

Specifications



Photo is representative



Eaton 169093

Eaton DA1 Variable frequency drive, 240 V AC, 3-phase, 13.2 A, NEMA Other, IP20, FS2, Radio interference, Brake chopper, Digital display

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	169093
MODEL CODE	DA1-32011FB-A20C
EAN	4015081655786
PRODUCT LENGTH/DEPTH	186 mm
PRODUCT HEIGHT	231 mm
PRODUCT WIDTH	107 mm
PRODUCT WEIGHT	1.8 kg

UL File No.: E172143
UL report applies to both
US and Canada
EAC
IEC/EN61800-3
IEC/EN61800-5
RoHS, ISO 9001
UL 508C
Safety: EN 61800-5-1: 2003

CERTIFICATIONS

Certified by UL for use in
Canada
CUL
CE
IEC/EN 61800-3
UL Category Control No.:
NMMS, NMMS7
Specification for general
requirements: IEC/EN
61800-2
UkrSEPRO
CSA-C22.2 No. 14
RCM
UL

CATALOG NOTES

The brake resistors are
assigned based on the
maximum rated power of
the variable frequency
drive. Additional brake

Apparent power

APPARENT POWER AT 230 V	4.18 kVA
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APPARENT POWER AT 240 V	4.36 kVA
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Climatic environmental conditions

ALTITUDE	Max. 4000 m Max. 1000 m Above 1000 m with 1 % derating per 100 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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resistors and designs (e.g. different duty cycles) are available upon request.

Braking function

BRAKING RESISTANCE	35 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	390 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 300 m, unscreened, with motor choke, maximum permissible, Motor feeder C2 ≤ 5 m, Radio interference level, maximum motor cable length C3 ≤ 25 m, Radio interference level, maximum motor cable length 100 m, screened, maximum permissible, Motor feeder 200 m, screened, with motor choke, maximum permissible, Motor feeder
COMMUNICATION INTERFACE	SmartWire-DT, optional OP-Bus (RS485), built in Modbus-TCP, optional EtherCAT, optional PROFIBUS, optional DeviceNet, optional PROFINET, optional CANopen®, built in Ethernet IP, optional Modbus RTU, built in
CONNECTION TO SMARTWIRE-DT	In conjunction with DX-NET-SWD1 SmartWire DT module Yes
DEGREE OF PROTECTION	IP20 NEMA Other
ELECTROMAGNETIC COMPATIBILITY	1st and 2nd environments (according to EN 61800-3)
FITTED WITH:	Additional PCB protection PC connection IGBT inverter 7-digital display assembly Radio interference suppression filter Breaking resistance Brake chopper Control unit Internal DC link
FRAME SIZE	FS2
FUNCTIONS	4-quadrant operation possible
MOUNTING POSITION	Vertical
PRODUCT CATEGORY	Variable frequency drives

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	90.2 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	10.5 A
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	0 W

PROTECTION	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
PROTOCOL	PROFIBUS Other bus systems EtherNet/IP PROFINET IO MODBUS CAN DeviceNet TCP/IP
RADIO INTERFERENCE CLASS	Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments C2, C3: depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary.
SAFETY FUNCTION/LEVEL	STO (Safe Torque Off, SIL2, PLc Cat 2)
SUITABLE FOR	Branch circuits, (UL/CSA)

Main circuit

EFFICIENCY	95.9 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	112 W at 100% current and 90% speed 42 W at 50% current and 0% speed 43 W at 25% current and 0% speed 51 W at 25% current and 50% speed 62 W at 50% current and 50% speed 74 W at 100% current and 0% speed 74 W at 50% current and 90% speed 90 W at 100% current and 50% speed
INPUT CURRENT ILN AT 150% OVERLOAD	13.2 A
LEAKAGE CURRENT AT GROUND IPE - MAX	1.73 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	240 V
MAINS VOLTAGE - MIN	200 V
OPERATING MODE	U/f control Sensorless vector control (SLV) Speed control with slip compensation Optional: Vector control with feedback (CLV)
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT FREQUENCY - MIN	0 Hz
OUTPUT VOLTAGE (U2)	240 V AC, 3-phase 230 V AC, 3-phase
OVERLOAD CURRENT IL AT 150% OVERLOAD	15.75 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	10.5 A
RATED OPERATIONAL POWER AT 220/230 V, 50 HZ, 1-PHASE	2.2 kW

Motor rating

ASSIGNED MOTOR
CURRENT IM AT 220 - 240 V, 60 HZ, 150% OVERLOAD 9.6 A

ASSIGNED MOTOR
CURRENT IM AT 230 V, 50 HZ, 150% OVERLOAD 8.7 A

ASSIGNED MOTOR
POWER AT 230/240 V, 60 HZ, 1-PHASE 3 HP

RATED OPERATIONAL VOLTAGE	230 V AC, 3-phase 240 V AC, 3-phase
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
SHORT-CIRCUIT PROTECTION RATING	17.5 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	16 kHz, 4 - 32 kHz adjustable (audible), fPWM, Power section, Main circuit
SYSTEM CONFIGURATION TYPE	AC supply systems with earthed center point
VOLTAGE RATING - MAX	240 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-vfd-dual-rating-ap040114-en-us.pdf](#)

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

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

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

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

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

APPLICATION NOTES

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

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

[eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-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-dc1-de1-internal-motor-protection-ap040016-en-us.pdf](#)

[Start, Stopp und Betrieb](#)

	eaton-powerxl-da1-starting-stopping-operation-ap040030-en-us.pdf eaton-powerxl-da1-droop-function-ap040023-en-us.pdf eaton-powerxl-da1-use-of-multiple-ramps-ap040031-en-us.pdf eaton-powerxl-da1-set-point-setting-ap040040-en-us.pdf eaton-powerxl-da1-i-o-configuration-ap040034-en-us.pdf eaton-powerxl-da1-dc1-de1-conformal-coating-ap040182-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.DA1-32011FB-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

	eaton-da1-variable-frequency-drive-mn040063-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-powerxl-da1-application-manual-mn04020006z-en-us.pdf MN040018_EN
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-profinet-gsdml-v226.zip eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip eaton-powerxl-da1-ethercat-esi-v310.zip eaton-powerxl-da1-ethernetip-eds-v150.zip eaton-powerxl-da1-profinet-tia-v12-library.zip eaton-powerxl-dx-comstick3-ble-drivers.zip eaton-powerxl-da1-swd-codesys-v3-library.zip eaton-powerxl-da1-canopen-eds-v250.zip

[eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip](#)

[eaton-powerxl-da1-profibus-gsd-v216.zip](#)

[eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip](#)

[eaton-powerxl-da1-canopen-codesys-v3-library.zip](#)

[eaton-powerxl-da1-firmware-release-note-mz040041en-us.pdf](#)

[eaton-powerxl-da1-devicenet-eds-v100.zip](#)

[eaton-powerxl-pcsoftware-drivesconnect-v1501.zip](#)

PROJECT NAME:

PROJECT NUMBER:

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