



Variable frequency drives; 3-/3-phase 400 V; 2.2 A; 0.75 kW; EMC filters



Powering Business Worldwide™

**Part no.** DC1-342D2FN-A20CE1  
**Article no.** 185743  
**Catalog No.** DC1-342D2FN-A20NE1

## Technical data

### General

|                                   |          |    |   |
|-----------------------------------|----------|----|---|
| Standards                         |          |    | Specification for general requirements: IEC/EN 61800-2<br>EMC requirements: IEC/EN 61800-3<br>Safety requirements: IEC/EN 61800-5-1                                   |
| Certifications                    |          |    | CE, UL, cUL, c-Tick, Ukr Sepro, EAC   |
| Production quality                |          |    | RoHS, ISO 9001  |
| Climatic proofing                 | $\rho_w$ | %  | < 95%, average relative humidity (RH), non-condensing, non-corrosive  |
| Ambient temperature               |          |    |   |
| operation (150 % overload)        | $\theta$ | °C | -10 - +50   |
| Storage                           | $\theta$ | °C | -40 - +60   |
| Radio interference level          |          |    |   |
| Radio interference class (EMC)    |          |    | C2, C3, depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary. |
| Environment (EMC)                 |          |    | 1st and 2nd environments as per EN 61800-3  |
| maximum motor cable length        | l        | m  | C2 ≤ 5 m<br>C3 ≤ 25 m   |
| Mounting position                 |          |    | Vertical  |
| Altitude                          |          | m  | 0 - 1000 m above sea level<br>Above 1000 m: 1% derating for every 100 m<br>max. 4000 m  |
| Degree of Protection              |          |    | IP20/NEMA 0   |
| Protection against direct contact |          |    | BGV A3 (VBG4, finger- and back-of-hand proof)   |

### Main circuit

|                                       |            |     |  |
|---------------------------------------|------------|-----|--|
| Supply                                |            |     |  |
| Rated operational voltage             | $U_e$      |     | 400 V AC, 3-phase<br>480 V AC, 3-phase   |
| Mains voltage (50/60Hz)               | $U_{LN}$   | V   | 380 (-10%) - 480 (+10%)  |
| Input current (150% overload)         | $I_{LN}$   | A   | 3.5  |
| System configuration                  |            |     | AC supply systems with earthed center point  |
| Supply frequency                      | $f_{LN}$   | Hz  | 50/60  |
| Frequency range                       | $f_{LN}$   | Hz  | 48 - 62  |
| Mains switch-on frequency             |            |     | Maximum of one time every 30 seconds   |
| Power section                         |            |     |  |
| Function                              |            |     | Frequency inverter with internal DC link and IGBT inverter   |
| Overload current (150% overload)      | $I_L$      | A   | 3.3  |
| max. starting current (High Overload) | $I_H$      | %   | 175  |
| Note about max. starting current      |            |     | for 3.75 seconds every 600 seconds   |
| Output voltage with $V_e$             | $U_2$      |     | 400 V AC, 3-phase<br>480 V AC, 3-phase   |
| Output Frequency                      | $f_2$      | Hz  | 0 - 50/60 (max. 500)   |
| Switching frequency                   | $f_{PWM}$  | kHz | 16<br>adjustable 4 - 32 (audible)  |
| Operation Mode                        |            |     | U/f control<br>Speed control with slip compensation<br>sensorless vector control (SLV)                 |
| Frequency resolution (setpoint value) | $\Delta f$ | Hz  | 0.1  |
| Rated operational current             |            |     |  |
| At 150% overload                      | $I_e$      | A   | 2.2  |
| Note                                  |            |     | Rated operational current at an operating frequency of 16 kHz and an ambient air temperature of +50 °C |

|  |          |     |   |
|--|----------|-----|---|
| Power loss   |          |     |   |
| Heat dissipation at rated operational current $I_{\theta} = 150\%$ | $P_V$    | W   | 63.75   |
| Efficiency   | $\eta$   | %   | 91.5  |
| Maximum leakage current to ground (PE) without motor               | $I_{PE}$ | mA  | 13  |
| Fan  |          |     | 0   |
| Fitted with  |          |     | Radio interference suppression filter<br>7-digital display assembly   |
| Frame size   |          |     | FS1   |
| Motor feeder   |          |     |   |
| Note   |          |     | for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with $1500 \text{ rpm}^{-1}$ at 50 Hz or $1800 \text{ min}^{-1}$ at 60 Hz |
| Note   |          |     | Overload cycle for 60 s every 600 s   |
| Note   |          |     | at 400 V, 50 Hz   |
| 150 % Overload   | P        | kW  | 0.75  |
| Note   |          |     | at 440 - 480 V, 60 Hz   |
| 150 % Overload   | P        | HP  | 1   |
| maximum permissible cable length                                   | l        | m   | screened: 50<br>screened, with motor choke: 100<br>unscreened: 75<br>unscreened, with motor choke: 150  |
| Apparent power   |          |     |   |
| Apparent power at rated operation 400 V                            | S        | kVA | 1.52  |
| Apparent power at rated operation 480 V                            | S        | kVA | 1.83  |
| Braking function   |          |     |   |
| Standard braking torque  |          |     | max. 30 % MN  |
| DC braking torque  |          |     | adjustable to 100 %   |

### Control section

|                                |       |   |   |
|--------------------------------|-------|---|---|
| Reference voltage              | $U_s$ | V | 10 V DC (max. 10 mA)  |
| Analog inputs                  |       |   | 2, parameterizable, 0 - 10 V DC, 0/4 - 20 mA                  |
| Analog outputs                 |       |   | 1, parameterizable, 0 - 10 V                                  |
| Digital inputs                 |       |   | 4, parameterizable, max. 30 V DC                              |
| Digital outputs                |       |   | 1, parameterizable, 24 V DC                                   |
| Relay outputs                  |       |   | 1, parameterizable, N/O, 6 A (250 V, AC-1) / 5 A (30 V, DC-1) |
| Interface/field bus (built-in) |       |   | OP bus (RS485)/Modbus RTU, CANopen®                           |

### Assigned switching and protective elements

|                                       |  |   |             |
|---------------------------------------|--|---|-------------|
| Power Wiring                          |  |   |             |
| IEC (Type B, gG), 150 %               |  |   | FAZ-B6/3    |
| UL (Class CC or J)                    |  | A | 6           |
| 150 % overload (CT/ $I_H$ , at 50 °C) |  |   | DX-LN3-004  |
| Motor feeder                          |  |   |             |
| 150 % overload (CT/ $I_H$ , at 50 °C) |  |   | DX-LM3-005  |
| 150 % overload (CT/ $I_H$ , at 50 °C) |  |   | DX-SIN3-004 |

## Design verification as per IEC/EN 61439

|  |            |    |  |
|--|------------|----|--|
| Technical data for design verification                                     |            |    |  |
| Rated operational current for specified heat dissipation                   | $I_n$      | A  | 2.2  |
| Heat dissipation per pole, current-dependent                               | $P_{vid}$  | W  | 0  |
| Equipment heat dissipation, current-dependent                              | $P_{vid}$  | W  | 63.75                                      |
| Static heat dissipation, non-current-dependent                             | $P_{vs}$   | W  | 0  |
| Heat dissipation capacity  | $P_{diss}$ | W  | 0  |
| Operating ambient temperature min.   |            | °C | -10  |
| 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 6.0

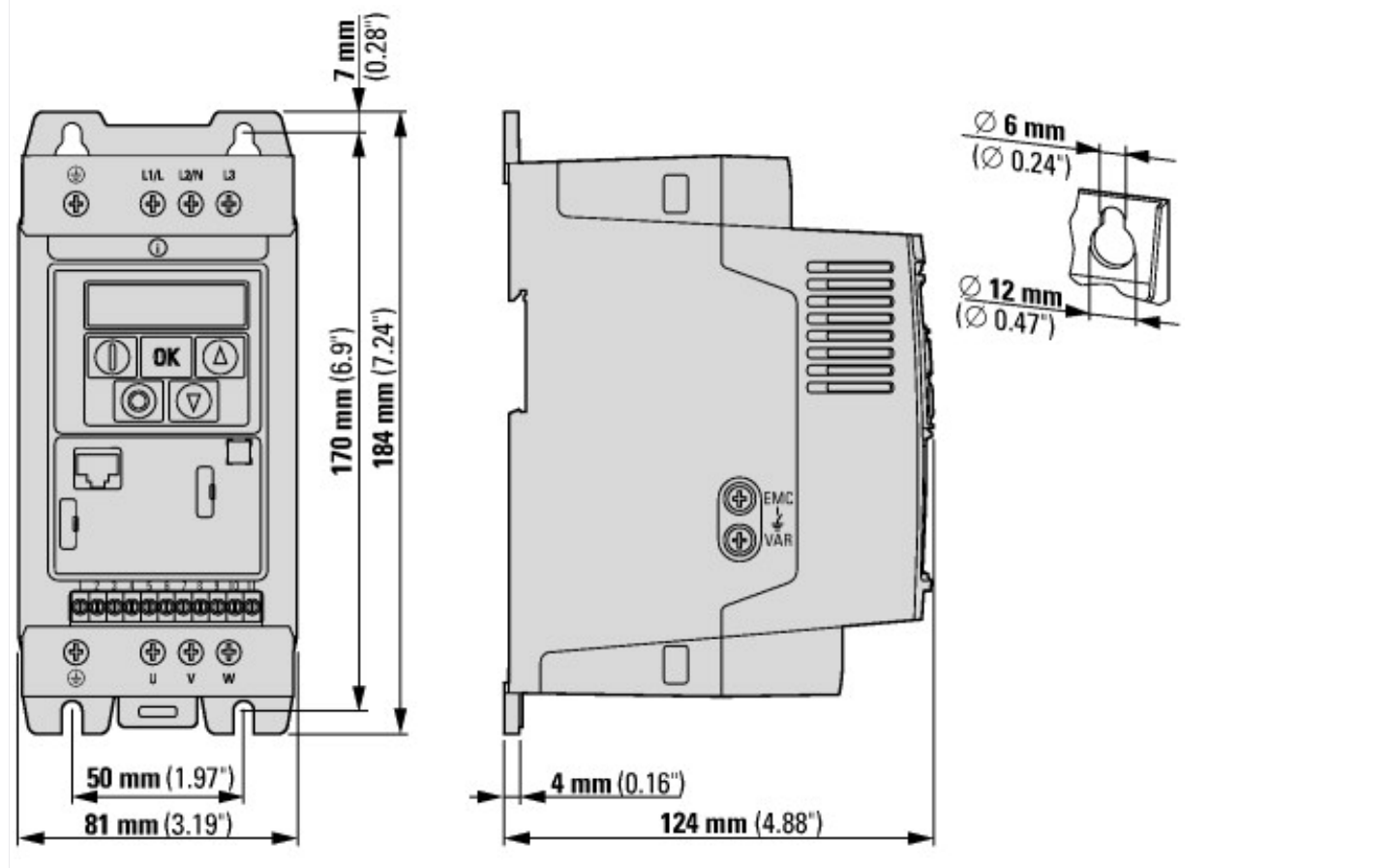
|   |    |           |
|---|----|-----------|
| Low-voltage industrial components (EG000017) / Frequency converter =< 1 kV (EC001857)   |    |           |
| Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kv (ecl@ss8.1-27-02-31-01 [AKE177011]) |    |           |
| Mains voltage   | V  | 380 - 480 |
| Mains frequency   |    | 50/60 Hz  |
| Number of phases input  |    | 3         |
| Number of phases output   |    | 3         |
| Max. output frequency   | Hz | 500       |
| Max. output voltage   | V  | 400       |
| Rated output current I2N  | A  | 2.2       |
| Max. output at quadratic load at rated output voltage   | kW | 0.75      |
| Max. output at linear load at rated output voltage  | kW | 0.75      |
| With control unit   |    | Yes       |
| Application in industrial area permitted  |    | Yes       |
| Application in domestic- and commercial area permitted  |    | Yes       |
| Supporting protocol for TCP/IP  |    | No        |
| Supporting protocol for PROFIBUS  |    | No        |
| Supporting protocol for CAN   |    | Yes       |
| Supporting protocol for INTERBUS  |    | No        |
| Supporting protocol for ASI   |    | No        |
| Supporting protocol for KNX   |    | No        |
| Supporting protocol for MODBUS  |    | No        |
| Supporting protocol for Data-Highway  |    | No        |
| Supporting protocol for DeviceNet   |    | No        |
| Supporting protocol for SUCONET   |    | No        |
| Supporting protocol for LON   |    | No        |
| Supporting protocol for PROFINET IO   |    | No        |
| Supporting protocol for PROFINET CBA  |    | No        |
| Supporting protocol for SERCOS  |    | No        |
| Supporting protocol for Foundation Fieldbus   |    | No        |
| Supporting protocol for EtherNet/IP   |    | No        |
| Supporting protocol for AS-Interface Safety at Work   |    | No        |

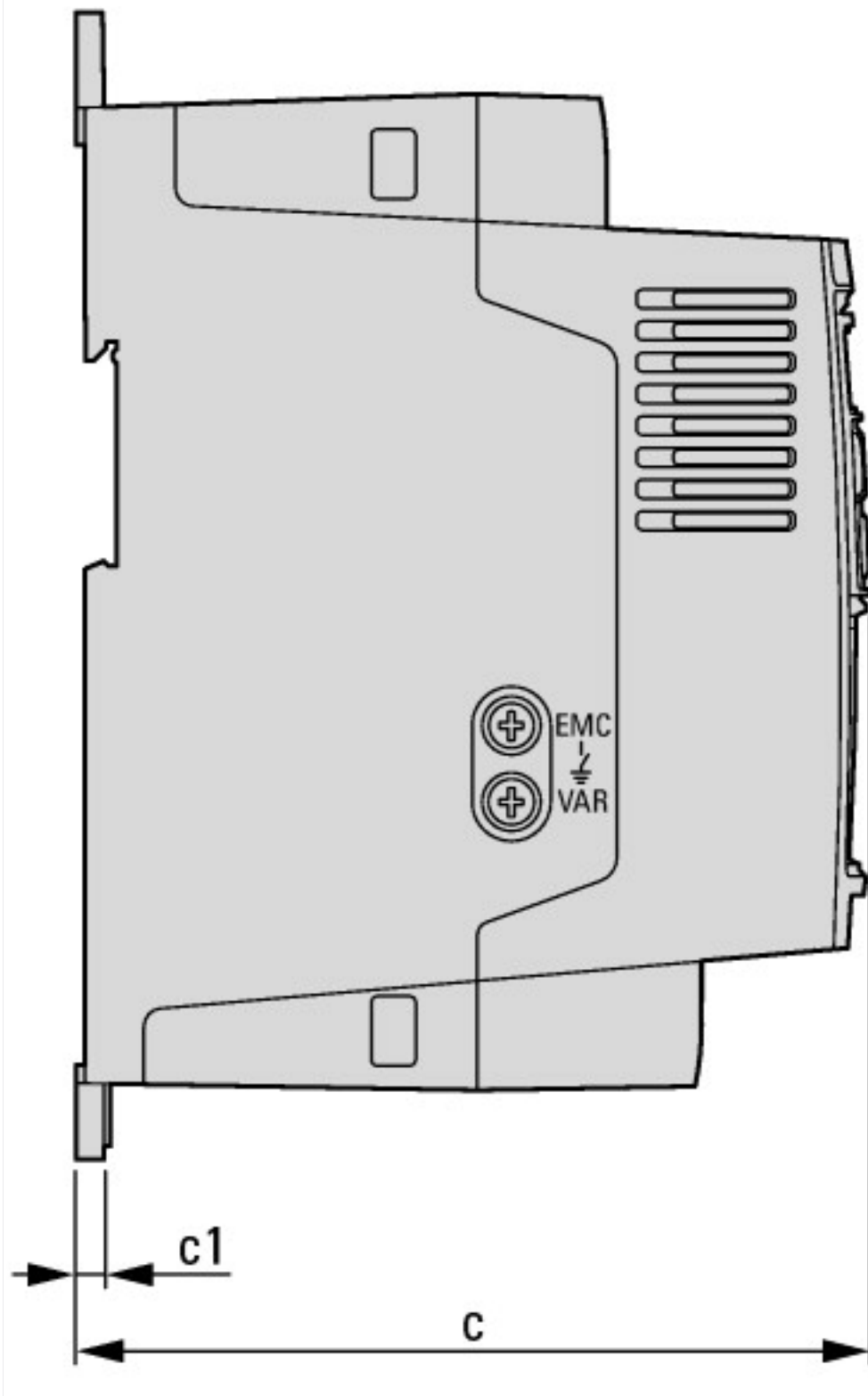
|   |  |    |             |
|---|--|----|-------------|
| Supporting protocol for DeviceNet Safety    |  |    | No          |
| Supporting protocol for INTERBUS-Safety     |  |    | No          |
| Supporting protocol for PROFIsafe           |  |    | No          |
| Supporting protocol for SafetyBUS p         |  |    | No          |
| Supporting protocol for other bus systems   |  |    | No          |
| Number of HW-interfaces industrial Ethernet |  |    | 0           |
| Number of HW-interfaces PROFINET            |  |    | 0           |
| Number of HW-interfaces RS-232              |  |    | 0           |
| Number of HW-interfaces RS-422              |  |    | 0           |
| Number of HW-interfaces RS-485              |  |    | 1           |
| Number of HW-interfaces serial TTY          |  |    | 0           |
| Number of HW-interfaces USB                 |  |    | 1           |
| Number of HW-interfaces parallel            |  |    | 0           |
| Number of HW-interfaces other               |  |    | 0           |
| With optical interface                      |  |    | No          |
| With PC connection                          |  |    | Yes         |
| Integrated breaking resistance              |  |    | No          |
| 4-quadrant operation possible               |  |    | No          |
| Type of converter                           |  |    | U converter |
| Degree of protection (IP)                   |  |    | IP20        |
| Height                                      |  | mm | 184         |
| Width                                       |  | mm | 81          |
| Depth                                       |  | mm | 124         |
| Relative symmetric net frequency tolerance  |  | %  | 10          |
| Relative symmetric net current tolerance    |  | %  | 10          |

## Approvals

|                                      |  |  |   |
|--------------------------------------|--|--|---|
| Product Standards                    |  |  | UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking |
| UL File No.                          |  |  | E172143   |
| UL Category Control No.              |  |  | NMMS, NMMS7   |
| CSA File No.                         |  |  | UL report applies to both US and Canada                             |
| North America Certification          |  |  | UL listed, certified by UL for use in Canada                        |
| Specially designed for North America |  |  | No  |
| Suitable for                         |  |  | Branch circuits   |
| Max. Voltage Rating                  |  |  | 3~ 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)            |
| Degree of Protection                 |  |  | IEC: IP20   |

## Dimensions





## Additional product information (links)

### IL04020009Z DC1 variable frequency drive (FS1 - FS3, IP20)

IL04020009Z DC1 variable frequency drive (FS1 - FS3, IP20) [ftp://ftp.moeller.net/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL04020009Z2016\\_07.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL04020009Z2016_07.pdf)

### MN040023 DC1...E1 Installation manual

MN040023 DC1...E1 Installation manual - Deutsch [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN040023\\_DE.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040023_DE.pdf)

MN040023 DC1...E1 Installation manual - English [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN040023\\_EN.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040023_EN.pdf)

### MN040022 DC1...E1, Parameters manual

MN040022 DC1...E1, Parameters manual - Deutsch [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN040022\\_DE.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_DE.pdf)

MN040022 DC1...E1, Parameters manual - English [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN040022\\_EN.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_EN.pdf)

