



MicroPhase I LRP is a dual phase VDS (Voltage Detecting System) with integrated UPC (Universal Phase Comparator) for the LR system in compliance with IEC/EN 61243-5 (DIN VDE 0682 Part 415). Additionally the device connects to HR, MR, LRM and LRP string parts with the appropriate adapter.

Its automatic, thorough self-test ensures reliable function. If an error is detected you will be notified of fault condition by deterministic flashlight signal before it shuts down.

The permanently enabled interface-testers warn against defect interfaces. The evaluated indication of the interface current is executed by means of two bright LEDs per phase, which display the conditions *voltage absent*, *residual voltage*, *voltage present*, *string part Ok* and *high current* respectively. The determination is accomplished with an rms-value measuring method independent of the applied waveform.

Thanks to the “LRP-switch” the threshold value can

be lowered from 2,5 µA (HR, MR, LR and LRM) to 1,0 µA (LRP).

The integrated “Universal Phase Comparator” compares two different interface signals, even if they are of different interface type or voltage. A unique error control avoids switching errors caused by erratic or unfeasible phase comparison.

The indication of a signed phase angle helps to sync different net segments or to put the phase sequence in desired order.

## Technical data

<b>Connecting system</b>	LR (IEC/EN 61243-5)
<b>Adaptable to</b>	HR, MR, LRM and LRP systems
<b>Impedance</b>	2 - 2,1 MΩ at f = 50 Hz
<b>Input voltage</b>	0 ... 65 V-
<b>Frequency range</b>	20 ... 200 Hz (VDS) 45 ... 65 Hz (UPC)
<b>Threshold values</b>	0,3 μA - residual voltage
<i>Normal mode</i>	2,5 μA - voltage present 3,2 μA - string part ok 15 μA - high current
<i>LRP mode</i>	0,1 μA - residual voltage 1,0 μA - voltage present 1,3 μA - string part ok
<b>Phase angle (UPC)</b>	phase balance: ± 0 ... 20° phase unbalance: ± 21 ... 180° ( - = flashing light)
<b>Plug proportions</b>	2x phone plug Ø 6,3 mm at 1,5 m connection lead
<b>Electronics</b>	8 Bit MCU (2 MHz), 8 Bit ADC
<b>Self-test</b>	connection leads, battery, display (without LRP-LED), electronics and software
<b>Display</b>	3x LED green, 3x LED red, 1x LED amber, 1x LED blue
<b>Power supply</b>	3 lithium cells (BR2/3A), 9V
<b>Dimensions</b>	150 x 80 x 35 mm / ca. 463g
<b>Protection class</b>	IP54

## Configurations

Order-No.	MP1-02P	MP1-02BP	MP1-02P/K	MP1-02P/L	MP1-02BP/K	MP1-02BP/L
<b>Voltage detector (channels)</b>	2	2	2	2	2	2
<b>- U<sub>Operating</sub> / U<sub>Nominal</sub> adjustable</b>	-	-	-	-	-	-
<b>- LRP mode (1,0 μA)</b>	●	●	●	●	●	●
<b>- Amperemeter</b>	-	-	-	-	-	-
<b>- Oscilloscope</b>	-	-	-	-	-	-
<b>- Status indication LEDs</b>	4	4	4	4	4	4
<b>Phase comparator (UPC)</b>	●	●	●	●	●	●
<b>- Display of phase angle</b>	-	-	-	-	-	-
<b>- Phase sequence indication</b>	●	●	●	●	●	●
<b>- Error detection</b>	●	●	●	●	●	●
<b>- Status indication LEDs</b>	3	3	3	3	3	3
<b>Automatic self-test</b>	●	●	●	●	●	●
<b>- Adapter inspection</b>	-	-	-	-	-	-
<b>LED display (4 chars)</b>	-	-	-	-	-	-
<b>LCD (2x8 chars)</b>	-	-	-	-	-	-
<b>LCD (graphic)</b>	-	-	-	-	-	-
<b>User replaceable batteries</b>	-	●	-	-	●	●
<b>Plastic case</b>	-	-	●	-	●	-
<b>Leather wallet</b>	-	-	-	●	-	●
<b>Test adapter HR (MA-HL02)</b>	○	○	2	2	2	2
<b>Test adapter MR (MA-ML02)</b>	○	○	○	○	○	○
<b>Test adapter LRM (MA-LML01F)</b>	○	○	○	○	○	○
<b>Test adapter LRM (MA-LML01D)</b>	○	○	○	○	○	○
<b>Test adapter LRM (MA-LML01S)</b>	○	○	○	○	○	○
<b>Test adapter LRP (MA-LPL02D)</b>	-	-	-	-	-	-
<b>Test adapter LRP (MA-LPL02S)</b>	○	○	○	○	○	○
<b>T. adapter LRP (MA-LPL02D/6)</b>	-	-	-	-	-	-
<b>T. adapter LRP (MA-LPL02S/6)</b>	○	○	○	○	○	○
<b>T. adapter LRP (MA-LPL02D/CC)</b>	-	-	-	-	-	-
<b>T. adapter LRP (MA-LPL02S/CC)</b>	○	○	○	○	○	○

- Standard equipment
- Optional equipment
- ⊙ Available on request