
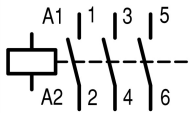




**Contactors, 3 pole, 380 V 400 V 37 kW, 48 V 50 Hz, AC operation, Screw terminals**

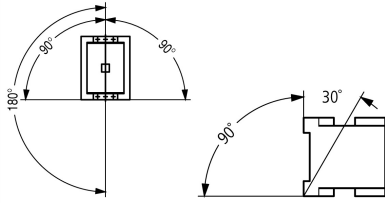
**Part no. DILM80(48V50HZ)**  
**Catalog No. 235909**  
**Alternate Catalog No. XTCE080F00Y**

**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>AC-3/AC-3e: Normal AC induction motors: Starting, switching off while running<br>AC-4: Normal AC induction motors: starting, plugging, reversing, inching |
|   |                |    |   |
| Notes   |                |    | 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.)<br>Also tested according to AC-3e.   |
| 380 V 400 V   | $I_e$          | A  | 80  |
| AC-1  |                |    |   |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz |                |    |   |
| Open  |                |    |   |
| at 40 °C  | $I_{th} = I_e$ | A  | 110   |
| enclosed  | $I_{th}$       | A  | 80  |
| Conventional free air thermal current, 1 pole             |                |    |   |
| open  | $I_{th}$       | A  | 225   |
| enclosed  | $I_{th}$       | A  | 200   |
| <b>Max. rating for three-phase motors, 50 - 60 Hz</b>     |                |    |   |
| AC-3  |                |    |   |
| 220 V 230 V   | P              | kW | 25  |
| 380 V 400 V   | P              | kW | 37  |
| 660 V 690 V   | P              | kW | 63  |
| AC-4  |                |    |   |
| 220 V 230 V   | P              | kW | 11.5  |
| 380 V 400 V   | P              | kW | 20  |
| 660 V 690 V   | P              | kW | 26  |
| Contact sequence  |                |    |   |
| <b>Instructions</b>                                       |                |    | Contacts to EN 50 012.  |
| Can be combined with auxiliary contact                    |                |    | DILM150-XHI(V)...<br>DILM1000-XHI(V)...   |
| Actuating voltage   |                |    | 48 V 50 Hz  |
| Voltage AC/DC   |                |    | AC operation  |
| Connection to SmartWire-DT                                |                |    | no  |
| Frame size  |                |    | 4   |

## Technical data

### General

|   |                                     |                   |  |
|---|-------------------------------------|-------------------|--|
| Standards   |                                     |                   | IEC/EN 60947, VDE 0660, UL, CSA  |
| Lifespan, mechanical  |                                     |                   |  |
| AC operated   | Operations                          | x 10 <sup>6</sup> | 5.7  |
| Operating frequency, mechanical                                       |                                     |                   |  |
| AC operated   | Operations/h                        |                   | 3600   |
| 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                 | 10   |
| Auxiliary contacts  |                                     |                   |  |
| N/O contact   |                                     | g                 | 7  |
| N/C contact   |                                     | g                 | 5  |
| Degree of Protection  |                                     |                   | IP00   |
| Protection against direct contact when actuated from front (EN 50274) |                                     |                   | Finger and back-of-hand proof  |
| Altitude  |                                     | m                 | Max. 2000  |
| Weight  |                                     |                   |  |
| AC operated   |                                     | kg                | 2.18   |
| Screw connector terminals   |                                     |                   |  |
| Terminal capacity main cable  |                                     |                   |  |
| Flexible with ferrule   |                                     | mm <sup>2</sup>   | 1 x (10 - 70)<br>2 x (10 - 50)   |
| Stranded  |                                     | mm <sup>2</sup>   | 1 x (16 - 70)<br>2 x (16 - 50)   |
| Solid or stranded   |                                     | AWG               | single 8...3/0, double 8...2/0   |
| Flat conductor  | Lamellenzahl<br>x Breite x<br>Dicke | mm                | 2 x (6 x 16 x 0.8)   |
| Stripping length  |                                     | mm                | 24   |
| Terminal screw  |                                     |                   | M10  |
| Tightening torque   |                                     | Nm                | 14   |
| Tool  |                                     |                   |  |
| Hexagon socket-head spanner   | SW                                  | mm                | 5  |
| 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 | 690   |
| between the contacts                   |                | V AC | 690   |
| Making capacity (p.f. to IEC/EN 60947) |                |      |       |
|  | $U_p$ to 690 V | A    | 1120  |
| Breaking capacity                      |                |      |       |
| 220 V 230 V                            |                | A    | 800   |
| 380 V 400 V                            |                | A    | 800   |
| 500 V                                  |                | A    | 800   |
| 660 V 690 V                            |                | A    | 650   |
| Short-circuit rating                   |                |      |       |
| Short-circuit protection maximum fuse  |                |      |       |
| Type "2" coordination                  |                |      |       |
| 400 V                                  | gG/gL 500 V    | A    | 160   |
| 690 V                                  | gG/gL 690 V    | A    | 160   |
| Type "1" coordination                  |                |      |       |
| 400 V                                  | gG/gL 500 V    | A    | 250   |
| 690 V                                  | gG/gL 690 V    | A    | 200   |

### 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 | 110   |
| at 50 °C  | $I_{th} = I_e$ | A | 98  |
| at 55 °C  | $I_{th} = I_e$ | A | 94  |
| at 60 °C  | $I_{th} = I_e$ | A | 90  |
| enclosed  | $I_{th}$       | A | 80  |
| Conventional free air thermal current, 1 pole             |                |   |   |
| open  | $I_{th}$       | A | 225   |
| enclosed  | $I_{th}$       | A | 200   |
| AC-3  |                |   |   |
| Rated operational current                                 |                |   |   |
| Open, 3-pole: 50 – 60 Hz                                  |                |   |   |
| Notes   |                |   | At maximum permissible ambient temperature (open.)<br>Also tested according to AC-3e. |
| 220 V 230 V   | $I_e$          | A | 80  |
| 240 V   | $I_e$          | A | 80  |
| 380 V 400 V   | $I_e$          | A | 80  |
| 415 V   | $I_e$          | A | 80  |
| 440V  | $I_e$          | A | 80  |
| 500 V   | $I_e$          | A | 80  |

|                          |                |     |      |
|--------------------------|----------------|-----|------|
| 660 V 690 V              | I <sub>e</sub> | A   | 65   |
| 380 V 400 V              | I <sub>e</sub> | A   | 80   |
| Motor rating             | P              | kWh |      |
| 220 V 230 V              | P              | kW  | 25   |
| 240V                     | P              | kW  | 27.5 |
| 380 V 400 V              | P              | kW  | 37   |
| 415 V                    | P              | kW  | 48   |
| 440 V                    | P              | kW  | 51   |
| 500 V                    | P              | kW  | 58   |
| 660 V 690 V              | P              | kW  | 63   |
| <b>AC-4</b>              |                |     |      |
| Open, 3-pole: 50 – 60 Hz |                |     |      |
| 220 V 230 V              | I <sub>e</sub> | A   | 40   |
| 240 V                    | I <sub>e</sub> | A   | 40   |
| 380 V 400 V              | I <sub>e</sub> | A   | 40   |
| 415 V                    | I <sub>e</sub> | A   | 40   |
| 440 V                    | I <sub>e</sub> | A   | 40   |
| 500 V                    | I <sub>e</sub> | A   | 40   |
| 660 V 690 V              | I <sub>e</sub> | A   | 27   |
| Motor rating             | P              | kWh |      |
| 220 V 230 V              | P              | kW  | 11.5 |
| 240 V                    | P              | kW  | 13   |
| 380 V 400 V              | P              | kW  | 20   |
| 415 V                    | P              | kW  | 24   |
| 440 V                    | P              | kW  | 25   |
| 500 V                    | P              | kW  | 29   |
| 660 V 690 V              | P              | kW  | 26   |

## DC

|                                 |                |   |     |
|---------------------------------|----------------|---|-----|
| Rated operational current, open |                |   |     |
| DC-1                            |                |   |     |
| 60 V                            | I <sub>e</sub> | A | 110 |
| 110 V                           | I <sub>e</sub> | A | 110 |
| 220 V                           | I <sub>e</sub> | A | 70  |

## Current heat loss

|   |  |    |      |
|---|--|----|------|
| 3 pole, at I <sub>th</sub> (60°)                  |  | W  | 11.4 |
| Current heat loss at I <sub>e</sub> to AC-3/400 V |  | W  | 9    |
| Impedance per pole                                |  | mΩ | 0.6  |

## Magnet systems

|  |          |                  |           |
|--|----------|------------------|-----------|
| Voltage tolerance  |          |                  |           |
| AC operated  | Pick-up  | x U <sub>c</sub> | 0.8 - 1.1 |
| Drop-out voltage AC operated   | Drop-out | x U <sub>c</sub> | 0.3 - 0.6 |
| Power consumption of the coil in a cold state and 1.0 x U <sub>S</sub> |          |                  |           |
| 50 Hz  | Pick-up  | VA               | 310       |
| 50 Hz  | Sealing  | VA               | 26        |
| 50 Hz  | Sealing  | W                | 5.8       |
| 60 Hz  | Pick-up  | VA               | 345       |
| 60 Hz  | Sealing  | VA               | 30        |
| 60 Hz  | Sealing  | W                | 5.8       |
| Duty factor  |          | % DF             | 100       |
| Changeover time at 100 % U <sub>S</sub> (recommended value)            |          |                  |           |
| Main contacts  |          |                  |           |
| AC operated  |          |                  |           |
| Closing delay  |          | ms               | 14 - 20   |
| Opening delay  |          | ms               | 9 - 14    |
| Arcing time  |          | ms               | 15        |

|  |    |     |
|--|----|-----|
| Permissible residual current with actuation of A1 - A2 by the electronics (with 0 signal). | mA | ≤ 1 |
|--|----|-----|

## Electromagnetic compatibility (EMC)

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

## Rating data for approved types

|   |    |                 |
|---|----|-----------------|
| Switching capacity  |    |                 |
| Maximum motor rating                                      |    |                 |
| Three-phase   |    |                 |
| 200 V<br>208 V  | HP | 25              |
| 230 V<br>240 V  | HP | 30              |
| 460 V<br>480 V  | HP | 60              |
| 575 V<br>600 V  | HP | 75              |
| Single-phase  |    |                 |
| 115 V<br>120 V  | HP | 7.5             |
| 230 V<br>240 V  | HP | 15              |
| General use   | A  | 125             |
| Short Circuit Current Rating                              |    |                 |
| Basic Rating  |    |                 |
| SCCR  | kA | 10              |
| max. Fuse   | A  | 600             |
| max. CB   | A  | 600             |
| 480 V High Fault  |    |                 |
| SCCR (fuse)   | kA | 30/100          |
| max. Fuse   | A  | 300/300 Class J |
| SCCR (CB)   | kA | 65              |
| max. CB   | A  | 250             |
| 600 V High Fault  |    |                 |
| SCCR (fuse)   | kA | 30/100          |
| max. Fuse   | A  | 300/300 Class J |
| SCCR (CB)   | kA | 30              |
| max. CB   | A  | 350             |
| Special Purpose Ratings                                   |    |                 |
| Electrical Discharge Lamps (Ballast)                      |    |                 |
| 480V 60Hz 3phase, 277V 60Hz 1phase                        | A  | 100             |
| 600V 60Hz 3phase, 347V 60Hz 1phase                        | A  | 100             |
| Incandescent Lamps (Tungsten)                             |    |                 |
| 480V 60Hz 3phase, 277V 60Hz 1phase                        | A  | 100             |
| 600V 60Hz 3phase, 347V 60Hz 1phase                        | A  | 100             |
| Resistance Air Heating                                    |    |                 |
| 480V 60Hz 3phase, 277V 60Hz 1phase                        | A  | 100             |
| 600V 60Hz 3phase, 347V 60Hz 1phase                        | A  | 100             |
| Refrigeration Control (CSA only)                          |    |                 |
| LRA 480V 60Hz 3phase                                      | A  | 540             |
| FLA 480V 60Hz 3phase                                      | A  | 90              |
| LRA 600V 60Hz 3phase                                      | A  | 420             |
| FLA 600V 60Hz 3phase                                      | A  | 70              |
| Definite Purpose Ratings (100,000 cycles acc. to UL 1995) |    |                 |
| LRA 480V 60Hz 3phase                                      | A  | 480             |
| FLA 480V 60Hz 3phase                                      | A  | 80              |
| Elevator Control  |    |                 |
| 200V 60Hz 3phase  | HP | 20              |
| 200V 60Hz 3phase  | A  | 62.1            |

|                  |    |    |
|------------------|----|----|
| 240V 60Hz 3phase | HP | 25 |
| 240V 60Hz 3phase | A  | 68 |
| 480V 60Hz 3phase | HP | 50 |
| 480V 60Hz 3phase | A  | 65 |
| 600V 60Hz 3phase | HP | 60 |
| 600V 60Hz 3phase | A  | 62 |

## Design verification as per IEC/EN 61439

| Technical data for design verification   |            |    |  |
|--|------------|----|--|
| Rated operational current for specified heat dissipation   | $I_n$      | A  | 80   |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 3  |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 9  |
| Static heat dissipation, non-current-dependent   | $P_{vs}$   | W  | 5.8  |
| 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  |  | 48 - 48 |
| Rated control supply voltage $U_s$ at AC 60HZ   | V  |  | 0 - 0   |
| 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  |  | 110     |
| Rated operation current $I_e$ at AC-3, 400 V  | A  |  | 80      |
| Rated operation power at AC-3, 400 V  | kW |  | 37      |
| Rated operation current $I_e$ at AC-4, 400 V  | A  |  | 40      |

|   |    |                  |
|---|----|------------------|
| Rated operation power at AC-4, 400 V                    | kW | 20               |
| Rated operation power NEMA                              | kW | 44.7             |
| Modular version   |    | No               |
| Number of auxiliary contacts as normally open contact   |    | 0                |
| 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





on the side: 2 x DILM820-XHI11(V)-SI; 2 x DILM820-XHI11-SA



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



Contacteur avec module de contact auxiliaire



distance at side to earthed parts: 10 mm

DILM80...DILM170  
 DILMC80...DILMC150  
 DILMF80...DILMF150

## Additional product information (links)

### IL03407039Z (AWA2100-2286) Contactors

|  |   |
|--|---|
| IL03407039Z (AWA2100-2286) Contactors  | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407039Z2020_04.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407039Z2020_04.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 Cable 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> |
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