



Variable frequency drive, 500 V AC, 3-phase, 208 A, 132 kW, IP54/NEMA12, DC link choke



**Part no.** DG1-35208FN-C54C  
**Catalog No.** 9703-6106-00P  
**Alternate Catalog No.** DG1-35208FN-C54C

## Delivery program

|                                  |          |    |   |
|----------------------------------|----------|----|---|
| Product range                    |          |    | Variable frequency drives   |
| Part group reference (e.g. DIL)  |          |    | DG1   |
| Rated operational voltage        | $U_e$    |    | 600 V AC, 3-phase   |
| Output voltage with $V_e$        | $U_2$    |    | 600 V AC, 3-phase   |
| Mains voltage (50/60Hz)          | $U_{LN}$ | V  | 500 (-10%) - 600 (+10%)   |
| <b>Rated operational current</b> |          |    |   |
| At 150% overload                 | $I_e$    | A  | 208   |
| At 110% overload                 | $I_e$    | A  | 250   |
| Note                             |          |    | Rated operational current for a switching frequency of 1 - 6 kHz and an ambient temperature of +50 °C for a 150% overload and +40 °C for a 110% overload        |
| <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 525 V, 50 Hz   |
| 150 % Overload                   | P        | kW | 132   |
| 110 % Overload                   | P        | kW | 160   |
| 150 % Overload                   | $I_M$    | A  | 184   |
| 110 % Overload                   | $I_M$    | A  | 224   |
| Note                             |          |    | at 600 V, 50 Hz   |
| 150 % Overload                   | P        | kW | 160   |
| 110 % Overload                   | P        | kW | 200   |
| 150 % Overload                   | $I_M$    | A  | 197   |
| 110 % Overload                   | $I_M$    | A  | 246   |
| Note                             |          |    | at 600 V, 60 Hz   |
| 150 % Overload                   | P        | HP | 200   |
| 110 % Overload                   | P        | HP | 250   |
| 150 % Overload                   | $I_M$    | A  | 192   |
| 110 % Overload                   | $I_M$    | A  | 242   |
| Degree of Protection             |          |    | IP54/NEMA12   |
| Interface/field bus (built-in)   |          |    | Modbus RTU<br>Modbus TCP<br>BACnet MS/TP<br>Ethernet IP   |
| Fieldbus connection (optional)   |          |    | PROFIBUS<br>CANopen®<br>DeviceNet<br>SmartWire-DT   |
| Fitted with                      |          |    | Radio interference suppression filter<br>Additional PCB protection<br>Multi-line graphic display<br>DC link choke   |
| Parameterization                 |          |    | Keypad<br>Feldbus<br>Power Xpert inControl  |
| Frame size                       |          |    | FS6   |
| Connection to SmartWire-DT       |          |    | yes<br>in conjunction with DXG-NET-SWD SmartWire DT module  |

## 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   |
| Certifications                     |          |    | UL, cUL, c-Tick, UkrSEPRO, EAC  |
| Production quality                 |          |    | RoHS, ISO 9001  |
| Climatic proofing                  | $\rho_w$ | %  | < 95%, average relative humidity (RH), non-condensing, non-corrosive  |
| Air quality                        |          |    | 3C2, 3S2  |
| Ambient temperature                |          |    |   |
| Operating ambient temperature min. |          | °C | -10   |
| Operating ambient temperature max. |          | °C | +50   |
| operation (110 % overload)         | $\theta$ | °C | -10 - +40   |
|                                    |          |    | Operation with 110 % overload (1 min./10 min.): -10 to +40 (max. +55 with 1% derating per Kelvin above limit)<br>Operation with 150% overload (1 min./10 min.): -10 to +50 (max. +60 with 1% derating per Kelvin above limit)<br>-20 with cold-weather mode |
| Storage                            | $\theta$ | °C | -40 - +70   |
| Overvoltage category               |          |    | III   |
| Pollution degree                   |          |    | 2   |
| Radio interference level           |          |    |   |
| Radio interference class (EMC)     |          |    | C1 (with external filter, 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  | C3 ≤ 10 m   |
| Mechanical shock resistance        |          | g  | EN 61800-5-1, EN 60068-2-27<br>UPS drop test (for weights inside the UPS frame)<br>Storage and transportation: maximum 15 g, 11 ms (inside the packaging)   |
| Vibration                          |          |    | EN 61800-5-1, EN 60068-2-6: 5 - 150 Hz<br>Amplitude: 1 mm (peak) at 5 - 15.8 Hz<br>Maximum acceleration amplitude: 1 g at 15.8 – 150 Hz   |
| Mounting position                  |          |    | Vertical  |
| Altitude                           |          | m  | 0 - 1000 m above sea level<br>Above 1000 m: 1% derating for every 100 m<br>max. 2000 m  |
| Degree of Protection               |          |    | IP54/NEMA12   |
| Protection against direct contact  |          |    | BGV A3 (VBG4, finger- and back-of-hand proof)   |

### Main circuit

|   |           |     |   |
|---|-----------|-----|---|
| Supply                                  |           |     |   |
| Rated operational voltage               | $U_e$     |     | 600 V AC, 3-phase   |
| Mains voltage (50/60Hz)                 | $U_{LN}$  | V   | 500 (-10%) - 600 (+10%)   |
| Input current (150% overload)           | $I_{LN}$  | A   | 193.3   |
| Input current (110% overload)           | $I_{LN}$  | T   | 230.7   |
| System configuration                    |           |     | TN-S, TN-C, TN-C-S, TT, IT  |
| Supply frequency                        | $f_{LN}$  | Hz  | 50/60   |
| Frequency range                         | $f_{LN}$  | Hz  | 45–66 (± 0%)  |
| Mains switch-on frequency               |           |     | Maximum of one time every 60 seconds  |
| Mains current distortion                | THD       | %   | 31.5  |
| Rated conditional short-circuit current | $I_q$     | kA  | < 100   |
| Power section                           |           |     |   |
| Function                                |           |     | Variable frequency drive with internal DC link, DC link choke and IGBT inverter |
| Overload current (150% overload)        | $I_L$     | A   | 312   |
| Overload current (110% overload)        | $I_L$     | A   | 275   |
| max. starting current (High Overload)   | $I_H$     | %   | 200   |
| Note about max. starting current        |           |     | for 2 seconds every 20 seconds  |
| Output voltage with $V_e$               | $U_2$     |     | 600 V AC, 3-phase   |
| Output Frequency                        | $f_2$     | Hz  | 0 - 50/60 (max. 400)  |
| Switching frequency                     | $f_{PWM}$ | kHz | 1.5<br>adjustable 1 - 6   |

|   |            |          |   |
|---|------------|----------|---|
| Operation Mode  |            |          | U/f control<br>Speed control with slip compensation<br>sensorless vector control (SLV)<br>Torque regulation   |
| Frequency resolution (setpoint value)                       | $\Delta f$ | Hz       | 0.01  |
| Rated operational current                                   |            |          |   |
| At 150% overload  | $I_e$      | A        | 208   |
| At 110% overload  | $I_e$      | A        | 250   |
| Note  |            |          | Rated operational current for a switching frequency of 1 - 6 kHz and an ambient temperature of +50 °C for a 150% overload and +40 °C for a 110% overload          |
| Motor current limit   | $I$        | A        | 0.1 - 2 x $I_H$ (CT)  |
| Power loss  |            |          |   |
| Heat dissipation at rated operational current $I_e = 150\%$ | $P_V$      | W        | 3165  |
| Heat dissipation at rated operational current $I_e = 110\%$ | $P_V$      | W        | 2506  |
| Efficiency  | $\eta$     | %        | 98.5  |
| Maximum leakage current to ground (PE) without motor        | $I_{PE}$   | mA       | 11.8  |
| Fan   |            |          | temperature controlled<br>externally accessible   |
| Internal fan delivery rate                                  |            | $m^3/h$  | 679   |
| Fitted with   |            |          | Radio interference suppression filter<br>Additional PCB protection<br>Multi-line graphic display<br>DC link choke   |
| Safety function   |            |          | STO (Safe Torque Off, SIL1, PLc Cat 1)  |
| Frame size  |            |          | FS6   |
| 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 525 V, 50 Hz   |
| 150 % Overload  | P          | kW       | 132   |
| 110 % Overload  | P          | kW       | 160   |
| Note  |            |          | at 600 V, 50 Hz   |
| 150 % Overload  | P          | kW       | 160   |
| 110 % Overload  | P          | kW       | 200   |
| Note  |            |          | at 600 V, 60 Hz   |
| 150 % Overload  | P          | HP       | 200   |
| 110 % Overload  | P          | HP       | 250   |
| maximum permissible cable length                            | $l$        | m        | screened: 200   |
| Apparent power  |            |          |   |
| Apparent power at rated operation 600 V                     | S          | kVA      | 259.8   |
| Braking function  |            |          |   |
| Standard braking torque                                     |            |          | max. 30 % $M_N$   |
| DC braking torque   |            |          | adjustable to 150 %   |
| Braking torque with external braking resistance             |            |          | Max. 100% of rated operational current $I_e$ with external braking resistor   |
| minimum external braking resistance                         | $R_{min}$  | $\Omega$ | 2.5   |
| Switch-on threshold for the braking transistor              | $U_{DC}$   | V        | Supply voltage UAUX 1050 V DC   |
| DC braking  | %          | $I/I_e$  | $\leq 150$ , adjustable   |

### Control section

|                                |       |   |   |
|--------------------------------|-------|---|---|
| External control voltage       | $U_c$ | V | 24 V DC (max. 250 mA options incl.)   |
| Reference voltage              | $U_s$ | V | 10 V DC (max. 10 mA)  |
| Analog inputs                  |       |   | 2, parameterizable, 0 - 10 V DC, 2 - 10 V DC, -10 - +10 V DC, 0/4 - 20 mA         |
| Analog outputs                 |       |   | 2, parameterizable, 0 - 10 V, 0/4 - 20 mA   |
| Digital inputs                 |       |   | 8, parameterizable, max. 30 V DC  |
| Digital outputs                |       |   | 1, parameterizable, 24 V DC   |
| Relay outputs                  |       |   | 3, parameterizable, 2 changeover contacts and 1 N/O, 6 A (240 VAC) / 6 A (24 VDC) |
| Interface/field bus (built-in) |       |   | Modbus RTU<br>Modbus TCP<br>BACnet MS/TP  |

|  |  |   |  |
|--|--|---|--|
| Expansion slots                                      |  |   | Ethernet IP  |
|  |  |   | 2  |
| <b>Assigned switching and protective elements</b>    |  |   |  |
| <b>Power Wiring</b>                                  |  |   |  |
| Safety device (fuse or miniature circuit-breaker)    |  |   |  |
| IEC (Type B, gG), 150 %                              |  |   | NZMC2-A250   |
| IEC (Type B, gG), 110 %                              |  |   | NZMC2-A250   |
| UL (Class CC or J)                                   |  | A | 400  |
| Mains contactor                                      |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)        |  |   | DILM185A   |
| 110 % overload (VT/I <sub>L</sub> , at 40 °C)        |  |   | DILM185A   |
| Main choke   |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)        |  |   | Integrated DC link choke, uk = 5%  |
| 110 % overload (VT/I <sub>L</sub> , at 40 °C)        |  |   | Integrated DC link choke, uk = 5%  |
| Note regarding radio interference suppression filter |  |   | Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments |
| <b>Motor feeder</b>                                  |  |   |  |
| motor choke  |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)        |  |   | DX-LM3-220   |
| 110 % overload (VT/I <sub>L</sub> , at 40 °C)        |  |   | DX-LM3-260   |
| Sine filter  |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)        |  |   | DX-SIN3-250  |
| 110 % overload (VT/I <sub>L</sub> , at 40 °C)        |  |   | DX-SIN3-250  |

## Design verification as per IEC/EN 61439

|  |                   |    |   |
|--|-------------------|----|---|
| <b>Technical data for design verification</b>  |                   |    |   |
| Rated operational current for specified heat dissipation   | I <sub>n</sub>    | A  | 208   |
| Heat dissipation per pole, current-dependent   | P <sub>vid</sub>  | W  | 0   |
| Equipment heat dissipation, current-dependent  | P <sub>vid</sub>  | W  | 3165  |
| Static heat dissipation, non-current-dependent   | P <sub>vs</sub>   | W  | 84.3  |
| Heat dissipation capacity  | P <sub>diss</sub> | W  | 0   |
| Operating ambient temperature min.   |                   | °C | -10   |
| Operating ambient temperature max.   |                   | °C | 50  |
|  |                   |    | Operation (with 150 % overload), allow for derating |
| <b>IEC/EN 61439 design verification</b>  |                   |    |   |
| 10.2 Strength of materials and parts   |                   |    |   |
| 10.2.2 Corrosion resistance  |                   |    |   |
| 10.2.2.1 Verification of thermal stability of enclosures   |                   |    |   |
| 10.2.2.2 Verification of resistance of insulating materials to normal heat   |                   |    |   |
| 10.2.2.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects |                   |    |   |
| 10.2.4 Resistance to ultra-violet (UV) radiation   |                   |    |   |
| 10.2.5 Lifting   |                   |    |   |
| 10.2.6 Mechanical impact   |                   |    |   |
| 10.2.7 Inscriptions  |                   |    |   |
| 10.3 Degree of protection of ASSEMBLIES  |                   |    |   |
| 10.4 Clearances and creepage distances   |                   |    |   |
| 10.5 Protection against electric shock   |                   |    |   |
| 10.6 Incorporation of switching devices and components   |                   |    |   |
| 10.7 Internal electrical circuits and connections  |                   |    |   |
| 10.8 Connections for external conductors   |                   |    |   |
| 10.9 Insulation properties   |                   |    |   |
| 10.9.2 Power-frequency electric strength   |                   |    |   |
| 10.9.3 Impulse withstand voltage   |                   |    |   |
| 10.9.4 Testing of enclosures made of insulating material   |                   |    |   |

|                                     |  |  |
|-------------------------------------|--|--|
| 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  | 525 - 600 |
| Mains frequency   |    | 50/60 Hz  |
| Number of phases input  |    | 3         |
| Number of phases output   |    | 3         |
| Max. output frequency   | Hz | 400       |
| Max. output voltage   | V  | 575       |
| Rated output current I2N  | A  | 208       |
| Max. output at quadratic load at rated output voltage   | kW | 160       |
| Max. output at linear load at rated output voltage  | kW | 132       |
| With control unit   |    | Yes       |
| Application in industrial area permitted  |    | Yes       |
| Application in domestic- and commercial area permitted  |    | Yes       |
| Supporting protocol for TCP/IP  |    | Yes       |
| Supporting protocol for PROFIBUS  |    | Yes       |
| 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   |    | Yes       |
| Supporting protocol for SUCONET   |    | No        |
| Supporting protocol for LON   |    | No        |
| Supporting protocol for PROFINET IO   |    | Yes       |
| 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   |    | Yes       |
| Number of HW-interfaces industrial Ethernet   |    | 1         |
| Number of HW-interfaces PROFINET  |    | 1         |
| 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   |    | 1         |
| With optical interface  |    | No        |
| With PC connection  |    | Yes       |

|  |    |             |
|--|----|-------------|
| Integrated breaking resistance             |    | No          |
| 4-quadrant operation possible              |    | Yes         |
| Type of converter                          |    | U converter |
| Degree of protection (IP)                  |    | IP54        |
| Height                                     | mm | 486         |
| Width                                      | mm | 1035        |
| Depth                                      | mm | 371         |
| Relative symmetric net frequency tolerance | %  | 10          |
| Relative symmetric net current tolerance   | %  | 10          |

## Approvals

|                             |  |  |
|-----------------------------|--|--|
| Product Standards           |  | UL508C, CSA-C22.2 No. 274-13; IEC/EN61800-3; IEC/EN61800-5; CE marking |
| UL File No.                 |  | E134360  |
| 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                           |
| Suitable for                |  | Branch circuits  |
| Max. Voltage Rating         |  | 3~600 V AC IEC: TN-S UL/CSA: 'Y' (Solidly Grounded Wey)                |
| Degree of Protection        |  | IP54/NEMA12  |

## Additional product information (links)

|               |   |
|---------------|---|
| Documentation | <a href="http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/PowerXLfrequencydrives/DG1GeneralPurposeDrives/index.htm?wtredirect=www.eaton.eu/dg1#tabs-7">http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/PowerXLfrequencydrives/DG1GeneralPurposeDrives/index.htm?wtredirect=www.eaton.eu/dg1#tabs-7</a> |
| Manuals       | <a href="http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/PowerXLfrequencydrives/DG1GeneralPurposeDrives/index.htm?wtredirect=www.eaton.eu/dg1#tabs-8">http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/PowerXLfrequencydrives/DG1GeneralPurposeDrives/index.htm?wtredirect=www.eaton.eu/dg1#tabs-8</a> |