

ELR W1/ 6-24DC

Order No.: 2982090

Illustration shows item ELR W1/ 6-24DC




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Electronic reversing load relay, for driving DC motors, with light indicator and protection circuit, output: 10-30 V DC/6 A



Commercial data

| | |
|--------------------------|--|
| GTIN (EAN) |  4 017918 943936 |
| sales group | G481 |
| Pack | 1 pcs. |
| Customs tariff | 85371099 |
| Catalog page information | Page 169 (IF-2009) |

Product notes

WEEE/RoHS-compliant since:
02/08/2007



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Technical data

Input data

| | |
|---------------------------|--|
| Input name | Device supply |
| Protective circuit | Protection against polarity reversal Polarity protection diode |
| | Surge protection |
| Operating voltage display | Green LED |

| | |
|---|--|
| Status display | LED yellow, forward running (R), LED yellow, reverse running (L) |
| Input name | Control input right/left |
| Nominal input voltage U_N | 24 V DC |
| Input voltage range in reference to U_N | 0.8 ... 1.2 |
| Typical input current at U_N | 3 mA |
| Protective circuit | Protection against polarity reversal Surge protection |
| Surge voltage protection | > 33 V DC |
| Typical response time | 200 μ s |
| Status display | LED yellow, forward running (R), LED yellow, reverse running (L) |
| Current consumption | 3 mA |
| Switchover time R_L/L_L (turn-on time) | 80 ms |

Output data, load relay

| | |
|--------------------------------------|--|
| Output name | DC output |
| Load current | 6 A (see derating curve) |
| Quiescent current | Approx. 7 mA (When switched off) |
| Type of protection | Protection against polarity reversal Surge protection |
| Surge voltage protection | > 33 V DC |
| Operating voltage display | Green LED |
| Current limitation at short-circuits | 20 A |

Connection data

| | |
|--|---------------------|
| Type of connection | Screw connection |
| Stripping length | 8 mm |
| Conductor cross section solid min. | 0.2 mm ² |
| Conductor cross section solid max. | 6 mm ² |
| Conductor cross section stranded min. | 0.2 mm ² |
| Conductor cross section stranded max. | 4 mm ² |
| Conductor cross section AWG/kcmil min. | 24 |
| Conductor cross section AWG/kcmil max | 10 |
| Screw thread | M3 |

General data

| | |
|--------|---------|
| Width | 12.5 mm |
| Height | 99 mm |

| | |
|---|---|
| Depth | 114.5 mm |
| Test voltage input/output | 2.5 kV AC |
| Ambient temperature (operation) | -20 °C ... 60 °C |
| Ambient temperature (storage/transport) | -20 °C ... 70 °C |
| Mounting position | Vertical (horizontal DIN rail) |
| Assembly instructions | Any |
| Operating mode | 100% operating factor |
| Degree of protection | IP20 |
| Name | Air and creepage distances between the power circuits |
| Standards/regulations | EN 50178 |
| | Basic insulation |
| Pollution degree | 2 |
| Surge voltage category | III |

Certificates / Approvals

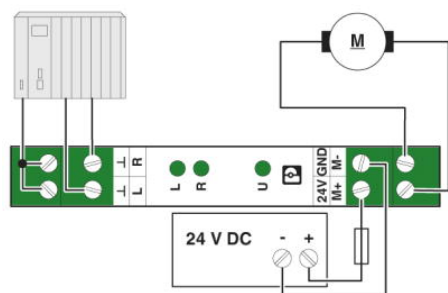


Certification

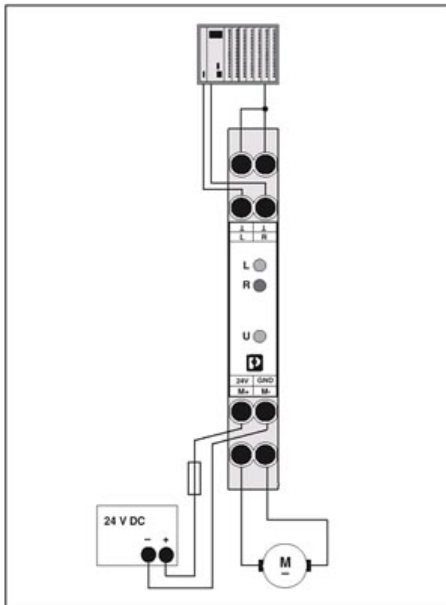
CUL Listed, UL Listed

Diagrams/Drawings

Connection diagram

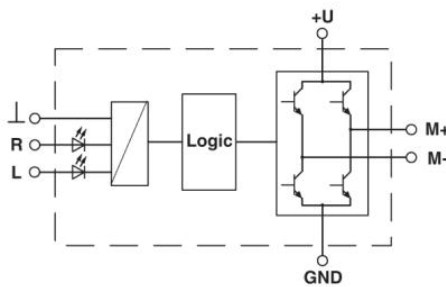


Application drawing

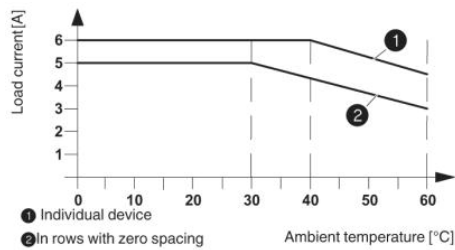


Example application

Block diagram



Diagram



FAQs

- **01. In which way and with which fuse do I have to protect a semiconductor switch against short-circuits and is there a special regulation?**

No, there is no special regulation for semiconductor switches. You may, however, designate three types of fuse. 1. Motor protection via bi-metal relay or switch, adjusted to the load current of the motor (can be dropped with ELR W3/9 400 MM which includes motor protection). 2. Conductor protection adjusted to the cross section of the conductors (VDE regulation, for example with 1,5 mm² 16A) 3. Semiconductor protection to protect the semiconductor electronics against short-circuit. In this case the tripping characteristic of the fuse must be below the I²t value of the semiconductor. For devices with a load current of 3 times 9A a 16 A FF is used. This fuse is fast enough to protect the semiconductor against short-circuit, but on the other hand slow enough to switch on a motor (high inrush current).

- **02. For which capacities (in kW) does Phoenix Contact provide electronic load relays and why are there only indications with respect to the maximum current?**

For a semiconductor the current is the value that sets limits to its capacity. (heat loss that has to be dissipated). Therefore with ELR's the maximum switched currents are mentioned in the data sheet. For example an ELR with 3 times 9 A corresponds to approx. 3 - 4 KW, depending on cos phi.

Following versions are available from Phoenix Contact :

1. Load relay 3 times 9 A
2. Load relay 1 time 25 A
3. Load relay 1 time 35 A
4. Reversing loaded relay 3 times 9 A
5. Reversing loaded relay with motor management 3 times 8 A

- **03. Are the electronic load relays also available with 230 V AC inputs?**

No, the control and possibly the supply voltage is always effected with 24 V DC (for example directly from the control). Other voltages have to be connected via the interface modules (for example PLC relay or PLC optical coupler).

- **04. Is a supply voltage necessary for the operation of electronic load relays of Phoenix Contact?**

Yes, for the intelligent device family ELR with Motor Management and for the reversing load relays. In this case it is required for the supply of internal electronics. "Supply voltage = 24 V DC"

- **05. To which fieldbus systems can ELR with Motor Management be connected?**

The device family ELR MM can be connected via a special gateway to "PROFIBUS-DP V1".

Gateways for additional bus systems like INTERBUS, CAN DeviceNet™ on demand/in planning process.

Via the RS-232 Interbus Inline disk the devices can be integrated in an Inline system. Then all bus systems of the Inline family, i.e. INTERBUS, PROFIBUS, CAN and DeviceNet™ are available.

- **06. Are there higher performance classes?**

At present, the class up to 3 x 9 A (approx. 3 – 4 KW) is three-phase. Single-phase up to 1 x 25 or 1 x 35 A. For the MM range, an extension to 7.5 and 18.5 KW is planned. For HMI 2003, there was a mechanical version for triggering power contactors. Input 3 x 5 A direct, larger currents are measured with a transducer. The motor management functions are therefore available for all performance classes.

• **07. Can a soft start and soft brake be realised with the ELR W 3/9 ...MM devices?**

No, this function is only planned for the higher performance classes. There is, however, an electronic reversing loaded relay with three-phase soft starter included in the Phoenix Contact product range. Performance class up to 3 times 8 A.

• **08. Can the ELR W3/9... MM only be parameterized with the software ELR-CONF?**

No, all rudimentary and relevant functions can be adjusted on the device directly via keyboard. With the assembled LC-display all important measured values are readable.

• **09. Which hardware and software equipment is at least required for operation of the ELR-CONF?**

1. Pentium > 90 MHz 2. 16 MByte main memory 3. 15 MByte free hard disk storage (without Internet Explorer) 4. CD-ROM drive 5. Mouse 6. Windows 95 (with Internet Explorer starting with version 5.0), Windows 98, Windows NT 4.0 with SP4, Windows 2000 or Windows XP 7. Serial interface (COM1... COM2)

• **10. Is it possible to connect the devices of the MM family to the PC or notebook via USB, too?**

No, the connection only functions via the RS-232 (COM1 or COM2) interface. There are, however, adapters for RS-232 to USB.

• **11. Is it necessary to use a bimetallic protection when using the Motor Management devices?**

No, a bimetal is not necessary (approval PTB is applied).

• **12. Can the Motor Management devices also be used in the Ex-range?**

The approval is applied at PTB!

• **13. Is there a minimum load for semiconductor switches?**

Yes, a minimum switching current is necessary to avoid that the holding current of the semiconductors does not fall below. For example with the ELR W3/9 400 these are 150 mA.

• **14. Can the ELR MM device be used after a frequency transducer?**

No, because the frequency transducer does not generate a pure Sinus voltage on the output side. The voltage is composed of high frequent signals (up to 40 KHz). The R-C-V protection circuitry of the semiconductor is not suitable for this type of voltage. Furthermore the present generation can only be operated in a frequency range of 45 - 65 Hz.

An application before a frequency transducer, however, is possible (maybe with corresponding protection circuitry).

• **15. To achieve a longer lifetime electromagnetic contactors are over-dimensioned. Is it necessary to also choose a higher class of the semiconductor switches?**

No, all ELR are equipped with over-dimensioned power semiconductors. This is necessary to meet the relatively high inrush current (5 to 7fold rated current) of the motor. The current indication on the ELRs (observe the derating) refers to 100% ED. In case of proper use a semiconductor switch achieves > 10 to the power of 9 cycles.

• **16. If a contactor-type reversing starter combination is set up, it has to be locked mechanically and/or electrically. What about a reversal load relay?**

With the ELR-W no further measures are necessary. The locking of the control inputs, the physically related downtime of the reversal and the wiring of the load side have already been realised in the module.

- **17. Is it possible to use three single-phase load relays for applications in three phase system?**

Yes!

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