174340
DE1-34016FN-N20N

Overview | Specifications | Resources

Delivery program
Technical data
Design verification as per IEC/EN 61439
Technical data ETIM 7.0
Approvals
Dimensions

DELIVERY PROGRAM

Product range
Variable speed starter

Part group reference (e.g. DIL)
DE1

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}]
380 (-10%) - 480 (+10%) V

Rated operational current [I_e]

At 150% overload [I_e]
16 A

Note
Rated operational current at an operating frequency of 16 kHz and an ambient air temperature of +50 °C

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 400 V, 50 Hz

150 % Overload [P]
7.5 kW

150 % Overload [I_M]
15.2 A

Note
at 440 - 480 V, 60 Hz

150 % Overload [P]
10 HP

150 % Overload [I_M]
14 A

Degree of Protection
IP20/NEMA 0

Interface/field bus (built-in)
OP-Bus (RS485)/Modbus RTU

Fitted with
Radio interference suppression filter

Parameterization
Keypad

Fieldbus
drivesConnect
drivesConnect mobile (App)

Frame size
FS2

Connection to SmartWire-DT
yes
in conjunction with DX-NET-SWD3 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 61800-5-1

Certifications
CE, UL, cUL, RCM

Production quality
RoHS, ISO 9001

Climatic proofing [ρ_W]
< 95%, average relative humidity (RH), non-condensing, non-corrosive %

Ambient temperature
Operating ambient temperature min.
-10 °C

Ambient temperature
Operating ambient temperature max.
+60 °C

Ambient temperature
Derating between 50 °C and 60 °C:
None if f_{PWM} ≤ 14 kHz up to a max. of 50 °C
None if f_{PWM} ≤ 16 kHz up to a max. of 46 °C
None if I_e ≤ 14.9 A and f_{PWM} ≤ 10 kHz
None if I_e ≤ 10.6 A and f_{PWM} ≤ 20 kHz

Ambient temperature
operation (150 % overload); max. +60 °C

Ambient temperature
Storage [ϑ]
-40 - +70 °C

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.

Radio interference level
Environment (EMC)
1st and 2nd environments as per EN 61800-3

Radio interference level
maximum motor cable length [l]
C2 ≤ 10 m
C3 ≤ 25 mm

Mechanical shock resistance
15 (11 m/s, EN 60068-2-27) g

Vibration
EN 61800-5-1

Altitude
0 - 1000 m above sea level
Above 1000 m: 1% derating for every 100 m
max. 2000 mm

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
480 V AC, 3-phase

Supply
Mains voltage (50/60Hz) [U_{LN}]
380 (-10%) - 480 (+10%) V

Supply
Input current (150% overload) [I_{LN}]
16.5 A

Supply
Supply frequency [f_{LN}]
50/60 Hz

Supply
Frequency range [f_{LN}]
45–66 (± 0%) Hz

Supply
Mains switch-on frequency
Maximum of one time every 30 seconds

Power section
Overload current (150% overload) [I_L]
24 A

Power section
max. starting current (High Overload) [I_H]
200 %

Power section
Note about max. starting current
for 1.875 seconds every 600 seconds

Power section
Output voltage with V_e [U_2]
400 V AC, 3-phase
480 V AC, 3-phase

Power section
Output Frequency [f_2]
0 - 50/60 (max. 300) Hz

Power section
Switching frequency [f_{PWM}]
16
adjustable 4 - 32 (audible) kHz

Power section

Operation Mode
U/f control
Speed control with slip compensation

Power section
Frequency resolution (setpoint value) [Δf]
0.025 Hz

Power section
Rated operational current
At 150% overload [I_e]
16 A

Power section
Note
Rated operational current at an operating frequency of 16 kHz and an ambient air temperature of +50 °C

Power section
Maximum leakage current to ground (PE) without motor [I_{PE}]
< 3.5 AC, < 10 DC mA

Power section
Fitted with
Radio interference suppression filter

Power section
Frame size
FS2

Motor feeder
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

Motor feeder
Note
Overload cycle for 60 s every 600 s

Motor feeder
Note
at 400 V, 50 Hz

Motor feeder
150 % Overload [P]
7.5 kW

Motor feeder
Note
at 440 - 480 V, 60 Hz

Motor feeder
150 % Overload [P]
10 HP

Motor feeder
Apparent power
Apparent power at rated operation 400 V [S]
11.09 kVA

Motor feeder
Apparent power
Apparent power at rated operation 480 V [S]
13.3 kVA

Motor feeder
Braking function
Standard braking torque
max. 30 % M_N

Motor feeder
Braking function
DC braking torque
adjustable to 100 %

Control section

Reference voltage [U_s]
10 V DC (max. 0.2 mA) V

Analog inputs
1, parameterizable, 0 - 10 V DC, 0/4 - 20 mA

Digital inputs
4, parameterizable, 10 - 30 V DC

Relay outputs
1, N/O contact, 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 (Type B, gG), 150 %
FAZ-B25/3

Power Wiring
Safety device (fuse or miniature circuit-breaker)
UL (Class CC or J)
25 A

Power Wiring
Mains contactor
150 % overload (CT/I_H, at 50 °C)
DILM7-…

Power Wiring
Main choke
150 % overload (CT/I_H, at 50 °C)
DX-LN3-025

Power Wiring
Radio interference suppression filter (external, 150 %)
DX-EMC34-030

Power Wiring
Radio interference suppression filter, low leakage currents (external, 150 %)
DX-EMC34-030-L

Power Wiring
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_H, at 50 °C)
DX-LM3-016

DESIGN VERIFICATION AS PER IEC/EN 61439

Technical data for design verification

Rated operational current for specified heat dissipation [I_n]
16 A

Heat dissipation per pole, current-dependent [P_{vid}]
0 W

Equipment heat dissipation, current-dependent [P_{vid}]
240 W

Static heat dissipation, non-current-dependent [P_{vs}]
0 W

Heat dissipation capacity [P_{diss}]
0 W

Operating ambient temperature min.
-10 °C

Operating ambient temperature max.
+60 °C

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 Strength of materials and parts
10.2.3.1 Verification of thermal stability of enclosures
Meets the product standard's requirements.

10.2 Strength of materials and parts
10.2.3.2 Verification of resistance of insulating materials to normal heat
Meets the product standard's requirements.

10.2 Strength of materials and parts
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 Strength of materials and parts
10.2.4 Resistance to ultra-violet (UV) radiation
Meets the product standard's requirements.

10.2 Strength of materials and parts
10.2.5 Lifting
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts
10.2.6 Mechanical impact
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts
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 Insulation properties
10.9.3 Impulse withstand voltage

Is the panel builder's responsibility.

10.9 Insulation properties
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
380 - 480 V

Mains frequency
50/60 Hz

Number of phases input
3

Number of phases output

3

Max. output frequency
300 Hz

Max. output voltage
500 V

Nominal output current I2N
7.5 A

Max. output at quadratic load at rated output voltage
0.5 kW

Max. output at linear load at rated output voltage
0.5 kW

Relative symmetric net frequency tolerance
10 %

Relative symmetric net voltage tolerance
10 %

Number of analogue outputs
0

Number of analogue inputs
1

Number of digital outputs
0

Number of digital inputs
4

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
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
No

4-quadrant operation possible
No

Type of converter
U converter

Degree of protection (IP)
IP20

Degree of protection (NEMA)
Other

Height
230 mm

Width
90 mm

Depth
168 mm

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