



Variable speed starter, Rated operational voltage 230 V AC, 1-phase, I_e 1.4 A, 0.25 kW, 0.33 HP, Radio interference suppression filter

Part no. DE1-121D4FN-N20N
Catalog No. 174327
Eaton Catalog No. DE1-121D4FN-N20N
EL-Nummer 0004110091
(Norway)

Delivery program

| | | | |
|------------------------------------|-----------------|----|---|
| Product range | | | Variable speed starter |
| Part group reference (e.g. DIL) | | | DE1 |
| Rated operational voltage | U _e | | 230 V AC, 1-phase 240 V AC, single-phase |
| Output voltage with V _e | U ₂ | | 230 V AC, 3-phase 240 V AC, 3-phase |
| Mains voltage (50/60Hz) | U _{LN} | V | 200 (-10%) - 240 (+10%) |
| Rated operational current | | | |
| At 150% overload | I _e | A | 1.4 |
| Note | | | Rated operational current at an operating frequency of 16 kHz and an ambient air temperature of +50 °C |
| Assigned motor rating | | | |
| 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 | 0.25 |
| 150 % Overload | I _M | A | 1.4 |
| Note | | | at 220 - 240 V, 60 Hz |
| 150 % Overload | P | HP | 0.33 |
| 150 % Overload | I _M | A | 1.4 |
| Degree of Protection | | | IP20/NEMA 0 |
| Interface/field bus (built-in) | | | OP-Bus (RS485)/Modbus RTU |
| Fitted with | | | Radio interference suppression filter |
| Frame size | | | FS1 |
| Connection to SmartWire-DT | | | yes in conjunction with DX-NET-SWD3 SmartWire DT module |

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, RCM |
| 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 - +60 |
| Storage | θ | °C | -40 - +70 |
| Radio interference level | | | |
| Radio interference class (EMC) | | | C1 (for conducted emissions only), 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 | C1 ≤ 5 m |

| | | | |
|-----------------------------------|--|---|--|
| | | | C2 ≤ 10 m C3 ≤ 25 m |
| Mechanical shock resistance | | g | 15 (11 m/s, EN 60068-2-27) |
| Vibration | | | EN 61800-5-1 |
| Altitude | | m | 0 - 1000 m above sea level Above 1000 m: 1% derating for every 100 m max. 2000 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 | | 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 | 3.6 |
| Supply frequency | f_{LN} | Hz | 50/60 |
| Frequency range | f_{LN} | Hz | 45 - 66 |
| Mains switch-on frequency | | | Maximum of one time every 30 seconds |
| Power section | | | |
| Overload current (150% overload) | I_L | A | 2.1 |
| max. starting current (High Overload) | I_H | % | 200 |
| Note about max. starting current | | | for 1.875 seconds every 600 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. 300) |
| 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 | 0.025 |
| Rated operational current | | | |
| At 150% overload | I_e | A | 1.4 |
| Note | | | Rated operational current at an operating frequency of 16 kHz and an ambient air temperature of +50 °C |
| Maximum leakage current to ground (PE) without motor | I_{PE} | mA | < 3.5 AC, < 10 DC |
| Fitted with | | | Radio interference suppression filter |
| Frame size | | | FS1 |
| 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 | 0.25 |
| Note | | | at 220 - 240 V, 60 Hz |
| 150 % Overload | P | HP | 0.33 |
| Apparent power | | | |
| Apparent power at rated operation 230 V | S | kVA | 0.56 |
| Apparent power at rated operation 240 V | S | kVA | 0.58 |
| Braking function | | | |
| Standard braking torque | | | max. 30 % M_N |
| DC braking torque | | | adjustable to 100 % |

Control section

| | | | |
|--------------------------------|-------|---|---|
| Reference voltage | U_s | V | 10 V DC (max. 0.2 mA) |
| Analog inputs | | | 1, parameterizable, 0 - 10 V DC, 0/4 - 20 mA |
| Digital inputs | | | 4, parameterizable, 10 - 30 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 |

Assigned switching and protective elements

| | | | |
|--------------|--|--|--|
| Power Wiring | | | |
|--------------|--|--|--|

| | | | |
|---|--|---|------------------------|
| Safety device (fuse or miniature circuit-breaker) | | | |
| IEC (Type B, gG), 150 % | | | FAZ-B10/1N |
| UL (Class CC or J) | | A | 10 |
| Mains contactor | | | |
| 150 % overload (CT/I _H , at 50 °C) | | | DILEM-... + P1DILEM |
| 110 % overload (VT/I _L , at 40 °C) | | | DILM7-... + DILM12-XP1 |
| Main choke | | | |
| 150 % overload (CT/I _H , at 50 °C) | | | DX-LN1-006 |
| Motor feeder | | | |
| motor choke | | | |
| 150 % overload (CT/I _H , at 50 °C) | | | DX-LM3-005 |

Design verification as per IEC/EN 61439

| | | | |
|--|-------------------|----|--|
| Technical data for design verification | | | |
| Rated operational current for specified heat dissipation | I _n | A | 1.4 |
| Heat dissipation per pole, current-dependent | P _{vid} | W | 0 |
| Equipment heat dissipation, current-dependent | P _{vid} | W | 17 |
| 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 7.0

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|--|---|-----------|
| 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@ss10.0.1-27-02-31-01 [AKE177014]) | | |
| Mains voltage | V | 200 - 240 |
| Mains frequency | | 50/60 Hz |

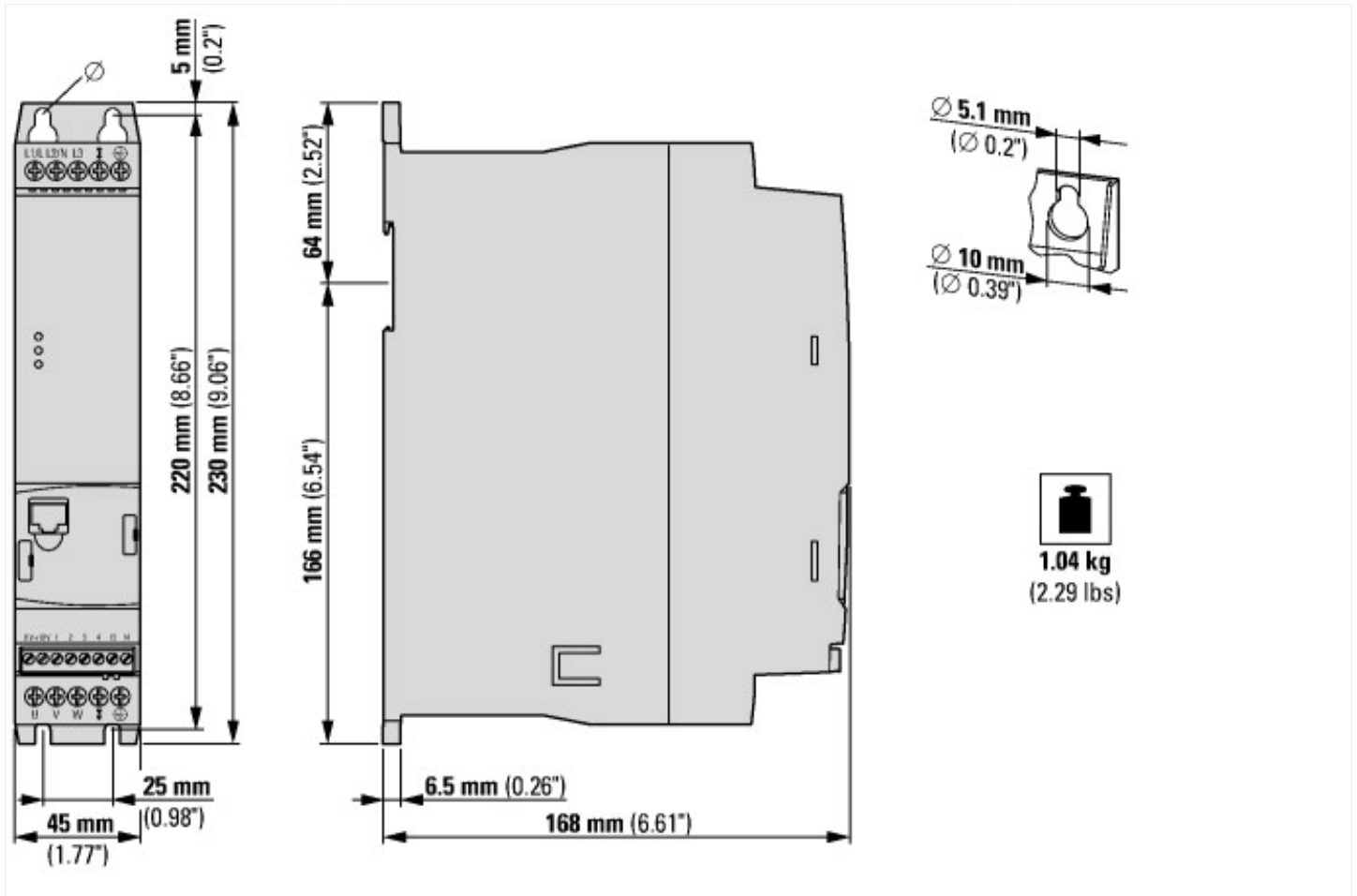
| | | |
|--|----|-------------|
| Number of phases input | | 1 |
| Number of phases output | | 3 |
| Max. output frequency | Hz | 300 |
| Max. output voltage | V | 250 |
| Nominal output current I2N | A | 1.4 |
| Max. output at quadratic load at rated output voltage | kW | 0.5 |
| Max. output at linear load at rated output voltage | kW | 0.5 |
| Relative symmetric net frequency tolerance | % | 10 |
| Relative symmetric net voltage tolerance | % | 10 |
| Number of analogue outputs | | 0 |
| Number of analogue inputs | | 1 |
| Number of digital outputs | | 0 |
| Number of digital inputs | | 4 |
| With control unit | | No |
| 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 | | No |
| 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 | | No |
| 4-quadrant operation possible | | No |
| Type of converter | | U converter |
| Degree of protection (IP) | | IP20 |
| Degree of protection (NEMA) | | Other |

| | | |
|--------|----|-----|
| Height | mm | 230 |
| Width | mm | 45 |
| Depth | mm | 168 |

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: IP20 |

Dimensions



Additional product information (links)

IL040005ZU Variable frequency drives DE1

IL040005ZU Variable frequency drives DE1 ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL040005ZU2018_05.pdf

MN040011 DE1 Variable speed starter, Manual

MN040011 DE1 variabler Drehzahlstarter, Handbuch - Deutsch ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_DE.pdf

MN040011 DE1 Variable speed starter, Manual - English ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_EN.pdf

MN040011 Démarreur à vitesse variable DE1, manuel d'utilisation - français ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_FR.pdf

MN040011 Avviatore a velocità variabile DE1, Manuale - italiano ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_IT.pdf

MN040011 DE1 Variable speed starter, Manual ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_NO.pdf

MN040011 Rozrusznik silnikowy z regulacją prędkości DE1, podręcznik - polski ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_PL.pdf

MN040011 Устройства пуска с регулировкой скорости DE1, руководство - русский

ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_RU.pdf

CA04020001Z-EN Product Range Catalog: Efficient Engineering for Starting and Controlling Motors

http://www.eaton.eu/DE/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_1095238.pdf