



Variable frequency drive, 115 V AC, single-phase, 5.8 A, 1.1 kW, IP66/  
NEMA 4X, Brake chopper, Local controls, FS2



**Part no.** DC1-1D5D8NB-A6SCE1  
**Catalog No.** 185773  
**Alternate Catalog No.** DC1-1D5D8NB-A6SCE1

## Delivery program

|                                  |          |    |   |
|----------------------------------|----------|----|---|
| Product range                    |          |    | Variable frequency drives   |
| Part group reference (e.g. DIL)  |          |    | DC1   |
| Rated operational voltage        | $U_e$    |    | 115 V AC, single-phase  |
| Output voltage with $V_e$        | $U_2$    |    | 230 V AC, 3-phase   |
| Mains voltage (50/60Hz)          | $U_{LN}$ | V  | 110 (-10%) - 115 (+10%)   |
| <b>Rated operational current</b> |          |    |   |
| At 150% overload                 | $I_e$    | A  | 5.8   |
| Note                             |          |    | Rated operational current at an operating frequency of 6 kHz and an ambient air temperature of +40 °C   |
| <b>Assigned motor rating</b>     |          |    |   |
| Note                             |          |    | for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with 1500 rpm <sup>-1</sup> at 50 Hz or 1800 min <sup>-1</sup> at 60 Hz |
| Note                             |          |    | Overload cycle for 60 s every 600 s   |
| Note                             |          |    | at 230 V, 50 Hz   |
| 150 % Overload                   | P        | kW | 1.1   |
| 150 % Overload                   | $I_M$    | A  | 4.6   |
| Note                             |          |    | at 220 - 240 V, 60 Hz   |
| 150 % Overload                   | P        | HP | 1.5   |
| 150 % Overload                   | $I_M$    | A  | 5.8   |
| Degree of Protection             |          |    | IP66/NEMA 4X  |
| Interface/field bus (built-in)   |          |    | OP-Bus (RS485)/Modbus RTU, CANopen®   |
| Fieldbus connection (optional)   |          |    | SmartWire-DT  |
| Fitted with                      |          |    | Brake chopper<br>7-digital display assembly<br>Local controls<br>Additional PCB protection  |
| Frame size                       |          |    | FS2   |
| Connection to SmartWire-DT       |          |    | no  |

## Technical data

|                                    |          |    |   |
|------------------------------------|----------|----|---|
| <b>General</b>                     |          |    |   |
| 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, RCM, Ukr SEPPO, EAC  |
| Production quality                 |          |    | RoHS, ISO 9001  |
| Climatic proofing                  | $\rho_w$ | %  | < 95%, average relative humidity (RH), non-condensing, non-corrosive  |
| Air quality                        |          |    | 3C3, 3S3  |
| Ambient temperature                |          |    |   |
| Operating ambient temperature min. |          | °C | -10   |
| Operating ambient temperature max. |          | °C | +40   |
|                                    |          |    | operation (with 150 % overload)   |
| Storage                            | $\theta$ | °C | -40 - +60   |
| 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               |          |    | IP66/NEMA 4X  |

|   |            |          |   |
|---|------------|----------|---|
| Protection against direct contact                           |            |          | BGV A3 (VBG4, finger- and back-of-hand proof)   |
| <b>Main circuit</b>   |            |          |   |
| <b>Supply</b>   |            |          |   |
| Rated operational voltage                                   | $U_e$      |          | 115 V AC, single-phase  |
| Notes   |            |          | The mains voltage of 115 V is raised to 230 V (output voltage) through an internal voltage double connection.   |
| Mains voltage (50/60Hz)                                     | $U_{LN}$   | V        | 110 (-10%) - 115 (+10%)   |
| Input current (150% overload)                               | $I_{LN}$   | A        | 21.9  |
| 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  |
| <b>Power section</b>  |            |          |   |
| Function  |            |          | Variable frequency drive with internal DC link and IGBT inverter  |
| Overload current (150% overload)                            | $I_L$      | A        | 8.7   |
| max. starting current (High Overload)                       | $I_H$      | %        | 175   |
| Note about max. starting current                            |            |          | for 2,5 seconds every 600 seconds   |
| Output voltage with $V_e$                                   | $U_2$      |          | 230 V AC, 3-phase   |
| Output Frequency  | $f_2$      | Hz       | 0 - 50/60 (max. 500)  |
| Switching frequency   | $f_{PWM}$  | kHz      | 8<br>adjustable 4 - 32 (audible)  |
| Operation Mode  |            |          | U/f control<br>Speed control with slip compensation<br>sensorless vector control (SLV)<br>PM motors<br>Synchronous reluctance motors<br>BLDC motors               |
| Frequency resolution (setpoint value)                       | $\Delta f$ | Hz       | 0.1   |
| Rated operational current                                   |            |          |   |
| At 150% overload  | $I_e$      | A        | 5.8   |
| Note  |            |          | Rated operational current at an operating frequency of 6 kHz and an ambient air temperature of +40 °C   |
| Power loss  |            |          |   |
| Heat dissipation at rated operational current $I_e = 150\%$ | $P_V$      | W        | 44  |
| Efficiency  | $\eta$     | %        | 96  |
| Maximum leakage current to ground (PE) without motor        | $I_{PE}$   | mA       | 4.8   |
| Fitted with   |            |          | Brake chopper<br>7-digital display assembly<br>Local controls<br>Additional PCB protection  |
| Frame size  |            |          | FS2   |
| <b>Motor feeder</b>   |            |          |   |
| 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 230 V, 50 Hz   |
| 150 % Overload  | P          | kW       | 1.1   |
| Note  |            |          | at 220 - 240 V, 60 Hz   |
| 150 % Overload  | P          | HP       | 1.5   |
| maximum permissible cable length                            | l          | m        | screened: 100<br>screened, with motor choke: 200<br>unscreened: 150<br>unscreened, with motor choke: 300  |
| <b>Braking function</b>                                     |            |          |   |
| Standard braking torque                                     |            |          | max. 30 % MN  |
| DC braking torque   |            |          | max. 100% of rated operational current $I_e$ , variable   |
| Braking torque with external braking resistance             |            |          | Max. 100% of rated operational current $I_e$ with external braking resistor   |
| minimum external braking resistance                         | $R_{min}$  | $\Omega$ | 100   |
| Switch-on threshold for the braking transistor              | $U_{DC}$   | V        | 390 V DC  |

## 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  |  |   |  |
| Safety device (fuse or miniature circuit-breaker)       |  |   |  |
| IEC (Type B, gG), 150 %                                 |  |   | FAZ-B32/1N   |
| UL (Class CC or J)                                      |  | A | 35   |
| Mains contactor   |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)           |  |   | DILEM-... + P1DILEM  |
| Main choke  |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)           |  |   | DX-LN1-024   |
| Radio interference suppression filter (external, 150 %) |  |   | DX-EMC12-025-FS2   |
| Note regarding radio interference suppression filter    |  |   | Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments |
| Motor feeder  |  |   |  |
| motor choke   |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)           |  |   | DX-LM3-008   |
| Sine filter   |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)           |  |   | DX-SIN3-010  |

## Design verification as per IEC/EN 61439

|  |            |    |  |
|--|------------|----|--|
| Technical data for design verification   |            |    |  |
| Rated operational current for specified heat dissipation   | $I_n$      | A  | 5.8  |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 0  |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 44   |
| 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 | 40   |
|  |            |    | Operation (with 150 % overload)                                    |
| 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

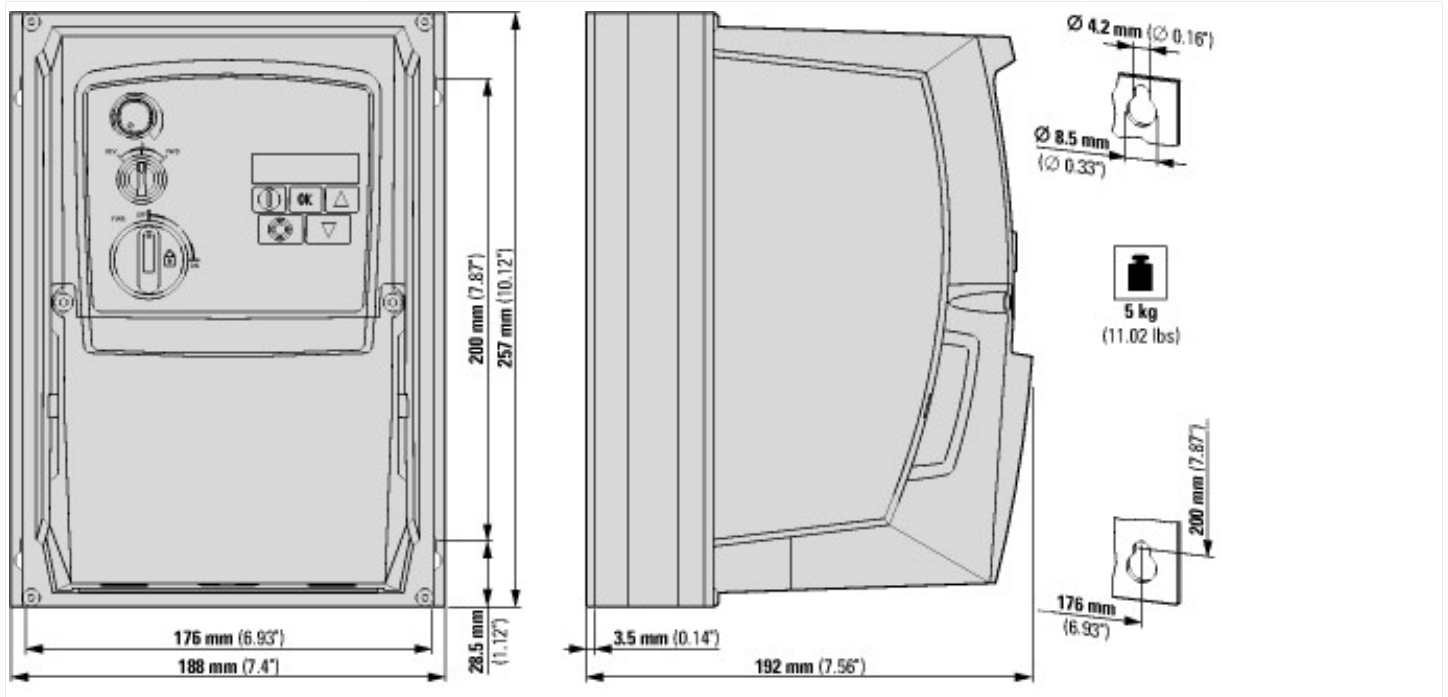
|   |    |           |
|---|----|-----------|
| Low-voltage industrial components (EG000017) / Frequency converter =< 1 kV (EC001857)   |    |           |
| Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kV (ec@ss10.0.1-27-02-31-01 [AKE177014]) |    |           |
| Mains voltage   | V  | 110 - 115 |
| Mains frequency   |    | 50/60 Hz  |
| Number of phases input  |    | 1         |
| Number of phases output   |    | 3         |
| Max. output frequency   | Hz | 500       |
| Max. output voltage   | V  | 250       |
| Nominal output current I2N  | A  | 5.8       |
| Max. output at quadratic load at rated output voltage   | kW | 1.1       |
| Max. output at linear load at rated output voltage  | kW | 1.1       |
| Relative symmetric net frequency tolerance  | %  | 10        |
| Relative symmetric net voltage tolerance  | %  | 10        |
| Number of analogue outputs  |    | 1         |
| Number of analogue inputs   |    | 2         |
| Number of digital outputs   |    | 1         |
| Number of digital inputs  |    | 4         |
| 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  |    | Yes       |
| 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   |    | Yes       |
| 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 BACnet  |    | No        |
| Supporting protocol for other bus systems   |    | Yes       |
| Number of HW-interfaces industrial Ethernet   |    | 0         |
| Number of 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        |    | 0           |
| Number of HW-interfaces parallel   |    | 0           |
| Number of HW-interfaces other      |    | 0           |
| With optical interface             |    | No          |
| With PC connection                 |    | Yes         |
| Integrated breaking resistance     |    | Yes         |
| 4-quadrant operation possible      |    | No          |
| Type of converter                  |    | U converter |
| Degree of protection (IP)          |    | IP66        |
| Degree of protection (NEMA)        |    | 4X          |
| Height                             | mm | 257         |
| Width                              | mm | 188         |
| Depth                              | mm | 192         |

## 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                  |  | 1~ 120 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)            |
| Degree of Protection                 |  | IEC: IP66   |

## Dimensions



## Additional product information (links)

### IL04020013Z DC1 variable frequency drive (FS1 - FS3, IP66)

IL04020013Z DC1 variable frequency drive (FS1 - FS3, IP66) [ftp://ftp.moeller.net/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL04020013Z2019\\_08.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL04020013Z2019_08.pdf)

### MN040023 DC1...E1 Installation manual

MN040023 DC1...E1 Installationshandbuch - 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   | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040023_EN.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040023_EN.pdf</a>   |
| MN040023 DC1...E1 manuale Installazione - italiano  | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040023_IT.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040023_IT.pdf</a>   |
| MN040023 DC1...E1 podręcznik instalacji - polski  | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040023_PL.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040023_PL.pdf</a>   |
| <b>MN040022 DC1...E1, Parameters manual</b>   |   |
| MN040022 DC1...E1, Parameterhandbuch - Deutsch  | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_DE.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_DE.pdf</a>   |
| MN040022 DC1...E1, Parameters manual - English  | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_EN.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_EN.pdf</a>   |
| MN040022 DC1...E1, manuale Parametri - italiano   | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_IT.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_IT.pdf</a>   |
| MN040022 DC1...E1, podręcznik parametrów - polski   | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_PL.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040022_PL.pdf</a>   |
| CA04020001Z-EN Product Range Catalog: Efficient Engineering for Starting and Controlling Motors | <a href="http://www.eaton.eu/DE/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_1095238.pdf">http://www.eaton.eu/DE/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_1095238.pdf</a> |