Specifications



Photo is representative





Eaton 169393

Eaton DA1 Variable frequency drive, 480 V AC, 3-phase, 46 A/22 kW/30 HP, NEMA 12, IP55, FS4, Radio interference, Brake chopper

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	169393
MODEL CODE	DA1-34046FB-B55C
EAN	4015081658350
PRODUCT LENGTH/DEPTH	240 mm
PRODUCT HEIGHT	450 mm
PRODUCT WIDTH	173 mm
PRODUCT WEIGHT	11.5 kg
CERTIFICATIONS	UL 508C CSA-C22.2 No. 14 UL IEC/EN61800-5 EAC CE UkrSEPRO Safety: EN 61800-5-1: 2003 UL File No.: E172143 CUL UL report applies to both US and Canada Certified by UL for use in Canada IEC/EN61800-3 DNV RCM Specification for general requirements: IEC/EN 61800-2 RoHS, ISO 9001 UL Category Control No.: NMMS, NMMS7 IEC/EN 61800-3
CATALOG NOTES	The brake resistors are assigned based on the maximum rated power of the variable frequency drive. Additional brake

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

Apparent power

APPARENT POWER AT 400 V	31.87 kVA
APPARENT POWER AT 480 V	38.24 kVA

Braking function

BRAKING RESISTANCE	22 Ω
BRAKING TORQUE	Max. 100 % of rated operational current Ie with external braking resistor - Main circuit Max. 100 % of rated operational current Ie, variable, DC - Main circuit Max. 30 % MN, Standard - Main circuit
SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR	780 VDC

Climatic environmental conditions

ALTITUDE	Above 1000 m with 1 % derating per 100 m Max. 4000 m Max. 1000 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	200 m, screened, with motor choke, maximum permissible, Motor feeder 100 m, screened, maximum permissible, Motor feeder C3 ≤ 25 m, Radio interference level, maximum motor cable length 300 m, unscreened, with motor choke, maximum permissible, Motor feeder C2 ≤ 5 m, Radio interference level, maximum motor cable length 150 m, unscreened, maximum permissible, Motor feeder
COMMUNICATION INTERFACE	CANopen®, built in PROFINET, optional Ethernet IP, optional PROFIBUS, optional DeviceNet, optional OP-Bus (RS485), built in Modbus RTU, built in Modbus-TCP, optional EtherCAT, optional SmartWire-DT, optional
CONNECTION TO SMARTWIRE-DT	Yes In conjunction with DX-NET-SWD1 SmartWire DT module
DEGREE OF PROTECTION	NEMA 12 IP55
ELECTROMAGNETIC COMPATIBILITY	1st and 2nd environments (according to EN 61800-3)
FITTED WITH:	Control unit OLED display Radio interference suppression filter Additional PCB protection Breaking resistance PC connection IGBT inverter Brake chopper Internal DC link
FRAME SIZE	FS4
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	506 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	46 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	CAN PROFIBUS EtherNet/IP PROFINET IO DeviceNet MODBUS Other bus systems 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, PLd Cat 2)
SUITABLE FOR	Branch circuits, (UL/CSA)

Main circuit

EFFICIENCY	97.7 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	192 W at 25% current and 0% speed 231 W at 25% current and 50% speed 261 W at 50% current and 0% speed 303 W at 50% current and 50% speed 350 W at 50% current and 90% speed 447 W at 100% current and 0% speed 527 W at 100% current and 50% speed 614 W at 100% current and 90% speed
INPUT CURRENT ILN AT 150% OVERLOAD	51.9 A
LEAKAGE CURRENT AT GROUND IPE - MAX	2.47 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	480 V
MAINS VOLTAGE - MIN	380 V
MAINS VOLTAGE TOLERANCE	380 - 480 V (-10 %/+10 %, at 50/60 Hz)
OPERATING MODE	U/f control Sensorless vector control (SLV) Speed control with slip compensation Optional: Vector control with feedback (CLV)
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT FREQUENCY - MIN	0 Hz
OUTPUT VOLTAGE (U2)	400 V AC, 3-phase 480 V AC, 3-phase
OVERLOAD CURRENT IL AT 150% OVERLOAD	69 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	46 A
RATED OPERATIONAL	22 kW

Motor rating

ASSIGNED MOTOR CURRENT IM AT 400 V, 50 HZ, 150% OVERLOAD	41 A
ASSIGNED MOTOR CURRENT IM AT 440 - 480 V, 60 HZ, 150% OVERLOAD	40 A
ASSIGNED MOTOR POWER AT 460/480 V, 60 HZ, 3-PHASE	30 HP

POWER AT 380/400 V, 50 HZ, 3-PHASE	
RATED OPERATIONAL VOLTAGE	400 V AC, 3-phase 480 V AC, 3-phase
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
SHORT-CIRCUIT PROTECTION RATING	70 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	480 VAC

Resources

APPLICATION NOTES	eaton-powerxl-da1-derating-ap040039-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-i-o-configuration-ap040034-en-us.pdf eaton-powerxl-da1-dc1-de1-internal-motor-protection-ap040016-en-us.pdf eaton-powerxl-da1-dc1-de1-system-bus-ap040022-en-us.pdf eaton-powerxl-vfd-dual-rating-ap040114-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 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-set-point-setting-ap040040-en-us.pdf eaton-powerxl-da1-master-slave-operation-ap040026-en-us.pdf

	eaton-powerxl-da1-dc1-db1-de1-rapidlink5-firmware-update-ap040214-en-us.pdf eaton-powerxl-da1-use-of-multiple-ramps-ap040031-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-hoist-applications-ap040032-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-023.eps eaton-frequency-inverter-3d-drawing-014.eps
ECAD MODEL	DA-CE-ETN.DA1-34046FB-B55C
INSTALLATION INSTRUCTIONS	eaton-da1-variable-frequency-drive-il04020011z.pdf
INSTALLATION VIDEOS	Video PowerXL DA1 PowerXL Variable Frequency Drives DC1 and DA1 - EN
MANUALS AND USER GUIDES	eaton-da1-variable-frequency-drive-mn040063en-us.pdf eaton-powerxl-da1-installation-manual-mn04020005z-en-us.pdf

	eaton-canopen-communication-manual-for-variable-frequency-drives-variable-speed-starters-da1-db1-dc1-de11-mn040019-en-us.pdf eaton-powerxl-vfd-profinet-manual-mn040062en-us.pdf eaton-powerxl-da1-application-manual-mn04020006z-en-us.pdf MN040018_EN
MCAD MODEL	eaton-general-purpose-drives-mcad-drawings-da1-fs4-ip55.dwg DA-CS-da1_fs4_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-da1-firmware-release-note-mz040041en-us.pdf eaton-powerxl-pcsoftware-drivesconnect-v1501.zip eaton-powerxl-da1-profinet-tia-v12-library.zip eaton-powerxl-da1-profibus-gsd-v216.zip eaton-powerxl-da1-swd-codesys-v3-library.zip eaton-powerxl-da1-canopen-eds-v250.zip eaton-powerxl-da1-canopen-codesys-v3-library.zip eaton-powerxl-dx-comstick3-ble-drivers.zip eaton-powerxl-da1-ethernetip-eds-v150.zip

	eaton-powerxl-da1-devicenet-eds-v100.zip
	eaton-powerxl-da1-profinet-gsdml-v226.zip
	eaton-powerxl-da1-ethercat-esi-v310.zip
	eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip
	eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip
	eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip

PROJECT NAME:	
PROJECT NUMBER:	
PREPARED BY:	
DATE:	

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