

BRIEF INFORMATION

Mini and Time Relays

- HELLA produces more than 100 million units per year at its own facilities
- OE quality – versatile and reliable

Product features

Relays are used in automotive engineering to switch high currents. The engine control unit, for example, is switched by a relay. Because relays are robust and not particularly susceptible to failure, they can be installed near electric devices. They require only low control currents, making small line cross-sections sufficient. The switching and amplifier function of a relay could only be achieved with a lot more effort and a lot less reliability using more “modern” electronics. Another benefit of the relay is that it is quick and easy to replace. These positive characteristics are the reason why relays are still in use today. And they ensure that, in the future, relays will still be at home in many vehicles.

MINI RELAYS



Mini relays according to ISO 7588-1, blade terminals according to ISO 8092-1.

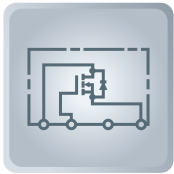
Contact arrangements: make contact, change-over contact, max. 40 A switching power (make contact), rated voltage:

→ 12 V (for passenger cars, agricultural and construction machinery)

→ 24 V (for commercial vehicles, buses, municipal vehicles)

Areas of application include: headlights, starters, fuel pumps, fan motors, horns and fanfares.

FUNCTIONAL PRINCIPLE



Relays are basically electrically operated switches which use an electromagnet to move a switching mechanism by switching one or more contacts. They are used where one or more load circuits need to be switched on or off by means of a control signal. Characteristic of the electromechanical relay is the complete (galvanic) isolation between the control and controlled circuits.

Change-over relays

Change-over relays switch the load circuit over from one electrical load to another. These relays can be operated by a dashboard switch, for example. Change-over relays are used for switch applications with two stages/speeds such as heated rear windows or fan motors etc.

How change-over relays work

A change-over relay operates on the same principle as a make relay. The only difference is that the armature is connected to a second (alternative) output (87a) when released. As soon as the control circuit is active, the armature is pulled in, opens the break contact (87a) and switches over to the make contact (87). A change-over relay can be used as either a make or a break relay. By design, the switching current of the make contact is always higher than that of the break contact.

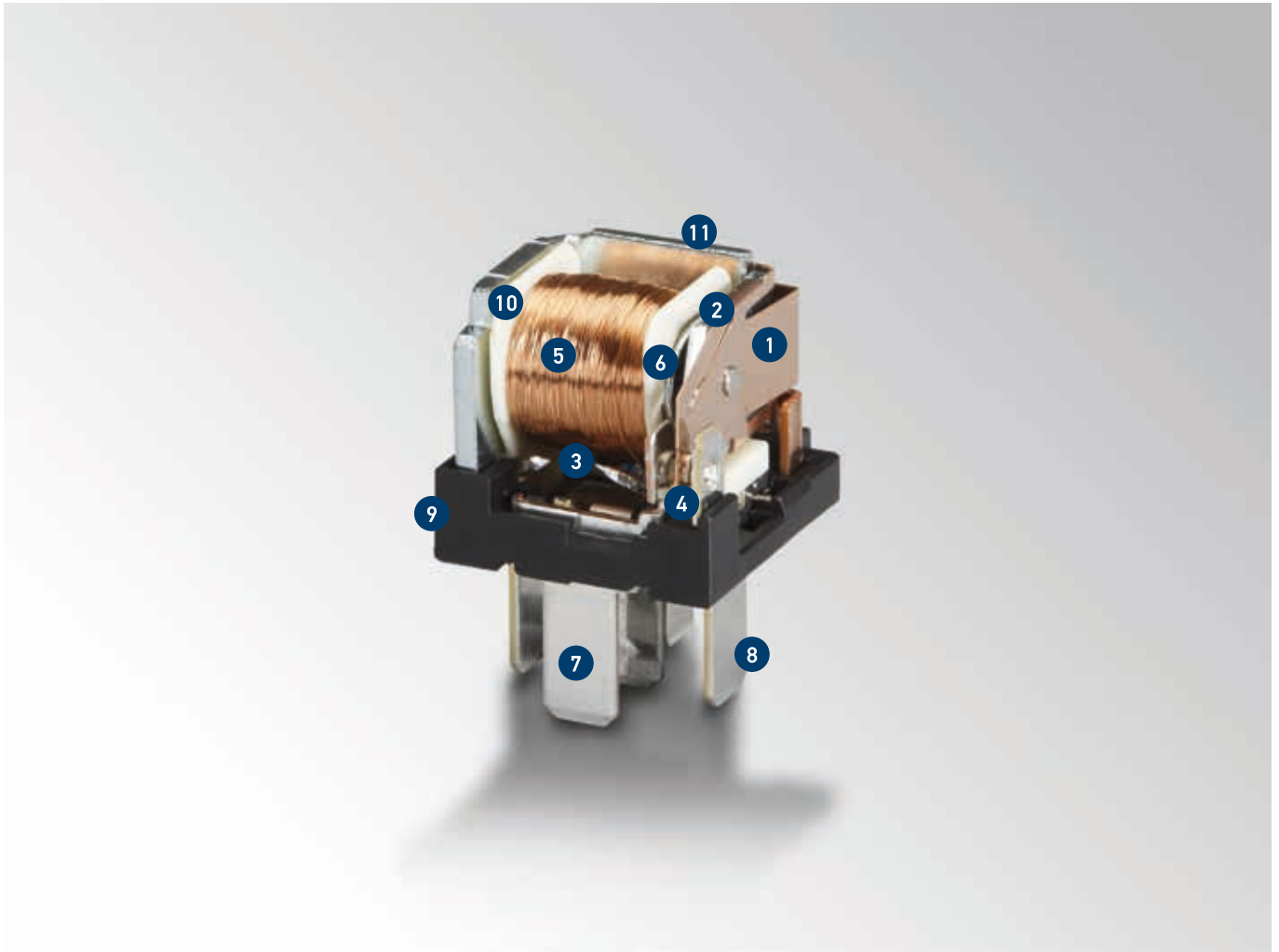


Rated voltage

→ 12 V: for passenger cars, agricultural and construction machinery etc.

→ 24 V: for commercial vehicles, buses, municipal vehicles etc.

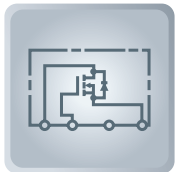
KEY COMPONENTS OF AN ELECTROMECHANICAL RELAY



Legend

- | | |
|---------------------------|--|
| 1 Contact plates | 7 Blade terminal (load) made of E-Cu (electrolytic copper) with tin-plated surface |
| 2 Armature | 8 Blade terminal (coil) made of CuZn (brass) with tin-plated surface |
| 3 Pins for coil wire | 9 Base plate |
| 4 Switch contacts | 10 Coil body |
| 5 Coil made of Cu wire | 11 Yoke |
| 6 Iron core (in the coil) | |

TIME RELAYS – FUNCTIONAL PRINCIPLE



A time relay is a combination of an electromechanical output relay and a control circuit.

The time relay is available in two variants:

- **Pick-up delay:** the control circuit is activated by applying a voltage to the device input. Depending on the set time, the relay is then switched on with a delay. After deactivating the input, the relay voltage drops immediately.
- **Drop-off delay:** the relay is switched on immediately by applying a voltage to the input of the monovibrator. After deactivating the input, the relay voltage drops after a predetermined time.

HELLA also supplies time relays with neither pick-up nor drop-off delay. In this case, the output is activated or switched on for a specific period of time.

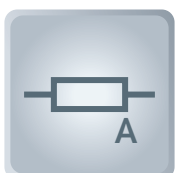
The delay or turn-on time can be adjusted with a DIP switch and fine-tuned with a potentiometer.

If a more powerful relay is used, higher current strengths or different load types – e.g. inductive, capacitive / lamps – can be easily activated.



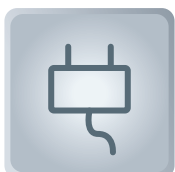
Rated voltage

- 12 V: for passenger cars, agricultural and construction machinery etc.
- 24 V: for commercial vehicles, buses, municipal vehicles etc.



Rated load, rated switching current

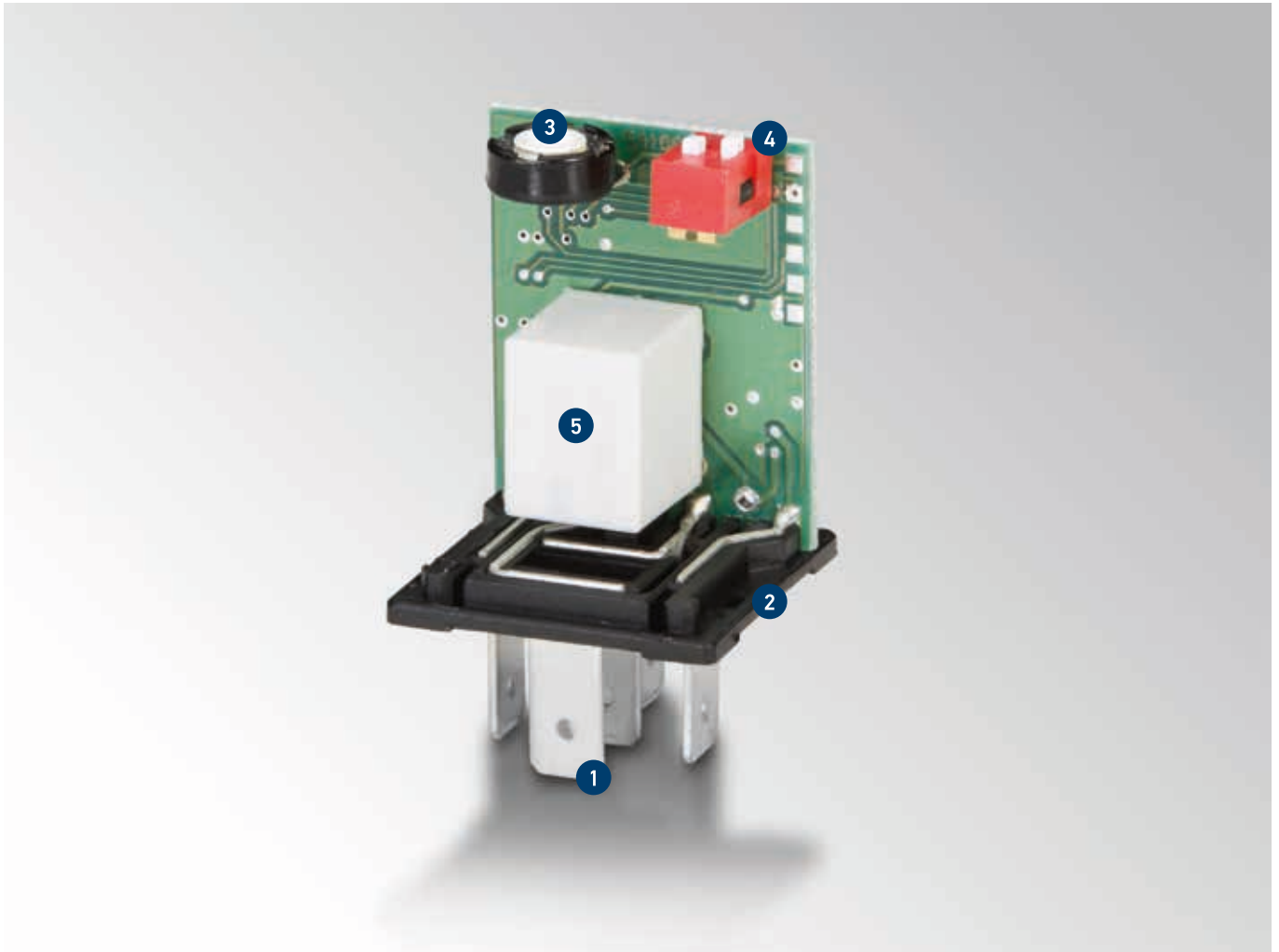
- Up to 20 A, make contact.
- Up to 10 A, break contact.



Contacts and connector configurations

HL	Handbrake control (input)
HK	Handbrake contact (input)
L, 87	Load current, make contact (output)
N	Emergency-off switch (input)
S, 15	Actuating switch (input)
SK	Grounding contact (input)
30	Load current +, terminal 15 (input)
31	Ground
87a	Load current, break contact (output)

KEY COMPONENTS OF A TIME RELAY



Legend

- 1 Blade terminal made of E-Cu with tin-plated surface
- 2 Base plate
- 3 Potentiometer (for fine adjustment of delay time)
- 4 DIP switch (for setting the time base)
- 5 PCB relay

RANGE OVERVIEW

Product photo	Type	Description	Part number	VPE*
	Mini Relay	Normally Open Relay, 12 V, 4-pole, Coil resistance: 90 ohm, Bracket: Yes	4RA 965 400-001	1
	Mini Relay	Change Over Relay, 24 V, 5-pole, with parallel diode, Coil resistance: 350 ohm, Bracket: No	4RD 933 332-097	40
	Mini Relay	Normally Open Relay, 12 V, 4-pole, with 9,5 mm load connections, Coil resistance: 100 ohm, Parallel resistance: 680 ohm, Bracket: No	4RA 007 793-037	175
	Mini Relay	Change Over Relay, 12 V, 5-pole, Coil resistance: 85 ohm, Bracket: Yes	4RD 933 332-041	1
	Mini Relay	Change Over Relay, 12 V, 5-pole, Coil resistance: 85 ohm, Bracket: Yes	4RD 933 332-017	100
	Time Control Unit	Voltage range: 9 to 16 V, Temperature range: -25 to +80°C, Bracket: Yes	5HE 996 152-131	1

* Packaging unit