

3-phase voltage monitoring relay

EMR IU11D1, IU21D1



EMR IU11D1

- Voltage monitoring in 3-phase mains
- Measuring range 400/230 Vac 3Ph
- Monitoring of phase sequence and phase failure
- Monitoring of asymmetry
- Connection of neutral wire optional
- 1 or 2 change-over contacts

Functions

Monitoring of phase sequence, phase failure and monitoring of asymmetry with adjustable asymmetry.

Indicators

Green LED ON: indication of supply voltage
Yellow LED ON/OFF: indication of relay output

Output relay

1 or 2 potential free change-over contact(s)
Rated voltage: 250 Vac
Switching capacity: 1250 VA (5 A / 250 Vac)
Fusing: 5A fast acting

Connecting voltages

3(N) ~400/230 V, Terminals (N)-L1-L2-L3 (= supply voltage)
-30% ... +30% of U_N
100% duration of operation

Reference data

Selectron® EMR	Article no.
IU11D1	41230030
IU21D1	41230031
(Order data see chapter 1)	



EMR IU21D1

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Technical data		
Nominal consumption	EMR IU11D1	3(N) ~400/230 V, 8 VA / 0.8 W
	EMR IU21D1	3(N) ~400/230 V, 11 VA / 1.2 W
Nominal frequency		48 ... 63 Hz
Drop-out voltage		>20% of the supply voltage
Base accuracy		±5%
Adjustment accuracy		≤5%
Repetition accuracy		±2%
Temperature influence		≤0.05% / °C
Recovery time		fixed, approx. 100 ms
Recovery time		500 ms
Measuring circuit: Input:		
	3(N) ~400/230 V	terminals (N)-L1-L2-L3 (= supply voltage)
Overload capacity:		
	3(N) ~400/230 V	-30% ... +30%
Input resistance:		
	3(N) ~400/230 V	according to nominal voltage 8 VA / 0.8 W for EMR IU11D1 according to nominal voltage 11 VA / 1.2 W for EMR IU21D1
Asymmetry:		5% ... 25%

Type key

EMR I U 1 1 D 1

Construction

- D** Industrial design 22.5 mm
- S** pluggable 11 poles
- I** Mounting position 22.5/35 mm

Function

- U** Voltage
- I** Current
- P** CosPhi
- T** Temperature
- S** Star-Delta

Output

- 1** 1 changer
- 2** 2 changers
- 3** 1 NC contact / 1 NO contact

Special functions

- 1** = Additional asymmetry monitoring

Measuring circuit

- | | |
|--------------------------------|--------------------|
| A No measuring circuit | I 12 Vdc |
| B 3(N)~115/66 Vac | J 24 Vdc |
| C 3(N)~230/132 Vac | K 36 Vdc |
| D 3(N)~400/230 Vac | L 48 Vdc |
| E 1≅ 30/60/300 Vac/dc | M 1~110 Vac |
| F 1≅ 100mA/1A/10A ac/dc | N 1~230 Vac |
| G PTC | O 1 A |
| H CosPhi | P 5 A |
| | Q 10 A |

Connecting voltage

- 1** Measuring circuit
- 2** 24...240 Vac/dc
- 3** 230 Vac

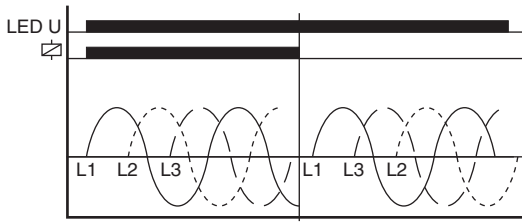
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Function description

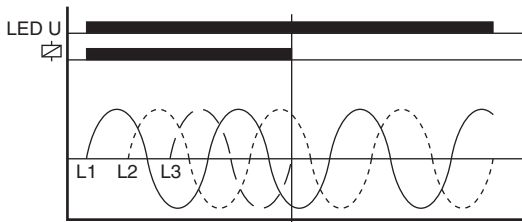
Phase sequence monitoring

When all the phases are connected in the correct sequence and the measured asymmetry is less than the fixed value, the output relay switches into on-position (yellow LED illuminated). When the phase sequence changes, the output relay switches into off-position (yellow LED not illuminated).



Phase failure monitoring

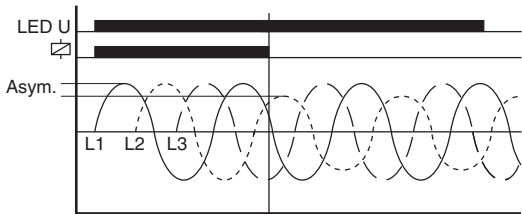
The output relay switches into off-position (yellow LED not illuminated), when one of the three phases fails.



Asymmetry monitoring

The output relay R switches into off-position (yellow LED not illuminated) when the asymmetry exceeds the value set at the ASYM-regulator.

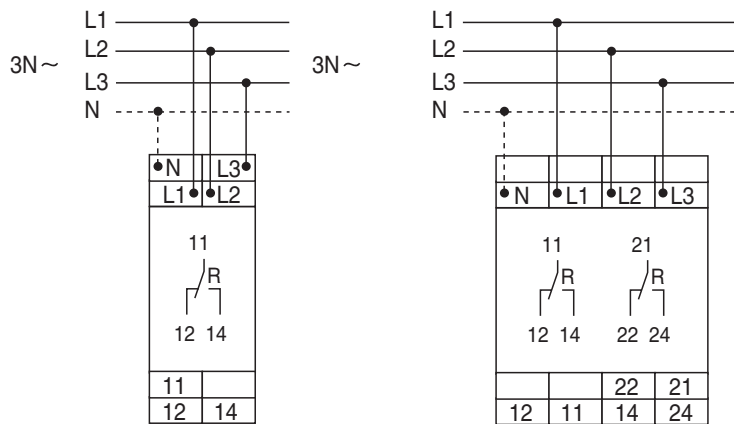
Reverse voltages of a consumer (e.g. a motor which continues to run on two phases only) do not effect the disconnection.



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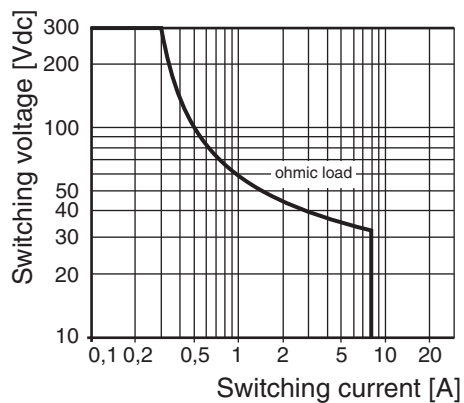
EMR IU11D1, IU21D1

Connection

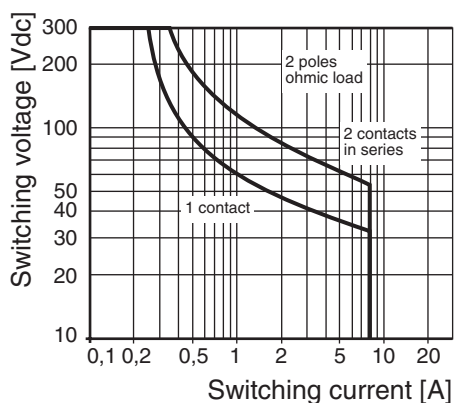


Load limit curves

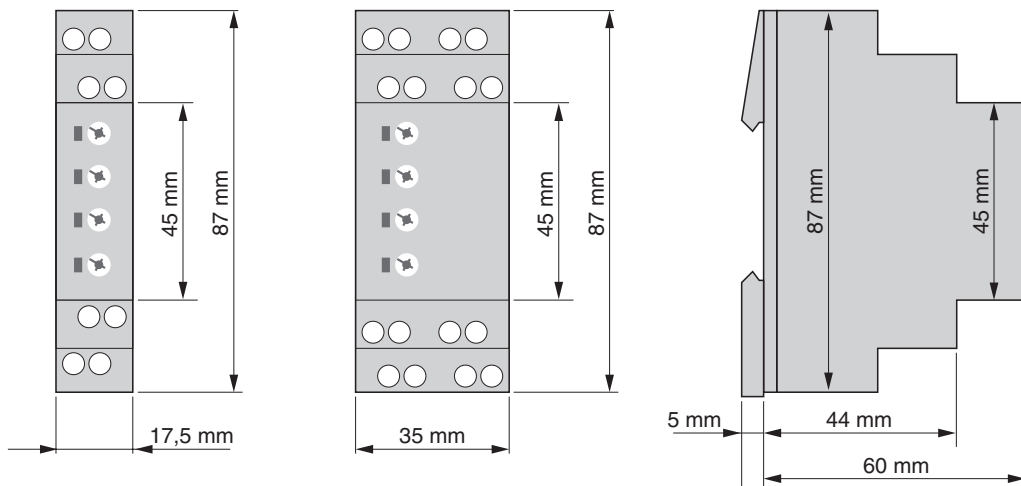
EMR IU11D1



EMR IU21D1



Dimensions



Technical safety advice

This manual contains the information necessary for the correct utilisation of the products described therein. It is intended for technically qualified persons who are involved as either

- planning engineers familiar with the safety concepts of automation technology;
- or, operating personnel, who have been instructed in handling automation equipment and have a knowledge of the contents of this manual concerning operation;
- or, installation and servicing personnel possessing the necessary training to repair such an automation system or who have the authority to put such circuits and equipment/systems into operation, to earth or label them according to the relevant safety standards.

The products are constructed, manufactured and tested in compliance with the relevant VDE standards, VDE specifications and IEC recommendations.

Danger warning

These warnings serve both as a guide for those persons involved in a project and as safety advice to prevent damage to the products themselves or to associated equipment.

Due to advancements in technology, the wiring diagram on the actual device may be different than shown in this catalogue. In all instances where the actual device diagram is different, the wiring diagram on the device must be used when electrical connections are made.

Correct utilisation, configuration and assembly

The equipment is to be used only for the applications stated in the catalogue and technical literature, and only in conjunction with auxiliary equipment and devices that are recommended or approved by Selectron Systems Ltd.

Further, it should be noted that:

- the automation equipment must be disconnected from any power supply before it is assembled, disassembled or the configuration modified.
- Solid state electronic switches must not be tested with incandescent lamps or connected to a load that exceeds its rating.
- trouble-free and safe operation of the

products requires correct transportation as well as appropriate storage, assembly and wiring.

- the systems may only be installed by trained personnel. In doing so, the relevant requirements contained in VDE 0100, VDE 0113, IEC 364, etc. must be complied with.

Prevention of material damage or personal injury

Additional external safety devices or facilities must be provided wherever significant material damage or even personal injury could result from a fault occurring in an automation system. A defined operating status must be ensured or forced by such devices or facilities (e.g. by independent limit switches, mechanical interlocks, etc.).

Advice concerning planning and installation of the products

- The safety and accident prevention measures applicable to a specific application are to be observed.
- In the case of mains-operated equipment, a check is to be made before putting it into operation to ensure that the preset mains voltage range is suitable for the local supply.
- In the case of a 24 V supply, care must be taken to ensure sufficient electrical insulation of the secondary side. Use only mains power supply units that conform to IEC 364-4-41 or HD 384.04.41 (VDE 0100 Part 410).
- Automation systems and their operating elements are to be installed in such a way that they are sufficiently protected against accidental operation.

Warranty

Selectron Systems Ltd. warrants its products to be free from defects in material and workmanship for a period of one year from the date of shipment. All claims under this warranty must be made within thirty (30) days of the discovery of the defect, and all defective products must be returned at the buyer's expense. Buyer's sole and exclusive right will be limited to, at the option of Selectron Systems Ltd., the repair or replacement by Selectron Systems Ltd., of any defective products for which a claim is made.

In all other matters please refer to the "General terms of business" concerning Selectron Systems Ltd.

Note

The information given in this documentation corresponds to the state of development at the time of going to press and is therefore not binding. Selectron Systems Ltd. reserves the right to make alterations in the interests of technical advancement or product improvement at any time without giving reasons for doing so.

Prescriptions and standards

Mechanical data	
Housings in self-extinguishing plastic material. Protection mode IP 40	
Fixing on profile rail TS 35 according to EN 60715	
Connection mark according to IEC 60067-1-18a	
Environmental conditions	
Admissible environmental temperatures from -25 °C ... +55 °C (according to IEC 60068-1)	
Storage and transport temperature from -25 °C ... +70 °C	
Relative humidity 15% to 85% (according to IEC 60721-3-3 class 3K3)	
Pollution degree 2, if built-in 3 (according to IEC 60664-1)	
Vibration resistance 10 to 55 Hz 0,35 mm (according to IEC 60068-2-6)	
Shock resistance 15 g 11 ms (according to IEC 60068-2-27)	
Output relay	
Electrical lifetime:	2 x 10 ⁵ switching cycles at 1000 VA ohmic load
Mechanical lifetime:	20 x 10 ⁶ switching cycles
Contact material	AgNi 0,15
Supply voltage	
Frequency range	48 ... 63 Hz
Duty cycle	100%, according to IEC class 1c
Protection	
Protection of the unit	5 A fast
Terminals	
Contact protection according VDE 0106 and VBG 4	
Terminal arrangement and connecting mark according DIN 46 199	
Terminal type:	Terminal connection according to VBG 4 (PZ1 required) IP 20
Terminal variants:	1 wire 0,5 mm ² ... 2,5 mm ² with/without wire end covers
	1 wire 4 mm ² without wire end covers
	2 wires 0,5 mm ² ... 1,5 mm ² with/without wire end covers
	2 wires 2,5 mm ² flexible without wire end covers
max. screw in torque:	1,0 Nm
Insulation	
Overvoltage category	III (according to IEC 60664-1)
Rating surge voltage:	4 kV
Electromagnetic compatibility	
Electrostatic discharge:	6 kV contact, 8 kV air (according to IEC 61000-4-2)
High frequency electromagnetic fields:	Level 3, 10 V/m (according to IEC 61000-4-3)
Fast transients:	4 kV / 5 kHz, 5/50 ns (according to IEC 61000-4-4)
Lightning discharge:	2 kV com., 1 kV dif., (according to IEC 61000-4-5)
Cable running disturbances inducted by HF fields:	Level 3, 10 V RMS (according to IEC 71000-4-6)
Spurious radiation net and aerial network:	Class B (according to EN 55011)
Prescriptions	
Air and leakage paces:	EN 61812-1 (see Insulation)
Test voltage:	EN 61812-1 (see Insulation)
Low voltage directions according to EN 61812-1 (see Insulation)	
EMC emissions:	IEC 61000-6-4
EMC interference stability:	IEC 61000-6-2
Burst:	4 kV / 5 kHz, 5/50 ns (according to IEC 61000-4-4)
ESD:	6 kV contact, 8 kV air (according to IEC 61000-4-2)
Production standard:	according to ISO 9001
Basic standards:	IEC 61000-6-4, IEC 61000-4-2