The MRM4 is a protection relay which uses the latest Dual-Core-Processor Technology to provide precise and reliable protective functions and is very easy to operate. The MRM4 provides all necessary functions to protect low and medium voltage motor at all power levels. The protection functions based on current measurement and supervise all thermal conditions, motor start sequence, stall and locked rotor, undercurrent and incomplete sequence. Overcurrent functions and earth fault functions are also available. The motor operation can be monitored by statistic and trending recorders. Start, event, fault and disturbance recorders are tracking all important actions.

**FUNCTIONS**

- All protection features without extra charge
- Para. setting and evaluation software
- Disturbance record analysis software

**APPLICABLE FOR:**

- Low and high voltage asynchronous motors

**MOTOR PROTECTION FUNCTIONS**

- Thermal overload protection 49M
- Locked rotor Protection 51RS
- JAM or Stall protection 51LR
- Underload protection 37
- Motor start 48
- Excessive current 51P
- Undercurrent 37UE
- Overcurrent/short circuit prot. 50P/51P
- Earth overcurrent- and short circuit protection 50N/51N
- Reclosing lockout 86
- RTD supervision via external temperature box (Type MRM4-B, on request)

**SYSTEM SUPERVISION FUNCTIONS**

- CBF, circuit breaker failure 50BF
- TCS, trip circuit supervision via digital inputs 74TC
- CTS, current transformer supervision 60

**ALL INCLUSIVE:**

- 120 s non volatile, 32 samples per cycles
- Number of successful starts
- Average I2T values
- Average max. start current
- Records up to 20 faults, failsafe

**HISTORY COUNTER**

- Motor starts values, Numbers of alarms and trips of all important protection functions like I, IG, Thermal supervision, JAM, undercurrent and Negative phase sequence
- Breaker wear values
- Motor run time
- Motor operation counter
- History

**TOTAL COUNTER**

- Start duration
- Motor operation counter
- History

**TRENDING RECORDER**

- Up to 10 selectable values with a selectable time windows like IL1 RMS, IL2 RMS, IL3 RMS, Thermal capacity...

**MOTOR START RECORDER**

- Max. RMS values of phase currents
- Negative phase sequence currents
- Start duration
- Used thermal capacity
- Successful starts
- Temperature profile (optional)

**FAULT RECORDER**

- Copy parameter sets
- Compare parameter sets
- Setting files are up and down convertible (across versions)
FUNCTIONAL OVERVIEW

<table>
<thead>
<tr>
<th>Protective Functions</th>
<th>Elements</th>
<th>ANSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>IB, thermal overload protection</td>
<td>49M</td>
<td></td>
</tr>
<tr>
<td>I, time overcurrent and short circuit protection (non direction)</td>
<td>6</td>
<td>50P, 51P</td>
</tr>
<tr>
<td>(instantaneous, definite time, characteristics according to IEC60255, ANSI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I2, unbalanced load protection with evaluation of the negative phase sequence current</td>
<td>2</td>
<td>46</td>
</tr>
<tr>
<td>IG, earth time overcurrent and short circuit protection (non direction)</td>
<td>4</td>
<td>50N, 51N</td>
</tr>
<tr>
<td>(instantaneous, definite time, characteristics according to IEC60255, ANSI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I&lt; underload protection</td>
<td>2</td>
<td>37</td>
</tr>
<tr>
<td>Reclosing lockout</td>
<td>49R</td>
<td></td>
</tr>
<tr>
<td>Incomplete sequence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JAM protection</td>
<td>51LR</td>
<td></td>
</tr>
<tr>
<td>Locked rotor Protection</td>
<td>51LRS</td>
<td></td>
</tr>
<tr>
<td>Motor start</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Starts per Hour</td>
<td></td>
<td>66</td>
</tr>
<tr>
<td>Start control input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reversing mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency start</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBF, circuit breaker failure</td>
<td>1</td>
<td>50BF</td>
</tr>
<tr>
<td>TCS, trip circuit supervision via digital inputs</td>
<td>1</td>
<td>74TC</td>
</tr>
<tr>
<td>CTS, current transformer supervision</td>
<td>1</td>
<td>60L</td>
</tr>
</tbody>
</table>

DIMENSIONS

![Dimensions Diagram]
FUNCTIONAL OVERVIEW IN ANSI FORM

APPROVALS

- certified regarding UL508 (Industrial Controls)
- certified regarding CSA-C22.2 No. 14 (Industrial Controls)
- certified by EAC (Eurasian Conformity)

Type tested according to IEC60255-1

CONNECTIONS

Measured and calculated values
- RMS Values, Max/Min/Avg, Theta, Sequence currents, I, IE, THD
- Recorders
- Event Disturbance Fault Start Statistic Trend

Logics
- IRIG-B00X
- Control
- SNTP
- Breaker Wear

Motor Statistics
- 4-20 mA Output

Device type: MRM4Bxxx

60L
SOTF
66

86 50N 51N

74 TC 37 46 48 49M 49R 50 51 50 BF 51 LR 51 LRS

MRM4

M

1 3

1

X

100 101 103

145 Ethernet

X

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Only for use with external galvanic decoupled CT's See chapter Current Transformers of the manual
ORDER FORM MRM4

<table>
<thead>
<tr>
<th>Motor Protection</th>
<th>MRM4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog output</td>
<td>–</td>
</tr>
<tr>
<td>RTD remote</td>
<td>–</td>
</tr>
<tr>
<td>Digital inputs</td>
<td>8</td>
</tr>
<tr>
<td>Output relays</td>
<td>6</td>
</tr>
<tr>
<td>Housing</td>
<td>B1</td>
</tr>
<tr>
<td>Hardware variant 2</td>
<td>Standard 0</td>
</tr>
<tr>
<td>Housing and mounting</td>
<td>Door mounting A</td>
</tr>
<tr>
<td></td>
<td>Door mounting 19&quot; (flush mounting) B</td>
</tr>
</tbody>
</table>

**Communication protocol**
- Without protocol
- Modbus RTU, IEC60870-5-103, IRIG-B (terminals), RS485/terminals
- Modbus TCP, IRIG-B (terminals), Ethernet 100MB/RI4S
- Profibus-DP, IRIG-B (terminals), optic fibre
- Profibus-DP, IRIG-B (terminals), RS485/D-SUB
- Modbus RTU, IEC 60870-5-103, IRIG-B (terminals), optic fibre
- Modbus RTU, IEC 60870-5-103, IRIG-B (terminals), RS485/D-SUB interface

**Available menu languages**
- Standard English
- German
- Russian
- Polish
- Portuguese
- French

All devices are equipped with IRIG-B interface.
The parameterizing- and disturbance analyzing software Smart view is included in the delivery of HighPROTEC devices.

**Current inputs**
- 4 (1 A and 5 A) with automatic short-circuiters

**Digital inputs**
- Switching thresholds adjustable via software

**Power supply**
- Wide range power supply
  - 24 V$_{DC}$ - 270 V$_{DC}$ / 48 V$_{AC}$ - 230 V$_{AC}$ (-20/4+10%)
- All terminals plug type

**Terminals**
- IP54

**Type of enclosure (Front)**
- 19" flush mounting: 141.5 mm x 173 mm x 209 mm
  - 5.57 in. x 6.81 in. x 8.228 in.
- Door mounting: 141.5 mm x 183 mm x 209 mm
  - 5.57 in. x 7.205 in. x 8.228 in.

**Dimensions of housing**
- (W x H x D)

**Weight (max. components)**
- approx. 2.9 kg