

Specifications



Eaton 169371

Eaton DA1 Variable frequency drive, 240 V AC, 3-phase, 159.7 A, IP55, NEMA 12, FS6, Radio interference, Brake chopper

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	169371
MODEL CODE	DA1-32150FB-B55C
EAN	4015081658176
PRODUCT LENGTH/DEPTH	313.5 mm
PRODUCT HEIGHT	865 mm
PRODUCT WIDTH	330 mm
PRODUCT WEIGHT	50 kg

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

CATALOG NOTES

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



Powering Business Worldwide

	resistors and designs (e.g. different duty cycles) are available upon request.
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Apparent power	
APPARENT POWER AT 230 V	59.76 kVA
APPARENT POWER AT 240 V	62.35 kVA

Braking function	
BRAKING RESISTANCE	6 Ω
BRAKING TORQUE	Max. 100 % of rated operational current I_e , variable, DC - Main circuit Max. 30 % MN, Standard - 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

Climatic environmental conditions	
ALTITUDE	Max. 1000 m Max. 4000 m Above 1000 m with 1 % derating per 100 m
AMBIENT OPERATING TEMPERATURE - MAX	40 °C
AMBIENT STORAGE TEMPERATURE - MAX	60 °C
AMBIENT OPERATING TEMPERATURE - MIN	-10 °C
AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MAX	40 °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

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 C2 ≤ 5 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 C3 ≤ 25 m, Radio interference level, maximum motor cable length 300 m, unscreened, with motor choke, maximum permissible, Motor feeder
COMMUNICATION INTERFACE	PROFINET, optional PROFIBUS, optional SmartWire-DT, optional OP-Bus (RS485), built in Modbus-TCP, optional Ethernet IP, optional EtherCAT, optional Modbus RTU, built in CANopen®, built in DeviceNet, optional
CONNECTION TO SMARTWIRE-DT	In conjunction with DX-NET-SWD1 SmartWire DT module Yes
DEGREE OF PROTECTION	IP55 NEMA 12
ELECTROMAGNETIC COMPATIBILITY	1st and 2nd environments (according to EN 61800-3)
FITTED WITH:	OLED display DC link choke Brake chopper Control unit Additional PCB protection Breaking resistance IGBT inverter Internal DC link PC connection Radio interference suppression filter
FRAME SIZE	FS6
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	814 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	150 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	PROFINET IO EtherNet/IP PROFIBUS CAN MODBUS Other bus systems DeviceNet 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	97.8 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	1180 W at 100% current and 50% speed 1430 W at 100% current and 90% speed 350 W at 25% current and 0% speed 490 W at 25% current and 50% speed 490 W at 50% current and 0% speed 640 W at 50% current and 50% speed 790 W at 50% current and 90% speed 960 W at 100% current and 0% speed
INPUT CURRENT ILN AT 150% OVERLOAD	159.7 A
LEAKAGE CURRENT AT GROUND IPE - MAX	1.54 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 Optional: Vector control with feedback (CLV) 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	225 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	150 A
RATED OPERATIONAL POWER AT 220/230 V, 50 HZ, 1-PHASE	45 kW

Motor rating

ASSIGNED MOTOR
CURRENT IM AT 220 - 240 V, 60 HZ, 150% OVERLOAD 130 A

ASSIGNED MOTOR
CURRENT IM AT 230 V, 50 HZ, 150% OVERLOAD 141 A

ASSIGNED MOTOR
POWER AT 230/240 V, 60 HZ, 1-PHASE 50 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	225 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	4 kHz, 4 - 12 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-vector-control-induction-motors-ap040028-en-us.pdf](#)

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

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

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

[Start, Stopp und Betrieb](#)

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

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

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

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

APPLICATION NOTES

	eaton-powerxl-da1-starting-stopping-operation-ap040030-en-us.pdf Electromagnetic compatibility (EMC) eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf eaton-powerxl-da1-set-point-setting-ap040040-en-us.pdf eaton-powerxl-da1-pid-controller-ap040025-en-us.pdf eaton-powerxl-da1-pointer-to-parameter-ap040133-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-025.eps eaton-frequency-inverter-3d-drawing-016.eps
ECAD MODEL	DA-CE-ETN.DA1-32150FB-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 MN040018_EN

	eaton-powerxl-da1-application-manual-mn04020006z-en-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-vfd-profinet-manual-mn040062en-us.pdf
MCAD MODEL	eaton-general-purpose-drives-mcad-drawings-da1-fs6.dwg DA-CS-da1_fs6
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-pcsoftware-drivesconnect-v1501.zip eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip eaton-powerxl-da1-ethercat-esi-v310.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-da1-ethernetip-eds-v150.zip eaton-powerxl-da1-devicenet-eds-v100.zip

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profibus-gsd-v216.zip](#)

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

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

PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



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