

Specifications



Photo is representative



Eaton 169096

Eaton DA1 Variable frequency drive, 240 V AC, 3-phase, 20.9 A, NEMA Other, IP20, FS3, Radio interference, Brake chopper, Digital display

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	169096
MODEL CODE	DA1-32018FB-A20C
EAN	4015081658794
PRODUCT LENGTH/DEPTH	204 mm
PRODUCT HEIGHT	273 mm
PRODUCT WIDTH	131 mm
PRODUCT WEIGHT	3.5 kg

IEC/EN61800-3
UkrSEPRO
CSA-C22.2 No. 14
IEC/EN 61800-3
CUL
UL 508C
UL Category Control No.:
NMMS, NMMS7
UL report applies to both
US and Canada
Certified by UL for use in
Canada
RCM
CE
RoHS, ISO 9001
EAC
Specification for general
requirements: IEC/EN
61800-2
UL
UL File No.: E172143
Safety: EN 61800-5-1: 2003

CERTIFICATIONS

IEC/EN61800-5

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 7.17 kVA

APPARENT POWER AT 240 V 7.48 kVA

Climatic environmental conditions

ALTITUDE Above 1000 m with 1 % derating per 100 m
Max. 1000 m
Max. 4000 m

AMBIENT OPERATING TEMPERATURE - MAX 50 °C

AMBIENT STORAGE TEMPERATURE - MAX 60 °C

AMBIENT OPERATING TEMPERATURE - MIN -10 °C

AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MAX 50 °C

AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MIN -10 °C

AMBIENT STORAGE TEMPERATURE - MIN -40 °C

CLIMATIC PROOFING < 95 average relative humidity (RH), no condensation, no corrosion

resistors and designs (e.g. different duty cycles) are available upon request.

Braking function

BRAKING RESISTANCE 20 Ω

BRAKING TORQUE

Max. 30 % MN, Standard - Main circuit
Max. 100 % of rated operational current I_e , variable, DC - Main circuit
Max. 100 % of rated operational current I_e with external braking resistor - Main circuit

SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR 390 VDC

Control circuit

NUMBER OF INPUTS (ANALOG) 2

NUMBER OF INPUTS (DIGITAL) 5

NUMBER OF OUTPUTS (ANALOG) 2

NUMBER OF OUTPUTS (DIGITAL) 2

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))

RATED CONTROL VOLTAGE (UC) 24 V DC (external, max. 100 mA)

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 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 C2 ≤ 5 m, Radio interference level, maximum motor cable length 300 m, unscreened, with motor choke, maximum permissible, Motor feeder
COMMUNICATION INTERFACE	OP-Bus (RS485), built in EtherCAT, optional CANopen®, built in SmartWire-DT, optional Modbus RTU, built in Modbus-TCP, optional PROFIBUS, optional DeviceNet, optional Ethernet IP, optional PROFINET, optional
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:	Brake chopper 7-digital display assembly PC connection Internal DC link Control unit Breaking resistance Radio interference suppression filter IGBT inverter Additional PCB protection
FRAME SIZE	FS3
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	160 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	18 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	EtherNet/IP CAN MODBUS PROFINET IO Other bus systems DeviceNet PROFIBUS TCP/IP
RADIO INTERFERENCE CLASS	C2, C3: depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary. Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments
SAFETY FUNCTION/LEVEL	STO (Safe Torque Off, SIL2, PLc Cat 2)
SUITABLE FOR	Branch circuits, (UL/CSA)

Main circuit

EFFICIENCY	96 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	109 W at 50% current and 50% speed 122 W at 50% current and 90% speed 172 W at 100% current and 0% speed 175 W at 100% current and 50% speed 178 W at 100% current and 90% speed 75 W at 25% current and 0% speed 86 W at 25% current and 50% speed 91 W at 50% current and 0% speed
INPUT CURRENT ILN AT 150% OVERLOAD	20.9 A
LEAKAGE CURRENT AT GROUND IPE - MAX	0.93 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	240 V
MAINS VOLTAGE - MIN	200 V
OPERATING MODE	Optional: Vector control with feedback (CLV) U/f control Speed control with slip compensation Sensorless vector control (SLV)
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	27 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	18 A
RATED OPERATIONAL POWER AT 220/230 V, 50 HZ, 1-PHASE	4 kW

Motor rating

ASSIGNED MOTOR
CURRENT IM AT 220 - 240 V, 60 HZ, 150% OVERLOAD 15.2 A

ASSIGNED MOTOR
CURRENT IM AT 230 V, 50 HZ, 150% OVERLOAD 14.8 A

ASSIGNED MOTOR
POWER AT 230/240 V, 60 HZ, 1-PHASE 5 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	30 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 - 24 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-hoist-applications-ap040032-en-us.pdf](#)

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

[eaton-powerxl-da1-use-of-multiple-ramps-ap040031-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-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](#)

APPLICATION NOTES

[Start, Stopp und Betrieb](#)

[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](#)

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

[eaton-powerxl-da1-starting-stopping-operation-ap040030-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-da1-master-slave-operation-ap040026-en-us.pdf eaton-powerxl-da1-motor-vf-curves-induction-motors-ap040018-en-us.pdf eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-en-us.pdf eaton-powerxl-dx-com-stick-3-ap040190-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.DA1-32018FB-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-powerxl-da1-installation-manual-mn04020005z-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 eaton-powerxl-da1-application-manual-mn04020006z-en-us.pdf MN040018_EN
MCAD MODEL	DA-CS-da1_fs3_ip20 eaton-general-purpose-drives-mcad-drawings-da1-fs3-ip20.dwg
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-firmware-release-note-mz040041en-us.pdf eaton-powerxl-da1-ethernetip-eds-v150.zip eaton-powerxl-da1-ethercat-esi-v310.zip eaton-powerxl-da1-canopen-codesys-v3-library.zip eaton-powerxl-da1-devicenet-eds-v100.zip eaton-powerxl-pcsoftware-drivesconnect-v1501.zip eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip

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

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canopen-eds-v250.zip](#)

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1m5-usb-driver.zip](#)

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comstick3-ble-drivers.zip](#)

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profinet-tia-v12-library.zip](#)

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

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

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

PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



Eaton Corporation plc Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com

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