Mechanical and hybrid power relays (MPR/HPR)

Preliminary

Description

The mechanical power relays (MPR10/MPR20/HPR10) are a product group of electro-mechanical high current relays.

These relays have been designed for the use in utility vehicles and are able to switch and carry up to 300 A continuous load at
12 and/or 24 VDC.

The high number of operating cycles at rated load, including capacitive and inductive loads, makes these power relays particularly suitable for the utility vehicle sector.

The main terminals are M8 or M10 stud terminals

Screw flanges allow horizontal and vertical mounting.

Thus the power relays can replace any conventional power relays in the market.

Versions

- Single-pole make contact
- Monostable (MPR20) or bistable (MPR10) electromechanical version.
- Hybrid version (HPR10) including electronic control unit for signal adjustment
- Side mount flange as standard version
- Extendable mounting with foot flange or side flange with standard hole sizes and also customised mounting methods
- Standard: screw terminals for the activation

Options (HPR10)

The HPR10 provides a number of smart functions, e.g.

- ON and/or OFF delay
- Under-/overvoltage detection and automatic load disconnection
- Pulse or level control

For further details please visit our online relay configurator.

Applications

Battery isolation switch or battery switch-over relay

Switching of high-capacity loads
(examples: air-conditioning, compressor units)

Replacing massive cylindrical standard automotive relays in utility vehicles and relays for applications with extreme requirements, e.g. in construction machinery

MPR10 **MPR20** **HPR10**

Features

- water-proof and dust-proof
- side mount and foot mount
- low weight
- long life-span
- high continuous current
- low current consumption and power loss, also as monostable version
- wide temperature range
- integral free-wheeling diode
- integral electronic control unit of the hybrid version for smart control (including timer function, under/overvoltage detection etc.)
- barrier between main terminals
- MPR20 with a wide range control input. You can use the same device for 12V and for 24V systems.

Target Industries

- Commercial vehicles
- Buses
- Trucks
- Construction equipment
- Special vehicles (blue light / yellow light / municipal)
- agricultural vehicles

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Technical data (25°C)

Load circuit

Rated voltage	U_N	12 V_{DC}, 24 V_{DC}
Cont. load	I_N	100 A, 200A, 300 A
Overload	20 s	2 × I_N
	1 s	8 × I_N
Contact voltage drop		initially <150mV

Control circuit

Operating voltage	MPR10 and HPR10	
	12 V DC:	9 … 16 V_{DC}
	24 V_{DC}:	16 … 32 V_{DC}
	MPR20	wide range input
	12V&24V	10….32 V_{DC}
coil power	bistable	switching < 60 W
		pulse duration 50ms..1s
	monostable	switching: < 3A (70ms)
		holding: < 2 W (tbd)

General

Endurance	mechanical	
	monostable	> 500,000 cycles (tbd)
	bistable	> 100,000 cycles
	resistive	> 50,000 cycles at I_N
Dielectric strength		1kV to ISO 16750-2 code F
Insulation resistance		> 100 MΩ to ISO 16750-2 code F
Temperature range		-40 ... +85°C at I_N
Degree	housing	IP67 or IP 6K9K
		of protection to ISO 20653
	terminal area	IP00
Vibration	> 6 g	
	57,9 m/s2 to ISO 16750-3, 4.1.2.7	
Shock	> 50g or 30g	
	500 m/s^2: in the ON and 300 m/s^2 in the	
	OFF position to ISO 16750-3, 4.2.2	
Flammability	UL V0 and meets the requirements of	
	ECE R-118.02, Annex 6, 7 particularly for	
	vehicles used for passenger transporting	

Chemical resistance to ISO 16750-5
Oil, fuels, hydraulic liquids, alcohol, urea, extinguishing agents, battery acid, detergents, grease, cold cleaner

Corrosion 5% salt mist to ISO 16750-4, chapter 5.5 code H

Humidity 85% RH to ISO 16750-4 chapter 5.7 code H

Dimensions w x h x d (without terminals or flanges)
49.6 (62) × 91.3 × 45.8 [mm]

Mass ≤ 290 g

Material

Housing	plastic material (PA)
	glass fiber reinforced
Additional terminal flanges	aluminum
Terminal studs	brass tin-plated
Permanent magnets	neodym
Screws, washers and nuts	stainless steel
Tightening torque values:	M10 studs 15 Nm
	M8 studs 12 Nm
	M4 screws 2.0 Nm
	M5 side flange 6.0 Nm

Order numbering code

Type No.
- MPR10-N bistable
- MPR20-N monostable
- HPR10-N hybrid

Number of poles
1. single pole

Voltage rating
1. 12 V (MPR10/HPR10)
2. 24 V (MPR10/HPR10)
3. n
4. 12V/24V (MPR20)

Current ratings
1. 100 A
2. 200 A
3. 300 A

Design of main terminals
1. M8 studs
2. M10 studs

Accessories of main terminals
1. washers and nuts mounted
2. washers and nuts bulk shipped

Coil connection (control contacts)
1. M4 screws

Mounting method
0. without
1. side flange with M5 hole
2.
3. plate for side flange
4. plate for foot mount
5. M4 connectors side and foot

Options 1
0. without
2 with suppressor diode

Options 2
0. without

Options 3
0. without

Software (HPR10)
0. without
1. universal

Monitoring of the switching function (HPR10)
0. without
1. main terminals
2. auxiliary contacts
3. main terminals and auxiliary contacts

Options 4 (HPR10)
0. without

Options 5 (HPR10)
0. without

Ordering example:

MPR10-N-122-1111-200

MPR20-N-143-2211-200

HPR10-N-123-1111-200-1100

Preliminary

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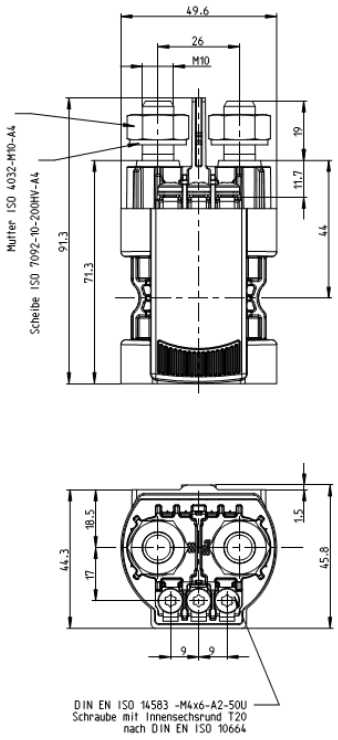
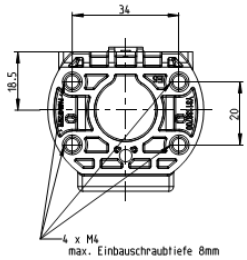
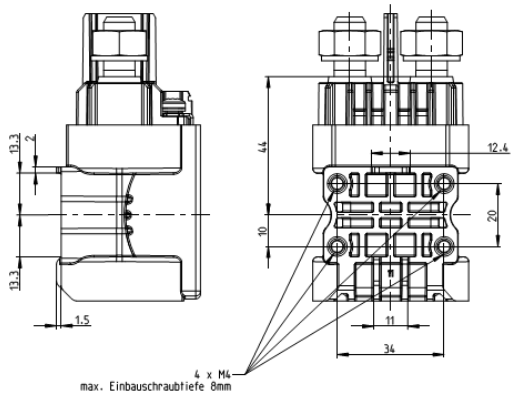
Dimensions

Version without integral side flange for optional side and foot plate with M4 connectors

MPR10 and HPR10



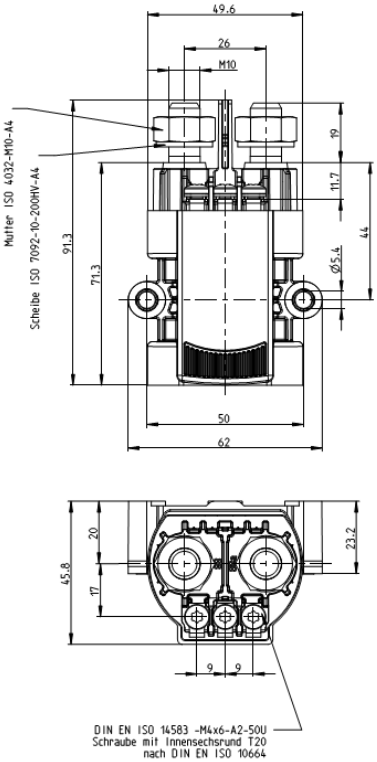




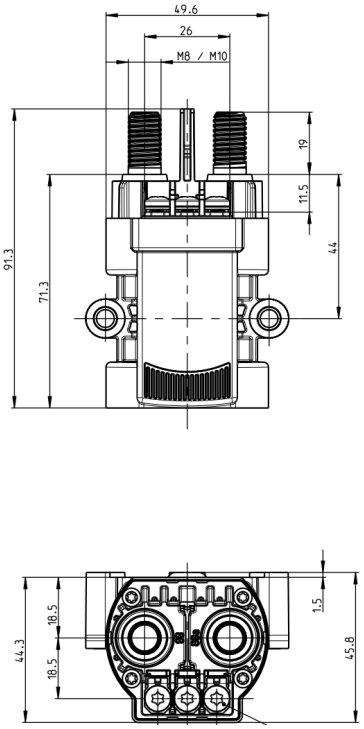
Dimensions

Version with side flange (50 mm distance between holes) and M4 screw terminals

MPR10 and HPR10



MPR20



Preliminary

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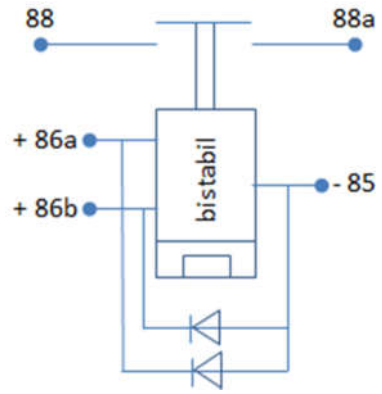
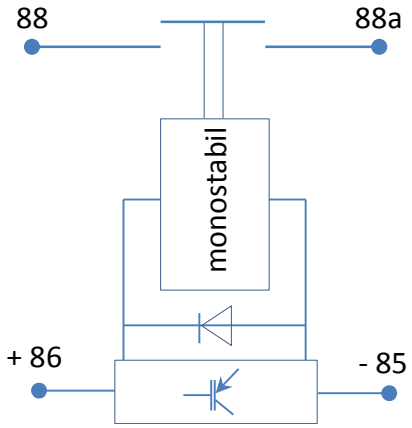
Schematic diagrams

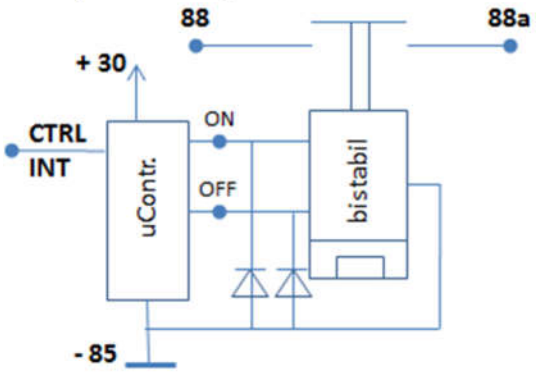
MPR10 bistable



MPR20 monostable (incl. power saving electronic)



HPR10 hybrid including electronic control unit



Notes

The following applies to prototypes and pre-series product:

The technical execution of the product and any enclosed documentation are preliminary.

- The technical data are subject to alterations.
- The specified performance data are target data.
- We cannot guarantee that we will manufacture and supply an identical or identically constructed product.
- The release tests have not yet been completed.
- Only with start of series production will the product be available in substantial quantities.
- First operation of the product requires special diligence. It is mandatory that safety instructions be observed.
- The product must only be used under laboratory conditions so as to reliably exclude a hazard for life and limb, for machinery or other valuable goods in the event of a malfunction or a total failure.
- Pre-production models or products are explicitly not meant to be operated continuously and/or be left unattended. Unless expressly agreed otherwise, there is no guaranteed minimum service life or meantime between failures.
- The samples are intended to be used for testing their basic suitability for specific applications.
- They do not carry any series approvals. They are not meant to be put into circulation.

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