6 / 2x2.5 | 1x4 / 2x2.5 | |
| Ā | NG | 1x10/2x14 | 1x12 / 2x14 | |

* Complies with EN 45545-2:2013 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, TX class)

L 96 - Rated current vs ambient temperature







094.06 10 A - 250 V

EE:

FE:



finder



Rated values 135 5.1 26.3



0.75 26.3 27

6-way jumper link for 96.02.7 socket

| 86 series timer modules | |
|--|---|
| Multi-voltage: (12240)V AC/DC; | |
| Multi-functions: AI, DI, SW, BE, CE, DE, EE, FE; (0.05 s100 h) | 86.00.0.240.0000T |
| (1224)V AC/DC; Bi-function: AI, DI; (0.05 s100 h) | 86.30.0.024.0000T |
| Approvals (according to type): CE [fill 💽 🔊 us | Al: ON-delay Dl: Interval SW: Symmetrical flasher (starting pulse on) |

86.00T



| | Approvals (according to type): | CE | EHE | P | c SU ® _{US} | |
|---|--------------------------------|----|-----|---|-----------------------------|--|
| | | | | | | |
| | | | | | | |
| P | | | | | | |



| 99.02 coil indication and EMC suppression modules | | |
|---|----------------|----------------|
| Diode (+A1, standard polarity) | (6220)V DC | 99.02.3.000.00 |
| LED + Diode (+A1, standard polarity) | (624)V DC | 99.02.9.024.99 |
| LED + Diode (+A1, standard polarity) | (2872)V DC | 99.02.9.060.99 |
| LED + Diode (+A1, standard polarity) | (110220)V DC | 99.02.9.220.99 |
| LED + Varistor | (624)V DC/AC | 99.02.0.024.98 |
| LED + Varistor | (2872)V DC/AC | 99.02.0.060.98 |
| LED + Varistor | 110240)V DC/AC | 99.02.0.230.98 |
| | | |

Approvals (according to type):

DC Modules with non-standard polarity (+A2) on request.

BE: Off-delay with control signal CE: On- and off-delay with control signal DE: Interval with control signal on

Interval with control signal off Interval with control signal on and off

86 Series - Timer modules



Series Туре

Ordering information

Example: 86 series multi-function timer module, (12...240)V AC/DC supply voltage.



See 46T, 56T series relays

No. of poles

Poles for chosen relay/socket combination according to chart below

Combinations Number of poles Timer module **Relay type** Socket type 46.61T 97.01.7 / 97.51.7 86.30T 1 97.02.7 / 97.52.7 2 46.52T 86.30T 2 56.32T 96.02.7 86.30T 4 56.34T 96.04.7 86.00T / 86.30T

Technical data

| EMC specifications | | | | |
|--|---------------------------|------------------------|------------------|------------|
| Type of test | | Reference standard | 86.00T | 86.30T |
| Electrostatic discharge | contact discharge | EN 61000-4-2 | 4 kV | n.a. |
| | air discharge | EN 61000-4-2 | 8 kV | 8 kV |
| Radio-frequency electromagnetic field (80 | ÷ 1,000 MHz) | EN 61000-4-3 | 10 V/m | 10 V/m |
| Fast transients (burst) (5-50 ns, 5 kHz) on Supply terminals | | EN 61000-4-4 | 4 kV | 2 kV |
| Surges (1.2/50 µs) on Supply terminals | common mode | EN 61000-4-5 | 4 kV | 2 kV |
| | differential mode | EN 61000-4-5 | 4 kV | 1 kV |
| Radio-frequency common mode (0.15 ÷ 80 |) MHz) | EN 61000-4-6 | 10 V | 10 V |
| on Supply terminals | | | | |
| Radiated and conducted emission | | EN 55022 | class B | class B |
| Other data | | 86.00T | 86.30T | |
| Current absorption on control signal (B1) | mA | 1 | — | |
| Power lost to the environment | without contact current W | 0.1 (12 V) - 1 (230 V) | 0.2 | |
| | with rated current | See 56T series relays | See 46T, 56T ser | ies relays |

Time scales



NOTE: Time scales and functions must be set before energising the timer.

To achieve the minimum time setting of 0.05 seconds it is necessary to use one of the functions with control signal. When setting very short times it may be necessary to take into account the operate time of the relay used.

86 Series - Timer modules

Functions

- **U** = Supply voltage
- **S** = Control signal
- = Output contact

A1

1/+

U

N/ -

Λ

U

т

| LED Type 86.00T | LED Type 86.30T | Supply voltage | NO output contact |
|--------------------|--------------------|-------------------|------------------------------|
| | | OFF | Open |
| | | ON | Open |
| | | ON | Open (timing in progress) |
| | | ON | Closed |

Without control signal= Start via contact in supply line (A1). With control signal = Start via contact into control terminal (B1).



Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.

(DI) Interval.

t< T

t<T

Apply power to timer. Output contacts transfer immediately. After the preset time has elapsed, contacts reset.

86 Series - Sockets and accessories





96.02.7 Approvals (according to type):



Approvals (according to type):

CE

| Screw terminal (Box clamp) socket panel or 35 mm EN 60715) rail mount | 96.02.7 SMA* | 96.04.7 SMA* |
|--|--------------|----------------|
| For relay type | 56.32T | 56.34T |
| Accessories | | |
| Netal retaining clip (supplied with socket - packaging code SMA) | 094.71 | 096.71 |
| 5-way jumper link | 094.06 | - |
| dentification tag | 095.00.4 | 090.00.2 |
| Nodules (see table below) | 99.02 | 99.02 |
| Fimer modules (see table below) | 86.30T | 86.00T, 86.30T |
| Technical data | | |
| Rated values | 12 A - 250 V | |
| Dielectric strength | 2 kV AC | |
| Protection category | IP 20 | |
| Ambient temperature °C | -40+70 | |
| Screw torque Nm | 0.8 | |
| Wire strip length mm | 8 | |
| Max. wire size for 96.02 and 96.04 socket | solid wire | stranded wire |
| mm ² | 1x6 / 2x2.5 | 1x4 / 2x2.5 |
| AWG | 1x10 / 2x14 | 1x12 / 2x14 |
| | | |

* Complies with **EN 45545-2:2013** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)



96.02.7 + 56.32T + 094.71 + 86.30T



96.04.7 + 56.34T + 096.71 + 86.00T / 86.30T

86 Series - Sockets and accessories



Approvals (according to type):



| Screw terminal socket panel or 35 mm rail (EN 60715) mount | 97.01.7 SMA* | 97.02.7 SMA* | |
|--|--|----------------|--|
| For relay type | 46.61T | 46.52T | |
| Accessories | | | |
| Metal retaining clip (supplied with socket - packaging code SMA) | 097 | 7.71 | |
| Identification tag | 095. | 00.4 | |
| 8-way jumper link | 095 | 5.18 | |
| Modules (see table below) | 99 | .02 | |
| Timer modules (see table below) | 86. | 30T | |
| Technical data | | | |
| Rated current | 16 A - 250 V AC | 8 A - 250 V AC | |
| Dielectric strength | 6 kV (1.2/50 µs) between coil and contacts | | |
| Protection category | IP 20 | | |
| Ambient temperature °C | -40+70 | | |
| Screw torque Nm | 0.8 | | |
| Wire strip length mm | 8 | | |
| Max. wire size for 97.01.7 and 97.02.7 sockets | solid wire | stranded wire | |
| mm ² | 1x6 / 2x2.5 | 1x4 / 2x2.5 | |
| AWG | 1x10 / 2x14 | 1x12 / 2x14 | |

* Complies with **EN 45545-2:2013** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)



97.01.7 + 46.61T + 097.71 + 86.30T



97.02.7 + 46.52T + 097.71 + 86.30T

86 Series - Sockets and accessories





Approvals (according to type):





| Screwless terminal socket panel or 35 mm rail (EN 60715) mount | 97.51.7 SMA* | 97.52.7 SMA* | |
|--|--|----------------|--|
| For relay type | 46.61T | 46.52T | |
| Accessories | | | |
| Netal retaining clip (supplied with socket - packaging code SMA) | 097.71 | | |
| Nodules (see table below) | 99 | .02 | |
| Timer modules (see table below) | 86. | 30T | |
| Technical data | | | |
| Rated current | 10 A - 250 V AC | 8 A - 250 V AC | |
| Dielectric strength | 6 kV (1.2/50 µs) between coil and contacts | | |
| Protection category | IP 20 | | |
| Ambient temperature °C | -25+70 | | |
| Wire strip length mm | 8 | | |
| Max. wire size for 97.51 and 97.52 sockets | solid wire | stranded wire | |
| mm ² | 2x(0.21.5) | 2x(0.21.5) | |
| AWG | 2x(2418) | 2x(2418) | |

* Complies with **EN 45545-2:2013** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)



97.51.7 + 46.61T + 097.71 + 86.30T



97.52 + 46.52T + 097.71 + 86.30T

70 Series - Monitoring relays 6 A

Features

- 3 Phase Rotation and phase loss monitoring relay
- Complies with EN 45545-2:2013 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, T1 class)
- Universal voltage monitoring (U_N from 208 V to 480 V, 50/60 Hz)
- Phase loss monitoring, under phase regeneration
 Positive safety logic make contact opens
- if the relay detects an error • Small size (17.5 mm wide)
- Small size (17.5 mm wide) • 35 mm rail (EN 60715) mount
- European patent pending for the innovative principle at the root of the 3 phase monitoring and error survey system







Three-phase (208...480 V) voltage monitoring:

- Phase loss
- Phase rotation



| Contact specification | |
|---|-------------------------|
| Contact configuration | 1 CO (SPDT) |
| Rated current/Maximum peak current | 6/15 |
| Rated voltage/Maximum switching voltage VAC | 250/400 |
| Rated load AC1 V | 1,500 |
| Rated load AC15 (230 V AC) V/ | 250 |
| Single phase motor rating (230 V AC) kV | 0.185 |
| Breaking capacity DC1: 30/110/220 V | 3/0.35/0.2 |
| Minimum switching load mW(V/mA |) 500 (10/5) |
| Standard contact material | AgCdO |
| Supply specification | |
| Nominal system voltage (U_N) V AC 3 \cdot | 208480 |
| Frequency H | z 50/60 |
| Rated power VA 50 Hz/ W | 8/1 |
| Operating range VAC 3 | - 170500 |
| Technical data | |
| Electrical life at rated load AC1 cycle | s 100 · 10 ³ |
| Switch-off/reaction time | s <0.5/<0.5 |
| Ambient temperature °C | -20+50 |
| Protection category | IP20 |
| Approvals (according to type) | |

Ordering information

Monitoring relays

Example: 3 phase line monitoring relay, phase rotation and loss monitoring



Technical data

| Insulation | | | | | |
|------------------------------------|-----------------------------|-----------------|-----------------------------------|---------------------|--|
| Insulation | | | Dielectric strength | Impulse (1.2/50 µs) | |
| | between supply and contacts | | 3,000 V | 5 kV | |
| | between open contacts | | 1,000 V | 1.5 kV | |
| EMC specifications | | | | | |
| Type of test | | | Reference standard | | |
| Electrostatic discharge | contact discharge | | EN 61000-4-2 | 4 kV | |
| | air discharge | | EN 61000-4-2 | 8 kV | |
| Fast transients (burst) (5-50ns, 5 | 5kHz) on A1, A2, A3 | | EN 61000-4-4 | 2 kV | |
| Surge (1.2/50 µs) | differential mode | | EN 61000-4-5 | 4 kV | |
| Other data | | | | | |
| Start up time (NO contact closu | re after energising) | S | < 2 | | |
| Regeneration level (Maximum) | | | ≤ 80% of average of other 2 phase | | |
| Power lost to the environment | without contact current | W | 1 | | |
| | with rated current | W | 1.4 | | |
| Screw torque | | Nm | 0.8 | | |
| Max. wire size | | | solid cable | stranded cable | |
| | | mm ² | 1x6 / 2x4 | 1x4 / 2x2.5 | |
| | | AWG | 1x10 / 2x12 | 1x12 / 2x14 | |

Functions

| L1, L2, L3 = Supply voltage LED status | | | Supply voltage | NO output contact | Con Open | tacts Closed |
|--|--|--|----------------|----------------------|-------------|-----------------|
| = Contact 11-14 | | Supply voltage OFF | OFF | | | |
| | | - Incorrect phase rotation - Phase loss | ON | Open | 11 - 14 | 11 - 12 |
| | | Normal operation | ON | Closed | 11 - 12 | 11 - 14 |



7S Series - Relay module with forcibly guided contacts 6 A

75.12.....5110 75.14.....0220/0310 **Features** 75.16.....0420 Relay module with forcibly guided contacts 75.12 with 2 pole (1NO + 1 NC) 75.14 with 4 pole (2 NO + 2 NC and 3 NO + 1 NC) 75.16 with 6 pole (4 NO + 2 NC) • For railway applications; materials compliant with fire and smoke characteristics (EN 45545-2:2013); mechanical and climatic characteristics compliant with EN 61373 and FN 50155 • For safety applications, with class A forcibly • 4 pole (2 NO + 2 NC • 2 pole (1 NO + 1 NC) • 6 pole (4 NO + 2 NC) guided contact relays (EN 50205) and 3 NO + 1 NC• For functional reliability in machinery and plant engineering according to EN 13849-1 • DC and AC supply versions • 24 and 110 V DC versions with extended operating range (0.7....1.25) U_N • Coil status visual indication with LED • 35 mm rail (EN 60715) mount Screwless terminal * Single contact current \leq 6 A, total NO contacts current \leq 12 A For outline drawing see page 23 **Contact specification** Contact configuration 1 NO + 1 NC 2 NO + 2 NC, 3 NO + 1 NC 4 NO + 2 NC Rated current / Max. peak current 6/15 6*/12 6*/12 А Rated switching voltage V AC (50/60 Hz) 250 250 250 Rated load AC1 VA 1,500 1,500 1,500 Rated load AC15 (230 V AC) 700 500 VA 500 Breaking capacity DC1: 30/110/220 V 6/0.6/0.2 6/0.6/0.3 6/0.6/0.3 A Breaking capacity DC13: 24 V A 1 1 1 Minimum switching load mW (V/mA) 60 (5/5) 60 (5/5) 60 (5/5) Standard contact material AgNi + Au AgNi with notched crown AgNi with notched crown **Coil specification** 110...125 - 230...240 110...125 - 230...240 110...125 - 230...240 Nominal voltage (U_N) V AC (50/60 Hz) V DC 24 24 - 110 24 - 110 Rated power VA (50 Hz) / W 2.3/1 2.3/12.3/1 (0.85...1.1) U_N Operating range AC (0.85...1.1) U_N (0.85...1.1) U_N DC (0.8...1.2) U_N (0.8...1.2) U_N (0.8...1.2) U_N DC extended range (24 and 110 V only) (0.7....1.25) U_N (0.7....1.25) U_N (0.7....1.25) U_N Holding voltage AC/DC 0.45 U_N/0.45 U_N 0.55 U_N/0.55 U_N 0.55 U_N/0.55 U_N Must drop-out voltage AC/DC 0.1 U_N/0.1 U_N $0.1 U_{N} / 0.1 U_{N}$ $0.1 U_{N} / 0.1 U_{N}$ **Technical data** Mechanical life 10 . 106 10 . 106 10 . 106 cycles Electrical life at rated load AC1 cycles 100 · 10³ 100 · 10³ $100 \cdot 10^3$ 7/11 Operate / release time 12/10 12/10 ms 6 (4 against 13-14) 6 (4 against 13-14) Insulation between coil and contacts (1.2/50 µs) kV 6 1,500 Dielectric strength between open contacts VAC 1,500 1,500 °C -40....+70 -40....+70 -40....+70 Ambient temperature Protection category IP 20 IP 20 IP 20 Approvals (according to type) CE c(UL) us EHC

Ordering information

Example: 7S series Relay module with forcibly guided contacts, 6 contact (4 NO + 2 NC) 6 A, supply voltage 24 V DC.



Technical data

| Insulation according to EN 61810-1 | | | | |
|---|-----------------------|---------------------|---------|--------------|
| Nominal voltage of supply system | V AC | 230/400 | | |
| Rated insulation voltage | V AC | 250 | | |
| Pollution degree | | 2 | | |
| Insulation between coil and contact set | | | | |
| Type of Insulation | | Reinforced * | Basic * | Reinforced * |
| Overvoltage category | | III | III | II |
| Rated impulse voltage | kV (1.2/50 μs) | 6 | 4 | 4 |
| Dielectric strength | V AC | 4,000 | 2,500 | 2,500 |
| Insulation between adjacent contacts | | | | |
| Type of Insulation | | Reinforced * | Basic* | Reinforced * |
| Overvoltage category | | III | III | II |
| Rated impulse voltage | kV (1.2/50 μs) | 6 | 4 | 4 |
| Dielectric strength | V AC | 4,000 | 2,500 | 2,500 |
| Insulation between open contacts | | | | |
| Type of disconnection | | Micro-disconnection | | |
| Dielectric strength | V AC / kV (1.2/50 µs) | 1,500 / 2.5 | | |

* Tables below indicate, for each 7S type, those contacts (R) meeting Reinforced Insulation Overvoltage category III, those contacts (R2) meeting Reinforced Insulation Overvoltage category II, and those contacts (B) meeting Basic Insulation Overvoltage category III.

| EMC specifications | | | Reference standard | | | |
|---------------------------------------|-------------------------|-----------------|--------------------|---------------|----------|-------|
| Burst (5/50 ns) | on supply terminals | | EN 61000-4-4 | | 4 kV | |
| Surge (1.2/50 µs) on supply terminals | differential mode | | EN 61000-4-5 | | 1.5 kV | |
| Terminals | | | solid cable | | stranded | cable |
| Max. wire size | | mm ² | 1 x 1.5 | | 1 x 1.5 | |
| | | AWG | 1 x 14 | | 1 x 16 | |
| Wire strip length | | mm | 9 | | | |
| Other data | | | 75.12 | 7S .14 | | 7S.16 |
| Bounce time: NO/NC | | ms | 2/8 | 1/20 | | 1/20 |
| Vibration resistance (10200) Hz: NO/N | 1C | g | 10/5 | 15/4 | | 15/4 |
| Shock resistance: NO/NC | | g | 20/6 | 25/13 | | 25/13 |
| Power lost to the environment | without contact current | W | 0.8 | 0.8 | | 0.8 |
| | with rated current | W | 1.4 | 2.3 | | 2.8 |

75.12....5110 Coil 13-14

13-14 21-22

R

B/R2

R

_

Type of insulation between coil and contacts and between adjacent contacts

Coil

13-14

21-22

| Code | | | | |
|--------------------|------------|----------------------|--|--|
| Type of Insulation | | Overvoltage category | | |
| R | Reinforced | III | | |
| В | Basic | III | | |
| R2 | Reinforced | ll | | |

| 75.160420 | | | | | | | | |
|-----------|------|-------|-------|-------|-------|-------|-------|--|
| | Coil | 13-14 | 21-22 | 31-32 | 43-44 | 53-54 | 63-64 | |
| Coil | _ | В | R | R | R | R | R | |
| 13-14 | | _ | В | R | R | R | R | |
| 21-22 | | | _ | R | R | R | R | |
| 31-32 | | | | _ | B/R2 | R | R | |
| 43-44 | | | | | _ | B/R2 | R | |
| 53-54 | | | | | | _ | B/R2 | |
| 63-64 | | | | | | | _ | |

| 75.140310 | | | | | | | |
|-----------|------|-------|-------|-------|-------|--|--|
| | Coil | 13-14 | 21-22 | 33-34 | 43-44 | | |
| Coil | _ | В | R | R | R | | |
| 13-14 | | _ | В | R | R | | |
| 21-22 | | | _ | R | R | | |
| 33-34 | | | | _ | B/R2 | | |
| 43-44 | | | | | _ | | |

| 75.140220 | | | | | | | |
|-----------|------|-------|-------|-------|-------|--|--|
| | Coil | 11-12 | 21-22 | 33-34 | 43-44 | | |
| Coil | — | R | R | R | R | | |
| 11-12 | | — | R | R | R | | |
| 21-22 | | | _ | R | R | | |
| 33-34 | | | | — | B/R2 | | |
| 43-44 | | | | | _ | | |



Contact specifications

| Contact diagrams | | | |
|--|--|---|--|
| 75.12 | 75.140220 | 75.140310 | 75.16 |
| $ \begin{array}{cccc} A1 & 22 & 14 \\ \hline \\ \hline \\ \hline \\ A2 & 21 & 13 \end{array} $ | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ |
| 21 22 14 13 A1 A1 A2 A2 | 11 12 44 34 22 43 33 21 A1 A1 A2 A2 | 21 22 14 13 44 34 34 43 33 A1 A1 A2 | 21 22 14 13 64 54 44 32 63 53 43 31 A1 A1 A2 A2 |

F 7S12 - Electrical life (AC) v contact current - 7S.12





H 7S12 - Maximum DC breaking capacity - 7S.12



 When switching a load having voltage and current values under the curve, an electrical life of ≥ 100·10³ can be expected.

H 7S16 - Maximum DC breaking capacity - 7S.14 / 7S.16



 When switching a load having voltage and current values under the curve, an electrical life of ≥ 100.10³ can be expected.

Coil specifications

DC coil data - type 7S.12

| Nominal | Coil | Operating range | | Rated | Rated |
|----------------|---------------|------------------|------------------|-------------------|-------------------|
| voltage | code | | | input current | power |
| | | | | at U _N | at U _N |
| U _N | | U _{min} | U _{max} | I _N | |
| V | | V | V | mA | W |
| 24 | 9 .024 | 16.8 | 30 | 38.2 | 0.9 |

DC coil data - type 7S.14 / 7S.16

| Nominal | Coil | Operating range | | Rated | Rated |
|----------------|---------------|------------------|------------------|-------------------|-------------------|
| voltage | code | | | input current | power |
| | | | | at U _N | at U _N |
| U _N | | U _{min} | U _{max} | I _N | |
| V | | V | V | mA | W |
| 24 | 9 .024 | 16.8 | 30 | 28 | 0.7 |
| 110 | 9 .110 | 77 | 138 | 9.2 | 0.7 |

R 7S - DC coil operating range v ambient temperature -7S.12 / 7S.14 / 7S.16



1 - Max. permitted coil voltage.

2 - Min. pick-up voltage with coil at ambient temperature.

---- 24 and 110 V DC coils only (extended range)

Outline drawings



Accessories

| • | linininininininininin |
|---|-----------------------|
| • | <u>Innaninana</u> |
| • | (miniminimini) |
| • | intrinintation |

Sheet of marker tags, plastic, 72 tags, 6x12 mm

AC coil data - type 7S.12

| | <i>/</i> 1 | | | | |
|----------------|---------------|------------------|------------------|-------------------|-------------------|
| Nominal | Coil | Operating range | | Rated | Rated |
| voltage | code | | | input current | power |
| | | | | at U _N | at U _N |
| U _N | | U _{min} | U _{max} | I _N | |
| V | | V | V | mA | VA/W |
| 110125 | 8 .120 | 93 | 138 | 9.5 | 1.1/1 |
| 230240 | 8 .230 | 195 | 264 | 9 | 2/0.8 |

AC coil data - type 7S.14 / 7S.16

| Nominal | Coil | Operating range | | Rated | Rated |
|----------------|---------------|------------------|------------------|-------------------|-------------------|
| voltage | code | | | input current | power |
| | | | | at U _N | at U _N |
| U _N | | U _{min} | U _{max} | I _N | |
| V | | V | V | mA | VA/W |
| 110125 | 8 .120 | 93 | 138 | 8.9 | 1.1/0.9 |
| 230240 | 8 .230 | 195 | 264 | 8.5 | 2/0.8 |

R 75 - AC coil operating range v ambient temperature -75.12 / 75.14 / 75.16



1 - Max. permitted coil voltage.

2 - Min. pick-up voltage with coil at ambient temperature.



060.72

80 Series - Modular timers 16 A

finder

| Features | 80.01T | 80.11T |
|--|--|--|
| Multi-function and mono-function timer range 80.01T - Multi-function & multi-voltage 80.11T - ON delay, multi-voltage | | |
| Complies with EN 45545-2:2013 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, T1 class) 17.5 mm wide | | |
| Six time scales from 0.1s to 24h High input/output isolation "Blade + cross" - both flat blade and cross head screw drivers can be used to adjust the range and function selectors, the timing trigger and the discount the scill accurate the scilla acc | Multi-voltage Multi-function | Multi-voltage Mono-function |
| New multi-voltage versions with "PWM clever" technology 35 mm rail (EN 60715) mount | Al: On-delay DI: Interval SW: Symmetrical flasher (starting pulse on) BE: Off-delay with control signal CE: On- and off-delay with control signal | Al: On-delay |
| 80.01T / 80.11T Screw terminal | DE: Interval with control signal on | |
| | N/-L/+ $A_2 A_1$ $A_1 A_2 A_1$ $A_2 A_1 B_1$ $A_2 A_1 B_1$ $A_3 A_1 B_1$ $A_4 B_1 B_1$ $A_5 B_1 B_1$ | N/-L/+ A2 A1 A1 A2 A1 A1 A1 A2 A1 |
| For outline drawing see page 30 | Wiring diagram Wiring diagram (without control signal) (with control signal) | Wiring diagram (without control signal) |
| Contact specification | | |
| Contact configuration | 1 CO (SPDT) | 1 CO (SPDT) |
| Rated current/Maximum peak current A | 16/30 | 16/30 |
| Rated voltage/Maximum switching voltage V AC | 250/400 | 250/400 |
| Rated load AC1 VA | 4,000 | 4,000 |
| Rated load AC15 (230 V AC) VA | 750 | 750 |
| Single phase motor rating (230 V AC) kW | 0.55 | 0.55 |
| Breaking capacity DC1: 30/110/220 V A | 16/0.3/0.12 | 16/0.3/0.12 |
| Minimum switching load mW (V/mA) | 500 (10/5) | 500 (10/5) |
| Standard contact material | AgCdO | AgCdO |
| Nominal voltage //) | 12 240 | 24 240 |
| | 12240 | 24240 |
| Rated power AC/DC VA (50 Hz)/W | < 1.8 / < 1 | < 1.8 / < 1 |
| Operating range VAC | (10.8 265) | (16.8 265) |
| V DC | (10.8265) | (16.8265) |
| Technical data | () | (|
| Specified time range | (0.12)s, (120)s, (0.12)min, | (120)min, (0.12)h, (124)h |
| Repeatability % | ± 1 | ± 1 |
| Recovery time ms | ≤ 50 | ≤ 50 |
| Minimum control impulse ms | 50 | _ |
| Setting accuracy-full range % | ± 5 | ± 5 |
| Electrical life at rated load in AC1 cycles | 100·10 ³ | 100·10 ³ |
| Ambient temperature range °C | -10+50 | -10+50 |
| Protection category | IP 20 | IP 20 |
| Approvals (according to type) | CE .®. | s [AL 💽 |

80 Series - Modular timers 8 - 16 A

finder

| Features | 80.41T | 80.61T | |
|--|---|--|--|
| Mono-function timer range 80.41T - Off-delay with control signal, multi-voltage 80.61T - Power off-delay (True off-delay), multi-voltage • Complies with EN 45545-2:2013 (protection | | | |
| against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, T1 class) | | (P t) | |
| 17.5 mm wide Type 80.41T: six time scales from 0.1s to 24h Type 80.61T: four time scales from 0.1s to 3 min High input/output isolation | Multi-voltage Mono-function | Multi-voltage Mono-function | |
| "Blade + cross" - both flat blade and cross head screw drivers can be used to adjust the range and function selectors, the timing trimmer, and to disengage the rail mounting clip New multi-voltage versions with "PWM clever" technology 35 mm rail (EN 60715) mount | BE: Off-delay with control signal | BI: Power off-delay (True off-delay) | |
| 80.41T / 80.61T Screw terminal | A2 A1 B1 -0-0-0- -0-0 -18 15 16 | $\begin{array}{c} - & - & - \\ - & - & - \\ - & - & - \\ 18 & 15 & 16 \end{array}$ | |
| For outline drawing see page 30 | Wiring diagram (with control signal) | Wiring diagram (without control signal) | |
| Contact specification | | | |
| Contact contiguration | | | |
| Rated current/Maximum peak current A | 16/30 | 8/15 | |
| Rated voltage/Maximum switching voltage V AC | 250/400 | 250/400 | |
| Rafed load ACT VA | 4,000 | 2,000 | |
| Kaled load ACTS (230 V AC) VA | 0.55 | 400 | |
| Broaking capacity DC1: 30/110/220 V | 16/03/012 | 8/03/012 | |
| Minimum switching load mW (V/mA) | 500 (10/5) | 300 (5/5) | |
| Standard contact material | | AqNi | |
| Supply specification | , | , 1 , 1, | |
| Nominal voltage (UN) V AC (50/60 Hz) | 24., 240 | 24240 | |
| V DC | 24240 | 24220 | |
| Rated power AC/DC VA (50 Hz)/W | < 1.8 / < 1 | < 0.6/ < 0.6 | |
| Operating range VAC | 16.8265 | 16.8265 | |
| V DC | 16.8265 | 16.8242 | |
| Technical data | | | |
| Specified time range | (0.12)s, (120)s, (0.12)min, (120)min, (0.12)h, (124)h | (0.052)s, (116)s, (870)s, (50180)s | |
| Repeatability % | ± 1 | ±1 | |
| Recovery time ms | ≤ 50 | _ | |
| Minimum control impulse ms | 50 | 500 (A1-A2) | |
| Setting accuracy-full range % | ± 5 | ± 5 | |
| Electrical life at rated load in AC1 cycles | 100·10 ³ | 100·10 ³ | |
| Ambient temperature range °C | -10+50 | -10+50 | |
| Protection category | IP 20 | IP 20 | |
| Approvals (according to type) | | ERL 👁 | |

80 Series - Modular timers 8 - 16 A

Ordering information

Example: 80 series, modular timers, 1 CO (SPDT) - 16 A, supply rated at (12...240)V AC/DC.



Technical data

| Insulation | | | | | | |
|--|---|-------------------|-------------------------|--------------|--------------------|----------------|
| Dielectric s | strength | | | | 80.01T/11T/41T | 80.61T |
| | | between input o | and output circuit | V AC | 4,000 | 2,500 |
| | | between open o | contacts | V AC | 1,000 | 1,000 |
| Insulation (| Insulation (1.2/50 $\mu s)$ between input and output $$kV$$ | | | 6 | 4 | |
| EMC specif | fications | | | | | |
| Type of tes | t | | | | Reference standard | |
| Electrostati | ic discharge | | contact discharge | | EN 61000-4-2 | 4 kV |
| | | | air discharge | | EN 61000-4-2 | 8 kV |
| Radio-frequency electromagnetic field (80 ÷ 1,000 MHz) | | | EN 61000-4-3 | 10 V/m | | |
| Fast transients (burst) (5-50 ns, 5 kHz) on Supply terminals | | | EN 61000-4-4 | 4 kV | | |
| Surges (1.2/50 µs) on Supply terminal | | erminals | common mode | | EN 61000-4-5 | 4 kV |
| | | | differential mode | | EN 61000-4-5 | 4 kV |
| on control signal (B1) | | | common mode | | EN 61000-4-5 | 4 kV |
| | | differential mode | | EN 61000-4-5 | 4 kV | |
| Radio-freq | uency common mode | (0.15 ÷ 80 MH | z) on Supply terminals | | EN 61000-4-6 | 10 V |
| Radiated a | and conducted emissic | on | | | EN 55022 | class A |
| Other data | 1 | | | | | |
| Current ab | sorption on control sig | gnal (B1) | | | < 1 mA | |
| Power lost | to the environment | | without contact current | W | 1.4 | |
| | | | with rated current | W | 3.2 | |
| 🕀 Screw | v torque | | | Nm | 0.8 | |
| Max. wire | size | | | | solid cable | stranded cable |
| | | | | mm² | 1x6 / 2x4 | 1x4 / 2x2.5 |
| | | | | AWG | 1x10 / 2x12 | 1x12 / 2x14 |
| | | | | | | |



Functions

U = Supply voltage

S = Control signal

____ = Output contact

| | | | Contacts | | |
|--|----------------|------------------------------|----------|---------|--|
| | Supply voltage | NO output contact | Open | Closed | |
| | OFF | Open | 15 - 18 | 15 - 16 | |
| | | Open | 15 - 18 | 15 - 16 | |
| | ON | Open (Timing in Progress) | 15 - 18 | 15 - 16 | |
| | ON | Closed | 15 - 16 | 15 - 18 | |

* The LED on type 80.61T is illuminated only when the supply voltage is applied to the timer; during the timing period the LED is not illuminated.





• Possible to control an external load, such as another relay coil or timer, connected to the control signal terminal B1.

* With DC supply, positive polarity has to be connected to B1 terminal (according to EN 60204-1).



- ** A voltage other than the supply voltage can be applied to the control signal (B1), example: A1 - A2 = 230 V AC
 - B1 A2 = 12 V DC

80 Series - Modular timers 8 - 16 A



Functions







- Possible to control an external load, such as another relay coil or timer, connected to the control signal terminal B1.
- * With DC supply, positive polarity has to be connected to B1 terminal (according to EN 60204-1).
- ** A voltage other than the supply voltage can be applied to the control signal (B1), example: A1 - A2 = 230 V AC B1 - A2 = 12 V DC



Outline drawings









Accessories



Sheet of marker tags, for types 80.01/11/41/61, plastic, 72 tags, 6x12 mm

060.72

060.72

30

81 Series - Modular timers 16 A



Ordering information

Example: 81 series, multi function timer; 1 CO 16 A - 250 V AC, supply rated at (12...230)V AC/DC.



Technical data

| EMC specifications | | | | | |
|--|-------------------------|-----------------|--|----------------|--|
| Type of test | | | Reference standard | | |
| Electrostatic discharge | contact discharge | | EN 61000-4-2 | 4 kV | |
| | air discharge | | EN 61000-4-2 | 8 kV | |
| Radio-frequency electromagnetic field (80 ÷ 1,000 MHz) | | | EN 61000-4-3 | 10 V/m | |
| Fast transients (burst) (5-50 ns, 5 kHz) on Supply terminals | | | EN 61000-4-4 | 4 kV | |
| Surges (1.2/50 µs) on Supply terminals common mode | | EN 61000-4-5 | 4 kV | | |
| | differential mode | | EN 61000-4-5 | 4 kV | |
| Radio-frequency common mode (0.15 ÷ 80 MI | Hz) on Supply terminals | | EN 61000-4-6 | 10 V | |
| Radiated and conducted emission | | | EN 55022 | class A | |
| Other data | | | | | |
| Current absorption on control signal (B1) | | | < 1 mA (S-X) | < 1 mA (R-X) | |
| Voltage potential on the input terminal R - X and | ∃S-X | | Not galvanic separation from the supply voltage on A1 - A2 | | |
| Power lost to the environment | without contact current | W | 1.3 | | |
| | with rated current | W | 3.2 | | |
| Screw torque | | Nm | 0.8 | | |
| Max. wire size | | | solid cable | stranded cable | |
| | | mm ² | 1x6 / 2x4 | 1x4 / 2x2.5 | |
| | | AWG | 1x10 / 2x12 | 1x12 / 2x14 | |

| Time range | (0.11)s | (110)s | (1060)s | (110)min | (1060)min | (110)h |
|------------|------------------|------------------|------------------|------------------|------------------|------------------|
| setting | 1 2 3 4 | 1 2 3 4 | 1 2 3 4 | 1 2 3 4 | 1 2 3 4 | 1 2 3 4 |
| | 5 | 5 6 | 5 6 | 5 6 | 5 | 5 6 |

NOTE: time range and function must be set before energising the timer.

Functions

| U | = Supply voltage | LED | LED | Supply | NO output | Con | tacts |
|----|--------------------|---------|-------|---------|-----------|---------|---------|
| S | = Control signal | (green) | (red) | voltage | contact | Open | Closed |
| R | = Reset | | | OFF | Open | 15 - 18 | 15 - 16 |
| ~- | - = Output contact | | | ON | Open | 15 - 18 | 15 - 16 |
| | | | | ON | Closed | 15 - 16 | 15 - 18 |

Without control signal = Start via contact in supply line (A1).

With control signal = Start via contact into control terminal (B1).

R

Т

Т

t<T

Wiring diagram



Closing the external reset switch terminates the interval time and resets the timer. To re-start, it is necessary to open the reset switch, before closing the control signal contact.

83 Series - Modular timers 8 - 12 A

finder

| Features | 83.02 | 83.62 |
|--|--|---|
| Multi-function and Mono-function timer range 83.02 - Multi-function & multi-voltage, 2 Pole (timed + instantaneous options), external time setting potentiometer option 83.62 - Power off-delay, multi-voltage, 2 Pole | | |
| Complies with EN 45545-2:2013 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, T1 class) 22 5 mm wide | Multi-voltage Multi-function Timing can be regulated using ext. Potentiometer 2 timed contacts or 1 timed + 1 instantaneous contact | Multi-voltage Mono-function 2 pole |
| 83.02: eight time scales from 0.05s to 10 days 83.62: four time scales from 0.05s to 3 minutes High input/output isolation Wide supply range (24240)V AC/DC "Blade + cross" - both flat blade and cross head screw drivers can be used to adjust the range and function selectors, the timing trimmer, and to disengage the rail mounting clip Multi-voltage versions with "PWM clever" technology 35 mm rail (EN 60715) mount | Al: On-delay DI: Interval GI: Pulse delayed SW: Symmetrical flasher (starting pulse on) BE: Off-delay with control signal CE: On- and off-delay with control signal DE: Interval with control signal on WD: Watchdog (Retriggerable interval with control signal on) $\frac{U'+ W'- }{A1 A2 } \xrightarrow{25(21) 28(22)} = (=)$ Wiring | BI: Power off-delay (True off-delay) $\begin{bmatrix} L/+ & N/- \\ A_1 & A_2 \\ C & C & C \\ C & C & C \\ C & C & C \\ C & C &$ |
| 83.02 / 83.62 Screw terminal * (0.051)s, (0.510)s, (0.051)min, (0.510)min, (0.051)h, (0.510)h, (0.051)d, (0.510)d For outline drawing see page 38 | $\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$ | Wiring diagram (without control signal) |
| Contact specification | | |
| Contact configuration | 2 CO (DPDT) | 2 CO (DPDT) |
| Rated current/Maximum peak current A | 12/30 | 8/15 |
| Rated voltage/Maximum switching voltage V AC | 250/400 | 250/400 |
| Rated load AC1 VA | 3,000 | 2,000 |
| Rated load AC15 (230 V AC) VA | 750 | 400 |
| Single phase motor rating (230 V AC) kW | 0.5 | 0.3 |
| Breaking capacity DC1: 30/110/220 V A | 12/0.3/0.12 | 8/0.3/0.12 |
| Minimum switching load mW (V/mA) | 300 (5/5) | 300 (5/5) |
| Standard contact material | AgNi | AgNi |
| Supply specification | | |
| Nominal voltage (U _N) V AC (50/60 Hz) | 24240 | 24240 |
| V DC | 24240 | 24240 |
| Rated power AC/DC VA (50 Hz)/W | < 2 / < 2 | < 1.5 / < 2 |
| Operating range V AC | 16.8265 | 16.8265 |
| V DC | 16.8265 | 16.8242 |
| Technical data | | |
| Specified time range | * | (0.052)s, (116)s, (870)s, (50180)s |
| Repeatability % | ± 1 | ± 1 |
| Recovery time ms | 200 | _ |
| Minimum control impulse ms | 50 | 500 ms (A1 - A2) |
| Setting accuracy-full range % | ± 5 | ± 5 |
| Electrical life at rated load in AC1 cycles | 60·10 ³ | 100·10 ³ |
| Ambient temperature range °C | -20+60 | -20+60 |
| Protection category | IP 20 | IP 20 |
| Approvals (according to type) | CE ERE | e Uus |

83 Series - Modular timers 16 A

finder

| Features | 83.11 | 83.41 |
|--|--|--|
| Mono-function timer range | | |
| 83.11 - ON-delay, multi-voltage - 1 Pole 83.41 - Off-delay with control signal, multi-voltage - 1 Pole | Difference Difference Difference Difference | In the second se |
| Complies with EN 45545-2:2013 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, T1 class) 22.5 mm wide Eight time scales from 0.05s to 10 days High input/output isolation | • Multi-voltage • Mono-function • 1 Pole | Multi-voltage Mono-function 1 Pole |
| Wide supply range (24240)V AC/DC "Blade + cross" - both flat blade and cross head screw drivers can be used to adjust the range and function selectors, the timing trimmer, and to disengage the rail mounting clip Multi-voltage versions with "PWM clever" technology 35 mm rail (EN 60715) mount | Al: On-delay | BE: Off-delay with control signal |
| 83.11 / 83.41 Screw terminal | L ⁺⁺ N- A1 A2 | L ⁺⁺ N ⁻ |
| For outline drawing see page 38 | Wiring diagram (without control signal) | Wiring diagram (with control signal) |
| Contact specification | | |
| Contact configuration | 1 CO (SPDT) | 1 CO (SPDT) |
| Rated current/Maximum peak current A | 16/30 | 16/30 |
| Rated voltage/Maximum switching voltage V AC | 250/400 | 250/400 |
| Rated load AC1 VA | 4,000 | 4,000 |
| Rated load AC15 (230 V AC) VA | 750 | 750 |
| Single phase motor rating (230 V AC) kW | 0.5 | 0.5 |
| Breaking capacity DC1: 30/110/220 V A | 16/0.3/0.12 | 16/0.3/0.12 |
| Minimum switching load mW (V/mA) | 300 (5/5) | 300 (5/5) |
| Standard contact material | AgNi | AgNi |
| | 04,040 | |
| Nominal voltage (U _N) V AC (50/60 Hz) | 24240 | 24240 |
| | 24240 | 24240 |
| Rated power AC/DC VA (50 Hz)/W | < 1.5 / < 2 | < 1.5 / < 2 |
| Operating range V AC | 16.8205 | 10.8203 |
| V DC | 10.8203 | 10.8203 |
| Securitad time commo | | |
| Specified time range | (0.031)s, (0.510)s, (0.051)min, (0.510)m | in, (0.051)n, (0.510)n, (0.051)d, (0.510)d |
| Repeatability % | ± 1 | ± 1 |
| Minimum control impulse | 200 | 50 |
| Setting accuracy full range % | | |
| Electrical life at rated load in AC1 | ± 5 50,10 ³ | <u> </u> |
| Ambient temperature range | 20 ±60 | 20 ±60 |
| Protection category | IP 20 | IP 20 |
| Approvals (according to type) | CE ERE (| |

Ordering information

Example: 83 series, modular timers, 2 CO (DPDT) - 12 A, supply rated at (24...240)V AC/DC.



Technical data

| Insulation | | | | | | | |
|-----------------------------------|-------------------------------------|---------------------------------|-----------------|---|---------------|----------------------|--------------|
| Dielectric strength | between input and output circuitVAC | | 4,000 | | | | |
| | between open o | contacts | V AC | 1,000 | | | |
| Insulation (1.2/50 µs) between | 6 | | | | | | |
| EMC specifications | | | | | | | |
| Type of test | | | | Reference standard | 83.02/11 | /41 | 83.62 |
| Electrostatic discharge | | contact discharge | | EN 61000-4-2 | 4 kV | | 4 kV |
| | | air discharge | | EN 61000-4-2 | 8 kV | | 8 kV |
| Radio-frequency electromagneti | c field | (80 ÷ 1,000 MHz) | | EN 61000-4-3 | 10 V/m | | 10 V/m |
| | | (1,000 ÷ 2,700 MHz) | | EN 61000-4-3 | 3 V/m | | 3 V/m |
| Fast transients (burst) (5-50 ns, | 5 and 100 kHz) | on Supply terminals | | EN 61000-4-4 | 7 kV | | 6 kV |
| | | on control signal terminal (B1) | | EN 61000-4-4 | 7 kV | | 6 kV |
| Surges (1.2/50 µs) on Supply t | erminals | common mode | | EN 61000-4-5 | 6 kV | | 6 kV |
| | | differential mode | | EN 61000-4-5 | 6 kV | | 4 kV |
| on control signal termi | nal (B1) | common mode | | EN 61000-4-5 | 6 kV | | 6 kV |
| | | differential mode | | EN 61000-4-5 | 4 kV | | 4 kV |
| Radio-frequency common mode | • | (0.15 ÷ 80 MHz) | | EN 61000-4-6 | 10 V | | 10 V |
| on Supply terminals | | (80 ÷ 230 MHz) | | EN 61000-4-6 | 10 V | | 10 V |
| Radiated and conducted emissi | on | | | EN 55022 | class A | | class A |
| Other data | | | | | | | 1 |
| Current absorption on control s | ignal (B1) | | | < 1 mA | | | |
| | - max cable lenç | gth (capacity of ≤ 10 nF / | 100 m) | 150 m | | | |
| | - when applying | g a control signal to B1, | which is | B1 is isolated from A | A1 and A2 | by an opto-coupler, | and can |
| | different from | the supply voltage at A1 | /A2 | therefore be operated at a voltage other than the supply | | | |
| | | | | voltage. If using a control signal of between (24 48)V DC and | | | |
| | | | | a supply voltage of (24240)V AC, ensure that the signal – is | | | |
| | | | | connected to A2 and the + is applied to B1, and that L is | | | |
| | | | | applied to B1 and N | to A2. | | |
| External potentiometer for 83.0 | 2 | | | Use a 10 k $\Omega/ \ge 0.25$ W linear potentiometer. Maximum cable | | | |
| | | | | length 10 m. When | using an e> | kternal potentiomete | r, the timer |
| | | | | automatically use its | setting in p | lace of the internal | setting. |
| | | | | Consider the voltage | e potential c | at the potentiometer | to be the |
| | | . 1 | | same as the timer su | pply voltag | e. | |
| Power lost to the environment | | without contact current | W | 1.4 | | | |
| | | with rated current | W | 3.2 | | | |
| Screw torque | | | Nm | 0.8 | | | |
| Max. wire size | | | 0 | solid cable | | stranded cable | |
| | | | mm ² | 1x6 / 2x4 | | 1x4 / 2x2.5 | |
| | | | AWG | 1x10 / 2x12 | | 1x12 / 2x14 | |

83 Series - Modular timers 8 - 12 - 16 A



Outline drawings









Accessories



Sheet of marker tags, for types 83.01/11/21/41/52/62/82, plastic, 72 tags, 6x12 mm 060.72





Potentiometer usable as external potentiometer for type 83.02/52

087.02.2





Functions

| Supply NO output | | Contacts | | |
|------------------|------------------------------|--------------------|--------------------|--|
| voltage | contact | Open | Closed | |
| OFF | Open | 15 - 18 25 - 28 | 15 - 16 25 - 26 | |
| ON | Open | 15 - 18 25 - 28 | 15 - 16 25 - 26 | |
| ON | Open (Timing in Progress) | 15 - 18 25 - 28 | 15 - 16 25 - 26 | |
| ON | Closed | 15 - 16 25 - 26 | 15 - 18 25 - 28 | |

* The LED on type 83.62 is illuminated when supply voltage is supplied to timer.



• Possible to control an external load, such as another relay coil or timer, connected to the control signal terminal B1.



N/-

L/+

6 9 Ó A2

A1 B1

S

- * With DC supply, positive polarity has to be connected to B1 terminal (according to EN 60204-1).
- ** A voltage other than the supply voltage can be applied to the control signal (B1), example: A1 - A2 = 230 V ACB1 - A2 = 12 V DC

Functions



NOTE: The timing function must be set when the timer is de-energised. Or for the 83.02/52, when the contact mode selector is in the OFF position.

83.02 type

| Contact mode selector | Functions without control signal (example: AI) | Functions with control signal (example: BE) |
|--------------------------------------|---|---|
| 2 timed contacts | | |
| | 25-28 T | |
| | 15 - 18 T | 15-18 T |
| | Both output contacts (15-18 and 25-28) follow the timing function | Both output contacts (15-18 and 25-28) follow the timing function |
| OFF | U | |
| | Both output contacts [15-18 and 25(21)-28(24)] stay permanently open | Both output contacts [15-18 and 25(21)-28(24)] stay permanently open |
| 1 timed + 1 instantaneous contact | | |
| | 21-24 | 21 - 24 |
| | The output contact 15-18 follows the timing function | The output contact 15-18 follows the timing function |

83 Series - Modular timers 8 - 12 - 16 A

finder





11 Series - Light Dependent Relay 16 A

| Features | 11.31 | | | | |
|---|---------------------------------------|----------------------------|--|--|--|
| Relays for automatic control of lighting to ambient light level - with separate light level - with separate light against fire of materials), EN 61373 (resistance against random vibration shock, Category 1, Class B), EN 503 (resistance to temperature and humi T1 class) Sensitivity adjustment from 1 to 1003 One module, 17.5mm wide | | | | | |
| Low energy consumption 24 V DC/AC version For the first 3 working cycles the de (On and Off) is reduced to zero in a aid installation LED status indication | lay time order to | • 1 pole • 17.5 mm wide | | | |
| SELV separation between contact ar circuit Double insulation between supply a sensor "Delay Time: 1 sec ON 3 sec OFF | nd supply nd light | | | | |
| 35 mm rail (EN 60715) mount Cadmium free contact material Cadmium free light sensor (IC photo | o diode) | | | | |
| For outline drawings see page 43 | | | | | |
| Contact specification | | | | | |
| Contact configuration | | 1 NO (SPST-NO) | | | |
| Rated current/Maximum peak current | (I _N /I _{max}) A | 16 / 30 (120 – 5 ms) | | | |
| Rated voltage/Maximum switching voltage (U _N | /U _{max}) V AC | 250 / 400 | | | |
| | VA | 4,000 | | | |
| Rated load AC15 (230 V AC) | VA | 750 | | | |
| | | 750 | | | |
| | | 1.000 | | | |
| | | 2,000 | | | |
| Minimum switching load m | $W (V/m\Delta)$ | 1 000 (10 / 10) | | | |
| Standard contact material | | AgSnO2 | | | |
| Supply specification | | | | | |
| Nominal voltage (U _N) V AC (5 | 50/60 Hz) | 24 | | | |
| | DC | 24 | | | |
| Rated power VA (| 50 Hz)/W | 2.5 | | | |
| Operating range V A | C (50 Hz) | 16.828.8 | | | |
| | DC | 16.832 | | | |
| Technical data | | | | | |
| Electrical life at rated load in AC1 | cycles | 100 · 10 ³ | | | |
| Threshold setting: Standar | d range lx | 1100 | | | |
| Hig | h range lx | _ | | | |
| Hysteresis (switching Off/On ratio) | | 1.25 | | | |
| Delay time: switching On / Off | S | 1/6 | | | |
| Ambient temperature range | °C | -20+50 | | | |
| Protection category: light dependent relay/ | light sensor | IP 20 / IP 54 | | | |
| Approvals (according to type) | Approvals (according to type) | | | | |

Ordering information

Example: 11 series light dependent relay with time switch, 1 NO (SPST-NO) 16 A contact, 24 V AC/DC supply.



Technical data

| Insulation | Dielectric strength | Impulse (1.2/50 μs) | |
|---|---------------------------------|---------------------|--|
| between supply and contacts | 4,000 V AC | 6 kV | |
| between supply and light sensor | 2,000 V AC | 4 kV | |
| between open contacts | 1,000 V AC | 1.5 kV | |
| EMC specifications | | | |
| Type of test | Reference standard | | |
| Electrostatic discharge contact discharge | EN 61000-4-2 | 4 kV | |
| air discharge | EN 61000-4-2 | 8 kV | |
| Radiated electromagnetic field (80 1,000 MHz) | EN 61000-4-3 | 10 V/m | |
| Fast transients on supply terminals | EN 61000-4-4 | 3 kV | |
| (burst 5/50 ns, 5 and 100 kHz) on light sensor connection | EN 61000-4-4 | 3 kV | |
| Voltage pulses on supply terminals common mode | EN 61000-4-5 | 4 kV | |
| (surge 1.2/50 µs) differential mode | EN 61000-4-5 | 3 kV | |
| Radiofrequency common mode voltage on supply terminals | EN 61000-4-6 | 10 V | |
| (0.1580 MHz) on light sensor | EN 61000-4-6 | 3 V | |
| Voltage dips 70 % U _N , 40 % U _N | EN 61000-4-11 | 10 cycles | |
| Short interruptions | EN 61000-4-11 | 10 cycles | |
| Radio frequency conducted emissions 0.1530 MHz | EN 55014 | class B | |
| Radiated emissions 301,000 MHz | EN 55014 | class B | |
| Terminals | | | |
| Screw torque | 0.8 Nm | | |
| Max. wire size solid cable | 1 x 6 / 2 x 4 mm ² | 1 x 10 / 2 x 12 AWG | |
| stranded cable | 1 x 4 / 2 x 2.5 mm ² | 1 x 12 / 2 x 14 AWG | |
| Wire strip lenght | 9 mm | | |
| Other data | | | |
| Cable grip of light sensor | 7.59 mm | | |
| Maximum cable length relay to light sensor | 50 m (2 x 1.5 mm ²) | | |
| Preset threshold | 10 lx | | |
| Power lost to the environment | | | |
| in stand-by | 0.3 W | | |
| without contact current | 0.9 W | | |
| with rated current | 1.7 W | | |

LED functions

| LED | Supply voltage | NO output contact 11.31 |
|-----|----------------|----------------------------|
| | OFF | Open |
| | ON | Open |
| | ON | Closed |
| 42 | | |

Outline drawings



Wiring diagrams



011.02

11 Series - Light Dependent Relay 16 A

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Accessories

Light sensor (supplied with light dependent relay)

- Ambient temperature range: -40...+70 °C
- Cadmium free
- Non polarized

- Cadmium free - Non polarized

- Double insulated with respect to light dependent relay supply

Flush-mounted light sensor (protection category: IP66/67)

- Double insulated with respect to light dependent relay supply

- Ambient temperature range: -40...+70 °C

- Not compatible with type 11.71.0.024.1001

- Not compatible with type 11.71.0.024.1001





011.03

011.02

6

011.03

| - Supplied with light dependent relay (packaging code POA) | | | | | | | |
|--|----------------------|--|--|--|--|--|--|
| Connection cable | | | | | | | |
| Material | PVC, flame retardant | | | | | | |
| Conductor size mm ² | 2 0.5 | | | | | | |
| Cable length mn | 500 | | | | | | |
| Cable diameter mn | 5.0 | | | | | | |
| Working voltage | / 300/500 | | | | | | |
| Test voltage, cable kV | / 2.5 | | | | | | |
| Max. temperature °C | +90 | | | | | | |





Sheet of marker tags, plastic, 72 tags, 6x12 mm

060.72

060.72

22 Series - Modular contactors 25 A

Features

25 A modular contactor - 2 pole or 4 pole

- For railway applications; materials compliant with fire and smoke characteristics (EN 45545-2:2013)
- 17.5 or 35 mm wide
- NO contact gap \geq 3 mm, double break
- Continuous duty for the coil and contacts
- AC/DC silent coil (with varistor protection)
- Protective separation (reinforced insulation) between coil and contacts
- Mechanical and LED indicators
- Compliant with EN 61095: 2009
- Auxiliary contact module available, quick-assembly with the main contactor (1 NO + 1 NC and 2 NO versions)
- 35 mm rail (EN 60715) mount

22.32...4x20 / 22.34...4x20 Screw terminal



* Contact gap \geq 3 mm for NO contacts only; NC contacts ≥ 1.5 mm

| For outling drawings see page 40 | | 2 NO + 2 NC | |
|--|--|---|--|
| Contact specification | | (4620) | |
| | 2 NO 2 mm * (ar 1 NO + 1 NC ar 2 NO) | 4 NO 2 mm * (ar 2NO + 1NC ar 2NO + 2NC) | |
| Pated surrent / Maximum neak surrent | | | |
| Pated voltage | 25 / 120 | 257 120 | |
| Rated voltage V AC | 250 / 440 | 250 / 440 | |
| Rated load ACT / AC-/ a (per pole @ 250 V) VA | 0,250 | 0,250 | |
| Rated current AC3 / AC-/ b A | 10 | 10 | |
| Rated load ACTS (per pole @ 230 V) VA | 1,800 | 1,800 | |
| Single-phase motor rating (230 V AC) kW | | _ | |
| Three-phase motor rating (400 - 440 V AC) kW | - | 4 | |
| Rated current AC-7c A | 10 | 10 | |
| 230 V lamps rating: incandescent or halogen W | 2,000 | 2,000 | |
| compact fluorescent (CFL) W | 200 | 200 | |
| electronic ballast fluorescent tubes W | 800 | 800 | |
| electromagnetic ballast compens. fluorescent tubes ${\sf W}$ | 500 | 500 | |
| Breaking capacity DC1: 30/110/220 V A | 25/5/1 | 25/5/1 | |
| Minimum switching load mW (V/mA) | 1,000 (10/10) | 1,000 (10/10) | |
| Contact material | AgSnO ₂ | AgSnO ₂ | |
| Coil specification | | | |
| Nominal voltage (U $_{\rm N}$) $$ V DC/AC (50/60 Hz) $$ | 24 - 48 - 120 - 230 | 24 - 48 - 120 - 230 | |
| Rated power AC/DC VA (50 Hz)/W | 2 /2.2 | 2 / 2.2 | |
| Operating range DC/AC (50/60 Hz) | (0.81.1) U _N | (0.81.1) U _N | |
| Holding voltage DC/AC (50/60 Hz) | 0.4 U _N | 0.4 U _N | |
| Must drop-out voltage DC/AC (50/60 Hz) | 0.1 U _N | 0.1 U _N | |
| Technical data | | | |
| Mechanical life AC/DC cycles | 2 · 10 ⁶ | 2 · 10 ⁶ | |
| Electrical life at rated load AC-7a cycles | 30 · 10 ³ | 30 · 10 ³ | |
| Operate/release time ms | 30 / 20 | 18 / 40 | |
| Insulation between coil and contacts (1.2/50 $\mu s)~kV$ | 6 | 6 | |
| Ambient temperature range °C | -20+50 | -20+50 | |
| Protection category | IP20 | IP20 | |
| Approvals (according to type) | CE ERE 👁 🕸 | RINA cub us | |

22.32.0.xxx.4x20

 \bullet AgSnO_2 contacts, specifically intended for lamp loads and for high inrush current loads

3 A1 1 3 A2 2 4 A2 2 4 1 NO + 1 NC

(4520)

A1 1

5

2 NO

(4320)



(4420)



- ${\rm AgSnO}_2$ contacts, specifically intended for lamp loads and for high inrush current loads





Exemple: 22 series, modular contactor 25 A, 4 NO contacts, coil 24 V AC/DC, AgSnO₂ contacts, mechanical indicator + LED.



 $4 = AgSnO_2$

finder

Selecting features and options: only combinations in the same row are possible. Preferred selections for best availability are shown in **bold**.

| Туре | Coil version | Α | В | С | D |
|-------|--------------|---|------------------|---|---|
| 22.32 | AC/DC | 4 | 3 - 5 | 2 | 0 |
| 22.34 | AC/DC | 4 | 3 - 6 - 7 | 2 | 0 |

Technical data

| Insulation | | 22.32 / 22.34 | | |
|--|-------------------------------|--------------------------|------------|--|
| Rated insulation voltage | V AC | 250 | 440 | |
| Pollution degree | | 3 | 2 | |
| Insulation between coil and contact set | | | | |
| Type of insulation | | Reinforced | | |
| Overvoltage category | | | | |
| Rated impulse voltage | kV (1.2/50 μs) | 6 | | |
| Dielectric strength | V AC | 4,000 | | |
| Insulation between adjacent contacts | | | | |
| Type of insulation | | Basic | | |
| Overvoltage category | | III | | |
| Rated impulse voltage | kV (1.2/50 μs) | 4 | | |
| Dielectric strength | V AC | 2,500 | | |
| Insulation between open contacts | | NO contact | NC contact | |
| Contact gap | mm | 3 | 1.5 | |
| Overvoltage category | | III | II | |
| Rated impulse voltage | kV (1.2/50 μs) | 4 | 2.5 | |
| Dielectric strength | V AC/kV (1.2/50 µs) | 2,500/4 | 2,000/3 | |
| Conducted disturbance immunity | | Reference standard | | |
| Fast transients (burst 5/50 ns, 5 kHz) at co | oil terminals | EN 61000-4-4 | | |
| Voltage pulses (surge 1.2/50 µs) at supply | terminals (differential mode) | EN 61000-4-5 | | |
| Short circuit protection | | | | |
| Rated conditional short circuit current | kA | 3 | | |
| Back-up fuse | А | 32 (gL/gG type) | | |
| Terminals | | Solid and stranded cable | | |
| Max. wire size – contact terminals | mm ² | 1 x 6 / 2 x 4 | | |
| | AWG | 1 x 10 / 2 x 12 | | |
| Max. wire size – coil terminals | mm ² | 1 x 4 / 2 x 2.5 | | |
| | AWG | 1 x 12 / 2 x 14 | | |
| Min. wire size – contact and coil terminals | mm ² | 1 x 0.2 | | |
| | AWG | 1 x 24 | | |
| Screw torque | Nm | 0.8 | | |
| Wire strip length | mm | 9 | | |
| Power lost to the environment | | 22.32 | 22.34 | |
| | without contact current W | 2 | 2 | |
| | with rated current W | 4.8 | 6.3 | |

NOTE: It is suggested an air gap of 9 mm between adjacent relays for installations and working conditions close to the limit

(that is, ambient temperature > 40 °C, coil operated for a prolonged period of time, all contacts loaded with current > 20 A).

Contact specification

Ratings and utilization categories according to EN 61095: 2009

| Туре | | | Utilizatio | n category | | |
|---|---------------|--------------------|---------------|--------------------|---------------|-------------------------|
| | AC-7a | | AC-7b | | AC-7c | |
| | Rated current | Rated electrical | Rated current | Rated electrical | Rated current | Rated electrical |
| | (A) | life (Cycles) | (A) | life (Cycles) | (A) | life (Cycles) |
| 22.324xx0 (AgSnO ₂ contacts) | 25 | 30.10 ³ | 10 | 30.10 ³ | 10 | 30.10 ³ |
| 22.344xx0 (AgSnO ₂ contacts) | 25 | 30.10 ³ | 10 | 30.10 ³ | 10 | 30.10 ³ |

Utilization category: AC-7a = Slightly inductive loads (cos φ =0.8)

AC-7b = Motor loads; (cosq=0.45, Imaking= 6xlbreaking)

AC-7c = Compensated electric discharge lamps ($\cos\varphi=0.9$, C= 10 mF/A)

H 22 - Maximum DC1 breaking capacity - Type 22.32 / 22.34



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of ≥ 100·10³ can be expected.
- In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load. Note: the release time for the load will be increased.

Coil specifications

AC/DC version data (type 22.32)

| Nominal | Coil | Operatir | Rated coil | |
|----------------|---------------|------------------|------------------|---------------------------------------|
| voltage | code | | | consumption |
| U _N | | U _{min} | U _{max} | I _N at U _N (AC) |
| V | | V | V | mA |
| 24 | 0 .024 | 19.2 | 26.4 | 83 |
| 48 | 0 .048 | 38.4 | 52.8 | 42 |
| 120 | 0 .120 | 88 | 138 | 16.5 |
| (110125) | | | | |
| 230 | | 181 (AC) | 261 (AC) | |
| (230240 AC) | 0 .230 | 104 (70) | 204 (AC) | 8.7 |
| (220 DC) | | 176 (DC) | 242 (DC) | |

AC/DC version data (type 22.34)

| Coil | Operating range | | Rated coil | | |
|---------------|--|--|---|--|--|
| code | | | consumption | | |
| | U _{min} | U _{max} | I _N at U _N (AC) | | |
| | V | V | mA | | |
| 0 .024 | 19.2 | 26.4 | 83 | | |
| 0 .048 | 38.4 | 52.8 | 42 | | |
| 0 .120 | 88 | 138 | 16.5 | | |
| | | | | | |
| | 181 (AC) | 261 1001 | | | |
| 0 .230 | 104 (AC) | 204 (AC) | 8.7 | | |
| | 176 (DC) | 242 (DC) | | | |
| | Coil code 0.024 0.048 0.120 0.230 | Coil code Operatin Umin 0.024 19.2 0.048 38.4 0.120 88 0.230 184 (AC) 176 (DC) | Coil code Operating range Umin Umax V V 0.024 19.2 26.4 0.048 38.4 52.8 0.120 88 138 0.230 184 (AC) 264 (AC) 176 (DC) 242 (DC) | | |

R 22 - Coil operating range v ambient temperature



1 - Max. permitted coil voltage.

2 - Min. pick-up voltage with coil at ambient temperature.



Wiring diagrams



22 Series - Modular contactors 25 A

Outline drawings







Type 022.33 / 022.35 Screw terminal



OES!

Type 22.32 + 022.33 / 022.35 Screw terminal 17.5 8.75 60.8 Binde 000 010 33.8 0 45 84 88.8 0000 010 30.5 000 I C€ cj ġ



C)





| Auxiliary modules | | 022.33 | 022.35 | |
|--|--------|---|---|--|
| | | | | |
| | | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | |
| Type of contactor | | Туре 22.32 | Туре 22.32 | |
| | | lype 22.34 | Type 22.34 | |
| Contact specification | | 0.110 | | |
| | | 2 NO | I NO + I NC | |
| Conventional tree air thermal current I_{tl} | | 6 | 6 | |
| Rated power AC15 (230 V) | VA | /00 | /00 | |
| Electrical lite at rated load | cycles | 30 x 10 ³ | 30 x 10 ³ | |
| Contact material | | AgNi | AgNi | |
| Short circuit protection | | | | |
| Rated conditional short circuit current | kA | 1 | 1 | |
| Back-up tuse | A | 6 (gL/gG type) | 6 (gL/gG type) | |
| Terminals | | Solid and stranded cable | | |
| Max. wire size | mm² | 1 x 4 / 2 x 2.5 | 1 x 4 / 2 x 2.5 | |
| | AWG | 1 x 12 / 2 x 14 | 1 x 12 / 2 x 14 | |
| Min. wire size | mm² | 1 x 0.2 | 1 x 0.2 | |
| | AWG | 1 x 24 | 1 x 24 | |
| Screw torque | Nm | 0.8 | 0.8 | |
| Wire strip length | mm | 9 | 9 | |
| Power lost to the environment | | | | |
| without contact current | W | _ | | |
| with rated current | W | 0.5 | 0.5 | |
| Approvals (according to type) | | CE [fi @ RINA @ us | | |

NOTE: it is not possible to assembly the auxiliary module on 22.32.0.xxx.x4x0 (2 NC versions).





22 Series - Modular contactors 25 A

Accessories



011.01

060.72

019.01

| | Adaptor for panel mounting (for 22.32 type), plastic, 17.5 mm wide | 020.01 |
|----|--|--------|
| 0 | | |
| | Adaptor for panel mounting (for 22.34 type), plastic, 35 mm wide | 011.01 |
| 35 | | |
| | Sheet of marker tags, plastic, 72 tags, 6x12 mm | 060.72 |
| | | |
| | Identification tag, plastic, 1 tag, 17x25.5 mm | 019.01 |
| | | |
| | Separator for rail mounting, plastic, 3 mm wide | 020.03 |
| | | |

14

020.03





| 8-way jumper link for type 22.32, 17.5 mm wide | 022.18 (blue) |
|--|---------------|
| Rated values | 10 A - 250 V |
| 122.4 2.7 2.7 16.7 17.5 17.5 17.5 17.5 16.7 16.7 17.5 17.5 17.5 16.7 | |

022.26



















FINDER SpA Via Drubiaglio, 14 10040 ALMESE (TO) - ITALY Tel. +39 011 9346211 Fax +39 011 9359079 export@findernet.com



FINDER FRANCE Sarl

Avenue d'Italie - BP 40 Zone Ind. du Pré de la Garde F - 73302 ST. JEAN DE MAURIENNE Cédex Tel. +33/479/83 27 27 Fax +33/479/59 80 04 finder.fr@finder.fr

S.P.R.L. FINDER BELGIUM B.V.B.A.

Bloemendael, 5 B - 1547 BEVER Tel. +32/54/30 08 68 Fax +32/54/30 08 67 finder.be@findernet.com

FINDER PLC Opal Way - Stone Business Park STONE, STAFFORDSHIRE, ST15 OSS - UK Tel. +44 (0)1785 818100 Fax +44 (0)1785 815500 finder.uk@findernet.com

FINDER AB

Skruvgatan 5 SE – 211 24 Malmö Tel: +46 40 93 77 77 Fax:+46 40 93 78 78 finder.se@findernet.com

FINDER ApS Postbox 26

DK – 2770 Kastrup Tel. +45 60 22 44 77

FINDER ELÉCTRICA S.L.U.

C/ Severo Ochoa, 6 Pol. Ind. Cap de L'Horta E - 46185 La Pobla de Vallbona (VALENCIA) Aptdo. de correos 234 Tel. +34-96 272 52 62 Fax +34-96 275 02 50 finder.es@findernet.com

FINDER PORTUGAL, LDA

Travessa Campo da Telheira, nº 56 Vila Nova da Telha, P - 4470 - 828 – MAIA Tel. +351/22 99 42 900 - 1 - 6 - 7 - 8 Fax +351/22 99 42 902 finder.pt@finder.pt

FINDER ECHIPAMENTE srl

Str. Clujului nr. 75 F, 401180 TURDA jud. CLUJ ROMANIA Tel. +40 264 403 888 Fax +40 264 403 889 finder.ro@finder.ro

FINDER COMPONENTES LTDA.

Rua Olavo Bilac, 326 Bairro Santo Antonio São Caetano do Sul - SÃO PAULO CEP 09530-260 - BRASIL Tel. +55/11/2147 1550 Tel. +55/11/4223 1550 Fax +55/11/2147 1590 finder.br@findernet.com

FINDER ARGENTINA

Calle Martín Lezica, 3079 San Isidro - Buenos Aires CP B1642GJA - ARGENTINA Tel. +54/11/5648.6576 Fax +54/11/5648.6577 finder.ar@findernet.com

FINDER GmbH Hans-Böckler-Straße 44 D - 65468 Trebur-Astheim Tel. +49 / 6147/2033-0 Fax. +49 / 6147/2033-377 info@finder.de

FINDER RELAIS NEDERLAND B.V.

Dukdalfweg 51 NL - 1041 BC AMSTERDAM Tel. +31/20/615 65 57 Fax +31/20/617 89 92 finder.nl@findernet.com

FINDER RELAIS VERTRIEBS GmbH Industriezentrum NÖ-Süd

Straße 2a, Objekt M40 A - 2351 WIENER NEUDORF Tel. +43/2236/86 41 36 - 0 Fax +43/2236/86 41 36 - 36 finder.at@findernet.com

FINDER CZ, s.r.o. Radiová 1567/2b

102 00 Praha 10 Tel. +420 286 889 504 Fax +420 286 889 505 finder.cz@findernet.com

FINDER-Hungary Kereskedelmi Kft. HU - 1046 BUDAPEST

Kiss Ernő u. 1-3. Tel. +36/1 369-30-54 Fax +36/1 369-34-54 finder.hu@findernet.com

FINDER (SCHWEIZ) AG Industriestrasse 1 a, Postfach 23 CH - 8157 DIELSDORF (ZH) Tel. +41 44 885 30 10 Fax +41 44 885 30 20 finder.ch@finder-relais.ch

FINDER RELAYS, INC.

4191 Capital View Drive Suwanee, GA 30024 - U.S.A. Tel. +1/770/271-4431 Fax +1/770/271-7530 finder.us@findernet.com

RELEVADORES FINDER, S.A. de C.V. Calle 2 Sur 1003-C

Chipilo de Francisco Javier Mina C.P. 74325 Chipilo, Puebla - MEXICO Tel. +52/222/2832392 - 3 Fax +52/222/2832394 finder.mx@findernet.com

FINDER 000

Electrozavodskaya street 24-1 107023 MOSCOW RUSSIAN FEDERATION Tel. +7/495/229 4929 Fax +7/495/229 4942 finder.ru@findernet.com

FINDER ASIA Ltd.

Room 901 - 903, 9F, Premier Center, 20 Cheung Shun Street, Cheung Sha Wan, Kowloon, Hong Kong Tel. +852 3188 0212 Fax +852 3188 0263 finder.hk@finder-asia.com

FINDER INDIA PVT. LTD.

Unit No.902 - R.G. Trade Tower, Netaji Subhash Place, Wazirpur District Centre, Pitampura - Delhi - 110034 - India Tel. +91-11-47564343 Fax +91-11-47564344 finder.in@findernet.com

