

## Low Voltage Motor Protection Relay PMC-550D

CE LVD 2014/35/EU standards, EN 61010-1:2010 + A1: 2019, EN IEC 61010-2-030: 2021, CE EMC Directive 2014/30/EU (EN IEC 61326:2021)



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## Description

The PMC-550D Low Voltage Motor Protection and Control Device seamlessly integrates motor protection, control, and temperature and insulation monitoring through a modular design. The equipment offers extensive I/O options, providing as standard 10 digital inputs (DI), 5 digital outputs (DO), 2 RS-485 ports, 1 analog output, and 1 residual current input, offering great installation flexibility.

The relay architecture allows for easy expansion through the connection of a standalone HMI module for local operation, a PMC-KT module (which adds 6 NTC inputs, 2 DI and 1 DO for thermal monitoring), and a PMC-KR module for monitoring insulation resistance against ground faults. Designed for demanding industrial environments, it supports native communication via Modbus RTU, Modbus-TCP, PROFINET, or PROFIBUS and features a robust power supply capable of ensuring uninterrupted (ride-through) operation for 30 seconds during power outages.

## Operation

The PMC-550D is a microprocessor-based device that manages the operation of electric motors, and can be fully parameterized through the HMI module or integrated via PMC-Designer software. The device's operation is based on four operational pillars:

**Starting Control:** The equipment directly controls the starting sequence (ON/OFF), supporting generic functions such as Direct Start, Forward-Reverse, and Two Speeds. It also executes starting schemes with Reduced Voltage to limit high current peaks and prevent unwanted drops in the mains voltage.

**Motor Control:** Executes operational safety and recovery logic, including immediate or delayed undervoltage reclosing, automatic start-up after periods of interruption, and management of local or remote activation authority.

**Comprehensive Protection:** It works by interrupting the engine's operation when it detects that physical or electrical limits have been exceeded, preventing shutdowns due to mechanical stress or burnouts.

**Measurement and Monitoring:** During its operation, the relay measures and processes Fundamental and Rm2 data (voltage, current, active/reactive power, power factor, energy) and Harmonics (THD, TOHD, TEHD up to the 31st order). Continuous operation generates statistics and storage in up to 64 protection registers (SOE), reports with the results of the last starts and stops, and triggering of Waveform Recording (WFR) during protection events.

## Technical Specifications

|                             |                                                                                                                                                                                                                  |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards Followed          | CE LVD 2014/35/EU, EN 61010-1:2010 + A1: 2019, EN IEC 61010-2-030: 2021, CE EMC Directive 2014/30/EU (EN IEC 61326:2021)                                                                                         |
| Electrical Power Supply     | 95-250 VAC/VDC with reinforced power supply (30-second walk capability) Power consumption: < 6W                                                                                                                  |
| Frequency                   | 50 Hz / 60 Hz                                                                                                                                                                                                    |
| Voltage Inputs (VA, VB, VC) | Standard: 240VLN / 415VLL Range: 10V to 828V Measurement Category: CAT III 300VLL                                                                                                                                |
| Current Inputs (PMC-MTA)    | Ranges: 1A / 5A / 25A / 100A / 300A / 400A / 800A<br>Operating Range: 2% to 120% I <sub>e</sub>                                                                                                                  |
| Inputs and Outputs (I/O)    | 10 Digital Inputs (24VDC internal or 220VAC/DC external)<br>5 Relay Outputs (Max. Switching Voltage: 400VAC/30VDC, Current from 5A to 10A depending on the channel)<br>1 Programmable Analog Output (4 to 20 mA) |
| Measurement Accuracy        | Voltage: $\pm 0.5\%$                                                                                                                                                                                             |
|                             | Current: $\pm 0.5\%$                                                                                                                                                                                             |
|                             | Frequency: $\pm 0.02\text{Hz}$                                                                                                                                                                                   |
|                             | Power (kW, kvar, kVA): $\pm 1.0\%$<br><br>Active Energy (kWh): $\pm 1.0\%$                                                                                                                                       |
| Communication               | 2x Optically Isolated RS-485 Ports Options: PROFIBUS DP, Ethernet 10/100Base-T, PROFINET                                                                                                                         |

|                                   |                                                                                                                                                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental Conditions          | Operating Temperature: -25°C to 70°C                                                                                                                                                                |
|                                   | Storage Temperature: -40°C to 85°C                                                                                                                                                                  |
|                                   | Humidity: 5% to 95% (non-condensing)                                                                                                                                                                |
| Degree of Protection              | IP40                                                                                                                                                                                                |
| Módulo PMC-KT (Temperatura e I/O) | Power and Communication: Via RJ45 port (Max. 70mA, 5VDC), RS-485 transmission                                                                                                                       |
|                                   | Temperature Input (TC): 6 NTC channels (range 0 to 150°C)                                                                                                                                           |
|                                   | Digital Inputs (DI): 2 dry contact channels (DI11, DI12), internally powered with 24VDC.<br><br>Digital Output (DO): 1 channel mechanical relay Form C (250VAC/30VDC, 5A)                           |
| PMC-KR Module (Isolation)         | Power supply: 95-250VAC/DC (Consumption < 3W) Insulation<br>Resistance Test: Test voltage of<br>500VDC/1000VDC, measurement range from 100kΩ to 100MΩ.<br>Communication: RS-485 via expansion port. |
| PMC-KI Converter Module           | Input Voltage: 110VAC/DC or 220VAC/DC Output: Maximum<br>forward voltage of 40V, maximum current of 50mA                                                                                            |
| IHM Display Module                | Power and Interface: Via RJ45 port (Max. 60mA, 5VDC), RS-232 transmission                                                                                                                           |

## Diagram

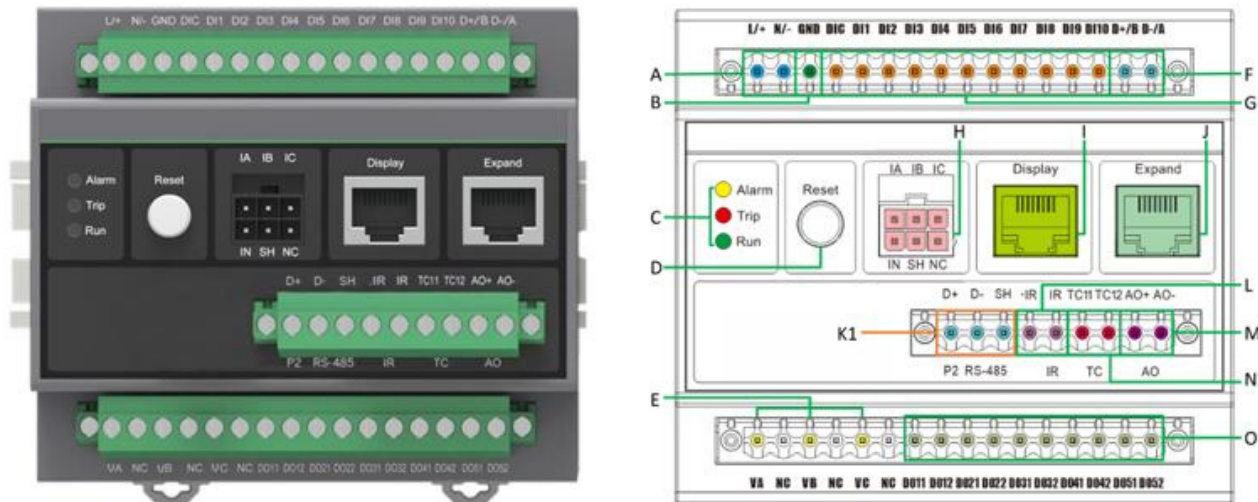


Figure 1: Panel and terminal display diagram for PMC-550D with 2xRS-485

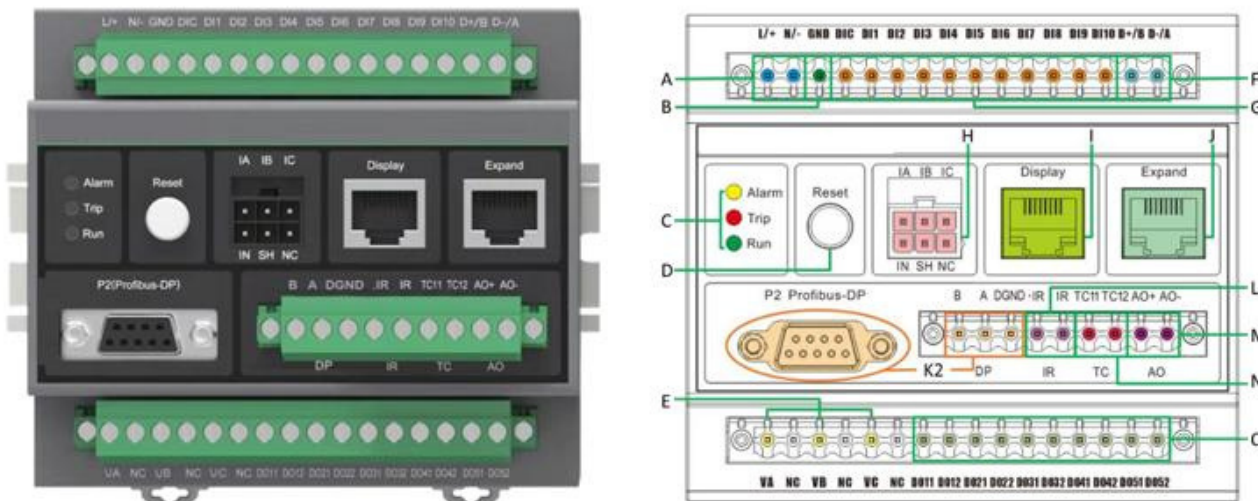


Figure 2: Panel and terminal visualization diagram for PMC-550D with 1xPROFIBUS DP + 1xRS-485 (or 2xPROFIBUS DP)

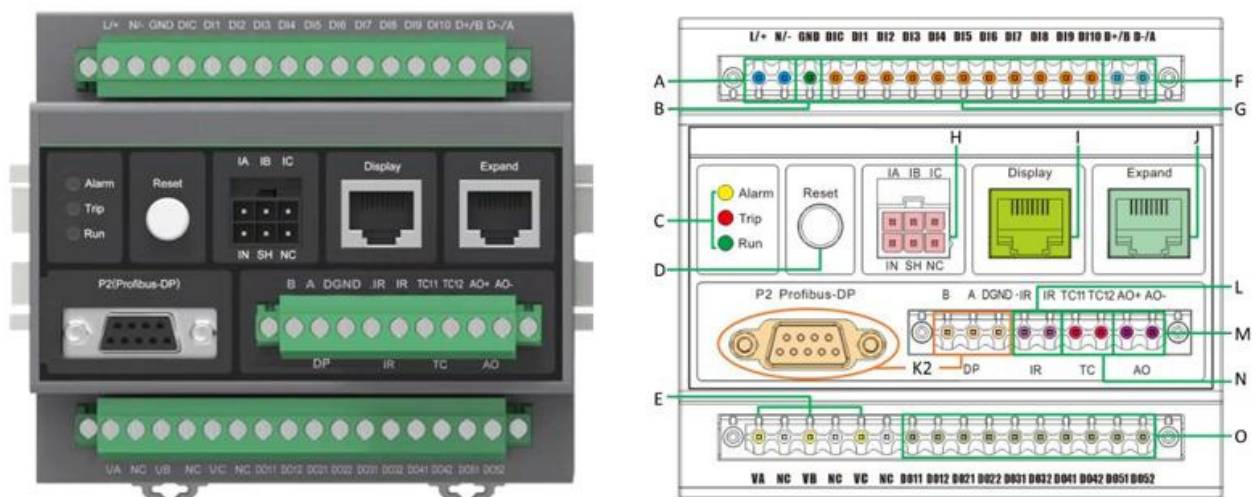


Figure 3: Panel and terminal visualization diagram for PMC-550D with 2x10/100BaseT Ethernet Port

The figures above show the relay connections to cover all ordering options.  
The interface components are labeled A through O, as shown in the figures above.

| Region | Labels                                                           | Descriptions                                                           |
|--------|------------------------------------------------------------------|------------------------------------------------------------------------|
| A      | L/+, N/-                                                         | Power Supply, Chassis Grounding, LED Indicators, Reset Button, Voltage |
| B      | GND                                                              | Inputs, RS-485 Port (supports PROFIBUS DP for "D" Communication        |
| C      | Alarm/Trip/Operation                                             | option), Digital Inputs, Current Inputs, RJ45 Connector for Remote     |
| D      | Reset VA, VB, VC D+/B,                                           | Display Module (PoE) connection, RJ45 Connector for PMC-KT Expansion   |
| E      | D-/A DIC, DI1 to DI10                                            | Module (PoE) or PMC-KR (external power supply), RS-485 Port            |
| F      | IA, IB, IC, IN, SH                                               |                                                                        |
| G      | Display Expansion                                                |                                                                        |
| H      |                                                                  |                                                                        |
| I      |                                                                  |                                                                        |
| J      |                                                                  |                                                                        |
| K1     | D+, D-<br>P2 RS-485 P2                                           |                                                                        |
| K2     | (Profibus DP), DP                                                | PROFIBUS DP (DB9 terminal or 3-position terminal block)                |
| K3     | P2(10/100M) P3<br>(10/100M) ·IR, IR                              | 10/100BaseT Ethernet ports                                             |
| L M    | AO+, AO-                                                         | Residual Current Input Analog Output                                   |
| N      | TC11, TC12                                                       | Temperature Input (PTC or NTC)                                         |
|        |                                                                  |                                                                        |
| THE    | DO11, DO12, DO21, DO22,<br>DO31, DO32, DO41, DO42,<br>DO51, DO52 | Digital Outputs                                                        |



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