

# Eaton 9702-3105-00P

Eaton DG1 Variable frequency drive, 400 V  
AC, 3-phase, 46 A, 22 kW, IP54/NEMA12,  
Brake chopper, DC link choke

<b>PRODUCT NAME</b>	Eaton DG1 variable frequency drive
<b>CATALOG NUMBER</b>	9702-3105-00P
<b>PRODUCT LENGTH/DEPTH</b>	265.1 mm
<b>PRODUCT HEIGHT</b>	558 mm
<b>PRODUCT WIDTH</b>	204.6 mm
<b>PRODUCT WEIGHT</b>	22.6 kg
<b>CERTIFICATIONS</b>	UL508 UL CE RoHS, ISO 9001 EAC IEC/EN61800-3 UL File No.: E134360 UL report applies to both US and Canada IEC/EN61800-5 IEC/EN 61800-3 CUL Specification for general requirements: IEC/EN 61800-2 CSA-C22.2 No. 274-13 UkrSEPRO UL Category Control No.: NMMS, NMMS7 Certified by UL for use in Canada Safety requirements: IEC/EN 61800-5 C-Tick
<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



<b>PRODUCT CATEGORY</b>	Variable frequency drives
<b>FEATURES</b>	<p>Temperature-controlled fan Tool-less swapping of fan Parameterization: Fieldbus</p> <p>Parameterization: Keypad Parameterization: Power Xpert inControl</p>
<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.

<a href="#">eaton-profinet-de1-dc1-da1-dg1-dm1-dx1-mn040062-en-en.pdf</a>
<a href="#">eaton-frequency-inverter-dg1-dimensions-003.eps</a>
<a href="#">eaton-frequency-inverter-dg1-3d-drawing-003.eps</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>	Control unit Multi-line graphic display Internal DC link Additional PCB protection Radio interference suppression filter Brake chopper PC connection IGBT inverter DC link choke Breaking resistance
<b>POLLUTION DEGREE</b>	2
<b>CLIMATIC PROOFING</b>	< 95 average relative humidity (RH), no condensation, no corrosion
<b>CONNECTION TO SMARTWIRE-DT</b>	In conjunction with DXG-NET-SWD SmartWire DT module Yes
<b>OPERATING MODE</b>	U/f control

	Sensorless vector control (SLV) Torque regulation Speed control with slip compensation
<b>FRAME SIZE</b>	FS3
<b>AIR VOLUME CAPACITY</b>	144 m <sup>3</sup> /h
<b>ALTITUDE</b>	Max. 1000 m Max. 3000 m Above 1000 m with 1 % derating per 100 m Max. 2000 m for Corner Grounded TN Systems
<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 60 seconds
<b>APPLICATION IN INDUSTRIAL AREA PERMITTED</b>	Yes
<b>AMBIENT OPERATING TEMPERATURE - MAX</b>	50 °C
<b>AMBIENT OPERATING TEMPERATURE - MIN</b>	-10 °C
<b>AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MAX</b>	50 °C
<b>AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MIN</b>	-30 °C
<b>AMBIENT STORAGE TEMPERATURE - MAX</b>	70 °C
<b>AMBIENT STORAGE TEMPERATURE - MIN</b>	-40 °C
<b>APPARENT POWER AT 400 V</b>	42.3 kVA
<b>APPARENT POWER AT 480 V</b>	52.8 kVA
<b>ASSIGNED MOTOR CURRENT IM AT 400 V, 50 HZ, 110% OVERLOAD</b>	55.2 A
<b>ASSIGNED MOTOR CURRENT IM AT 400 V, 50 HZ, 150% OVERLOAD</b>	41 A
<b>MOUNTING POSITION</b>	Vertical
<b>RATED CONDITIONAL</b>	100 kA

<b>SHORT-CIRCUIT CURRENT (IQ)</b>	
<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>HEAT DISSIPATION DETAILS</b>	Operation (with 150 % overload), allow for derating
<b>RATED OPERATIONAL POWER AT 500 V, 50 HZ, 3-PHASE, 110% OVERLOAD</b>	37 kW
<b>RESOLUTION</b>	0.01 Hz (Frequency resolution, setpoint value)
<b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>	24.12 W
<b>SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR</b>	850 VDC
<b>VOLTAGE RATING - MAX</b>	500 VAC
<b>OVERVOLTAGE CATEGORY</b>	III
<b>COMMUNICATION INTERFACE</b>	SmartWire-DT, optional PROFIBUS, optional Ethernet IP, built in BACnet MS/TP, built in CANopen®, optional Modbus RTU, built in Modbus TCP, built in DeviceNet, optional
<b>CONVERTER TYPE</b>	U converter
<b>DEGREE OF PROTECTION</b>	IP54 NEMA 12
<b>PROTOCOL</b>	PROFINET IO Other bus systems TCP/IP PROFIBUS MODBUS CAN BACnet DeviceNet EtherNet/IP

<b>ASSIGNED MOTOR CURRENT IM AT 440 - 480 V, 60 HZ, 150% OVERLOAD</b>	40 A
<b>ASSIGNED MOTOR CURRENT IM AT 440/480 V, 60 HZ, 110% OVERLOAD</b>	52 A
<b>ASSIGNED MOTOR CURRENT IM AT 500 V, 50 HZ, 110% OVERLOAD</b>	54 A
<b>ASSIGNED MOTOR CURRENT IM AT 500 V, 50 HZ, 150% OVERLOAD</b>	44 A
<b>SYSTEM CONFIGURATION TYPE</b>	TN-S, TN-C, TN-C-S, TT, IT
<b>ELECTROMAGNETIC COMPATIBILITY</b>	1st and 2nd environments (according to EN 61800-3)
<b>ASSIGNED MOTOR POWER AT 460/480 V, 60 HZ, 3-PHASE</b>	30 HP
<b>ASSIGNED MOTOR POWER AT 460/480 V, 60 HZ, 3-PHASE, 110 % OVERLOAD</b>	40 HP
<b>BRAKING RESISTANCE</b>	14 $\Omega$
<b>EQUIPMENT HEAT DISSIPATION, CURRENT- DEPENDENT PVID</b>	818 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 110% OVERLOAD</b>	55.7 A
<b>INPUT CURRENT ILN AT 150% OVERLOAD</b>	42.6 A
<b>MAINS CURRENT DISTORTION</b>	32.6 %
<b>CURRENT LIMITATION</b>	0.1 - 2 x IH (CT), motor, main circuit
<b>NUMBER OF SLOTS</b>	2 (expansion)
<b>BRAKING TORQUE</b>	Adjustable to 150 %, DC - Main circuit Max. 30 % MN, Standard - Main circuit Max. 100 % of rated operational current Ie with external braking resistor -

	Main circuit Adjustable to 150 % (I/le), DC - Main circuit
<b>CABLE LENGTH</b>	C2 ≤ 10 m, Radio interference level, maximum motor cable length C3 ≤ 50 m, Radio interference level, maximum motor cable length 150 m, screened, maximum permissible, Motor feeder
<b>FUNCTIONS</b>	4-quadrant operation possible
<b>OUTPUT VOLTAGE (U2)</b>	500 V AC, 3-phase 400 V AC, 3-phase 480 V AC, 3-phase
<b>NUMBER OF INPUTS (ANALOG)</b>	2
<b>NUMBER OF INPUTS (DIGITAL)</b>	8
<b>RADIO INTERFERENCE CLASS</b>	Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments C1: with external filter, for conducted emissions only C2, C3: depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary.
<b>NUMBER OF OUTPUTS (DIGITAL)</b>	1
<b>STARTING CURRENT - MAX</b>	200 %, IH, max. starting current (High Overload), For 2 seconds every 20 seconds, Power section
<b>NUMBER OF PHASES (INPUT)</b>	3
<b>NUMBER OF RELAY OUTPUTS</b>	3 (parameterizable, 2 changeover contacts and 1 N/O, 6 A (240 V AC) / 6 A (24 V DC))
<b>NUMBER OF PHASES</b>	3



<b>(OUTPUT)</b>	
<b>POWER CONSUMPTION</b>	818 W
<b>RATED CONTROL SUPPLY VOLTAGE</b>	10 V DC (Us, max. 10 mA)
<b>EFFICIENCY</b>	97.7 % ( $\eta$ )
<b>RATED CONTROL VOLTAGE (UC)</b>	24 V DC (external, max. 250 mA options incl.)
<b>SUPPLY FREQUENCY</b>	50/60 Hz
<b>LEAKAGE CURRENT AT GROUND IPE - MAX</b>	12.2 mA
<b>MAINS VOLTAGE - MAX</b>	500 V
<b>MAINS VOLTAGE - MIN</b>	380 V
<b>NOMINAL OUTPUT CURRENT I2N</b>	46 A
<b>NUMBER OF HW-INTERFACES (INDUSTRIAL ETHERNET)</b>	1
<b>NUMBER OF HW-INTERFACES (OTHER)</b>	1
<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>	1
<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>	22 kW
<b>OUTPUT AT QUADRATIC LOAD AT RATED OUTPUT VOLTAGE - MAX</b>	30 kW
<b>OUTPUT FREQUENCY - MAX</b>	400 Hz
<b>OUTPUT FREQUENCY - MIN</b>	0 Hz
<b>OUTPUT VOLTAGE - MAX</b>	500 V

<b>OVERLOAD CURRENT IL AT 110% OVERLOAD</b>	67.1 A
<b>OVERLOAD CURRENT IL AT 150% OVERLOAD</b>	69 A
<b>SHOCK RESISTANCE</b>	Storage and transportation: maximum 15 g, 11 ms (inside the packaging) Mechanical, According to EN 61800-5-1, IEC/EN 60068-2-27 UPS drop test (for weights inside the UPS frame)
<b>SUITABLE FOR</b>	Branch circuits, (UL/CSA)
<b>SWITCHING FREQUENCY</b>	4 kHz, 1 - 12 kHz adjustable, fPWM, Power section, Main circuit
<b>RATED OPERATIONAL VOLTAGE</b>	480 V AC, 3-phase 400 V AC, 3-phase 500 V AC, 3-phase
<b>SHORT-CIRCUIT PROTECTION RATING</b>	80 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
<b>VIBRATION</b>	Resistance: 5 - 15.8 Hz, Amplitude 1 mm (peak) Resistance: 5 - 150 Hz, According to EN 61800-5-1, IEC/EN 60068-2-6 Resistance: 15.8 - 150 Hz, 1 g, Maximum acceleration amplitude
<b>RATED FREQUENCY - MAX</b>	66 Hz
<b>RATED FREQUENCY - MIN</b>	45 Hz
<b>RATED OPERATIONAL CURRENT (IE) AT 110% OVERLOAD</b>	61 A
<b>RATED OPERATIONAL CURRENT (IE) AT 150% OVERLOAD</b>	46 A
<b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b>	46 A
<b>RATED OPERATIONAL POWER AT 380/400 V, 50 HZ, 3-PHASE</b>	22 kW
<b>RATED OPERATIONAL POWER AT 380/400 V, 50 HZ, 3-PHASE, 110% OVERLOAD</b>	30 kW

<b>RATED OPERATIONAL POWER AT 500 V, 50 HZ, 3-PHASE</b>	30 kW
<b>SAFETY FUNCTION/LEVEL</b>	STO (Safe Torque Off, SIL1, PLc Cat 1)
<b>HEAT DISSIPATION AT CURRENT/SPEED</b>	177 W at 25% current and 0% speed 213 W at 25% current and 50% speed 232 W at 100% current and 50% speed 290 W at 50% current and 50% speed 331 W at 50% current and 90% speed 423 W at 100% current and 0% speed 529 W at 50% current and 0% speed 652 W at 100% current and 90% speed

<b>PROJECT NAME:</b>
<b>PROJECT NUMBER:</b>
<b>PREPARED BY:</b>
:



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