

**BRETZEL GmbH**  
Antriebs- und Elektrotechnik  
Am Rotböhl 8  
64331 Weiterstadt  
  
[www.bretzel-gmbh.de](http://www.bretzel-gmbh.de)  
[info@bretzel-gmbh.de](mailto:info@bretzel-gmbh.de)  
Telefon: 0 61 50 / 8 65 60 - 0

# R1000

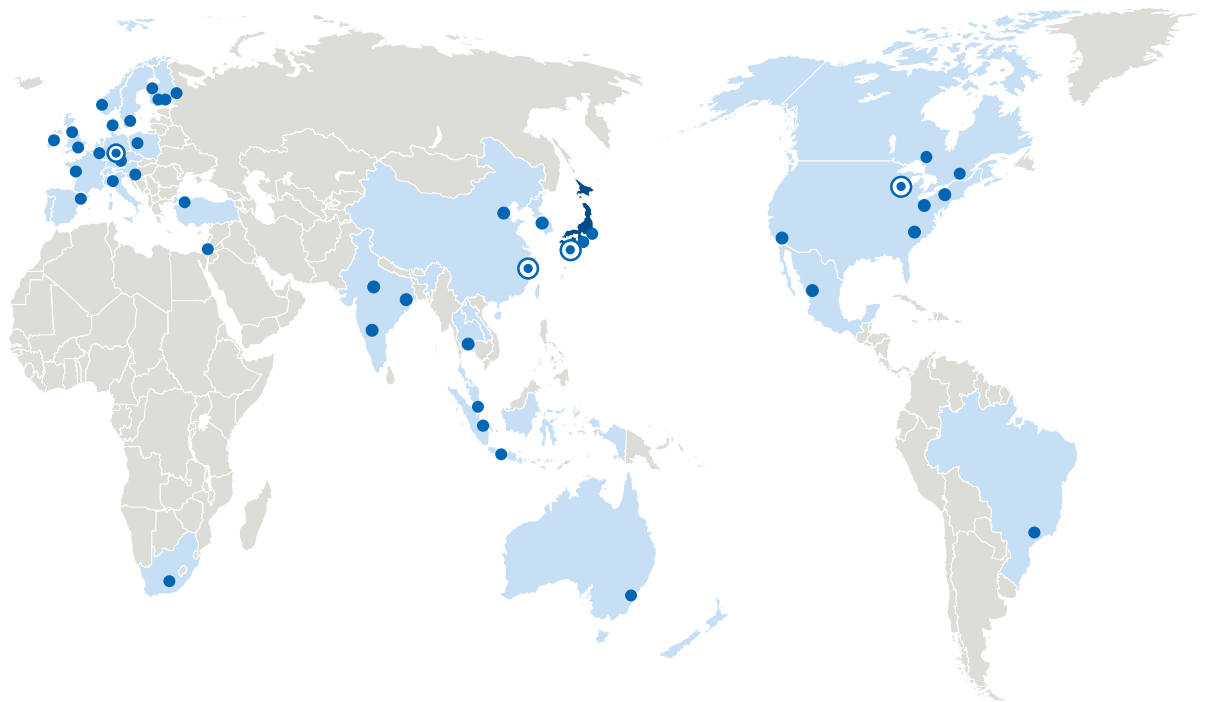
Regenerative Unit



# The power regenerative unit

The R1000 regenerative braking unit is a smart and efficient alternative to dynamic braking for single or multi-axis drive installations with high amounts of regenerative motor operation. Instead of wasting it as heat, the R1000 feeds excessive braking energy back to the grid, thus reducing the energy consumption of the installation.

Wherever you are -  
Our support team is always close to you



More than **14,500** employees worldwide

More than **1,350** employees in our global service network

More than **1,600** employees in europe



### Energy efficient four-quadrant

R1000 saves energy by making excessive braking energy available to other consumers in the same grid instead of wasting it as heat. R1000 provides high duty cycle braking capability, thus it can shorten machine cycles and increase productivity of machinery.



### Smart system design

R1000 is purely selected by braking power and can therefore be selected smaller than the drive it is connected to. Thus it allows to minimize system space, optimize cost and maximize efficiency.



### Save energy cost

Especially in high duty braking applications such as cranes, escalators or lifts the R1000 provides numerous advantages. The small installation space and low heat generation impact installation cost, while using the regenerated energy reduces the running cost so that the R1000 pays back in a short period.



### Cool operation

R1000 eliminates the need for safely located braking resistors, thus saving valuable space and reducing the risk of fire. Less heat is generated so that the demand for ventilation is greatly reduced. Maintenance, e.g. for resistor cleaning, is not necessary.



### Compatible

R1000 regenerative units can be used with any conventional drive that has full access to the DC bus.



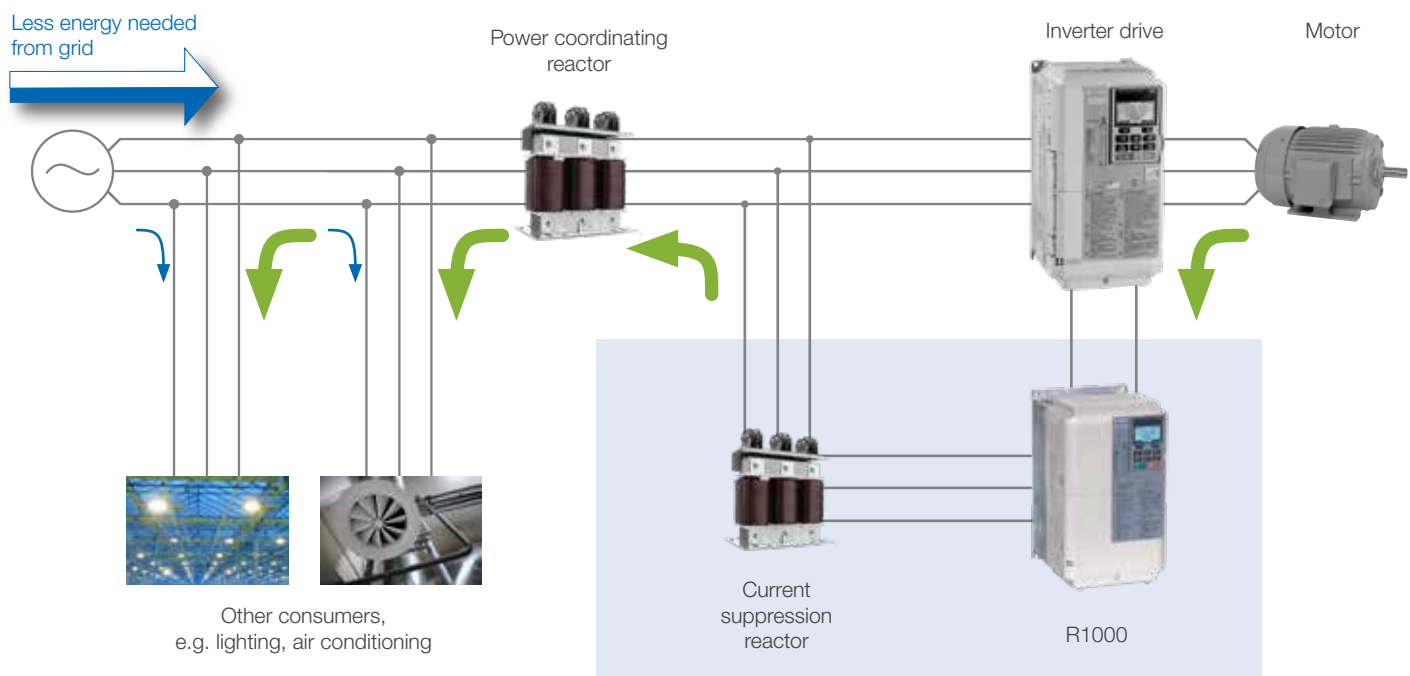
### Easy to handle package

R1000 comes in an easy to handle package. Only one material number for all components makes procurement simple and assures completeness and parts compatibility.



# Save energy with power regeneration

The R1000 avoids wasted energy by delivering it back to the power source for use by other loads. R1000 can be used to maximize efficiency of single- and multi-axis systems.



## Economical dynamic braking

The R1000 provides the most economical way of dynamic braking by

- Selection purely by braking power – R1000 can be smaller than the drive
- Less energy consumption from grid as other consumers in the same installation can use braking energy
- Less space and heat by removed braking choppers and resistors
- Reduced ventilation requirements by less heat emission

## Flexible application

The R1000 can be used on single drives as well as in drives, servo or other systems that have an interconnected DC bus.

## Compatible

The R1000 can work with all conventional drives having full power access to DC bus. By that it is the perfect match when planning energy efficient new installations or upgrading existing ones.

# For a wide range of applications



- Elevators, lifts, escalators
- Centrifuges, winders, downhill conveyors
- Cranes, hoists

- Saws, large fans, machine tool spindles
- Presses, dryers, vibratory equipment
- and many other applications

# Package selection

Use one of the following methods to determine what you need for your application.

## 1a. Determine braking power

- Select a kit using the maximum regenerative (braking) power.  
Select an R1000 kit with a power rating higher than the calculated braking power, keeping in mind the R1000 duty cycle and overload capability (150 % for 30 seconds).

| Max. regenerative power [kW] | 3.5   | 5    | 7    | 10   | 14   | 17   | 20   | 28   | 35   | 43   | 53   | 73   | 105  | 150  | 210  | 300  |
|------------------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| R1000 Kit<br>R1KIT4____AA□AA | 0003  | 0005 | 0007 | 0010 | 0014 | 0017 | 0020 | 0028 | 0035 | 0043 | 0053 | 0073 | 0105 | 0150 | 0210 | 0300 |
| Braking Torque               | 150 % braking torque for 30 s<br>100 % braking torque for 30 s with 25 % ED<br>80 % braking torque continuous |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

## 1b. If the braking power is unknown

- Select a kit using the motor/drive capacity.

| Motor/Drive capacity [kW]    | 4.0 or less | 5.5  | 7.5  | 11   | 15   | 18.5 | 22   | 30   | 37   | 45   | 55   | 75   | 110  | 160  | 220  | 315  |
|------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| R1000 Kit<br>R1KIT4____AA□AA | 0003        | 0005 | 0007 | 0010 | 0014 | 0017 | 0020 | 0028 | 0035 | 0043 | 0053 | 0073 | 0105 | 0150 | 0210 | 0300 |

## 2. Power coordinating reactor

- Select a power coordinating reactor and EMC filter according to the drive used.

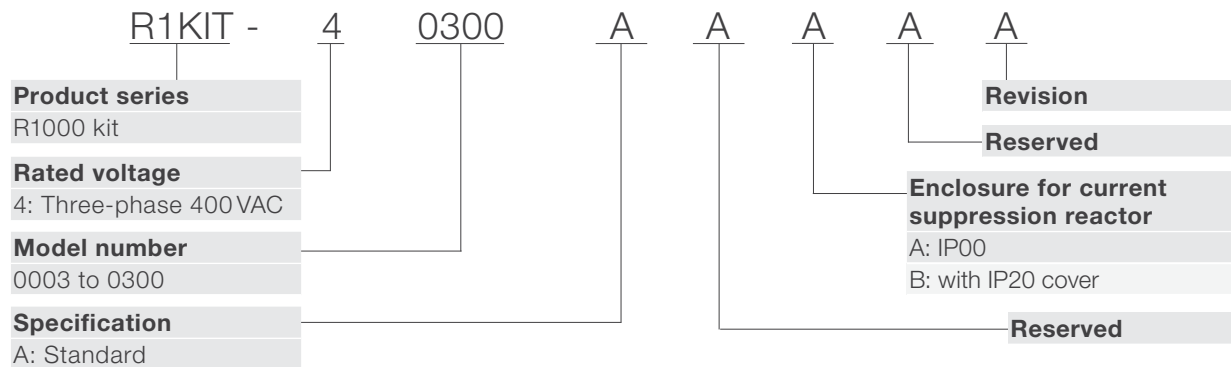
### A1000 and V1000 general inverter

| A1000 drive<br>CIMR-AC4A | V1000 drive<br>CIMR-VC4A | Power coordinating<br>reactor | EMC filter     |
|--------------------------|--------------------------|-------------------------------|----------------|
| 0002                     | 0002                     | LR3 40-4/2                    | HLD 110-500/8  |
| 0004                     | 0004                     | LR3 40-4/4                    | HLD 110-500/8  |
| 0005                     | 0005                     | LR3 40-4/6                    | HLD 110-500/8  |
| 0007                     | 0007                     | LR3 40-4/10                   | HLD 110-500/8  |
| 0009                     | 0009                     | LR3 40-4/10                   | HLD 110-500/12 |
| 0011                     | 0011                     | LR3 40-4/16                   | HLD 110-500/16 |
| 0018                     | 0018                     | LR3 40-4/20                   | HLD 110-500/30 |
| 0023                     | 0023                     | LR3 40-4/25                   | HLD 110-500/30 |
| 0031 / 0038              | 0031 / 0038              | LR3 40-4/45                   | HLD 110-500/42 |
| 0044 / 0058              |                          | LR3 40-4/63                   | FB-40060A      |
| 0072                     |                          | LR3 40-4/70                   | FB-40072A      |
| 0088                     |                          | LR3 40-4/90                   | FB-40105A      |
| 0103                     |                          | LR3 40-4/115                  | FB-40105A      |
| 0139 / 0165              |                          | LR3 40-4/160                  | FB-40170A      |
| 0208                     |                          | LR3 40-4/200                  | FB-40250A      |
| 0250                     |                          | LR3 40-4/250                  | FB-40250A      |
| 0296                     |                          | LR3 40-4/300                  | FB-40414A      |
| 0362 / 0414              |                          | LR3 40-4/400                  | FB-40414A      |
| 0515                     |                          | LR3 40-4/500                  | FB-40675A      |
| 0675                     |                          | LR3 40-4/710                  | FB-40675A      |
| 0930 / 1200              |                          | LR3 40-4/1200                 | FB-41200A      |

### L1000A and L1000V lift inverter

| L1000A drive<br>CIMR-LC4F | L1000V drive<br>CIMR-LC4V | EN12015 compliant<br>power coordinating<br>reactor | EMC filter     |
|---------------------------|---------------------------|--|----------------|
| 0005                      | 0009                      | B 1103136  | HLD 110-500/8  |
| 0006                      | 0015                      | B 1103136  | HLD 110-500/8  |
| 0009                      | 0018                      | B 1103136  | HLD 110-500/8  |
| 0015                      | 0024                      | B 1103138  | HLD 110-500/8  |
| 0018                      | 0031                      | B 1103138  | HLD 110-500/12 |
| 0024                      |                           | B 1103139  | HLD 110-500/16 |
| 0031                      |                           | B 1103140  | HLD 110-500/30 |
| 0039                      |                           | B 1103141  | HLD 110-500/30 |
| 0045                      |                           | B 1103141  | HLD 110-500/42 |
| 0060                      |                           | B 1103142  | HLD 110-500/42 |
| 0075                      |                           | B 1103142  | FB-40105A      |
| 0091                      |                           | B 0910013  | FB-40105A      |
| 0112                      |                           | B 0910013  | FB-40170A      |
| 0150                      |                           | B 1411053  | FB-40170A      |
| 0180                      |                           | B 1411053  | FB-40250A      |
| 0216                      |                           | 2 x B 0910013                                      | FB-40250A      |

# Model designation



| Model number | Ratings            |                                |                       | Part numbers     |                                   |  |
|--------------|--------------------|--------------------------------|-----------------------|------------------|-----------------------------------|--|
|              | Regenerative power | Max. applicable motor capacity | Rated current AC / DC | R1000 unit       | Current suppression reactor (1 %) | Optional IP20 Cover for current suppression reactor (optional) |
| 0003         | 3.5kW              | 3.7kW                          | 5A / 7A               | CIMR-RC4A03P5FAA | B1509105                          | IP20-Box31   |
| 0005         | 5kW                | 5.5kW                          | 8A / 11A              | CIMR-RC4A0005FAA | B1509105                          | IP20-Box31   |
| 0007         | 7kW                | 7.5kW                          | 11A / 15A             | CIMR-RC4A0007FAA | B1509106                          | IP20-Box31   |
| 0010         | 10kW               | 11kW                           | 16A / 22A             | CIMR-RC4A0010FAA | B1509107                          | IP20-Box31   |
| 0014         | 14kW               | 15kW                           | 22A / 30A             | CIMR-RC4A0014FAA | B1509108                          | IP20-Box31   |
| 0017         | 17kW               | 18.5kW                         | 27A / 36A             | CIMR-RC4A0017FAA | B1509108                          | IP20-Box31   |
| 0020         | 20kW               | 22kW                           | 32A / 43A             | CIMR-RC4A0020FAA | B1509109                          | IP20-Box31   |
| 0028         | 28kW               | 30kW                           | 43A / 58A             | CIMR-RC4A0028FAA | B1509110                          | IP20-Box32   |
| 0035         | 35kW               | 37kW                           | 54A / 73A             | CIMR-RC4A0035AAA | B1504118                          | IP20-Box32   |
| 0043         | 43kW               | 45kW                           | 66A / 89A             | CIMR-RC4A0043AAA | B1509111                          | IP20-Box32   |
| 0053         | 53kW               | 55kW                           | 81A / 109A            | CIMR-RC4A0053AAA | B1509112                          | IP20-Box33   |
| 0073         | 73kW               | 75kW                           | 110A / 149A           | CIMR-RC4A0073AAA | B1509113                          | IP20-Box35   |
| 0105         | 105kW              | 110kW                          | 161A / 217A           | CIMR-RC4A0105AAA | B1509114                          | IP20-Box35   |
| 0150         | 150kW              | 160kW                          | 237A / 320A           | CIMR-RC4A0150AAA | B1505002                          | IP20-Box39   |
| 0210         | 210kW              | 220kW                          | 326A / 440A           | CIMR-RC4A0210AAA | B1505008                          | IP20-Box39   |
| 0300         | 300kW              | 315kW                          | 466A / 629A           | CIMR-RC4A0300AAA | B1505011                          | IP20-Box39   |

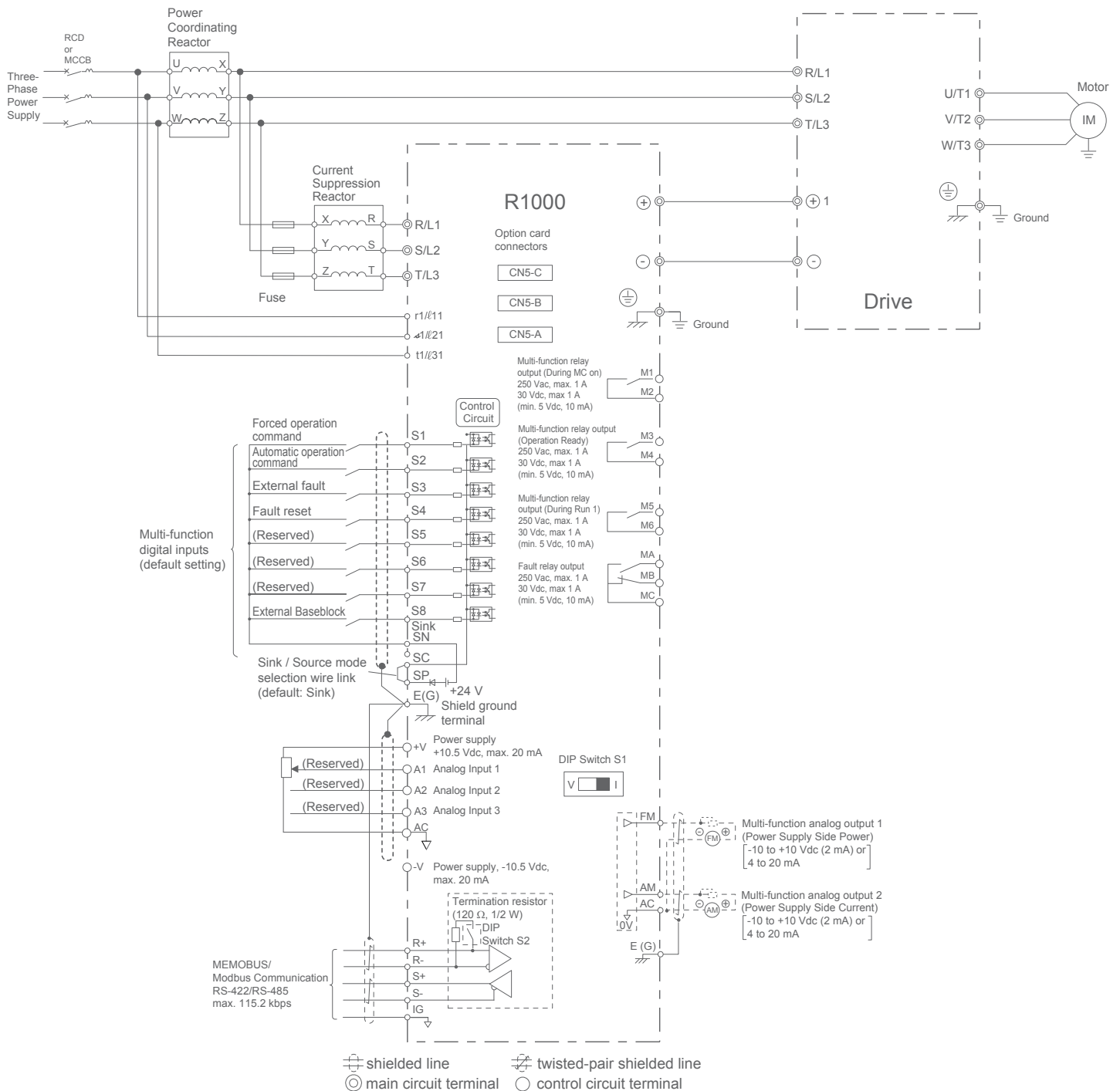
## Package content

- R1000 regenerative unit
- Current suppression reactor
- Optional IP20 cover for current suppression reactor

# Specifications and options

| Operating environment                     |  |  |
|---|--|--|
| <b>Ambient temperature</b>                | -10 to +50 °C (open chassis)   |  |
| <b>Storage temperature</b>                | -20 to +60 °C  |  |
| <b>Humidity</b>                           | 95 % RH or less (non-condensing)   |  |
| <b>Altitude</b>                           | Up to 1,000 m without derating, up to 3,000 m with derating  |  |
| <b>Vibration/Shock</b>                    | Model 4A03P5 to 4A0073: 10 to 20 Hz: 9.8 m/s <sup>2</sup> , 20 to 55 Hz: 5.9 m/s <sup>2</sup><br>Model 4A0105 to 4A0300: 10 to 20 Hz: 9.8 m/s <sup>2</sup> , 20 to 55 Hz: 2.0 m/s <sup>2</sup> |  |
| <b>Protection design</b>                  | IP00 open type enclosure, Indoor use (Protected from corrosive gases and dust)   |  |
| <b>Standards</b>                          | UL508C, IEC 61800-5-1, IEC 61800-3, RoHS   |  |
| Power ratings                             |  |  |
| <b>Rated voltage/<br/>Rated frequency</b> | 380 to 480 VAC -15 to +10 % / 50/60 Hz ±2 %  |  |
| <b>Control method</b>                     | 120° excitation method   |  |
| <b>Input power factor</b>                 | 0.9 min (for rated load)   |  |
| <b>Overload protection</b>                | 30 s at approx. 150 % of rated current   |  |
| <b>Regenerative torque</b>                | 150 % braking torque for 30 s<br>100 % braking torque for 30 s with 25 % ED<br>80 % braking torque continuous  |  |
| Options                                   |  | Model code   |
| <b>Communication</b>                      | CC-Link  | SI-C3  |
|   | DeviceNet  | SI-N3  |
|   | EtherCAT   | SI-ES3   |
|   | Ethernet/IP  | SI-EN3 / SI-EN3/D  |
|   | MECHATROLINK-II  | SI-T3  |
|   | Modbus/TCP   | SI-EM3 / SI-EM3/D  |
|   | PROFIBUS-DP  | SI-P3  |
| <b>Input/Output</b>                       | Analog output: 2-channel, -/+10 VDC (Res. 1/2048)  | AO-A3  |
|   | Digital output: 6 photocoupler (48 V, 50 mA or less), 2 relay contacts (250 VAC/30 VDC, 1 A max.)  | DO-A3  |
| <b>Other</b>                              | 24 V power supply: For control circuit and option boards, when main circuit power is off   | PS-A10LB/ PS-A10HB   |
|   | USB copy unit: For easy parameter setup duplication and backup   | JVOP-181   |
|   | IP65 operator mounting frame: A simple way to install the LCD operator of the drive on a cabinet wall or door  | JVOP-V11001  |
|   | DriveWizard Plus: Software used for parametrization  |  |
|   | Heatsink outside mounting kit:<br>To mount the drive with heatsink outside of the panel  | Models 03P5 to 0007:<br>EZZ020800B<br>Models 0010 to 0014:<br>EZZ020800C<br>Models 0017 to 0028:<br>EZZ020800D |
| IP20/NEMA1 Kit                            | Models 0035 to 0043:<br>DACT36126<br>Models 0053 to 0073:<br>DACT36186<br>Models 0105 to 0150:<br>DACT36662  |  |

# Connection diagram



# Dimensions

## R1000 regenerative unit

| Kit number      | R1000 Model<br>CIMR-RC4A | Regenerative<br>capacity | IP protection           | Figure | Dimensions [mm] |     |      | Weight<br>[kg] |
|-----------------|--------------------------|--------------------------|-------------------------|--------|-----------------|-----|------|----------------|
|                 |                          |                          |                         |        | W               | H   | D    |                |
| R1KIT40003AA□AA | 03P5                     | 3.5kW                    | IP20/NEMA1,<br>UL Type1 | 1      | 140             | 260 | 167  | 4              |
| R1KIT40005AA□AA | 0005                     | 5kW                      |                         |        |                 |     |      |                |
| R1KIT40007AA□AA | 0007                     | 7kW                      |                         |        |                 |     |      |                |
| R1KIT40010AA□AA | 0010                     | 10kW                     |                         |        |                 |     |      |                |
| R1KIT40014AA□AA | 0014                     | 14kW                     |                         |        |                 |     |      |                |
| R1KIT40017AA□AA | 0017                     | 17kW                     | Open-Chassis<br>IP00    | 2      | 220             | 365 | 197  | 8              |
| R1KIT40020AA□AA | 0020                     | 20kW                     |                         |        |                 |     |      |                |
| R1KIT40028AA□AA | 0028                     | 28kW                     |                         |        |                 |     |      |                |
| R1KIT40035AA□AA | 0035                     | 35kW                     |                         |        |                 |     |      |                |
| R1KIT40043AA□AA | 0043                     | 43kW                     |                         |        |                 |     |      |                |
| R1KIT40053AA□AA | 0053                     | 53kW                     | 3 (IP00),<br>4 (IP20)   | 3      | 275             | 450 | 258  | 20             |
| R1KIT40073AA□AA | 0073                     | 73kW                     |                         |        |                 |     |      |                |
| R1KIT40105AA□AA | 0105                     | 105kW                    |                         |        |                 |     |      |                |
| R1KIT40150AA□AA | 0150                     | 150kW                    |                         |        |                 |     |      |                |
| R1KIT40210AA□AA | 0210                     | 210kW                    |                         |        |                 |     |      |                |
| R1KIT40300AA□AA | 0300                     | 300kW                    | 1                       | 500    | 800             | 350 | 85.6 |                |
|                 |                          |                          |                         |        |                 |     | 87   |                |

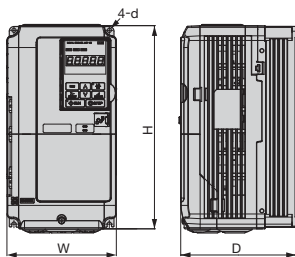


Figure 1

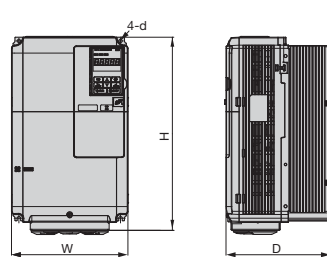


Figure 2

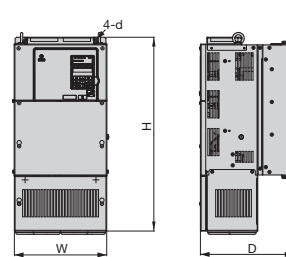


Figure 3

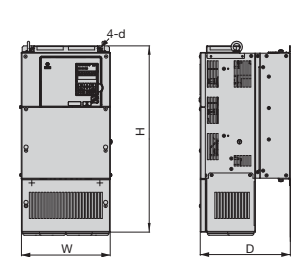


Figure 4

## Current suppression reactor

| Kit number      | Current suppression<br>reactor (1%) | Figure | Dimensions [mm] |     |      | Weight<br>[kg] | IP20 cover<br>(optional) | Dimensions [mm] |     |     | Weight<br>[kg] |
|-----------------|-------------------------------------|--------|-----------------|-----|------|----------------|--------------------------|-----------------|-----|-----|----------------|
|                 |                                     |        | W               | H   | D    |                |                          | W               | H   | D   |                |
| R1KIT40003AA□AA | B1509105                            | 5      | 78              | 102 | 63   | 0.85           | IP20-Box31               | 170             | 130 | 170 | 0.9            |
| R1KIT40005AA□AA | B1509105                            |        | 78              | 102 | 63   | 0.85           | IP20-Box31               | 170             | 130 | 170 | 0.9            |
| R1KIT40007AA□AA | B1509106                            |        | 96              | 118 | 60   | 1.31           | IP20-Box31               | 170             | 130 | 170 | 0.9            |
| R1KIT40010AA□AA | B1509107                            |        | 96              | 118 | 60   | 1.32           | IP20-Box31               | 170             | 130 | 170 | 0.9            |
| R1KIT40014AA□AA | B1509108                            |        | 120             | 150 | 90   | 1.9            | IP20-Box31               | 170             | 130 | 170 | 0.9            |
| R1KIT40017AA□AA | B1509108                            | 6      | 120             | 150 | 90   | 1.9            | IP20-Box31               | 170             | 130 | 170 | 0.9            |
| R1KIT40020AA□AA | B1509109                            |        | 120             | 150 | 90   | 1.93           | IP20-Box31               | 170             | 130 | 170 | 0.9            |
| R1KIT40028AA□AA | B1509110                            |        | 155             | 195 | 102  | 3.8            | IP20-Box32               | 190             | 155 | 220 | 1.25           |
| R1KIT40035AA□AA | B1504118                            |        | 155             | 175 | 95   | 4.0            | IP20-Box32               | 190             | 155 | 220 | 1.25           |
| R1KIT40043AA□AA | B1509111                            |        | 155             | 195 | 102  | 4.43           | IP20-Box34               | 210             | 188 | 220 | 1.4            |
| R1KIT40053AA□AA | B1509112                            | 7      | 155             | 195 | 110  | 5.95           | IP20-Box33               | 205             | 170 | 280 | 1.5            |
| R1KIT40073AA□AA | B1509113                            |        | 185             | 160 | 125  | 6.9            | IP20-Box35               | 225             | 145 | 250 | 1.45           |
| R1KIT40105AA□AA | B1509114                            |        | 185             | 160 | 140  | 10.8           | IP20-Box35               | 225             | 145 | 250 | 1.45           |
| R1KIT40150AA□AA | B1505002                            |        | 220             | 205 | 115  | 17.0           | IP20-Box39               | 240             | 210 | 330 | 2.2            |
| R1KIT40210AA□AA | B1505008                            |        | 230             | 215 | 140  | 22.0           | IP20-Box39               | 240             | 210 | 330 | 2.2            |
| R1KIT40300AA□AA | B1505011                            | 240    | 235             | 150 | 29.0 | IP20-Box39     | 240                      | 210             | 330 | 2.2 |                |

## Power coordinating reactor for L1000A/L1000V lift drive

| AC input reactor<br>(8% IP00) | Figure | Dimensions [mm] |     |     | Weight<br>[kg] | IP20 cover<br>(optional) | Dimensions [mm] |     |     | Weight<br>[kg] |
|-------------------------------|--------|-----------------|-----|-----|----------------|--------------------------|-----------------|-----|-----|----------------|
|                               |        | W               | H   | D   |                |                          | W               | H   | D   |                |
| B1103136                      | 5      | 155             | 110 | 170 | 6.0            | IP20-Box32               | 190             | 155 | 220 | 1.25           |
| B1103138                      | 6      | 185             | 102 | 196 | 7.1            | IP20-Box35               | 225             | 145 | 250 | 1.45           |
| B1103139                      |        | 210             | 125 | 220 | 9.6            | IP20-Box36               | 240             | 165 | 275 | 1.75           |
| B1103140                      | 7      | 210             | 135 | 220 | 10.7           | IP20-Box37               | 240             | 175 | 275 | 1.8            |
| B1103141                      |        | 230             | 166 | 205 | 12.5           | IP20-Box39               | 240             | 210 | 330 | 2.2            |
| B1103142                      |        | 263             | 166 | 205 | 25.0           | IP20-Box39               | 240             | 210 | 330 | 2.2            |
| B0910013                      | 7      | 330             | 180 | 270 | 36.4           | IP20-Box42               | 290             | 220 | 395 | 2.9            |
| B1411053                      |        | 412             | 220 | 320 | 61.5           | on request               |                 |     |     |                |
| 2 x B0910013                  |        | 660             | 360 | 540 | 72.8           | 2 x IP20-Box42           | 580             | 440 | 190 | 5.8            |

## Power coordinating reactor for A1000/V1000 general AC drive

| AC input reactor<br>(4% IP00) | Figure | Dimensions [mm] |     |     | Weight<br>[kg] | IP20 cover<br>(optional) | Dimensions [mm] |     |     | Weight<br>[kg] |
|-------------------------------|--------|-----------------|-----|-----|----------------|--------------------------|-----------------|-----|-----|----------------|
|                               |        | W               | H   | D   |                |                          | W               | H   | D   |                |
| LR3 40-4/2                    | 5      | 78              | 56  | 100 | 0.53           | IP20-Box31               | 170             | 130 | 170 | 0.9            |
| LR3 40-4/4                    |        | 96              | 60  | 117 | 1.31           | IP20-Box32               | 190             | 155 | 220 | 1.25           |
| LR3 40-4/6                    |        | 96              | 69  | 117 | 1.45           | IP20-Box32               | 190             | 155 | 220 | 1.25           |
| LR3 40-4/10                   |        | 120             | 85  | 140 | 2.0            | IP20-Box32               | 190             | 155 | 220 | 1.25           |
| LR3 40-4/16                   |        | 120             | 95  | 140 | 2.7            | IP20-Box32               | 190             | 155 | 220 | 1.25           |
| LR3 40-4/20                   | 6      | 155             | 95  | 162 | 3.8            | IP20-Box32               | 190             | 155 | 220 | 1.25           |
| LR3 40-4/25                   |        | 155             | 110 | 177 | 5.8            | IP20-Box33               | 205             | 170 | 280 | 1.5            |
| LR3 40-4/45                   |        | 185             | 112 | 210 | 8.25           | IP20-Box35               | 225             | 145 | 250 | 1.45           |
| LR3 40-4/63                   |        | 185             | 122 | 210 | 9.65           | IP20-Box36               | 240             | 165 | 275 | 1.75           |
| LR3 40-4/70                   |        | 210             | 117 | 240 | 10.8           | IP20-Box37               | 240             | 175 | 275 | 1.8            |
| LR3 40-4/90                   |        | 267             | 149 | 200 | 16.0           | IP20-Box39               | 240             | 210 | 330 | 2.2            |
| LR3 40-4/115                  |        | 291             | 179 | 210 | 21.0           | IP20-Box41               | 280             | 240 | 400 | 2.75           |
| LR3 40-4/160                  |        | 291             | 189 | 210 | 25.5           | IP20-Box41               | 280             | 240 | 400 | 2.75           |
| LR3 40-4/200                  |        | 352             | 194 | 260 | 32.0           | IP20-Box41               | 280             | 240 | 400 | 2.75           |
| LR3 40-4/250                  |        | 7               | 352 | 207 | 260            | 41.0                     | IP20-Box44      | 430 | 250 | 420            |
| LR3 40-4/300                  | 352    |                 | 219 | 260 | 48.0           | IP20-Box44               | 430             | 250 | 420 | 4.2            |
| LR3 40-4/400                  | 352    |                 | 234 | 260 | 56.0           | IP20-Box44               | 430             | 250 | 420 | 4.2            |
| LR3 40-4/500                  | 352    |                 | 245 | 260 | 62.0           | IP20-Box45               | 460             | 250 | 420 | 4.4            |
| LR3 40-4/710                  | 180    |                 | 235 | 380 | 102.0          | IP20-Box46               | 630             | 472 | 650 | 15.3           |
| LR3 40-4/1200                 |        | 555             | 330 | 445 | 186.2          | IP20-Box46               | 630             | 472 | 650 | 15.3           |

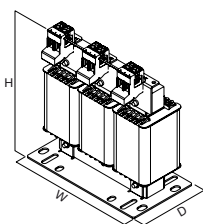


Figure 5\*

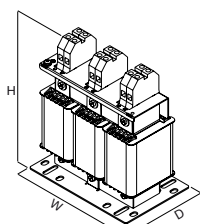


Figure 6\*

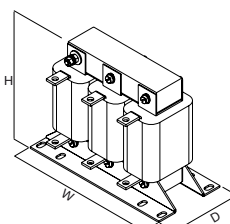
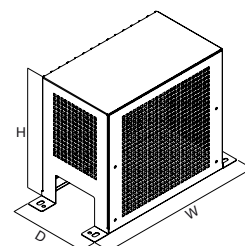


Figure 7\*



IP20 cover

\* Appearance might change with capacity.

**YASKAWA Europe GmbH**

Philipp-Reis-Str. 6  
65795 Hattersheim am Main  
Germany

+49 6196 569-500  
support@yaskawa.eu  
www.yaskawa.eu.com

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