

Variable frequency drive, 400 V AC, 3-phase, 920 A, 500 kW, IP00, Brake chopper, DC link choke



Part no. **DG1-34920FB-C00C**  
 Catalog No. **3-4918-110A**

**Delivery program**

Product range			Variable frequency drives
Part group reference (e.g. DIL)			DG1
Rated operational voltage	$U_e$		400 V AC, 3-phase 480 V AC, 3-phase 500 V AC, 3-phase
Output voltage with $V_e$	$U_2$		400 V AC, 3-phase 480 V AC, 3-phase 500 V AC, 3-phase
Mains voltage (50/60Hz)	$U_{LN}$	V	380 (-15%) - 500 (+10%)
<b>Rated operational current</b>			
At 150% overload	$I_e$	A	920
At 110% overload	$I_e$	A	1010
Note			Rated operational current for a switching frequency of 1.5 - 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 $1500 \text{ rpm}^{-1}$ at 50 Hz or $1800 \text{ min}^{-1}$ at 60 Hz
Note			Overload cycle for 60 s every 600 s
Note			at 400 V, 50 Hz
150 % Overload	P	kW	500
110 % Overload	P	kW	560
150 % Overload	$I_M$	A	900
110 % Overload	$I_M$	A	977
Note			at 500 V, 50 Hz
150 % Overload	P	kW	630
110 % Overload	P	kW	710
150 % Overload	$I_M$	A	855
110 % Overload	$I_M$	A	991.2
Note			at 480 V, 60 Hz
150 % Overload	P	HP	800
110 % Overload	P	HP	800
150 % Overload	$I_M$	A	775
110 % Overload	$I_M$	A	920
Degree of Protection			IP00
Interface/field bus (built-in)			Modbus RTU Modbus TCP BACnet MS/TP Ethernet IP
Fieldbus connection (optional)			PROFIBUS CANopen® DeviceNet SmartWire-DT
Fitted with			Radio interference suppression filter Additional PCB protection Multi-line graphic display Brake chopper DC link choke
Frame size			FS8
Connection to SmartWire-DT			yes in conjunction with DXG-NET-SWD 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
Certifications			CE, 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			
operation (150 % overload)	$\theta$	°C	-10 - +40 (max. +50 with 1% derating per Kelvin temperature increase)
operation (110 % overload)	$\theta$	°C	-10 - +40 (max. +50 with 1% derating per Kelvin temperature increase)
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	C2 ≤ 10 m C3 ≤ 50 m
Mechanical shock resistance		g	EN 61800-5-1, EN 60068-2-27 UPS drop test (for weights inside the UPS frame) Storage and transportation: maximum 15 g, 11 ms (inside the packaging)
Vibration			EN 61800-5-1, EN 60068-2-6: 5 - 150 Hz Amplitude: 1 mm (peak) at 5 - 15.8 Hz Maximum acceleration amplitude: 1 g at 15.8 – 150 Hz
Mounting position			Vertical
Altitude		m	0 - 1000 m above sea level Above 1000 m: 1% derating for every 100 m max. 3000 m (2000 m for Corner Grounded TN Systems)
Degree of Protection			IP00
Protection against direct contact			BGV A3 (VBG4, finger- and back-of-hand proof)

### Main circuit

Supply			
Rated operational voltage	$U_e$		400 V AC, 3-phase 480 V AC, 3-phase 500 V AC, 3-phase
Mains voltage (50/60Hz)	$U_{LN}$	V	380 (-15%) - 500 (+10%)
Input current (150% overload)	$I_{LN}$	A	908
Input current (110% overload)	$I_{LN}$	T	1030
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	%	28
Rated conditional short-circuit current	$I_q$	kA	< 65
Power section			
Function			Variable frequency drive with internal DC link, DC link choke and IGBT inverter
Overload current (150% overload)	$I_L$	A	1380
Overload current (110% overload)	$I_L$	A	1111
max. starting current (High Overload)	$I_H$	%	200
Note about max. starting current			for 2 seconds every 20 seconds
Output voltage with $V_e$	$U_2$		400 V AC, 3-phase 480 V AC, 3-phase 500 V AC, 3-phase
Output Frequency	$f_2$	Hz	0 - 50/60 (max. 400)
Switching frequency	$f_{PWM}$	kHz	2 adjustable 1.5 - 6
Operation Mode			U/f control Speed control with slip compensation

			sensorless vector control (SLV) Torque regulation
Frequency resolution (setpoint value)	$\Delta f$	Hz	0.01
Rated operational current			
At 150% overload	$I_e$	A	920
At 110% overload	$I_e$	A	1010
Note			Rated operational current for a switching frequency of 1.5 - 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 $I_e=110\%$	$P_V$	W	15638
Efficiency	$\eta$	%	97.4
Fan			temperature controlled externally accessible
Internal fan delivery rate		$m^3/h$	2800
Fitted with			Radio interference suppression filter Additional PCB protection Multi-line graphic display Brake chopper DC link choke
Safety function			STO (Safe Torque Off, SIL1, PLc Cat 1)
Frame size			FS8
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 400 V, 50 Hz
150 % Overload	P	kW	500
110 % Overload	P	kW	560
Note			at 500 V, 50 Hz
150 % Overload	P	kW	630
110 % Overload	P	kW	710
Note			at 480 V, 60 Hz
150 % Overload	P	HP	800
110 % Overload	P	HP	800
maximum permissible cable length	$l$	m	screened: 200
Apparent power			
Apparent power at rated operation 400 V	S	kVA	699.7
Apparent power at rated operation 480 V	S	kVA	874.7
Braking function			
Standard braking torque			max. 30 % MN
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	$R_{min}$	$\Omega$	1.4
Switch-on threshold for the braking transistor	$U_{DC}$	V	850 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 Modbus TCP BACnet MS/TP Ethernet IP
Expansion slots			2

## Assigned switching and protective elements

Power Wiring			
Safety device (fuse or miniature circuit-breaker)			
IEC (Type B, gG), 150 %			NZMN4-AE1000
IEC (Type B, gG), 110 %			NZMN4-AE1250
UL (Class CC or J)		A	2
Mains contactor			
150 % overload (CT/I <sub>H</sub> , at 50 °C)			DILM820
110 % overload (VT/I <sub>L</sub> , at 40 °C)			DILM1600
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
DC link connection			
Braking resistance			
10 % duty factor (DF)			DX-BR002-54K3
20 % duty factor (DF)			R2P2: DX-BR002-102K4
40 % duty factor (DF)			?

## Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I <sub>n</sub>	A	920
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	15638
Static heat dissipation, non-current-dependent	P <sub>vs</sub>	W	215
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.
10.9 Insulation properties			
10.9.3 Impulse withstand voltage			Is the panel builder's responsibility.

## 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 (ecl@ss10.0.1-27-02-31-01 [AKE177014])			
Mains voltage	V		380 - 500
Mains frequency			50/60 Hz
Number of phases input			3
Number of phases output			3
Max. output frequency	Hz		400
Max. output voltage	V		500
Nominal output current I <sub>2N</sub>	A		1010
Max. output at quadratic load at rated output voltage	kW		560
Max. output at linear load at rated output voltage	kW		500

Relative symmetric net frequency tolerance	%	10
Relative symmetric net voltage tolerance	%	10
Number of analogue outputs		2
Number of analogue inputs		2
Number of digital outputs		1
Number of digital inputs		8
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		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		Yes
Supporting protocol for other bus systems		Yes
Number of HW-interfaces industrial Ethernet		1
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		1
With optical interface		No
With PC connection		Yes
Integrated breaking resistance		Yes
4-quadrant operation possible		Yes
Type of converter		U converter
Degree of protection (IP)		IP00
Degree of protection (NEMA)		Other
Height	mm	1538
Width	mm	1012
Depth	mm	561

## Approvals

UL File No.	E134360
UL Category Control No.	NMMS, NMMS7

Suitable for		Branch circuits
Max. Voltage Rating		3-500 V AC IEC: TN-S UL/CSA: 'Y' (Solidly Grounded Wey)
Degree of Protection		IP00

## Assets (links)

### Declaration of CE Conformity

00003265

## 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>