

Specifications



Photo is representative



Eaton 169081

Eaton DA1 Variable frequency drive, 240 V AC, 1-phase, 12.9 A, IP20, NEMA Other, FS2, Radio interference, Brake chopper, Digital display

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	169081
MODEL CODE	DA1-127D0FB-A20C
EAN	4015081655670
PRODUCT LENGTH/DEPTH	186 mm
PRODUCT HEIGHT	231 mm
PRODUCT WIDTH	107 mm
PRODUCT WEIGHT	1.8 kg

CERTIFICATIONS

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

EAC
IEC/EN61800-5
RoHS, ISO 9001

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	2.79 kVA
APPARENT POWER AT 240 V	2.91 kVA

Climatic environmental conditions	
ALTITUDE	Max. 1000 m Max. 4000 m Above 1000 m with 1 % derating per 100 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	50 Ω
BRAKING TORQUE	Max. 100 % of rated operational current I _e with external braking resistor - Main circuit Max. 30 % MN, Standard - Main circuit Max. 100 % of rated operational current I _e , variable, DC - 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	200 m, screened, with motor choke, maximum permissible, Motor feeder C1 ≤ 1 m, Radio interference level, maximum motor cable length C3 ≤ 25 m, Radio interference level, maximum motor cable length C2 ≤ 5 m, Radio interference level, maximum motor cable length 150 m, unscreened, maximum permissible, Motor feeder 300 m, unscreened, with motor choke, maximum permissible, Motor feeder 100 m, screened, maximum permissible, Motor feeder
COMMUNICATION INTERFACE	EtherCAT, optional Modbus RTU, built in Ethernet IP, optional PROFIBUS, optional DeviceNet, optional Modbus-TCP, optional OP-Bus (RS485), built in SmartWire-DT, optional CANopen®, built in PROFINET, optional
CONNECTION TO SMARTWIRE-DT	Yes In conjunction with DX-NET-SWD1 SmartWire DT module
DEGREE OF PROTECTION	IP20 NEMA Other
ELECTROMAGNETIC COMPATIBILITY	1st and 2nd environments (according to EN 61800-3)
FITTED WITH:	Internal DC link Control unit Additional PCB protection IGBT inverter PC connection Radio interference suppression filter Brake chopper Breaking resistance 7-digital display assembly
FRAME SIZE	FS2
FUNCTIONS	4-quadrant operation possible

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	63 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	7 A
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	0 W

MOUNTING POSITION	Vertical
PRODUCT CATEGORY	Variable frequency drives
PROTECTION	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
PROTOCOL	DeviceNet PROFIBUS CAN Other bus systems EtherNet/IP MODBUS PROFINET IO TCP/IP
RADIO INTERFERENCE CLASS	Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments C1: for conducted emissions only 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	95.8 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	30 W at 25% current and 0% speed 38 W at 25% current and 50% speed 39 W at 50% current and 0% speed 46 W at 50% current and 50% speed 54 W at 50% current and 90% speed 55 W at 100% current and 0% speed 66 W at 100% current and 50% speed 77 W at 100% current and 90% speed
INPUT CURRENT ILN AT 150% OVERLOAD	12.9 A
LEAKAGE CURRENT AT GROUND IPE - MAX	2.49 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	240 V
MAINS VOLTAGE - MIN	200 V
OPERATING MODE	Speed control with slip compensation U/f control Optional: Vector control with feedback (CLV) Sensorless vector control (SLV)
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT FREQUENCY - MIN	0 Hz
OUTPUT VOLTAGE (U2)	230 V AC, 3-phase 240 V AC, 3-phase
OVERLOAD CURRENT IL AT 150% OVERLOAD	10.5 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	7 A
RATED OPERATIONAL POWER AT 220/230 V, 50 HZ, 1-PHASE	1.5 kW

Motor rating

ASSIGNED MOTOR
CURRENT IM AT 220 - 240 V, 60 HZ, 150% OVERLOAD 6.8 A

ASSIGNED MOTOR
CURRENT IM AT 230 V, 50 HZ, 150% OVERLOAD 6.3 A

ASSIGNED MOTOR
POWER AT 230/240 V, 60 HZ, 1-PHASE 2 HP

RATED OPERATIONAL VOLTAGE	230 V AC, 1-phase 240 V AC, 1-phase
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
SHORT-CIRCUIT PROTECTION RATING	20 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-dx-com-stick-3-ap040190-en-us.pdf](#)

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

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

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

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

APPLICATION NOTES

[eaton-powerxl-da1-hoist-applications-ap040032-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-dc1-de1-internal-motor-protection-ap040016-en-us.pdf](#)

[eaton-powerxl-da1-pointer-to-parameter-ap040133-en-us.pdf](#)

[eaton-powerxl-da1-pid-controller-ap040025-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-vector-control-induction-motors-ap040028-en-us.pdf eaton-powerxl-da1-master-slave-operation-ap040026-en-us.pdf eaton-powerxl-da1-derating-ap040039-en-us.pdf Electromagnetic compatibility (EMC) eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-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-027.eps eaton-frequency-inverter-3d-drawing-012.eps
ECAD MODEL	DA-CE-ETN.DA1-127D0FB-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-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 MN040018_EN eaton-powerxl-da1-application-manual-mn04020006z-en-us.pdf eaton-powerxl-da1-installation-manual-mn04020005z-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-ethercat-esi-for-omron-v311.zip eaton-powerxl-da1-profinet-gsdml-v226.zip eaton-powerxl-da1-swd-codesys-v3-library.zip eaton-powerxl-da1-canopen-eds-v250.zip eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip eaton-powerxl-pcsoftware-drivesconnect-v1501.zip eaton-powerxl-da1-profinet-tia-v12-library.zip eaton-powerxl-da1-profibus-gsd-v216.zip

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

[eaton-powerxl-dx-comstick3-ble-drivers.zip](#)

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

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

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

[eaton-powerxl-da1-ethernetip-eds-v150.zip](#)

[eaton-powerxl-da1-ethercat-esi-v310.zip](#)

PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



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

© 2026 Eaton. All Rights Reserved.

Follow us on social media to get the latest product and support information.

