

User manual

ATEX motor switch type HCS1P



Certified engine switch with a large 97 mm diameter knob allowing engine operation even when wearing work gloves



Ø 97 mm

The HARDO HSC1P motor circuit breaker protects electric motors against damage caused by overload, short circuit, overheating, phase failure in three-phase networks and, optionally, against voltage drops .

The robust housing design provides resistance to chemicals and provides a high level of protection. It is designed for use indoors and outdoors in explosive gas and dust atmospheres.

Parameters

Intended For zones Ex	Gases: 1 and 2 Dust: 21 and 22
Marking According to ATEX	Ⓔ II 2 G Ex db eb IIB/ IIC T4/T5/T6 Gb Ⓔ II 2 D Ex tbh IIIC T85°C Db NOTE: Switches in different versions may have different markings, so always refer to the values on the nameplate.
Marking According to IECEx	Ex db eb IIC T5/T6 Gb Ex tbh IIIC T85°C Db
Size knobs	ABOUT 97 mm
Permissible temperature surroundings	Maximum range from -40°C down +55°C NOTE: switches in different designs may have different ambient temperature ranges, so always refer to the values on the nameplate
Housing protection class	IP66
Tension rated	440V
Applied security	▶ overload ▶ undervoltage (optional) ▶ disappearance Phases ▶ short circuit ▶ thermal
Range settings trigger overload	From 0.1 down 25A NOTE: available ranges are shown in Table 1; the range for your circuit breaker can be found on the nameplate
Capacity connecting engine In category AC3	down 440V / 25A
Connection sizes - contacts Main	From 1 down 10 mm ² (From 6 down 10 mm ² by use sleeves clamping)
Connection sizes - contacts auxiliary	From 1 down 2.5 mm ²
Contact connection capacity auxiliary	AC15 1A / 230V
Rated short-circuit breaking capacity	(high) 12 - 65 kA

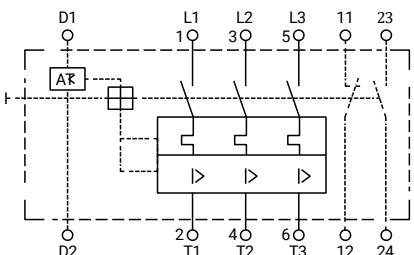
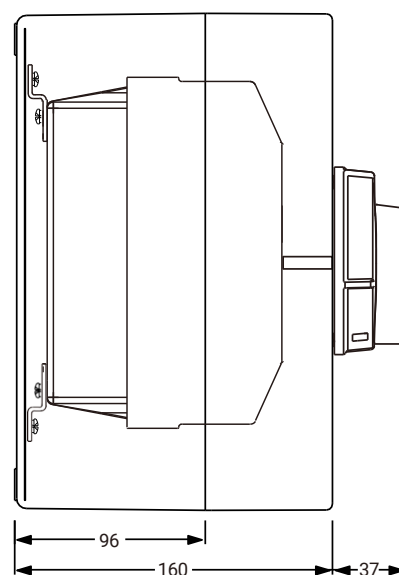
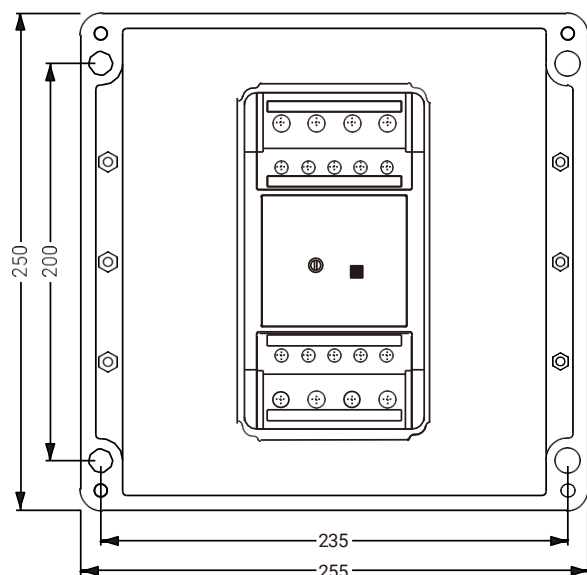
Photo	Trigger setting range overload	Rated short-circuit breaking capacity	Cable glands	No. order
 ~ 6.25kg 250 x 260 x 160 mm	0.1 - 0.16A	65kA	2 x M25	HCS1P 252616 S01211
	0.16 - 0.25A	65kA	2 x M25	HCS1P 252616 S01221
	0.25 - 0.4A	65kA	2 x M25	HCS1P 252616 S01231
	0.4 - 0.63A	65kA	2 x M25	HCS1P 252616 S01241
	0.63 - 1A	65kA	2 x M25	HCS1P 252616 S01251
	1 - 1.6A	65kA	2 x M25	HCS1P 252616 S01261
	1.6 - 2.5A	65kA	2 x M25	HCS1P 252616 S01271
	2.5 - 4A	16kA	2 x M25	HCS1P 252616 S01281
	4 - 6.3A	16kA	2 x M25	HCS1P 252616 S01291
	6.3 - 10A	16kA	2 x M25	HCS1P 252616 S01301
	10 - 16A	16kA	2 x M25	HCS1P 252616 S01311
	16 - 20A	12kA	2 x M32	HCS1P 252616 S01321
	20 - 25A	12kA	2 x M32	HCS1P 252616 S01331
Diagram electric			Options	
			1 - basic version without trigger undervoltage and contacts auxiliary 2 - With undervoltage release 3 - That contacts auxiliary 1NO + 1NC 4 - with trigger undervoltage and auxiliary contacts 1NO + 1NC	

Table 1: Overload protection ranges



Characteristic triggering (temp. surroundings 30°C)

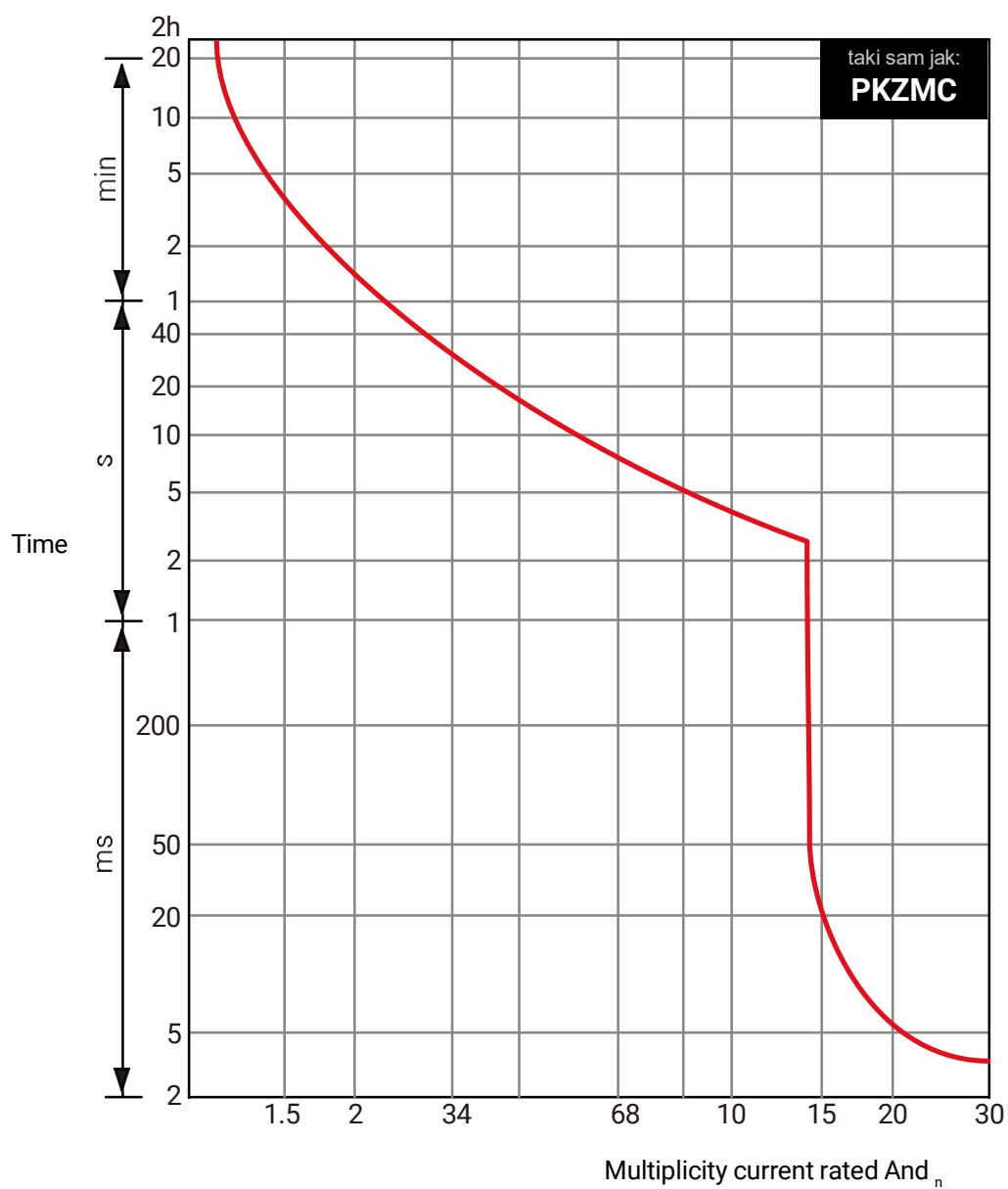
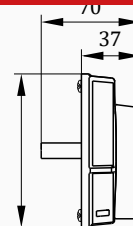
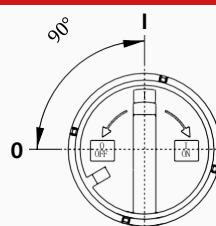


Figure 1: overload protection tripping characteristic

Pokręto wyłącznika silnikowego



8003/2DA



1. Safety and terms of use

1.1 Target group and staff qualifications

The installation and operation of the **HARDO HCS1P motor circuit-breaker**, as well as other inspection and operating activities of the device, may only be carried out by qualified personnel with current and appropriate authorizations, trained in all necessary instructions regarding installation methods, in accordance with national regulations and the **IEC/EN 60079-14 standard** regarding devices in explosive atmospheres.

Before use, you must:

- make sure that the device is complete and free from foreign objects,
- check the device's compliance with the technical requirements of the installation,
- carry out the inspection in accordance with the procedures in Chapter 6.

ATTENTION!

Improper assembly or installation of the device may result in explosion and result in serious or fatal injury.

1.2 Environmental conditions

The HARDO HCS1P switch is designed to operate in:

- Zone 1 and 2 (gases, vapors),
- Zone 21 and 22 (dust),

in accordance with standard **IEC/EN 60079-10** .

Not approved for use in Zone 0 or Zone 20.

From the point of view of explosion safety, the following must be taken into account at least when installing and operating the circuit breaker:

- device group and category,
- explosiveness subgroup of the device,
- the temperature class of the device (gases and liquid vapours) and/or the maximum surface temperature of the device (dust).

The motor switch module should be used in the following atmospheric conditions:

- pressure: from 80 kPa (0.8 bar) to 110 kPa (1.1 bar),
 - oxygen content in air: 21% by volume,
 - relative air humidity: below 95%,
 - no strong shocks and vibrations,
 - no presence of liquid vapours or gases of a corrosive or aggressive nature (may be used only after written consent from HARDO).
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1.3 Construction and materials

The main structural elements of the HARDO HCS1P switch are made of the following materials:

- glass fibre reinforced polyester (switch housing),
 - unsaturated resin (switch module housing),
 - stainless steel (mounting screws, mounting plate),
 - galvanized steel (mounting plate – in some models).
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1.4 Prohibited Activities

It is prohibited to:

- making design changes,
- interference in internal systems by unauthorized persons,
- use of non-original spare parts.

Repairs that affect the effectiveness of explosion protection may only be carried out by HARDO employees or authorized personnel in accordance with **IEC/EN 60079-19**.

ATTENTION!

Any modifications or changes made by the purchaser / end user that affect the mechanical and / or electrical structure and functionality of the device will void certifications, warranty and any other agreements.

2. Compliance and certification

For HARDO HCS1P motor switches the following have been issued:

- EU Type Examination Certificate
- IECEx Certificate of Conformity
- EU Declaration of Conformity

The above-mentioned documents present the norms and standards that the HARDO motor switch meets.

3. Purpose and security

3.1 Purpose

- manual switching ON and OFF of electric motors,
- protection of engines against damage (see point 3.2),
- starting and switching off squirrel cage motors while running (AC-3 category).

3.2 Security

- overload protection
the switch is available in 13 variants of the overload protection setting range (see Table 1); adjustment of the setting is possible within a given range using the knob located on the front wall of the switch module (next to the ON/OFF knob)
- undervoltage protection (optional)
- phase failure protection
- short circuit protection
- thermal protection

3.3 Padlock lock

- The switch can be locked in the OFF position with a padlock (ear diameter up to 5 mm).

3.3 Additional Features

Optionally, the switch can be equipped with:

- auxiliary contact that can be used, for example, to signal the operating status,
- undervoltage protection,
- additional PE terminals on the mounting plate (each device has at least 2 PE terminals built into the switch module),
- steel glands together with the element grounding them (grounding plate / grounding nut),
- grounding screw to route the ground wire outside the housing.

4. Installation, maintenance and operation

4.1 Device assembly

- Installation using screws or bolts screwed through screw channels located outside the sealing space,
- the mounting screws or bolts should match the mounting hole,
- the housing should be screwed using all mounting holes,
- devices should be mounted horizontally on a wall or horizontally on other even surfaces,
- Please note that over-tightening the screws may damage the housing.

4.2 Electrical connection

The electrical connection of the device and other inspection and operating activities of the device may only be carried out by qualified personnel with current and appropriate authorizations, trained in all necessary instructions regarding installation methods, relevant regulations and standards and general principles of classification of hazardous areas.

Before making the electrical connection, you must:

- check whether the device shows no signs of external damage,
- check the quality of the housing seals and the correct mounting of housing parts and components,
- Before connecting the wires, make sure there is no voltage.

The connection cannot be made only by qualified personnel with current and appropriate authorizations, taking into account the selection of the appropriate diameter of the cables for connecting the terminals, described in the device parameters. Safety procedures must be followed.

ATTENTION!

Motors with a long starting time ($>1.7 \times t_E$) must be protected by a starting time supervision system.

4.3 Cable glands and plugs

- IECEx) cable glands and plugs may be used ,
- when using bushings/plugs with a lower IP rating, the protection level of the entire device is reduced,
- If metal bushings are used, they must be grounded.

4.4 Clamps

Main terminals:

- 1 – 10mm² (6 – 10mm² when using a crimped ferrule)
- suggested tightening torque: 1.5N

PE terminals:

- 1 – 10mm² (6 – 10mm² when using a crimped ferrule)
- suggested tightening torque: 1.5N

Auxiliary clamps:

- 1 - 2.5mm²
- suggested tightening torque: 1.1N

4.5 Closing the casing

- Before closing the casing, make sure that no dirt or moisture remains inside,
- check the quality of the housing seals,
- Install the cover in the original position,
- tighten the screws with appropriate force, suggested tightening torque – 2Nm.

4.6 Before starting

- Check that the design data is consistent with the ratings on the nameplate, the nominal value of the device and in accordance with the design and construction documentation,
- s check that there are no possible environmental hazards at the installation site

(e.g. exposing the device to collision damage, presence of corrosive factors),

- check the circuit breaker current settings,
- perform tests in accordance with national regulations,
- check the correct operation and installation of the device.

ATTENTION!

Improper use will void the warranty.

5. Maintenance and service

Maintenance of the HARDO HCS1P should be carried out in accordance with **IEC/EN 60079-17** and applicable national regulations.

Inspections should include:

- condition of the housing and seals,
- inspection of cable glands,
- checking electrical connections,
- correct operation of the mechanism.

ATTENTION!

In environments with an explosive atmosphere due to the presence and accumulation of combustible dust, the user must ensure regular cleaning of the device housings.

6. Repairs and modifications

- Cover fastening screws and device fasteners should only be replaced with HARDO spare parts,
- all repairs affecting the type of protection used in an explosion hazard zone (except for replacing damaged or faulty parts with original HARDO spare parts) are permissible only after prior written agreement, based on written authorization from HARDO, with mandatory performance of appropriate verification and tests after repair, and sending full documentation of the repair to HARDO,
- n repairs affecting explosion safety must comply with **IEC/EN 60079-19** .

7. Disposal

The device is an electrical device and must be disposed of after use. It must be handed over to an appropriate collection point for electrical and electronic devices for recycling.



This symbol on the product or packaging indicates that the product should not be treated as normal industrial waste, but must be disposed of after use and taken to an appropriate collection point for electrical and electronic devices for recycling.