

**Speed starters, three-phase power supply connection, three-phase motor connection at 400 V, 5 A and 2, 2 kW / 3 HP**



**Part no.** DE1-345D0FN-N20N  
**Article no.** 174336  
**Catalog No.** DE1-345D0FN-N20N

## Delivery programme

Product range			PowerXL™ DE1 Speed Starters
Rated operational voltage	$U_e$		400 V AC, 3-phase
Output voltage with $V_{<sub>e</sub>}$	$U_2$		400 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	5
Note			Rated operational current at an operating frequency of 16 kHz and an ambient air temperature of +50 °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 $1500 \text{ rpm}^{-1}$ 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	2.2
150 % Overload	$I_e$	A	5
Note			at 440 - 480 V, 60 Hz
150 % Overload	P	HP	3
150 % Overload	$I_e$	A	4.8
Degree of Protection			IP20/NEMA 0
Interface/field bus (built-in)			OP-Bus (RS485)/Modbus RTU
Fitted with			Radio interference suppression filter
Frame size			FS2
Connection to SmartWire-DT			with SmartWire-DT module DX-NET-SWD3

## Technical data

### General

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, c-Tick
Production quality			RoHS, ISO 9001
Climatic proofing	$\rho_w$	%	< 95%, average relative humidity (RH), non-condensing, non-corrosive (EN 50178)
Ambient temperature		°C	
operation (150 % overload)	$\theta$	°C	-10 - +50, max. +60
Storage	$\theta$	°C	-40 - +70
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
maximum motor cable length	l	m	C2 ≤ 10 m C3 ≤ 25 m
Mechanical shock resistance		g	15 (11 m/s, EN 60068-2-27)
Vibration			EN 61800-5-1
Altitude		m	0 - 1000 m above sea level above 1000 m with 1 % performance reduction per 100 m max. 2000 m

Degree of Protection			IP20/NEMA 0
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
Mains voltage (50/60Hz)	$U_{LN}$	V	380 (-10%) - 480 (+10%)
Input current (150% overload)	$I_{LN}$	A	7
Supply frequency	$f_{LN}$	Hz	50/60
Frequency range	$f_{LN}$	Hz	45 - 66
Mains switch-on frequency			Maximum of one time every 30 seconds
Power section			
Overload current (150% overload)	$I_L$	A	7.5
max. starting current (High Overload)	$I_H$	%	200
Note about max. starting current			for 1.875 seconds every 600 seconds
Output voltage with $V_e$	$U_2$		400 V AC, 3-phase
Output Frequency	$f_2$	Hz	0 - 50/60 (max. 300)
Switching frequency	$f_{PWM}$	kHz	16 adjustable 4 - 32 (audible)
Operation Mode			U/f control Speed control with slip compensation
Frequency resolution (setpoint value)	$\Delta f$	Hz	0.025
Rated operational current			
At 150% overload	$I_e$	A	5
Note			Rated operational current at an operating frequency of 16 kHz and an ambient air temperature of +50 °C
Maximum leakage current to ground (PE) without motor	$I_{PE}$	mA	< 3,5 AC, < 10 DC
Fitted with			Radio interference suppression filter
Frame size			FS2
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	2.2
Note			at 440 - 480 V, 60 Hz
150 % Overload	P	HP	3
Apparent power			
Apparent power at rated operation 400 V	S	kVA	3.46
Apparent power at rated operation 480 V	S	kVA	4.16
Braking function			
Standard braking torque			max. 30 % $M_N$
DC braking torque			100 %, adjustable

### Control section

Reference voltage	$U_s$	V	10 V DC (max. 0.2 mA)
Analog inputs			1, parameterizable, 0 - 10 V DC, 0/4 - 20 mA
Digital inputs			4, parameterizable, 10 - 30 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

### Assigned switching and protective elements

Power Wiring			
Safety device (fuse or miniature circuit-breaker)			
IEC (Typ B, gG)			FAZ-B16/3
UL (Class CC or J)		A	15
Mains contactor			
150 % overload (CT/ $I_H$ , at 50 °C)			DILEM-...
110 % overload (VT/ $I_L$ , at 40 °C)			DILM7-...

Main choke			
150 % overload (CT/I <sub>H</sub> , at 50 °C)			DX-LN3-010
Radio interference suppression filter (external)			DX-EMC34-019-FS3...
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 <sub>H</sub> , at 50 °C)			DX-LM3-005
Sine filter			
150 % overload (CT/I <sub>H</sub> , at 50 °C)			DX-SIN3-010

## Design verification as per IEC/EN 61439

Technical data for design verification				
Rated operational current for specified heat dissipation	I <sub>n</sub>	A		5
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W		56
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.
10.6 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		380 - 480
Mains frequency				50/60 Hz
Number of phases input				3
Number of phases output				3
Max. output frequency		Hz		300
Rated output voltage		V		400
Measuring output current		A		5

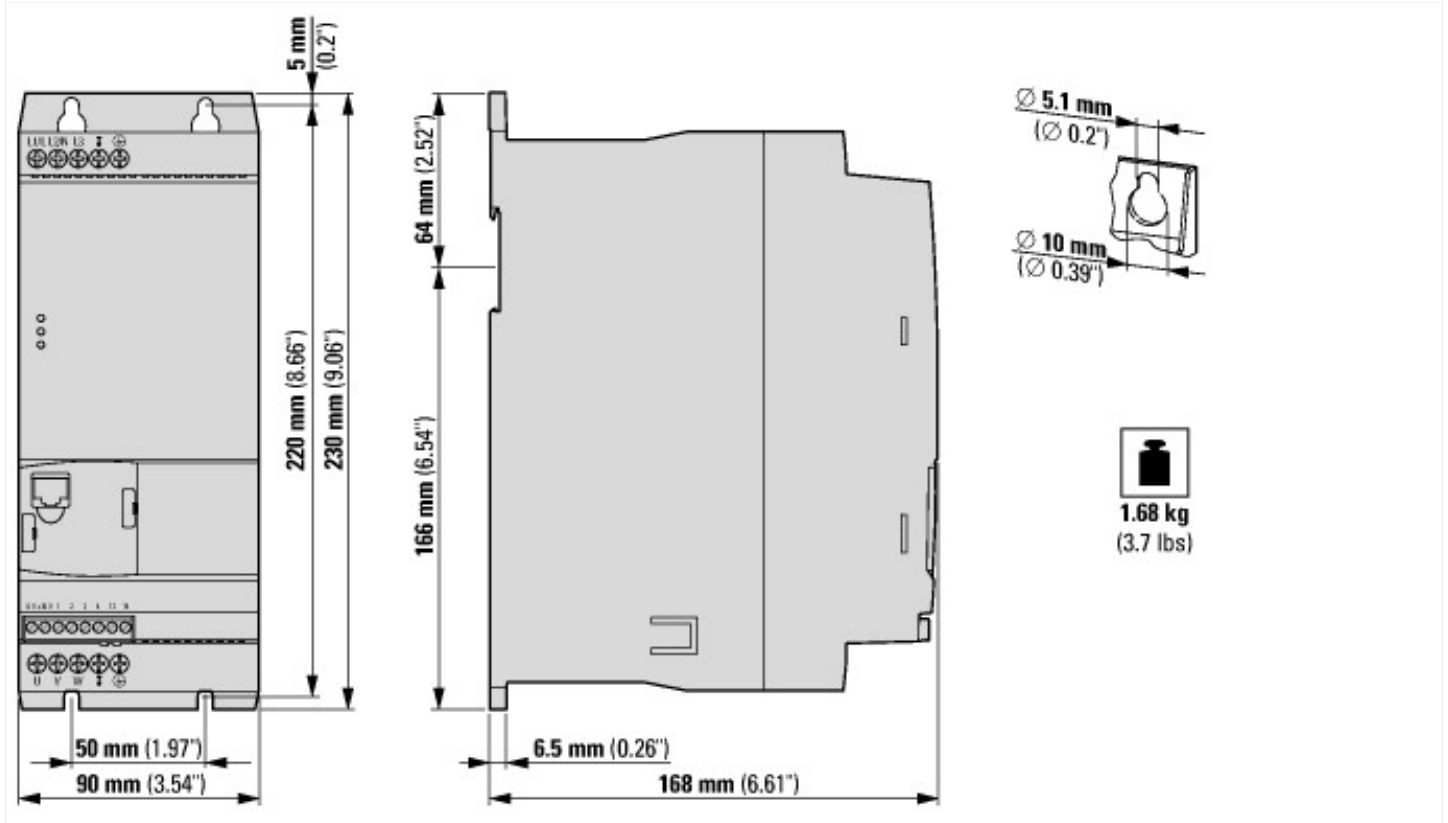
Output power at rated output voltage		kW	0.5
Max. output at quadratic load at rated output voltage		kW	0.5
Max. output at linear load at rated output voltage		kW	0.5
With control unit			No
Application in industrial area permitted			Yes
Application in domestic- and commercial area permitted			Yes
Supporting protocol for TCP/IP			No
Supporting protocol for PROFIBUS			No
Supporting protocol for CAN			No
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 PROFIsafe			No
Supporting protocol for SafetyBUS p			No
Supporting protocol for other bus systems			Yes
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			0
Number of HW-interfaces parallel			0
Number of HW-interfaces other			0
With optical interface			No
With PC connection			Yes
Integrated braking resistance			No
4-quadrant operation possible			No
Type of converter			U converter
Degree of protection (IP)			IP20
Height		mm	230
Width		mm	90
Depth		mm	168
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~ 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection		IEC: IP20

## Dimensions



## Additional product information (links)

<b>IL040005ZU Variable frequency drives DE1</b>	
IL040005ZU Variable frequency drives DE1	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL040005ZU2014_07.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL040005ZU2014_07.pdf</a>
<b>MN040011 DE1 Variable speed starter, Manual</b>	
MN040011 Drehzahlstarter DE1, Handbuch - Deutsch	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_DE.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_DE.pdf</a>
MN040011 DE1 Variable speed starter, Manual - English	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_EN.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_EN.pdf</a>
MN040011 Démarreur à vitesse variable DE1, manuel d'utilisation - français	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_FR.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_FR.pdf</a>
MN040011 Avviatore a velocità variabile DE1, Manuale - italiano	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_IT.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_IT.pdf</a>
MN040011 DE1 Variable speed starter, Manual	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_NO.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_NO.pdf</a>
MN040011 Rozrusznik silnikowy z regulacją prędkości DE1, podręcznik - polski	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_PL.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_PL.pdf</a>
MN040011 DE1 Variable speed starter, Manual	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_RO.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN040011_RO.pdf</a>

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