



**Variable frequency drive, 400 V AC, 3-phase, 90 A, 45 kW, IP55/NEMA 12, Radio interference suppression filter, OLED display, DC link choke**

**Part no. DA1-34090FB-B55C**  
**Catalog No. 169397**  
**Eaton Catalog No. DA1-34090FB-B55C**  
**EL-Nummer 0004137319**  
**(Norway)**

## Delivery program

Product range			Variable frequency drives
Part group reference (e.g. DIL)			DA1
Rated operational voltage	$U_e$		400 V AC, 3-phase 480 V AC, 3-phase
Output voltage with $V_e$	$U_2$		400 V AC, 3-phase 480 V AC, 3-phase
Mains voltage (50/60Hz)	$U_{LN}$	V	380 (-10%) - 480 (+10%)
<b>Rated operational current</b>			
At 150% overload	$I_e$	A	90
Note			Rated operational current at an operating frequency of 4 kHz and an ambient air temperature of +40 °C
<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 400 V, 50 Hz
150 % Overload	P	kW	45
150 % Overload	$I_M$	A	81
Note			at 440 - 480 V, 60 Hz
150 % Overload	P	HP	60
150 % Overload	$I_M$	A	77
Degree of Protection			IP55/NEMA 12
Interface/field bus (built-in)			OP-Bus (RS485)/Modbus RTU, CANopen®
Fieldbus connection (optional)			Ethernet IP DeviceNet PROFIBUS PROFINET Modbus-TCP EtherCAT SmartWire-DT
Fitted with			Radio interference suppression filter Brake chopper Additional PCB protection OLED display DC link choke
Frame size			FS6
Connection to SmartWire-DT			yes in conjunction with DX-NET-SWD1 SmartWire DT module

## Technical data

<b>General</b>			
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, UkrSEPRO, EAC
Approvals			DNV
Production quality			RoHS, ISO 9001
Climatic proofing	$\rho_w$	%	< 95%, average relative humidity (RH), non-condensing, non-corrosive

<b>Ambient temperature</b>			
operation (150 % overload)	θ	°C	-10 - +40
Storage	θ	°C	-40 - +60
<b>Radio interference level</b>			
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 C3 ≤ 25 m
<b>Mounting position</b>			
Altitude		m	0 - 1000 m above sea level Above 1000 m: 1% derating for every 100 m max. 4000 m
<b>Degree of Protection</b>			
Protection against direct contact			IP55/NEMA 12
<b>Protection against direct contact</b>			
			BGV A3 (VBG4, finger- and back-of-hand proof)

## Main circuit

<b>Supply</b>			
Rated operational voltage	$U_e$		400 V AC, 3-phase 480 V AC, 3-phase
Mains voltage (50/60Hz)	$U_{LN}$	V	380 (-10%) - 480 (+10%)
Input current (150% overload)	$I_{LN}$	A	102.7
<b>System configuration</b>			
Supply frequency	$f_{LN}$	Hz	50/60
Frequency range	$f_{LN}$	Hz	48 - 62
<b>Mains switch-on frequency</b>			
			Maximum of one time every 30 seconds
<b>Power section</b>			
<b>Function</b>			
			Variable frequency drive with internal DC link, DC link choke and IGBT inverter
Overload current (150% overload)	$I_L$	A	135
max. starting current (High Overload)	$I_H$	%	200
<b>Note about max. starting current</b>			
			for 4 seconds every 40 seconds
Output voltage with $V_e$	$U_2$		400 V AC, 3-phase 480 V AC, 3-phase
Output Frequency	$f_2$	Hz	0 - 50/60 (max. 250)
Switching frequency	$f_{PWM}$	kHz	4 adjustable 4 - 16 (audible)
<b>Operation Mode</b>			
			U/f control Speed control with slip compensation sensorless vector control (SLV) optional: Vector control with feedback (CLV)
Frequency resolution (setpoint value)	$\Delta f$	Hz	0.1
<b>Rated operational current</b>			
At 150% overload	$I_e$	A	90
<b>Note</b>			
			Rated operational current at an operating frequency of 4 kHz and an ambient air temperature of +40 °C
<b>Power loss</b>			
Heat dissipation at rated operational current $I_e = 150\%$	$P_V$	W	1080
Efficiency	$\eta$	%	97.6
Maximum leakage current to ground (PE) without motor	$I_{PE}$	mA	2.68
<b>Fitted with</b>			
			Radio interference suppression filter Brake chopper Additional PCB protection OLED display DC link choke
<b>Safety function</b>			
			STO (Safe Torque Off, SIL1, PLc Cat 1)
<b>Frame size</b>			
			FS6
<b>Motor feeder</b>			
<b>Note</b>			
			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
<b>Note</b>			
			Overload cycle for 60 s every 600 s
<b>Note</b>			
			at 400 V, 50 Hz
150 % Overload	P	kW	45

Note			at 440 - 480 V, 60 Hz
150 % Overload	P	HP	60
maximum permissible cable length	l	m	screened: 100 screened, with motor choke: 200 unscreened: 150 unscreened, with motor choke: 300
Apparent power			
Apparent power at rated operation 400 V	S	kVA	62.35
Apparent power at rated operation 480 V	S	kVA	74.82
Braking function			
Standard braking torque			max. 30 % $M_N$
DC braking torque			max. 100% of rated operational current $I_g$ , variable
Braking torque with external braking resistance			Max. 100% of rated operational current $I_g$ with external braking resistor
minimum external braking resistance	$R_{min}$	$\Omega$	6
Switch-on threshold for the braking transistor	$U_{DC}$	V	780 V DC

### Control section

External control voltage	$U_c$	V	24 V DC (max. 100 mA)
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			2, parameterizable, 0 - 10 V, 0/4 - 20 mA
Digital inputs			3, parameterizable, max. 30 VDC, max. 5 for non-parameterized analog inputs
Digital outputs			2, parameterizable, 24 V DC
Relay outputs			2, parameterizable, 1 N/O and 1 changeover contact, 6 A (250 V, AC-1) / 5 A (30 V, DC-1)
Interface/field bus (built-in)			OP-Bus (RS485)/Modbus RTU, CANopen <sup>®</sup>

### Assigned switching and protective elements

Power Wiring			
Safety device (fuse or miniature circuit-breaker)			
IEC (Type B, gG), 150 %			NZMC2-S125
UL (Class CC or J)		A	125
Mains contactor			
150 % overload (CT/ $I_H$ , at 50 °C)			DILM80
Main choke			
150 % overload (CT/ $I_H$ , at 50 °C)			DX-LN3-100
Note regarding mains choke			Mains choke recommended only if the power quality is poor. Current harmonics (THD) are attenuated by internal DC link chokes.
Radio interference suppression filter (external, 150 %)			DX-EMC34-100
Radio interference suppression filter, low leakage currents (external, 150 %)			DX-EMC34-100-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
DC link connection			
Braking resistance			
10 % duty factor (DF)			DX-BR006-18K1
20 % duty factor (DF)			DX-BR006-33K3
Motor feeder			
motor choke			
150 % overload (CT/ $I_H$ , at 50 °C)			DX-LM3-100
Sine filter			
150 % overload (CT/ $I_H$ , at 50 °C)			DX-SIN3-090

### Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	$I_n$	A	90
Heat dissipation per pole, current-dependent	$P_{vid}$	W	0
Equipment heat dissipation, current-dependent	$P_{vid}$	W	1080
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	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 7.0

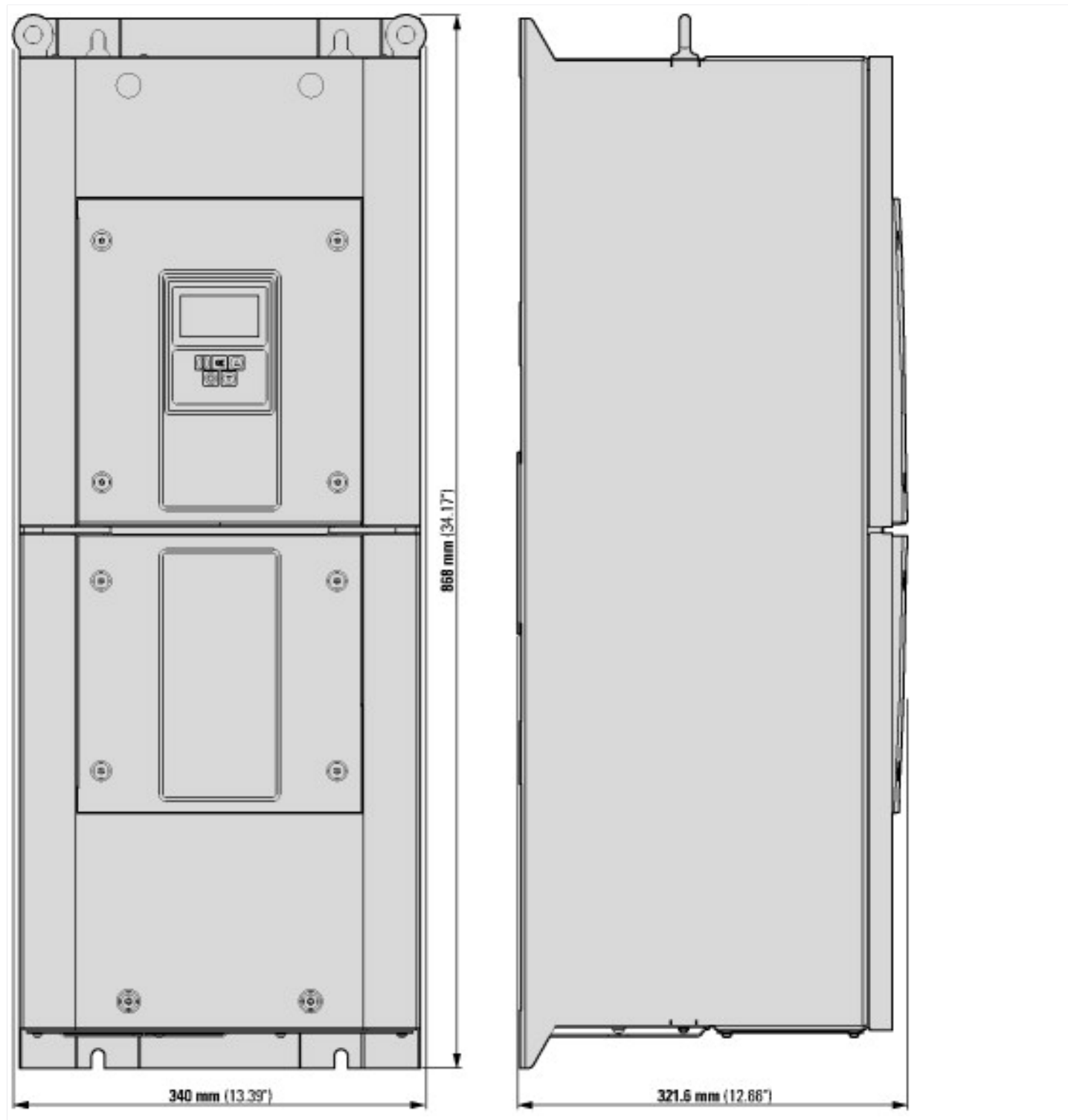
Low-voltage industrial components (EG000017) / Frequency converter =< 1 kV (EC001857)		
Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kV (ecl@ss10.0.1-27-02-31-01 [AKE177014])		
Mains voltage	V	380 - 480
Mains frequency		50/60 Hz
Number of phases input		3
Number of phases output		3
Max. output frequency	Hz	500
Max. output voltage	V	500
Nominal output current I <sub>2N</sub>	A	90
Max. output at quadratic load at rated output voltage	kW	45
Max. output at linear load at rated output voltage	kW	45
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		2
Number of digital inputs		5
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		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		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		Yes
4-quadrant operation possible		No
Type of converter		U converter
Degree of protection (IP)		IP55
Degree of protection (NEMA)		12
Height	mm	865
Width	mm	330
Depth	mm	313.5

## 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- 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection		IEC: IP55

## Dimensions



## Additional product information (links)

### IL04020011Z DA1 variable frequency drives (FS4 - 7)

IL04020011Z DA1 variable frequency drives (FS4 [ftp://ftp.moeller.net/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL04020011Z2018\\_04.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL04020011Z2018_04.pdf) - 7)

### MN04020005Z DA1 variable frequency drives, Installation manual

MN04020005Z Frequenzumrichter DA1, Installationshandbuch - Deutsch [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020005Z\\_DE.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020005Z_DE.pdf)

MN04020005Z DA1 variable frequency drives, Installation manual - English [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020005Z\\_EN.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020005Z_EN.pdf)

MN04020005Z Convertitore di frequenza DA1, manuale Installazione - italiano [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020005Z\\_IT.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020005Z_IT.pdf)

### MN04020006Z DA1 variable frequency drives, Parameters manual

MN04020006Z Frequenzumrichter DA1, Parameterhandbuch - Deutsch [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020006Z\\_DE.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020006Z_DE.pdf)

MN04020006Z DA1 variable frequency drives, Parameters manual - English [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020006Z\\_EN.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020006Z_EN.pdf)

MN04020006Z Convertitore di frequenza DA1,  
manuale Parametri - italiano

[ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020006Z\\_IT.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020006Z_IT.pdf)

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

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