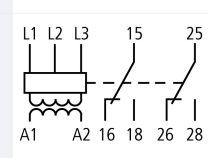




**Phase monitoring relays, Multi-functional, 180 - 280 V AC, 50/60 Hz**

**Part no.** EMR6-AWN280-D-1  
**Catalog No.** 184770  
**Alternate Catalog No.** EMR6-AWN280-D-1  
**EL-Nummer (Norway)** 4101966

**Delivery program**

|                              |       |      |   |
|------------------------------|-------|------|---|
| Product range                |       |      | EMR Measuring and monitoring relays   |
| Basic function               |       |      | Phase monitoring relays   |
| Function                     |       |      | Multi-functional<br>Power supply from the measuring circuit<br>On-delay/off-delay: none = 0 or adjustable between 0.1 - 30 s<br>Imbalance threshold values adjustable 2 - 25 % of mean value of phase voltages<br>Suitable for single-phase networks as well. |
| Monitoring voltage per phase | $U_N$ | V AC | 180 - 280 V AC, 50/60 Hz  |
| Monitoring of                |       |      | Phase sequence (can be deactivated)<br>Phase failure<br>Overvoltage<br>Undervoltage<br>Imbalance<br>Neutral cable break   |
| Contact sequence             |       |      |    |
| Supply voltage               |       |      | 180 - 280 V AC, 50/60 Hz  |
| Width                        |       | mm   | 22.5  |

**Technical data**

**General**

|                                    |            |                 |   |
|------------------------------------|------------|-----------------|---|
| Standards                          |            |                 | IEC, UL, CSA, CCC, GL   |
| Lifespan, mechanical               | Operations | $\times 10^6$   | 30  |
| Climatic proofing                  |            |                 | Damp heat, cyclical to IEC 60068-2-30: 24 h cycle, 55° C, 93% relative humidity, 96 h |
| Ambient temperature                |            |                 |   |
| Operation                          |            | °C              |   |
| Operating ambient temperature min. |            | °C              | -25   |
| Operating ambient temperature max. |            | °C              | + 60  |
| Storage                            |            | °C              | - 40 - 85   |
| Mounting position                  |            |                 | As required   |
| Shock resistance                   |            |                 | Class 2   |
| Degree of protection               |            |                 |   |
| Terminals                          |            |                 | IP20  |
| Enclosures                         |            |                 | IP50  |
| Terminal capacities                |            | mm <sup>2</sup> |   |
| Solid                              |            | mm <sup>2</sup> | 1 x 0.5-2.5 (1 x 18-14 AWG)   |
| Flexible with ferrule              |            | mm <sup>2</sup> | 2 x 0.5-1.5 (2 x 18-16 AWG)   |
| Standard screwdriver               |            | mm              | 5.5 x 0.8   |
| Tightening torque                  |            | Nm              | 0.6 - 0.8   |
| Fixing                             |            |                 | Snap fixing, top-hat rail IEC/EN 60715  |
| MTBF (mean time between failures)  |            |                 | 382977 h  |

**Contacts**

|                                       |           |      |       |
|---------------------------------------|-----------|------|-------|
| Rated impulse withstand voltage       | $U_{imp}$ | V AC | 4000  |
| Overvoltage category/pollution degree |           |      | III/3 |

**Power supply**

|                |  |  |                          |
|----------------|--|--|--------------------------|
| Supply voltage |  |  | 180 - 280 V AC, 50/60 Hz |
|----------------|--|--|--------------------------|

|                   |   |                  |            |
|-------------------|---|------------------|------------|
| Voltage tolerance |   | x U <sub>c</sub> | 0.85 - 1.1 |
| Power consumption |   | VA               | 3          |
| Rated frequency   | f | Hz               | 50 - 60    |
| Duty factor       |   | % DF             | 100        |

### Timing cycle

|                                     |  |      |                          |
|-------------------------------------|--|------|--------------------------|
| Response delay time                 |  | s    | 0.2                      |
| Reset delay/Off-delay time          |  | s    | Adjustable from 0.1 – 30 |
| Time error within supply voltage    |  | %    | 0.5                      |
| Time error within temperature range |  | %/°C | 0.06                     |

### Measuring circuits

|                             |  |      |              |
|-----------------------------|--|------|--------------|
| Frequency                   |  | Hz   | 50/60 ± 10 % |
| Hysteresis                  |  | %    | 0 ... 5      |
| Frequency                   |  | Hz   | 50/60 ± 10 % |
| Measuring cycle             |  | ms   | 50           |
| Temperature error           |  | %/°C | 0.06         |
| Error within supply voltage |  | %    | 0.5          |

### Status indication

|                        |  |  |  |
|------------------------|--|--|--|
| Supply voltage         |  |  | LED yellow   |
| Overvoltage            |  |  | LED red: F1 on   |
| Undervoltage           |  |  | LED red: F2 on   |
| Status indicator (LED) |  |  | Yellow, solid: Supply voltage<br>Yellow, solid (R): Relay energized<br>Yellow, flashing (R/T): Delay time running<br>Red, solid (F1 & F2): Imbalance<br>Red, solid (F1): Overvoltage<br>Red, solid (F2): Undervoltage<br>Red: F1 solid, F2 flashing: Phase failure<br>Red, F1 solid & F2 flashing: Open neutral conductor<br>Red, flashing (F1 & F2 alternating): Phase sequence fault |

### Relay output contacts

|  |                |                   |              |
|--|----------------|-------------------|--------------|
| Rated operational voltage              | U <sub>e</sub> | V AC              | 250          |
| Rated operational current              | I <sub>e</sub> | A                 |              |
| AC-12 at 230 V                         | I <sub>e</sub> | A                 | 4            |
| AC-15 with 230 V                       | I <sub>e</sub> | A                 | 3            |
| DC-12 at 24 V                          | I <sub>e</sub> | A                 | 4            |
| DC-13 at 24 V                          | I <sub>e</sub> | A                 | 2            |
| Minimum Switching capacity             |                |                   | 10 mA / 24 V |
| Lifespan, electrical (AC-12/230 V/4 A) | Operations     | x 10 <sup>6</sup> |              |
| Lifespan, electrical                   | Operations     | x 10 <sup>6</sup> | 0.1          |
| Short-circuit rating                   |                |                   |              |
| max. fuse                              | Fast/gL        | A                 | 5            |

### Electromagnetic compatibility (EMC)

|  |                       |    |                          |
|--|-----------------------|----|--------------------------|
| Electromagnetic compatibility              |                       |    | IEC/EN 60947-6-2         |
| ESD  | Air/contact discharge | kV | IEC/EN 61000-4-2 level 3 |
| HF-immunity to radiation                   |                       |    | IEC/EN 61000-4-3 level 3 |
| Burst                                      |                       |    | IEC/EN 61000-4-4 level 3 |
| Surge                                      |                       |    | IEC/EN 61000-4-5 Level 4 |
| HF-immunity to line-conducted interference |                       |    | IEC/EN 61000-4-6 level 3 |

### Design verification as per IEC/EN 61439

|  |  |    |  |
|--|--|----|--|
| Technical data for design verification                   |  |    |  |
| Operating ambient temperature min.                       |  | °C | -25                                    |
| Operating ambient temperature max.                       |  | °C | 60                                     |
| IEC/EN 61439 design verification                         |  |    |  |
| 10.9 Insulation properties                               |  |    |  |
| 10.9.4 Testing of enclosures made of insulating material |  |    | Is the panel builder's responsibility. |

### Technical data ETIM 7.0

Relays (EG000019) / Phase monitoring relay (EC001441)

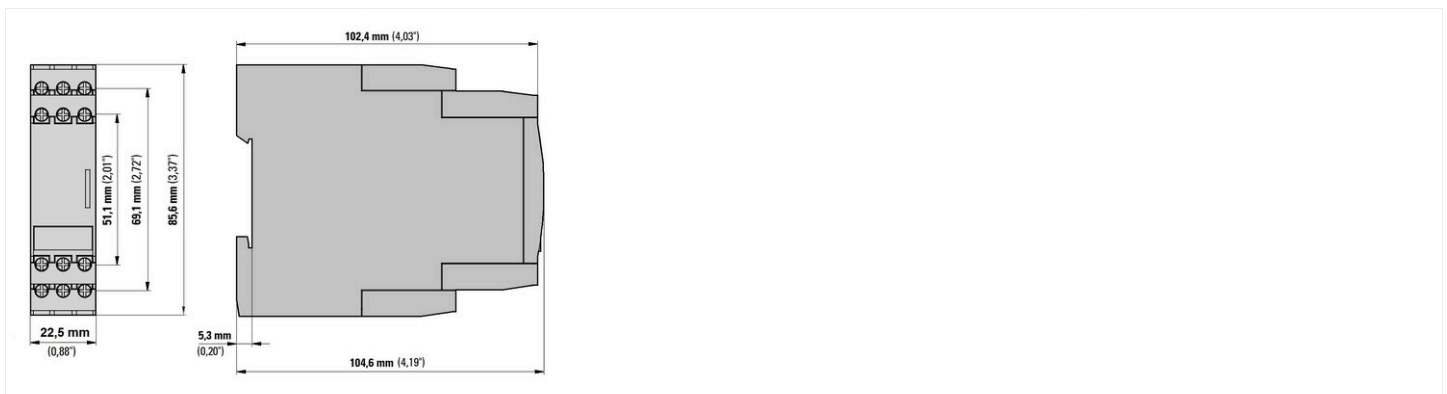
Electric engineering, automation, process control engineering / Low-voltage switch technology / Monitoring equipment (low-voltage switch technology) / Asymmetry monitoring equipment (ecl@ss10.0.1-27-37-18-03 [AKF097014])

|   |    |                  |
|---|----|------------------|
| Type of electric connection                   |    | Screw connection |
| With detachable clamps                        |    | No               |
| Rated control supply voltage Us at AC 50HZ    | V  | 180 - 280        |
| Rated control supply voltage Us at AC 60HZ    | V  | 180 - 280        |
| Rated control supply voltage Us at DC         | V  | 0 - 0            |
| Voltage type for actuating                    |    | AC               |
| Phase sequence monitoring                     |    | Yes              |
| Phase failure detection                       |    | Yes              |
| Function under voltage detection              |    | Yes              |
| Function over voltage detection               |    | Yes              |
| Phase imbalance monitoring                    |    | Yes              |
| Voltage measurement range                     | V  | 180 - 280        |
| Min. adjustable delay-on energization time    | s  | 0.1              |
| Max. permitted delay-on energization time     | s  | 30               |
| Min. adjustable off-delay time                | s  | 0.1              |
| Max. permitted off-delay time                 | s  | 30               |
| Number of contacts as normally closed contact |    | 0                |
| Number of contacts as normally open contact   |    | 0                |
| Number of contacts as change-over contact     |    | 2                |
| Width   | mm | 22.5             |
| Height  | mm | 85.6             |
| Depth   | mm | 104.6            |

## Approvals

|                             |  |   |
|-----------------------------|--|---|
| Product Standards           |  | IEC 255-6; UL 508; CSA-22.2 No. 14-05; CE marking |
| UL File No.                 |  | E29184  |
| UL Category Control No.     |  | NKCR, NKCR7                                       |
| CSA File No.                |  | UL report valid                                   |
| CSA Class No.               |  | 3211-03   |
| North America Certification |  | UL listed, certified by UL for use in Canada      |

## Dimensions



## Additional product information (links)

|   |   |
|---|---|
| <b>IL121007ZU Multifunction three-phase monitoring relays</b> |   |
| IL121007ZU Multifunction three-phase monitoring relays        | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL121007ZU.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL121007ZU.pdf</a>               |
| IL121007ZU Multifunction three-phase monitoring relays        | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL121007ZU2018_07.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL121007ZU2018_07.pdf</a> |
| Phase monitoring relays                                       | <a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=11.36">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=11.36</a>                           |