

VZ

# V1000

## More performance & Quality in less space

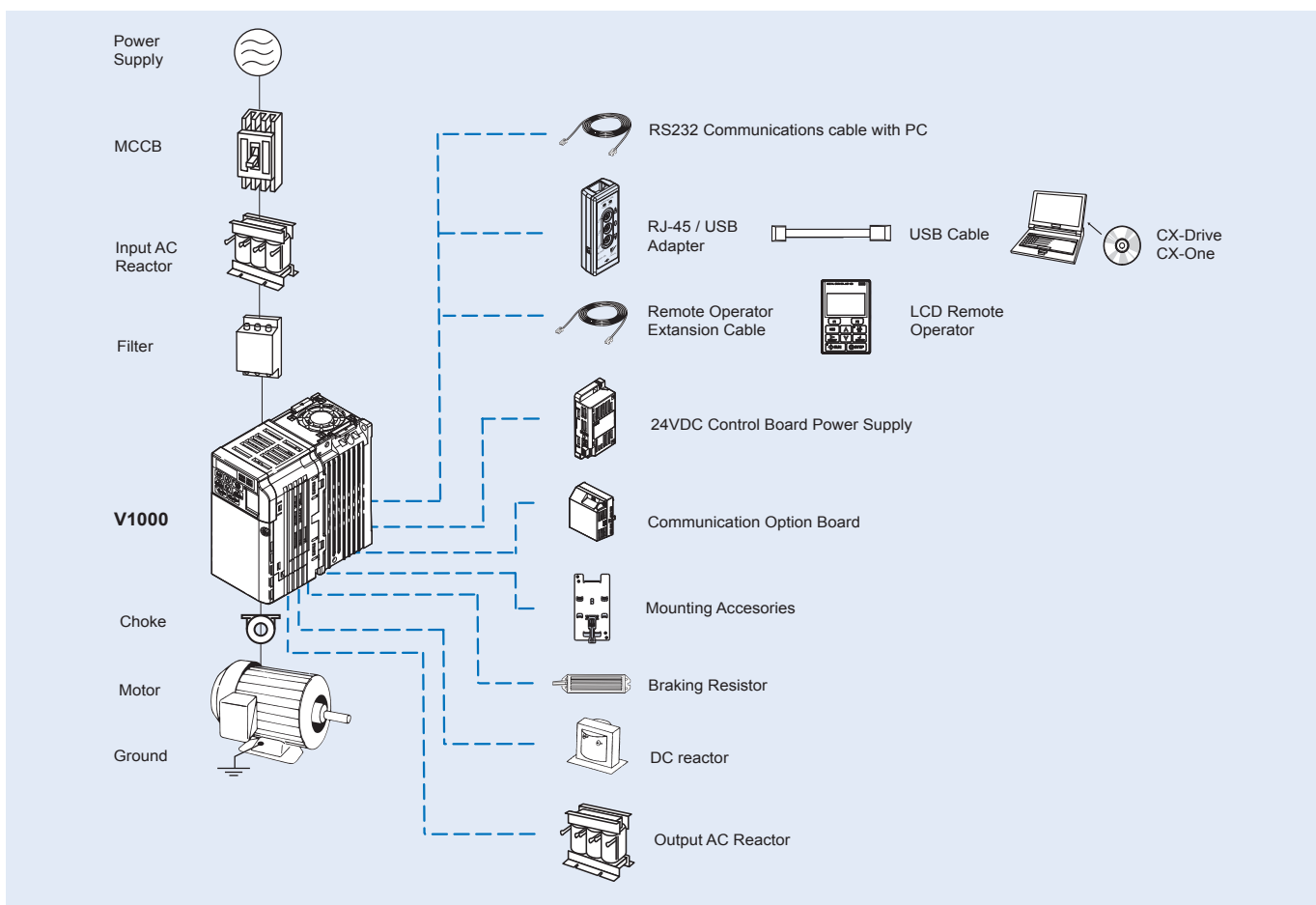
- Current vector control
- High starting torque (200% / 0.5 Hz)
- 1:100 speed control range
- Double rating ND 120%/1min and HD 150%/1 min
- IM&PM motor control
- Online Tuning
- Low-noise Low carrier technology
- 10 years lifetime design
- Built-in filter
- Screw-less terminals
- Control Terminals with memory backup
- Fieldbus communications: Modbus, Profibus, CANopen, DeviceNet, LONworks, CompoNet, Ethernet, ML-II, PROFINET and EtherCAT
- Safety embedded: EN954-1 safety cat. 3, EN6158 SIL II and EN60204-1 Stop category 0
- CE, UL, cUL and TUV

## Ratings

- 200 V Class single-phase 0.1 to 4 kW
- 200 V Class three-phase 0.1 to 15 kW
- 400 V Class three-phase 0.2 to 15 kW

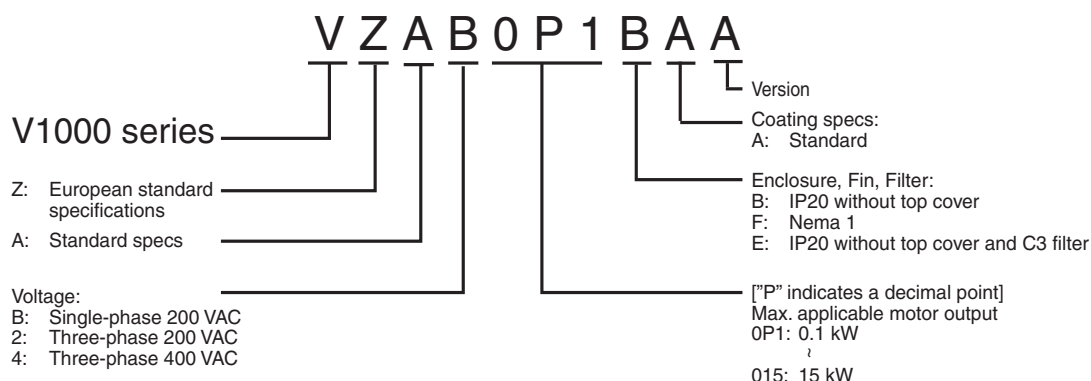


## System configuration



## Specifications

### Type designation



### 200 V class

| Single-phase: VZA□        |                                   | B0P1                                                            | B0P2 | B0P4 | B0P7 | B1P5 | B2P2 | B4P0 <sup>1</sup> | -    | -    | -    | -    |
|---------------------------|-----------------------------------|-----------------------------------------------------------------|------|------|------|------|------|-------------------|------|------|------|------|
| Three-phase: VZA□         |                                   | 20P1                                                            | 20P2 | 20P4 | 20P7 | 21P5 | 22P2 | 24P0              | 25P5 | 27P5 | 2011 | 2015 |
| Motor<br>kW <sup>2</sup>  | For HD setting                    | 0.12                                                            | 0.25 | 0.4  | 1.1  | 1.5  | 2.2  | 4.0               | 5.5  | 7.5  | 11   | 15   |
|                           | For ND setting                    | 0.18                                                            | 0.37 | 0.55 | 1.1  | 2.2  | 3.0  | 5.5 <sup>1</sup>  | 7.5  | 11   | 15   | 18.5 |
| Output<br>characteristics | Drive capacity kVA                | 0.3                                                             | 0.6  | 1.1  | 1.9  | 3.0  | 4.2  | 6.7               | 9.5  | 13   | 18   | 23   |
|                           | Rated output current (A) at HD    | 0.8                                                             | 1.6  | 3.0  | 5.0  | 8.0  | 11.0 | 17.5              | 25.0 | 33.0 | 47.0 | 60.0 |
|                           | Rated output current (A) at ND    | 1.2                                                             | 1.9  | 3.5  | 6.0  | 9.6  | 12.0 | 19.6              | 30.0 | 40.0 | 56.0 | 69.0 |
|                           | Max. output voltage               | Proportional to input voltage: 0..240 V                         |      |      |      |      |      |                   |      |      |      |      |
| Power<br>supply           | Max. output frequency             | 400 Hz                                                          |      |      |      |      |      |                   |      |      |      |      |
|                           | Rated input voltage and frequency | Single-phase 200..240 V 50/60 Hz<br>3-phase 200..240 V 50/60 Hz |      |      |      |      |      |                   |      |      |      |      |
|                           | Allowable voltage fluctuation     | -15%..+10%                                                      |      |      |      |      |      |                   |      |      |      |      |
|                           | Allowable frequency fluctuation   | +5%                                                             |      |      |      |      |      |                   |      |      |      |      |

1. Only HD settings is available for this model
2. Based on a standard 4-pole motor for maximum applicable motor output:  
Heavy Duty (HD) mode with a 150% overload capacity  
Normal Duty (ND) mode with a 120% overload capacity

### 400 V class

| Three-phase: VZA□         |                                   | 40P2                                     | 40P4 | 40P7 | 41P5 | 42P2 | 43P0 | 44P0 | 45P5 | 47P5 | 4011 | 4015 |
|---------------------------|-----------------------------------|------------------------------------------|------|------|------|------|------|------|------|------|------|------|
| Motor<br>kW <sup>1</sup>  | For HD setting                    | 0.37                                     | 0.55 | 1.10 | 1.5  | 2.2  | 3.0  | 4.0  | 5.5  | 7.5  | 11   | 15   |
|                           | For ND setting                    | 0.37                                     | 0.75 | 1.5  | 2.2  | 3.0  | 4.0  | 5.5  | 7.5  | 11   | 15   | 18.5 |
| Output<br>characteristics | Drive capacity kVA                | 0.9                                      | 1.4  | 2.6  | 3.7  | 4.2  | 5.5  | 7.2  | 9.2  | 14.8 | 18   | 24   |
|                           | Rated output current (A) at HD    | 1.2                                      | 1.8  | 3.4  | 4.8  | 5.5  | 7.2  | 9.2  | 14.8 | 18.0 | 24   | 31   |
|                           | Rated output current (A) at ND    | 1.2                                      | 2.1  | 4.1  | 5.4  | 6.9  | 8.8  | 11.1 | 17.5 | 23   | 31   | 38   |
|                           | Max. output voltage               | 0..480 V (proportional to input voltage) |      |      |      |      |      |      |      |      |      |      |
| Power<br>supply           | Max. output frequency             | 400 Hz                                   |      |      |      |      |      |      |      |      |      |      |
|                           | Rated input voltage and frequency | 3-phase 380..480 VAC, 50/60 Hz           |      |      |      |      |      |      |      |      |      |      |
|                           | Allowable voltage fluctuation     | -15%..+10%                               |      |      |      |      |      |      |      |      |      |      |
|                           | Allowable frequency fluctuation   | +5%                                      |      |      |      |      |      |      |      |      |      |      |

1. Based on a standard 4-pole motor for maximum applicable motor output:  
Heavy Duty (HD) mode with a 150% overload capacity  
Normal Duty (ND) mode with a 120% overload capacity

# Specifications

## Common specifications

| Model number<br>VZA□ |                                            | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Control functions    | Control methods                            | Sine wave PWM (V/f control, sensorless current vector control)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                      | Output frequency range                     | 0.1..400 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                      | Frequency tolerance                        | Digital set value: $\pm 0.01\%$ ( $-10..+50\text{ }^{\circ}\text{C}$ )<br>Analogue set value: $\pm 0.1\%$ ( $25\pm 10\text{ }^{\circ}\text{C}$ )                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                      | Resolution of frequency set value          | Digital set value: 0.01 Hz ( $<100\text{ Hz}$ ), 0.1 Hz ( $>100\text{ Hz}$ )<br>Analogue set value: 1/1000 of maximum frequency                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                      | Resolution of output frequency             | 0.01 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                      | Overload capability                        | Heavy duty use: 150% rated output current for one minute<br>Normal duty use: 120% rated output current for one minute                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                      | Frequency set value                        | 0..10 V (20 k $\Omega$ ), 4..20 mA (250 $\Omega$ ), 0..20 mA (250 $\Omega$ )<br>Pulse train input, frequency setting value (selectable)                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                      | Braking torque<br>(short term peak torque) | Short-term average deceleration torque: 150% (up 1.5 kW), 100% (for 1.5 kW), 50% (for 2.2 kW), 20% (for bigger size)<br>Continuous regenerative torque: Approx 20% (125% with optional braking resistor, 10%ED, 10 s, braking transistor built in)                                                                                                                                                                                                                                                                                                               |
|                      | V/f Characteristics                        | Possible to program any V/f pattern                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Functionality        | Inputs signals                             | Seven of the following input signals are selectable: Forward/reverse run (3-wire sequence), fault reset, external fault (NO/NC contact input), multi-step speed operation, Jog command, accel/decel time select, external baseblock, speed search command, UP/DOWN command, accel/decel hold command, LOCAL/REMOTE selection, communication/control circuit terminal selection, emergency stop fault, emergency stop alarm, self test                                                                                                                            |
|                      | Output signals                             | Following output signals are selectable (NO/NC contact output, 2 photo-coupler outputs): Fault, running, zero speed, speed agree, frequency detection (output frequency $\leq$ or $\geq$ set value), during overtorque detection, minor error, during baseblock, operation mode, drive run ready, during fault retry, during undervoltage detection, reverse running, during speed search, data output through communication.                                                                                                                                    |
|                      | Standard functions                         | Open-loop vector control, full-range automatic torque boost, slip compensation, 17-step speed operation (max.), restart after momentary power loss, DC injection braking current at stop/start (50% of drive rated current, 0.5 sec, or less), frequency reference bias/gain, MEMOBUS communications (RS-485/422, max. 115K bps), fault retry, speed search, frequency upper/lower limit setting, overtorque detection, frequency jump, accel/decel time switch, accel/decel prohibited, S-curve accel/decel, PID control, energy-saving control, constant copy. |
|                      | Analogue inputs                            | 2 analogue inputs, 0..10 V, 4..20 mA, 0..20 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                      | Braking/acceleration times                 | 0.01..6000 s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                      | Display                                    | Optionally frequency, current or set value<br>Error and status LED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Protection functions | Motor overload protection                  | Electronic thermal overload relay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                      | Instantaneous overcurrent                  | Motor coasts to a stop at approx. 250% of drive rated current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                      | Overload                                   | Heavy Duty: Motor coasts to a stop after 1 minute at 150% of drive rated output current<br>Normal Duty: Motor coasts to a stop after 1 minute at 120% of drive rated output current                                                                                                                                                                                                                                                                                                                                                                              |
|                      | Overvoltage                                | Motor coasts to a stop if DC bus voltage exceed 410 V (double for 400 V class)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                      | Undervoltage                               | Stops when DC bus voltage is approx. 190 V or less (double for 400 V class)<br>(approx. 150 V or less for single-phase series)                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                      | Momentary power loss                       | Following items are selectable: not provided (stop if power loss is 15 ms or longer), continuous operation if power loss is approx. 0.5 s or shorter, continuous operation                                                                                                                                                                                                                                                                                                                                                                                       |
|                      | Cooling fin overheat                       | Protected by thermistor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                      | Stall prevention level                     | Stall prevention during acceleration/deceleration and constant speed operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                      | Ground fault                               | Protected by electronic circuit (operation level is approx. 250% of rated output current)                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Ambient conditions   | Power charge indication                    | Indicates until the main circuit voltage reaches 50 V.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                      | Degree of protection                       | IP20, NEMA1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                      | Cooling                                    | Cooling fan is provided for 200 V, 0.75 kW (1HP) (3/single-phase)<br>400 V, 1.5 kW (2HP) (3-phase), others are self-cooling                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                      | Ambient humidity                           | 95% RH or less (without condensation)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                      | Storage temperature                        | -20 $^{\circ}\text{C}$ ..+60 $^{\circ}\text{C}$ (short-term temperature during transportation)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                      | Installation                               | Indoor (no corrosive gas, dust, etc.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                      | Installation height                        | Max. 1000 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                      | Vibration                                  | Up to 9.8 m/s <sup>2</sup> at 10 to less than 20 Hz, Up to 6.37 m/s <sup>2</sup> at 20 to 50 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Dimensions

### IP20 type

Figure 1

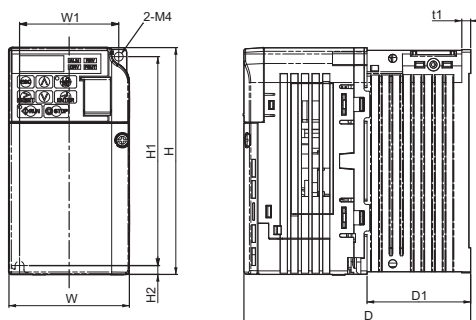
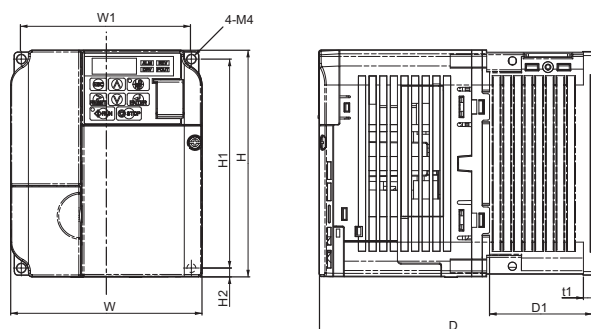
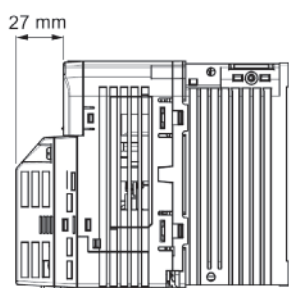


Figure 2

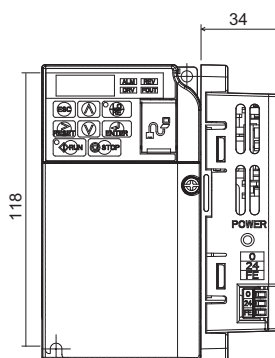


| Voltage class      | Max. applicable motor output kW | Drive model VZA□ | Figure | Dimensions in mm |     |     |     |       |      |      |     |    |     | Weight kg |     |    |    |     |
|--------------------|---------------------------------|------------------|--------|------------------|-----|-----|-----|-------|------|------|-----|----|-----|-----------|-----|----|----|-----|
|                    |                                 |                  |        | W1               | H1  | W   | H   | D     | t1   | H2   | D1  | H3 | H4  |           |     |    |    |     |
| Single-phase 200 V | 0.12                            | B0P1             | 1      | 56               | 118 | 68  | 128 | 76    | 3    | 5    | 6.5 | -  | -   | 0.6       |     |    |    |     |
|                    | 0.25                            | B0P2             |        |                  |     |     |     | 108   | 38.5 |      | 0.7 |    |     |           |     |    |    |     |
|                    | 0.55                            | B0P4             |        |                  |     |     |     |       |      |      | 1.0 |    |     |           |     |    |    |     |
|                    | 1.1                             | B0P7             | 2      | 96               |     | 108 |     | 137.5 | 5    | 58   | 1.7 |    |     |           |     |    |    |     |
|                    | 1.5                             | B1P5             |        |                  |     |     |     |       |      |      | 1.8 |    |     |           |     |    |    |     |
|                    | 2.2                             | B2P2             |        |                  |     |     |     |       |      |      | 2.4 |    |     |           |     |    |    |     |
|                    | 4.0                             | B4P0             |        |                  |     |     |     |       |      |      | 3.0 |    |     |           |     |    |    |     |
| Three-phase 200 V  | 0.12                            | 20P1             | 1      | 56               | 118 | 68  | 128 | 76    | 3    | 5    | 6.5 | -  | -   | 0.6       |     |    |    |     |
|                    | 0.25                            | 20P2             |        |                  |     |     |     | 108   | 38.5 |      | 0.6 |    |     |           |     |    |    |     |
|                    | 0.55                            | 20P4             |        |                  |     |     |     |       |      |      | 0.9 |    |     |           |     |    |    |     |
|                    | 1.1                             | 20P7             | 2      | 96               |     | 108 |     | 128   | 5    | 58   | 1.1 |    |     |           |     |    |    |     |
|                    | 1.5                             | 21P5             |        |                  |     |     |     |       |      |      | 1.3 |    |     |           |     |    |    |     |
|                    | 2.2                             | 22P2             |        |                  |     |     |     |       |      |      | 1.4 |    |     |           |     |    |    |     |
|                    | 4.0                             | 24P0             |        |                  |     |     |     |       |      |      | 2.1 |    |     |           |     |    |    |     |
|                    | 5.5                             | 25P5             | 3      | 122              | 248 | 140 | 254 | 140   | -    | 6    | 55  | 13 | 6.2 | 3.8       |     |    |    |     |
|                    | 7.5                             | 27P5             |        |                  |     |     |     |       |      | 8    | 75  | 15 |     | 3.8       |     |    |    |     |
|                    | 11                              | 2011             |        |                  |     |     |     |       |      | 7    | 78  |    | 5.5 |           |     |    |    |     |
|                    | 15                              | 2015             |        |                  |     |     |     |       |      | 192  | 336 |    | 220 | 358       | 187 | 7  | 78 | 7.2 |
|                    | Three-phase 400 V               | 0.37             |        |                  |     |     |     |       |      | 40P2 | 2   | 96 | 118 | 108       | 128 | 81 | 5  | 5   |
|                    |                                 | 0.55             | 40P4   | 99               | 28  | 1.0 |     |       |      |      |     |    |     |           |     |    |    |     |
|                    |                                 | 1.1              | 40P7   | 137.5            | 58  | 1.4 |     |       |      |      |     |    |     |           |     |    |    |     |
|                    |                                 | 1.5              | 41P5   | 154              |     | 1.5 |     |       |      |      |     |    |     |           |     |    |    |     |
| 2.2                |                                 | 42P2             | 1.5    |                  |     |     |     |       |      |      |     |    |     |           |     |    |    |     |
| 3.0                |                                 | 43P0             | 2.1    |                  |     |     |     |       |      |      |     |    |     |           |     |    |    |     |
| 4.0                |                                 | 44P0             | 3      | 128              | 140 | 254 | 140 | -     | 6    | 55   | 13  | 6  |     | 3.8       |     |    |    |     |
| 5.5                |                                 | 45P5             |        |                  |     |     |     |       |      |      |     |    | 6.2 | 3.8       |     |    |    |     |
| 7.5                |                                 | 47P5             |        |                  |     |     |     |       |      |      |     |    | 15  | 6         | 5.2 |    |    |     |
| 11                 |                                 | 4011             |        |                  |     |     |     |       |      |      |     |    |     |           | 5.5 |    |    |     |
| 15                 |                                 | 4015             |        |                  |     |     |     |       |      |      |     |    |     |           | 5.5 |    |    |     |

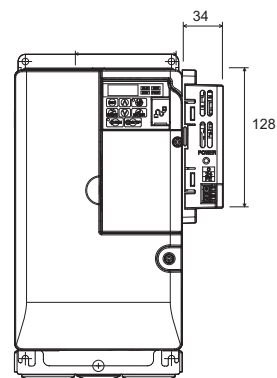
### V1000 + Option board (Communication and 24 VDC power supply)



Communication option boards

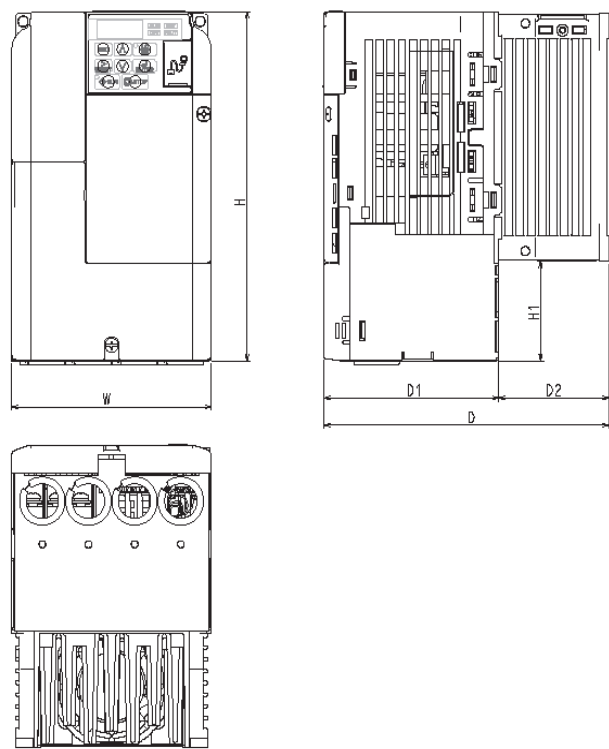


PS-V10S  
24 VDC Power supply Options



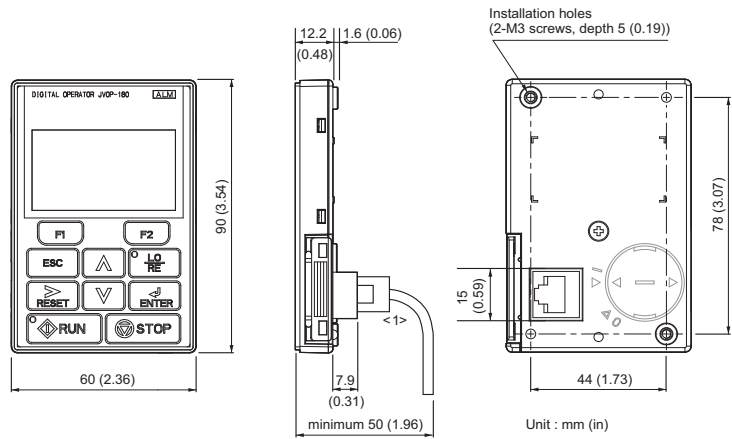
PS-V10M

Built-in filter



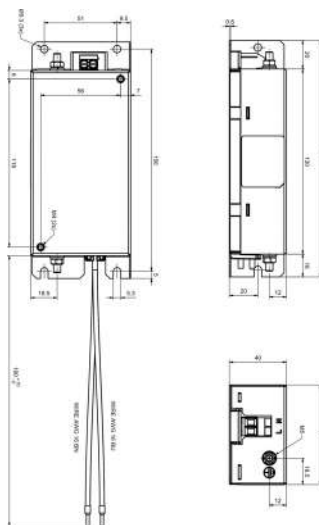
| VZA□ | Dimensions in mm |     |    |      |      |       |
|------|------------------|-----|----|------|------|-------|
|      | W                | H   | H1 | D1   | D2   | D     |
| B0P1 | 68+              | 178 | 50 | 69.5 | 6.5  | 76    |
| B0P2 |                  |     |    | 79.5 | 38.5 | 118   |
| B0P4 |                  |     |    | 77.9 | 59.6 | 137.5 |
| B0P7 | 108              | 178 | 50 | 89.4 | 64.6 | 154   |
| B1P5 |                  |     |    | 96.4 | 66.6 | 163   |
| B2P2 | 140              | 183 | 55 | 69.4 | 11.6 | 81    |
| 40P2 | 108              | 178 | 50 | 77.9 | 29.6 | 99    |
| 40P4 |                  |     |    | 94.4 | 59.6 | 137.5 |
| 40P7 |                  |     |    |      |      |       |
| 41P5 |                  |     |    | 94.4 |      | 154   |
| 42P2 |                  |     |    |      |      |       |
| 43P0 | 140              | 183 | 55 | 76.4 | 66.6 | 143   |

Remote LCD operator

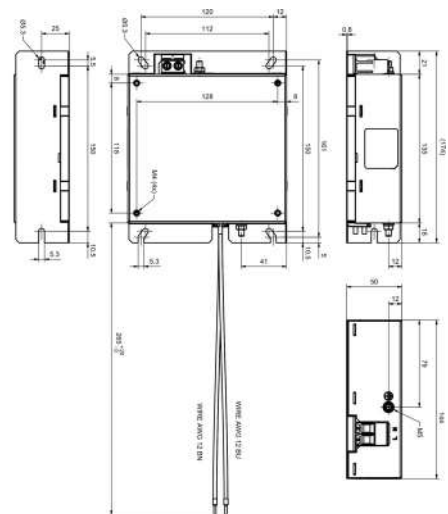


## Line filters

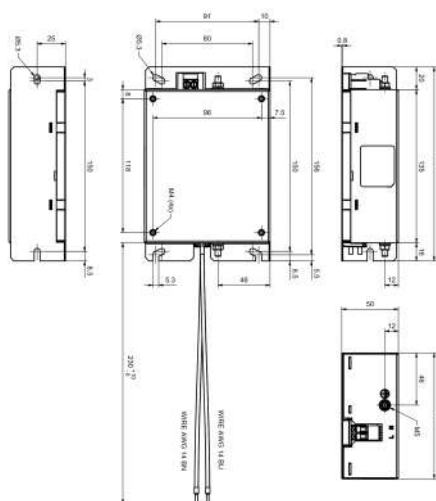
### AX-FIC1010-SE



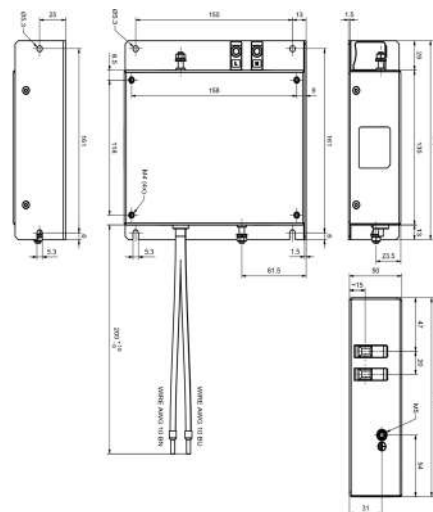
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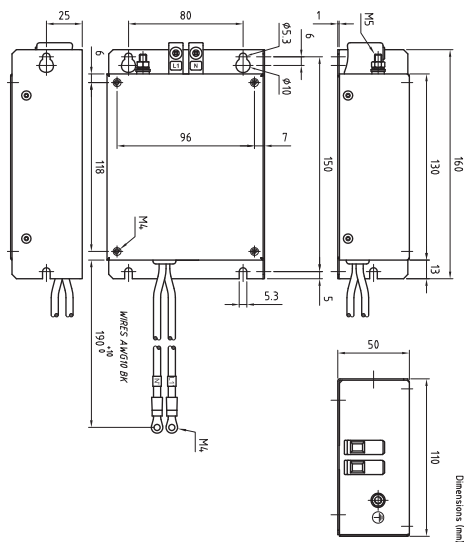
### AX-FIC1020-SE



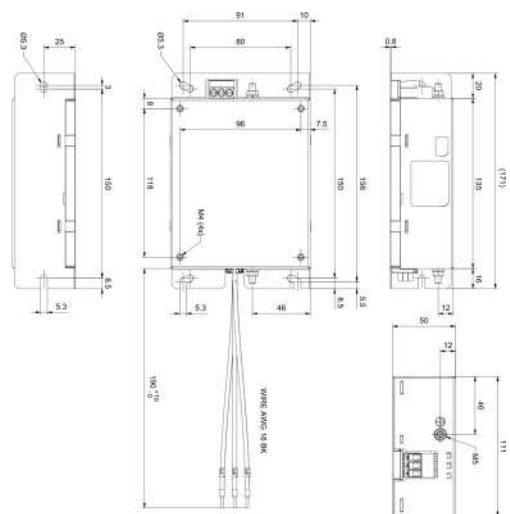
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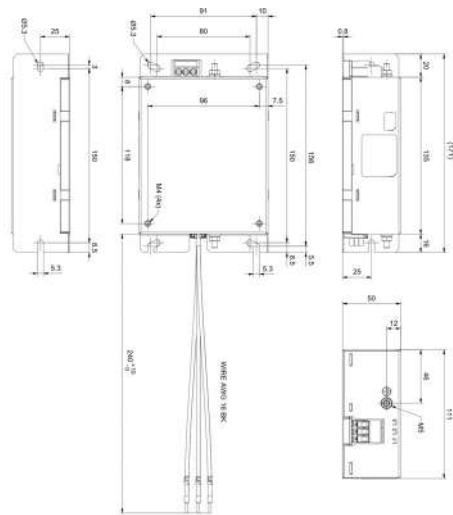
### AX-FIM1024-SE



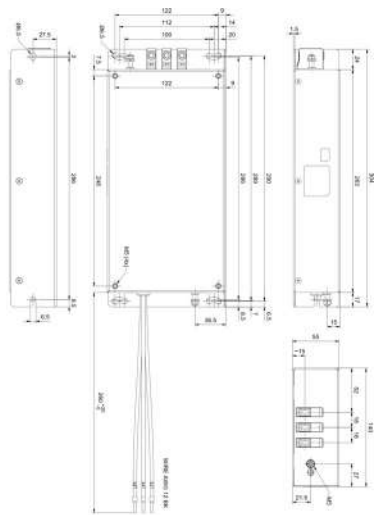
### AX-FIC4005-SE



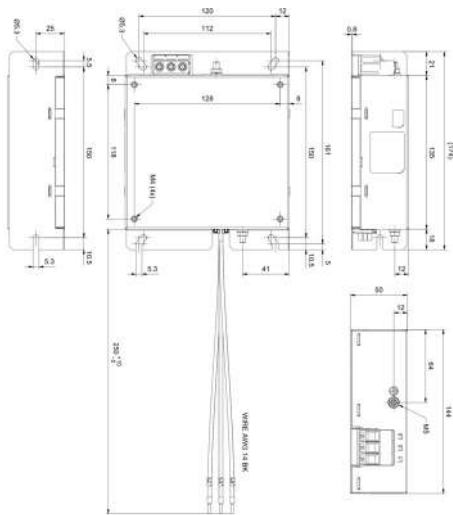
AX-FIC4010-SE



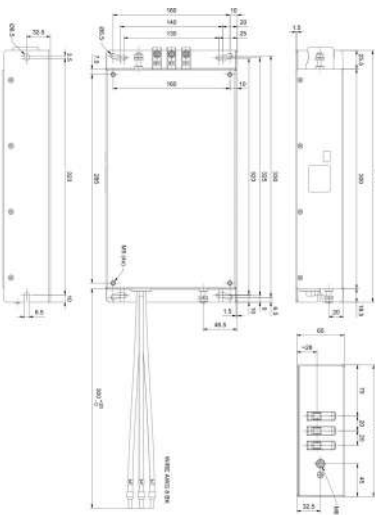
AX-FIC4030-SE



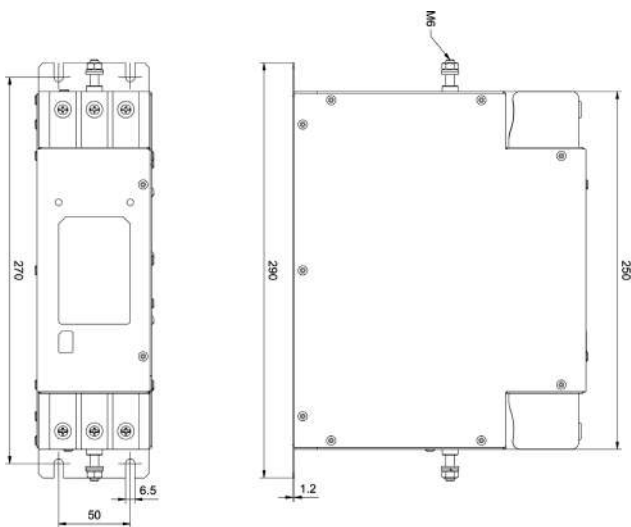
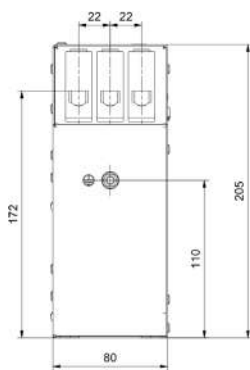
AX-FIC4015-SE



AX-FIC4050-SE



AX-FIC4080-SE

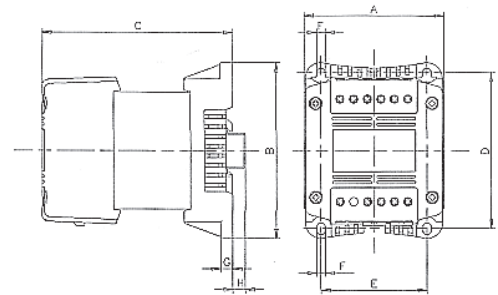


Note: LL filters has same dimensions than standard ones.

## Input AC Reactor

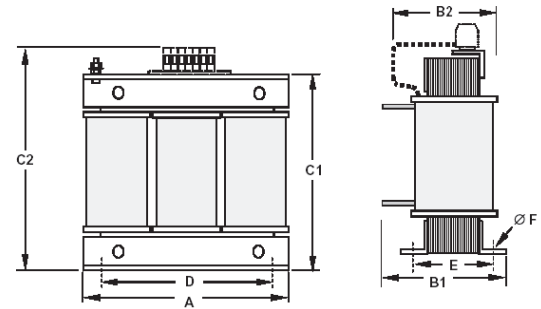
### Single-phase

| Voltage | Reference         | Dimensions |     |     |     |    |   |     |   | Weight<br>kg |
|---------|-------------------|------------|-----|-----|-----|----|---|-----|---|--------------|
|         |                   | A          | B   | C   | D   | E  | F | G   | H |              |
| 200 V   | AX-RAI02000070-DE | 84         | 113 | 96  | 101 | 66 | 5 | 7.5 | 2 | 1.22         |
|         | AX-RAI01700140-DE | 84         | 113 | 116 | 101 | 66 | 5 | 7.5 | 2 | 1.95         |
|         | AX-RAI01200200-DE | 84         | 113 | 131 | 101 | 66 | 5 | 7.5 | 2 | 2.55         |
|         | AX-RAI00630240-DE | 84         | 113 | 116 | 101 | 66 | 5 | 7.5 | 2 | 1.95         |



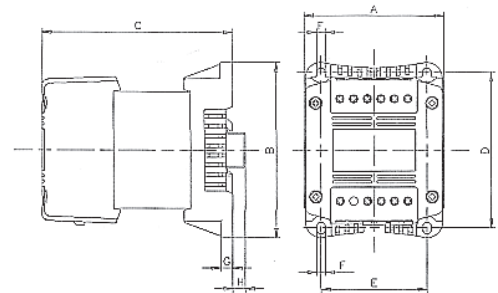
### Three-phase

| Voltage | Reference         | Dimensions |    |     |     |    |     | Weight<br>kg |
|---------|-------------------|------------|----|-----|-----|----|-----|--------------|
|         |                   | A          | B2 | C2  | D   | E  | F   |              |
| 200 V   | AX-RAI02800080-DE | 120        | 70 | 120 | 80  | 52 | 5.5 | 1.78         |
|         | AX-RAI00880200-DE | 120        | 80 | 120 | 80  | 62 | 5.5 | 2.35         |
|         | AX-RAI00350335-DE | 180        | 85 | 190 | 140 | 55 | 6   | 5.5          |
|         | AX-RAI00180670-DE | 180        | 85 | 190 | 140 | 55 | 6   | 5.5          |
| 400 V   | AX-RAI07700050-DE | 120        | 70 | 120 | 80  | 52 | 5.5 | 1.78         |
|         | AX-RAI03500100-DE | 120        | 80 | 120 | 80  | 62 | 5.5 | 2.35         |
|         | AX-RAI01300170-DE | 120        | 80 | 120 | 80  | 62 | 5.5 | 2.50         |
|         | AX-RAI00740335-DE | 180        | 85 | 190 | 140 | 55 | 6   | 5.5          |



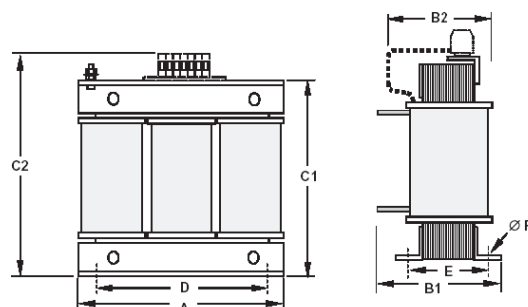
## DC Reactor

| Voltage          | Reference        | Dimensions |     |      |      |     |     |      |      | Weight<br>kg |      |      |
|------------------|------------------|------------|-----|------|------|-----|-----|------|------|--------------|------|------|
|                  |                  | A          | B   | C    | D    | E   | F   | G    | H    |              |      |      |
| 200 V            | AX-RC21400016-DE | 84         | 113 | 96   | 101  | 66  | 5   | 7.5  | 2    | 1.22         |      |      |
|                  | AX-RC10700032-DE |            |     | 105  |      |     |     |      |      | 1.60         |      |      |
|                  | AX-RC06750061-DE |            |     |      |      |     |     |      |      |              |      |      |
|                  | AX-RC03510093-DE |            |     |      |      |     |     |      |      |              |      |      |
|                  | AX-RC02510138-DE |            |     | 116  |      |     |     |      |      |              | 1.95 |      |
|                  | AX-RC01600223-DE | 108        | 135 | 124  | 120  | 82  | 6.5 | 9.5  | -    | 3.20         |      |      |
|                  | AX-RC01110309-DE | 120        | 152 | 136  | 135  | 94  | 7   |      |      | 5.20         |      |      |
|                  | AX-RC00840437-DE |            |     | 146  |      |     |     | 6.00 |      |              |      |      |
|                  | AX-RC00590614-DE | 150        | 177 | 160  | 160  | 115 |     |      | 2    |              | 11.4 |      |
| AX-RC00440859-DE | 182.6            |            |     | 14.3 |      |     |     |      |      |              |      |      |
| 400 V            | AX-RC43000020-DE | 84         | 113 |      | 96   | 101 | 66  |      | 5    | 7.5          |      | 2    |
|                  | AX-RC27000030-DE |            |     |      | 105  |     |     | 1.60 |      |              |      |      |
|                  | AX-RC14000047-DE |            |     |      |      |     |     |      |      |              |      |      |
|                  | AX-RC10100069-DE |            |     | 116  |      |     |     |      |      |              |      |      |
|                  | AX-RC06400116-DE | 108        | 135 |      | 133  | 120 | 82  |      | 6.5  | 9.5          | -    | 3.70 |
|                  | AX-RC04410167-DE | 120        | 152 |      | 136  | 135 | 94  | 7    | 5.20 |              |      |      |
|                  | AX-RC03350219-DE |            |     | 146  | 6.00 |     |     |      |      |              |      |      |
|                  | AX-RC02330307-DE | 150        | 177 | 160  |      | 160 | 115 | 7    |      | 2            | 11.4 |      |
|                  | AX-RC01750430-DE |            |     | 183  |      |     |     |      |      |              |      | 14.3 |



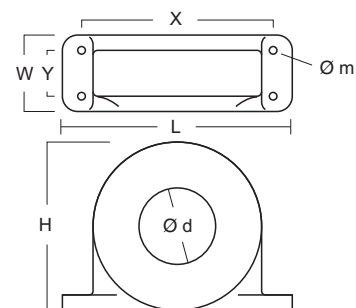
# Output AC Reactor

| Voltage | Reference         | Dimensions |     |     |     |    |     | Weight<br>kg |
|---------|-------------------|------------|-----|-----|-----|----|-----|--------------|
|         |                   | A          | B2  | C2  | D   | E  | F   |              |
| 200 V   | AX-RAO11500026-DE | 120        | 70  | 120 | 80  | 52 | 5.5 | 1.78         |
|         | AX-RAO07600042-DE | 120        | 70  | 120 | 80  | 52 | 5.5 | 1.78         |
|         | AX-RAO04100075-DE | 120        | 80  | 120 | 80  | 62 | 5.5 | 2.35         |
|         | AX-RAO03000105-DE | 120        | 80  | 120 | 80  | 62 | 5.5 | 2.35         |
|         | AX-RAO01830180-DE | 180        | 85  | 195 | 140 | 55 | 6   | 5.5          |
|         | AX-RAO01150220-DE | 180        | 85  | 195 | 140 | 55 | 6   | 5.5          |
|         | AX-RAO00950320-DE | 180        | 85  | 210 | 140 | 55 | 6   | 6.5          |
|         | AX-RAO00630430-DE | 180        | 95  | 210 | 140 | 65 | 6   | 9.1          |
|         | AX-RAO00490640-DE | 180        | 105 | 210 | 140 | 75 | 6   | 11.7         |
| 400 V   | AX-RAO16300038-DE | 120        | 80  | 120 | 80  | 62 | 5.5 | 2.35         |
|         | AX-RAO11800053-DE | 120        | 80  | 120 | 80  | 62 | 5.5 | 2.35         |
|         | AX-RAO07300080-DE | 180        | 85  | 195 | 140 | 55 | 6   | 5.5          |
|         | AX-RAO04600110-DE | 180        | 85  | 195 | 140 | 55 | 6   | 5.5          |
|         | AX-RAO03600160-DE | 180        | 85  | 210 | 140 | 55 | 6   | 6.5          |
|         | AX-RAO02500220-DE | 180        | 95  | 210 | 140 | 65 | 6   | 9.1          |
|         | AX-RAO02000320-DE | 240        | 110 | 275 | 200 | 75 | 6   | 16.0         |

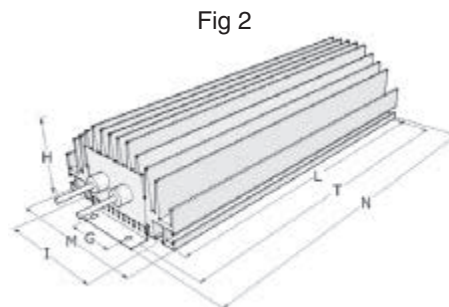
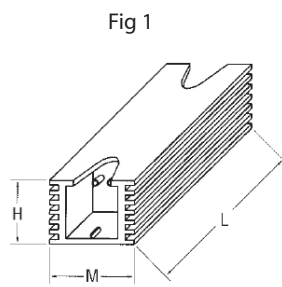
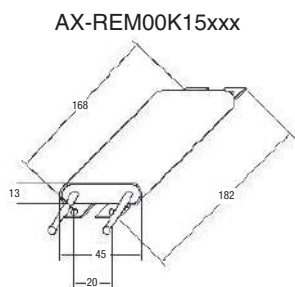


# Chokes

| Description   | D<br>diameter | Motor<br>KW | Dimensions in mm |    |     |     |    |   | Weight<br>kg |
|---------------|---------------|-------------|------------------|----|-----|-----|----|---|--------------|
|               |               |             | L                | W  | H   | X   | Y  | m |              |
| AX-FER2102-RE | 21            | < 2.2       | 85               | 22 | 46  | 70  | -  | 5 | 0.1          |
| AX-FER2515-RE | 25            | < 15        | 105              | 25 | 62  | 90  | -  | 5 | 0.2          |
| AX-FER5045-RE | 50            | < 45        | 150              | 50 | 110 | 125 | 30 | 5 | 0.7          |

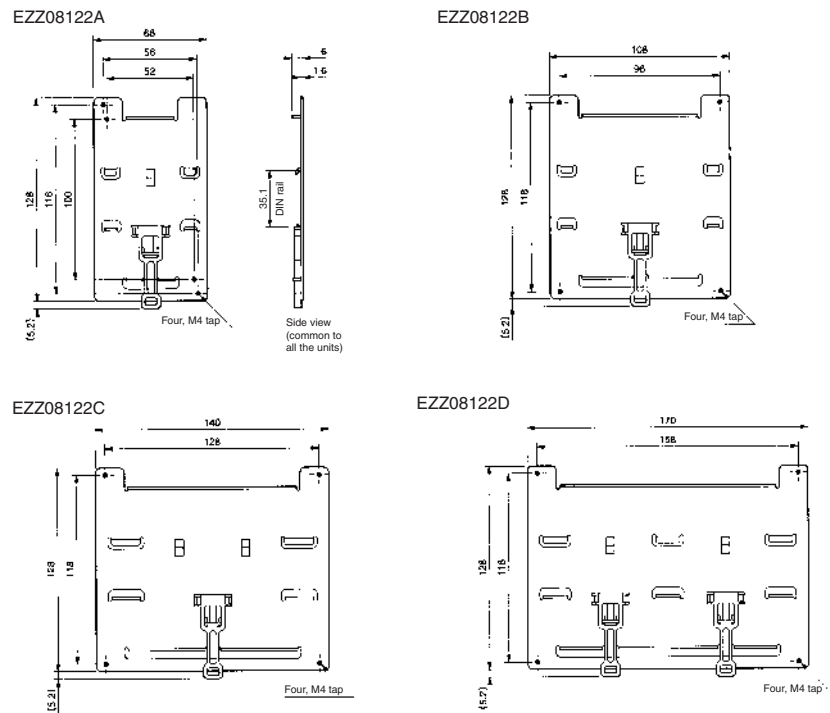


# Resistor Dimensions



| Type             | Fig. | Dimensions in mm |    |     |      |     |    |     | Weight<br>kg |
|------------------|------|------------------|----|-----|------|-----|----|-----|--------------|
|                  |      | L                | H  | M   | I    | T   | G  | N   |              |
| AX-REM00K1400-IE | 1    | 105              | 27 | 36  | 94   | -   | -  | -   | 0.2          |
| AX-REM00K2070-IE |      |                  |    |     |      |     |    |     |              |
| AX-REM00K2120-IE |      |                  |    |     |      |     |    |     |              |
| AX-REM00K2200-IE |      |                  |    |     |      |     |    |     |              |
| AX-REM00K4035-IE | 2    | 200              | 61 | 100 | 74.5 | 216 | 40 | 230 | 1.41         |
| AX-REM00K6035-IE |      |                  |    |     |      |     |    |     |              |
| AX-REM00K9020-IE |      |                  |    |     |      |     |    |     |              |
| AX-REM00K9017-IE |      |                  |    |     |      |     |    |     |              |

DIN rail mounting bracket



| Drive VZA□      |                              | DIN rail mounting bracket |
|-----------------|------------------------------|---------------------------|
| 1-phase 200 VAC | B0P1/ B0P2/ B0P4             | EZZ08122A                 |
|                 | B0P7/ B1P5                   | EZZ08122B                 |
|                 | B2P2                         | EZZ08122C                 |
|                 | B4P0                         | EZZ08122D                 |
| 3-phase 200 VAC | 20P1/ 20P2 / 20P4/ 20P7      | EZZ08122A                 |
|                 | 21P5/ 22P2                   | EZZ08122B                 |
|                 | 24P0                         | EZZ08122C                 |
| 3-phase 400 VAC | 40P2/ 40P4/ 40P7/ 41P5/ 42P2 | EZZ08122B                 |
|                 | 44P0                         | EZZ08122C                 |

# Heatsink attachment and Panel cut dimensions

Heatsink External Mounting Attachment

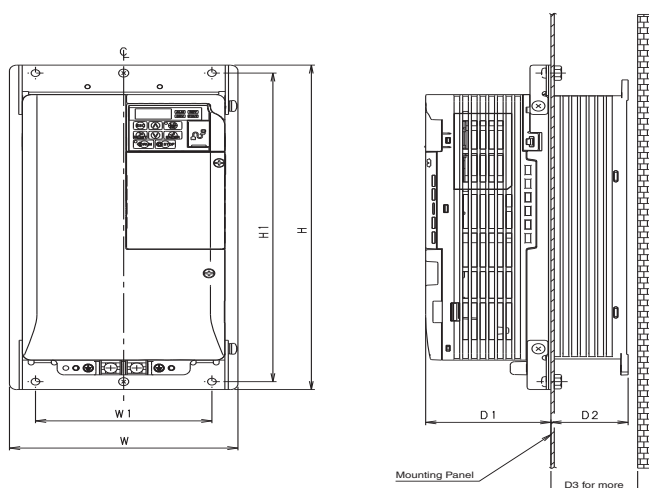


Fig 1

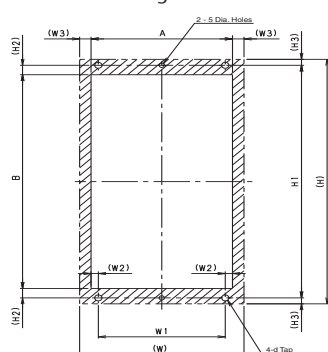


Fig 2

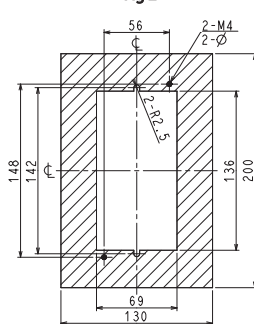


Fig 3

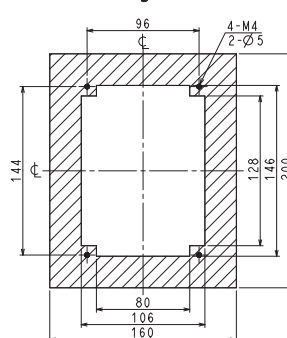
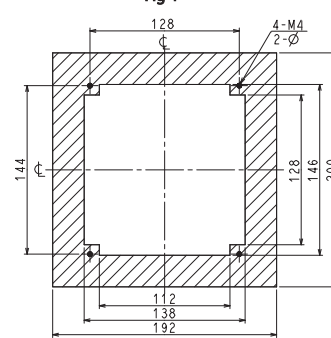


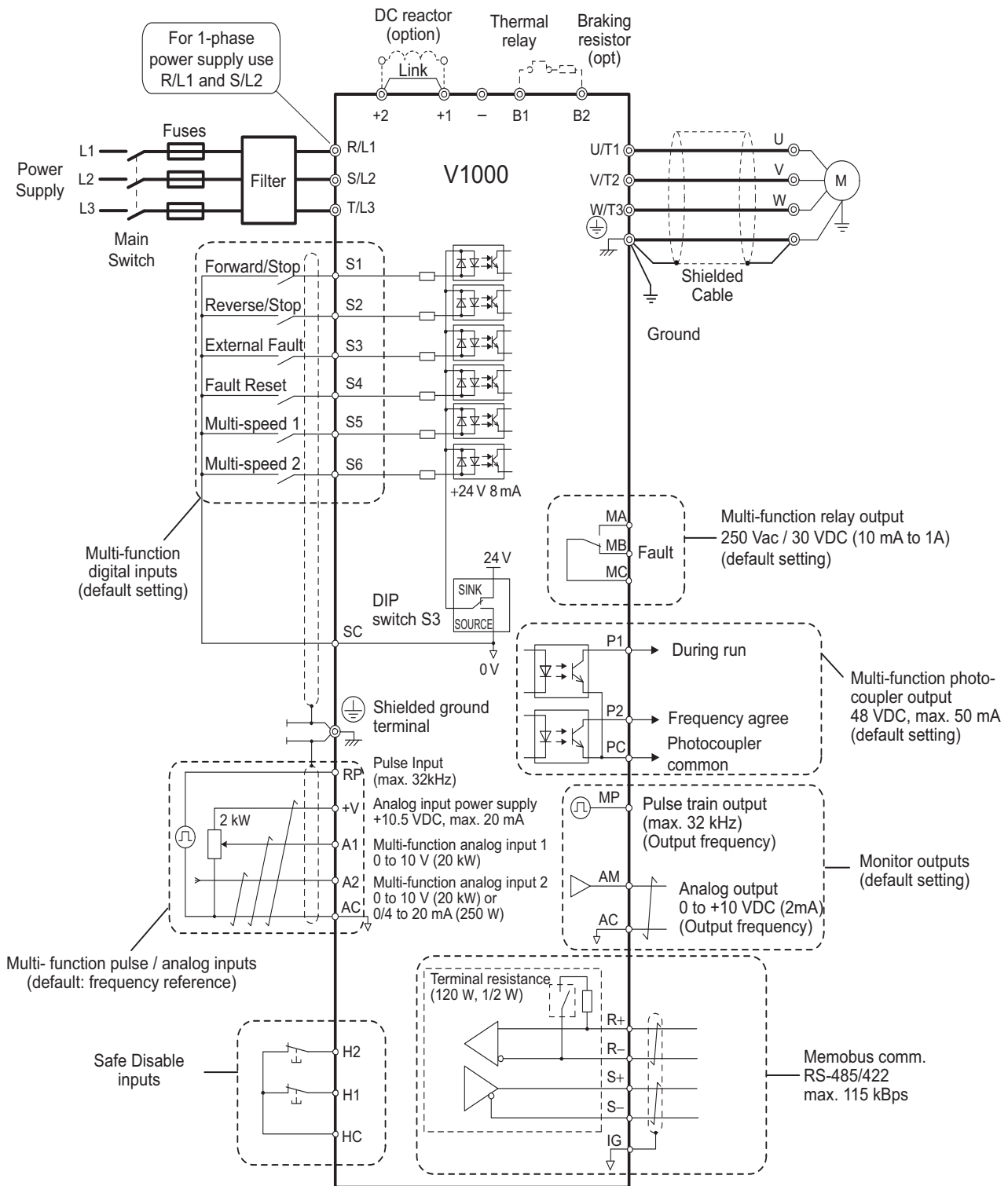
Fig 4



| VZA□    |      | Reference   | Frame |     |     |     |             |      |    | Panel Cutting |      |      |      |      |   |     |
|---------|------|-------------|-------|-----|-----|-----|-------------|------|----|---------------|------|------|------|------|---|-----|
|         |      |             | W     | H   | W1  | H1  | D1          | D2   | D3 | Fig           | (W2) | (W3) | (H2) | (H3) | A | B   |
| 1X200 V | B0P1 | 100-034-075 | 68    | 128 | 56  | 118 | 69.2        | 12   | 30 | 2             | -    |      |      |      |   |     |
|         | B0P2 |             |       |     |     |     |             |      |    |               |      |      |      |      |   |     |
|         | B0P4 |             |       |     |     |     | 79.2        | 42   | 50 |               |      |      |      |      |   |     |
|         | B0P7 | 100-035-418 | 108   |     | 96  |     | 79.5        | 58   | 70 | 3             | -    |      |      |      |   |     |
|         | B1P5 | 100-034-079 |       |     |     |     | 96          |      |    |               |      |      |      |      |   |     |
|         | B2P2 | 100-034-080 |       |     |     |     | 98          |      |    |               |      |      |      |      |   |     |
|         | B4P0 | 100-036-357 |       |     |     |     | 115         | 65   |    |               |      |      |      |      |   |     |
|         |      | 140         | 128   | 98  |     | 4   | -           |      |    |               |      |      |      |      |   |     |
|         |      | 170         | 158   | 115 |     |     |             |      |    |               |      |      |      |      |   |     |
| 3x200 V | 20P1 | 100-034-075 | 68    | 128 | 56  | 118 | 69.2        | 12   | 30 | 2             | -    |      |      |      |   |     |
|         | 20P2 |             |       |     |     |     |             |      |    |               |      |      |      |      |   |     |
|         | 20P4 |             |       |     |     |     |             | 42   | 50 |               |      |      |      |      |   |     |
|         | 20P7 | 62          |       |     |     |     | 70          |      |    |               |      |      |      |      |   |     |
|         | 21P5 | 100-034-079 | 108   |     | 96  |     | 71          | 58   | 70 | 3             | -    |      |      |      |   |     |
|         | 22P2 |             |       |     |     |     | 79.5        |      |    |               |      |      |      |      |   |     |
|         | 24P0 | 100-034-080 | 140   |     | 128 |     | 86.5        | 53.5 | 60 | 4             | -    |      |      |      |   |     |
|         | 25P5 | 100-036-300 | 158   | 286 | 122 | 272 | 86.6        | 53.4 | 60 | 1             |      |      |      |      |   | 9   |
|         | 27P5 |             |       |     |     |     |             |      |    |               | 10   | 10.5 | 180  | 287  |   |     |
|         | 2011 |             |       |     |     |     |             |      |    |               | 14   | 10.5 | 220  | 341  |   |     |
|         | 2015 | 100-036-302 | 241   | 380 | 192 | 362 | 110.6       | 76.4 | 85 |               |      |      |      |      |   |     |
| 3X400 V | 40P2 | 100-034-078 | 108   | 128 | 96  | 118 | 71          | 13.2 | 30 | 3             | -    |      |      |      |   |     |
|         | 40P4 | 100-036-418 |       |     |     |     |             | 28   | 40 |               |      |      |      |      |   |     |
|         | 40P7 |             |       |     |     |     | 79.5        |      |    |               |      |      |      |      |   |     |
|         | 41P5 |             |       |     |     |     | 100-034-079 | 96   | 58 |               |      |      |      |      |   | 70  |
|         | 42P2 |             |       |     |     |     |             |      |    |               |      |      |      |      |   |     |
|         | 43P0 |             |       |     |     |     |             |      |    |               |      |      |      |      |   |     |
|         | 44P0 | 100-034-080 | 140   |     | 128 |     | 78          | 65   | 4  | -             |      |      |      |      |   |     |
|         | 45P5 | 100-036-300 | 158   | 286 | 122 | 272 | 86.6        | 53.4 | 60 |               |      |      |      |      | 1 | 9   |
|         | 47P5 |             |       |     |     |     |             |      |    |               |      |      |      |      |   |     |
|         | 4011 | 100-036-301 | 198   | 322 | 160 | 308 |             |      |    | 73.4          | 80   | 10   | 10.5 | 180  |   | 287 |
| 4015    |      |             |       |     |     |     |             |      |    |               |      |      |      |      |   |     |

# Installation

## Standard connections



Symbols:

⊗ Use twisted pair cables

⊙ Indicates a main circuit terminal

⊗ Use shielded twisted pair cables

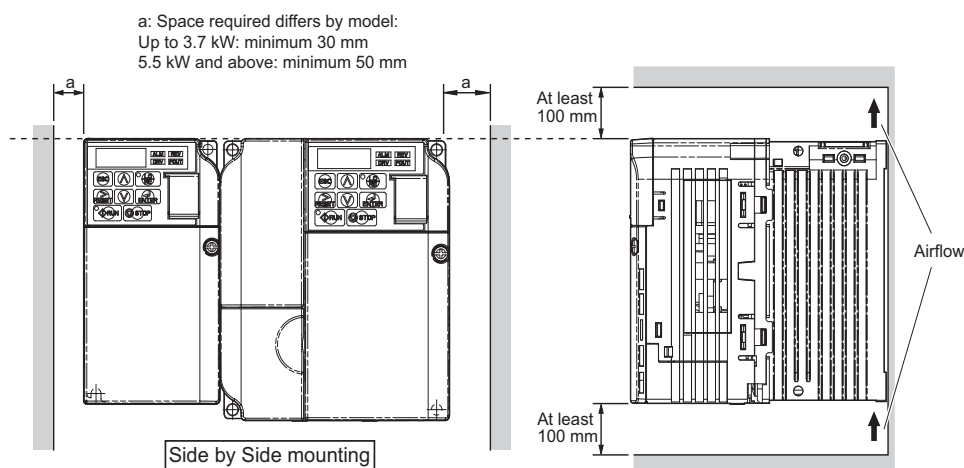
○ Indicates a control circuit terminal.

## Main circuit

| Terminal         | Name                            | Function (signal level)                                                                                                                                     |
|------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R/L1, S/L2, T/L3 | Main circuit power supply input | Used to connect line power to the drive.<br>Drives with single-phase 200 V input power use only terminals R/L1 and S/L2 (T/L3 is not connected to anything) |
| U/T1, V/T2, W/T3 | Drive output                    | Used to connect the motor                                                                                                                                   |
| B1, B2           | Braking resistor connection     | Available for connecting a braking resistor or the braking resistor unit option.                                                                            |
| +2, +1           | DC reactor connection           | Remove the short bar between +2 and +1 when connecting DC reactor (option)                                                                                  |
| +1, –            | DC power supply input           | For power supply input (+1: positive electrode; – : negative electrode)                                                                                     |
| ⊕                | Grounding                       | For grounding (grounding should conform to the local grounding code.)                                                                                       |

## Control Circuit

| Type                   | No. | Signal name                              | Function                                                                               | Signal level                                                          |
|------------------------|-----|------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Digital input signals  | S1  | Multi-function input selection 1         | Factory setting: runs when CLOSED, stops when OPEN.                                    | 24 VDC, 8 mA<br>photocoupler<br>insulation                            |
|                        | S2  | Multi-function input selection 2         | Factory setting: runs when CLOSED, stops when OPEN.                                    |                                                                       |
|                        | S3  | Multi-function input selection 3         | Factory setting: External Fault (N.O.)                                                 |                                                                       |
|                        | S4  | Multi-function input selection 4         | Factory setting: Fault reset                                                           |                                                                       |
|                        | S5  | Multi-function input selection 5         | Factory setting: Multi-step speed cmd 1                                                |                                                                       |
|                        | S6  | Multi-function input selection 6         | Factory setting: Multi-step speed cmd 2                                                |                                                                       |
|                        | SC  | Multi-function input selection<br>Common | Common for control signal                                                              |                                                                       |
| Analog input signals   | RP  | Main Speed Cmd Pulse Train Input         | 32 kHz max.                                                                            |                                                                       |
|                        | FS  | Power Supply for Frequency Setting       | +10 V (allowable max current 20 mA)                                                    |                                                                       |
|                        | FR1 | Main Speed Freq Ref                      | Voltage input or current input<br>0 to +10 VDC (20 kΩ) (resolution 1/1000)             |                                                                       |
|                        | FR2 |                                          | 4 to 20 mA (250 Ω) or 0 to 20 mA (250 Ω) Resolution: 1/500                             |                                                                       |
|                        | FC  | Frequency reference common               | 0 V                                                                                    |                                                                       |
| Fast Stop Cmd          | HC  | Power Supply Fast Stop Cmd               | +24 V (max allowable current 10 mA)                                                    |                                                                       |
|                        | H1  | Special Digital input                    | Open: Fast Stop   Closed: Normal Operation                                             |                                                                       |
|                        | H2  | Special Digital input                    |                                                                                        |                                                                       |
| Digital output signals | MA  | NO contact output                        | Factory setting: "fault"                                                               | Contact capacity<br>250 VAC,<br>1 A or less<br>30 VDC, 1 A<br>or less |
|                        | MB  | NC Output                                |                                                                                        |                                                                       |
|                        | MC  | Relay Output common                      |                                                                                        |                                                                       |
|                        | P1  | Photocoupler output 1                    | Factory setting: During run                                                            | Photocoupler output:<br>+48 VDC, 50 mA or<br>less                     |
|                        | P2  | Photocoupler output 2                    | Factory setting: Frequency Agree                                                       |                                                                       |
|                        | PC  | Photocoupler output common               | 0 V                                                                                    |                                                                       |
| Analog output signals  | PM  | Pulse train Output                       | max 33 kHz                                                                             |                                                                       |
|                        | AM  | Analog monitor output                    | Factory setting: "output frequency" 0 to +10 V output Resolution: 1/1000               | 0 to 10 V 2 mA<br>or less<br>Resolution: 8 bits                       |
|                        | AC  | Analog monitor common                    | 0 V                                                                                    |                                                                       |
| RS-485/422             | R+  | Communication input (+)                  | For MEMOBUS communication<br>operation by RS-485 or RS-422 communication is available. | RS-485/422<br>MEMOBUS<br>protocol                                     |
|                        | R-  | Communication input (-)                  |                                                                                        |                                                                       |
|                        | S+  | Communication output (+)                 |                                                                                        |                                                                       |
|                        | S-  | Communication output (-)                 |                                                                                        |                                                                       |



## Drive heat loss

### Single-phase 200 V class

| Model VZA               |                 | B0P1        | B0P2 | B0P4 | B0P7       | B1P5 | B2P2  | B4P0  |
|-------------------------|-----------------|-------------|------|------|------------|------|-------|-------|
| Drive capacity kVA      |                 | 0.3         | 0.6  | 1.1  | 1.9        | 3.0  | 4.2   | 6.7   |
| Rated current (A) at HD |                 | 0.8         | 1.6  | 3    | 5          | 8    | 11    | 17.5  |
| Rated current (A) at ND |                 | 1.2         | 1.9  | 3.5  | 6.0        | 9.6  | 12.0  | -     |
| Heat loss W HD          | Fin             | 4.3         | 7.9  | 16.1 | 42.5       | 54.8 | 70.7  | 110.5 |
|                         | Inside unit     | 7.4         | 8.9  | 11.5 | 19.0       | 25.9 | 34.1  | 51.4  |
|                         | Total heat loss | 11.7        | 16.7 | 27.7 | 61.5       | 80.7 | 104.8 | 161.9 |
| Heat loss W ND          | Fin             | 4.7         | 7.2  | 15.1 | 26.2       | 48.6 | 57.9  | 93.3  |
|                         | Inside unit     | 8.4         | 9.6  | 14.3 | 20.8       | 29.0 | 36.3  | 58.5  |
|                         | Total heat loss | 13.1        | 16.8 | 28.3 | 56.5       | 77.6 | 94.2  | 151.8 |
| Cooling Method          |                 | Self Cooled |      |      | Fan Cooled |      |       |       |

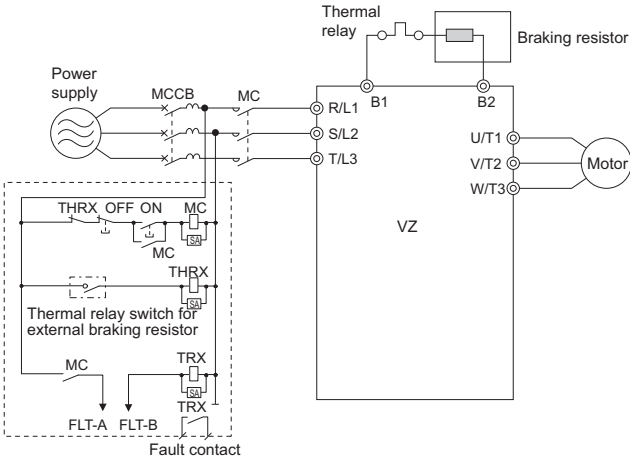
### Three-phase 200 V class

| Model VZA               |                 | 20P1        | 20P2 | 20P4 | 20P7       | 21P5 | 22P2  | 24P0  | 25P5  | 27P5  | 2011  | 2015  |
|-------------------------|-----------------|-------------|------|------|------------|------|-------|-------|-------|-------|-------|-------|
| Drive capacity kVA      |                 | 0.3         | 0.6  | 1.1  | 1.9        | 3.0  | 4.2   | 6.7   | 9.5   | 13    | 18    | 23    |
| Rated current (A) at HD |                 | 0.8         | 1.6  | 3    | 5          | 8    | 11    | 17.5  | 25    | 33    | 47.0  | 60.0  |
| Rated current (A) at ND |                 | 1.2         | 1.9  | 3.5  | 6.0        | 9.6  | 12.0  | 19.6  | 30.0  | 40.0  | 56.0  | 69.0  |
| Heat loss W HD          | Fin             | 4.3         | 7.9  | 16.1 | 27.4       | 54.8 | 70.7  | 110.5 | 231.5 | 239.5 | 347.6 | 437.7 |
|                         | Inside unit     | 7.3         | 8.8  | 11.5 | 15.9       | 23.8 | 30.0  | 43.3  | 72.2  | 81.8  | 117.6 | 151.4 |
|                         | Total heat loss | 11.6        | 16.7 | 27.7 | 43.3       | 78.6 | 100.6 | 153.8 | 303.7 | 321.3 | 465.2 | 589.1 |
| Heat loss W ND          | Fin             | 4.7         | 7.2  | 14.0 | 35.6       | 48.6 | 57.9  | 93.3  | 236.8 | 258.8 | 342.8 | 448.5 |
|                         | Inside unit     | 7.9         | 9.4  | 13.4 | 16.9       | 25.0 | 29.6  | 45.0  | 87.2  | 11.4  | 149.1 | 182.2 |
|                         | Total heat loss | 12.6        | 16.6 | 28.5 | 43.1       | 73.6 | 87.5  | 138.2 | 324.0 | 370.3 | 491.9 | 630.7 |
| Cooling Method          |                 | Self Cooled |      |      | Fan Cooled |      |       |       |       |       |       |       |

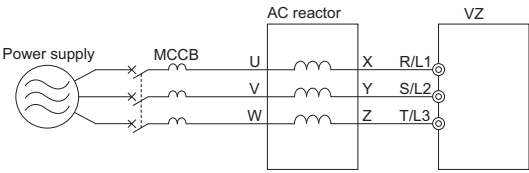
### Three-phase 400 V class

| Model VZA               |                 | 40P2        | 40P4 | 40P7 | 41P5       | 42P2  | 43P0  | 44P0  | 45P5  | 47P5  | 4011  | 4015  |
|-------------------------|-----------------|-------------|------|------|------------|-------|-------|-------|-------|-------|-------|-------|
| Drive capacity kVA      |                 | 0.9         | 1.4  | 2.6  | 3.7        | 4.2   | 5.5   | 7.2   | 9.2   | 14.8  | 18    | 24    |
| Rated current (A) at HD |                 | 1.2         | 1.8  | 3.4  | 4.8        | 5.5   | 7.2   | 9.2   | 14.8  | 18.0  | 24    | 31    |
| Rated current (A) at ND |                 | 1.2         | 2.1  | 4.1  | 5.4        | 6.9   | 8.8   | 11.1  | 17.5  | 23    | 31    | 38    |
| Heat loss W HD          | Fin             | 19.2        | 28.9 | 42.3 | 70.7       | 81.0  | 84.6  | 107.2 | 166.0 | 207.1 | 266.9 | 319.1 |
|                         | Inside unit     | 11.4        | 14.9 | 17.9 | 26.2       | 30.7  | 32.9  | 41.5  | 62.7  | 78.1  | 105.9 | 126.6 |
|                         | Total heat loss | 30.6        | 43.7 | 60.2 | 96.9       | 111.7 | 117.5 | 148.7 | 228.7 | 285.2 | 372.7 | 445.8 |
| Heat loss W ND          | Fin             | 8.2         | 15.5 | 26.4 | 37.5       | 49.7  | 55.7  | 71.9  | 170.3 | 199.5 | 268.6 | 298.7 |
|                         | Inside unit     | 9.2         | 13.1 | 15.8 | 20.0       | 26.3  | 29.4  | 43.6  | 78.1  | 105.3 | 142.8 | 152.2 |
|                         | Total heat loss | 17.4        | 28.6 | 42.2 | 57.5       | 76.0  | 85.1  | 115.5 | 248.4 | 304.8 | 411.4 | 450.9 |
| Cooling Method          |                 | Self Cooled |      |      | Fan Cooled |       |       |       |       |       |       |       |

# Connections for braking resistor

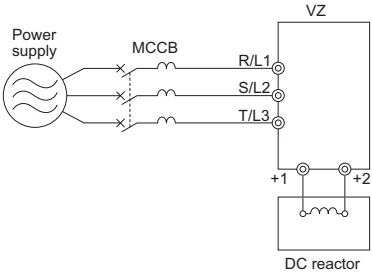


# Input AC Reactor



| 1 phase 200 V class             |                   |                 |               | 3 phase 200 V class             |                   |                 |               | 400 V class                     |                   |                 |               |
|---------------------------------|-------------------|-----------------|---------------|---------------------------------|-------------------|-----------------|---------------|---------------------------------|-------------------|-----------------|---------------|
| Max. applicable motor output kW | Reference         | Current value A | Inductance mH | Max. applicable motor output kW | Reference         | Current value A | Inductance mH | Max. applicable motor output kW | Reference         | Current value A | Inductance mH |
| 0.4                             | AX-RAI02000070-DE | 7.0             | 2.0           | 1.5                             | AX-RAI02800080-DE | 8.0             | 2.8           | 1.5                             | AX-RAI07700050-DE | 5.0             | 7.7           |
| 0.75                            | AX-RAI01700140-DE | 14.0            | 1.7           | 3.7                             | AX-RAI00880200-DE | 20.0            | 0.88          | 4.0                             | AX-RAI03500100-DE | 10.0            | 3.5           |
| 1.5                             | AX-RAI01200200-DE | 20.0            | 1.2           | 7.5                             | AX-RAI00350335-DE | 33.5            | 0.35          | 7.5                             | AX-RAI01300170-DE | 17.0            | 1.3           |
| 2.2                             | AX-RAI00630240-DE | 24.0            | 0.63          | 11                              | AX-RAI00180670-DE | 67.0            | 0.18          | 11                              | AX-RAI00740335-DE | 33.5            | 0.74          |
| -                               | -                 | -               | -             | 15                              | AX-RAI00091000-DE | 100.0           | 0.09          | 15                              | AX-RAI00360500-DE | 50.0            | 0.36          |

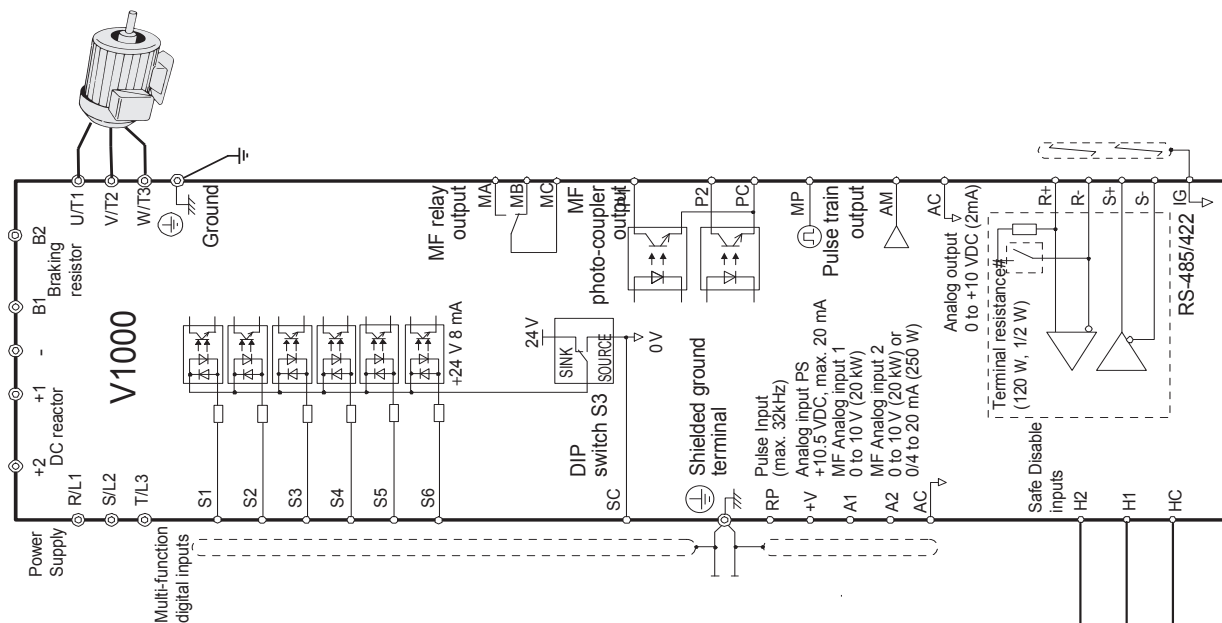
# DC Reactor



| 200 V class                     |                  |                 |               | 400 V class                     |                  |                 |               |
|---------------------------------|------------------|-----------------|---------------|---------------------------------|------------------|-----------------|---------------|
| Max. applicable motor output kW | Reference        | Current value A | Inductance mH | Max. applicable motor output kW | Reference        | Current value A | Inductance mH |
| 0.2                             | AX-RC21400016-DE | 1.6             | 21.4          | 0.4                             | AX-RC43000020-DE | 2.0             | 43.0          |
| 0.4                             | AX-RC10700032-DE | 3.2             | 10.7          | 0.7                             | AX-RC27000030-DE | 3.0             | 27.0          |
| 0.7                             | AX-RC06750061-DE | 6.1             | 6.75          | 1.5                             | AX-RC14000047-DE | 4.7             | 14.0          |
| 1.5                             | AX-RC03510093-DE | 9.3             | 3.51          | 2.2                             | AX-RC10100069-DE | 6.9             | 10.1          |
| 2.2                             | AX-RC02510138-DE | 13.8            | 2.51          | 3.0 to 4.0                      | AX-RC06400116-DE | 11.6            | 6.40          |
| 3.7                             | AX-RC01600223-DE | 22.3            | 1.60          | 5.5                             | AX-RC04410167-DE | 16.7            | 4.41          |
| 5.5                             | AX-RC01110309-DE | 30.9            | 1.11          | 7.5                             | AX-RC03350219-DE | 21.9            | 3.35          |
| 7.5                             | AX-RC00840437-DE | 43.7            | 0.84          | 11.0                            | AX-RC02330307-DE | 30.7            | 2.33          |
| 11.0                            | AX-RC00590614-DE | 61.4            | 0.59          | 15.0                            | AX-RC01750430-DE | 43.0            | 1.75          |
| 15.0                            | AX-RC00440859-DE | 85.9            | 0.44          | -                               | -                | -               | -             |

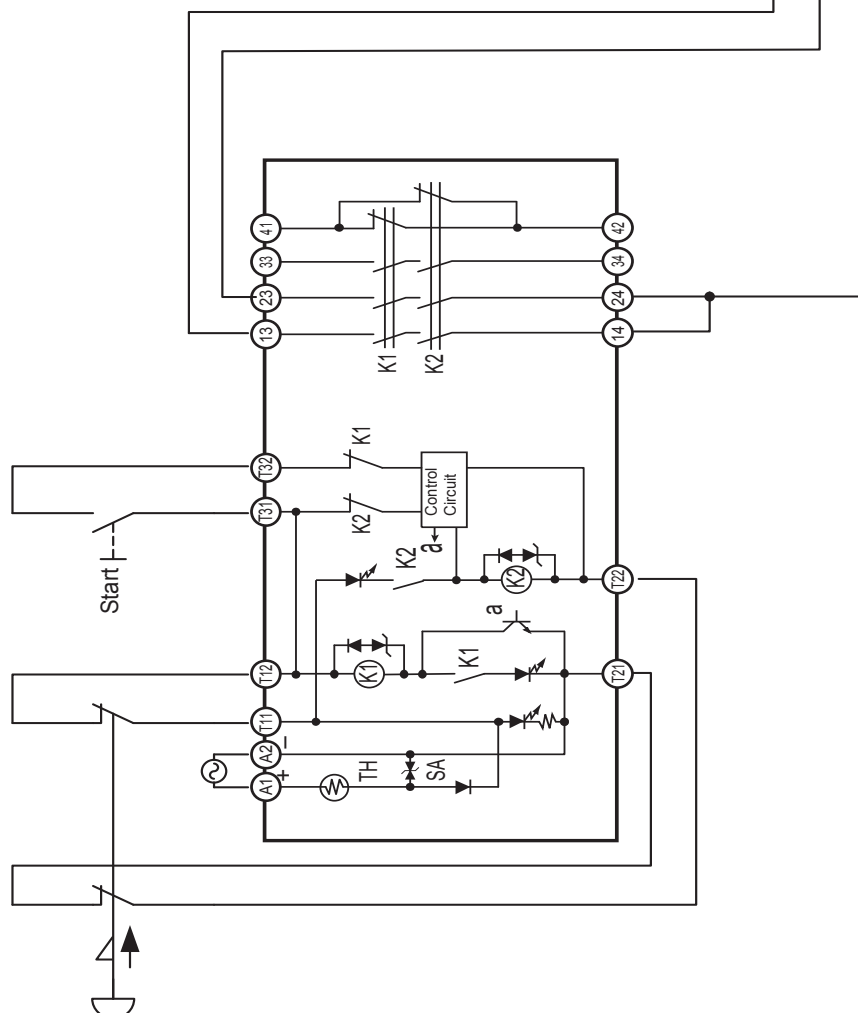
# Output AC Reactor

| 200 V class                     |                   |                 |               | 400 V class                     |                   |                 |               |
|---------------------------------|-------------------|-----------------|---------------|---------------------------------|-------------------|-----------------|---------------|
| Max. applicable motor output kW | Reference         | Current value A | Inductance mH | Max. applicable motor output kW | Reference         | Current value A | Inductance mH |
| 0.4                             | AX-RAO11500026-DE | 2.6             | 11.50         | 1.5                             | AX-RAO16300038-DE | 3.8             | 16.30         |
| 0.75                            | AX-RAO07600042-DE | 4.2             | 7.60          |                                 |                   |                 |               |
| 1.5                             | AX-RAO04100075-DE | 7.5             | 4.10          |                                 |                   |                 |               |
| 2.2                             | AX-RAO03000105-DE | 10.5            | 3.00          | 2.2                             | AX-RAO11800053-DE | 5.3             | 11.80         |
| 3.7                             | AX-RAO01830160-DE | 16.0            | 1.83          | 4.0                             | AX-RAO07300080-DE | 8.0             | 7.30          |
| 5.5                             | AX-RAO01150220-DE | 22.0            | 1.15          | 5.5                             | AX-RAO04600110-DE | 11.0            | 4.60          |
| 7.5                             | AX-RAO00950320-DE | 32.0            | 0.95          | 7.5                             | AX-RAO03600160-DE | 16.0            | 3.60          |
| 11                              | AX-RAO00630430-DE | 43.0            | 0.63          | 11                              | AX-RAO02500220-DE | 22.0            | 2.50          |
| 15                              | AX-RAO00490640-DE | 64.0            | 0.49          | 15                              | AX-RAO02000320-DE | 32.0            | 2.00          |

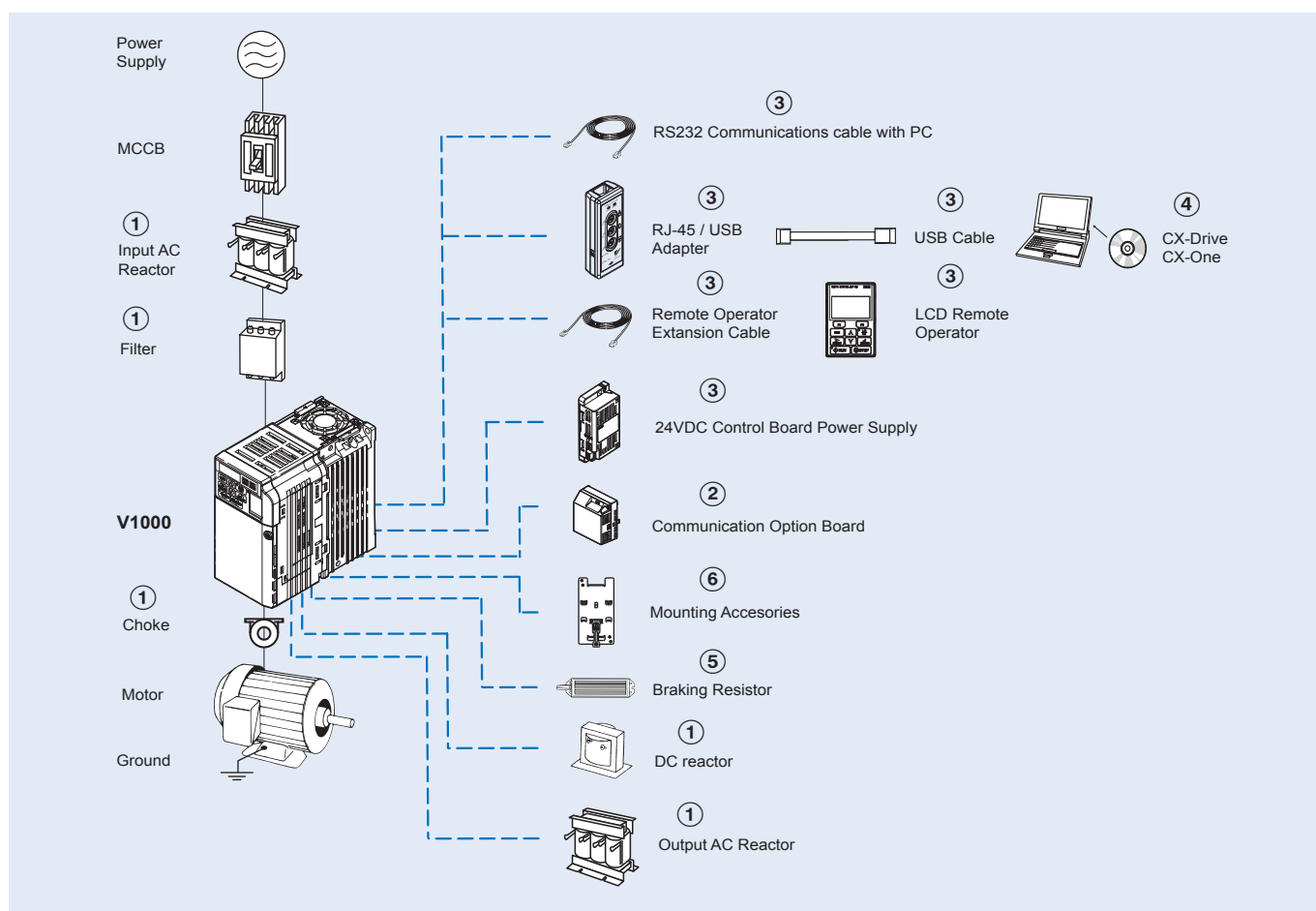


V1000 safe stop application using OMRON G9SB safety relay unit complies to safety category 3 according EN 954-1 / Stop category 0 according EN60204

Ensure V1000 and safety relay are mounted in the same cabinet to exclude cross circuit between H1 and H2



## Ordering information



### V1000

| Specifications |            |        |             |        | Model      |                 |
|----------------|------------|--------|-------------|--------|------------|-----------------|
|                | Heavy Duty |        | Normal Duty |        | Standard   | Built-in filter |
| 1x200 V        | 0.12 kW    | 0.8 A  | 0.18 kW     | 0.8 A  | VZAB0P1BAA | VZAB0P1EAB      |
|                | 0.25 kW    | 1.6 A  | 0.37 kW     | 1.6 A  | VZAB0P2BAA | VZAB0P2EAB      |
|                | 0.55 kW    | 3.0 A  | 0.75 kW     | 3.5 A  | VZAB0P4BAA | VZAB0P4EAB      |
|                | 1.1 kW     | 5.0 A  | 1.1 kW      | 6.0 A  | VZAB0P7BAA | VZAB0P7EAB      |
|                | 1.5 kW     | 8.0 A  | 2.2 kW      | 9.6 A  | VZAB1P5BAA | VZAB1P5EAB      |
|                | 2.2 kW     | 11.0 A | 3.0 kW      | 12.0 A | VZAB2P2BAA | VZAB2P2EAB      |
| 3x200 V        | 4.0 kW     | 17.5 A | 5.5 kW      | 21.0 A | VZAB4P0BAA | -               |
|                | 0.12 kW    | 0.8 A  | 0.18 kW     | 0.8 A  | VZA20P1BAA | -               |
|                | 0.25 kW    | 1.6 A  | 0.37 kW     | 1.6 A  | VZA20P2BAA | -               |
|                | 0.55 kW    | 3.0 A  | 0.75 kW     | 3.5 A  | VZA20P4BAA | -               |
|                | 1.1 kW     | 5.0 A  | 1.1 kW      | 6.0 A  | VZA20P7BAA | -               |
|                | 1.5 kW     | 8.0 A  | 2.2 kW      | 9.6 A  | VZA21P5BAA | -               |
|                | 2.2 kW     | 11.0 A | 3.0 kW      | 12.0 A | VZA22P2BAA | -               |
|                | 4.0 kW     | 17.5 A | 5.5 kW      | 21.0 A | VZA24P0BAA | -               |
|                | 5.5 kW     | 25.0 A | 7.5 kW      | 30.0 A | VZA25P5FAA | -               |
|                | 7.5 kW     | 33.0 A | 11.0 kW     | 40.0 A | VZA27P5FAA | -               |
| 3x400 V        | 11 kW      | 47.0 A | 15.0 kW     | 56.0 A | VZA2011FAA | -               |
|                | 15 kW      | 60.0 A | 18.5 kW     | 69.0 A | VZA2015FAA | -               |
|                | 0.37 kW    | 1.2 A  | 0.37 kW     | 1.2 A  | VZA40P2BAA | VZA40P2EAB      |
|                | 0.55 kW    | 1.8 A  | 0.75 kW     | 2.1 A  | VZA40P4BAA | VZA40P4EAB      |
|                | 1.1 kW     | 3.4 A  | 1.5 kW      | 4.1 A  | VZA40P7BAA | VZA40P7EAB      |
|                | 1.5 kW     | 4.8 A  | 2.2 kW      | 5.4 A  | VZA41P5BAA | VZA41P5EAB      |
|                | 2.2 kW     | 5.5 A  | 3.0 kW      | 6.9 A  | VZA42P2BAA | VZA42P2EAB      |
|                | 3.0 kW     | 7.2 A  | 4.0 kW      | 8.8 A  | VZA43P0BAA | VZA43P0EAB      |
|                | 4.0 kW     | 9.2 A  | 5.5 kW      | 11.1 A | VZA44P0BAA | VZA44P0EAB      |
|                | 5.5 kW     | 14.8 A | 7.5 kW      | 17.5 A | VZA45P5FAA | -               |
|                | 7.5 kW     | 18.0 A | 11.0 kW     | 23.0 A | VZA47P5FAA | -               |
|                | 11 kW      | 24.0 A | 15.0 kW     | 31.0 A | VZA4011FAA | -               |
|                | 15 kW      | 31.0 A | 18.5 kW     | 38.0 A | VZA4015FAA | -               |

① Line filters

| Drive             |                           | Standard                   |             | Low leakage                    |             |
|-------------------|---------------------------|----------------------------|-------------|--------------------------------|-------------|
| Voltage           | Model VZA□                | Reference                  | Current (A) | Reference                      | Current (A) |
| 1Phase<br>200 VAC | B0P1 / B0P2 / B0P4        | AX-FIC1010-SE              | 7.3         | AX-FIC1010-SE-LL               | 7.3         |
|                   | B0P7                      | AX-FIC1020-SE              | 13.8        | AX-FIC1020-SE-LL               | 13.8        |
|                   | B1P5                      | AX-FIM1024-SE <sup>1</sup> | 27          | AX-FIM1024-SE-LL <sup>*1</sup> | 27          |
|                   |                           | AX-FIC1030-SE <sup>2</sup> | 24          | AX-FIC1030-SE-LL <sup>*2</sup> | 24          |
|                   | B2P2                      | AX-FIC1030-SE              | 24          | AX-FIC1030-SE-LL               | 24          |
|                   | B4P0                      | AX-FIC1040-SE              | 35          | AX-FIC1040-SE-LL               | 35          |
| 3Phase<br>200 VAC | 20P1 / 20P2 / 20P4 / 20P7 | AX-FIC4010-SE              | 9.4         | AX-FIC4010-SE-LL               | 9.4         |
|                   | 21P5 / 22P2               | AX-FIC4015-SE              | 14          | AX-FIC4015-SE-LL               | 14          |
|                   | 24P0                      | AX-FIC4030-SE              | 24          | AX-FIC4030-SE-LL               | 24          |
|                   | 25P0                      | AX-FIC4050-SE              | 44          | AX-FIC4050-SE-LL               | 44          |
|                   | 27P5 / 2011 / 2015        | AX-FIC4080-SE              | 81          | AX-FIC4080-SE-LL               | 81          |
|                   | 2015                      | AX-FIC4100-SE              | 100         | -                              | -           |
| 3Phase<br>400 VAC | 40P2 / 40P4 / 4004        | AX-FIC4005-SE              | 4.3         | AX-FIC4005-SE-LL               | 4.3         |
|                   | 40P7 / 41P5 / 42P2        | AX-FIC4010-SE              | 9.4         | AX-FIC4010-SE-LL               | 9.4         |
|                   | 43P0                      | AX-FIC4015-SE              | 14          | AX-FIC4015-SE-LL               | 14          |
|                   | 44P0 / 45P5               | AX-FIC4030-SE              | 24          | AX-FIC4030-SE-LL               | 24          |
|                   | 47P5 / 4011               | AX-FIC4050-SE              | 44          | AX-FIC4050-SE-LL               | 44          |
|                   | 4015                      | AX-FIC4080-SE              | 81          | AX-FIC4080-SE-LL               | 81          |

1. No UL approved  
2. No footprint

Note: 200 V Three-phase filters are not footprint.

① Input AC reactors

| Drive           |                           | AC Reactor        |
|-----------------|---------------------------|-------------------|
| Voltage         | Model VZA□                | Reference         |
| 1-Phase 200 VAC | B0P1 / B0P2 / B0P4        | AX-RAI02000070-DE |
|                 | B0P7                      | AX-RAI01700140-DE |
|                 | B1P5                      | AX-RAI01200200-DE |
|                 | B2P2                      | AX-RAI00630240-DE |
|                 | B4P0                      | -                 |
| 3-Phase 200 VAC | 20P1 / 20P2 / 20P4 / 20P7 | AX-RAI02800080-DE |
|                 | 21P5 / 22P2 / 24P0        | AX-RAI00880200-DE |
|                 | 25P5 / 27P5               | AX-RAI00350335-DE |
|                 | 2011 / 2015               | AX-RAI00180670-DE |
| 3-Phase 400 VAC | 40P2 / 40P4 / 40P7 / 41P5 | AX-RAI07700050-DE |
|                 | 42P2 / 43P0 / 44P0        | AX-RAI03500100-DE |
|                 | 45P5 / 47P5               | AX-RAI01300170-DE |
|                 | 4011 / 4015               | AX-RAI00740335-DE |

① DC reactors

| 200V 1-phase |                  | 200V 3-phase |                  | 400V 3-phase |                  |
|--------------|------------------|--------------|------------------|--------------|------------------|
| Model VZA□   | DC Reactor       | Model VZA□   | DC Reactor       | Model VZA□   | DC Reactor       |
| B0P1         | AX-RC10700032-DE | 20P1         | AX-RC21400016-DE | 40P2 / 40P4  | AX-RC43000020-DE |
| B0P2         |                  | 20P2         |                  | 40P7         | AX-RC27000030-DE |
| B0P4         | AX-RC06750061-DE | 20P4         | AX-RC10700032-DE | 41P5         | AX-RC14000047-DE |
| B0P7         | AX-RC03510093-DE | 20P7         | AX-RC06750061-DE | 42P2         | AX-RC10100069-DE |
| B1P5         | AX-RC02510138-DE | 21P5         | AX-RC03510093-DE | 43P0 / 44P0  | AX-RC06400116-DE |
| B2P2         | AX-RC01600223-DE | 22P2         | AX-RC02510138-DE | 45P5         | AX-RC04410167-DE |
| B4P0         | -                | 24P0         | AX-RC01600223-DE | 47P5         | AX-RC03350219-DE |
| -            | -                | 25P5         | AX-RC01110309-DE | 4011         | AX-RC02330307-DE |
|              |                  | 27P5         | AX-RC00840437-DE | 4015         | AX-RC01750430-DE |
|              |                  | 2011         | AX-RC00590614-DE | -            |                  |
|              |                  | 2015         | AX-RC00440859-DE |              |                  |

## ① Chokes

| Model         | Diameter | Description                |
|---------------|----------|----------------------------|
| AX-FER2102-RE | 21       | For 2.2 KW motors or below |
| AX-FER2515-RE | 25       | For 15 KW motors or below  |
| AX-FER5045-RE | 50       | For 45 KW motors or below  |

## ① Output AC reactor

| Drive   |                                          | AC Reactor        |
|---------|------------------------------------------|-------------------|
| Voltage | Model VZA□                               | Reference         |
| 200 VAC | B0P1 / B0P2 / B0P4<br>20P1 / 20P2 / 20P4 | AX-RAO11500026-DE |
|         | B0P7 / 20P7                              | AX-RAO07600042-DE |
|         | B1P5 / 21P5                              | AX-RAO04100075-DE |
|         | B2P2 / 22P2                              | AX-RAO03000105-DE |
|         | B4P0 / 24P0                              | AX-RAO01830160-DE |
|         | 25P5                                     | AX-RAO01150220-DE |
|         | 27P5                                     | AX-RAO00950320-DE |
|         | 2011                                     | AX-RAO00630430-DE |
|         | 2015                                     | AX-RAO00490640-DE |
| 400 VAC | 40P2 / 40P4 / 40P7 / 41P5                | AX-RAO16300038-DE |
|         | 42P2                                     | AX-RAO11800053-DE |
|         | 43P0 / 44P0                              | AX-RAO07300080-DE |
|         | 45P5                                     | AX-RAO04600110-DE |
|         | 47P5                                     | AX-RAO03600160-DE |
|         | 4011                                     | AX-RAO02500220-DE |
|         | 4015                                     | AX-RAO02000320-DE |

## ② Communication cards

| Type                       | Model    | Description                 | Function                                                                                                                                                                                                       |
|----------------------------|----------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Communication option board | SI-N3/V  | DeviceNet option card       | • Used for running or stopping the drive, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.       |
|                            | SI-P3/V  | PROFIBUS-DP option card     | • Used for running or stopping the drive, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.     |
|                            | SI-S3/V  | CANopen option card         | • Used for running or stopping the drive, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.         |
|                            | SI-T3/V  | MECHATROLINK-II option card | • Used for running or stopping the drive, setting or referencing parameters, and monitoring output frequency, output current, or similar items through MECHATROLINK-II communication with the host controller. |
|                            | SI-ES3/V | EtherCAT option card        | • Used for running or stopping the drive, setting or referencing parameters, and monitoring output frequency, output current, or similar items through EtherCAT communication with the host controller.        |
|                            | SI-EP3/V | PROFINET option card        | • Used for running or stopping the drive, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFINET communication with the host controller.        |

## ③ Accessories

| Types            | Model             | Description               | Functions                                                   |
|------------------|-------------------|---------------------------|-------------------------------------------------------------|
| Digital operator | JVOP-180          | LCD remote operator       | LCD Display operator with language support                  |
|                  | A1000-CAVOP300-EE | Remote operator cable     | 3 meters cable for connecting remote operator               |
| Accessories      | JVOP-181          | USB converter / USB cable | USB converter unit with copy and backup function            |
|                  | PS-V10S           | 24 VDC option board       | 24VDC control board power supply VZA-B/2/4 from 0.1 to 4 KW |
|                  | PS-V10M           |                           | 24VDC control board power supply VZA-2/4 from 5.5 to 15 KW  |
|                  | A1000-CAVPC232-EE | PC connection cable       | RS232 PC tool connection cable                              |

## ④ Computer software

| Types    | Model    | Description       | Installation                               |
|----------|----------|-------------------|--------------------------------------------|
| Software | CX-Drive | Computer software | Configuration and monitoring software tool |
|          | CX-One   | Computer software | Configuration and monitoring software tool |

## ⑤ Braking unit, braking resistor unit

| Drive                       |               |                  |         |                               | Braking resistor unit                  |          |                  |
|-----------------------------|---------------|------------------|---------|-------------------------------|----------------------------------------|----------|------------------|
| Voltage                     | Max. motor kW | Drive model VZA□ |         | Connectable min. resistance Ω | Drive mounted type (3 %ED, 10 sec max) |          | Braking torque % |
|                             |               | 1-phase          | 3-phase |                               | Type AX-                               | Resist Ω |                  |
| 200 V (single-/three-phase) | 0.12          | B0P1             | 20P1    | 300                           | REM00K1400-IE                          | 400      | 135              |
|                             | 0.25          | B0P2             | 20P2    |                               |                                        |          | 120              |
|                             | 0.55          | B0P4             | 20P4    | 200                           | REM00K1200-IE                          | 200      | 120              |
|                             | 1.1           | B0P7             | 20P7    | 120                           |                                        |          | 70               |
|                             | 1.5           | B1P5             | 21P5    | 60                            | REM00K2070-IE                          | 70       | 190              |
|                             | 2.2           | B2P2             | 22P2    |                               |                                        |          | 120              |
|                             | 4.0           | B4P0             | 24P0    | 32                            | REM00K4035-IE                          | 35       | 135              |
|                             | 5.5           | –                | 25P5    | 16                            |                                        |          | 75               |
|                             | 7.5           | –                | 27P5    | 9.6                           |                                        |          | REM00K6035-IE    |
|                             | 11            | –                | 2011    |                               | 40                                     |          |                  |
|                             | 15            | –                | 2015    |                               | REM00K9017-IE                          | 17       |                  |
| 400 V (three-phase)         | 0.37          | –                | 40P2    | 750                           | 2 x REM00K1400-IE                      | 800      | 270              |
|                             | 0.55          | –                | 40P4    |                               |                                        |          | 270              |
|                             | 1.1           | –                | 40P7    | 510                           |                                        |          | 270              |
|                             | 1.5           | –                | 41P5    | 240                           | REM00K1400-IE                          | 400      | 130              |
|                             | 2.2           | –                | 42P2    | 200                           | REM00K2200-IE                          | 200      | 130              |
|                             | 3.0           | –                | 43P0    | 100                           | REM00K2120-IE                          | 120      | 215              |
|                             | 4.0           | –                | 44P0    |                               |                                        |          | 160              |
|                             | 5.5           | –                | 45P5    | 32                            | REM00K4035-IE                          | 35       | 140              |
|                             | 7.5           | –                | 47P5    |                               |                                        |          | 80               |
|                             | 11            | –                | 4011    | 20                            | REM00K6035-IE                          | 35       | 50               |
|                             | 15            | –                | 4015    |                               | REM00K9020-IE                          | 20       | 55               |

## ⑥ Mounting accessories

| Types                                 | Model       | Description                                                            | Applicable models VZA□                             |
|---------------------------------------|-------------|------------------------------------------------------------------------|----------------------------------------------------|
| DIN Rail                              | EZZ08122A   | Necessary to mount the drive on a DIN rail                             | B0P1/B0P2/B0P4<br>20P1/20P2/20P4/20P7              |
|                                       | EZZ08122B   |                                                                        | B0P7/B1P5<br>21P5/22P2<br>40P2/40P4/40P7/41P5/42P2 |
|                                       | EZZ08122C   |                                                                        | B2P2<br>24P0<br>44P0                               |
|                                       | EZZ08122D   |                                                                        | B4P0                                               |
| Heatsink external mounting attachment | 100-034-075 | Additional items to mount the drive with the heatsink out of the panel | B0P1/B0P2<br>20P1/20P2                             |
|                                       | 100-034-076 |                                                                        | B0P4<br>20P4                                       |
|                                       | 100-034-077 |                                                                        | 20P7                                               |
|                                       | 100-034-078 |                                                                        | 40P2                                               |
|                                       | 100-034-079 |                                                                        | B1P5<br>21P5/22P2<br>41P5/42P2/43P0                |
|                                       | 100-034-080 |                                                                        | B2P2<br>24P0<br>44P0                               |
|                                       | 100-036-357 |                                                                        | B4P0                                               |
|                                       | 100-036-418 |                                                                        | B0P7<br>40P2/40P4                                  |
|                                       | 100-036-300 |                                                                        | 25P5/27P5<br>45P5/47P5                             |
|                                       | 100-036-301 |                                                                        | 2011<br>4011/4015                                  |
|                                       | 100-036-302 |                                                                        | 2015                                               |

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.