

**Contactor, 110 V DC, 3 pole, 380 V 400 V, 4 kW, Contacts N/O = Normally open= 1 N/O, Screw terminals, DC operation**

**Part no.** DILEM-10-G(110VDC)  
**Catalog No.** 010309  
**Alternate Catalog No.** XTMC9A10E0

## Delivery program

|                      |  |  |                                                                                                                                                                                                                                   |
|----------------------|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product range        |  |  | Contactors                                                                                                                                                                                                                        |
| Application          |  |  | Mini Contactors for Motors and Resistive Loads                                                                                                                                                                                    |
| Subrange             |  |  | DILEM contactors                                                                                                                                                                                                                  |
| 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>Also tested according to AC-3e.                                                                                                                                            |
| Connection technique |  |  | Screw terminals                                                                                                                                                                                                                   |
| Description          |  |  | With auxiliary contact                                                                                                                                                                                                            |
| Number of poles      |  |  | 3 pole                                                                                                                                                                                                                            |

## Rated operational current

|                                                           |                                  |   |    |
|-----------------------------------------------------------|----------------------------------|---|----|
| AC-3                                                      |                                  |   |    |
| 380 V 400 V                                               | I <sub>e</sub>                   | A | 9  |
| AC-1                                                      |                                  |   |    |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz |                                  |   |    |
| Open                                                      |                                  |   |    |
| at 40 °C                                                  | I <sub>th</sub> = I <sub>e</sub> | A | 22 |

## Max. rating for three-phase motors, 50 - 60 Hz

|             |   |    |     |
|-------------|---|----|-----|
| AC-3        |   |    |     |
| 220 V 230 V | P | kW | 2.2 |
| 380 V 400 V | P | kW | 4   |
| 660 V 690 V | P | kW | 4   |
| AC-4        |   |    |     |
| 220 V 230 V | P | kW | 1.5 |
| 380 V 400 V | P | kW | 3   |
| 660 V 690 V | P | kW | 3   |

## Contacts

|                     |  |  |                                       |
|---------------------|--|--|---------------------------------------|
| N/O = Normally open |  |  | 1 N/O                                 |
| <b>Instructions</b> |  |  | Integrated diode-resistor combination |
| For use with        |  |  | ...DILEM<br>...DILE                   |
| Actuating voltage   |  |  | 110 V DC                              |
| Voltage AC/DC       |  |  | DC operation                          |

## Technical data

### General

|                                                |              |                   |                                                                                |
|------------------------------------------------|--------------|-------------------|--------------------------------------------------------------------------------|
| Standards                                      |              |                   | IEC/EN 60947, VDE 0660, CSA, UL                                                |
| Lifespan, mechanical                           | Operations   | x 10 <sup>6</sup> | 20                                                                             |
| Maximum operating frequency                    |              |                   |                                                                                |
| Mechanical                                     |              | Ops./h            | 9000                                                                           |
| electrical (Contactors without overload relay) | Operations/h |                   | Page 05/070                                                                    |
| Climatic proofing                              |              |                   | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |
| Ambient temperature                            |              |                   |                                                                                |
| Open                                           |              | °C                | -25 - +50                                                                      |
| Enclosed                                       |              | °C                | - 25 - 40                                                                      |

|                                                                       |  |                 |                                                                 |
|-----------------------------------------------------------------------|--|-----------------|-----------------------------------------------------------------|
| Storage                                                               |  | °C              |                                                                 |
| Min. ambient temperature, storage                                     |  | °C              | - 40                                                            |
| Ambient temperature, storage max.                                     |  | °C              | + 80                                                            |
| Mounting position                                                     |  |                 | As required, except vertical with terminals A1/A2 at the bottom |
| Mechanical shock resistance (IEC/EN 60068-2-27)                       |  |                 |                                                                 |
| Half-sinusoidal shock, 10 ms                                          |  |                 |                                                                 |
| Basic unit without auxiliary contact module                           |  |                 |                                                                 |
| Main contacts, make contacts                                          |  | g               | 10                                                              |
| Main contacts Make/break contacts                                     |  | g               |                                                                 |
| Make                                                                  |  | g               | 8                                                               |
| Basic unit with auxiliary contact module                              |  |                 |                                                                 |
| Main contacts make contact                                            |  | g               |                                                                 |
| Make                                                                  |  | g               | 10                                                              |
| Auxiliary contacts Make/break contacts                                |  | g               | 20 / 20                                                         |
| 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                                                                |  | kg              | 0.206                                                           |
| Terminal capacity of auxiliary and main contacts                      |  |                 |                                                                 |
| Screw terminals                                                       |  |                 |                                                                 |
| Solid                                                                 |  | mm <sup>2</sup> | 1 x (0.75 - 2.5)<br>2 x (0.75 - 2.5)                            |
| Flexible with ferrule                                                 |  | mm <sup>2</sup> | 1 x (0.75 - 1.5)<br>2 x (0.75 - 1.5)                            |
| Solid or stranded                                                     |  | AWG             | 18 - 14                                                         |
| Stripping length                                                      |  | mm              | 8                                                               |
| Terminal screw                                                        |  |                 | M3.5                                                            |
| Pozidriv screwdriver                                                  |  | Size            | 2                                                               |
| Standard screwdriver                                                  |  | mm              | 0.8 x 5.5<br>1 x 6                                              |
| Max. tightening torque                                                |  | Nm              | 1.2                                                             |

## Main conducting paths

|                                         |                  |      |       |
|-----------------------------------------|------------------|------|-------|
| Rated impulse withstand voltage         | U <sub>imp</sub> | V AC | 6000  |
| Overvoltage category/pollution degree   |                  |      | III/3 |
| Rated insulation voltage                | U <sub>i</sub>   | V AC | 690   |
| Rated operational voltage               | U <sub>e</sub>   | V AC | 690   |
| Safe isolation to EN 61140              |                  |      |       |
| between coil and contacts               |                  | V AC | 300   |
| between the contacts                    |                  | V AC | 300   |
| Making capacity (cos φ to IEC/EN 60947) |                  | A    | 110   |
| Breaking capacity                       |                  |      |       |
| 220 V 230 V                             |                  | A    | 90    |
| 380 V 400 V                             |                  | A    | 90    |
| 500 V                                   |                  | A    | 64    |
| 660 V 690 V                             |                  | A    | 42    |
| Short-circuit protection maximum fuse   |                  |      |       |
| Type "2", 500 V                         | gL/gG            | A    | 10    |
| Type "1", 500 V                         | gL/gG            | A    | 20    |

## AC

|                                                           |                                  |   |    |
|-----------------------------------------------------------|----------------------------------|---|----|
| AC-1                                                      |                                  |   |    |
| Rated operational current                                 |                                  |   |    |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz |                                  |   |    |
| Open                                                      |                                  |   |    |
| at 40 °C                                                  | I <sub>th</sub> = I <sub>e</sub> | A | 22 |
| at 50 °C                                                  | I <sub>th</sub> = I <sub>e</sub> | A | 20 |
| at 55 °C                                                  | I <sub>th</sub> = I <sub>e</sub> | A | 19 |

|                                               |          |     |                                                                                       |
|-----------------------------------------------|----------|-----|---------------------------------------------------------------------------------------|
| enclosed                                      | $I_{th}$ | A   | 16                                                                                    |
| Notes                                         |          |     | At maximum permissible ambient air temperature.                                       |
| Conventional free air thermal current, 1 pole |          |     |                                                                                       |
| Notes                                         |          |     | At maximum permissible ambient air temperature.                                       |
| open                                          | $I_{th}$ | A   | 50                                                                                    |
| enclosed                                      | $I_{th}$ | A   | 40                                                                                    |
| 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   | 9                                                                                     |
| 240 V                                         | $I_e$    | A   | 9                                                                                     |
| 380 V 400 V                                   | $I_e$    | A   | 9                                                                                     |
| 415 V                                         | $I_e$    | A   | 9                                                                                     |
| 440V                                          | $I_e$    | A   | 9                                                                                     |
| 500 V                                         | $I_e$    | A   | 6.4                                                                                   |
| 660 V 690 V                                   | $I_e$    | A   | 4.8                                                                                   |
| Motor rating                                  | P        | kWh |                                                                                       |
| 220 V 230 V                                   | P        | kW  | 2.2                                                                                   |
| 240V                                          | P        | kW  | 2.5                                                                                   |
| 380 V 400 V                                   | P        | kW  | 4                                                                                     |
| 415 V                                         | P        | kW  | 4.3                                                                                   |
| 440 V                                         | P        | kW  | 4.6                                                                                   |
| 500 V                                         | P        | kW  | 4                                                                                     |
| 660 V 690 V                                   | P        | kW  | 4                                                                                     |
| AC-4                                          |          |     |                                                                                       |
| Rated operational current                     |          |     |                                                                                       |
| Open, 3-pole: 50 – 60 Hz                      |          |     |                                                                                       |
| Notes                                         |          |     | At maximum permissible ambient air temperature.                                       |
| 220 V 230 V                                   | $I_e$    | A   | 6.6                                                                                   |
| 240 V                                         | $I_e$    | A   | 6.6                                                                                   |
| 380 V 400 V                                   | $I_e$    | A   | 6.6                                                                                   |
| 415 V                                         | $I_e$    | A   | 6.6                                                                                   |
| 440 V                                         | $I_e$    | A   | 6.6                                                                                   |
| 500 V                                         | $I_e$    | A   | 5                                                                                     |
| 660 V 690 V                                   | $I_e$    | A   | 3.4                                                                                   |
| Motor rating                                  | P        | kWh |                                                                                       |
| 220 V 230 V                                   | P        | kW  | 1.5                                                                                   |
| 240 V                                         | P        | kW  | 1.8                                                                                   |
| 380 V 400 V                                   | P        | kW  | 3                                                                                     |
| 415 V                                         | P        | kW  | 3.1                                                                                   |
| 440 V                                         | P        | kW  | 3.3                                                                                   |
| 500 V                                         | P        | kW  | 3                                                                                     |
| 660 V 690 V                                   | P        | kW  | 3                                                                                     |
| DC                                            |          |     |                                                                                       |
| Rated operational current open                |          |     |                                                                                       |
| DC-1                                          |          |     |                                                                                       |
| 12 V                                          | $I_e$    | A   | 20                                                                                    |
| 24 V                                          | $I_e$    | A   | 20                                                                                    |
| 60 V                                          | $I_e$    | A   | 20                                                                                    |
| 110 V                                         | $I_e$    | A   | 20                                                                                    |
| 220 V                                         | $I_e$    | A   | 20                                                                                    |

## Magnet systems

|                                                   |  |      |                                                     |
|---------------------------------------------------|--|------|-----------------------------------------------------|
| Voltage tolerance                                 |  |      |                                                     |
| DC operated                                       |  |      |                                                     |
| Pick-up voltage                                   |  |      | 0.8 - 1.1                                           |
| Power consumption                                 |  |      |                                                     |
| DC operation                                      |  |      |                                                     |
| Power consumption Pick-up = Sealing               |  | VA/W | 2.3                                                 |
| Notes                                             |  |      | Smoothed DC voltage or three-phase bridge rectifier |
| Duty factor                                       |  | % DF | 100                                                 |
| Switching times at 100 % U <sub>c</sub>           |  |      |                                                     |
| Make contact                                      |  | ms   |                                                     |
| Closing delay                                     |  | ms   |                                                     |
| Closing delay min.                                |  | ms   | 26                                                  |
| Closing delay max.                                |  | ms   | 35                                                  |
| Opening delay                                     |  | ms   |                                                     |
| Opening delay min.                                |  | ms   | 15                                                  |
| Opening delay max.                                |  | ms   | 25                                                  |
| Closing delay with top mounting auxiliary contact |  | ms   | 70                                                  |
| Reversing contactors                              |  |      |                                                     |
| Changeover time at 110 % U <sub>c</sub>           |  |      |                                                     |
| Changeover time min.                              |  | ms   | 40                                                  |
| Changeover time max.                              |  | ms   | 50                                                  |
| Arcing time at 690 V AC                           |  | ms   | 12                                                  |

## Current heat losses (3- or 4-pole)

|                                 |  |    |      |
|---------------------------------|--|----|------|
| at I <sub>th</sub> , 50 °C      |  | W  | 4.4  |
| at I <sub>e</sub> to AC-3/400 V |  | W  | 0.9  |
| Impedance per pole              |  | mΩ | 7.86 |

## Auxiliary contacts

|                                                                                            |                  |                   |                                                                                                                                                  |
|--------------------------------------------------------------------------------------------|------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Positive operating contacts to EN 60947-5-1 appendix L, including auxiliary contact module |                  |                   | Yes                                                                                                                                              |
| Rated impulse withstand voltage                                                            | U <sub>imp</sub> | V AC              | 6000                                                                                                                                             |
| Overvoltage category/pollution degree                                                      |                  |                   | III/3                                                                                                                                            |
| Rated insulation voltage                                                                   | U <sub>i</sub>   | V AC              | 690                                                                                                                                              |
| Rated operational voltage                                                                  | U <sub>e</sub>   | V AC              | 600                                                                                                                                              |
| Safe isolation to EN 61140                                                                 |                  |                   |                                                                                                                                                  |
| between coil and auxiliary contacts                                                        |                  | V AC              | 300                                                                                                                                              |
| between the auxiliary contacts                                                             |                  | V AC              | 300                                                                                                                                              |
| Rated operational current                                                                  |                  |                   |                                                                                                                                                  |
| AC-15                                                                                      |                  |                   |                                                                                                                                                  |
| 220 V 240 V                                                                                | I <sub>e</sub>   | A                 | 6                                                                                                                                                |
| 380 V 415 V                                                                                | I <sub>e</sub>   | A                 | 3                                                                                                                                                |
| 500 V                                                                                      | I <sub>e</sub>   | A                 | 1.5                                                                                                                                              |
| DC L/R ≤ 15 ms                                                                             |                  |                   |                                                                                                                                                  |
| Contacts in series:                                                                        |                  | A                 |                                                                                                                                                  |
| 1                                                                                          | 24 V             | A                 | 2.5                                                                                                                                              |
| 2                                                                                          | 60 V             | A                 | 2.5                                                                                                                                              |
| 3                                                                                          | 100 V            | A                 | 1.5                                                                                                                                              |
| 3                                                                                          | 220 V            | A                 | 0.5                                                                                                                                              |
| Conv. thermal current                                                                      | I <sub>th</sub>  | A                 | 10                                                                                                                                               |
| Control circuit reliability                                                                | Failure rate     | λ                 | <10 <sup>-8</sup> , < one failure at 100 million operations<br>(at U <sub>e</sub> = 24 V DC, U <sub>min</sub> = 17 V, I <sub>min</sub> = 5.4 mA) |
| Component lifespan at U <sub>e</sub> = 240 V                                               |                  |                   |                                                                                                                                                  |
| AC-15                                                                                      | Operations       | x 10 <sup>6</sup> | 0.2                                                                                                                                              |
| DC current                                                                                 |                  |                   |                                                                                                                                                  |
| L/R = 50 ms: 2 contacts in series at I <sub>e</sub> = 0.5 A                                | Operations       | x 10 <sup>6</sup> | 0.15                                                                                                                                             |

|                                                     |  |         |                                                                                |
|-----------------------------------------------------|--|---------|--------------------------------------------------------------------------------|
| Notes                                               |  |         | Switch-on and switch-off conditions based on DC-13, time constant as specified |
| Short-circuit rating without welding                |  |         |                                                                                |
| Maximum overcurrent protective device               |  |         |                                                                                |
| Short-circuit protection only                       |  |         | PKZM0-4                                                                        |
| Short-circuit protection maximum fuse               |  |         |                                                                                |
| 500 V                                               |  | A gG/gL | 6                                                                              |
| 500 V                                               |  | A fast  | 10                                                                             |
| Current heat loss at a load of $I_{th}$ per contact |  | W       | 1.1                                                                            |

### Rating data for approved types

|                              |  |      |      |
|------------------------------|--|------|------|
| Switching capacity           |  |      |      |
| Maximum motor rating         |  |      |      |
| Three-phase                  |  |      |      |
| 200 V<br>208 V               |  | HP   | 2    |
| 230 V<br>240 V               |  | HP   | 3    |
| 460 V<br>480 V               |  | HP   | 5    |
| 575 V<br>600 V               |  | HP   | 5    |
| Single-phase                 |  |      |      |
| 115 V<br>120 V               |  | HP   | 0.5  |
| 230 V<br>240 V               |  | HP   | 1.5  |
| General use                  |  | A    | 15   |
| Auxiliary contacts           |  |      |      |
| Pilot Duty                   |  |      |      |
| AC operated                  |  |      | A600 |
| DC operated                  |  |      | P300 |
| General Use                  |  |      |      |
| AC                           |  | V    | 600  |
| AC                           |  | A    | 10   |
| DC                           |  | V    | 250  |
| DC                           |  | A    | 0.5  |
| Short Circuit Current Rating |  | SCCR |      |
| Basic Rating                 |  |      |      |
| SCCR                         |  | kA   | 5    |
| max. Fuse                    |  | A    | 45   |

## Design verification as per IEC/EN 61439

|                                                                                                                        |            |    |                                                                    |
|------------------------------------------------------------------------------------------------------------------------|------------|----|--------------------------------------------------------------------|
| Technical data for design verification                                                                                 |            |    |                                                                    |
| Rated operational current for specified heat dissipation                                                               | $I_n$      | A  | 9                                                                  |
| Heat dissipation per pole, current-dependent                                                                           | $P_{vid}$  | W  | 0.3                                                                |
| Equipment heat dissipation, current-dependent                                                                          | $P_{vid}$  | W  | 0.9                                                                |
| Static heat dissipation, non-current-dependent                                                                         | $P_{vs}$   | W  | 2.3                                                                |
| Heat dissipation capacity                                                                                              | $P_{diss}$ | W  | 0                                                                  |
| Operating ambient temperature min.                                                                                     |            | °C | -25                                                                |
| Operating ambient temperature max.                                                                                     |            | °C | 50                                                                 |
| 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 8.0

|                                                                                                                                                                                       |    |                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------|
| 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 Us at AC 50HZ                                                                                                                                            | V  | 0 - 0            |
| Rated control supply voltage Us at AC 60HZ                                                                                                                                            | V  | 0 - 0            |
| Rated control supply voltage Us at DC                                                                                                                                                 | V  | 110 - 110        |
| Voltage type for actuating                                                                                                                                                            |    | DC               |
| Rated operation current Ie at AC-1, 400 V                                                                                                                                             | A  | 22               |
| Rated operation current Ie at AC-3, 400 V                                                                                                                                             | A  | 9                |
| Rated operation power at AC-3, 400 V                                                                                                                                                  | kW | 4                |
| Rated operation current Ie at AC-4, 400 V                                                                                                                                             | A  | 6.6              |
| Rated operation power at AC-4, 400 V                                                                                                                                                  | kW | 3                |
| Rated operation power NEMA                                                                                                                                                            | kW | 3.7              |
| 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 normally open contacts as main contact                                                                                                                                      |    | 3                |