# DATASHEET - DA1-34039FB-B55C

**Variable frequency drive, 400 V AC, 3-phase, 39 A, 18.5 kW, IP55/NEMA 12, Radio interference suppression filter, OLED display**

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| **Part no.** | **DA1-34039FB-B55C** |
| | **169392** |
| **EL Number (Norway)** | **4137314** |

## General specifications

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|---|---|
| Product name | Eaton DA1 Variable frequency drive |
| Part no. | DA1-34039FB-B55C |
| EAN | 4015081660421 |
| Product Length/Depth | 240 millimetre |
| Product height | 450 millimetre |
| Product width | 173 millimetre |
| Product weight | 11.5 kilogram |
| Certifications | Safety: EN 61800-5-1: 2003<br>IEC/EN 61800-3<br>CSA-C22.2 No. 14<br>RoHS, ISO 9001<br>CE<br>Certified by UL for use in Canada<br>EAC<br>UL 508C<br>CUL<br>UkrSEPRO<br>UL<br>RCM<br>Specification for general requirements: IEC/EN 61800-2<br>UL report applies to both US and Canada<br>DNV<br>UL File No.: E172143<br>IEC/EN61800-5<br>IEC/EN61800-3<br>UL Category Control No.: NMMS, NMMS7 |
| Product Tradename | DA1 |
| Product Type | Variable frequency drive |
| Product Sub Type | None |
| 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. different duty cycles) are available upon request. |

## General information

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| Cable length | 200 m, screened, with motor choke, maximum permissible, Motor feeder<br>C2 ≤ 5 m, Radio interference level, maximum motor cable length<br>150 m, unscreened, maximum permissible, Motor feeder<br>100 m, screened, maximum permissible, Motor feeder<br>300 m, unscreened, with motor choke, maximum permissible, Motor feeder<br>C3 ≤ 25 m, Radio interference level, maximum motor cable length |
| Communication interface | EtherCAT, optional<br>Modbus RTU, built in<br>Modbus-TCP, optional<br>DeviceNet, optional<br>CANopen®, built in<br>OP-Bus (RS485), built in<br>PROFIBUS, optional<br>SmartWire-DT, optional<br>PROFINET, optional<br>Ethernet IP, optional |
| Connection to SmartWire-DT | In conjunction with DX-NET-SWD1 SmartWire DT module<br>Yes |
| Degree of protection | IP55<br>NEMA 12 |
| Electromagnetic compatibility | 1st and 2nd environments (according to EN 61800-3) |
| Fitted with: | PC connection<br>IGBT inverter<br>Radio interference suppression filter<br>Control unit<br>OLED display<br>Breaking resistance<br>Additional PCB protection<br>Internal DC link<br>Brake chopper |
| Frame size | FS4 |

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| Functions | 4-quadrant operation possible |
| Mounting position | Vertical |
| Product Category | Variable frequency drives |
| Protection | Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4) |
| Protocol | TCP/IP<br>DeviceNet<br>EtherNet/IP<br>Other bus systems<br>PROFINET IO<br>CAN<br>PROFIBUS<br>MODBUS |
| Safety function/level | STO (Safe Torque Off, SIL2, PLc Cat 2) |
| Suitable for | Branch circuits, (UL/CSA) |
| 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.<br>Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments |

## Climatic environmental conditions

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| Ambient operating temperature - min | -10 °C |
| Altitude | Above 1000 m with 1 % derating per 100 m<br>Max. 4000 m<br>Max. 1000 m |
| Ambient operating temperature - max | 40 °C |
| Ambient operating temperature at 150% overload - min | -10 °C |
| Ambient operating temperature at 150% overload - max | 40 °C |
| Ambient storage temperature - min | -40 °C |
| Ambient storage temperature - max | 60 °C |
| Climatic proofing | < 95 average relative humidity (RH), no condensation, no corrosion |

## Main circuit

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| Efficiency | 97.6 % (η) |
| Heat dissipation at current/speed | 504 W at 100% current and 90% speed<br>428 W at 100% current and 50% speed<br>371 W at 100% current and 0% speed<br>296 W at 50% current and 90% speed<br>246 W at 50% current and 50% speed<br>221 W at 50% current and 0% speed<br>205 W at 25% current and 50% speed<br>178 W at 25% current and 0% speed |
| Input current ILN at 150% overload | 44.1 A |
| Leakage current at ground IPE - max | 2.47 mA |
| Mains switch-on frequency | Maximum of one time every 30 seconds |
| Mains voltage - min | 380 V |
| Mains voltage - max | 480 V |
| Operating mode | U/f control<br>Optional: Vector control with feedback (CLV)<br>Speed control with slip compensation<br>Sensorless vector control (SLV) |
| Output frequency - min | 0 Hz |
| Output frequency - max | 500 Hz |
| Output voltage (U2) | 400 V AC, 3-phase<br>480 V AC, 3-phase |
| Overload current IL at 150% overload | 58.5 A |
| Rated control supply voltage | 10 V DC (Us, max. 10 mA) |
| Rated frequency - min | 48 Hz |
| Rated frequency - max | 62 Hz |
| Rated operational current (Ie) at 150% overload | 39 A |
| Rated operational power at 380/400 V, 50 Hz, 3-phase | 18.5 kW |
| Rated operational voltage | 400 V AC, 3-phase<br>480 V AC, 3-phase |
| Resolution | 0.1 Hz (Frequency resolution, setpoint value) |
| Short-circuit protection rating | 60 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 |

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| 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 V AC |
| **Motor rating** | |
| Assigned motor current IM at 400 V, 50 Hz, 150% overload | 36 A |
| Assigned motor current IM at 440 - 480 V, 60 Hz, 150% overload | 34 A |
| Assigned motor power at 460/480 V, 60 Hz, 3-phase | 25 HP |
| **Apparent power** | |
| Apparent power at 400 V | 27.02 kV·A |
| Apparent power at 480 V | 32.42 kV·A |
| **Braking function** | |
| Braking resistance | 22 Ω |
| Braking torque | Max. 100 % of rated operational current Ie with external braking resistor - Main circuit<br>Max. 30 % MN, Standard - Main circuit<br>Max. 100 % of rated operational current Ie, variable, DC - Main circuit |
| Switch-on threshold for the braking transistor | 780 V DC |
| **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** | |
| Equipment heat dissipation, current-dependent Pvid | 444 W |
| Heat dissipation capacity Pdiss | 0 W |
| Heat dissipation per pole, current-dependent Pvid | 0 W |
| Rated operational current for specified heat dissipation (In) | 39 A |
| Static heat dissipation, non-current-dependent Pvs | 0 W |
| 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 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. |
| 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. |

## Technical data ETIM 9.0

Low-voltage industrial components (EG000017) / Frequency converter =< 1 kV (EC001857)

Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency / Servo converter = < 1 kV (ecl@ss13-27-02-31-01 [AKE177019])

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|---|---|---|
| Mains voltage | V | 380 - 480 |
| Mains frequency | | 50/60 Hz |
| Number of phases input | | 3 |
| Number of phases output | | 3 |
| Max. output frequency | Hz | 500 |
| Max. output voltage | V | 500 |
| Nominal output current I2N | A | 39 |
| Max. output at quadratic load at rated output voltage | kW | 18.5 |
| Max. output at linear load at rated output voltage | kW | 18.5 |
| Power consumption | W | 444 |
| Relative symmetric net frequency tolerance | % | 10 |
| Relative symmetric net voltage tolerance | % | 10 |
| Number of analogue outputs | | 2 |
| Number of analogue inputs | | 2 |
| Number of digital outputs | | 2 |
| Number of digital inputs | | 5 |
| With control element | | Yes |
| Application in industrial area permitted | | Yes |
| Application in domestic- and commercial area permitted | | Yes |
| Supporting protocol for TCP/IP | | Yes |
| Supporting protocol for PROFIBUS | | Yes |
| Supporting protocol for CAN | | Yes |
| Supporting protocol for INTERBUS | | No |
| Supporting protocol for ASI | | No |
| Supporting protocol for KNX | | No |
| Supporting protocol for Modbus | | Yes |
| Supporting protocol for Data-Highway | | No |
| Supporting protocol for DeviceNet | | Yes |
| Supporting protocol for SUCONET | | No |
| Supporting protocol for LON | | No |
| Supporting protocol for PROFINET IO | | Yes |
| Supporting protocol for PROFINET CBA | | No |
| Supporting protocol for SERCOS | | No |
| Supporting protocol for Foundation Fieldbus | | No |
| Supporting protocol for EtherNet/IP | | Yes |
| Supporting protocol for AS-Interface Safety at Work | | No |
| Supporting protocol for DeviceNet Safety | | No |
| Supporting protocol for INTERBUS-Safety | | No |
| Supporting protocol for PROFIsafe | | No |
| Supporting protocol for SafetyBUS p | | No |
| Supporting protocol for BACnet | | No |
| Supporting protocol for other bus systems | | Yes |
| Number of HW-interfaces industrial Ethernet | | 0 |
| Number of interfaces PROFINET | | 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 HW-interfaces parallel | | 0 |
| Number of HW-interfaces other | | 0 |
| With optical interface | | No |

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|---|---|---|---|
| With PC connection | | | Yes |
| Integrated breaking resistance | | | Yes |
| 4-quadrant operation possible | | | Yes |
| Type of converter | | | U converter |
| Degree of protection (IP) | | | IP55 |
| Degree of protection (NEMA) | | | 12 |
| Height | | mm | 450 |
| Width | | mm | 173 |
| Depth | | mm | 240 |


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