TIME RELAY
- MOTOR START (STAR/DELTA) 4097636 (PCM-08)

INSTRUCTION MANUAL

MALMBERGS

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DESCRIPTION

The PCM-08 time relay is used to control the STAR-DELTA contactor switch. It is applied in three-phase motor control systems. This control method allows to reduce starting currents in case of motor units with a capacity of more than 4-5 kW and additionally it provides safety. The PCM-08 device has two independent relay outputs activated according to the settings of P1-P3 potentiometers. It is possible to adjust the starting time (in the STAR system) and time interval of star to delta switching. Relay operation is triggered by applying power supply voltage to the L, N supply terminals. The device is designed to be mounted in distribution boards (TH35 rail). The LEDs on the front panel indicate power supply (LED green), and device operating mode (LED red).

FEATURES

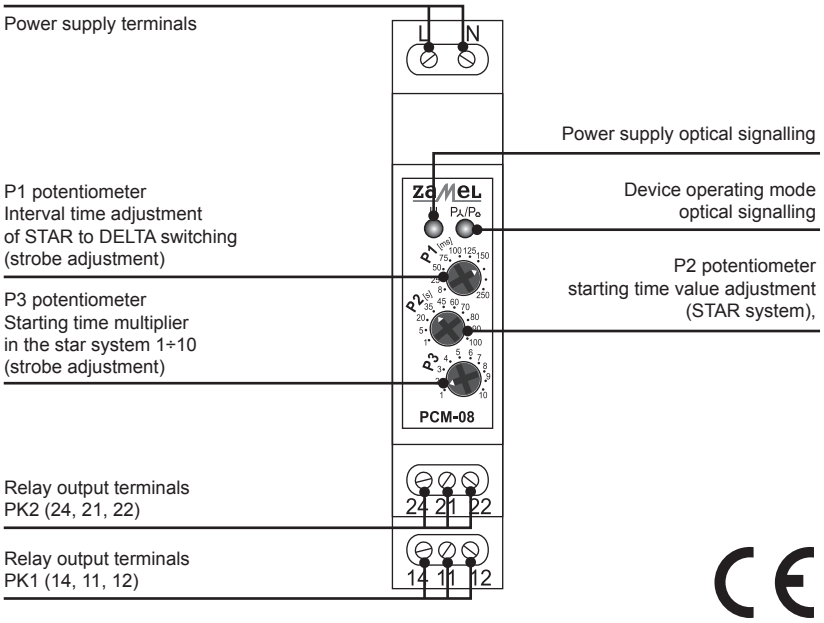
- Three-phase delta-star motor control,
- current decrease during high power motor start,
- device mode optical signalling (LED red),
- supply voltage optical signalling (LED green),
- trigger by applying supply voltage,
- starting time adjustment (STAR system),
- interval time adjustment of STAR to DELTA switching,
- two independent relay outputs, dry contact 2 x NO/NC of 10 A capacity,
- mounting in distribution boards (TH35 rail).

The symbol means selective collecting of electrical and electronical equipment. It is forbidden to put the used equipment together with other waste.

TECHNICAL PARAMETERS

4097636 (PCM-08)	
Power supply terminals:	L, N
Nominal supply voltage:	230 V AC
Input voltage tolerance:	-15 ÷ +10 %
Nominal frequency:	50 Hz
Nominal power consumption:	0,8 W
Supply voltage control indicator:	LED green
Device mode indicator:	LED red
Interval time adjustment of STAR to DELTA switching:	discreet – 8 ÷ 250 ms
Starting time adjustment (STAR system):	1 ÷ 100 s with multiplier 1÷10
Output elements:	2 x relay
Output relay parameters:	NO/NC – 10 A / 250 VAC
Number of terminal clamps:	8
Cross-section of connecting cables:	0,2 ÷ 2,5 mm^2
Operating temperature range:	-20 ÷ +50 °C
Operating position:	free
Casing mounting:	TH35 rail (1-MOD casing)
Casing protection degree:	IP20
Protection level:	II
Overvoltage category:	II
Pollution degree:	2
Surge voltage:	1 kV (PN-EN 61000-4-5)
Dimensions:	monomodular 90x17,5x66 mm
Weight:	0,08 kg
Reference standard:	PN-EN 60669-1, PN-EN 60669-2-1, PN-EN 61000-4-2,3,4,5,6,11

APPEARANCE



MOUNTING

1. Disconnect power supply by the phase fuse, the circuit-breaker or the switch--disconnector combined to the proper circuit.
2. Check if there is no voltage on connection cables by means of a special measure equipment.
3. Mount the PCM-08 device on the TH35 rail.
4. Connect the cables with the terminals in accordance with the installing diagram.
5. By means of P1 ÷ P3 potentiometers adjust:
   a) starting time in the star system t_{Y} – potentiometer P2 (1 ÷ 100 s)
   b) starting time multiplier – P3 potentiometer (1 ÷ 10 with strobe '1')

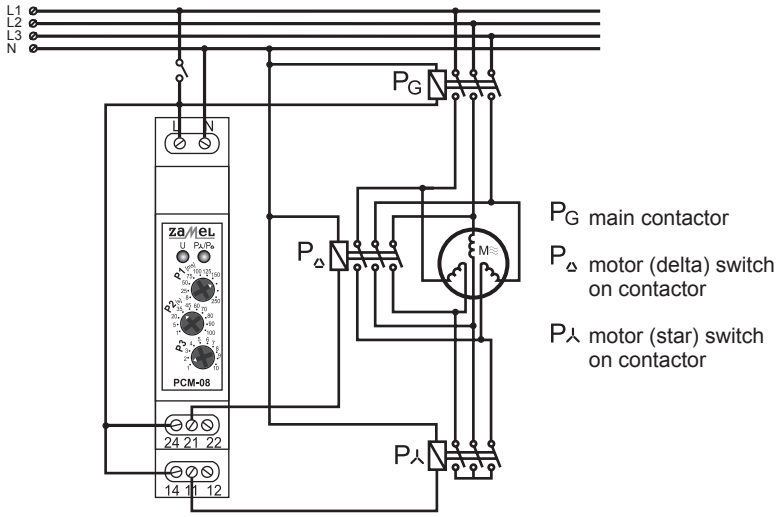
$$t_{STARTING} = \underset{\text{(potentiometer P2)}}{t_{Y}} \times \underset{\text{(potentiometer P3)}}{\textbf{multiplier}}$$

   c) star to delta switching time (P1 potentiometer)
6. Switch on the power supply from the mains. After power supply voltage is applied to the L, N supply terminals, the P_{Y} and P_{Δ} output relays switch according to the adjusted time.

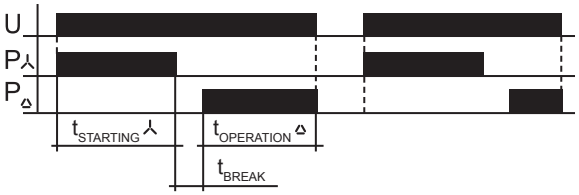
CAUTION

The device is designed for single-phase installation and must be installed in accordance with standards valid in a particular country. Installation, connection and control should be carried out by a qualified electrician staff, who act in accordance with the instruction manual and the device functions. In case of casing dismantling, the guarantee is lost and an electric shock may occur. Before installation make sure the connection cables are not under voltage. The cruciform head screwdriver 3,5 mm should be used to install the device. Improper transport, storage, and use of the device influence its wrong functioning. It is not advisable to install the device in the following cases: if any device part is missing or the device is damaged or deformed. In case of improper functioning of the device contact the producer.

CONNECTION



FUNCTION



The PCM-08 device is equipped with two electromagnetic relays at its end, which control the correct contactors that switch the motor winding according to the adjusted time of start and interval (P - „star" contactor, P - „delta" contactor).

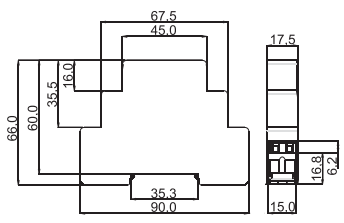
After power supply is switched on, the PK1 relay switches on the contactor responsible for switching the motor windings into STAR system for the adjusted time. After that time has elapsed, the relay switches off PK1 relay and the interval time, adjusted by P1 potentiometer, is measured. After the interval time has elapsed, the PK2 relay switches on. It is responsible for switching the motor windings into DELTA system. PK2 relay remains on until there is no power supply in L, N terminals.

Switching on PK1 relay – normally closed 11-14.

Switching on PK2 relay – normally closed 21-24.

Measuring delta start time is indicated by a flashing red LED with a frequency of 1 second. Whereas delta operation is optically signalled by a continuous LED light.

CASING DIMENSIONS



INNER DIAGRAM