



Variable Frequency Drive, 1-/3- 230 V, 10.5 A, 2.2 kW, Brake-Chopper

Part no. DC1-12011NB-A66N
Article no. 169235
Catalog No. DC1-12011NB-A66N

Technical data

General

| | | | |
|-----------------------------------|----------|----|---|
| Standards | | | Specification for general requirements: IEC/EN 61800-2 EMC requirements: IEC/EN 61800-3 Safety requirements: IEC/EN 61800-5-1 |
| Certifications | | | CE, UL, cUL, c-Tick, UkrSepro, EAC |
| Production quality | | | RoHS, ISO 9001 |
| Climatic proofing | ρ_w | % | < 95%, average relative humidity (RH), non-condensing, non-corrosive |
| Ambient temperature | | | |
| operation (150 % overload) | θ | °C | -10 - +40 |
| | | | -10 - +45 °C for UL compliance over a period of 24 hours. |
| Storage | θ | °C | -40 - +60 |
| Mounting position | | | Vertical |
| Altitude | | m | 0 - 1000 m above sea level Above 1000 m: 1% derating for every 100 m max. 4000 m |
| Degree of Protection | | | IP66/NEMA 4X |
| Protection against direct contact | | | BGV A3 (VBG4, finger- and back-of-hand proof) |

Main circuit

| | | | |
|---|------------|-----|---|
| Supply | | | |
| Rated operational voltage | U_e | | 230 V AC, 1-phase 240 V AC, single-phase |
| Mains voltage (50/60Hz) | U_{LN} | V | 200 (-10%) - 240 (+10%) |
| Input current (150% overload) | I_{LN} | A | 19.2 |
| 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 | 15.75 |
| max. starting current (High Overload) | I_H | % | 175 |
| Note about max. starting current | | | for 2 seconds every 20 seconds |
| Output voltage with V_e | U_2 | | 230 V AC, 3-phase 240 V AC, 3-phase |
| Output Frequency | f_2 | Hz | 0 - 50/60 (max. 500) |
| Switching frequency | f_{PWM} | kHz | 16 adjustable 4 - 32 (audible) |
| Operation Mode | | | U/f control Speed control with slip compensation |
| Frequency resolution (setpoint value) | Δf | Hz | 0.1 |
| Rated operational current | | | |
| At 150% overload | I_e | A | 10.5 |
| Note | | | Rated operational current at a switching frequency of 16 kHz and an ambient air temperature of +40 °C |
| Power loss | | | |
| Heat dissipation at rated operational current $I_e = 150\%$ | P_V | W | 103.4 |
| Efficiency | η | % | 95.3 |
| Maximum leakage current to ground (PE) without motor | I_{PE} | mA | < 1 |
| Fitted with | | | Brake chopper 7-digital display assembly |
| Frame size | | | FS2 |

| | | | |
|---|------------|----------|---|
| Motor feeder | | | |
| Note | | | for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with 1500 rpm^{-1} at 50 Hz or 1800 min^{-1} at 60 Hz |
| Note | | | Overload cycle for 60 s every 600 s |
| Note | | | at 230 V, 50 Hz |
| 150 % Overload | P | kW | 2.2 |
| Note | | | at 220 - 240 V, 60 Hz |
| 150 % Overload | P | HP | 3 |
| maximum permissible cable length | l | m | screened: 100 screened, with motor choke: 200 unscreened: 150 unscreened, with motor choke: 300 |
| Apparent power | | | |
| Apparent power at rated operation 230 V | S | kVA | 4.18 |
| Apparent power at rated operation 240 V | S | kVA | 4.36 |
| Braking function | | | |
| Standard braking torque | | | max. 30 % M_N |
| DC braking torque | | | adjustable to 100 % |
| Braking torque with external braking resistance | | | Max. 100% of rated operational current I_e with external braking resistor |
| minimum external braking resistance | R_{\min} | Ω | 50 |
| 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 | | | |
| IEC (Type B, gG), 150 % | | | FAZ-B25/1N |
| UL (Class CC or J) | | A | 25 |
| 150 % overload (CT/ I_H , at 50 °C) | | | DX-LN1-024 |
| Motor feeder | | | |
| 150 % overload (CT/ I_H , at 50 °C) | | | DX-LM3-011 |
| 150 % overload (CT/ I_H , at 50 °C) | | | DX-SIN3-016 |
| 10 % duty factor (DF) | | | DX-BR050-0K4 |
| 20 % duty factor (DF) | | | DX-BR050-0K8 |
| 40 % duty factor (DF) | | | DX-BR047-3K1 |

Design verification as per IEC/EN 61439

| | | | |
|--|------------|----|--|
| Technical data for design verification | | | |
| Rated operational current for specified heat dissipation | I_n | A | 10.5 |
| Heat dissipation per pole, current-dependent | P_{vid} | W | 0 |
| Equipment heat dissipation, current-dependent | P_{vid} | W | 103.4 |
| 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 |
| 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. |

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| 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])

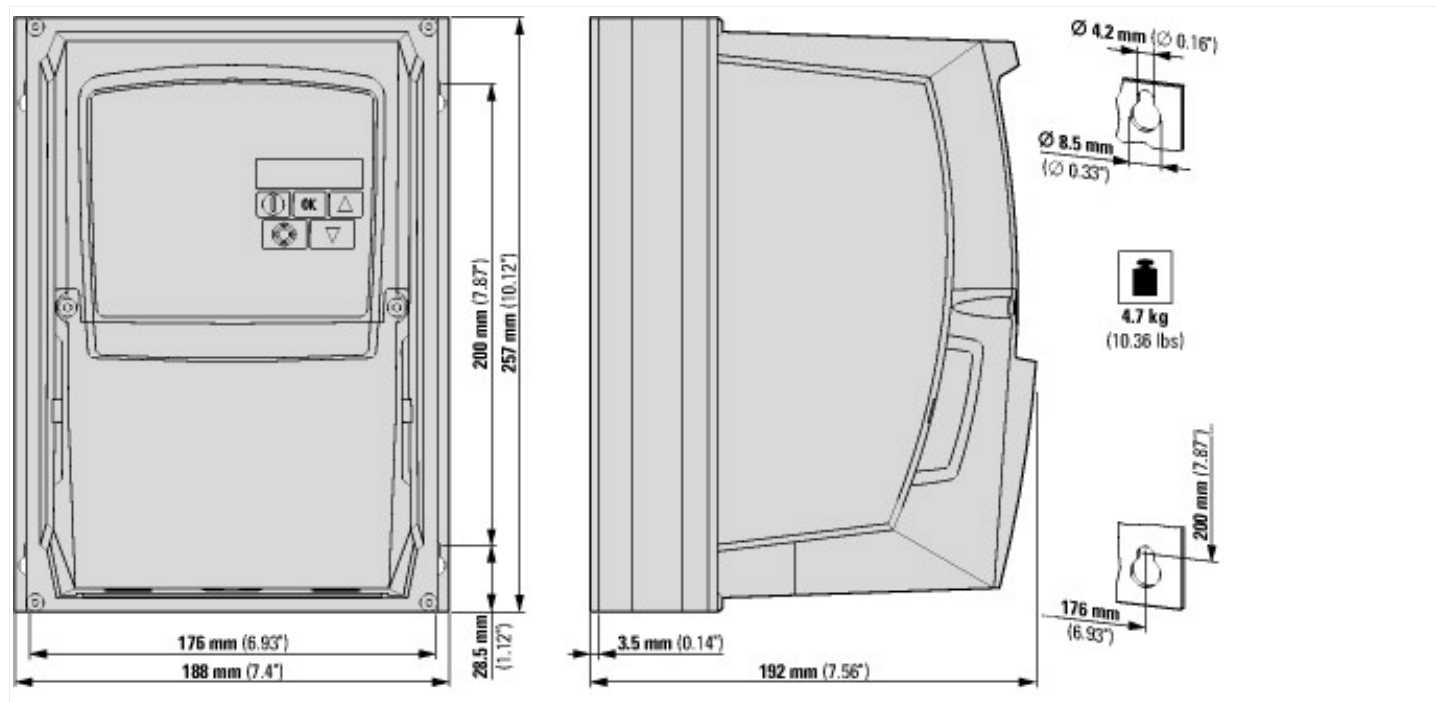
| | | |
|--|----|-----------|
| Mains voltage | V | 200 - 240 |
| Mains frequency | | 50/60 Hz |
| Number of phases input | | 1 |
| Number of phases output | | 3 |
| Max. output frequency | Hz | 500 |
| Max. output voltage | V | 230 |
| Rated output current I _{2N} | A | 11 |
| Max. output at quadratic load at rated output voltage | kW | 2.2 |
| Max. output at linear load at rated output voltage | kW | 2.2 |
| 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 | | 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 | | | Yes |
| 4-quadrant operation possible | | | No |
| Type of converter | | | U converter |
| Degree of protection (IP) | | | IP66 |
| Height | | mm | 231 |
| Width | | mm | 107 |
| Depth | | mm | 152 |
| 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 | | | 1~ 240 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 drives (FS1 - FS3, IP66)

IL04020013Z DC1 variable frequency drives (FS1 ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL04020013Z2016_07.pdf - FS3, IP66)

MN04020003Z DC1 variable frequency drives, Installation manual

MN04020003Z Frequenzumrichter DC1, Handbuch - Deutsch ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020003Z_DE.pdf

MN04020003Z DC1 variable frequency drive, manual - English ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020003Z_EN.pdf

MN04020003Z Frekvenční měnič DC1, manuál - čeština ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020003Z_CZ.pdf

MN04020003Z Convertitori di frequenza DC1, manuale - italiano ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020003Z_IT.pdf

MN04020004Z DC1 variable frequency drives, Parameters manual

MN04020004Z DC1 variable frequency drives, Parameters manual - Deutsch ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020004Z_DE.pdf

MN04020004Z DC1 variable frequency drives, Parameters manual - English ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020004Z_EN.pdf

CA04020001Z-DE Sortimentskatalog: Antriebstechnik effizient gestalten, Motoren starten und steuern http://www.eaton.eu/DE/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_1095238_de.pdf