


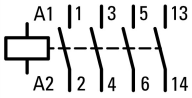


**Contactors, 3 pole, 380 V 400 V 5.5 kW, 1 N/O, 110 V 50/60 Hz, AC operation, Screw terminals**



**Part no.** DILM12-10(110V50/60HZ)  
**Catalog No.** 276836  
**Alternate Catalog No.** XTCE012B10E2

**Delivery program**

|   |                |    |  |
|---|----------------|----|--|
| Product range   |                |    | Contactors   |
| Application   |                |    | Contactors for Motors  |
| Subrange  |                |    | Contactors up to 170 A, 3 pole   |
| Utilization category                                      |                |    | AC-1: Non-inductive or slightly inductive loads, resistance furnaces<br>NAC-3: Normal AC induction motors: starting, switch off during running<br>AC-4: Normal AC induction motors: starting, plugging, reversing, inching |
| Notes   |                |    | <br>Also suitable for motors with efficiency class IE3.<br>IE3-ready devices are identified by the logo on their packaging.              |
| Connection technique                                      |                |    | Screw terminals  |
| Number of poles   |                |    | 3 pole   |
| <b>Rated operational current</b>                          |                |    |  |
| AC-3  |                |    |  |
| Notes   |                |    | At maximum permissible ambient temperature (open.)   |
| 380 V 400 V   | $I_e$          | A  | 12   |
| AC-1  |                |    |  |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz |                |    |  |
| Open  |                |    |  |
| at 40 °C  | $I_{th} = I_e$ | A  | 22   |
| enclosed  | $I_{th}$       | A  | 18   |
| Conventional free air thermal current, 1 pole             |                |    |  |
| open  | $I_{th}$       | A  | 50   |
| enclosed  | $I_{th}$       | A  | 45   |
| <b>Max. rating for three-phase motors, 50 - 60 Hz</b>     |                |    |  |
| AC-3  |                |    |  |
| 220 V 230 V   | P              | kW | 3.5  |
| 380 V 400 V   | P              | kW | 5.5  |
| 660 V 690 V   | P              | kW | 6.5  |
| AC-4  |                |    |  |
| 220 V 230 V   | P              | kW | 2  |
| 380 V 400 V   | P              | kW | 3  |
| 660 V 690 V   | P              | kW | 4.4  |
| <b>Contacts</b>   |                |    |  |
| N/O = Normally open                                       |                |    | 1 N/O  |
| Contact sequence  |                |    |    |
| <b>Instructions</b>                                       |                |    |  |
| Can be combined with auxiliary contact                    |                |    | Contacts to EN 50 012.<br>DILM32-XHI...<br>DILA-XHI(V)...  |
| Actuating voltage   |                |    | 110 V 50/60 Hz   |
| Voltage AC/DC   |                |    | AC operation   |
| Connection to SmartWire-DT                                |                |    | no   |
| Frame size  |                |    | 1  |

## Technical data

### General

|   |              |                 |  |
|---|--------------|-----------------|--|
| Standards   |              |                 | IEC/EN 60947, VDE 0660, UL, CSA  |
| Lifespan, mechanical  |              |                 |  |
| AC operated   | Operations   | $\times 10^6$   | 10   |
| Operating frequency, mechanical                                       |              |                 |  |
| AC operated   | Operations/h |                 | 9000   |
| Climatic proofing   |              |                 | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30     |
| Ambient temperature   |              |                 |  |
| Open  |              | °C              | -25 - +60  |
| Enclosed  |              | °C              | - 25 - 40  |
| Storage   |              | °C              | - 40 - 80  |
| Mounting position   |              |                 |  |
| Mechanical shock resistance (IEC/EN 60068-2-27)                       |              |                 |  |
| Half-sinusoidal shock, 10 ms  |              |                 |  |
| Main contacts   |              |                 |  |
| N/O contact   |              | g               | 10   |
| Auxiliary contacts  |              |                 |  |
| N/O contact   |              | g               | 7  |
| N/C contact   |              | g               | 5  |
| Mechanical shock resistance (IEC/EN 60068-2-27) when tabletop-mounted |              |                 |  |
| Half-sinusoidal shock, 10 ms  |              |                 |  |
| Main contacts   |              |                 |  |
| N/O contact   |              | g               | 5.7  |
| Auxiliary contacts  |              |                 |  |
| N/O contact   |              | g               | 3.4  |
| N/C contact   |              | g               | 3.4  |
| Degree of Protection  |              |                 | IP20   |
| Protection against direct contact when actuated from front (EN 50274) |              |                 | Finger and back-of-hand proof  |
| Altitude  |              | m               | Max. 2000  |
| Weight  |              |                 |  |
| AC operated   |              | kg              | 0.24   |
| Screw connector terminals   |              |                 |  |
| Terminal capacity main cable  |              |                 |  |
| Solid   |              | mm <sup>2</sup> | 1 x (0.75 - 4)<br>2 x (0.75 - 2.5)   |
| Flexible with ferrule   |              | mm <sup>2</sup> | 1 x (0.75 - 2.5)<br>2 x (0.75 - 2.5)   |
| Solid or stranded   |              | AWG             | single 18 - 10, double 18 - 14   |
| Stripping length  |              | mm              | 10   |
| Terminal screw  |              |                 | M3.5   |
| Tightening torque   |              | Nm              | 1.2  |
| Tool  |              |                 |  |
| Pozidriv screwdriver  |              | Size            | 2  |
| Standard screwdriver  |              | mm              | 0.8 x 5.5<br>1 x 6   |
| Terminal capacity control circuit cables                              |              |                 |  |
| Solid   |              | mm <sup>2</sup> | 1 x (0.75 - 4)<br>2 x (0.75 - 2.5)   |
| Flexible with ferrule   |              | mm <sup>2</sup> | 1 x (0.75 - 2.5)<br>2 x (0.75 - 2.5)   |
| Solid or stranded   |              | AWG             | 18 - 14  |

|                      |  |      |                    |
|----------------------|--|------|--------------------|
| Stripping length     |  | mm   | 10                 |
| Terminal screw       |  |      | M3.5               |
| Tightening torque    |  | Nm   | 1.2                |
| Tool                 |  |      |                    |
| Pozidriv screwdriver |  | Size | 2                  |
| Standard screwdriver |  | mm   | 0.8 x 5.5<br>1 x 6 |

### Main conducting paths

|  |             |      |       |
|--|-------------|------|-------|
| Rated impulse withstand voltage        | $U_{imp}$   | V AC | 8000  |
| Overvoltage category/pollution degree  |             |      | III/3 |
| Rated insulation voltage               | $U_i$       | V AC | 690   |
| Rated operational voltage              | $U_e$       | V AC | 690   |
| Safe isolation to EN 61140             |             |      |       |
| between coil and contacts              |             | V AC | 400   |
| between the contacts                   |             | V AC | 400   |
| Making capacity (p.f. to IEC/EN 60947) |             |      |       |
|  | Up to 690 V | A    | 144   |
| Breaking capacity                      |             |      |       |
| 220 V 230 V                            |             | A    | 120   |
| 380 V 400 V                            |             | A    | 120   |
| 500 V                                  |             | A    | 100   |
| 660 V 690 V                            |             | A    | 70    |
| Short-circuit rating                   |             |      |       |
| Short-circuit protection maximum fuse  |             |      |       |
| Type "2" coordination                  |             |      |       |
| 400 V                                  | gG/gL 500 V | A    | 20    |
| 690 V                                  | gG/gL 690 V | A    | 20    |
| Type "1" coordination                  |             |      |       |
| 400 V                                  | gG/gL 500 V | A    | 35    |
| 690 V                                  | gG/gL 690 V | A    | 25    |

### AC

|   |                |   |  |
|---|----------------|---|--|
| AC-1  |                |   |  |
| Rated operational current                                 |                |   |  |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz |                |   |  |
| Open  |                |   |  |
| at 40 °C  | $I_{th} = I_e$ | A | 22   |
| at 50 °C  | $I_{th} = I_e$ | A | 21   |
| at 55 °C  | $I_{th} = I_e$ | A | 21   |
| at 60 °C  | $I_{th} = I_e$ | A | 20   |
| enclosed  | $I_{th}$       | A | 18   |
| Conventional free air thermal current, 1 pole             |                |   |  |
| open  | $I_{th}$       | A | 50   |
| enclosed  | $I_{th}$       | A | 45   |
| AC-3  |                |   |  |
| Rated operational current                                 |                |   |  |
| Open, 3-pole: 50 – 60 Hz                                  |                |   |  |
| Notes   |                |   | At maximum permissible ambient temperature (open.) |
| 220 V 230 V   | $I_e$          | A | 12   |
| 240 V   | $I_e$          | A | 12   |
| 380 V 400 V   | $I_e$          | A | 12   |
| 415 V   | $I_e$          | A | 12   |
| 440V  | $I_e$          | A | 12   |
| 500 V   | $I_e$          | A | 10   |
| 660 V 690 V   | $I_e$          | A | 7  |
| 380 V 400 V   | $I_e$          | A | 12   |

|              |   |     |     |
|--------------|---|-----|-----|
| Motor rating | P | kWh |     |
| 220 V 230 V  | P | kW  | 3.5 |
| 240V         | P | kW  | 4   |
| 380 V 400 V  | P | kW  | 5.5 |
| 415 V        | P | kW  | 7   |
| 440 V        | P | kW  | 7.5 |
| 500 V        | P | kW  | 7   |
| 660 V 690 V  | P | kW  | 6.5 |

#### AC-4

|                          |       |   |   |
|--------------------------|-------|---|---|
| Open, 3-pole: 50 – 60 Hz |       |   |   |
| 220 V 230 V              | $I_e$ | A | 7 |
| 240 V                    | $I_e$ | A | 7 |
| 380 V 400 V              | $I_e$ | A | 7 |
| 415 V                    | $I_e$ | A | 7 |
| 440 V                    | $I_e$ | A | 7 |
| 500 V                    | $I_e$ | A | 6 |
| 660 V 690 V              | $I_e$ | A | 5 |

|              |   |     |     |
|--------------|---|-----|-----|
| Motor rating | P | kWh |     |
| 220 V 230 V  | P | kW  | 2   |
| 240 V        | P | kW  | 2.2 |
| 380 V 400 V  | P | kW  | 3   |
| 415 V        | P | kW  | 3.4 |
| 440 V        | P | kW  | 3.6 |
| 500 V        | P | kW  | 3.5 |
| 660 V 690 V  | P | kW  | 4.4 |

#### DC

|                                 |       |   |    |
|---------------------------------|-------|---|----|
| Rated operational current, open |       |   |    |
| DC-1                            |       |   |    |
| 60 V                            | $I_e$ | A | 20 |
| 110 V                           | $I_e$ | A | 20 |
| 220 V                           | $I_e$ | A | 15 |

#### Current heat loss

|  |  |    |     |
|--|--|----|-----|
| 3 pole, at $I_{th}$ (60°)                |  | W  | 2.5 |
| Current heat loss at $I_e$ to AC-3/400 V |  | W  | 0.9 |
| Impedance per pole                       |  | mΩ | 2.5 |

#### Magnet systems

|  |          |          |  |
|--|----------|----------|--|
| Voltage tolerance  |          |          |  |
| AC operated  | Pick-up  | $x U_c$  | 0.8 - 1.1  |
| Drop-out voltage AC operated                                       | Drop-out | $x U_c$  | 0.3 - 0.6  |
| Power consumption of the coil in a cold state and $1.0 \times U_S$ |          |          |  |
| 50/60 Hz   | Pick-up  | VA       | 27<br>25   |
| 50/60 Hz   | Sealing  | VA       | 4.2<br>3.3   |
| 50/60 Hz   | Sealing  | W        | 1.4<br>1.2   |
| Duty factor  |          | % DF     | 100  |
| Changeover time at 100 % $U_S$ (recommended value)                 |          |          |  |
| Main contacts  |          |          |  |
| AC operated  |          |          |  |
| Closing delay  |          | ms       | 15 - 21  |
| Opening delay  |          | ms       | 9 - 18   |
| Arcing time  |          | ms       | 10   |
| Lifespan, mechanical; Coil 50/60 Hz                                |          | $x 10^6$ | Mechanical lifespan at 50 Hz approx. 30% lower than under → Technical data general |

#### Electromagnetic compatibility (EMC)

|                      |  |  |               |
|----------------------|--|--|---------------|
| Emitted interference |  |  | to EN 60947-1 |
|----------------------|--|--|---------------|

## Rating data for approved types

|   |    |                         |      |
|---|----|-------------------------|------|
| Switching capacity  |    |                         |      |
| Maximum motor rating                                      |    |                         |      |
| Three-phase   |    |                         |      |
| 200 V<br>208 V  | HP | 3                       |      |
| 230 V<br>240 V  | HP | 3                       |      |
| 460 V<br>480 V  | HP | 10                      |      |
| 575 V<br>600 V  | HP | 10                      |      |
| Single-phase  |    |                         |      |
| 115 V<br>120 V  | HP | 1                       |      |
| 230 V<br>240 V  | HP | 2                       |      |
| General use   | A  | 20                      |      |
| Auxiliary contacts  |    |                         |      |
| Pilot Duty  |    |                         |      |
| AC operated   |    |                         | A600 |
| DC operated   |    |                         | P300 |
| General Use   |    |                         |      |
| AC  | V  | 600                     |      |
| AC  | A  | 10                      |      |
| DC  | V  | 250                     |      |
| DC  | A  | 1                       |      |
| Short Circuit Current Rating                              |    |                         |      |
| SCCR  |    |                         |      |
| Basic Rating  |    |                         |      |
| SCCR  | kA | 5                       |      |
| max. Fuse   | A  | 45                      |      |
| max. CB   | A  | 60                      |      |
| 480 V High Fault  |    |                         |      |
| SCCR (fuse)   | kA | 30/100                  |      |
| max. Fuse   | A  | 25 Class RK5/45 Class J |      |
| 600 V High Fault  |    |                         |      |
| SCCR (fuse)   | kA | 30/100                  |      |
| max. Fuse   | A  | 25 Class RK5/45 Class J |      |
| Special Purpose Ratings                                   |    |                         |      |
| Electrical Discharge Lamps (Ballast)                      |    |                         |      |
| 480V 60Hz 3phase, 277V 60Hz 1phase                        | A  | 20                      |      |
| 600V 60Hz 3phase, 347V 60Hz 1phase                        | A  | 20                      |      |
| Incandescent Lamps (Tungsten)                             |    |                         |      |
| 480V 60Hz 3phase, 277V 60Hz 1phase                        | A  | 14                      |      |
| 600V 60Hz 3phase, 347V 60Hz 1phase                        | A  | 14                      |      |
| Resistance Air Heating                                    |    |                         |      |
| 480V 60Hz 3phase, 277V 60Hz 1phase                        | A  | 20                      |      |
| 600V 60Hz 3phase, 347V 60Hz 1phase                        | A  | 20                      |      |
| Refrigeration Control (CSA only)                          |    |                         |      |
| LRA 480V 60Hz 3phase                                      | A  | 60                      |      |
| FLA 480V 60Hz 3phase                                      | A  | 10                      |      |
| LRA 600V 60Hz 3phase                                      | A  | 60                      |      |
| FLA 600V 60Hz 3phase                                      | A  | 10                      |      |
| Definite Purpose Ratings (100,000 cycles acc. to UL 1995) |    |                         |      |
| LRA 480V 60Hz 3phase                                      | A  | 72                      |      |
| FLA 480V 60Hz 3phase                                      | A  | 12                      |      |
| Elevator Control  |    |                         |      |

|                  |    |     |
|------------------|----|-----|
| 200V 60Hz 3phase | HP | 2   |
| 200V 60Hz 3phase | A  | 7.8 |
| 240V 60Hz 3phase | HP | 2   |
| 240V 60Hz 3phase | A  | 6.8 |
| 480V 60Hz 3phase | HP | 7.5 |
| 480V 60Hz 3phase | A  | 11  |
| 600V 60Hz 3phase | HP | 7.5 |
| 600V 60Hz 3phase | A  | 9   |

## Design verification as per IEC/EN 61439

| Technical data for design verification   |            |    |  |
|--|------------|----|--|
| Rated operational current for specified heat dissipation   | $I_n$      | A  | 12   |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 0.3  |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 0  |
| Static heat dissipation, non-current-dependent   | $P_{vs}$   | W  | 1.4  |
| Heat dissipation capacity  | $P_{diss}$ | W  | 0  |
| Operating ambient temperature min.   |            | °C | -25  |
| Operating ambient temperature max.   |            | °C | 60   |
| IEC/EN 61439 design verification   |            |    |  |
| 10.2 Strength of materials and parts   |            |    |  |
| 10.2.2 Corrosion resistance  |            |    | Meets the product standard's requirements.   |
| 10.2.3.1 Verification of thermal stability of enclosures   |            |    | Meets the product standard's requirements.   |
| 10.2.3.2 Verification of resistance of insulating materials to normal heat   |            |    | Meets the product standard's requirements.   |
| 10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects |            |    | Meets the product standard's requirements.   |
| 10.2.4 Resistance to ultra-violet (UV) radiation   |            |    | Meets the product standard's requirements.   |
| 10.2.5 Lifting   |            |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.2.6 Mechanical impact   |            |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.2.7 Inscriptions  |            |    | Meets the product standard's requirements.   |
| 10.3 Degree of protection of ASSEMBLIES  |            |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.4 Clearances and creepage distances   |            |    | Meets the product standard's requirements.   |
| 10.5 Protection against electric shock   |            |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.6 Incorporation of switching devices and components   |            |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.7 Internal electrical circuits and connections  |            |    | Is the panel builder's responsibility.   |
| 10.8 Connections for external conductors   |            |    | Is the panel builder's responsibility.   |
| 10.9 Insulation properties   |            |    |  |
| 10.9.2 Power-frequency electric strength   |            |    | Is the panel builder's responsibility.   |
| 10.9.3 Impulse withstand voltage   |            |    | Is the panel builder's responsibility.   |
| 10.9.4 Testing of enclosures made of insulating material   |            |    | Is the panel builder's responsibility.   |
| 10.10 Temperature rise   |            |    | The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices. |
| 10.11 Short-circuit rating   |            |    | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.12 Electromagnetic compatibility  |            |    | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.13 Mechanical function  |            |    | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.                         |

## Technical data ETIM 7.0

| Low-voltage industrial components (EG000017) / Power contactor, AC switching (EC000066)   |   |           |
|---|---|-----------|
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Contactor (LV) / Power contactor, AC switching (ecl@ss10.0.1-27-37-10-03 [AAB718015]) |   |           |
| Rated control supply voltage $U_s$ at AC 50HZ   | V | 110 - 110 |
| Rated control supply voltage $U_s$ at AC 60HZ   | V | 110 - 110 |
| Rated control supply voltage $U_s$ at DC  | V | 0 - 0     |
| Voltage type for actuating  |   | AC        |
| Rated operation current $I_e$ at AC-1, 400 V  | A | 22        |
| Rated operation current $I_e$ at AC-3, 400 V  | A | 12        |

|   |  |    |                  |
|---|--|----|------------------|
| Rated operation power at AC-3, 400 V                    |  | kW | 5.5              |
| Rated operation current Ie at AC-4, 400 V               |  | A  | 7                |
| Rated operation power at AC-4, 400 V                    |  | kW | 3                |
| Rated operation power NEMA                              |  | kW | 7.4              |
| Modular version   |  |    | No               |
| Number of auxiliary contacts as normally open contact   |  |    | 1                |
| Number of auxiliary contacts as normally closed contact |  |    | 0                |
| Type of electrical connection of main circuit           |  |    | Screw connection |
| Number of normally closed contacts as main contact      |  |    | 0                |
| Number of main contacts as normally open contact        |  |    | 3                |

## Approvals

|                                      |  |  |  |
|--------------------------------------|--|--|--|
| Product Standards                    |  |  | IEC/EN 60947-4-1; UL 60947-4-1; CSA - C22.2 No. 60947-4-1-14; CE marking |
| UL File No.                          |  |  | E29096   |
| UL Category Control No.              |  |  | NLDX   |
| CSA File No.                         |  |  | 012528   |
| CSA Class No.                        |  |  | 2411-03, 3211-04   |
| North America Certification          |  |  | UL listed, CSA certified   |
| Specially designed for North America |  |  | No   |



- 1: Overload relay
- 2: Suppressor
- 3: Auxiliary contact modules





- Squirrel-cage motor
- Operating characteristics
- Starting: from rest
- Stopping: after attaining full running speed
- Electrical characteristics
- Make: up to 6 x rated motor current
- Break: up to 1 x rated motor current
- Utilization category
- 100 % AC-3
- Typical applications
- Compressors
- Lifts
- Mixers
- Pumps
- Escalators
- Agitators
- Fans
- Conveyor belts
- Centrifuges
- Hinged flaps
- Bucket-elevators
- Air conditioning system
- General drives in manufacturing and processing machines



- Extreme switching duty
- Squirrel-cage motor
- Operating characteristics
- Inching, plugging, reversing
- Electrical characteristics
- Make: up to 6 x rated motor current
- Break: up to 6 x rated motor current
- Utilization category
- 100 % AC-4
- Typical applications
- Printing presses
- Wire-drawing machines
- Centrifuges
- Special drives for manufacturing and processing machines



Switching conditions for non-motor consumers, 3 pole, 4 pole  
 Operating characteristics  
 Non inductive and slightly inductive loads  
 Electrical characteristics  
 Switch on: 1 x rated operational current  
 Switch off: 1 x rated operational current  
 Utilization category  
 100 % AC-1  
 Typical examples of application  
 Electric heat

## Dimensions



Contactor with auxiliary contact module DILM32-XHI.../DILA-XHI...



Contactor with auxiliary contact module DILA-XHIT...



### Additional product information (links)

#### IL03407013Z (AWA2100-2126) Contactors

|  |   |
|--|---|
| IL03407013Z (AWA2100-2126) Contactors  | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407013Z2020_05.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407013Z2020_05.pdf</a>                               |
| Motor starters and "Special Purpose Ratings" for the North American market                   | <a href="http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_3258146.pdf">http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_3258146.pdf</a> |
| Switchgear of Power Factor Correction Systems  | <a href="http://www.moeller.net/binary/ver_techpapers/ver934en.pdf">http://www.moeller.net/binary/ver_techpapers/ver934en.pdf</a>   |
| X-Start - Modern Switching Installations Efficiently Fitted and Wired Securely               | <a href="http://www.moeller.net/binary/ver_techpapers/ver938en.pdf">http://www.moeller.net/binary/ver_techpapers/ver938en.pdf</a>   |
| Mirror Contacts for Highly-Reliable Information Relating to Safety-Related Control Functions | <a href="http://www.moeller.net/binary/ver_techpapers/ver944en.pdf">http://www.moeller.net/binary/ver_techpapers/ver944en.pdf</a>   |
| Effect of the Cabel Capacitance of Long Control Cables on the Actuation of Contactors        | <a href="http://www.moeller.net/binary/ver_techpapers/ver949en.pdf">http://www.moeller.net/binary/ver_techpapers/ver949en.pdf</a>   |
| Switchgear for Luminaires  | <a href="http://www.moeller.net/binary/ver_techpapers/ver955en.pdf">http://www.moeller.net/binary/ver_techpapers/ver955en.pdf</a>   |

|  |   |
|--|---|
| Standard Compliant and Functionally Safe Engineering Design with Mechanical Auxiliary Contacts | <a href="http://www.moeller.net/binary/ver_techpapers/ver956en.pdf">http://www.moeller.net/binary/ver_techpapers/ver956en.pdf</a> |
| The Interaction of Contactors with PLCs  | <a href="http://www.moeller.net/binary/ver_techpapers/ver957en.pdf">http://www.moeller.net/binary/ver_techpapers/ver957en.pdf</a> |
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