



**Speed controllers, 4.3 A, 1.5 kW, Sensor input 4, Actuator output 2, 400/480 V AC, PROFINET, HAN Q4/2, with manual override switch, with braking resistance, STO (Safe Torque Off)**



**Part no. RASP5-4424PNT-412R110S1**  
**Catalog No. 198995**

## Delivery program

|                                                                                                                                           |          |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product range                                                                                                                             |          |        | Speed controller                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Rated operational voltage                                                                                                                 | $U_e$    |        | 400 V AC, 3-phase<br>480 V AC, 3-phase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Output voltage with $V_e$                                                                                                                 | $U_2$    |        | 0 - $U_{LN}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Mains voltage (50/60Hz)                                                                                                                   | $U_{LN}$ | V      | 380 (-15%) - 480 (+10%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| At 150% overload                                                                                                                          | $I_e$    | A      | 4.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>assigned motor rating P</b>                                                                                                            |          |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Note                                                                                                                                      |          |        | at 400 V, 50 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 150 % Overload                                                                                                                            | P        | kW     | 1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Note                                                                                                                                      |          |        | at 480 V, 60 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 150 % Overload                                                                                                                            | P        | HP     | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Description                                                                                                                               |          |        | integrated PTC thermistor monitoring and Thermoclick with safe isolation<br>Two sensor inputs through M12 sockets (max. 150 mA) for quick stop and interlocked manual operation<br>optional: 4 sensor inputs with M12-Y adapter for switchover to creep speed<br>Connection of supply voltage via adapter cable on round or flexible busbar junction<br>Diagnostics and reset on the device and via PROFINET<br>with AUTO - OFF/RESET - HAND key switches<br>3 fixed speeds and 1 potentiometer speed<br>can be switched over from U/f to (vector) speed control<br>with selector switch REV - OFF - FWD<br>optional: Faster stop if external 24 V fails |
| Sensor input                                                                                                                              |          | Number | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Actuator output                                                                                                                           |          | Number | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Control voltage external brake (50/60 Hz)                                                                                                 |          | V      | 400/480 V AC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Interface/field bus (built-in)                                                                                                            |          |        | PROFINET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Plug arrangement                                                                                                                          |          |        | HAN Q4/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Repair switch                                                                                                                             |          |        | with manual override switch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Braking resistance                                                                                                                        |          |        | with braking resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Safety function                                                                                                                           |          |        | STO (Safe Torque Off)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Parameterization                                                                                                                          |          |        | Keypad<br>Fieldbus<br>drivesConnect<br>drivesConnect mobile (App)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Instructions</b> for actuation of motors with mechanical brake<br>integrated brake chopper with braking resistance for dynamic braking |          |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Technical data

### General

|                                    |          |    |                                                                                               |
|------------------------------------|----------|----|-----------------------------------------------------------------------------------------------|
| Standards                          |          |    | IEC/EN 61800-5-1<br>UL 61800-5-1<br>Guideline 2011/65/EU (RoHS)<br>CE approval<br>UL approval |
| Climatic proofing                  | $\rho_w$ | %  | < 95%, non-condensing<br>IEC/EN 50178                                                         |
| Ambient temperature                |          |    |                                                                                               |
| Operating ambient temperature min. |          | °C | -10                                                                                           |
| Operating ambient temperature max. |          | °C | +40                                                                                           |
|                                    |          |    | -10 – +55 with derating                                                                       |
| Storage                            | $\theta$ | °C | -40 - +70                                                                                     |
| Overvoltage category               |          |    | III                                                                                           |

|                                 |           |    |                                                                                                                                            |
|---------------------------------|-----------|----|--------------------------------------------------------------------------------------------------------------------------------------------|
| Rated impulse withstand voltage | $U_{imp}$ | kV | 2                                                                                                                                          |
| Radio interference level        |           |    |                                                                                                                                            |
| Radio interference class (EMC)  |           |    | C1 (for conducted emissions only), C2, C3, depending on the motor cable length, the connected load, and ambient conditions.                |
| Environment (EMC)               |           |    | 1st and 2nd environments as per EN 61800-3                                                                                                 |
| maximum motor cable length      | l         | m  | C1 ≤ 1 m<br>C2 ≤ 5 m<br>C3 ≤ 25 m                                                                                                          |
| Mechanical shock resistance     |           | g  | 1000 shocks per shaft, semi-sinusoidal 15 g/11 ms<br>IEC/EN 60068-2-27                                                                     |
| Vibration                       |           |    | Oscillation frequency: 10 - 150 Hz<br>Amplitude 0.15 mm: 6 Hz<br>Amplitude transition frequency on acceleration: 57 Hz<br>IEC/EN 60068-2-6 |
| Mounting position               |           |    | Vertical                                                                                                                                   |
| Altitude                        |           | m  | 0 - 1000 m above sea level<br>above 1000 m with 1 % performance reduction per 100 m<br>max. 2000 m                                         |
| Degree of Protection            |           |    | IP65<br>NEMA12                                                                                                                             |

## 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 (-15%) - 480 (+10%)                                                                                              |
| Input current (150% overload)                               | $I_{LN}$   | A   | 4.1                                                                                                                  |
| System configuration                                        |            |     | AC voltage<br>Center-point earthed star network (TN-S network)<br>Phase-earthed AC supply systems are not permitted. |
| Supply frequency                                            | $f_{LN}$   | Hz  | 50/60                                                                                                                |
| Frequency range                                             | $f_{LN}$   | Hz  | 45–66 (± 0%)                                                                                                         |
| Mains switch-on frequency                                   |            |     | Maximum of one time every 60 seconds                                                                                 |
| Mains current distortion                                    | THD        | %   | < 120                                                                                                                |
| Rated conditional short-circuit current                     | $I_q$      | kA  | < 10                                                                                                                 |
| Short-circuit protection for output circuits, external      |            |     | Type 1 coordination via the power bus' feeder unit                                                                   |
| Power section                                               |            |     |                                                                                                                      |
| Function                                                    |            |     | Variable frequency drive with internal DC link and IGBT inverter                                                     |
| On-delay                                                    | $t_{ON}$   | ms  | < 10                                                                                                                 |
| Off-delay                                                   | $t_{OFF}$  | ms  | < 10                                                                                                                 |
| Overload current (150% overload)                            | $I_L$      | A   | 6.5                                                                                                                  |
| Note regarding overload current                             |            |     | For 60 s every 600 s<br>at 40 °C                                                                                     |
| max. starting current (High Overload)                       | $I_H$      | %   | 200                                                                                                                  |
| Note about max. starting current                            |            |     | at 40 °C                                                                                                             |
| Output voltage with $V_e$                                   | $U_2$      |     | 0 - $U_{LN}$                                                                                                         |
| Output Frequency                                            | $f_2$      | Hz  | 0 - 50/60 (max. 500)                                                                                                 |
| Switching frequency                                         | $f_{PWM}$  | kHz | 8<br>adjustable 4 - 32                                                                                               |
| Operation Mode                                              |            |     | U/f control<br>sensorless vector control (SLV)<br>PM and LSPM motors<br>Synchronous reluctance motors<br>BLDC motors |
| Frequency resolution (setpoint value)                       | $\Delta f$ | Hz  | 0.1                                                                                                                  |
| Rated operational current                                   |            |     |                                                                                                                      |
| At 150% overload                                            | $I_e$      | A   | 4.3                                                                                                                  |
| Note                                                        |            |     | Rated operational current at a switching frequency of 8 kHz and an ambient air temperature of +40 °C                 |
| Motor current limit                                         | I          | A   | 0,4 - 4,3<br>adjustable                                                                                              |
| Power loss                                                  |            |     |                                                                                                                      |
| Heat dissipation at rated operational current $I_e = 150\%$ | $P_V$      | W   | 46                                                                                                                   |
| Efficiency                                                  | $\eta$     | %   | 98                                                                                                                   |

|                                                      |                 |                  |                                                                                                                                                                 |
|------------------------------------------------------|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum leakage current to ground (PE) without motor | I <sub>PE</sub> | mA               | 3.5                                                                                                                                                             |
| Fitted with                                          |                 |                  | with manual override switch<br>without fan<br>with braking resistance                                                                                           |
| Safety function                                      |                 |                  | STO (Safe Torque Off)                                                                                                                                           |
| Motor feeder                                         |                 |                  |                                                                                                                                                                 |
| Note                                                 |                 |                  | for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with 1500 rpm <sup>-1</sup> at 50 Hz or 1800 min <sup>-1</sup> at 60 Hz |
| Note                                                 |                 |                  | at 400 V, 50 Hz                                                                                                                                                 |
| 150 % Overload                                       | P               | kW               | 1.5                                                                                                                                                             |
| Note                                                 |                 |                  | at 480 V, 60 Hz                                                                                                                                                 |
| 150 % Overload                                       | P               | HP               | 2                                                                                                                                                               |
| Actuator for external motor brake                    |                 |                  |                                                                                                                                                                 |
| Braking voltage                                      | U               | V                | 400/480 V AC -15% / +10%                                                                                                                                        |
| Braking current                                      | I               | A                | ≤ 0.6 A<br>(max. 6 A for 120 ms)                                                                                                                                |
| Braking function                                     |                 |                  |                                                                                                                                                                 |
| Braking torque                                       | %               | I/I <sub>e</sub> | ≤ 30                                                                                                                                                            |
| Switch-on threshold for the braking transistor       | U <sub>DC</sub> | V                | 765 V DC                                                                                                                                                        |
| DC braking                                           | %               | I/I <sub>e</sub> | ≤ 100, adjustable                                                                                                                                               |

### Control section

|                                |                |   |                                                                                                                                           |
|--------------------------------|----------------|---|-------------------------------------------------------------------------------------------------------------------------------------------|
| External control voltage       | U <sub>c</sub> | V | 24 V DC - 15 % / + 20 % via AS-Interface® plug                                                                                            |
| Interface/field bus (built-in) |                |   | PROFINET                                                                                                                                  |
| AS-Interface®                  |                |   | max. total power consumption from AS-Interface® power supply unit (30 V): 250 mA<br>Specification: S-7.4<br>Number of slave addresses: 31 |

## Design verification as per IEC/EN 61439

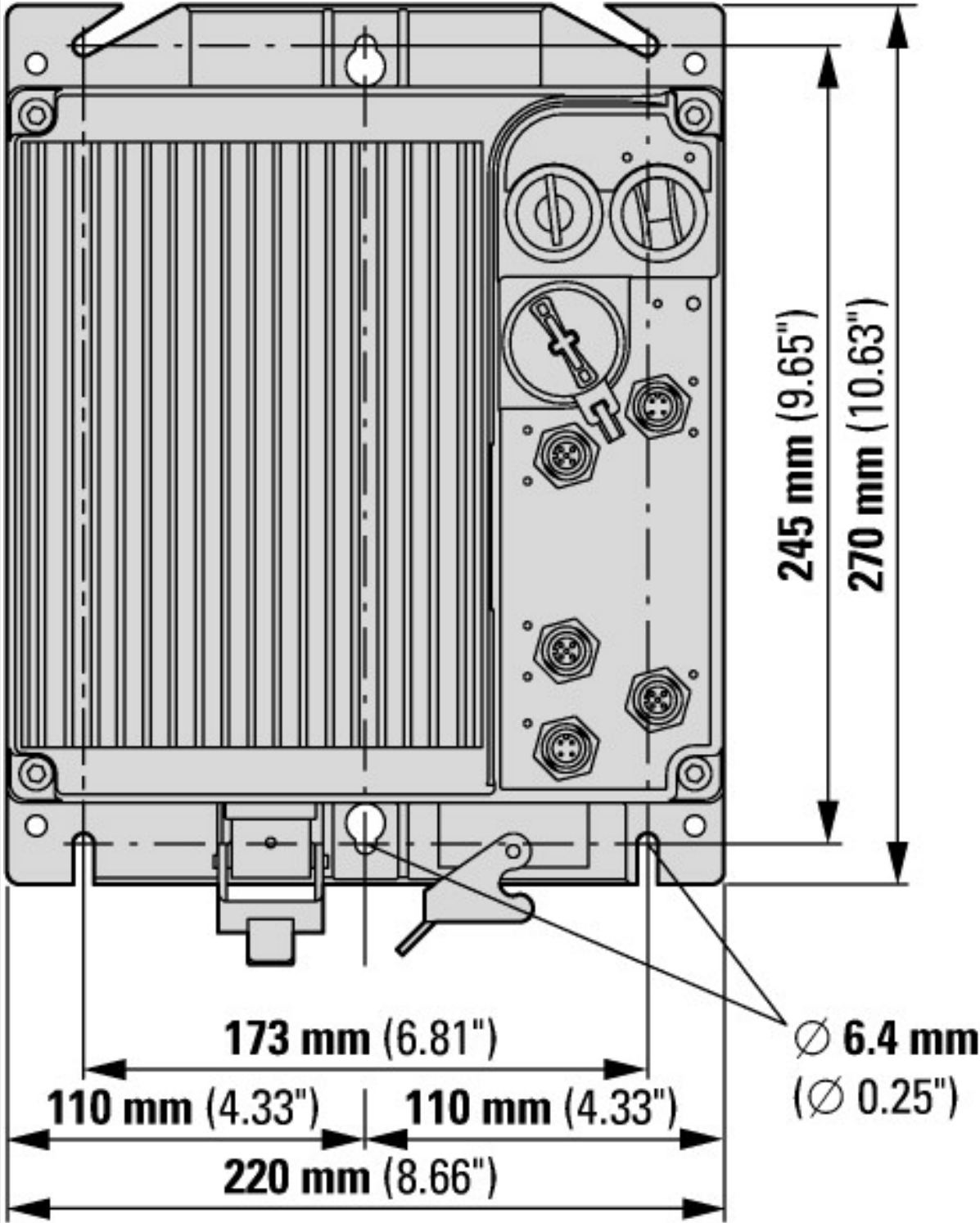
|                                        |  |    |     |
|----------------------------------------|--|----|-----|
| Technical data for design verification |  |    |     |
| Operating ambient temperature min.     |  | °C | -10 |
| Operating ambient temperature max.     |  | °C | 40  |

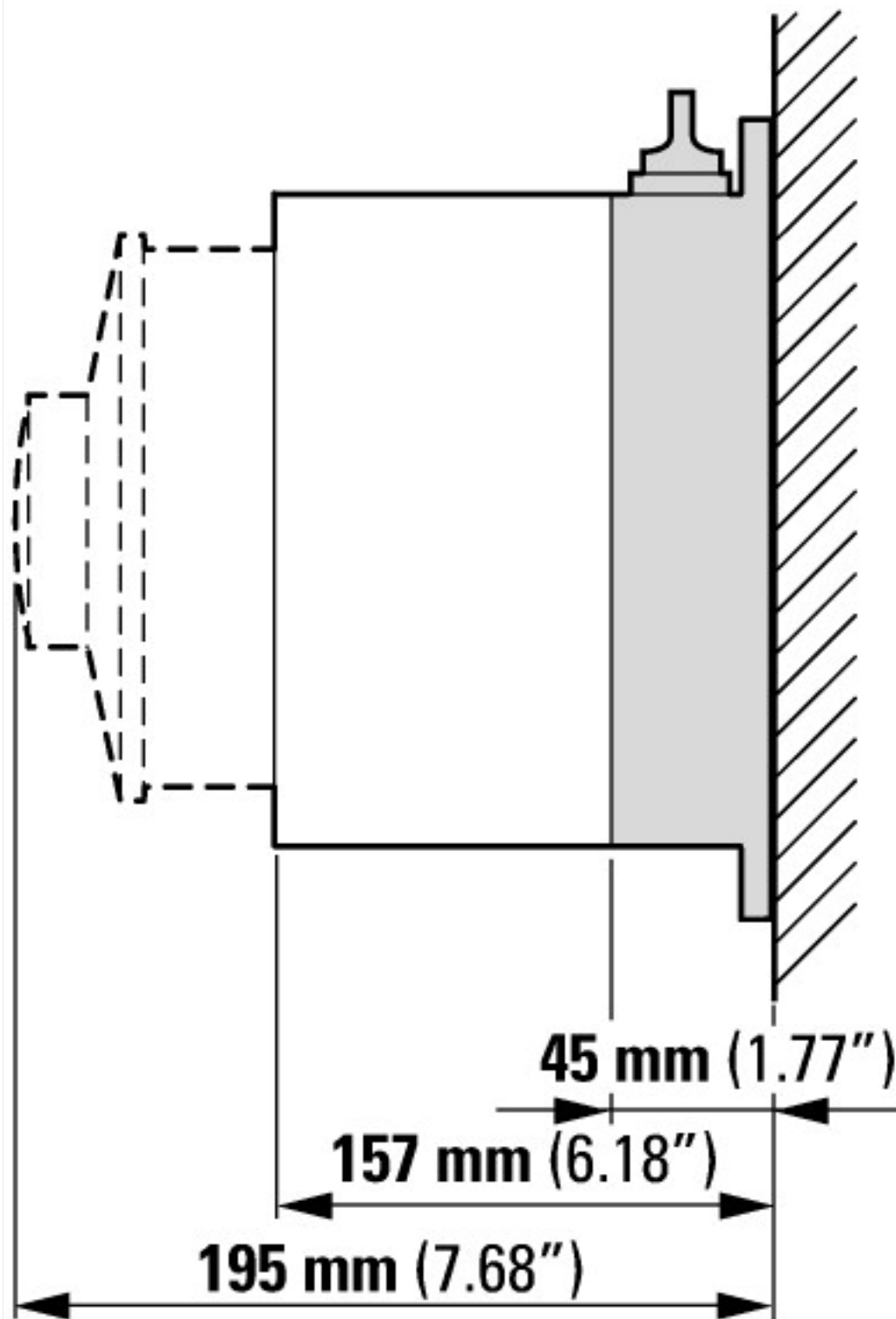
## Technical data ETIM 7.0

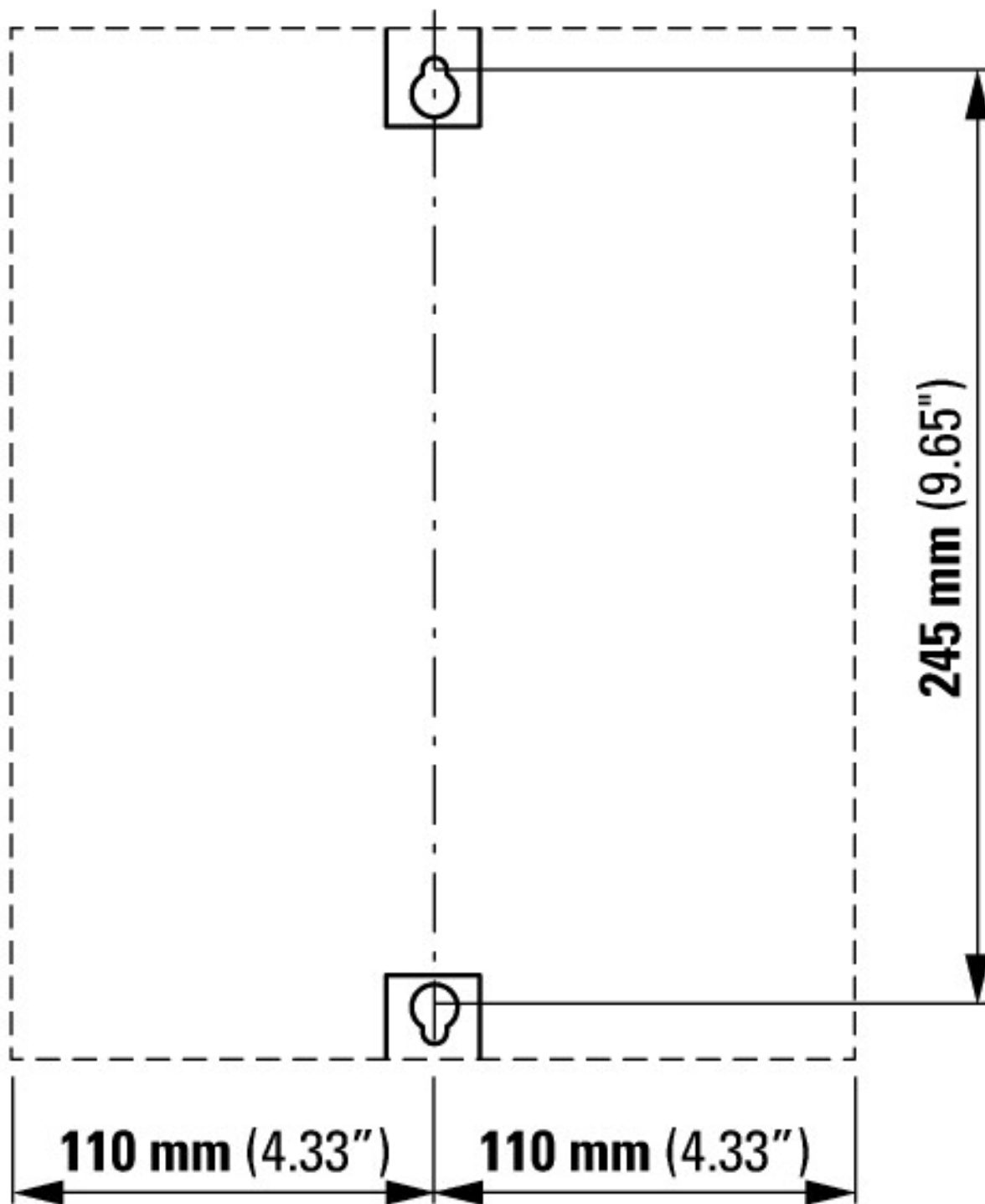
|                                                                                                                                                                                            |    |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------|
| 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 (ecI@ss10.0.1-27-02-31-01 [AKE177014]) |    |           |
| Mains voltage                                                                                                                                                                              | V  | 342 - 626 |
| 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 I <sub>2N</sub>                                                                                                                                                     | A  | 4.3       |
| Max. output at quadratic load at rated output voltage                                                                                                                                      | kW | 1.5       |
| Max. output at linear load at rated output voltage                                                                                                                                         | kW | 1.5       |
| Relative symmetric net frequency tolerance                                                                                                                                                 | %  | 10        |
| Relative symmetric net voltage tolerance                                                                                                                                                   | %  | 10        |
| Number of analogue outputs                                                                                                                                                                 |    | 0         |
| Number of analogue inputs                                                                                                                                                                  |    | 0         |
| Number of digital outputs                                                                                                                                                                  |    | 2         |
| Number of digital inputs                                                                                                                                                                   |    | 4         |
| 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                                                                                                                                                           |    | No        |
| Supporting protocol for CAN                                                                                                                                                                |    | No        |
| Supporting protocol for INTERBUS                                                                                                                                                           |    | No        |

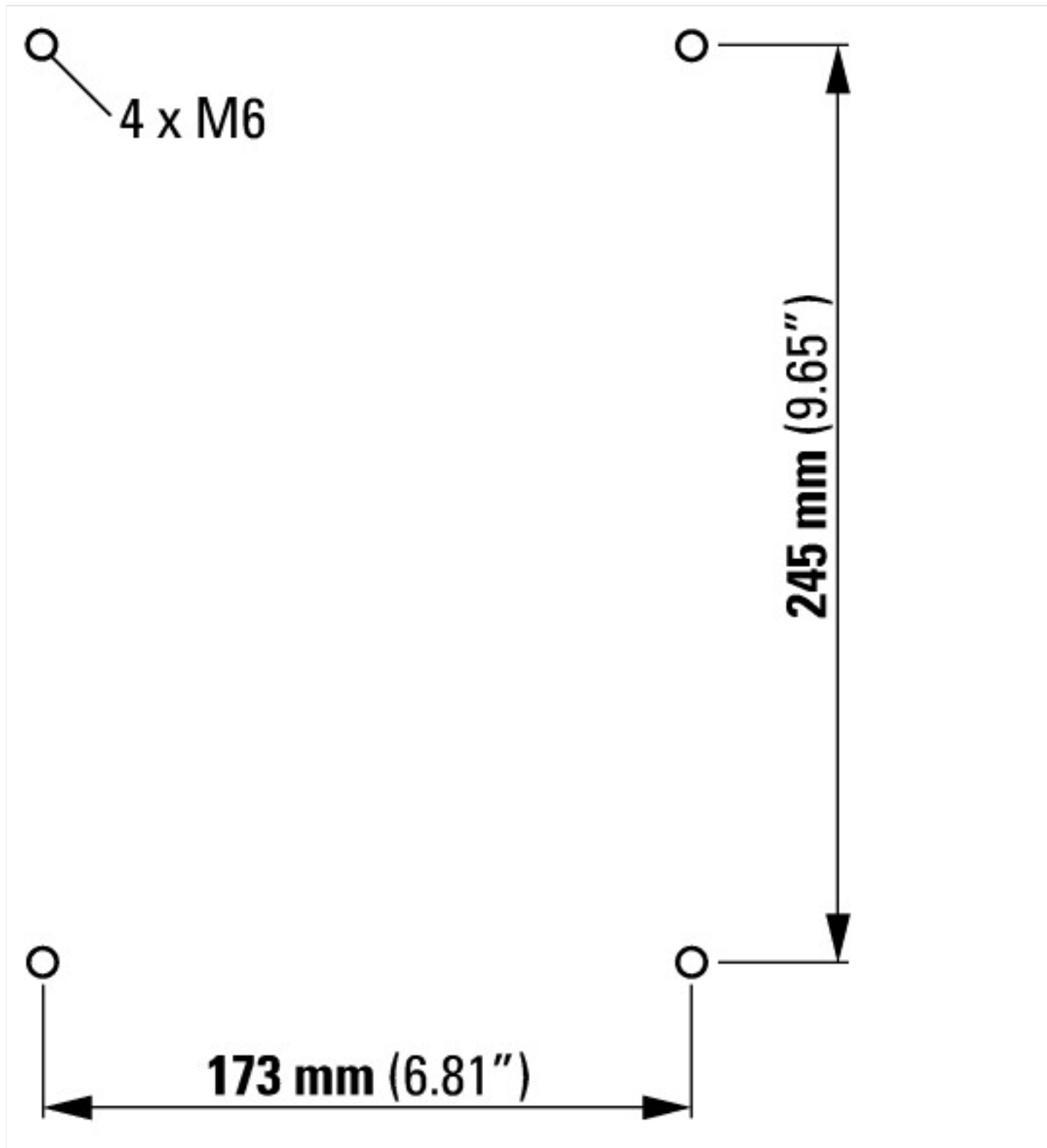
|                                                     |    |             |
|-----------------------------------------------------|----|-------------|
| Supporting protocol for ASI                         |    | No          |
| Supporting protocol for KNX                         |    | No          |
| Supporting protocol for MODBUS                      |    | No          |
| 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                 |    | No          |
| 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           |    | No          |
| Number of HW-interfaces industrial Ethernet         |    | 0           |
| Number of interfaces PROFINET                       |    | 2           |
| 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          |
| With PC connection                                  |    | Yes         |
| Integrated breaking resistance                      |    | Yes         |
| 4-quadrant operation possible                       |    | Yes         |
| Type of converter                                   |    | U converter |
| Degree of protection (IP)                           |    | IP65        |
| Degree of protection (NEMA)                         |    | 12          |
| Height                                              | mm | 278         |
| Width                                               | mm | 220         |
| Depth                                               | mm | 157         |

Dimensions









### Additional product information (links)

#### IL034085ZU Rapid Link 5 Speed Control Unit

IL034085ZU Rapid Link 5 Speed Control Unit [https://es-assets.eaton.com/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL034085ZU2020\\_09.pdf](https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL034085ZU2020_09.pdf)

#### MN034004 Rapid Link 5.0 RAMO RASP

MN034004 Schnellverbindung 5.0 RAMO RASP - Deutsch [https://es-assets.eaton.com/DOCUMENTATION/AWB\\_MANUALS/MN034004\\_DE.pdf](https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN034004_DE.pdf)

MN034004 Rapid Link 5.0 RAMO RASP - English [https://es-assets.eaton.com/DOCUMENTATION/AWB\\_MANUALS/MN034004EN.pdf](https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN034004EN.pdf)

MN034004 Rapid Link 5.0 RAMO RASP - English [https://es-assets.eaton.com/DOCUMENTATION/AWB\\_MANUALS/MN034004\\_EN.pdf](https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN034004_EN.pdf)