

## Eaton EP-400020

Eaton DA1 Variable frequency drive, 230 V AC, 1-phase, 10.5 A, 2.2 kW, IP66/NEMA 4X, Radio interference suppression filter, OLED display, Local controls, UV resistant

<b>PRODUCT NAME</b>	Eaton DA1 Variable frequency drive
<b>CATALOG NUMBER</b>	EP-400020
<b>PRODUCT LENGTH/DEPTH</b>	182 mm
<b>PRODUCT HEIGHT</b>	257 mm
<b>PRODUCT WIDTH</b>	188 mm
<b>PRODUCT WEIGHT</b>	3.5 kg
<b>CERTIFICATIONS</b>	CE Certified by UL for use in Canada CSA-C22.2 No. 14 CUL EAC IEC/EN 61800-3 IEC/EN61800-3 IEC/EN61800-5 RCM RoHS, ISO 9001 Safety: EN 61800-5-1: 2003  Specification for general requirements: IEC/EN 61800-2 UkrSEPRO UL UL 508C UL Category Control No.: NMMS, NMMS7 UL File No.: E172143 UL report applies to both US and Canada
<b>CATALOG NOTES</b>	The brake resistors are assigned based on the maximum rated power of the variable frequency drive. Additional brake

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

<b>PRODUCT CATEGORY</b>	Variable frequency drives
<b>FEATURES</b>	Parameterization: drivesConnect Parameterization: drivesConnect mobile (App) Parameterization: Fieldbus  Parameterization: Keypad
<b>10.10 TEMPERATURE RISE</b>	The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
<b>10.11 SHORT-CIRCUIT RATING</b>	Is the panel builder's responsibility. The specifications for the switchgear must be observed.
<b>10.12 ELECTROMAGNETIC COMPATIBILITY</b>	Is the panel builder's responsibility. The specifications for the switchgear must be observed.
<b>10.13 MECHANICAL FUNCTION</b>	The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.
<b>10.2.2 CORROSION RESISTANCE</b>	Meets the product standard's requirements.
<b>10.2.3.1 VERIFICATION OF THERMAL STABILITY OF ENCLOSURES</b>	Meets the product standard's requirements.
<b>10.2.3.2 VERIFICATION OF RESISTANCE OF INSULATING MATERIALS TO NORMAL HEAT</b>	Meets the product standard's requirements.
<b>10.2.3.3 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. EFFECTS</b>	Meets the product standard's requirements.
<b>10.2.4 RESISTANCE TO ULTRA-VIOLET (UV) RADIATION</b>	Meets the product standard's requirements.
<b>10.2.5 LIFTING</b>	Does not apply, since the entire switchgear needs to be evaluated.

<b>INSTALLATION VIDEOS</b>	<a href="#">Video PowerXL DA1</a>
	<a href="#">eaton-powerxl-variable-frequency-drives-dc1-da1-brochure-br040001en-en-us.pdf</a>

<b>10.2.6 MECHANICAL IMPACT</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.2.7 INSCRIPTIONS</b>	Meets the product standard's requirements.
<b>10.3 DEGREE OF PROTECTION OF ASSEMBLIES</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.4 CLEARANCES AND CREEPAGE DISTANCES</b>	Meets the product standard's requirements.
<b>10.5 PROTECTION AGAINST ELECTRIC SHOCK</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.6 INCORPORATION OF SWITCHING DEVICES AND COMPONENTS</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.7 INTERNAL ELECTRICAL CIRCUITS AND CONNECTIONS</b>	Is the panel builder's responsibility.
<b>10.8 CONNECTIONS FOR EXTERNAL CONDUCTORS</b>	Is the panel builder's responsibility.
<b>10.9.2 POWER-FREQUENCY ELECTRIC STRENGTH</b>	Is the panel builder's responsibility.
<b>10.9.3 IMPULSE WITHSTAND VOLTAGE</b>	Is the panel builder's responsibility.
<b>10.9.4 TESTING OF ENCLOSURES MADE OF INSULATING MATERIAL</b>	Is the panel builder's responsibility.
<b>FITTED WITH:</b>	PC connection Control unit Breaking resistance Additional PCB protection Brake chopper IGBT inverter Internal DC link OLED display Radio interference suppression filter Local controls
<b>CLIMATIC PROOFING</b>	< 95 average relative humidity (RH), no condensation, no corrosion
<b>CONNECTION TO SMARTWIRE-DT</b>	No
<b>OPERATING MODE</b>	Optional: Vector control with feedback (CLV) Sensorless vector control (SLV) Speed control with slip

	compensation U/f control
<b>FRAME SIZE</b>	FS2
<b>ALTITUDE</b>	Max. 1000 m Above 1000 m with 1 % derating per 100 m Max. 4000 m
<b>ENVIRONMENTAL CLASS</b>	3C2, 3S2 (Air quality)
<b>APPLICATION IN DOMESTIC AND COMMERCIAL AREA PERMITTED</b>	Yes
<b>MAINS SWITCH-ON FREQUENCY</b>	Maximum of one time every 30 seconds
<b>APPLICATION IN INDUSTRIAL AREA PERMITTED</b>	Yes
<b>AMBIENT OPERATING TEMPERATURE - MAX</b>	40 °C
<b>AMBIENT OPERATING TEMPERATURE - MIN</b>	-10 °C
<b>AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MAX</b>	40 °C
<b>AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MIN</b>	-10 °C
<b>AMBIENT STORAGE TEMPERATURE - MAX</b>	60 °C
<b>AMBIENT STORAGE TEMPERATURE - MIN</b>	-40 °C
<b>APPARENT POWER AT 230 V</b>	4.18 kVA
<b>APPARENT POWER AT 240 V</b>	4.36 kVA
<b>ASSIGNED MOTOR CURRENT IM AT 220 - 240 V, 60 HZ, 150% OVERLOAD</b>	9.6 A
<b>ASSIGNED MOTOR CURRENT IM AT 230 V, 50 HZ, 150% OVERLOAD</b>	8.7 A
<b>MOUNTING POSITION</b>	Vertical
<b>RELATIVE SYMMETRIC NET FREQUENCY TOLERANCE</b>	10 %
<b>RELATIVE SYMMETRIC NET VOLTAGE TOLERANCE</b>	10 %

<b>PROTECTION</b>	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
<b>RESOLUTION</b>	0.1 Hz (Frequency resolution, setpoint value)
<b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>	0 W
<b>SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR</b>	390 VDC
<b>VOLTAGE RATING - MAX</b>	240 VAC
<b>COMMUNICATION INTERFACE</b>	CANopen®, built in EtherCAT, optional Ethernet IP, optional Modbus RTU, built in Modbus-TCP, optional OP-Bus (RS485), built in PROFIBUS, optional PROFINET, optional BACnet/IP, optional
<b>CONVERTER TYPE</b>	U converter
<b>DEGREE OF PROTECTION</b>	IP66 NEMA 4X
<b>PROTOCOL</b>	CAN EtherNet/IP MODBUS Other bus systems PROFIBUS PROFINET IO TCP/IP BACnet/IP
<b>ASSIGNED MOTOR POWER AT 230/240 V, 60 HZ, 1-PHASE</b>	3 HP
<b>SYSTEM CONFIGURATION TYPE</b>	AC supply systems with earthed center point
<b>ELECTROMAGNETIC COMPATIBILITY</b>	1st and 2nd environments (according to EN 61800-3)
<b>BRAKING RESISTANCE</b>	35 $\Omega$
<b>EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID</b>	103.4 W
<b>HEAT DISSIPATION CAPACITY PDISS</b>	0 W
<b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID</b>	0 W

<b>INPUT CURRENT ILN AT 150% OVERLOAD</b>	19.2 A
<b>BRAKING TORQUE</b>	<p>Max. 30 % MN, Standard - Main circuit</p> <p>Max. 100 % of rated operational current <math>I_e</math>, variable, DC - Main circuit</p> <p>Max. 100 % of rated operational current <math>I_e</math> with external braking resistor - Main circuit</p>
<b>CABLE LENGTH</b>	<p>100 m, screened, maximum permissible, Motor feeder</p> <p>150 m, unscreened, maximum permissible, Motor feeder</p> <p>200 m, screened, with motor choke, maximum permissible, Motor feeder</p> <p>300 m, unscreened, with motor choke, maximum permissible, Motor feeder</p> <p>C1 <math>\leq</math> 1 m, Radio interference level, maximum motor cable length</p> <p>C2 <math>\leq</math> 5 m, Radio interference level, maximum motor cable length</p> <p>C3 <math>\leq</math> 25 m, Radio interference level, maximum motor cable length</p>
<b>FUNCTIONS</b>	4-quadrant operation possible
<b>OUTPUT VOLTAGE (U2)</b>	<p>240 V AC, 3-phase</p> <p>230 V AC, 3-phase</p>
<b>NUMBER OF INPUTS (ANALOG)</b>	2
<b>NUMBER OF INPUTS (DIGITAL)</b>	5
<b>RADIO INTERFERENCE CLASS</b>	<p>C1: for conducted emissions only</p> <p>Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments</p> <p>C2, C3: depending on the motor cable length, the connected load, and</p>

	ambient conditions.
<b>NUMBER OF OUTPUTS (DIGITAL)</b>	2
<b>STARTING CURRENT - MAX</b>	200 %, IH, max. starting current (High Overload), for 4 seconds every 40 seconds, Power section
<b>NUMBER OF PHASES (INPUT)</b>	1
<b>NUMBER OF RELAY OUTPUTS</b>	2 (parameterizable, 1 N/O and 1 changeover contact, 6 A (250 V, AC-1) / 5 A (30 V, DC-1))
<b>NUMBER OF PHASES (OUTPUT)</b>	3
<b>POWER CONSUMPTION</b>	103.4 W
<b>RATED CONTROL SUPPLY VOLTAGE</b>	10 V DC (Us, max. 10 mA)
<b>EFFICIENCY</b>	95.3 % ( $\eta$ )
<b>RATED CONTROL VOLTAGE (UC)</b>	24 V DC (external, max. 100 mA)
<b>SUPPLY FREQUENCY</b>	50/60 Hz
<b>LEAKAGE CURRENT AT GROUND IPE - MAX</b>	2.49 mA
<b>MAINS VOLTAGE - MAX</b>	264 V
<b>MAINS VOLTAGE - MIN</b>	180 V
<b>NOMINAL OUTPUT CURRENT I2N</b>	10.5 A
<b>NUMBER OF HW-INTERFACES (INDUSTRIAL ETHERNET)</b>	0
<b>NUMBER OF HW-INTERFACES (OTHER)</b>	0
<b>NUMBER OF HW-INTERFACES (PARALLEL)</b>	0
<b>NUMBER OF HW-INTERFACES (RS-232)</b>	0
<b>NUMBER OF HW-INTERFACES (RS-422)</b>	0
<b>NUMBER OF HW-INTERFACES (RS-485)</b>	2
<b>NUMBER OF HW-INTERFACES (SERIAL TTY)</b>	0
<b>NUMBER OF HW-INTERFACES (USB)</b>	0
<b>NUMBER OF INTERFACES (PROFINET)</b>	0



<b>NUMBER OF OUTPUTS (ANALOG)</b>	2
<b>OUTPUT AT LINEAR LOAD AT RATED OUTPUT VOLTAGE - MAX</b>	2.2 kW
<b>OUTPUT AT QUADRATIC LOAD AT RATED OUTPUT VOLTAGE - MAX</b>	2.2 kW
<b>OUTPUT FREQUENCY - MAX</b>	500 Hz
<b>OUTPUT FREQUENCY - MIN</b>	0 Hz
<b>OUTPUT VOLTAGE - MAX</b>	250 V
<b>OVERLOAD CURRENT IL AT 150% OVERLOAD</b>	15.75 A
<b>SUITABLE FOR</b>	Branch circuits, (UL/CSA)
<b>SWITCHING FREQUENCY</b>	16 kHz, 4 - 32 kHz adjustable (audible), fPWM, Power section, Main circuit
<b>RATED OPERATIONAL VOLTAGE</b>	240 V AC, 1-phase 230 V AC, 1-phase
<b>SHORT-CIRCUIT PROTECTION RATING</b>	25 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
<b>RATED FREQUENCY - MAX</b>	62 Hz
<b>RATED FREQUENCY - MIN</b>	48 Hz
<b>RATED OPERATIONAL POWER AT 220/230 V, 50 HZ, 1-PHASE</b>	2.2 kW
<b>SAFETY FUNCTION/LEVEL</b>	STO (Safe Torque Off, SIL3, PLe Cat 3)
<b>HEAT DISSIPATION AT CURRENT/SPEED</b>	101 W at 100% current and 0% speed 119 W at 100% current and 50% speed 139 W at 100% current and 90% speed 54 W at 50% current and 0% speed 78 W at 50% current and 50% speed 80 W at 50% current and 90% speed 62 W at 25% current and 50% speed 44 W at 25% current and 0% speed

PROJECT NAME:
PROJECT NUMBER:
PREPARED BY:
:



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