

**Contactor, 3 pole, 380 V 400 V 22 kW, RDC 24: 24 - 27 V DC, DC operation,  
Screw terminals**

**Part no.** DILM50-EA(RDC24)  
**Catalog No.** 190012

## 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.   |
| 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  | 50  |
| AC-1  |                |    |   |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz |                |    |   |
| Open  |                |    |   |
| at 40 °C  | $I_{th} = I_e$ | A  | 80  |
| enclosed  | $I_{th}$       | A  | 58  |
| Conventional free air thermal current, 1 pole             |                |    |   |
| open  | $I_{th}$       | A  | 162   |
| enclosed  | $I_{th}$       | A  | 145   |
| <b>Max. rating for three-phase motors, 50 - 60 Hz</b>     |                |    |   |
| AC-3  |                |    |   |
| 220 V 230 V   | P              | kW | 15.5  |
| 380 V 400 V   | P              | kW | 22  |
| 660 V 690 V   | P              | kW | 30  |
| AC-4  |                |    |   |
| 220 V 230 V   | P              | kW | 6   |
| 380 V 400 V   | P              | kW | 10  |
| 660 V 690 V   | P              | kW | 14  |
| Can be combined with auxiliary contact                    |                |    | DILM150-XHI(V)...<br>DILM1000-XHI(V)...   |
| Actuating voltage   |                |    | RDC 24: 24 - 27 V DC  |
| Voltage AC/DC   |                |    | DC operation  |
| Connection to SmartWire-DT                                |                |    | no  |
| <b>Instructions</b>                                       |                |    | Contacts to EN 50 012.<br>integrated suppressor circuit in actuating electronics  |
| Frame size  |                |    | 3   |

## Technical data

### General

|                                 |              |               |  |
|---------------------------------|--------------|---------------|--|
| Standards                       |              |               | IEC/EN 60947, VDE 0660, UL, CSA        |
| Lifespan, mechanical            |              |               |  |
| DC operated                     | Operations   | $\times 10^6$ | 10                                     |
| Operating frequency, mechanical |              |               |  |
| DC operated                     | Operations/h |               | 5000                                   |
| Climatic proofing               |              |               | Damp heat, constant, to IEC 60068-2-78 |

|   |                                     |                 |                                      |
|---|-------------------------------------|-----------------|--------------------------------------|
|   |                                     |                 | Damp heat, cyclic, to IEC 60068-2-30 |
| Ambient temperature   |                                     |                 |                                      |
| Open  |                                     | °C              | -25 - +60                            |
| Enclosed  |                                     | °C              | - 25 - 40                            |
| Storage   |                                     | °C              | - 40 - 80                            |
| 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 m                          |
| Weight  |                                     |                 |                                      |
| DC operated   |                                     | kg              | 1.052                                |
| Screw connector terminals   |                                     |                 |                                      |
| Terminal capacity main cable  |                                     |                 |                                      |
| Solid   |                                     | mm <sup>2</sup> | 1 x (0.75 - 16)<br>2 x (0.75 - 16)   |
| Flexible with ferrule   |                                     | mm <sup>2</sup> | 1 x (0.75 - 35)<br>2 x (0.75 - 25)   |
| Stranded  |                                     | mm <sup>2</sup> | 1 x (16 - 50)<br>2 x (16 - 35)       |
| Solid or stranded   |                                     | AWG             | single 14 - 1, double 14 - 2         |
| Flat conductor  | Lamellenzahl<br>x Breite x<br>Dicke | mm              | 2 x (6 x 9 x 0.8)                    |
| Stripping length  |                                     | mm              | 14                                   |
| Terminal screw  |                                     |                 | M6                                   |
| Tightening torque   |                                     | Nm              | 3.3                                  |
| 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 <sub>imp</sub>                    | V AC            | 8000                                 |
| 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 | 440 |
| between the contacts                   |                | V AC | 440 |
| Making capacity (p.f. to IEC/EN 60947) |                |      |     |
|  | Up to 690 V    | A    | 700 |
| Breaking capacity                      |                |      |     |
| 220 V 230 V                            |                | A    | 500 |
| 380 V 400 V                            |                | A    | 500 |
| 500 V                                  |                | A    | 500 |
| 660 V 690 V                            |                | A    | 320 |
| Short-circuit rating                   |                |      |     |
| Short-circuit protection maximum fuse  |                |      |     |
| Type "2" coordination                  |                |      |     |
| 400 V                                  | gG/gL 500 V    | A    | 80  |
| 690 V                                  | gG/gL 690 V    | A    | 63  |
| Type "1" coordination                  |                |      |     |
| 400 V                                  | gG/gL 500 V    | A    | 160 |
| 690 V                                  | gG/gL 690 V    | A    | 80  |

## 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   | 80  |
| at 50 °C  | I <sub>th</sub> = I <sub>e</sub> | A   | 71  |
| at 55 °C  | I <sub>th</sub> = I <sub>e</sub> | A   | 68  |
| at 60 °C  | I <sub>th</sub> = I <sub>e</sub> | A   | 65  |
| enclosed  | I <sub>th</sub>                  | A   | 58  |
| Conventional free air thermal current, 1 pole             |                                  |     |   |
| open  | I <sub>th</sub>                  | A   | 162   |
| enclosed  | I <sub>th</sub>                  | A   | 145   |
| 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 <sub>e</sub>                   | A   | 50  |
| 240 V   | I <sub>e</sub>                   | A   | 50  |
| 380 V 400 V   | I <sub>e</sub>                   | A   | 50  |
| 415 V   | I <sub>e</sub>                   | A   | 50  |
| 440V  | I <sub>e</sub>                   | A   | 50  |
| 500 V   | I <sub>e</sub>                   | A   | 50  |
| 660 V 690 V   | I <sub>e</sub>                   | A   | 32  |
| Motor rating  | P                                | kWh |   |
| 220 V 230 V   | P                                | kW  | 15.5  |
| 240V  | P                                | kW  | 17  |
| 380 V 400 V   | P                                | kW  | 22  |
| 415 V   | P                                | kW  | 30  |
| 440 V   | P                                | kW  | 32  |
| 500 V   | P                                | kW  | 36  |
| 660 V 690 V   | P                                | kW  | 30  |
| AC-4  |                                  |     |   |
| Open, 3-pole: 50 – 60 Hz                                  |                                  |     |   |

|              |                |     |     |
|--------------|----------------|-----|-----|
| 220 V 230 V  | I <sub>e</sub> | A   | 21  |
| 240 V        | I <sub>e</sub> | A   | 21  |
| 380 V 400 V  | I <sub>e</sub> | A   | 21  |
| 415 V        | I <sub>e</sub> | A   | 21  |
| 440 V        | I <sub>e</sub> | A   | 21  |
| 500 V        | I <sub>e</sub> | A   | 21  |
| 660 V 690 V  | I <sub>e</sub> | A   | 17  |
| Motor rating | P              | kWh |     |
| 220 V 230 V  | P              | kW  | 6   |
| 240 V        | P              | kW  | 6.5 |
| 380 V 400 V  | P              | kW  | 10  |
| 415 V        | P              | kW  | 11  |
| 440 V        | P              | kW  | 12  |
| 500 V        | P              | kW  | 13  |
| 660 V 690 V  | P              | kW  | 14  |

### DC

|                                 |                |   |    |
|---------------------------------|----------------|---|----|
| Rated operational current, open |                |   |    |
| DC-1                            |                |   |    |
| 60 V                            | I <sub>e</sub> | A | 60 |
| 110 V                           | I <sub>e</sub> | A | 50 |
| 220 V                           | I <sub>e</sub> | A | 45 |

### Current heat loss

|   |  |    |      |
|---|--|----|------|
| 3 pole, at I <sub>th</sub> (60°)                  |  | W  | 16.7 |
| Current heat loss at I <sub>e</sub> to AC-3/400 V |  | W  | 9.9  |
| Impedance per pole                                |  | mΩ | 1.9  |

### Magnet systems

|  |          |                  |   |
|--|----------|------------------|---|
| Voltage tolerance  |          |                  |   |
| DC operated  | Pick-up  | x U <sub>c</sub> | 0.7 - 1.2   |
| Notes  |          |                  | RDC 24 (U <sub>min</sub> 24 V DC/U <sub>max</sub> 27 V DC)<br>Example: U <sub>S</sub> = 0.7 x U <sub>min</sub> - 1.2 x U <sub>max</sub> / U <sub>S</sub> = 0.7 x 24V - 1.2 x 27V DC |
| DC operated  | Drop-out | x U <sub>c</sub> | 0.15 - 0.6  |
| Notes  |          |                  | at least smoothed two-phase bridge rectifier or three-phase rectifier   |
| Power consumption of the coil in a cold state and 1.0 x U <sub>S</sub> |          |                  |   |
| DC operated  | Pick-up  | W                | 24  |
| DC operated  | Sealing  | W                | 1   |
| Duty factor  |          | % DF             | 100   |
| Changeover time at 100 % U <sub>S</sub> (recommended value)            |          |                  |   |
| Main contacts  |          |                  |   |
| DC operated  |          | ms               |   |
| Closing delay  |          | ms               |   |
| Closing delay  |          | ms               | 54  |
| Opening delay  |          | ms               |   |
| Opening delay  |          | ms               | 24  |
| Arcing time  |          | ms               | 10  |

### Electromagnetic compatibility (EMC)

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

### Rating data for approved types

|                      |  |    |    |
|----------------------|--|----|----|
| Switching capacity   |  |    |    |
| Maximum motor rating |  |    |    |
| Three-phase          |  |    |    |
| 200 V<br>208 V       |  | HP | 15 |
| 230 V<br>240 V       |  | HP | 20 |
| 460 V<br>480 V       |  | HP | 40 |

|                                      |  |      |                 |
|--------------------------------------|--|------|-----------------|
| 575 V<br>600 V                       |  | HP   | 50              |
| Single-phase                         |  |      |                 |
| 115 V<br>120 V                       |  | HP   | 3               |
| 230 V<br>240 V                       |  | HP   | 10              |
| General use                          |  | A    | 80              |
| Short Circuit Current Rating         |  | SCCR |                 |
| Basic Rating                         |  |      |                 |
| SCCR                                 |  | kA   | 10              |
| max. Fuse                            |  | A    | 250             |
| max. CB                              |  | A    | 250             |
| 480 V High Fault                     |  |      |                 |
| SCCR (fuse)                          |  | kA   | 30/100          |
| max. Fuse                            |  | A    | 250/150 Class J |
| SCCR (CB)                            |  | kA   | 65              |
| max. CB                              |  | A    | 100             |
| 600 V High Fault                     |  |      |                 |
| SCCR (fuse)                          |  | kA   | 30/100          |
| max. Fuse                            |  | A    | 250/150 Class J |
| SCCR (CB)                            |  | kA   | 30              |
| max. CB                              |  | A    | 250             |
| Special Purpose Ratings              |  |      |                 |
| Electrical Discharge Lamps (Ballast) |  |      |                 |
| 480V 60Hz 3phase, 277V 60Hz 1phase   |  | A    | 79              |
| 600V 60Hz 3phase, 347V 60Hz 1phase   |  | A    | 79              |
| Incandescent Lamps (Tungsten)        |  |      |                 |
| 480V 60Hz 3phase, 277V 60Hz 1phase   |  | A    | 74              |
| 600V 60Hz 3phase, 347V 60Hz 1phase   |  | A    | 74              |
| Resistance Air Heating               |  |      |                 |
| 480V 60Hz 3phase, 277V 60Hz 1phase   |  | A    | 79              |
| 600V 60Hz 3phase, 347V 60Hz 1phase   |  | A    | 79              |
| Elevator Control                     |  |      |                 |
| 200V 60Hz 3phase                     |  | HP   | 10              |
| 200V 60Hz 3phase                     |  | A    | 32.2            |
| 240V 60Hz 3phase                     |  | HP   | 15              |
| 240V 60Hz 3phase                     |  | A    | 42              |
| 480V 60Hz 3phase                     |  | HP   | 30              |
| 480V 60Hz 3phase                     |  | A    | 40              |
| 600V 60Hz 3phase                     |  | HP   | 40              |
| 600V 60Hz 3phase                     |  | A    | 41              |

### Design verification as per IEC/EN 61439

|  |                   |    |  |
|--|-------------------|----|--|
| Technical data for design verification                   |                   |    |  |
| Rated operational current for specified heat dissipation | I <sub>n</sub>    | A  | 50   |
| Heat dissipation per pole, current-dependent             | P <sub>vid</sub>  | W  | 3.3  |
| Equipment heat dissipation, current-dependent            | P <sub>vid</sub>  | W  | 9.9  |
| Static heat dissipation, non-current-dependent           | P <sub>vs</sub>   | W  | 1  |
| Heat dissipation capacity                                | P <sub>diss</sub> | 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 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  | 24 - 27          |
| Voltage type for actuating  |    | DC               |
| Rated operation current Ie at AC-1, 400 V   | A  | 80               |
| Rated operation current Ie at AC-3, 400 V   | A  | 50               |
| Rated operation power at AC-3, 400 V  | kW | 22               |
| Rated operation current Ie at AC-4, 400 V   | A  | 21               |
| Rated operation power at AC-4, 400 V  | kW | 10               |
| Rated operation power NEMA  | kW | 29.8             |
| 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 normally open contacts as main contact  |    | 3                |