



**Variable Frequency Drive, 3-/3- 230 V, 18 A, 4 kW, EMC-Filter, Brake-Chopper**



**Part no.** DC1-32018FB-A6SN  
**Catalog No.** 169452  
**Eaton Catalog No.** DC1-32018FB-A6SN

**Delivery program**

|                                    |                 |    |  |   |
|------------------------------------|-----------------|----|--|---|
|                                    |                 |    |  | This item will continue to be available for a limited time only and is being replaced by the following item: 185720, DC1-32018FB-A6SCE1                         |
| Product range                      |                 |    |  | Variable frequency drives   |
| Part group reference (e.g. DIL)    |                 |    |  | DC1   |
| Rated operational voltage          | U <sub>e</sub>  |    |  | 230 V AC, 3-phase<br>240 V AC, 3-phase  |
| Output voltage with V <sub>e</sub> | U <sub>2</sub>  |    |  | 230 V AC, 3-phase<br>240 V AC, 3-phase  |
| Mains voltage (50/60Hz)            | U <sub>LN</sub> | V  |  | 200 (-10%) - 240 (+10%)   |
| <b>Rated operational current</b>   |                 |    |  |   |
| At 150% overload                   | I <sub>e</sub>  | A  |  | 18  |
| Note                               |                 |    |  | Rated operational current at a switching frequency of 8 kHz and an ambient air temperature of +40 °C  |
| Note                               |                 |    |  | Overload cycle for 60 s every 600 s   |
| <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 |  | 4   |
| 150 % Overload                     | I <sub>M</sub>  | A  |  | 14.8  |
| Note                               |                 |    |  | at 220 - 240 V, 60 Hz   |
| 150 % Overload                     | P               | HP |  | 5   |
| 150 % Overload                     | I <sub>M</sub>  | A  |  | 15.2  |
| Degree of Protection               |                 |    |  | IP66/NEMA 4X  |
| Interface/field bus (built-in)     |                 |    |  | OP-Bus (RS485)/Modbus RTU, CANopen®   |
| Fieldbus connection (optional)     |                 |    |  | SmartWire-DT  |
| Fitted with                        |                 |    |  | Radio interference suppression filter<br>Brake chopper<br>7-digit display assembly<br>Local controls  |
| Frame size                         |                 |    |  | FS3   |
| Connection to SmartWire-DT         |                 |    |  | with SmartWire-DT module DX-NET-SWD2  |

**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, RCM, UkrSEPRO, EAC   |
| Production quality             |                |    |  | RoHS, ISO 9001  |
| Climatic proofing              | ρ <sub>w</sub> | %  |  | < 95%, average relative humidity (RH), non-condensing, non-corrosive  |
| Ambient temperature            |                |    |  |   |
| operation (150 % overload)     | θ              | °C |  | -10 - +40   |
| Storage                        | θ              | °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              |   |   | 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, 3-phase<br>240 V AC, 3-phase  |
| Mains voltage (50/60Hz)                                     | $U_{LN}$   | V   | 200 (-10%) - 240 (+10%)   |
| Input current (150% overload)                               | $I_{LN}$   | A   | 20.9  |
| 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  |
| Power section   |            |     |   |
| Function  |            |     | Frequency inverter with internal DC link and IGBT inverter  |
| Overload current (150% overload)                            | $I_L$      | A   | 27  |
| 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<br>240 V AC, 3-phase  |
| Output Frequency  | $f_2$      | Hz  | 0 - 50/60 (max. 500)  |
| Switching frequency   | $f_{PWM}$  | kHz | 8<br>adjustable 4 - 24 (audible)  |
| Operation Mode  |            |     | U/f control<br>Speed control with slip compensation   |
| Frequency resolution (setpoint value)                       | $\Delta f$ | Hz  | 0.1   |
| Rated operational current                                   |            |     |   |
| At 150% overload  | $I_e$      | A   | 18  |
| Note  |            |     | Rated operational current at a switching frequency of 8 kHz and an ambient air temperature of +40 °C  |
| Power loss  |            |     |   |
| Heat dissipation at rated operational current $I_e = 150\%$ | $P_V$      | W   | 160   |
| Efficiency  | $\eta$     | %   | 96  |
| Maximum leakage current to ground (PE) without motor        | $I_{PE}$   | mA  | 1.60  |
| Fitted with   |            |     | Radio interference suppression filter<br>Brake chopper<br>7-digital display assembly<br>Local controls  |
| Frame size  |            |     | FS3   |
| 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 230 V, 50 Hz   |
| 150 % Overload  | P          | kW  | 4   |
| Note  |            |     | at 220 - 240 V, 60 Hz   |
| 150 % Overload  | P          | HP  | 5   |
| maximum permissible cable length                            | l          | m   | screened: 100<br>screened, with motor choke: 200<br>unscreened: 150<br>unscreened, with motor choke: 300  |
| Apparent power  |            |     |   |
| Apparent power at rated operation 230 V                     | S          | kVA | 7.17  |
| Apparent power at rated operation 240 V                     | S          | kVA | 7.48  |
| 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 $I_g$ with external braking resistor |
| minimum external braking resistance             | $R_{min}$ | $\Omega$ | 25  |
| 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-B20/3    |
| UL (Class CC or J)                    |  | A | 20           |
| 150 % overload (CT/ $I_H$ , at 50 °C) |  |   | DX-LN3-025   |
| Motor feeder                          |  |   |              |
| 150 % overload (CT/ $I_H$ , at 50 °C) |  |   | DX-LM3-035   |
| 150 % overload (CT/ $I_H$ , at 50 °C) |  |   | DX-SIN3-023  |
| 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  | 18   |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 0  |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 160  |
| Static heat dissipation, non-current-dependent   | $P_{vs}$   | W  | 0  |
| Heat dissipation capacity  | $P_{diss}$ | W  | 0  |
| Operating ambient temperature max.   |            | °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.                         |
| 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 5.0

Low-voltage industrial components (EG000017) / Frequency controller =< 1 kV (EC001857)

Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kv (ecl@ss8-27-02-31-01 [AKE177010])

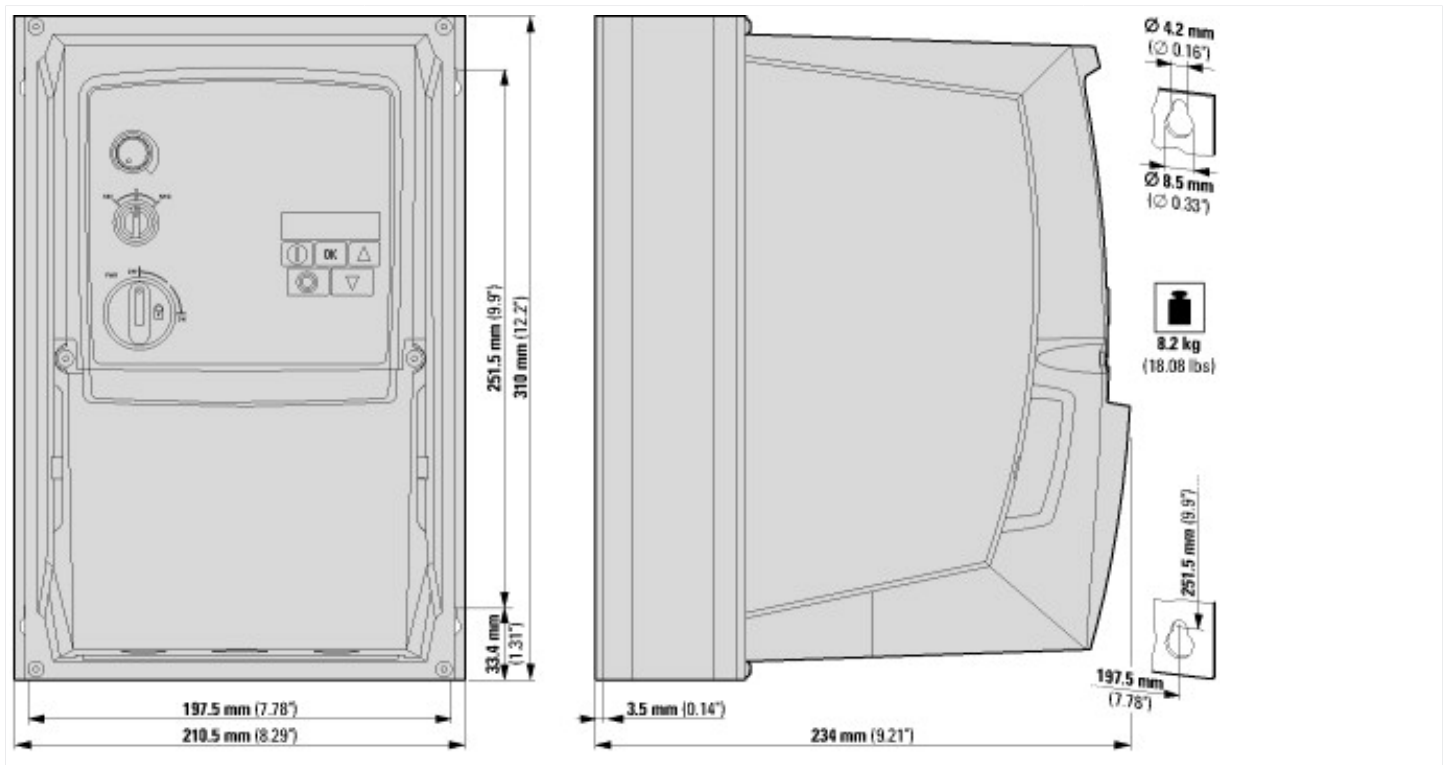
|  |    |           |
|--|----|-----------|
| Mains voltage  | V  | 200 - 240 |
| Mains frequency  |    | 50/60 Hz  |
| Number of phases input                                 |    | 3         |
| Number of phases output                                |    | 3         |
| Max. output frequency                                  | Hz | 500       |
| Rated output voltage                                   | V  | 230       |
| Measuring output current                               | A  | 18        |
| Output power at rated output voltage                   | kW | 4         |
| Max. output at quadratic load at rated output voltage  | kW | 4         |
| Max. output at linear load at rated output voltage     | kW | 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                    |    | 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 PROFI-safe                     |    | 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 braking resistance              |    | Yes         |
| 4-quadrant operation possible              |    | No          |
| Type of converter                          |    | U converter |
| Degree of protection (IP)                  |    | IP66        |
| Height                                     | mm | 273         |
| Width                                      | mm | 131         |
| Depth                                      | mm | 175         |
| Relative symmetric net frequency tolerance | %  | 5           |
| 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- 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 - FS3, IP66) [ftp://ftp.moeller.net/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL04020013Z2016\\_07.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL04020013Z2016_07.pdf)

### MN04020003Z DC1 variable frequency drives, Installation manual

MN04020003Z Frequenzumrichter DC1, Installationshandbuch - Deutsch [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020003Z\\_DE.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020003Z_DE.pdf)

MN04020003Z DC1 variable frequency drives, Installation manual - English [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020003Z\\_EN.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020003Z_EN.pdf)

MN04020003Z DC1 variable frequency drives, Installation manual - čeština [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020003Z\\_CZ.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020003Z_CZ.pdf)

MN04020003Z DC1 variable frequency drives, Installation manual - italiano [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020003Z\\_IT.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020003Z_IT.pdf)

**MN04020004Z DC1 variable frequency drives, Parameters manual**

|   |   |
|---|---|
| MN04020004Z Frequenzumrichter DC1,<br>Parameterhandbuch - Deutsch                                     | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020004Z_DE.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020004Z_DE.pdf</a>   |
| MN04020004Z DC1 variable frequency drives,<br>Parameters manual - English                             | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020004Z_EN.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020004Z_EN.pdf</a>   |
| CA04020001Z-EN Product Range Catalog:<br>Efficient Engineering for Starting and<br>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> |