

Mechanical features

- Modular design
- Operating temperature
–10 °C to +50 °C
(+14 °F to +122 °F)
- Compact housing as a result of high power density
- Easy cable connection, mains and motor connections are separated for optimum electromagnetic compatibility
- Detachable operator panels
- Screwless control terminals

Performance features

- Latest IGBT technology
- Digital microprocessor control
- Flux Current Control (FCC) for improved dynamic response and optimized motor control
- Linear V/f characteristic
- Quadratic V/f characteristic
- Multipoint characteristic (programmable V/f characteristic)
- Flying restart
- Slip compensation
- Automatic restart following mains failure or fault
- Internal PI controller for simple process control

Protection features

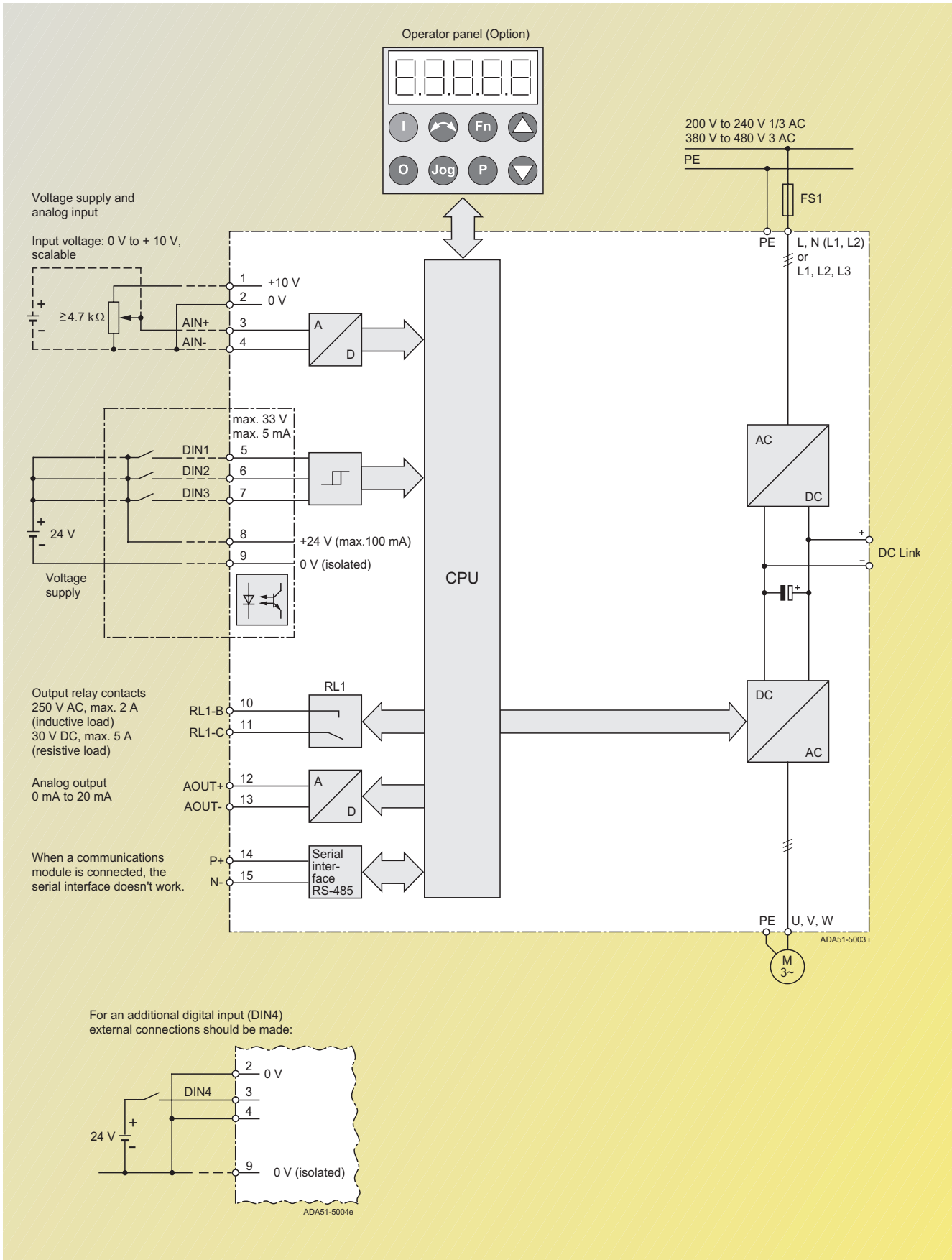
- Programmable acceleration/deceleration times from 0 s to 650 s
- Ramp smoothing
- Fast Current Limit (FCL) for trip-free operation
- Fast, repeatable digital input response time
- Fine adjustment using a high-resolution 10-bit analog input
- Compound braking for controlled rapid braking
- Four skip frequencies
- Removable “Y” capacitor for use on IT systems (with non-grounded mains supplies, the “Y” capacitor must be removed and an output choke installed).
- Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s
- Overvoltage/undervoltage protection
- Inverter overtemperature protection
- Motor protection using PTC via digital input (possible with supplementary circuit)
- Earth fault protection
- Short-circuit protection
- I^2t motor thermal protection
- Locked motor protection
- Stall prevention
- Parameter interlock

MICROMASTER 420

Circuit diagrams

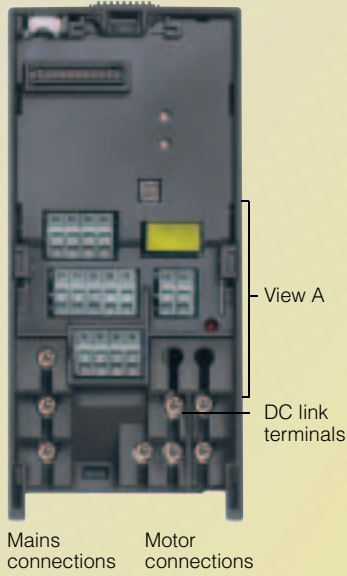
General circuit diagram

2

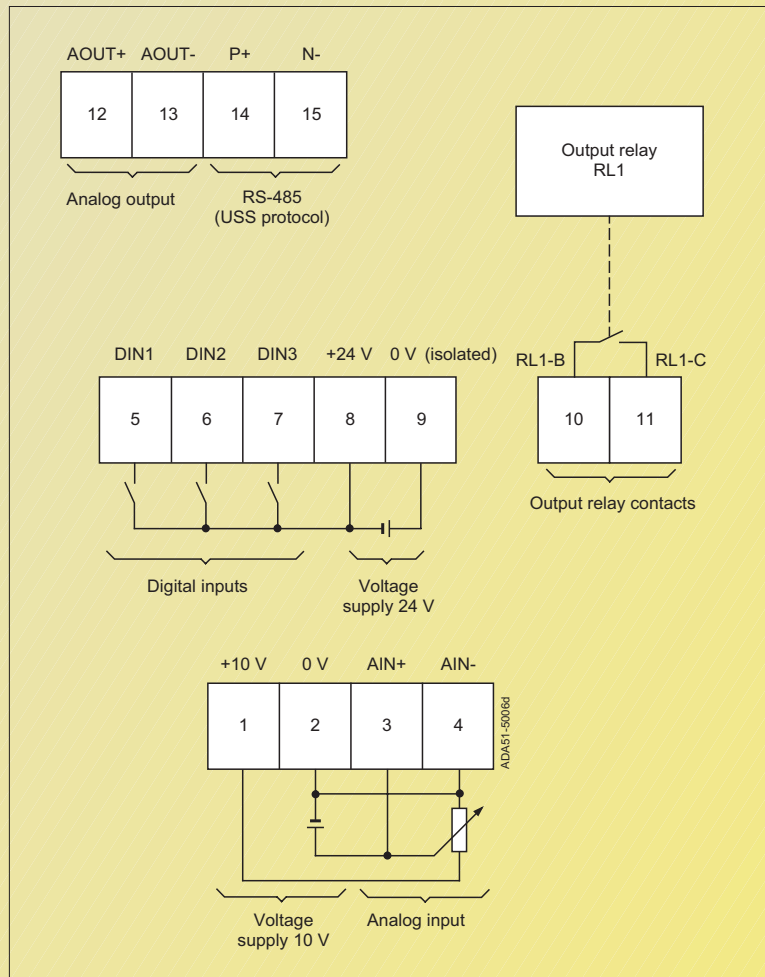


Terminal connection diagram

Example frame size A







View A



MICROMASTER 420

Technical data

MICROMASTER 420 inverter

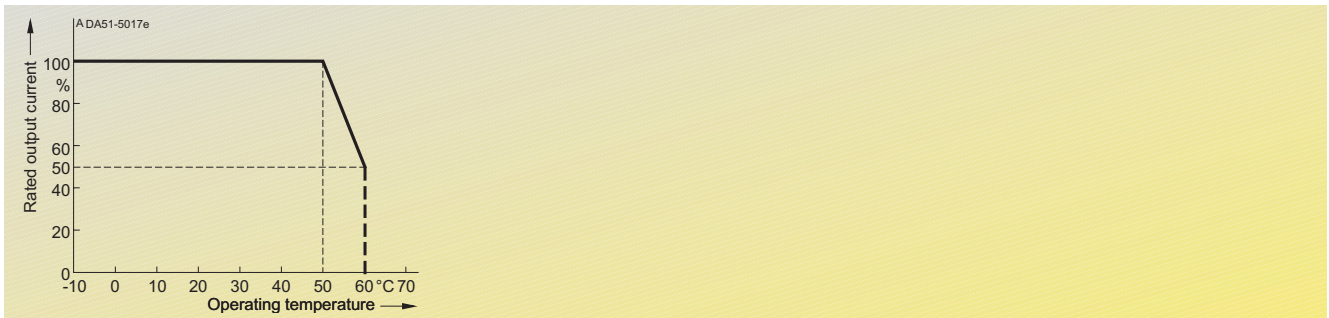
| | | |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Mains voltage and power ranges | 1 AC 200 V to 240 V \pm 10 % 3 AC 200 V to 240 V \pm 10 % 3 AC 380 V to 480 V \pm 10 % | 0.12 kW to 3 kW 0.12 kW to 5.5 kW 0.37 kW to 11 kW |
| Power frequency | 47 Hz to 63 Hz | |
| Output frequency | 0 Hz to 650 Hz | |
| Power factor | \geq 0.95 | |
| Inverter efficiency | 96 % to 97 % | |
| Overload capability | Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s | |
| Inrush current | Less than rated input current | |
| Control method | Linear V/f-characteristic; quadratic V/f characteristic; multipoint characteristic (programmable V/f characteristic); flux current control (FCC) | |
| Pulse frequency | 16 kHz (standard with 1/3 AC 230 V) 4 kHz (standard with 3 AC 400 V) 2 kHz to 16 kHz (in 2 kHz steps) | |
| Fixed frequencies | 7, programmable | |
| Skip frequency ranges | 4, programmable | |
| Setpoint resolution | 0.01 Hz digital 0.01 Hz serial 10 bit analog | |
| Digital inputs | 3 fully programmable isolated digital inputs; switchable PNP/NPN | |
| Analog input | 1, for setpoint or PI controller (0 V to 10 V, scaleable or for use as 4th digital input) | |
| Relay outputs | 1, programmable, 30 V DC/5 A (resistive load); 250 V AC/2A (inductive load) | |
| Analog output | 1, programmable (0 mA to 20 mA) | |
| Serial interfaces | RS-485, optional RS-232 | |
| Motor cable lengths | without output choke without output choke | |
| | max. 50 m (shielded) max. 100 m (unshielded) (see variant dependent options) | |
| Electromagnetic compatibility | Inverter available with internal EMC filter Class A; available as options are EMC filters to EN 55 011, Class A or Class B | |
| Braking | DC braking, compound braking | |
| Degree of protection | IP20 | |
| Operating temperature | -10 °C to +50 °C (+14 °F to +122 °F) | |
| Storage temperature | -40 °C to +70 °C (-40 °F to +158 °F) | |
| Relative humidity | 95 % (non-condensing) | |
| Site altitude | Up to 1000 m above sea level without derating | |
| Protection features for | <ul style="list-style-type: none"> • Undervoltage • Overvoltage • Overload • Earth faults • Short circuit • Stall prevention • Locked motor protection • Motor overtemperature • Inverter overtemperature • Parameter interlock | |
| Compliance with standards |     | |
| CE marking | Conformity with low-voltage directive 73/23/EEC | |
| Dimensions and weights (without options) | Frame size (FS) | H x W x D (mm) Weight, approx. (kg) |
| | A | 173 x 73 x 149 1.0 |
| | B | 202 x 149 x 172 3.3 |
| | C | 245 x 185 x 195 5.0 |

Derating data

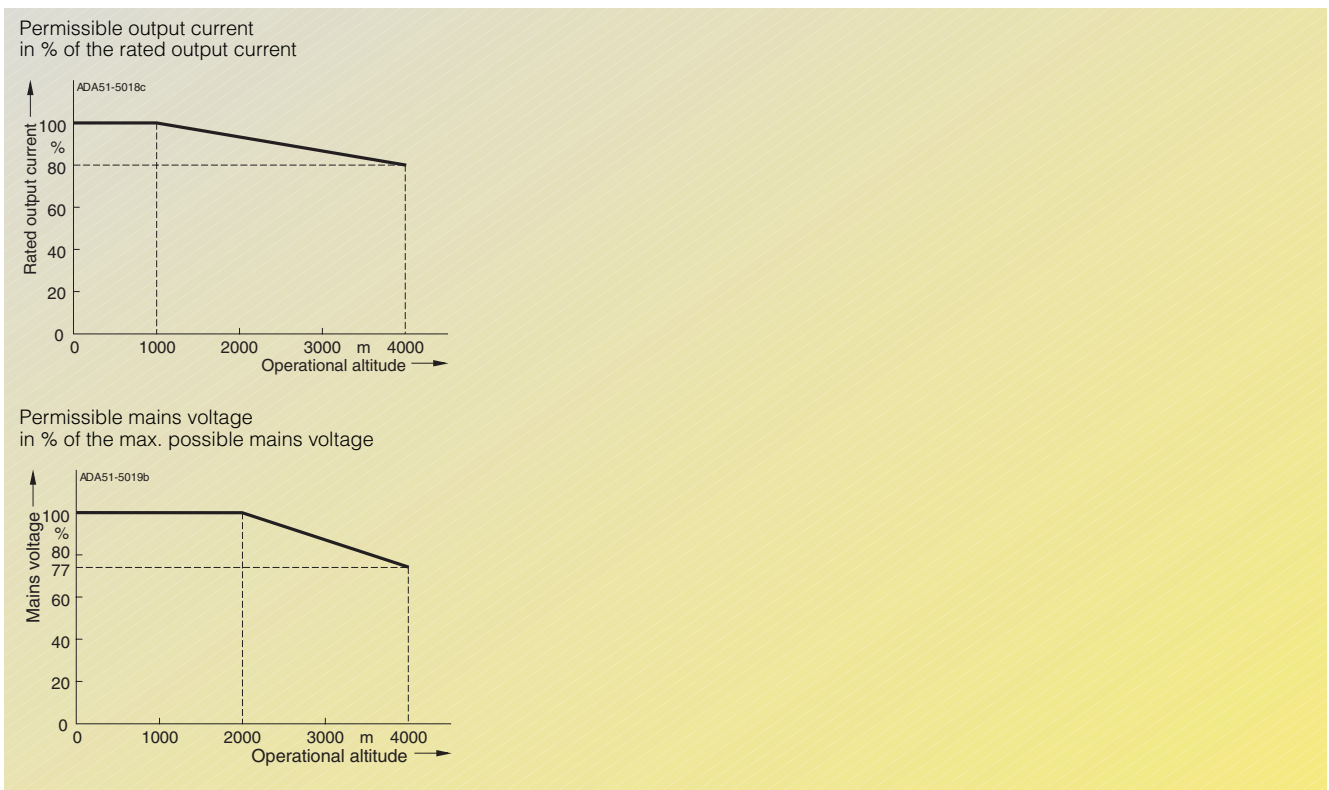
PWM frequency

| Output (for 3 AC 400 V) kW | Rated output current in A for a pulse frequency of | | | | | | |
|----------------------------------|-------------------------------------------------------|-------|-------|--------|--------|--------|--------|
| | 4 kHz | 6 kHz | 8 kHz | 10 kHz | 12 kHz | 14 kHz | 16 kHz |
| 0.37 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 |
| 0.55 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.1 |
| 0.75 | 2.1 | 2.1 | 2.1 | 2.1 | 1.6 | 1.6 | 1.1 |
| 1.1 | 3.0 | 3.0 | 2.7 | 2.7 | 1.6 | 1.6 | 1.1 |
| 1.5 | 4.0 | 4.0 | 2.7 | 2.7 | 1.6 | 1.6 | 1.1 |
| 2.2 | 5.9 | 5.9 | 5.1 | 5.1 | 3.6 | 3.6 | 2.6 |
| 3.0 | 7.7 | 7.7 | 5.1 | 5.1 | 3.6 | 3.6 | 2.6 |
| 4.0 | 10.2 | 10.2 | 6.7 | 6.7 | 4.8 | 4.8 | 3.6 |
| 5.5 | 13.2 | 13.2 | 13.2 | 13.2 | 9.6 | 9.6 | 7.5 |
| 7.5 | 18.4 | 18.4 | 13.2 | 13.2 | 9.6 | 9.6 | 7.5 |
| 11 | 26.0 | 26.0 | 17.9 | 17.9 | 13.5 | 13.5 | 10.4 |

Operating temperature



Installation height above sea level



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Selection and ordering data

MICROMASTER 420 inverter

| Output | | Rated input current ¹⁾ | Rated output current | Frame size | Order No. | |
|----------------------------------------------------|------|-----------------------------------|----------------------|------------|----------------------------------------------|------------------------------------------------------------|
| kW | hp | A | A | (FS) | MICROMASTER 420 without filter ³⁾ | MICROMASTER 420 with internal filter Class A ²⁾ |
| Mains operating voltage 1 AC 200 V to 240 V | | | | | | |
| 0.12 | 0.16 | 2.3 | 0.9 | A | 6SE6420-2UC11-2AA1 | 6SE6420-2AB11-2AA1 |
| 0.25 | 0.33 | 4.3 | 1.7 | A | 6SE6420-2UC12-5AA1 | 6SE6420-2AB12-5AA1 |
| 0.37 | 0.50 | 5.9 | 2.3 | A | 6SE6420-2UC13-7AA1 | 6SE6420-2AB13-7AA1 |
| 0.55 | 0.75 | 7.7 | 3.0 | A | 6SE6420-2UC15-5AA1 | 6SE6420-2AB15-5AA1 |
| 0.75 | 1.0 | 10.1 | 3.9 | A | 6SE6420-2UC17-5AA1 | 6SE6420-2AB17-5AA1 |
| 1.1 | 1.5 | 15.0 | 5.5 | B | 6SE6420-2UC21-1BA1 | 6SE6420-2AB21-1BA1 |
| 1.5 | 2.0 | 18.6 | 7.4 | B | 6SE6420-2UC21-5BA1 | 6SE6420-2AB21-5BA1 |
| 2.2 | 3.0 | 26.8 | 10.4 | B | 6SE6420-2UC22-2BA1 | 6SE6420-2AB22-2BA1 |
| 3.0 | 4.0 | 35.9 | 13.6 | C | 6SE6420-2UC23-0CA1 | 6SE6420-2AB23-0CA1 |
| Mains operating voltage 3 AC 200 V to 240 V | | | | | | |
| 0.12 | 0.16 | 1.1 | 0.9 | A | 6SE6420-2UC11-2AA1 | – |
| 0.25 | 0.33 | 2.2 | 1.7 | A | 6SE6420-2UC12-5AA1 | – |
| 0.37 | 0.50 | 3.0 | 2.3 | A | 6SE6420-2UC13-7AA1 | – |
| 0.55 | 0.75 | 3.9 | 3.0 | A | 6SE6420-2UC15-5AA1 | – |
| 0.75 | 1.0 | 5.2 | 3.9 | A | 6SE6420-2UC17-5AA1 | – |
| 1.1 | 1.5 | 7.6 | 5.5 | B | 6SE6420-2UC21-1BA1 | – |
| 1.5 | 2.0 | 10.2 | 7.4 | B | 6SE6420-2UC21-5BA1 | – |
| 2.2 | 3.0 | 14.1 | 10.4 | B | 6SE6420-2UC22-2BA1 | – |
| 3.0 | 4.0 | 18.4 | 13.6 | C | 6SE6420-2UC23-0CA1 | 6SE6420-2AC23-0CA1 |
| 4.0 | 5.0 | 23.3 | 17.5 | C | 6SE6420-2UC24-0CA1 | 6SE6420-2AC24-0CA1 |
| 5.5 | 7.5 | 28.0 | 22.0 | C | 6SE6420-2UC25-5CA1 | 6SE6420-2AC25-5CA1 |
| Mains operating voltage 3 AC 380 V to 480 V | | | | | | |
| 0.37 | 0.50 | 1.5 | 1.2 | A | 6SE6420-2UD13-7AA1 | – |
| 0.55 | 0.75 | 1.9 | 1.6 | A | 6SE6420-2UD15-5AA1 | – |
| 0.75 | 1.0 | 2.4 | 2.1 | A | 6SE6420-2UD17-5AA1 | – |
| 1.1 | 1.5 | 3.7 | 3.0 | A | 6SE6420-2UD21-1AA1 | – |
| 1.5 | 2.0 | 4.8 | 4.0 | A | 6SE6420-2UD21-5AA1 | – |
| 2.2 | 3.0 | 6.5 | 5.9 | B | 6SE6420-2UD22-2BA1 | 6SE6420-2AD22-2BA1 |
| 3.0 | 4.0 | 8.6 | 7.7 | B | 6SE6420-2UD23-0BA1 | 6SE6420-2AD23-0BA1 |
| 4.0 | 5.0 | 11.6 | 10.2 | B | 6SE6420-2UD24-0BA1 | 6SE6420-2AD24-0BA1 |
| 5.5 | 7.5 | 15.6 | 13.2 | C | 6SE6420-2UD25-5CA1 | 6SE6420-2AD25-5CA1 |
| 7.5 | 10.0 | 22.0 | 19.0 | C | 6SE6420-2UD27-5CA1 | 6SE6420-2AD27-5CA1 |
| 11 | 15.0 | 32.3 | 26.0 | C | 6SE6420-2UD31-1CA1 | 6SE6420-2AD31-1CA1 |



See Appendix for note on ordering.

All MICROMASTER 420 inverters are supplied with a Status Display Panel (SDP). A BOP, AOP or other options have to be ordered separately (see Pages 2/11 to 2/15).

Motors for MICROMASTER 420

Catalog M 11 contains selection and ordering data for motors which are particularly suitable for operation with the MICROMASTER 420 inverters (see Appendix for overview).

This catalog is suitable for IEC motors. For motors according to US standards (NEMA) please refer to: <http://www.sea.siemens.com/> motors

1) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply $U_{sc} = 1\%$ with reference to the inverter rated power and rated mains voltage of 240 V or 400 V

without a line commutating choke. If a line commutating choke is used, the specified values at 200 V to 240 V are reduced to between 55% and 70% and 380 V – 480 V to between 70% and 80%.

2) Use of MICROMASTER inverters with internal filter is not permissible on non-grounded (IT) mains supplies.

3) Generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.