Eaton 176970

Eaton DA1 Variable frequency drive, 500 V AC, 3-phase, 65 A, 45 kW, IP55/NEMA 12, OLED display, DC link choke

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	176970
PRODUCT LENGTH/DEPTH	270 mm
PRODUCT HEIGHT	540 mm
PRODUCT WIDTH	235 mm
PRODUCT WEIGHT	22.5 kg
CERTIFICATIONS	Certified by UL for use in Canada IEC/EN61800-5 RoHS, ISO 9001 UL CE CSA-C22.2 No. 14 Specification for general requirements: IEC/EN 61800-2 EAC UL 508C DNV Safety: EN 61800-5-1: 2003 UkrSEPRO UL Category Control No.: NMMS, NMMS7 RCM UL report applies to both US and Canada IEC/EN61800-3 CUL UL File No.: E172143 IEC/EN 61800-3
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

	different duty cycles) are available upon request.

PRODUCT CATEGORY	Variable frequency drives
FEATURES	Parameterization: drivesConnect Parameterization: drivesConnect mobile (App) Parameterization: Fieldbus Parameterization: Keypad
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.

INSTALLATION VIDEOS	Video PowerXL DA1
	eaton-powerxl-variable-frequency-drives-dc1-da1-brochure-br040001en-en-us.pdf
	eaton-powerxl-da1-application-manual-mn04020006z-en-us.pdf eaton-powerxl-da1-installation-manual-mn04020005z-en-us.pdf
	eaton-frequency-inverter-dimensions-024.eps eaton-frequency-inverter-3d-drawing-015.eps

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 AGAINST ELECTRIC SHOCK	Does not apply, since the 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.
FITTED WITH:	OLED display Additional PCB protection Internal DC link Brake chopper IGBT inverter DC link choke PC connection Breaking resistance Control unit
CLIMATIC PROOFING	< 95 average relative humidity (RH), no condensation, no corrosion
CONNECTION TO SMARTWIRE-DT	Yes In conjunction with DX-NET-SWD1 SmartWire DT module
OPERATING MODE	Optional: Vector control with feedback (CLV) U/f control Speed control with slip compensation

	Sensorless vector control (SLV)
FRAME SIZE	FS5
ALTITUDE	Max. 4000 m Max. 1000 m Above 1000 m with 1 % derating per 100 m
ENVIRONMENTAL CLASS	3C2, 3S2 (Air quality)
APPLICATION IN DOMESTIC AND COMMERCIAL AREA PERMITTED	Yes
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
APPLICATION IN INDUSTRIAL AREA PERMITTED	Yes
AMBIENT OPERATING TEMPERATURE - MAX	40 °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 - MAX	60 °C
AMBIENT STORAGE TEMPERATURE - MIN	-40 °C
APPARENT POWER AT 600 V	67.55 kVA
MOUNTING POSITION	Vertical
RELATIVE SYMMETRIC NET FREQUENCY TOLERANCE	10 %
RELATIVE SYMMETRIC NET VOLTAGE TOLERANCE	10 %
PROTECTION	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
HEAT DISSIPATION DETAILS	Operation (with 150 % overload)
RATED OPERATIONAL POWER AT 525 V, 50 HZ, 3-PHASE	45 kW

RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	0 W
SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR	975 VDC
VOLTAGE RATING - MAX	600 VAC
COMMUNICATION INTERFACE	SmartWire-DT, optional EtherCAT, optional CANopen®, built in DeviceNet, optional PROFIBUS, optional Modbus RTU, built in Ethernet IP, optional PROFINET, optional OP-Bus (RS485), built in Modbus-TCP, optional
CONVERTER TYPE	U converter
DEGREE OF PROTECTION	NEMA 12 IP55
PROTOCOL	EtherNet/IP CAN PROFIBUS MODBUS PROFINET IO Other bus systems DeviceNet TCP/IP
ASSIGNED MOTOR CURRENT IM AT 500 V, 50 HZ, 150% OVERLOAD	65 A
ASSIGNED MOTOR CURRENT IM AT 525 V, 50 HZ, 150% OVERLOAD	62 A
ASSIGNED MOTOR CURRENT IM AT 550 - 600 V, 60 HZ, 150% OVERLOAD	62 A
SYSTEM CONFIGURATION TYPE	AC supply systems with earthed center point
ASSIGNED MOTOR POWER AT 575/600 V, 60 HZ, 3-PHASE	60 HP
BRAKING RESISTANCE	12 Ω
EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID	1350 W

HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
INPUT CURRENT ILN AT 150% OVERLOAD	70.4 A
BRAKING TORQUE	Max. 100 % of rated operational current Ie with external braking resistor - Main circuit Max. 30 % MN, Standard - Main circuit Max. 100 % of rated operational current Ie, variable, DC - Main circuit
CABLE LENGTH	150 m, unscreened, maximum permissible, Motor feeder 100 m, screened, maximum permissible, Motor feeder 300 m, unscreened, with motor choke, maximum permissible, Motor feeder 200 m, screened, with motor choke, maximum permissible, Motor feeder
FUNCTIONS	4-quadrant operation possible
OUTPUT VOLTAGE (U2)	500 V AC, 3-phase 600 V AC, 3-phase
NUMBER OF INPUTS (ANALOG)	2
NUMBER OF INPUTS (DIGITAL)	5
NUMBER OF OUTPUTS (DIGITAL)	2
STARTING CURRENT - MAX	200 %, IH, max. starting current (High Overload), for 4 seconds every 40 seconds, Power section
NUMBER OF PHASES (INPUT)	3
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))
NUMBER OF PHASES (OUTPUT)	3
POWER CONSUMPTION	1350W

RATED CONTROL SUPPLY VOLTAGE	10 V DC (Us, max. 10 mA)
EFFICIENCY	97 % (η)
RATED CONTROL VOLTAGE (UC)	24 V DC (external, max. 100 mA)
SUPPLY FREQUENCY	50/60 Hz
LEAKAGE CURRENT AT GROUND IPE - MAX	65 mA
MAINS VOLTAGE - MAX	600 V
MAINS VOLTAGE - MIN	500 V
NOMINAL OUTPUT CURRENT I2N	65 A
NUMBER OF HW-INTERFACES (INDUSTRIAL ETHERNET)	0
NUMBER OF HW-INTERFACES (OTHER)	0
NUMBER OF HW-INTERFACES (PARALLEL)	0
NUMBER OF HW-INTERFACES (RS-232)	0
NUMBER OF HW-INTERFACES (RS-422)	0
NUMBER OF HW-INTERFACES (RS-485)	1
NUMBER OF HW-INTERFACES (SERIAL TTY)	0
NUMBER OF HW-INTERFACES (USB)	0
NUMBER OF INTERFACES (PROFINET)	0
NUMBER OF OUTPUTS (ANALOG)	2
OUTPUT AT LINEAR LOAD AT RATED OUTPUT VOLTAGE - MAX	45 kW
OUTPUT AT QUADRATIC LOAD AT RATED OUTPUT VOLTAGE - MAX	45 kW
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT FREQUENCY - MIN	0 Hz
OUTPUT VOLTAGE - MAX	600 V
OVERLOAD CURRENT IL AT 150% OVERLOAD	97.5 A
SUITABLE FOR	Branch circuits, (UL/CSA)

SWITCHING FREQUENCY	8 kHz, 4 - 24 kHz adjustable (audible), fPWM, Power section, Main circuit
RATED OPERATIONAL VOLTAGE	500 V AC, 3-phase 600 V AC, 3-phase
SHORT-CIRCUIT PROTECTION RATING	100 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
RATED FREQUENCY - MAX	62 Hz
RATED FREQUENCY - MIN	48 Hz
RATED OPERATIONAL CURRENT (IE) AT 150% OVERLOAD	65 A
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	65 A
RATED OPERATIONAL POWER AT 500 V, 50 HZ, 3-PHASE	45 kW
SAFETY FUNCTION/LEVEL	STO (Safe Torque Off, SIL2, PLc Cat 2)
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
HEAT DISSIPATION AT CURRENT/SPEED	1058 W at 100% current and 90% speed 328 W at 25% current and 0% speed 328 W at 25% current and 50% speed 328 W at 50% current and 0% speed 370 W at 50% current and 50% speed 420 W at 50% current and 90% speed 649 W at 100% current and 0% speed 836 W at 100% current and 50% speed

PROJECT NAME:	
PROJECT NUMBER:	
PREPARED BY:	
:	

Eaton House
30 Pembroke Road
Dublin 4,
Eaton.com

Follow us on social media to get the latest product and support information.