



moduLo

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**RELAYS**

- 10 Inputs/Outputs (LRD10...)
- 12 Inputs/Outputs (LRD12...)
- 20 Inputs/Outputs (LRD20...)
- 24VDC, 24VAC or 100-240VAC power supply
- Relay or transistor outputs.



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**EXPANSION AND COMMUNICATION MODULES**

- 8 Inputs/Outputs
- 24VDC, 24VAC or 100-240VAC
- Relay or transistor outputs
- Modbus® protocol communication unit.



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**ACCESSORIES**

- Program backup memory
- Programming and supervision software
- Power supply unit.



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**STARTER KITS**

- Complete kit to begin using the programmable relays
- Each equipped with LRD relay, programming-supervision software and connecting cable.

**LOGIC FUNCTIONS**

- 10 different operating modes:
- AND - Consent simultaneity (series connection of contact)
  - AND ↑ - Consent simultaneity with edge evaluation
  - NAND - No simultaneity (parallel connection of contact)
  - NAND ↓ - Simultaneity loss with edge evaluation
  - OR - At least one consent (parallel connection of contact)
  - NOR - No consents (series connection of contact)
  - XOR - 2 signals of diverse state (dual changeover contact)
  - NOT - State inverter
  - Pulse - Pulse output
  - SR - Two distinct signals for permanent enable and disable.

**TIMERS (15 maximum)**

- 7 different operating modes:
- ON delay - standard
  - ON delay - sum of time at enable and reset signals
  - OFF delay - output enable on up time, off on down time
  - OFF delay - output enable and off on down input
  - Recycle - input signal always enabled (equal timing)
  - Recycle - output enable on input and enable resets up time (equal timing)
  - Recycle - on-off intervals with independent timing.

**RTC - REAL TIME CLOCK (15 maximum)**

- 3 different operating modes:
- Daily - choice of days of the week (from ... to) and daily hours (from ... to)
  - Weekly - choice of week day and hours to begin and end of week day
  - Yearly - choice of date to begin and end.

**COUNTERS (15 maximum)**

- 8 different operating modes (up and down):
- Without over-counting and no retain at power loss
  - With over-counting function and no retain at power loss
  - Without over-counting and retain function at power loss
  - With over-counting and retain function at power loss
  - With over-counting and no retain at power loss and reset to 0
  - With over-counting and retain function at power loss and reset to 0
  - High speed counter
  - Frequency comparison.

**ANALOG COMPARATORS (15 maximum)**

- 5 different operating modes:
- Comparators for analog inputs
  - Comparators for analog inputs and constants

- ◆ 10, 12 and 20 Input-Output base units
- ◆ Expansion modules with 4 Inputs and 4 Outputs
- ◆ Maximum configuration: 44 Inputs/Outputs
- ◆ RS232 serial interface port for PC or program backup memory connection
- ◆ On-board programming languages: Italian, English, Spanish, French, German, Portuguese and Chinese
- ◆ PC programming languages: Italian, English and Spanish.



PLANET - LOGIC

**Programmable logic relays**

|   |     |   |
|---|-----|---|
| Base relay unit .....                     | 20- | 2 |
| Expansion and communication modules ..... | 20- | 2 |

**Accessories**

|                    |     |   |
|--------------------|-----|---|
| Starter kits ..... | 20- | 3 |
|--------------------|-----|---|

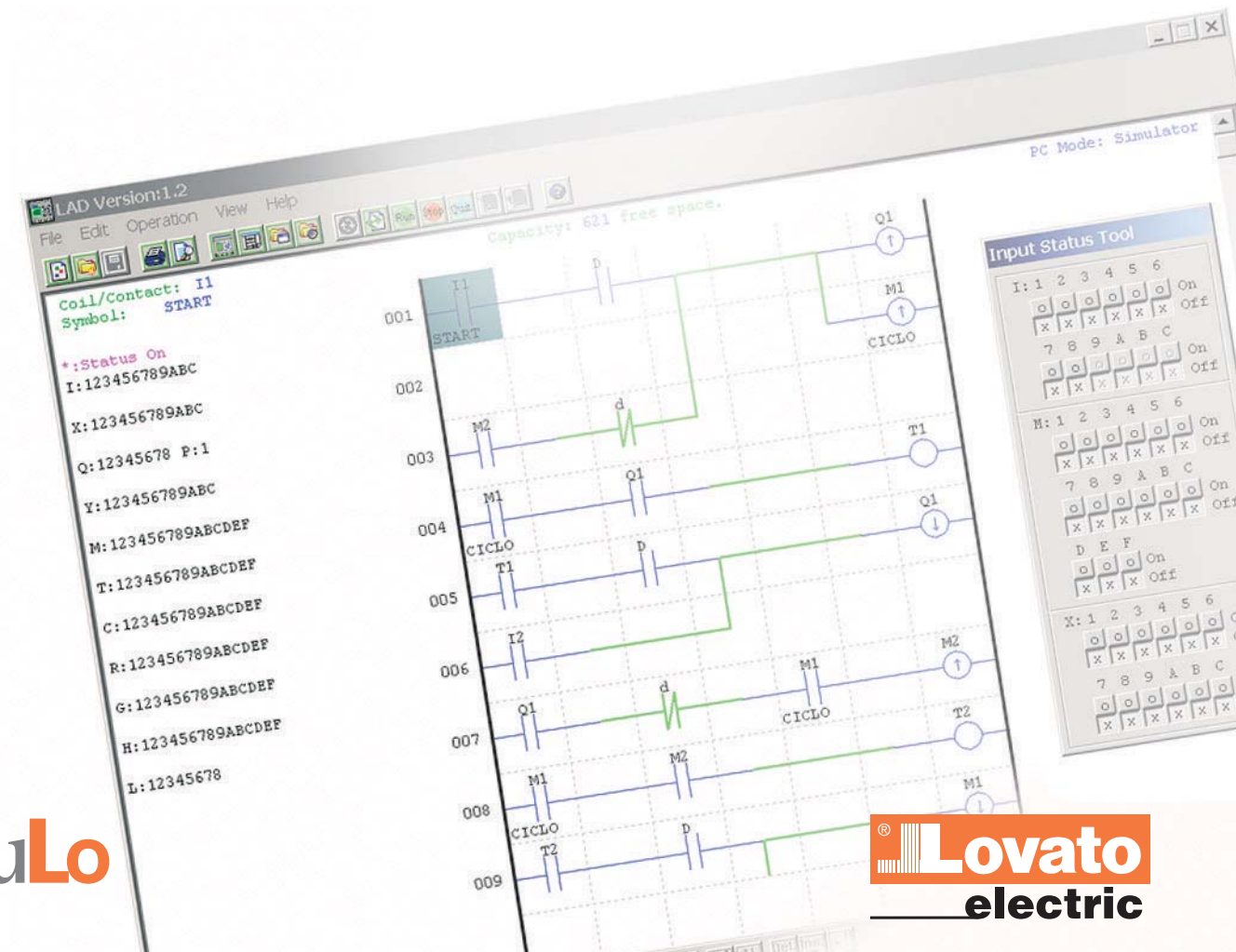
SEC. PAGE

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Lovato electric

Programmable logic relays



LRD10...  
LRD12... moduLo



LRD20... moduLo



LRE08... moduLo

| Order code       | Auxiliary supply voltage | In/Out <sup>①</sup> | Qty per pkg | Wt. [kg] |
|------------------|--------------------------|---------------------|-------------|----------|
|                  |                          |                     | n°          | [kg]     |
| Base relay unit. |                          |                     |             |          |
| LRD12R D024      | 24VDC                    | 8/4 relay           | 1           | 0.174    |
| LRD12T D024      | 24VDC                    | 8/4 transistor      | 1           | 0.174    |
| LRD20R D024      | 24VDC                    | 12/8 relay          | 1           | 0.252    |
| LRD20T D024      | 24VDC                    | 12/8 transistor     | 1           | 0.252    |
| LRD12R A024      | 24VAC                    | 8/4 relay           | 1           | 0.193    |
| LRD20R A024      | 24VAC                    | 12/8 relay          | 1           | 0.252    |
| LRD10R A240      | 100-240VAC               | 6/4 relay           | 1           | 0.193    |
| LRD20R A240      | 100-240VAC               | 12/8 relay          | 1           | 0.252    |

| Expansion and communication modules <sup>②</sup> . |            |   |   |       |
|--|------------|---|---|-------|
| LRE08R D024  | 24VDC      | 4/4 relay                                       | 1 | 0.125 |
| LRE08T D024  | 24VDC      | 4/4 transistor                                  | 1 | 0.125 |
| LRE08R A024  | 24VAC      | 4/4 relay                                       | 1 | 0.125 |
| LRE08R A240  | 100-240VAC | 4/4 relay                                       | 1 | 0.125 |
| LRE P00  |            | Modbus <sup>®</sup> protocol communication unit | 1 | 0.090 |

- ① Inputs/Outputs.
- ② The expansion modules are supplied with connector for base relay module.

Kinco can be easily adapted to every type of need. The number of inputs and outputs of the base relay unit can be directly increased by using the expansion modules. Supplied in three base units with 10, 12 or 20 inputs/outputs, Kinco can be expanded, mounting up to 3 expansion modules, to obtain a maximum configuration of 44 inputs/outputs. Expansion modules with 4 inputs and 4 outputs are available with 24VDC relay output, 24VDC transistor output and 24VAC or 100-240VAC relay output version.



| Kinco                | Expansions | Inputs/Outputs      |
|----------------------|------------|---------------------|
| LRD10...<br>LRD12... | —          | 10 (6 In + 4 Out)   |
|                      | + 1 LRE08  | 18 (10 In + 8 Out)  |
|                      | + 2 LRE08  | 26 (14 In + 12 Out) |
|                      | + 3 LRE08  | 34 (18 In + 16 Out) |
| LRD12...             | —          | 12 (8 In + 4 Out)   |
|                      | + 1 LRE08  | 20 (12 In + 8 Out)  |
|                      | + 2 LRE08  | 28 (16 In + 12 Out) |
|                      | + 3 LRE08  | 36 (20 In + 16 Out) |
| LRD20...             | —          | 20 (12 In + 8 Out)  |
|                      | + 1 LRE08  | 28 (16 In + 12 Out) |
|                      | + 2 LRE08  | 36 (20 In + 16 Out) |
|                      | + 3 LRE08  | 44 (24 In + 20 Out) |

| Type        | INPUT   |   | OUTPUT  |    |
|-------------|---------|---|---------|----|
|             | Digital | Digital/analog (0...10VDC) <sup>③</sup> | Digital |    |
|             | n°      | n°                                      | Type    | n° |
| LRD12R D024 | 6       | 2                                       | Relay   | 4  |
| LRD12T D024 | 6       | 2                                       | Trans.  | 4  |
| LRD20R D024 | 8       | 4                                       | Relay   | 8  |
| LRD20T D024 | 8       | 4                                       | Trans.  | 8  |
| LRD12R A024 | 8       | 0                                       | Relay   | 4  |
| LRD20R A024 | 12      | 0                                       | Relay   | 8  |
| LRD10R A240 | 6       | 0                                       | Relay   | 4  |
| LRD20R A240 | 12      | 0                                       | Relay   | 8  |
| LRE08R D024 | 4       | 0                                       | Relay   | 4  |
| LRE08T D024 | 4       | 0                                       | Trans.  | 4  |
| LRE08R A024 | 4       | 0                                       | Relay   | 4  |
| LRE08R A240 | 4       | 0                                       | Relay   | 4  |

③ Digital inputs can be used as analog inputs.

General characteristics

- 10, 12 and 20 input-output base units
- Expansion models with 4 inputs and 4 outputs
- Maximum configuration: 44 inputs/outputs
- Standard-supplied Real Time Clock (RTC)
- RS232 serial interface port for PC or program backup memory connection
- 4-line 12-character display with backlight
- Programming language logics: Ladder (200 lines maximum) or FBD (99 blocks maximum)
- On-board programming languages: Italian, English, Spanish, French, German, Portuguese and Chinese
- PC programming languages: Italian, English and Spanish

Operational characteristics

- 8A lth current relay outputs for AC and DC versions
- 0.3A 24VDC transistor outputs for DC version
- 0-10V analog inputs for DC version
- Sampling time: 5-20ms (LADDER)  
2-10ms (FDB)
- Version: modular for mounting on 35mm DIN rail (IEC/EN 60715) or M4x15mm screw fixing
- Type of terminal: Screw
- Degree of protection: IP20.

Certification and compliance

Certifications obtained: cULus.  
Compliant with standards: IEC/EN 61131-2.

## Accessories



LRX 1V3 D024

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LRX C00



| Order code   | Description                                   | Qty per pkg | Wt. [kg] |
|--------------|---|-------------|----------|
| Accessories. |   |             |          |
| LRX M00      | Program backup memory                         | 1           | 0.002    |
| LRX C00      | PC-LRD connecting cable, 1.5m long            | 1           | 0.060    |
| LRX SW       | Programming and supervision software (CD-ROM) | 1           | 0.004    |
| LRX 1V3 D024 | Power supply unit, 100-240VAC/24VDC, 1.3A     | 1           | 0.188    |
| LRX D00      | User's manual Italian edition (paper)         | 1           | 0.397    |
| LRX D01      | User's manual English edition (paper)         | 1           | 0.397    |
| LRX D02      | User's manual Spanish edition (paper)         | 1           | 0.397    |
| LRX D03      | User's manual French edition (paper)          | 1           | 0.397    |

### General characteristics

- The LRX 1V3 D024 power supply produces a direct-current voltage to power the Kinco base and expansion modules in circumstances when 24VDC is not available in the application. The power supply can also be used to power eventual 24VDC auxiliary circuits.
- The LRX M00 backup memory consents to save the user's program and to simply and quickly transfer it to other Kinco base modules.
- The LRE P00 expansion implements communications using Modbus® protocol.

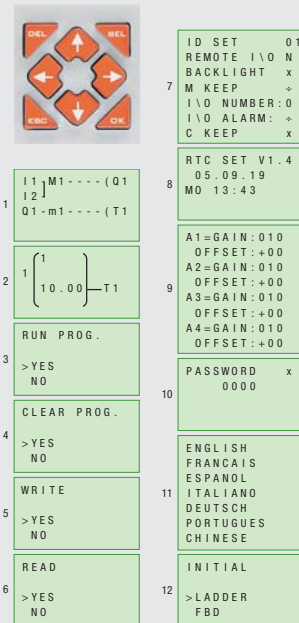
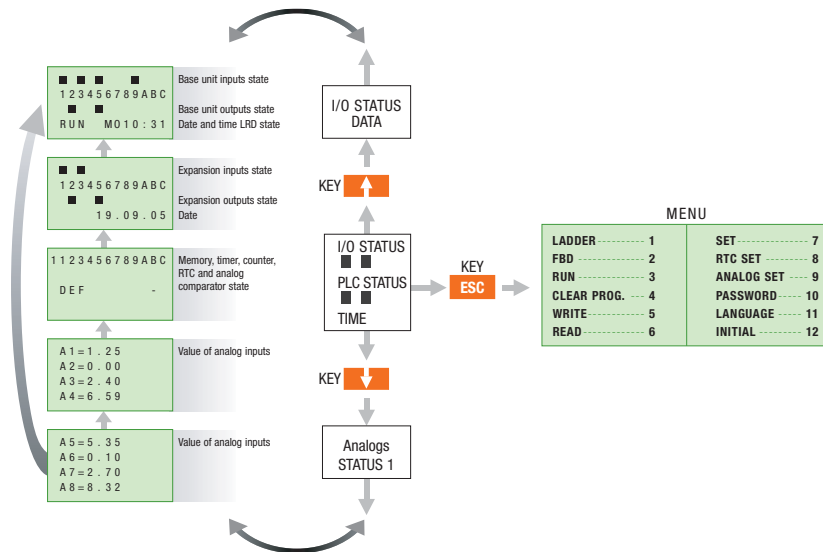
### Programming

At any time and with extreme simplicity, Kinco can be set up and reprogrammed to satisfy new requirements and improve the operation of a system. Programming is simple and intuitive and can be done directly on the relay keypad or by personal computer, connected by LRX C00 interface and using the relative LRX SW software.

Programming Kinco with the keypad is quite simple and straight forward, without particular programming knowledge. There are 8 function keys on the relay front, dedicated to on-board adjustment, control and supervision of digital input and output status, analog input values, time and date entry and the operation status of the relay itself.

Programming sequences are shown on a backlit 4-line 12-character display.

When using a Personal Computer (PC), two common language logics are available for programming: Function Block Diagram (FBD) and LADDER (contact scheme). Using the Simulator option, the user can control the exactness of the implemented program in off-line simulation, directly on the PC, before the ON-LINE testing and the system setup.



## Starter kits



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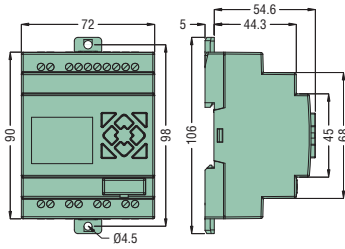
| Starter kits.   |  |   |       |
|-----------------|--|---|-------|
| LRDKIT 12R D024 | LRD starter kit complete with LRD12R D024 relay, LRX SW software and LRX C00 cable | 1 | 0.344 |
| LRDKIT 12R A024 | LRD starter kit complete with LRD12R A024 relay, LRX SW software and LRX C00 cable | 1 | 0.257 |
| LRDKIT 10R A240 | LRD starter kit complete with LRD10R A240 relay, LRX SW software and LRX C00 cable | 1 | 0.344 |

Dimensions page D-57

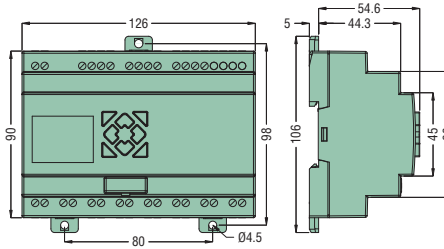
Wiring diagrams page W-38

Technical characteristics page TC-59

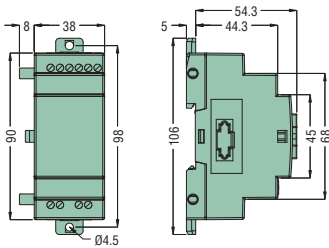
Base units **LRD10...**  
**LRD12...**



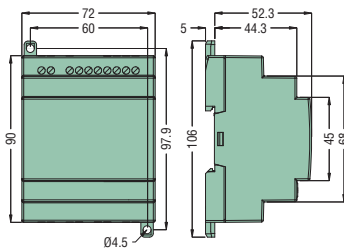
**LRD20...**



Expansion module **LRE...**

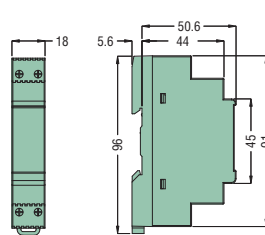


Power supply **LRX1V3 D024**

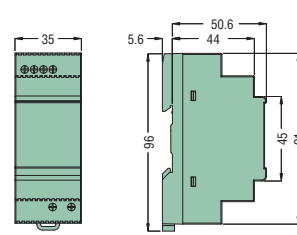


## Automatic power supplies

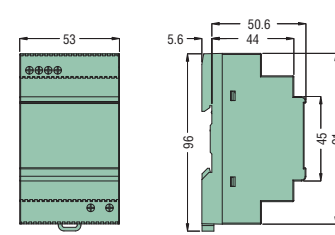
**PSL1M 010...**



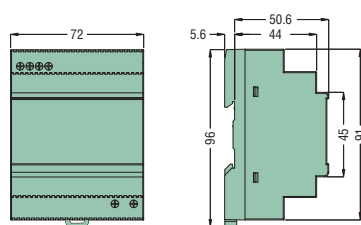
**PSL1M 024...**



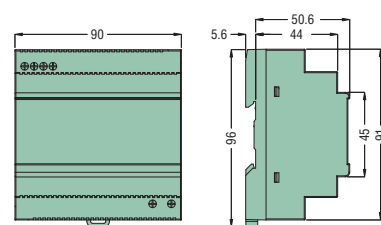
**PSL1M 033 12 - PSL1M 036 24**



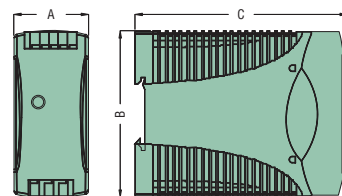
**PSL1M 054 12 - PSL1M 060 24**



**PSL1M 72 12 - PSL1M 100 24**

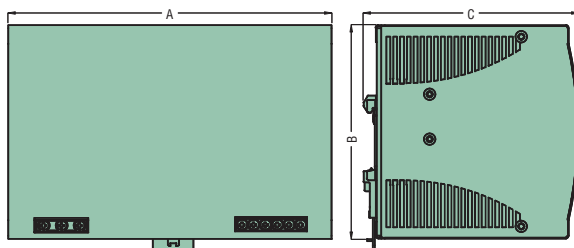


**PSL1 005 24 - PSL1 100 24**  
**PSL2 100 24**



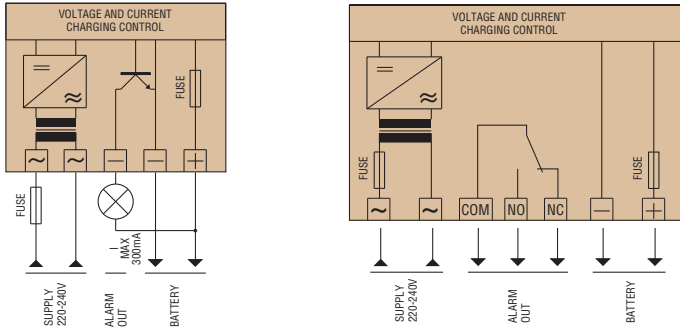
| TYPE        | A    | B  | C   |
|-------------|------|----|-----|
| PSL1 005 24 | 22.5 | 90 | 115 |
| PSL1 010 24 | 22.5 | 90 | 115 |
| PSL1 018 24 | 22.5 | 90 | 115 |
| PSL1 030 24 | 40.5 | 90 | 115 |
| PSL1 060 24 | 40.5 | 90 | 115 |
| PSL1 100 24 | 54   | 90 | 115 |
| PSL2 100 24 | 54   | 90 | 115 |

**PSL1 120 24 - PSL1 480 24**  
**PSL3...**



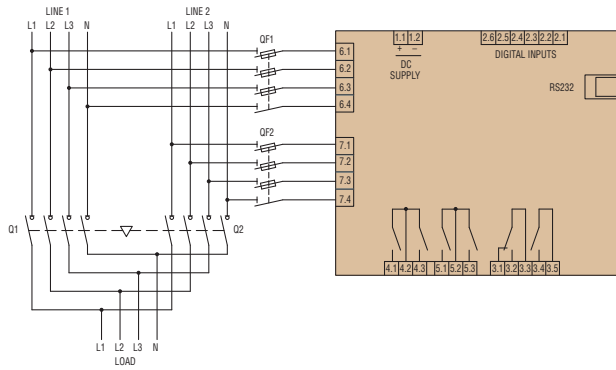
| TYPE        | A     | B     | C     |
|-------------|-------|-------|-------|
| PSL1 120 24 | 94    | 124.5 | 123.6 |
| PSL1 240 24 | 83.5  | 124.5 | 123.6 |
| PSL1 300 24 | 83.5  | 124.5 | 123.6 |
| PSL1 480 24 | 175.5 | 124.5 | 123.6 |
| PSL3 120 24 | 74.3  | 124   | 118.8 |
| PSL3 240 24 | 89    | 124   | 118.8 |
| PSL3 480 24 | 150   | 124   | 118.8 |
| PSL3 960 24 | 275.8 | 126.2 | 118.8 |

BCE...

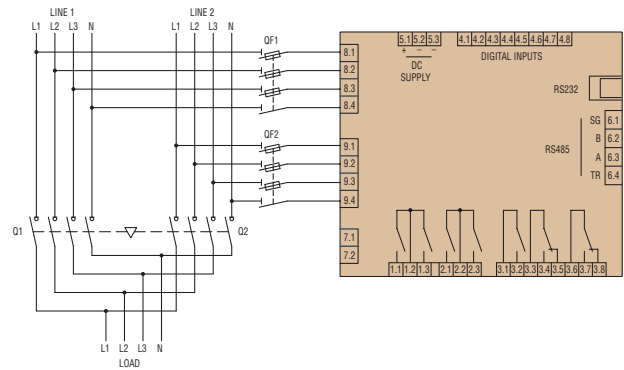


### Automatic transfer switch controllers

ATL 10



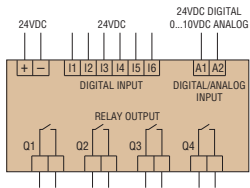
ATL 20 - ATL 30



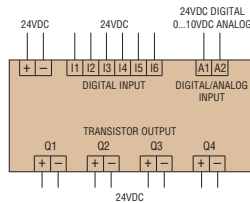
### Programmable logic relays

Base relay unit

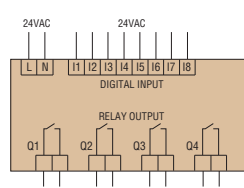
LRD12R D024



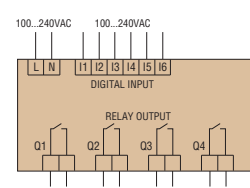
LRD12T D024



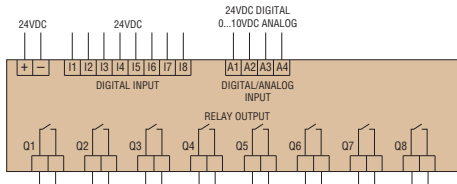
LRD12R A024



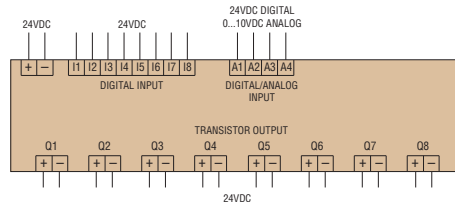
LRD10R A240



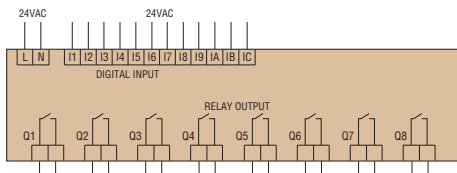
LRD20R D024



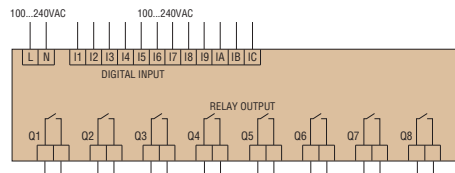
LRD20T D024



LRD20R A024

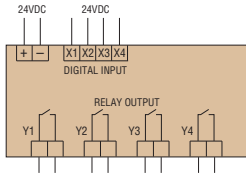


LRD20R A240

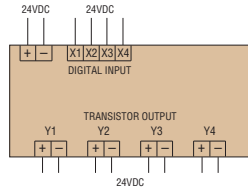


### Expansion modules

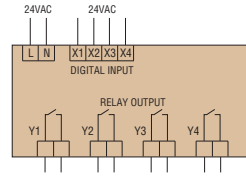
#### LRE08R D024



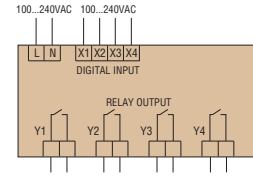
#### LRE08T D024



#### LRE8R A024

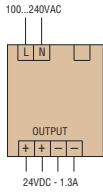


#### LRE8R A240



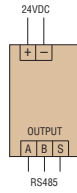
### Power supply unit

#### LRX 1V3 D024



### Communication modules

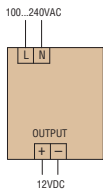
#### LRE P00



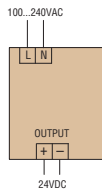
## Switching power supplies

### MODULAR SWITCHING POWER SUPPLIES

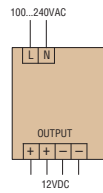
#### PSL1M 010 12



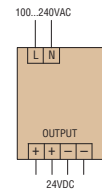
#### PSL1M 010 24



#### PSL1M 024 12 - PSL1M 033 12 PSL1M 054 12 - PSL1M 072 12



#### PSL1M 024 24 - PSL1M 036 24 PSL1M 060 24 - PSL1M 100 24

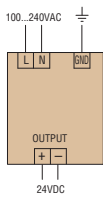


### DIN RAIL MOUNT SWITCHING POWER SUPPLIES

#### PSL1 005 24

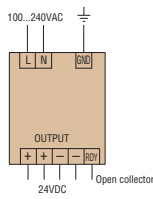
#### PSL1 010 24

#### PSL1 018 24



#### PSL1 030 24

#### PSL1 060 24

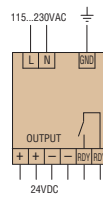


#### PSL1 100 24 - PSL1 120 24

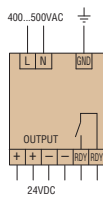
#### PSL1 240 24

#### PSL1 300 24

#### PSL1 480 24

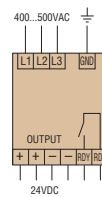


#### PSL2 100 24



#### PSL3 120 24 - PSL3 240 24

#### PSL3 480 24 - PSL3 900 24



### Operational characteristics

| TYPE  |                      | LRD... D024   | LRD... A024  | LRD... A240  |
|---|----------------------|---|--------------|--|
| <b>POWER SUPPLY</b>   |                      |   |              |  |
| Rated utilisation voltage U <sub>e</sub><br>(Frequency range) |                      | 24VDC   | 24VAC        | 100-240VAC (50-60Hz)   |
| Operating limits  |                      | 20.4-28.8VDC  | 20.4-28.8VAC | 85-265VAC (47-63Hz)  |
| <b>DIGITAL INPUTS</b>   |                      |   |              |  |
| Rated voltage   |                      | 24VDC   | 24VAC        | 110-220VAC   |
| Input voltage   | State 0              | ≤ 5VDC / < 0.625mA  | <6VAC        | < 40VAC / < 0.28mA<br>(LRD10A240)<br>< 0.15mA (LRD20A240)        |
|   | State 1              | > 15VDC / >1.875mA  | >14VAC       | > 79VAC / >0.41mA  |
| Delay time  | 0 to 1               | 5ms   | 5ms          | 50ms (U <sub>e</sub> =110VAC) -<br>25ms (U <sub>e</sub> =220VAC) |
|   | 1 to 0               | 3ms   | 3ms          | 50ms (U <sub>e</sub> =110VAC) -<br>90ms (U <sub>e</sub> =220VAC) |
| <b>ANALOG INPUTS FOR 24VDC VERSION ONLY</b>                   |                      |   |              |  |
| Input signal range  |                      | 0-10V   | —            | —  |
| Display resolution  |                      | 0.01V   | —            | —  |
| Conversion  |                      | 10bit   | —            | —  |
| Current consumption at 10VDC                                  |                      | < 0.17mA  | —            | —  |
| Input impedance   |                      | < 1kΩ   | —            | —  |
| Admissible overload   |                      | 28VDC   | —            | —  |
| Sampling time   |                      | 5-20ms (LADDER); 2-10ms (FBD)   |              |  |
| Maximum cable length  |                      | ≤ 30m of screened type  | —            | —  |
| <b>DIGITAL OUTPUTS</b>  |                      |   |              |  |
| Type of output / Rated current I <sub>th</sub>                |                      | Relay / 8A (LDR...R... / LRE08R... only)<br>Transistor / 0.3A 24VDC (LRD...T... / LRE08T... only) |              |  |
| Applied voltage   |                      | 12-24VAC / 12-125VDC (LDR...R... / LRE08R... only)<br>10-28.8VDC (LRD...T... / LRE08T... only)    |              |  |
| <b>AMBIENT CONDITIONS</b>                                     |                      |   |              |  |
| Operating temperature   |                      | -0...+55°C  |              |  |
| Storage temperature   |                      | -40...+70°C   |              |  |
| Relative humidity   |                      | 20-90% with condensation  |              |  |
| <b>HOUSING</b>  |                      |   |              |  |
| Version   |                      | Modular for mounting on 35mm DIN rail (IEC/EN 60715) or M4x15mm screw fixing                      |              |  |
| Connections   | Type of terminal     | Screw   |              |  |
|   | Conductor section    | 0.14-2.5mm <sup>2</sup> / 26-14AWG  |              |  |
|   | Tightening torque    | 0.4-0.6Nm / 0.3-0.4lbft   |              |  |
|   | Maximum cable length | ≤ 100m  |              |  |
| Degree of protection  |                      | IP20  |              |  |