

Specifications



Eaton 169405

Eaton DA1 Variable frequency drive, 480 V AC, 3-phase, 210.8 A, NEMA 12, IP55, FS7, Radio interference, Brake chopper

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	169405
MODEL CODE	DA1-34202FB-B55C
EAN	4015081658459
PRODUCT LENGTH/DEPTH	341 mm
PRODUCT HEIGHT	1280 mm
PRODUCT WIDTH	330 mm
PRODUCT WEIGHT	80 kg

UL Category Control No.:
NMMS, NMMS7
RCM
Safety: EN 61800-5-1: 2003

CERTIFICATIONS

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

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 400 V 139.95 kVA

APPARENT POWER AT 480 V 167.94 kVA

Climatic environmental conditions

ALTITUDE Max. 4000 m
Above 1000 m with 1 %
derating per 100 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

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

Braking function

BRAKING RESISTANCE 6 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 780 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	100 m, screened, maximum permissible, Motor feeder 200 m, screened, with motor choke, maximum permissible, Motor feeder 150 m, unscreened, maximum permissible, Motor feeder C2 ≤ 5 m, Radio interference level, maximum motor cable length C3 ≤ 25 m, Radio interference level, maximum motor cable length 300 m, unscreened, with motor choke, maximum permissible, Motor feeder
COMMUNICATION INTERFACE	Ethernet IP, optional PROFIBUS, optional Modbus-TCP, optional OP-Bus (RS485), built in CANopen®, built in EtherCAT, optional Modbus RTU, built in SmartWire-DT, optional DeviceNet, optional PROFINET, 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:	IGBT inverter Breaking resistance Brake chopper Radio interference suppression filter Control unit OLED display DC link choke Internal DC link Additional PCB protection PC connection
FRAME SIZE	FS7
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	2090 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	202 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 MODBUS DeviceNet PROFIBUS EtherNet/IP PROFINET IO 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, PLc Cat 2)
SUITABLE FOR	Branch circuits, (UL/CSA)

Main circuit

EFFICIENCY	98.1 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	1000 W at 50% current and 50% speed 1200 W at 50% current and 90% speed 150 W at 100% current and 0% speed 2200 W at 100% current and 50% speed 2400 W at 100% current and 90% speed 600 W at 25% current and 0% speed 700 W at 25% current and 50% speed 900 W at 50% current and 0% speed
INPUT CURRENT ILN AT 150% OVERLOAD	210.8 A
LEAKAGE CURRENT AT GROUND IPE - MAX	4.75 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	480 V
MAINS VOLTAGE - MIN	380 V
OPERATING MODE	Sensorless vector control (SLV) Optional: Vector control with feedback (CLV) Speed control with slip compensation U/f control
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	303 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	202 A
RATED OPERATIONAL POWER AT 380/400 V, 50 HZ, 3-PHASE	110 kW

Motor rating

ASSIGNED MOTOR
CURRENT IM AT 400 V, 50 HZ, 150% OVERLOAD 196 A

ASSIGNED MOTOR
CURRENT IM AT 440 - 480 V, 60 HZ, 150% OVERLOAD 180 A

ASSIGNED MOTOR
POWER AT 460/480 V, 60 HZ, 3-PHASE 150 HP

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	300 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 - 16 kHz adjustable (audible), fPWM, Power section, Main circuit
SYSTEM CONFIGURATION TYPE	AC supply systems with earthed center point
VOLTAGE RATING - MAX	480 VAC

Resources

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

[eaton-powerxl-da1-set-point-setting-ap040040-en-us.pdf](#)

[Start, Stopp und Betrieb](#)

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

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

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

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

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

APPLICATION NOTES

[eaton-powerxl-da1-master-slave-operation-ap040026-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-dx-com-stick-3-ap040190-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-dc1-db1-de1-rapidlink5-firmware-update-ap040214-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-uk251145en.pdf eaton-variable-frequency-drive-declaration-of-conformity-eu250662en.pdf
DRAWINGS	eaton-frequency-inverter-da1-dimensions-004.eps eaton-frequency-inverter-da1-3d-drawing-004.eps
ECAD MODEL	DA-CE-ETN.DA1-34202FB-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-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 MN040018_EN eaton-da1-variable-frequency-drive-mn040063-en-us.pdf eaton-powerxl-da1-application-manual-mn04020006z-en-us.pdf eaton-powerxl-da1-installation-manual-mn04020005z-en-us.pdf
MCAD MODEL	DA-CS-da1_fs7 eaton-general-purpose-drives-mcad-drawings-da1-fs7.dwg
MULTIMEDIA	Looking for variable frequency drives DC1 and DA1 which can be used in harsh environments? System solutions based on EtherCAT
PRODUCT NOTIFICATIONS	eaton-drives-ecodesign-directive-mz040046en-en.pdf
SOFTWARE, FIRMWARE, AND APPLICATIONS	eaton-powerxl-da1-ethercat-esi-v310.zip eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip eaton-powerxl-pcsoftware-drivesconnect-v1501.zip eaton-powerxl-da1-swd-codesys-v3-library.zip eaton-powerxl-da1-canopen-eds-v250.zip eaton-powerxl-da1-profinet-gsdml-v226.zip eaton-powerxl-da1-ethernetip-eds-v150.zip eaton-powerxl-da1-firmware-release-note-mz040041en-us.pdf

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profinet-tia-v12-library.zip](#)

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

PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



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