

Specifications



Photo is representative



Eaton 177040

Eaton DA1 Variable frequency drive, 600 V AC, 3-phase, 20.9 A, NEMA Other, IP20, FS3, Brake chopper, Digital display

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
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CATALOG NUMBER	177040
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MODEL CODE	DA1-35017NB-A20C
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EAN	4015081714834
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PRODUCT LENGTH/DEPTH	204 mm
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PRODUCT HEIGHT	273 mm
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PRODUCT WIDTH	131 mm
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PRODUCT WEIGHT	3.5 kg
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UL
CE
Certified by UL for use in Canada
UL report applies to both US and Canada
IEC/EN 61800-3
IEC/EN61800-5
RCM
IEC/EN61800-3
Specification for general requirements: IEC/EN 61800-2
UL File No.: E172143
EAC
RoHS, ISO 9001
UL 508C
CUL
Safety: EN 61800-5-1: 2003

CERTIFICATIONS

UL Category Control No.: NMMS, NMMS7
CSA-C22.2 No. 14
UkrSEPRO

CATALOG NOTES

The brake resistors are assigned based on the maximum rated power of the variable frequency drive. Additional brake resistors and designs (e.g.



Powering Business Worldwide

Apparent power

APPARENT POWER AT 600 V	17.65 kVA
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Climatic environmental conditions

ALTITUDE	Above 1000 m with 1 % derating per 100 m Max. 1000 m Max. 4000 m
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AMBIENT OPERATING TEMPERATURE - MAX	50 °C
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AMBIENT STORAGE TEMPERATURE - MAX	60 °C
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AMBIENT OPERATING TEMPERATURE - MIN	-10 °C
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AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MAX	50 °C
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AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MIN	-10 °C
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AMBIENT STORAGE TEMPERATURE - MIN	-40 °C
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CLIMATIC PROOFING	< 95 average relative humidity (RH), no condensation, no corrosion
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different duty cycles) are
available upon request.

Braking function

BRAKING RESISTANCE	50 Ω
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BRAKING TORQUE	Max. 30 % MN, Standard - Main circuit Max. 100 % of rated operational current I _e with external braking resistor - Main circuit Max. 100 % of rated operational current I _e , variable, DC - Main circuit
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SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR	975 VDC
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Control circuit

NUMBER OF INPUTS (ANALOG)	2
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NUMBER OF INPUTS (DIGITAL)	5
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NUMBER OF OUTPUTS (ANALOG)	2
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NUMBER OF OUTPUTS (DIGITAL)	2
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NUMBER OF RELAY OUTPUTS	2 (parameterizable, 1 N/O and 1 changeover contact, 6 A (250 V, AC-1) / 5 A (30 V, DC-1))
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RATED CONTROL VOLTAGE (UC)	24 V DC (external, max. 100 mA)
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Design verification

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.

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 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. 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

Does not apply, since the

General information

CABLE LENGTH

150 m, unscreened, maximum permissible, Motor feeder
100 m, screened, maximum permissible, Motor feeder
300 m, unscreened, with motor choke, maximum permissible, Motor feeder
200 m, screened, with motor choke, maximum permissible, Motor feeder

COMMUNICATION INTERFACE

EtherCAT, optional
PROFINET, optional
DeviceNet, optional
Ethernet IP, optional
CANopen®, built in
OP-Bus (RS485), built in
Modbus-TCP, optional
PROFIBUS, optional
SmartWire-DT, optional
Modbus RTU, built in

CONNECTION TO SMARTWIRE-DT

Yes
In conjunction with DX-NET-SWD1 SmartWire DT module

DEGREE OF PROTECTION

IP20
NEMA Other

FITTED WITH:

Control unit
Additional PCB protection
PC connection
IGBT inverter
Breaking resistance
Internal DC link
7-digital display assembly
Brake chopper

FRAME SIZE

FS3

FUNCTIONS

4-quadrant operation possible

MOUNTING POSITION

Vertical

PRODUCT CATEGORY

Variable frequency drives

PROTECTION

Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)

PROTOCOL

MODBUS
DeviceNet
PROFIBUS
Ethernet/IP
Other bus systems
CAN
PROFINET IO
TCP/IP

AGAINST ELECTRIC SHOCK	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.
10.9.2 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.
EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID	330 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION DETAILS	Operation (with 150 % overload)
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	17 A
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	0 W

SAFETY FUNCTION/LEVEL	STO (Safe Torque Off, SIL2, PLc Cat 2)
SUITABLE FOR	Branch circuits, (UL/CSA)

Main circuit

EFFICIENCY	97 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	115 W at 50% current and 0% speed 125 W at 50% current and 50% speed 137 W at 50% current and 90% speed 194 W at 100% current and 0% speed 208 W at 100% current and 50% speed 233 W at 100% current and 90% speed 92 W at 25% current and 50% speed 93 W at 25% current and 0% speed
INPUT CURRENT ILN AT 150% OVERLOAD	20.9 A
LEAKAGE CURRENT AT GROUND IPE - MAX	17 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	600 V
MAINS VOLTAGE - MIN	500 V
OPERATING MODE	Sensorless vector control (SLV) Speed control with slip compensation U/f control Optional: Vector control with feedback (CLV)
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT FREQUENCY - MIN	0 Hz
OUTPUT VOLTAGE (U2)	500 V AC, 3-phase 600 V AC, 3-phase
OVERLOAD CURRENT IL AT 150% OVERLOAD	25.5 A
RATED CONTROL SUPPLY VOLTAGE	10 V DC (Us, max. 10 mA)
RATED FREQUENCY - MAX	62 Hz
RATED FREQUENCY - MIN	48 Hz
RATED OPERATIONAL CURRENT (IE) AT 150% OVERLOAD	17 A
RATED OPERATIONAL POWER AT 500 V, 50 HZ, 3-PHASE	11 kW

Motor rating

ASSIGNED MOTOR CURRENT IM AT 500 V, 50 HZ, 150% OVERLOAD	17 A
ASSIGNED MOTOR CURRENT IM AT 525 V, 50 HZ, 150% OVERLOAD	16.6 A
ASSIGNED MOTOR CURRENT IM AT 550 - 600 V, 60 HZ, 150% OVERLOAD	17 A
ASSIGNED MOTOR POWER AT 575/600 V, 60 HZ, 3-PHASE	15 HP

RATED OPERATIONAL POWER AT 525 V, 50 HZ, 3-PHASE	11 kW
RATED OPERATIONAL VOLTAGE	600 V AC, 3-phase 500 V AC, 3-phase
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
SHORT-CIRCUIT PROTECTION	NH fuse used together with TB00-D fuse base, Power wiring, Assigned switching and protective elements LPJ fuse used together with J60060-3 fuse base, Power wiring, Assigned switching and protective elements
SHORT-CIRCUIT PROTECTION RATING	35 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
STARTING CURRENT - MAX	200 %, IH, max. starting current (High Overload), for 4 seconds every 40 seconds, Power section
SUPPLY FREQUENCY	50/60 Hz
SWITCHING FREQUENCY	8 kHz, 4 - 24 kHz adjustable (audible), fPWM, Power section, Main circuit
SYSTEM CONFIGURATION TYPE	AC supply systems with earthed center point
VOLTAGE RATING - MAX	600 VAC

Resources

[eaton-powerxl-da1-dc1-de1-system-bus-ap040022-en-us.pdf](#)

[eaton-powerxl-da1-dc1-db1-de1-rapidlink5-firmware-update-ap040214-en-us.pdf](#)

[eaton-powerxl-da1-dc1-de1-internal-motor-protection-ap040016-en-us.pdf](#)

[Start, Stopp und Betrieb](#)

[eaton-powerxl-da1-droop-function-ap040023-en-us.pdf](#)

[eaton-powerxl-da1-starting-stopping-operation-ap040030-en-us.pdf](#)

[eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-en-us.pdf](#)

APPLICATION NOTES

[eaton-powerxl-dx-com-stick-3-ap040190-en-us.pdf](#)

[eaton-powerxl-da1-derating-ap040039-en-us.pdf](#)

[eaton-powerxl-da1-master-slave-operation-ap040026-en-us.pdf](#)

[eaton-powerxl-da1-motor-vf-curves-induction-motors-ap040018-en-us.pdf](#)

[Electromagnetic compatibility \(EMC\)](#)

[eaton-powerxl-da1-vector-control-induction-motors-ap040028-en-us.pdf](#)

[eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf](#)

[eaton-powerxl-da1-set-point-setting-ap040040-en-us.pdf](#)

	eaton-powerxl-da1-dc1-de1-conformal-coating-ap040182-en-us.pdf eaton-powerxl-da1-use-of-multiple-ramps-ap040031-en-us.pdf eaton-powerxl-da1-i-o-configuration-ap040034-en-us.pdf eaton-powerxl-da1-pid-controller-ap040025-en-us.pdf eaton-powerxl-da1-pointer-to-parameter-ap040133-en-us.pdf eaton-powerxl-da1-hoist-applications-ap040032-en-us.pdf
BROCHURES	eaton-powerxl-variable-frequency-drives-dc1-da1-brochure-br040001en-en-us.pdf
CATALOGUES	eaton-drives-soft-starter-catalog-ca04020001zen-us.pdf
DECLARATIONS OF CONFORMITY	eaton-variable-frequency-drive-declaration-of-conformity-uk251145en.pdf eaton-variable-frequency-drive-declaration-of-conformity-eu250662en.pdf
DRAWINGS	eaton-frequency-inverter-dimensions-022.eps eaton-frequency-inverter-3d-drawing-013.eps
ECAD MODEL	DA-CE-ETN.DA1-35017NB-A20C
INSTALLATION INSTRUCTIONS	eaton-da1-variable-frequency-drive-il04020010z.pdf
INSTALLATION VIDEOS	PowerXL Variable Frequency Drives DC1 and DA1 - EN Video PowerXL DA1

MANUALS AND USER GUIDES	eaton-canopen-communication-manual-for-variable-frequency-drives-variable-speed-starters-da1-db1-dc1-de11-mn040019-en-us.pdf
	eaton-powerxl-vfd-profinet-manual-mn040062en-us.pdf
	eaton-da1-variable-frequency-drive-mn040063-en-us.pdf
	MN040018_EN
	eaton-powerxl-da1-application-manual-mn04020006z-en-us.pdf
MCAD MODEL	eaton-powerxl-da1-installation-manual-mn04020005z-en-us.pdf
	DA-CS-da1_fs3_ip20
MULTIMEDIA	eaton-general-purpose-drives-mcad-drawings-da1-fs3-ip20.dwg
	Looking for variable frequency drives DC1 and DA1 which can be used in harsh environments?
PRODUCT NOTIFICATIONS	System solutions based on EtherCAT
	eaton-drives-ecodesign-directive-mz040046en-en.pdf
SOFTWARE, FIRMWARE, AND APPLICATIONS	eaton-powerxl-da1-profibus-gsd-v216.zip
	eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip
	eaton-powerxl-da1-profinet-tia-v12-library.zip
	eaton-powerxl-dx-comstick3-ble-drivers.zip
	eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip
	eaton-powerxl-da1-firmware-release-note-mz040041en-us.pdf
	eaton-powerxl-da1-ethernetip-eds-v150.zip

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ethercat-esi-v310.zip](#)

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pcsoftware-drivesconnect-
v1501.zip](#)

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canopen-codesys-v3-
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codesys-v3-library.zip](#)

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canopen-eds-v250.zip](#)

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ethercat-esi-for-omron-
v311.zip](#)

[eaton-powerxl-da1-
profinet-gsdml-v226.zip](#)

PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



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