

Specifications



Photo is representative



Eaton 177035

Eaton DA1 Variable frequency drive, 600 V AC, 3-phase, 4.2 A, NEMA Other, IP20, FS2, Brake chopper, Digital display

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	177035
MODEL CODE	DA1-353D1NB-A20C
EAN	4015081714780
PRODUCT LENGTH/DEPTH	186 mm
PRODUCT HEIGHT	231 mm
PRODUCT WIDTH	107 mm
PRODUCT WEIGHT	1.8 kg

IEC/EN61800-3
UL report applies to both
US and Canada
IEC/EN61800-5
RCM
UkrSEPRO
UL
UL 508C
IEC/EN 61800-3
RoHS, ISO 9001
Safety: EN 61800-5-1: 2003

CERTIFICATIONS

UL File No.: E172143
Specification for general
requirements: IEC/EN
61800-2
UL Category Control No.:
NMMS, NMMS7
CUL
Certified by UL for use in
Canada
CSA-C22.2 No. 14
EAC
CE

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	3.22 kVA
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Climatic environmental conditions

ALTITUDE	Above 1000 m with 1 % derating per 100 m Max. 1000 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	300 Ω
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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
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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	200 m, screened, with motor choke, maximum permissible, Motor feeder 100 m, screened, maximum permissible, Motor feeder 150 m, unscreened, maximum permissible, Motor feeder 300 m, unscreened, with motor choke, maximum permissible, Motor feeder
COMMUNICATION INTERFACE	PROFINET, optional EtherCAT, optional SmartWire-DT, optional PROFIBUS, optional Ethernet IP, optional OP-Bus (RS485), built in CANopen®, built in Modbus-TCP, optional Modbus RTU, built in DeviceNet, optional
CONNECTION TO SMARTWIRE-DT	In conjunction with DX-NET-SWD1 SmartWire DT module Yes
DEGREE OF PROTECTION	IP20 NEMA Other
FITTED WITH:	Additional PCB protection Breaking resistance IGBT inverter Internal DC link Control unit 7-digital display assembly Brake chopper PC connection
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	CAN Other bus systems PROFIBUS PROFINET IO EtherNet/IP MODBUS DeviceNet 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	45 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)	3.1 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	45 W at 25% current and 0% speed 45 W at 25% current and 50% speed 47 W at 50% current and 0% speed 51 W at 50% current and 50% speed 53 W at 100% current and 0% speed 54 W at 50% current and 90% speed 55 W at 100% current and 50% speed 60 W at 100% current and 90% speed
INPUT CURRENT ILN AT 150% OVERLOAD	4.2 A
LEAKAGE CURRENT AT GROUND IPE - MAX	3.1 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) Optional: Vector control with feedback (CLV) U/f control Speed control with slip compensation
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT FREQUENCY - MIN	0 Hz
OUTPUT VOLTAGE (U2)	600 V AC, 3-phase 500 V AC, 3-phase
OVERLOAD CURRENT IL AT 150% OVERLOAD	4.65 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	3.1 A
RATED OPERATIONAL POWER AT 500 V, 50 HZ, 3-PHASE	1.5 kW

Motor rating

ASSIGNED MOTOR
CURRENT IM AT 500 V, 50 HZ, 150% OVERLOAD 2.9 A

ASSIGNED MOTOR
CURRENT IM AT 525 V, 50 HZ, 150% OVERLOAD 2.8 A

ASSIGNED MOTOR
CURRENT IM AT 550 - 600 V, 60 HZ, 150% OVERLOAD 2.7 A

ASSIGNED MOTOR
POWER AT 575/600 V, 60 HZ, 3-PHASE 2 HP

RATED OPERATIONAL POWER AT 525 V, 50 HZ, 3-PHASE	1.5 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	6 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-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-derating-ap040039-en-us.pdf](#)

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

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

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

APPLICATION NOTES

[eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-en-us.pdf](#)

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

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

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

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

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

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

[Start, Stopp und Betrieb](#)

	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-starting-stopping-operation-ap040030-en-us.pdf eaton-powerxl-da1-hoist-applications-ap040032-en-us.pdf eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf eaton-powerxl-da1-vector-control-induction-motors-ap040028-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.DA1-353D1NB-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
	MN040018_EN
	eaton-powerxl-da1-application-manual-mn04020006z-en-us.pdf
MCAD MODEL	DA-CS-da1_fs2_ip20 eaton-general-purpose-drives-mcad-drawings-da1-fs2-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-profibus-gsd-v216.zip
	eaton-powerxl-dx-comstick3-ble-drivers.zip
	eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip
	eaton-powerxl-da1-profinet-tia-v12-library.zip
	eaton-powerxl-pcsoftware-drivesconnect-v1501.zip
	eaton-powerxl-da1-canopen-codesys-v3-library.zip eaton-powerxl-da1-devicenet-eds-v100.zip

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

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[eaton-powerxl-da1-canopen-eds-v250.zip](#)

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

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

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

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

[eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip](#)

PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



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