# ELR W3- 24DC/500AC- 2I - Hybrid motor starter

2297031

https://www.phoenixcontact.com/gb/products/2297031

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Hybrid motor starter for reversing 3~ AC motors up to 500 V AC and 2 A output current, with 24 V DC control voltage, adjustable overload shutdown, emergency stop function to SIL 3/PL e, and screw connection

## Your advantages

- 22.5 mm wide
- Safety level in accordance with IEC 61508-1: SIL 3, ISO 13849: PL e
- Reduction in wiring
- Long service life
- Space saving
- 3-phase loop bridges
- Adjustable current for bimetal function
- Low-wear switching

## Commercial data

| | |
|---|---|
| Item number | 2297031 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | DK7412 |
| Product key | DK7412 |
| GTIN | 4046356167864 |
| Weight per piece (including packing) | 307 g |
| Weight per piece (excluding packing) | 282.7 g |
| Customs tariff number | 85371098 |
| Country of origin | DE |

# Technical data

## Product properties

| | |
|---|---|
| Product type | Hybrid motor starters |
| Product family | CONTACTRON |
| Operating mode | 100% operating factor |

## Electrical properties

| | |
|---|---|
| Number of phases | 3 |
| Motor starter type | Reversing starter |
| Switching frequency | ≤ 2 Hz (Load-dependent) |
| Maximum power dissipation for nominal condition | 2.2 W |
| Switching frequency | ≤ 2 Hz (Load-dependent) |
| Maximum power dissipation | 3.3 W |
| Minimum power dissipation | 1.1 W |

### Supply

| | |
|---|---|
| Rated control circuit supply voltage $U_S$ | 24 V DC |
| Control supply voltage range | 19.2 V DC ... 30 V DC |
| Rated control supply current $I_S$ | 40 mA |
| Protective circuit | Surge protection |
| | Reverse polarity protection |

### Insulation characteristics

| | |
|---|---|
| Rated insulation voltage | 500 V |
| Rated surge voltage | 6 kV |
| Overvoltage category | III |
| Degree of pollution | 2 |
| Insulation characteristics between the control input and control supply voltage, and auxiliary circuit to the main circuit | Safe isolation (IEC 60947-1) at operating voltage ≤ 300 V AC |
| | Basic insulation (IEC 60947-1) at operating voltage 300 V AC ... 500 V AC |
| Isolation characteristics between the control input and control supply voltage to auxiliary circuit | Safe isolation (IEC 60947-1) in the auxiliary circuit ≤ 300 V AC |

## Input data

### Control

| | |
|---|---|
| Input name | Control input right/left |
| Rated actuating voltage $U_C$ | 24 V DC |
| Triggering voltage range | 19.2 V DC ... 30 V DC |
| Rated actuating current $I_C$ | 5 mA |
| Switching threshold | 9.6 V (“0” signal) |
| | 19.2 V (“1” signal) |
| Switching level | < 5 V DC (For EMERGENCY STOP) |
| Typical response time | < 35 ms |

| | |
|---|---|
| Typical turn-off time | < 40 ms |

## Output data

AC output

| | |
|---|---|
| Rated operating voltage $U_e$ | 500 V AC |
| Operating voltage range | 42 V AC ... 550 V AC |
| Rated operating current $I_e$ | 2.4 A (AC-51) |
| | 2.4 A (AC-53a) |
| Mains frequency | 50/60 Hz |
| Load current range | 180 mA ... 2.4 A (see to derating) |
| Trigger characteristic in acc. with IEC 60947-4-2 | Class 10A |
| Cooling time | 20 min (for auto reset) |
| Leakage current | 0 mA |
| Residual voltage | < 0.3 V |
| Surge current | 100 A (t = 10 ms) |
| Protective circuit | Surge protection |

Acknowledge output

| | |
|---|---|
| Note | Confirmation: floating change-over contact, signal contact |
| Contact switching type | 1 changeover contact |
| Switching capacity in accordance with IEC 60947-5-1 | 3 A (230 V, AC15) |
| | 2 A (24 V, DC13) |
| Residual voltage | < 0.5 V |

## Connection data

Control circuits

| | |
|---|---|
| Connection method | Screw connection |
| Stripping length | 8 mm |
| Screw thread | M3 |
| Conductor cross-section rigid | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section AWG | 24 ... 14 |
| Tightening torque | 0.5 Nm ... 0.6 Nm |
| | 5 $lb_f$-in. ... 7 $lb_f$-in. |

Load circuit

| | |
|---|---|
| Connection method | Screw connection |
| Stripping length | 8 mm |
| Screw thread | M3 |
| Conductor cross-section rigid | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section AWG | 24 ... 14 |
| Tightening torque | 0.5 Nm ... 0.6 Nm |
| | 5 $lb_f$-in. ... 7 $lb_f$-in. |

## Signaling

| | |
|---|---|
| Status display | LED (yellow) |
| Operating voltage display | Green LED |
| Error indication | Red LED |

## Dimensions

| | |
|---|---|
| Width | 22.5 mm |
| Height | 107 mm |
| Depth | 114 mm |

## Material specifications

| | |
|---|---|
| Flammability rating according to UL 94 (Housing) | V0 (Housing) |

## Environmental and real-life conditions

### Ambient conditions

| | |
|---|---|
| Degree of protection | IP20 |
| Ambient temperature (operation) | -25 °C ... 70 °C (observe derating) |
| Ambient temperature (storage/transport) | -40 °C ... 80 °C |
| Altitude | ≤ 2000 m |

## Approvals

### ATEX

| | |
|---|---|
| Identification | Ⓔx II (2) G [Ex e] [Ex d] [Ex px] |
| | Ⓔx II (2) D [Ex t] [Ex p] |
| Certificate | PTB 07 ATEX 3145 |

### UL approval

| | |
|---|---|
| Certificate | NLDX.E228652 |

### Safety Integrity Level (SIL, IEC 61508)

| | |
|---|---|
| Identification | ≤ 3 |
| Note | Safe shutdown |

### Safety Integrity Level (SIL, IEC 61508)

| | |
|---|---|
| Identification | 2 |
| Note | Motor protection |

### Performance Level (ISO 13849)

| | |
|---|---|
| Identification | ≤ e |
| Note | Safe shutdown |

### Category (ISO 13849)

| | |
|---|---|
| Identification | ≤ 3 |
| Note | Safe shutdown |

UL data

| | |
|---|---|
| SCCR | 100 kA (500 V AC (fuse: 30 A class CC/30 A class J (high fault))) |
| | 5 kA (500 V AC (fuse: 20 A RK5 (standard fault))) |
| FLA | 2.4 A (500 V AC) |
| Group installation | 20 A (class RK5, SCCR 5kA, #24 - 14 AWG max. solid and stranded) |
| | 30 A (class CC or J, SCCR 100kA, #24 - 14 AWG max, solid and stranded) |
| Category code | NLDX |

## Standards and regulations

Standards/regulations

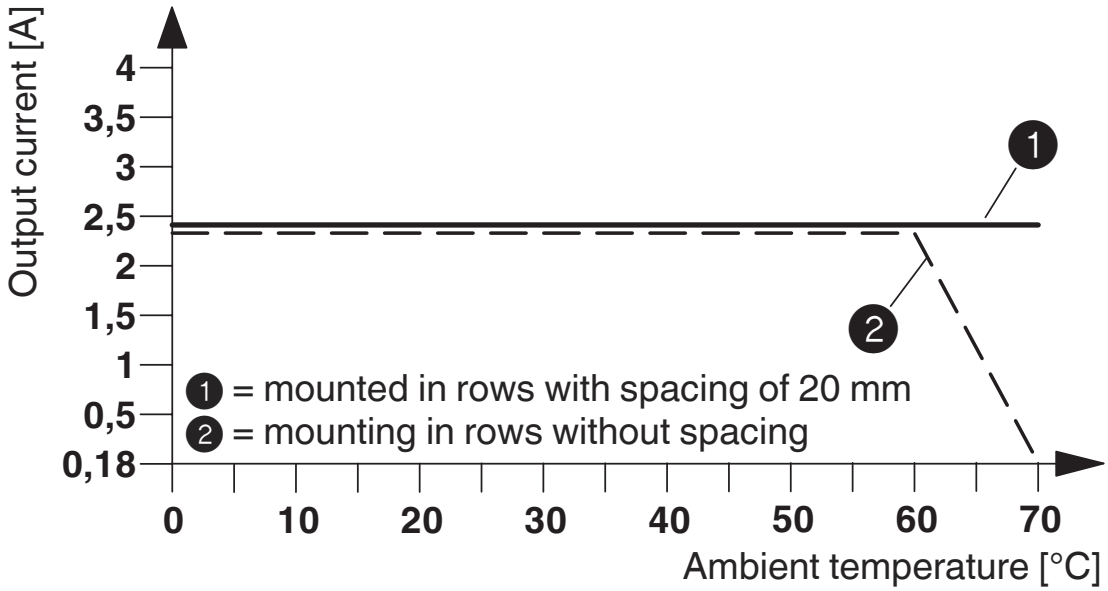
| | |
|---|---|
| Standards/regulations | EN 60947 |
| | IEC 61508 |
| | ISO 13849 |

## Mounting

| | |
|---|---|
| Mounting type | DIN rail mounting |
| Assembly note | can be aligned with spacing = 20 mm |
| Mounting position | Vertical (horizontal DIN rail) |

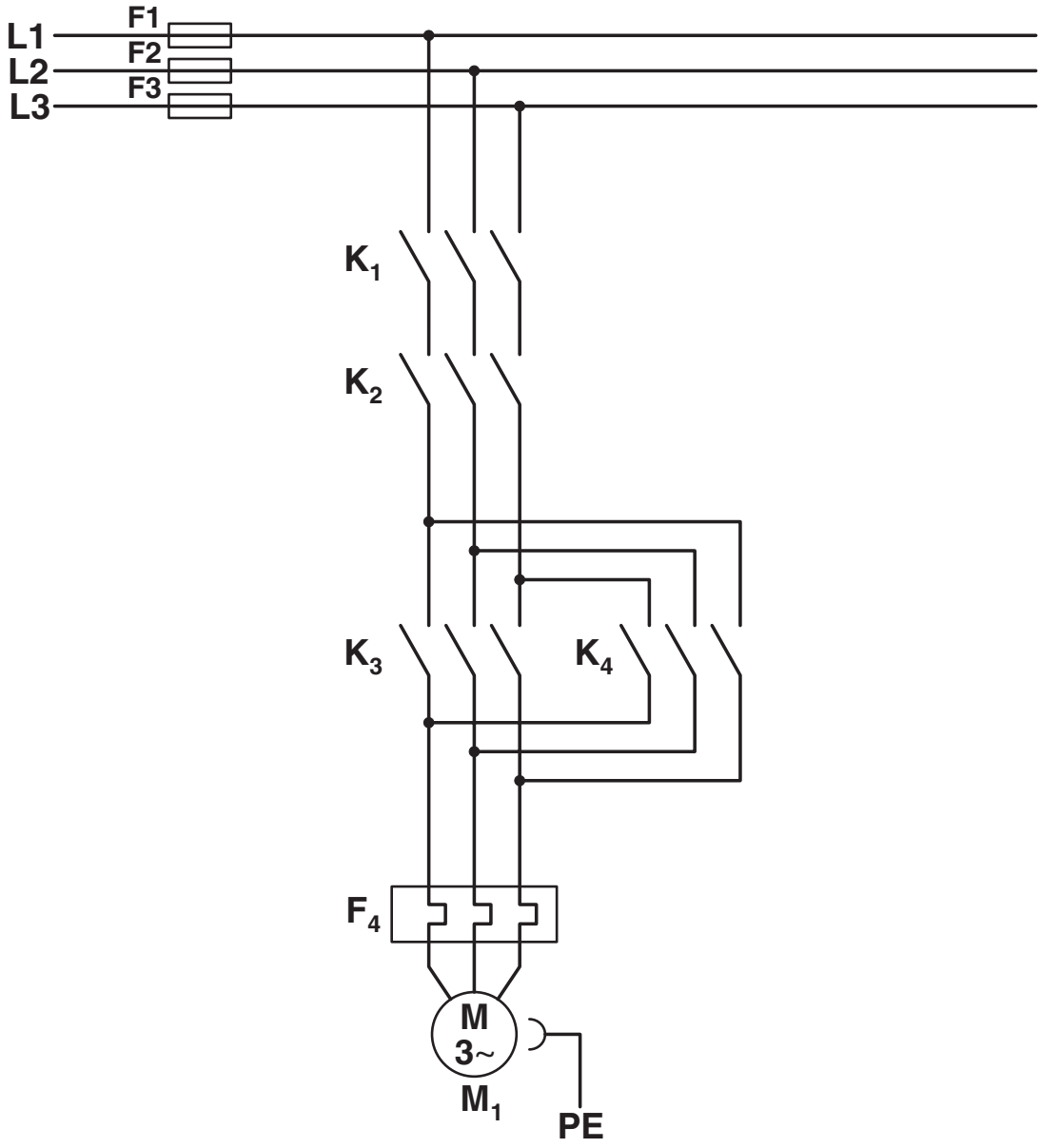
## Drawings

Diagram




Derating diagram

Circuit diagram

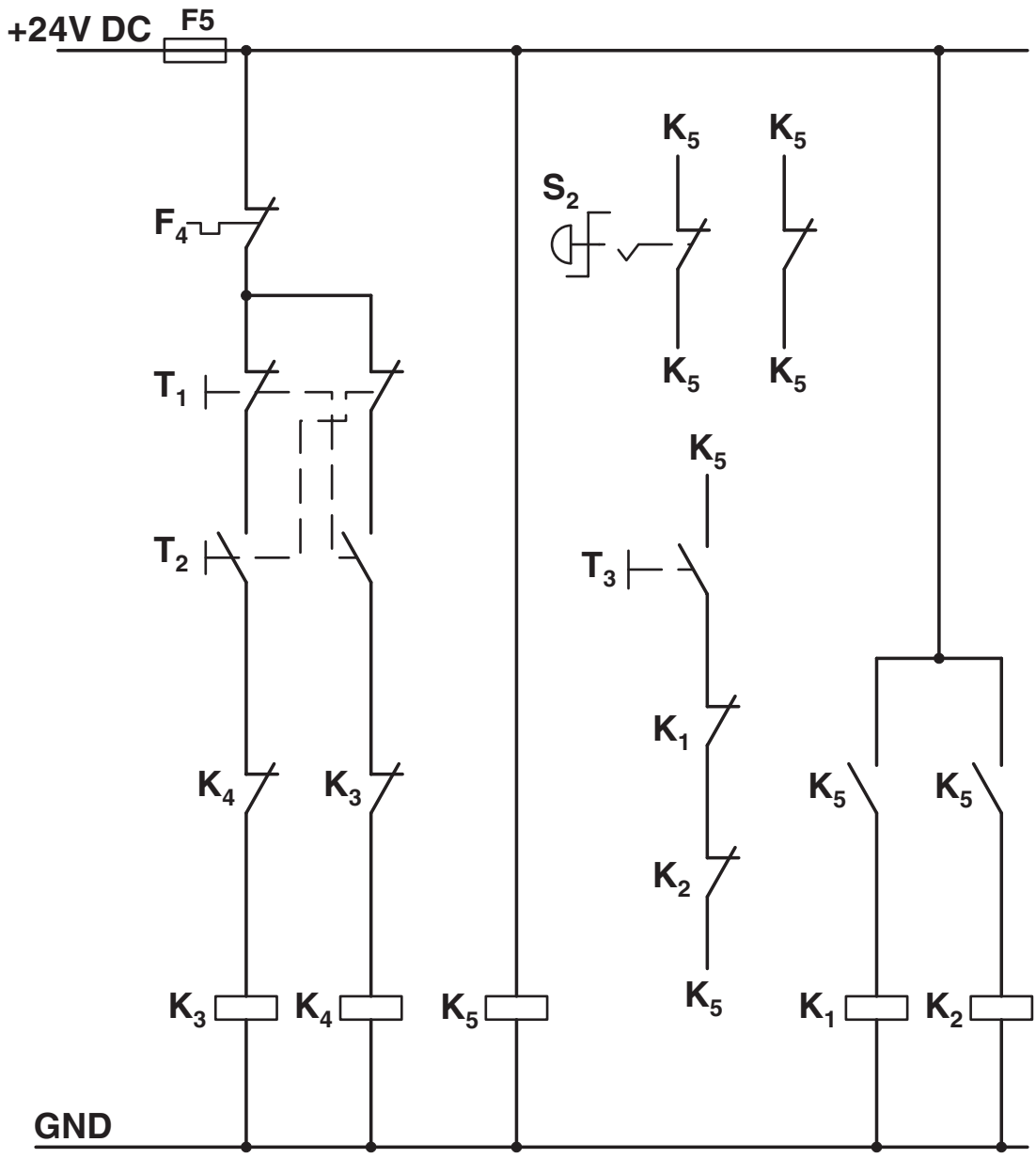



## Conventional structure

Main current path for reversing contactor according to category 3

K1 + K2 = Emergency stop contactor
K3 = Left contactor
K4 = Right contactor
F4 = Motor protection relay

Circuit diagram

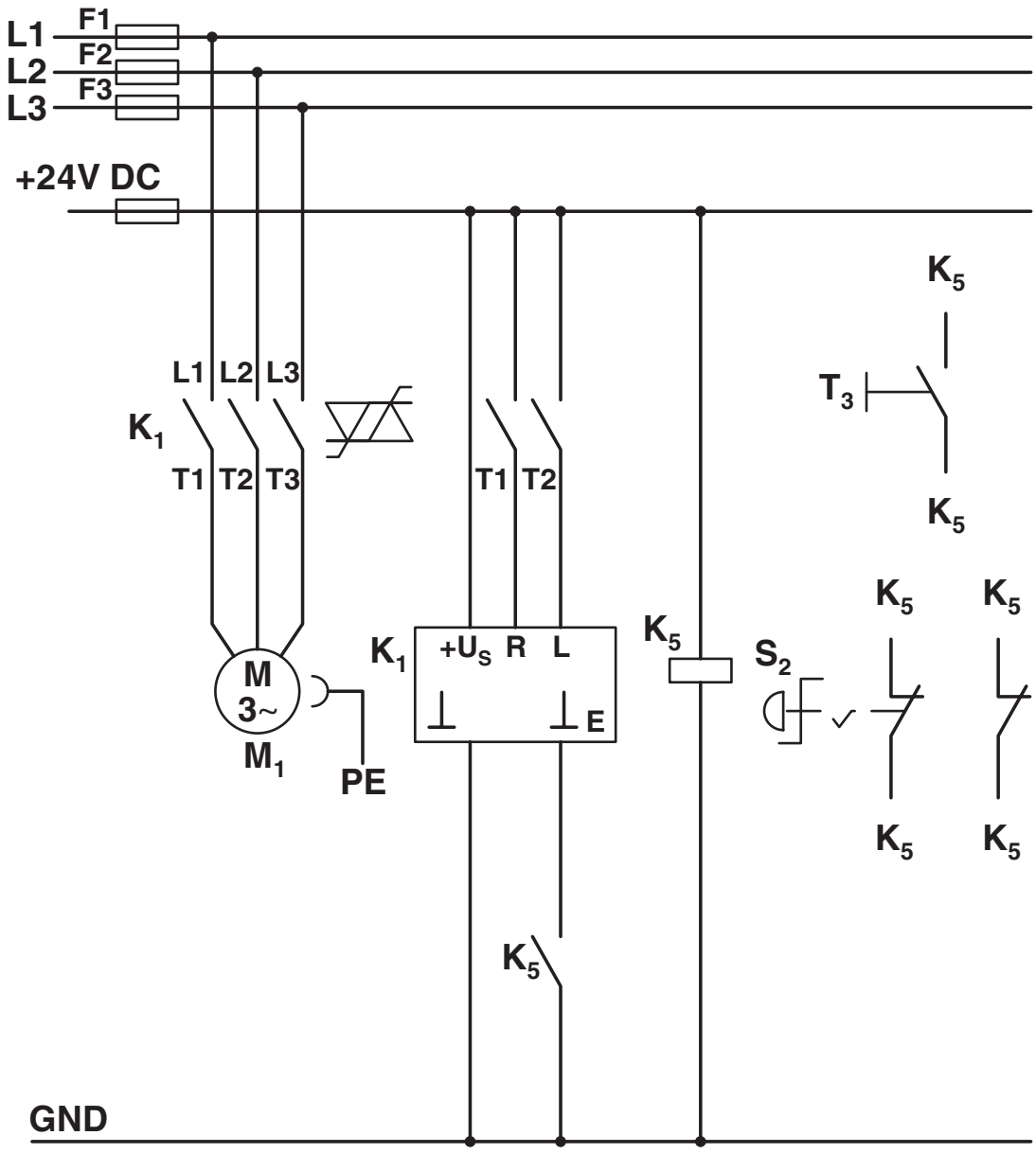



## Conventional structure

Control current path reversing contactor according to category 3

K1 + K2 = Emergency stop contactor
K3 = Left contactor
K4 = Right contactor
K5 = PSR SCP-24DC.../Safety relay
T1 = Right, T2 = Left, T3 = Reset
S2 = Emergency stop
F4 = Motor protection relay

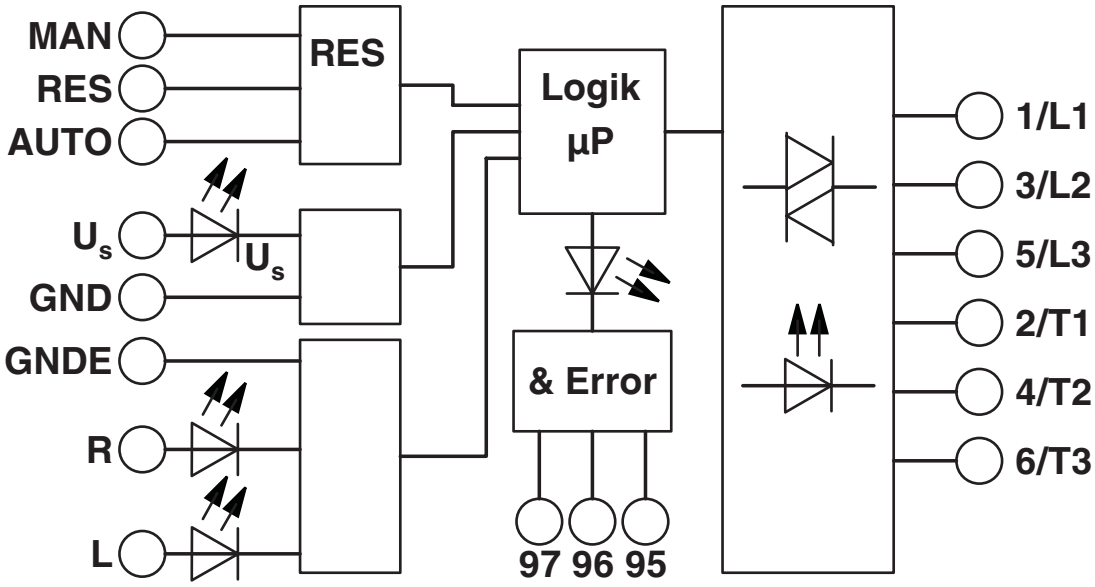
Circuit diagram




## Structure with CONTACTRON

Main and control current path for '4 in 1' hybrid motor starter with reversing function according to category 3
K1 = '4 in 1' hybrid motor starter with reversing function
K5 = PSR SCP-24DC.../Safety relay
T1 = Right, T2 = Left, T3 = Reset
S2 = Emergency stop

Block diagram



## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/gb/products/2297031

**IECEE CB Scheme**
Approval ID: DE1-55728

**UL Listed**
Approval ID: FILE E 323771

**CCC**
Approval ID: 2016010304871315

**cUL Listed**
Approval ID: FILE E 323771

**cUL Listed**
Approval ID: E228652

**UL Listed**
Approval ID: E228652

**CCC**
Approval ID: 2024010304672817

**DNV**
Approval ID: TAA00002HK

**ATEX**
Approval ID: PTB 07 ATEX 3145

## Classifications

### ECLASS

| | |
|---|---|
| ECLASS-13.0 | 27370905 |
| ECLASS-15.0 ASSET | 27250101 |
| ECLASS-15.0 | 27370905 |

### ETIM

| | |
|---|---|
| ETIM 10.0 | EC001037 |

### UNSPSC

| | |
|---|---|
| UNSPSC 21.0 | 25173900 |

## Environmental product compliance

EU RoHS

| | |
|---|---|
| Fulfills EU RoHS substance requirements | Yes |
| Exemption | 7(a), 7(a)-I, 7(c)-I |

China RoHS

| | |
|---|---|
| Environment friendly use period (EFUP) | EFUP-50 |
| | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |

EU REACH SVHC

| | |
|---|---|
| REACH candidate substance (CAS No.) | 1-Methyl-2-pyrrolidone (NMP)(CAS: 872-50-4) |
| | Lead(CAS: 7439-92-1) |
| SCIP | cc9358cc-6777-4686-8f14-76490f080910 |


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