

INTRODUCTION TO MOTOR PROTECTION

Relay Range



RTO: Thermal Overload Relay

REO: Electronic Overload Relay

eMPR: Electronic Motor Protection Relay

numrAL MPR21: Numerical Motor Protection Relay

iMMR: Intelligent Motor Management Relay

Motor Protection Relay Range

- › **RTO:** Thermal Overload Relay
- › **REO:** Electronic Overload Relay
- › **eMPR:** Electronic Motor Protection Relay
- › **numrAL MPR21:** Numerical Motor Protection Relay
- › **iMMR:** Intelligent Motor Management Relay

RTO: Thermal Overload Relay



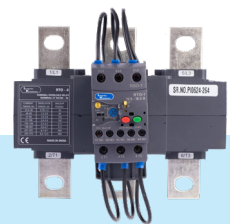
RTO 1



RTO 2



RTO 3



RTO 4

- › Direct mounting on MO contactors.
- › Available from 0.23 A to 375 A.
- › Visual status indication – Tripped / non-tripped.
- › Auto Manual Reset & Test function.
- › Three contacts: Alarm, Trip and Start

REO: Electronic Overload Relay



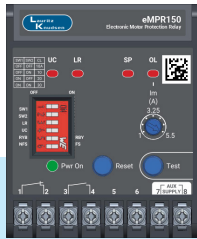
REO 1.1 / 1.1 G



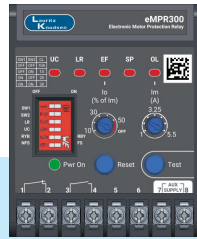
REO 4 / 4 G

- › Direct mounting on MO contactors.
- › Available from 0.15 A to 1350 A.
- › Visual status indication – Tripped / non-tripped.
- › Auto Manual Reset & Test function.
- › Three contacts: Alarm, Trip and Start
- › Protection - Thermal overload, single phasing, locked rotor and ground fault.

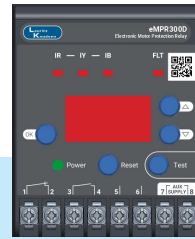
eMPR: Electronic Motor Protection Relay



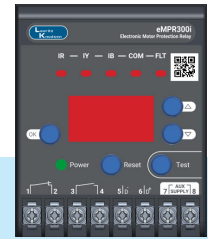
eMPR150



eMPR300



eMPR300D



eMPR300I

- › Compact, microcontroller-based relay with inbuilt CTs (up to 88A).
- › eMPR150: Protect against Overload, Phase Failure, Current Unbalance, Locked Rotor & Under Current.
- › eMPR300: Additional Earth Fault and Phase Sequence Reversal protection.
- › eMPR300D: Additional inbuilt Display for metering (R/Y/B/Ig current) and Definite Time Over Current protection.
- › eMPR300I: Additional Modbus RS485 communication for remote monitoring.

Ideal for essential current protection of standalone 3-phase LV motors up to 45 KW.

numrAL MPR21: Numerical Motor Protection Relay



- › Draw-out Enclosure: Allows for easy maintenance and replacement without disconnecting wiring.
- › LV/MV Applications: External CT input 1A/5A is site selectable.
- › Comprehensive Protection: 37, 46, 48, 49, 50BF, 50, 51, 50N, 51N, 51LR, 64, 66, 74TCS.
- › Advanced I/O: Features 6 Digital Inputs and 7 programmable Outputs.
- › Communication: Modbus RS485 and front micro-USB port for configuration through numrALSuite.

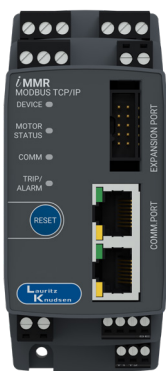
Ideal for comprehensive current-based and high-speed numerical protection of 3-phase LV/ MV motors.



iMMR: Intelligent Motor Management Relay



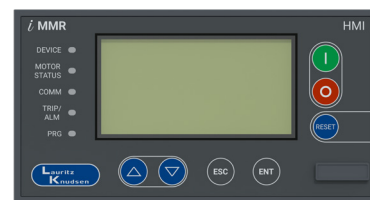
CTVT Unit



iMMR Main Unit



Expansion Unit



Display Unit

- › Modular Design with a Main Unit, CT/CTVT Unit, Expansion Units and a Display Unit.
- › Comprehensive Current and Voltage based protections.
- › Advanced Diagnostics: Real-time data monitoring, data logging (100 event, 20 trip, 20 IRF records) to enable predictive maintenance.
- › Seamless Integration: Supports Ethernet IP, Profinet, Profibus DP, Modbus TCP/RTU
- › Ease of programming with Display Unit / 'iMMRSuite' software for fast commissioning.

Ideal for advanced current and voltage-based protection, remote control and monitoring through DCS of 3-phase LV motors up to 360 KW.

Motor Protection Relay – Product Selection Guide

Parameter	RTO (Thermal OL)	REO (Electronic OL)	eMPR 150	eMPR 300	eMPR 300D	eMPR 300I	numrAL MPR21	iMMR with CTVT
Mounting	Direct on Contactor/ Separate	Direct on Contactor/ Separate	DIN Rail	DIN Rail	DIN Rail	DIN Rail	Flush	Flush mounted display
Inbuilt CT Range	0.23–375A	0.15–1350A	1–88A	1–88A	1–88A	1–88A	External 5P10 CT 1A/5A	0.3–70A (For Motor FLC > 70A, External 5P10 CT 1A/5A)
Thermal Overload (49) + Phase failure	✓	✓	✓	✓	✓	✓	✓	✓
Locked Rotor (51LR)		✓	✓	✓	✓	✓	✓	✓
Current Unbalance (46) and Under Current		✓	✓	✓	✓	✓	✓	✓
Phase Sequence Reversal				✓	✓	✓	✓	✓
Earth Fault – Residual (64/51N)		1.1G and 4G		✓	✓	✓	✓	✓
Definite-Time Over Current [EOCR]					✓	✓	✓	✓
Instantaneous OC (50)							✓	✓
Excessive Start Time (48)							✓	✓
Number of Starts Control (66)							✓	✓
Voltage based protections								✓
Metering + Trip records					✓	✓	✓	✓

For detailed specifications, please refer to the respective product catalogue.

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Product improvement is a continuous process. For the latest information and special application, please contact any of our offices listed here. Product photographs shown for representative purpose only.



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