



**Variable Frequency Drive, 3-3-phase 400 V, 24 A, 11 kW, Vector control, EMC-Filter, Brake-Chopper**

**Part no.** DA1-34024FB-B55C  
**Article no.** 169390  
**Catalog No.** DA1-34024FB-B55C

## Delivery program

|                                  |          |    |   |
|----------------------------------|----------|----|---|
| Product range                    |          |    | Variable frequency drives   |
| Part group reference (e.g. DIL)  |          |    | DA1   |
| Rated operational voltage        | $U_e$    |    | 400 V AC, 3-phase<br>480 V AC, 3-phase  |
| Output voltage with $V_e$        | $U_2$    |    | 400 V AC, 3-phase<br>480 V AC, 3-phase  |
| Mains voltage (50/60Hz)          | $U_{LN}$ | V  | 380 (-10%) - 480 (+10%)   |
| <b>Rated operational current</b> |          |    |   |
| At 150% overload                 | $I_e$    | A  | 24  |
| Note                             |          |    | Rated operational current at a switching frequency of 8 kHz and an ambient air temperature of +40 °C  |
| Note                             |          |    | Overload cycle for 60 s every 600 s   |
| <b>Assigned motor rating</b>     |          |    |   |
| Note                             |          |    | for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with $1500 \text{ rpm}^{-1}$ at 50 Hz or $1800 \text{ min}^{-1}$ at 60 Hz |
| Note                             |          |    | Overload cycle for 60 s every 600 s   |
| Note                             |          |    | at 400 V, 50 Hz   |
| 150 % Overload                   | P        | kW | 11  |
| 150 % Overload                   | $I_M$    | A  | 21.7  |
| Note                             |          |    | at 440 - 480 V, 60 Hz   |
| 150 % Overload                   | P        | HP | 15  |
| 150 % Overload                   | $I_M$    | A  | 21  |
| Degree of Protection             |          |    | IP55/NEMA 12  |
| Interface/field bus (built-in)   |          |    | OP-Bus (RS485)/Modbus RTU, CANopen®   |
| Fieldbus connection (optional)   |          |    | Ethernet IP<br>DeviceNet<br>PROFIBUS<br>PROFINET<br>Modbus-TCP<br>EtherCAT<br>SmartWire-DT  |
| Fitted with                      |          |    | Radio interference suppression filter<br>Brake chopper<br>Additional PCB protection<br>OLED display   |
| Frame size                       |          |    | FS4   |
| Connection to SmartWire-DT       |          |    | with SmartWire-DT module DX-NET-SWD2  |

## Technical data

### General

|                            |          |    |   |
|----------------------------|----------|----|---|
| Standards                  |          |    | Specification for general requirements: IEC/EN 61800-2<br>EMC requirements: IEC/EN 61800-3<br>Safety requirements: IEC/EN 61800-5-1 |
| Certifications             |          |    | CE, UL, cUL, c-Tick, UkrSepro, EAC  |
| Approvals                  |          |    | DNV   |
| Production quality         |          |    | RoHS, ISO 9001  |
| Climatic proofing          | $\rho_w$ | %  | < 95%, average relative humidity (RH), non-condensing, non-corrosive  |
| Ambient temperature        |          |    |   |
| operation (150 % overload) | $\theta$ | °C | -10 - +40   |

|                                   |   |    |   |
|-----------------------------------|---|----|---|
| Storage                           | θ | °C | -40 - +60   |
| Radio interference level          |   |    |   |
| Radio interference class (EMC)    |   |    | C2, C3, depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary. |
| Environment (EMC)                 |   |    | 1st and 2nd environments as per EN 61800-3  |
| maximum motor cable length        | l | m  | C2 ≤ 5 m<br>C3 ≤ 25 m   |
| Mounting position                 |   |    | Vertical  |
| Altitude                          |   | m  | 0 - 1000 m above sea level<br>Above 1000 m: 1% derating for every 100 m<br>max. 4000 m  |
| Degree of Protection              |   |    | IP55/NEMA 12  |
| Protection against direct contact |   |    | BGV A3 (VBG4, finger- and back-of-hand proof)   |

### Main circuit

|   |            |     |   |
|---|------------|-----|---|
| Supply  |            |     |   |
| Rated operational voltage                                   | $U_e$      |     | 400 V AC, 3-phase<br>480 V AC, 3-phase  |
| Mains voltage (50/60Hz)                                     | $U_{LN}$   | V   | 380 (-10%) - 480 (+10%)   |
| Input current (150% overload)                               | $I_{LN}$   | A   | 28  |
| System configuration  |            |     | AC supply systems with earthed center point   |
| Supply frequency  | $f_{LN}$   | Hz  | 50/60   |
| Frequency range   | $f_{LN}$   | Hz  | 48 - 62   |
| Mains switch-on frequency                                   |            |     | Maximum of one time every 30 seconds  |
| Power section   |            |     |   |
| Function  |            |     | Frequency inverter with internal DC link and IGBT inverter  |
| Overload current (150% overload)                            | $I_L$      | A   | 36  |
| max. starting current (High Overload)                       | $I_H$      | %   | 200   |
| Note about max. starting current                            |            |     | for 4 seconds every 40 seconds  |
| Output voltage with $V_e$                                   | $U_2$      |     | 400 V AC, 3-phase<br>480 V AC, 3-phase  |
| Output Frequency  | $f_2$      | Hz  | 0 - 50/60 (max. 500)  |
| Switching frequency   | $f_{PWM}$  | kHz | 8<br>adjustable 4 - 24 (audible)  |
| Operation Mode  |            |     | U/f control<br>Speed control with slip compensation<br>sensorless vector control (SLV)<br>optional: Vector control with feedback (CLV)                            |
| Frequency resolution (setpoint value)                       | $\Delta f$ | Hz  | 0.1   |
| Rated operational current                                   |            |     |   |
| At 150% overload  | $I_e$      | A   | 24  |
| Note  |            |     | Rated operational current at a switching frequency of 8 kHz and an ambient air temperature of +40 °C  |
| Power loss  |            |     |   |
| Heat dissipation at rated operational current $I_e = 150\%$ | $P_V$      | W   | 297   |
| Efficiency  | $\eta$     | %   | 97.3  |
| Maximum leakage current to ground (PE) without motor        | $I_{PE}$   | mA  | 2.47  |
| Fitted with   |            |     | Radio interference suppression filter<br>Brake chopper<br>Additional PCB protection<br>OLED display   |
| Safety function   |            |     | STO (Safe Torque Off, SIL1, PLc Cat 1)  |
| Frame size  |            |     | FS4   |
| Motor feeder  |            |     |   |
| Note  |            |     | for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with $1500 \text{ rpm}^{-1}$ at 50 Hz or $1800 \text{ min}^{-1}$ at 60 Hz |
| Note  |            |     | Overload cycle for 60 s every 600 s   |
| Note  |            |     | at 400 V, 50 Hz   |
| 150 % Overload  | P          | kW  | 11  |
| Note  |            |     | at 440 - 480 V, 60 Hz   |
| 150 % Overload  | P          | HP  | 15  |

|   |           |          |  |
|---|-----------|----------|--|
| maximum permissible cable length                | l         | m        | screened: 100<br>screened, with motor choke: 200<br>unscreened: 150<br>unscreened, with motor choke: 300 |
| Apparent power                                  |           |          |  |
| Apparent power at rated operation 400 V         | S         | kVA      | 16.63  |
| Apparent power at rated operation 480 V         | S         | kVA      | 19.95  |
| Braking function                                |           |          |  |
| Standard braking torque                         |           |          | max. 30 % $M_N$  |
| DC braking torque                               |           |          | adjustable to 100 %  |
| Braking torque with external braking resistance |           |          | Max. 100% of rated operational current $I_g$ with external braking resistor                              |
| minimum external braking resistance             | $R_{min}$ | $\Omega$ | 40   |
| Switch-on threshold for the braking transistor  | $U_{DC}$  | V        | 780 V DC   |

### Control section

|                                |       |   |  |
|--------------------------------|-------|---|--|
| External control voltage       | $U_c$ | V | 24 V DC (max. 100 mA)  |
| Reference voltage              | $U_s$ | V | 10 V DC (max. 10 mA)   |
| Analog inputs                  |       |   | 2, parameterizable, 0 - 10 V DC, 0/4 - 20 mA   |
| Analog outputs                 |       |   | 2, parameterizable, 0 - 10 V, 0/4 - 20 mA  |
| Digital inputs                 |       |   | 3, parameterizable, max. 30 VDC, max. 5 for non-parameterized analog inputs              |
| Digital outputs                |       |   | 2, parameterizable, 24 V DC  |
| Relay outputs                  |       |   | 2, parameterizable, 1 N/O and 1 changeover contact, 6 A (250 V, AC-1) / 5 A (30 V, DC-1) |
| Interface/field bus (built-in) |       |   | OP-Bus (RS485)/Modbus RTU, CANopen <sup>®</sup>  |

### Assigned switching and protective elements

|   |  |   |  |
|---|--|---|--|
| Power Wiring  |  |   |  |
| Safety device (fuse or miniature circuit-breaker)                             |  |   |  |
| IEC (Type B, gG), 150 %   |  |   | FAZ-B40/3  |
| UL (Class CC or J)  |  | A | 40   |
| Mains contactor   |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)                                 |  |   | DILM17   |
| Main choke  |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)                                 |  |   | DX-LN3-025   |
| Radio interference suppression filter (external, 150 %)                       |  |   | DX-EMC34-030   |
| Radio interference suppression filter, low leakage currents (external, 150 %) |  |   | DX-EMC34-030-L   |
| Note regarding radio interference suppression filter                          |  |   | Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments |
| DC link connection  |  |   |  |
| Braking resistance  |  |   |  |
| 10 % Einschaltdauer (ED)  |  |   | DX-BR040-3K1   |
| 20 % duty factor (DF)   |  |   | DX-BR040-5K1   |
| Motor feeder  |  |   |  |
| motor choke   |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)                                 |  |   | DX-LM3-035   |
| Sine filter   |  |   |  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C)                                 |  |   | DX-SIN3-023  |

### Design verification as per IEC/EN 61439

|  |            |    |     |
|--|------------|----|-----|
| Technical data for design verification                   |            |    |     |
| Rated operational current for specified heat dissipation | $I_n$      | A  | 24  |
| Heat dissipation per pole, current-dependent             | $P_{vid}$  | W  | 0   |
| Equipment heat dissipation, current-dependent            | $P_{vid}$  | W  | 297 |
| Static heat dissipation, non-current-dependent           | $P_{vs}$   | W  | 0   |
| Heat dissipation capacity                                | $P_{diss}$ | W  | 0   |
| Operating ambient temperature min.                       |            | °C | -10 |
| Operating ambient temperature max.                       |            | °C | 40  |
| IEC/EN 61439 design verification                         |            |    |     |

|  |  |  |
|--|--|--|
| 10.2 Strength of materials and parts   |  |  |
| 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 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric 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 Insulation properties   |  |  |
| 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 6.0

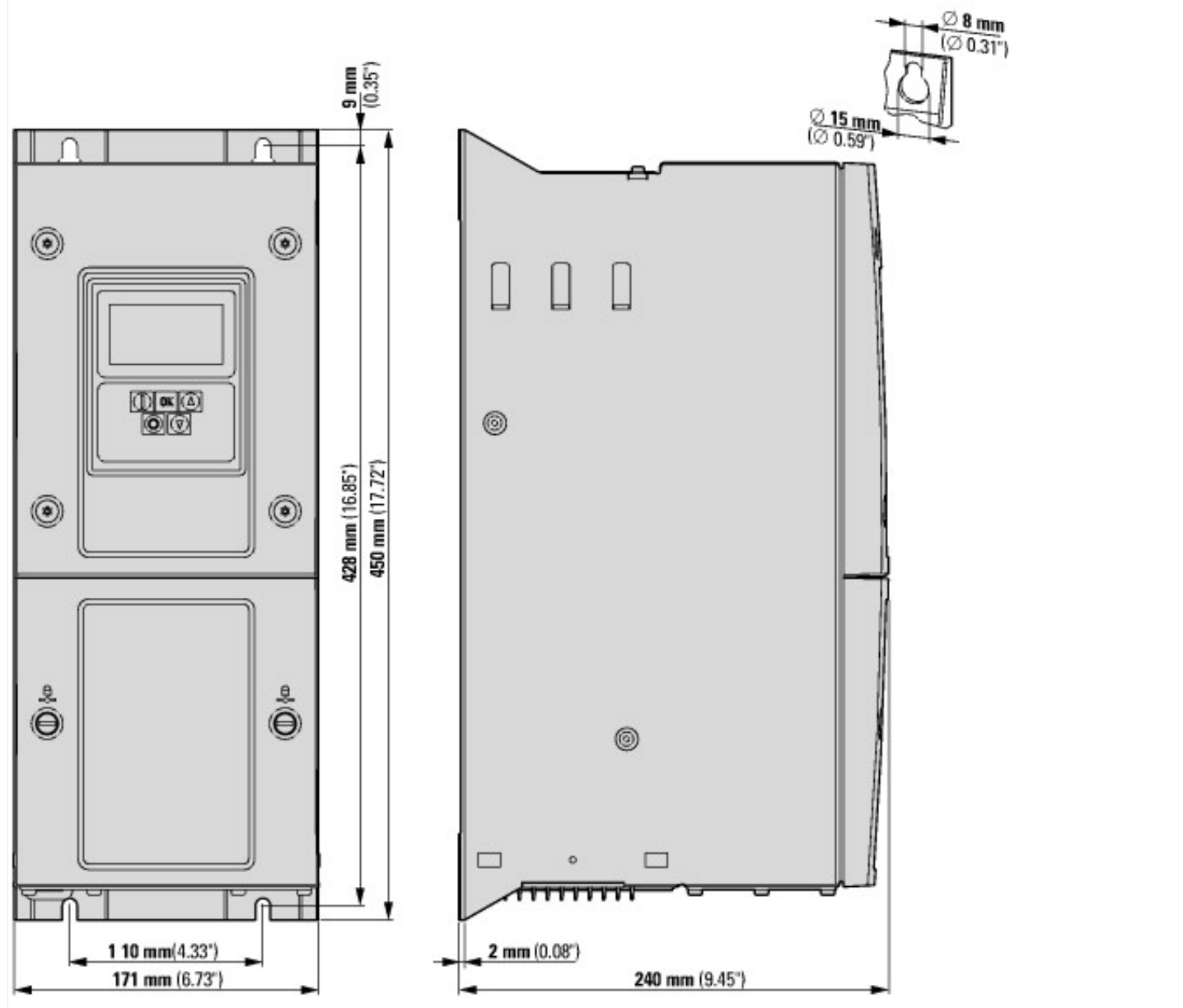
|   |    |  |           |
|---|----|--|-----------|
| Low-voltage industrial components (EG000017) / Frequency converter =< 1 kV (EC001857)   |    |  |           |
| Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kv (ecl@ss8.1-27-02-31-01 [AKE177011]) |    |  |           |
| 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  |  | 400       |
| Rated output current I2N  | A  |  | 24        |
| Max. output at quadratic load at rated output voltage   | kW |  | 11        |
| Max. output at linear load at rated output voltage  | kW |  | 11        |
| With control unit   |    |  | Yes       |
| Application in industrial area permitted  |    |  | Yes       |
| Application in domestic- and commercial area permitted  |    |  | Yes       |
| Supporting protocol for TCP/IP  |    |  | No        |
| 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   |    |  | No        |
| 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 other bus systems           |  |    | No          |
| Number of HW-interfaces industrial Ethernet         |  |    | 0           |
| Number of HW-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                         |  |    | 1           |
| Number of HW-interfaces parallel                    |  |    | 0           |
| Number of HW-interfaces other                       |  |    | 0           |
| With optical interface                              |  |    | No          |
| With PC connection                                  |  |    | Yes         |
| Integrated breaking resistance                      |  |    | Yes         |
| 4-quadrant operation possible                       |  |    | No          |
| Type of converter                                   |  |    | U converter |
| Degree of protection (IP)                           |  |    | IP55        |
| Height  |  | mm | 450         |
| Width   |  | mm | 171         |
| Depth   |  | mm | 240         |
| Relative symmetric net frequency tolerance          |  | %  | 5           |
| Relative symmetric net current tolerance            |  | %  | 10          |

## Approvals

|                                      |  |  |   |
|--------------------------------------|--|--|---|
| Product Standards                    |  |  | UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking |
| UL File No.                          |  |  | E172143   |
| UL Category Control No.              |  |  | NMMS, NMMS7   |
| CSA File No.                         |  |  | UL report applies to both US and Canada                             |
| North America Certification          |  |  | UL listed, certified by UL for use in Canada                        |
| Specially designed for North America |  |  | No  |
| Suitable for                         |  |  | Branch circuits   |
| Max. Voltage Rating                  |  |  | 3~ 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)            |
| Degree of Protection                 |  |  | IEC: IP55   |

## Dimensions



## Additional product information (links)

### IL04020011Z DA1 variable frequency drives (FS4 - 7)

IL04020011Z DA1 variable frequency drives (FS4 [ftp://ftp.moeller.net/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL04020011Z2013\\_10.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL04020011Z2013_10.pdf) - 7)

### MN04020005Z DA1 variable frequency drives, Installation manual

MN04020005Z Frequenzumrichter DA1, Handbuch - Deutsch [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020005Z\\_DE.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020005Z_DE.pdf)

MN04020005Z DA1 variable frequency drive, manual - English [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020005Z\\_EN.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020005Z_EN.pdf)

### MN04020006Z DA1 variable frequency drives, Parameters manual

MN04020006Z DA1 variable frequency drives, Parameters manual - Deutsch [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020006Z\\_DE.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020006Z_DE.pdf)

MN04020006Z DA1 variable frequency drives, Parameters manual - English [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04020006Z\\_EN.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04020006Z_EN.pdf)

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