High Tech Line

Full Flush Mounting for 19” Rack and Doors
High Tech Line
Reliable comprehensive protection in compact housing

- Overcurrent protection
- Voltage Protection
- Frequency protection
- Mains decoupling
- Generator protection
- Motor protection
- Auxiliary relays
High Tech Line – Why overcomplicate things?

- 19“ racks - fully withdrawable
- Door mounting – withdrawable and sealable
- Panel mounting – fully withdrawable
- Fault / disturbance recorder (MR series)
- Intuitive HMI
- Display (of primary values) (MR series)
- Easy setting software – Smart view
- Compact formfactor
Mounting Option 1 – In the Front door

Flush mounting D-housing
Mounting Option 2 – Into 19” racks (front door)
Mounting Option 3 – Mounting plate

Mounting plate set-up
A-housing

19” subunit rack for panel mounting A-housing
(also available with 42TE)

HTL-6M12

HTL-6M48

All dimensions in mm
HTL3 Device Names Legend

- MRI = Current based protection (Options: TOC and EOC directional features, sensitive earth, voltage controlled, thermal replica, control, modbus)
- MRU = Voltage based protection (Over- / Undervoltage, Negative sequence,...)
- MRN = Mains (Net) decoupling (Voltage, frequency, vector surge, Options: V(t), ROCOF, additional f-elements, modbus)
- MRF = Frequency
- MRG = Generator (voltage, frequency, ROCOF, vector jump, options: EOC directional feature, residual voltage)
- MRR = Rotor earth fault protection
- MRP = directional active Power
- MRS = negative Sequence protection
- MRQ = field failure relay (impedance)
- MRL = lockout relay
- MRA = trip circuit supervision
- MRM = motor protection
- MRT = test unit
- IRI = Current based protection (e.g. 64 REF)
- IRU = Voltage based protection
HTL3 Order Code Legend

- I = current
- I1 = 1A phase CTs
- I5 = 5A phase CTs
- E1 = 1A earth CTs
- E5 = 5A earth CTs
- X1 = 1A sensitive earth CTs
- X5 = 5A sensitive earth CTs
- LE5 = just earth current input 5A
- K = Auto Reclosure
- T = Thermal Replica
- C = control
- U = voltage
- U0 = residual voltage
- U1/U4 = rated voltage (e.g. for 51V)
- R1 = directional feature or rated voltage
- A = 19” rack
- D = flush mounting
- M = modbus
### HTL3 Order Code Example

**MR13 Time Overcurrent and Earth Fault Current Relay**

<table>
<thead>
<tr>
<th>MR13</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3-phase current b, b&gt;</td>
<td>none</td>
</tr>
<tr>
<td>Rated current</td>
<td>1 A, 5 A</td>
</tr>
<tr>
<td>Phase fault directional feature</td>
<td>none</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>100 V</td>
</tr>
<tr>
<td>Earth current measuring</td>
<td>none</td>
</tr>
<tr>
<td>Rated current</td>
<td>standard 1 A, 5 A, sensitive 1 A, 5 A</td>
</tr>
<tr>
<td>Directional feature in earth path</td>
<td>none</td>
</tr>
<tr>
<td>Rated voltage in earth circuits</td>
<td>100 V</td>
</tr>
<tr>
<td>Housing (12 TE)</td>
<td>19&quot;-rack, flush mounting</td>
</tr>
<tr>
<td>Communication protocol RS485 Pro Open Data</td>
<td>MODBUS RTU</td>
</tr>
<tr>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

- **I** = current
- **I1** = 1A phase CTs
- **I5** = 5A phase CTs
- **E1** = 1A earth CTs
- **E5** = 5A earth CTs
- **X1** = 1A sensitive earth CTs
- **X5** = 5A sensitive earth CTs
- **LE5** = just earth current input (5A)
- **K** = Auto Reclosure
- **T** = Thermal Replica
- **C** = control
- **U** = voltage
- **U0** = residual voltage
- **U1/U4** = rated voltage (e.g. for 51V)
- **R1** = directional feature or rated voltage
- **A** = 19" rack
- **D** = flush mounting
- **M** = modbus
### Overcurrent (MRI3, MRIK3,+++)

#### Product Overview

<table>
<thead>
<tr>
<th>Product</th>
<th>ANSI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI3-IE</td>
<td>50/ST</td>
<td>Phase current protection with dependent and independent characteristic curve</td>
</tr>
<tr>
<td>MRI3-IER</td>
<td>50</td>
<td>Phase current protection, high set element, DEFT</td>
</tr>
<tr>
<td>MRI3-IE</td>
<td>67</td>
<td>Direction element for (I_{&gt;}&gt;).with separate adjustment parameters for each direction</td>
</tr>
<tr>
<td>MRI3-IE</td>
<td>50N/51N</td>
<td>Earth fault current protection with dependent and independent characteristic curve</td>
</tr>
<tr>
<td>MRI3-IE</td>
<td>50N/51N</td>
<td>Earth current protection, high set element, DEFT</td>
</tr>
<tr>
<td>MRI3-IE</td>
<td>67N</td>
<td>Direction element (I_{&gt;}&gt;).with separate adjustment parameters for each direction</td>
</tr>
<tr>
<td>MRI3-IE</td>
<td>70</td>
<td>Auto-reclosing, up to 4 shots</td>
</tr>
<tr>
<td>MRI3-IE</td>
<td>86</td>
<td>Free assignment of functions common indication</td>
</tr>
<tr>
<td>MRI3-IE</td>
<td>50BF</td>
<td>Zero current criteria and switching time supervision</td>
</tr>
</tbody>
</table>

### Control functions
- Control of the circuit breaker via potential free output relay
- Supervision of the circuit breaker via wide range digital input
- Display of the CB position on the front panel
- Remote control of the CB settings via a communication interface
- Switching from local to remote control, with a separate password
- Integrated operation cycle counter
- Integrated \(n\) recorder, pre-settable with alarm
- Operation of the CB via three independent (interlocking) methods:
  - via digital inputs, expandable to logic functions
  - via the switch interface
  - via the front panel

### Additional functions
- In-counter only C.Norton: Breaking capacity counter, pre-setting
- Fault data: 5 to 25 events
- Disturbance value recorder: max. 16 events
- Output relay matrix: Free function allocation
- Reset matrix: Manual i.e. Auto-reset for every function
- Digital inputs: 2 to 7
- Communication: Modbus RTU. RS485
- Clock module: Display for day, time and time stamp
- Display of primary value: Display of adjustment of the transformer ratio
Mains decoupling

- **MRN3** Voltage, Frequency, ROCOF, Vector jump
  Options: 2 flexible voltage time characteristics V(t), modbus

- **MRU3** Voltage, Residual Voltage
  Options: Unbalance (U2), modbus

- **MRF3** Frequency, ROCOF
Generator Protection

- MRG3 Voltage, Frequency, ROCOF, Vector Surge, Overcurrent, Earth current
  Options: Residual Voltage, directional earth current, modbus

- Generator Auxiliary Relays
  - MRP2 Directional Active Power
  - MRS1 Negative Sequence
  - MRQ1 Field Failure Relays
  - MRR1 Rotor Earth Fault
Motor Protection

- MRM3 max start up time, thermal replica, modbus
Auxiliary Relays

- MRL1 Lockout Relay
- MRR1 Rotor Earth Fault
- MRA1 Trip circuit supervision
- MRT1 Test unit
- IRI1
- IRU1