

Variable frequency drive, 230 V AC, 3-phase, 211 A, 55 kW, IP21/NEMA1, DC link choke



6

Part no. DG1-32211FN-C21C 9701-6003-00P Catalog No. Alternate Catalog DG1-32211FN-C21C No.

Delivery	program
Product range	

Delivery program			
Product range			Variable frequency drives
Part group reference (e.g. DIL)			DG1
Rated operational voltage	U _e		230 V AC, 3-phase 240 V AC, 3-phase
Output voltage with $V_{\rm e}$	U ₂		230 V AC, 3-phase 240 V AC, 3-phase
Mains voltage (50/60Hz)	U_LN	V	208 (-15%) - 240 (+10%)
Rated operational current			
At 150% overload	I _e	Α	211
At 110% overload	I _e	Α	261
Note			Rated operational current for a switching frequency of 1 - 10 kHz and an ambient temperature of +50 °C for a 150% overload and +40 °C for a 110% overload
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	55
110 % Overload	P	kW	75
150 % Overload	I _M	Α	173
110 % Overload	I _M	Α	233
Note			at 230 V, 60 Hz
150 % Overload	P	HP	75
110 % Overload	P	HP	100
150 % Overload	I _M	Α	192
110 % Overload	I _M	Α	248
Degree of Protection			IP21/NEMA1
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 DC link choke
Parameterization			Keypad Feldbus Power Xpert inControl
Frame size			FS6
Connection to SmartWire-DT			yes in conjunction with DXG-NET-SWD SmartWire DT module

Technical data

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	ρ_{W}	%	< 95%, average relative humidity (RH), non-condensing, non-corrosive
	PW	70	7
Ambient temperature			3C2, 3S2
Ambient temperature		°C	-10
Operating ambient temperature min.			
Operating ambient temperature max.	9	°C	+50
operation (110 % overload)	9	°C	-10 - +40 Operation with 110 % overload (1 min./10 min.): -10 to +40 (max. +55 with 1% derating per Kelvin above limit) Operation with 150% overload (1 min./10 min.): -10 to +50 (max. +60 with 1% derating per Kelvin above limit) -20 with cold-weather mode
Storage	9	°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	I	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			IP21/NEMA1
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
nated operational voltage	Ό́́́́́́		240 V AC, 3-phase
Mains voltage (50/60Hz)	U _{LN}	V	208 (-15%) - 240 (+10%)
Input current (150% overload)	I _{LN}	Α	195.2
Input current (110% overload)	I _{LN}	Т	242.8
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	%	26
Rated conditional short-circuit current	Iq	kA	<100
Power section	ч		
Function			Variable frequency drive with internal DC link, DC link choke and IGBT inverter
Overload current (150% overload)	IL	Α	316.5
Overload current (130% overload)			287.1
	IL.	Α	
max. starting current (High Overload)	I _H	%	200
Note about max. starting current			for 2 seconds every 20 seconds
Output voltage with ${\sf V_e}$	U ₂		230 V AC, 3-phase 240 V AC, 3-phase
Output Frequency	f ₂	Hz	0 - 50/60 (max. 400)
Switching frequency	f _{PWM}	kHz	2 adjustable 1 - 10
Operation Mode			U/f control Speed control with slip compensation sensorless vector control (SLV) Torque regulation

Reted operational current A 1976 workhand A 211	
All 110% overload Iq	
Motor current limit Pewer loss Heat dissipation at rated operational current l _a = 159 N, Heat dissipation at rated operational current l _a = 159 N, Heat dissipation at rated operational current l _a = 110% or Heat dissipation at rated operational current l _a = 110% N Py W 2111 Efficiency In % 97.5 Maximum leakage current to ground PE without motor In	
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Fitted with Additional PCB protection Safety function Frame size Motor feeder Note Note Note Note Note Overload cycle for 60 s every 600 s at 230 V, 50 Hz 150 % Overload P NV 55 Note 110 % Overload P NV 55 Note Note 120 V, 60 Hz 150 % Overload P NV 75 Note 110 % Overload P NP 150 Note 110 % Overload Maximum permissible cable length Apparent power at rated operation 230 V S NVA 104 Apparent power at rated operation 240 V S NVA 108 S Braking function Standard braking torcupe D C braking function D C braking torque with external braking resistance minimum external braking transistor Upc V 425 V D C D C braking torque External control voltaga Reference voltage Ug V 24 V D C (max. 250 mA options incl.) Reference voltage Reference voltage D C parameterizable, 0 - 10 V D C, 2 - 10 V D C, 10 - 10 V D C, 04 - 20 mA Analog ontuputs Digital outputs Digital outputs	
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Digital inputs 8, parameterizable, max. 30 V DC Digital outputs 1, parameterizable, 24 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 TCP BACnet MS/TP Ethernet IP	
Expansion slots 2	
Assigned switching and protective elements	
Power Wiring Coftee design (for a serial translation)	
Safety device (fuse or miniature circuit-breaker)	

IEC (Type B, gG), 150 %		NZMC2-A250
IEC (Type B, gG), 110 %		NZMC2-A300
UL (Class CC or J)	Α	400
Mains contactor		
150 % overload (CT/I _H , at 50 °C)		DILM185A
110 % overload (VT/I _L , at 40 °C)		DILM185A
Main choke		
150 % overload (CT/I $_{\rm H}$, at 50 °C)		Integrated DC link choke, uk = 5%
110 % overload (VT/I _L , at 40 °C)		Integrated DC link choke, uk = 5%
Radio interference suppression filter (external, 150 %)		DX-EMC34-250
Radio interference suppression filter (external, 110 %)		DX-EMC34-400
Radio interference suppression filter, low leakage currents (external, 150 %)		DX-EMC34-250-L
Radio interference suppression filter, low leakage currents (external, 110 $\%)$		DX-EMC34-400-L
Note regarding radio interference suppression filter		Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments
Motor feeder		
motor choke		
150 % overload (CT/I $_{\rm H}$, at 50 °C)		DX-LM3-220
110 % overload (VT/I _L , at 40 °C)		DX-LM3-303
Sine filter		
150 % overload (CT/I $_{\rm H}$, at 50 °C)		DX-SIN3-250
110 % overload (VT/I _L , at 40 °C)		DX-SIN3-440

Design verification as per IEC/EN 61439

Design verification as per IEG/EN 61439			
Technical data for design verification			
Rated operational current for specified heat dissipation	In	Α	211
Heat dissipation per pole, current-dependent	P _{vid}	W	0
Equipment heat dissipation, current-dependent	P _{vid}	W	2191
Static heat dissipation, non-current-dependent	P _{vs}	W	59.17
Heat dissipation capacity	P _{diss}	W	0
Operating ambient temperature min.		°C	-10
Operating ambient temperature max.		°C	50
			Operation (with 150 % overload), allow for derating
EC/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

ow voltage industrial components (EC000017) / Fraguency convertor – < 1 kV	/EC0010E7\	
ow-voltage industrial components (EG000017) / Frequency converter =< 1 kV		(0, .; (
		er / Static frequency converter = < 1 kV (ecl@ss10.0.1-27-02-31-01 [AKE177014])
Aains voltage	V	208 - 240
Aains frequency		50/60 Hz
lumber of phases input		3
lumber of phases output		3
lax. output frequency	Hz	400
lax. output voltage	V	240
ominal output current I2N	Α	261
ax. output at quadratic load at rated output voltage	kW	75
lax. output at linear load at rated output voltage	kW	55
elative symmetric net frequency tolerance	%	10
elative symmetric net voltage tolerance	%	10
imber of analogue outputs		2
umber of analogue inputs		2
umber of digital outputs		1
umber of digital inputs		8
ith control unit		Yes
oplication in industrial area permitted		Yes
oplication in domestic- and commercial area permitted		Yes
pporting protocol for TCP/IP		Yes
pporting protocol for PROFIBUS		Yes
pporting protocol for CAN		Yes
pporting protocol for INTERBUS		No
pporting protocol for ASI		No
pporting protocol for KNX		No
upporting protocol for MODBUS		Yes
pporting protocol for Data-Highway		No
pporting protocol for DeviceNet		Yes
pporting protocol for SUCONET		No
pporting protocol for LON		No
pporting protocol for PROFINET IO		Yes
pporting protocol for PROFINET CBA		No
pporting protocol for SERCOS		No
pporting protocol for Foundation Fieldbus		No
pporting protocol for EtherNet/IP		No
pporting protocol for AS-Interface Safety at Work		No
pporting protocol for DeviceNet Safety		No
pporting protocol for INTERBUS-Safety		No
pporting protocol for PROFIsafe		No
pporting protocol for SafetyBUS p		No
pporting protocol for BACnet		Yes
pporting protocol for other bus systems		Yes
umber of HW-interfaces industrial Ethernet		1
umber of interfaces PROFINET		0
umber of HW-interfaces RS-232		0
umber 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)		IP21
Degree of protection (NEMA)		1
Height	mm	486
Width	mm	1035
Depth	mm	371

Approvals

Approvais	
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	3~240 V AC IEC: TN-S UL/CSA: 'Y' (Solidly Grounded Wey)
Degree of Protection	IP21/NEMA1

Assets (links)

Declaration of CE Conformity

00003264

Additional product information (links)

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