

Specifications



Photo is representative



Eaton 177037

Eaton DA1 Variable frequency drive, 600 V AC, 3-phase, 8.6 A, IP20, NEMA Other, FS2, Brake chopper, Digital display

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	177037
MODEL CODE	DA1-356D5NB-A20C
EAN	4015081714803
PRODUCT LENGTH/DEPTH	186 mm
PRODUCT HEIGHT	231 mm
PRODUCT WIDTH	107 mm
PRODUCT WEIGHT	1.8 kg

Safety: EN 61800-5-1: 2003

CE
UL 508C
RCM
Certified by UL for use in Canada
CSA-C22.2 No. 14
UL File No.: E172143
UL
EAC
IEC/EN61800-3
IEC/EN61800-5
UkrSEPRO
UL report applies to both US and Canada
RoHS, ISO 9001
Specification for general requirements: IEC/EN 61800-2
CUL
UL Category Control No.: NMMS, NMMS7
IEC/EN 61800-3

CERTIFICATIONS

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	6.75 kVA
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Climatic environmental conditions

ALTITUDE	Max. 1000 m Above 1000 m with 1 % derating per 100 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	150 Ω
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BRAKING TORQUE	Max. 100 % of rated operational current I_e , variable, DC - Main circuit Max. 30 % MN, Standard - Main circuit Max. 100 % of rated operational current I_e with external braking resistor - 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

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

COMMUNICATION INTERFACE

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

CONNECTION TO SMARTWIRE-DT

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

DEGREE OF PROTECTION

IP20
NEMA Other

FITTED WITH:

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

FRAME SIZE

FS2

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

PROFIBUS
CAN
DeviceNet
EtherNet/IP
PROFINET IO
MODBUS
Other bus systems
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	120 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)	6.5 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	102 W at 100% current and 50% speed 114 W at 100% current and 90% speed 71 W at 25% current and 0% speed 71 W at 25% current and 50% speed 82 W at 50% current and 0% speed 82 W at 50% current and 50% speed 84 W at 50% current and 90% speed 93 W at 100% current and 0% speed
INPUT CURRENT ILN AT 150% OVERLOAD	8.6 A
LEAKAGE CURRENT AT GROUND IPE - MAX	6.5 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) U/f control Optional: Vector control with feedback (CLV) Speed control with slip compensation
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	9.75 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	6.5 A
RATED OPERATIONAL POWER AT 500 V, 50 HZ, 3-PHASE	4 kW

Motor rating

ASSIGNED MOTOR
CURRENT IM AT 500 V, 50 HZ, 150% OVERLOAD 6.5 A

ASSIGNED MOTOR
CURRENT IM AT 525 V, 50 HZ, 150% OVERLOAD 6.5 A

ASSIGNED MOTOR
CURRENT IM AT 550 - 600 V, 60 HZ, 150% OVERLOAD 6.1 A

ASSIGNED MOTOR
POWER AT 575/600 V, 60 HZ, 3-PHASE 5 HP

RATED OPERATIONAL POWER AT 525 V, 50 HZ, 3-PHASE	4 kW
RATED OPERATIONAL VOLTAGE	500 V AC, 3-phase 600 V AC, 3-phase
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
SHORT-CIRCUIT PROTECTION	LPJ fuse used together with J60060-3 fuse base, Power wiring, Assigned switching and protective elements NH fuse used together with TB00-D fuse base, Power wiring, Assigned switching and protective elements
SHORT-CIRCUIT PROTECTION RATING	15 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-vector-control-induction-motors-ap040028-en-us.pdf](#)

[eaton-powerxl-da1-i-o-configuration-ap040034-en-us.pdf](#)

[eaton-powerxl-da1-dc1-de1-conformal-coating-ap040182-en-us.pdf](#)

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

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

[eaton-powerxl-da1-hoist-applications-ap040032-en-us.pdf](#)

APPLICATION NOTES

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

[Start, Stopp und Betrieb](#)

[eaton-powerxl-da1-use-of-multiple-ramps-ap040031-en-us.pdf](#)

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

[eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-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](#)

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

	eaton-powerxl-da1-starting-stopping-operation-ap040030-en-us.pdf eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf Electromagnetic compatibility (EMC) eaton-powerxl-da1-set-point-setting-ap040040-en-us.pdf eaton-powerxl-da1-pointer-to-parameter-ap040133-en-us.pdf eaton-powerxl-da1-pid-controller-ap040025-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-eu250662en.pdf eaton-variable-frequency-drive-declaration-of-conformity-uk251145en.pdf
DRAWINGS	eaton-frequency-inverter-dimensions-027.eps eaton-frequency-inverter-3d-drawing-012.eps
ECAD MODEL	DA-CE-ETN.DA1-356D5NB-A20C
INSTALLATION INSTRUCTIONS	eaton-da1-variable-frequency-drive-il04020010z.pdf
INSTALLATION VIDEOS	Video PowerXL DA1 PowerXL Variable Frequency Drives DC1 and DA1 - EN
MANUALS AND USER GUIDES	eaton-powerxl-da1-installation-manual-mn04020005z-en-us.pdf MN040018_EN

	eaton-powerxl-da1-application-manual-mn04020006z-en-us.pdf eaton-powerxl-vfd-profinet-manual-mn040062en-us.pdf eaton-canopen-communication-manual-for-variable-frequency-drives-variable-speed-starters-da1-db1-dc1-de11-mn040019-en-us.pdf eaton-da1-variable-frequency-drive-mn040063-en-us.pdf
MCAD MODEL	eaton-general-purpose-drives-mcad-drawings-da1-fs2-ip20.dwg DA-CS-da1 fs2 ip20
MULTIMEDIA	System solutions based on EtherCAT Looking for variable frequency drives DC1 and DA1 which can be used in harsh environments?
PRODUCT NOTIFICATIONS	eaton-drives-ecodesign-directive-mz040046en-en.pdf
SOFTWARE, FIRMWARE, AND APPLICATIONS	eaton-powerxl-da1-swd-codesys-v3-library.zip eaton-powerxl-da1-canopen-eds-v250.zip eaton-powerxl-da1-profinet-gsdml-v226.zip eaton-powerxl-da1-ethernetip-eds-v150.zip eaton-powerxl-da1-firmware-release-note-mz040041en-us.pdf eaton-powerxl-da1-devicenet-eds-v100.zip eaton-powerxl-da1-canopen-codesys-v3-library.zip eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip

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ethercat-esi-for-omron-
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[eaton-powerxl-
pcsoftware-drivesconnect-
v1501.zip](#)

PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



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