

Specifications



Eaton 176968

Eaton DA1 Variable frequency drive, 600 V AC, 3-phase, 48.9 A, IP55, NEMA 12, FS5, Brake chopper

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	176968
MODEL CODE	DA1-35043NB-B55C
EAN	4015081714117
PRODUCT LENGTH/DEPTH	270 mm
PRODUCT HEIGHT	540 mm
PRODUCT WIDTH	235 mm
PRODUCT WEIGHT	22.5 kg

CE
IEC/EN61800-3
IEC/EN61800-5
Specification for general requirements: IEC/EN 61800-2
Safety: EN 61800-5-1: 2003

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

CERTIFICATIONS

CATALOG NOTES

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



Powering Business Worldwide

Apparent power

APPARENT POWER AT 600 V	44.69 kVA
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Climatic environmental conditions

ALTITUDE	Above 1000 m with 1 % derating per 100 m Max. 4000 m Max. 1000 m
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AMBIENT OPERATING TEMPERATURE - MAX	40 °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	40 °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	16 Ω
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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
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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	100 m, screened, maximum permissible, Motor feeder 200 m, screened, with motor choke, maximum permissible, Motor feeder 300 m, unscreened, with motor choke, maximum permissible, Motor feeder 150 m, unscreened, maximum permissible, Motor feeder
COMMUNICATION INTERFACE	Modbus-TCP, optional EtherCAT, optional Modbus RTU, built in SmartWire-DT, optional PROFINET, optional OP-Bus (RS485), built in DeviceNet, optional CANopen®, built in Ethernet IP, optional PROFIBUS, optional
CONNECTION TO SMARTWIRE-DT	In conjunction with DX-NET-SWD1 SmartWire DT module Yes
DEGREE OF PROTECTION	IP55 NEMA 12
FITTED WITH:	Additional PCB protection PC connection IGBT inverter DC link choke Internal DC link OLED display Breaking resistance Control unit Brake chopper
FRAME SIZE	FS5
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 PROFINET IO MODBUS CAN EtherNet/IP Other bus systems DeviceNet

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	660 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)	43 A
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	0 W

	TCP/IP
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	198 W at 25% current and 0% speed 237 W at 25% current and 50% speed 265 W at 50% current and 0% speed 319 W at 50% current and 50% speed 382 W at 50% current and 90% speed 467 W at 100% current and 0% speed 574 W at 100% current and 50% speed 675 W at 100% current and 90% speed
INPUT CURRENT ILN AT 150% OVERLOAD	48.9 A
LEAKAGE CURRENT AT GROUND IPE - MAX	43 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	600 V
MAINS VOLTAGE - MIN	500 V
OPERATING MODE	Optional: Vector control with feedback (CLV) Speed control with slip compensation Sensorless vector control (SLV) U/f control
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	64.5 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	43 A
RATED OPERATIONAL POWER AT 500 V, 50 HZ, 3-PHASE	30 kW

Motor rating

**ASSIGNED MOTOR
CURRENT IM AT 500 V, 50 HZ, 150% OVERLOAD** 43 A

**ASSIGNED MOTOR
CURRENT IM AT 525 V, 50 HZ, 150% OVERLOAD** 42 A

**ASSIGNED MOTOR
CURRENT IM AT 550 - 600 V, 60 HZ, 150% OVERLOAD** 41 A

**ASSIGNED MOTOR
POWER AT 575/600 V, 60 HZ, 3-PHASE** 40 HP

RATED OPERATIONAL POWER AT 525 V, 50 HZ, 3-PHASE	30 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 JM60100-3 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	63 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-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-derating-ap040039-en-us.pdf](#)

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

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

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

APPLICATION NOTES

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

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

[Start, Stopp und Betrieb](#)

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

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

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

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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-024.eps eaton-frequency-inverter-3d-drawing-015.eps
ECAD MODEL	DA-CE-ETN.DA1-35043NB-B55C
INSTALLATION INSTRUCTIONS	eaton-da1-variable-frequency-drive-il04020011z.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-da1-application-manual-mn04020006z-en-us.pdf eaton-da1-variable-frequency-drive-mn040063-en-us.pdf eaton-canopen-communication-manual-for-variable-frequency-drives-variable-speed-starters-da1-db1-dc1-de11-mn040019-en-us.pdf MN040018_EN eaton-powerxl-vfd-profinet-manual-mn040062en-us.pdf
MCAD MODEL	eaton-general-purpose-drives-mcad-drawings-da1-fs5-ip55.dwg DA-CS-da1_fs5_ip55
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-dx-cbl-pc-1m5-usb-driver.zip eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip eaton-powerxl-da1-profibus-gsd-v216.zip eaton-powerxl-da1-profinet-tia-v12-library.zip eaton-powerxl-dx-comstick3-ble-drivers.zip eaton-powerxl-da1-profinet-gsdml-v226.zip eaton-powerxl-da1-canopen-eds-v250.zip eaton-powerxl-da1-swd-codesys-v3-library.zip eaton-powerxl-da1-ethernetip-eds-v150.zip

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

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

[eaton-powerxl-pcsoftware-drivesconnect-v1501.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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