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1.To prevent electrical shock, disconnect from power source before installing or servicing.

2.The bypass relays in the main circuit may be in an undefined switching state due to hand-ling during shipping. It is recommended to make the first cycle with the motor disconnected, to set the bypass relays to a defined switching state. If not performed, this may cause unexpected operation of the motor.

3.The RSE has been designed as Class A equipment. Use of the product in domestic environments can cause radio interference.

4. It is important to utilise this product according to its specified overvoltage category.

5. At high ambient temperatures, it is important to allow sufficient cooling time between starts.

6. For stand alone devices or with proper spacing between the devices, the maximum ambient temperature is 50°C.

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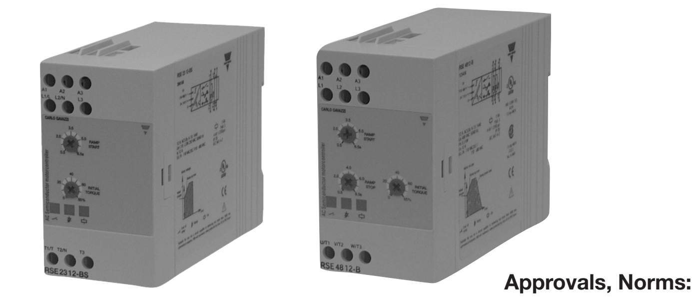
AC Semiconductor Motor Controller (RSE series) Instructions

CARLO GAVAZZI



Approvals, Norms:
UL, CSA, CE, EN/IEC 60 947-4-2

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Part no.........

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MODE OF OPERATION
Ramp up potentiometer: the motor starting time in a direct-on-line start depends on the characteristics of the motor load; the ramp up time must be longer than this time period so that the bypass relays are activated after the starting current has dropped to a steady level.

Ramp down potentiometer (Applicable only for RSE-B): the motor stopping time may be extended by gradually reducing the voltage over the ramp down time.

The actual time taken to start and stop the motor will vary according to the combinations of above settings and the type of motor load itself.

Initial Torque potentiometer: this adjusts the starting voltage and must be set to enable the motor to start rapidly. The soft start is a result of both initial torque and ramp up time adjustments.

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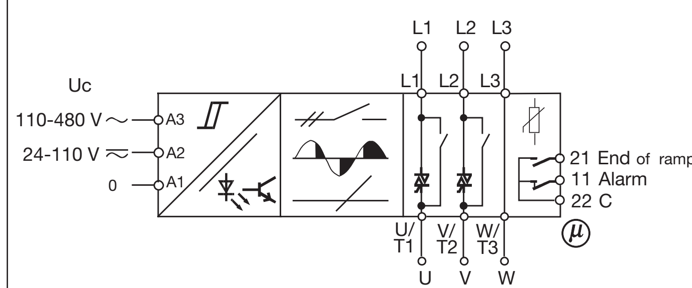
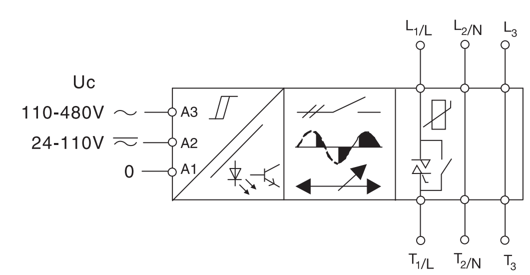
FUNCTIONAL DIAGRAM | FUNCTIONAL DIAGRAM | FUNCTIONAL DIAGRAM | FUNCTIONAL DIAGRAM | FUNCTIONAL DIAGRAM | FUNCTIONAL DIAGRAM |

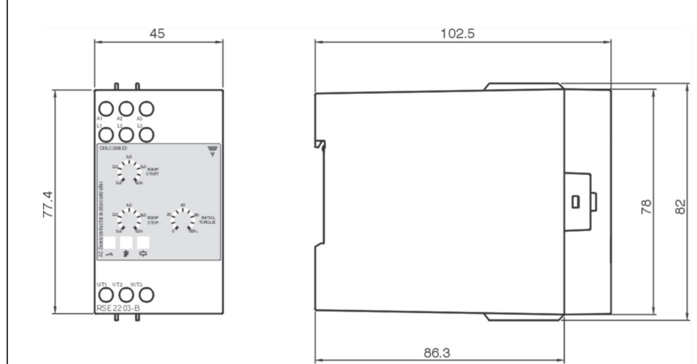


RSE-B



RSE-BS

DIMENSIONS | DIMENSIONS |DIMENSIONS |DIMENSIONS |DIMENSIONS |DIMENSIONS |DIMENSIONS |



All dimensions in mm

Wire Sizes | Wire Sizes | Wire Sizes | Wire Sizes | Wire Sizes | Wire Sizes | Wire Sizes |

L1, T1 L2, T2 L3, T3 A1, A2, A3	10mm	IEC/EN 60 947-4-2 UL/CSA Maximum size • Solid • Finely stranded with end sleeve • Stranded	 0.5...2.5mm² 0.5...2.5mm² 0.5...2.5mm²	max. 0.5Nm max. 4.4lb.in

Note: Use 60 or 75°C copper conductors only
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Applications | Applications | Applications | Applications ....

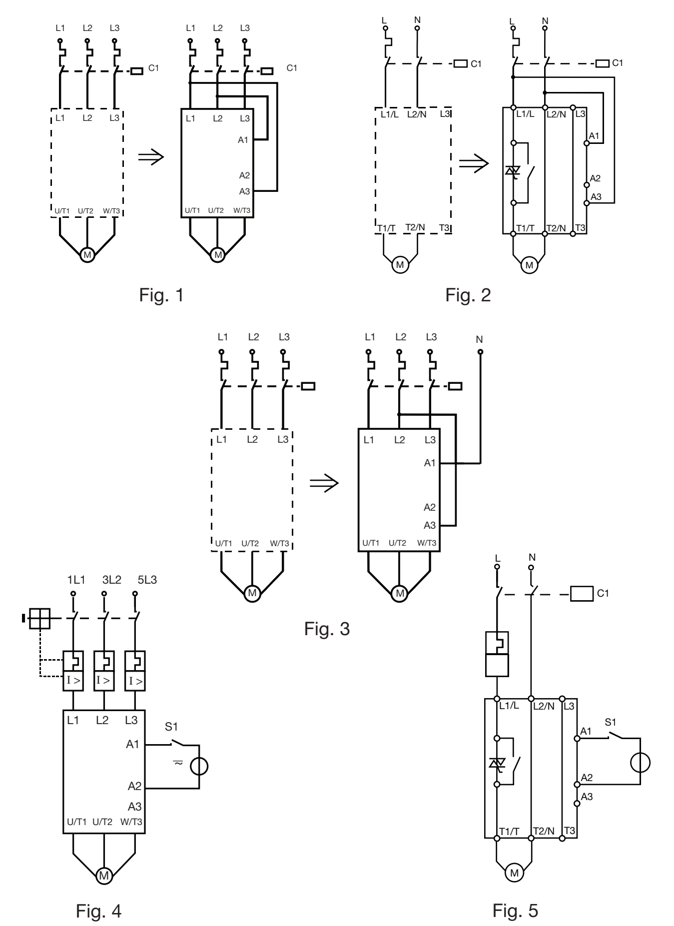
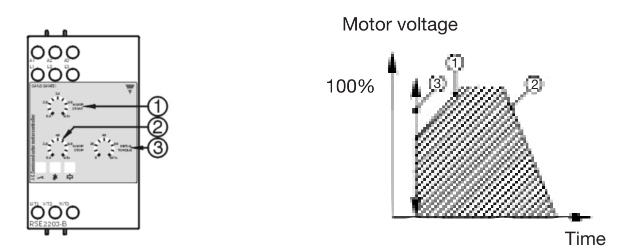


Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5

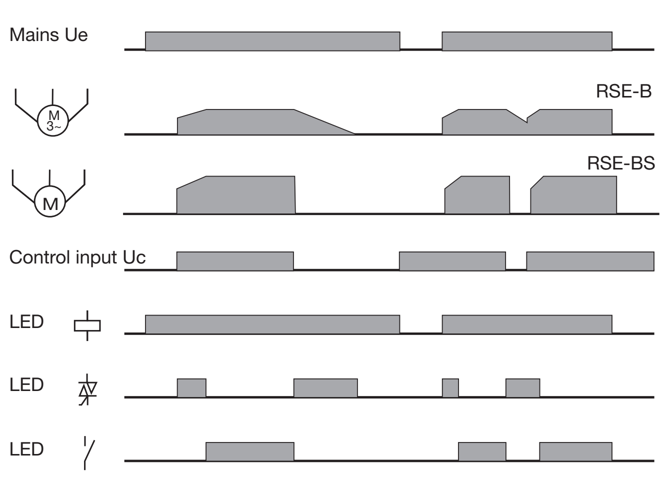
Operation Diagrams | Operation Diagrams |Operation Diagrams |Operation Diagrams |Operation Diagrams |Operation Diagrams |



1 Ramp-up: 0.5 - 6.5s. Time from zero load voltage to full load voltage.

2 Initial torque: 0 - 85% voltage at the start of the ramp-up function.

3 Ramp-down: 0.5 - 8.0s. Time from full load voltage to zero load current. Applicable only for RSE-B



Changing from Direct ON Line start to soft start (Line controlled soft-start) *(Fig. 1, Fig. 2 and Fig. 3)*

Changing a Direct On Line start into a soft start is very simple with the RSE soft-starting relay:
1) Cut the cable to the motor and insert the RSE relay.
2) Connect control input to two of the incoming lines. Set initial torque to minimum and ramp up and down to maximum. Set Initial Torque to minimum and ramp-up to maximum for the RSE-BS, while ramp -up and down for the RSE-B.
3) Power up again - adjust the start torque so the motor starts turning immediately after power is applied, and adjust ramp time to the appropriate value.

When C1 is operated, the motor controller will perform soft-start of the motor. When C1 is switched off, the motor will stop, the motor controller will reset and after 0.5 s a new soft-start can be performed.

Please note that the controller does not insulate the motor from the mains. Contactor C1 is therefore needed as a service switch for the motor.

Soft-start and soft-stop *(Fig. 4 & Fig. 5)*
When S1 is closed, soft-start of the motor will be performed according to the setting of the ramp-up potentiometer and the setting of the initial torque potentiometer (for both the RSE-B and RSE-BS).

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Time between rampings
To prevent the semiconductors from overheating, a certain time between ramping should be allowed. The time between rampings depends on the motor current during ramping and ramp time (see tables below).

Note:
Table is valid for ambient temperature 25°C. For higher ambient temperature add 5%/°C to values in the tables. The shaded areas in the tables are for blocked rotor. Do not repeat rampings with blocked rotor.

FUSING CONSIDERATIONS
The motor controller provides by-passing of the semiconductors during running operation. Therefore the semiconductors can only be damaged by short-circuit currents during ramp-up and ramp-down function.

A 3-phase induction motor with correctly installed and adjusted overload protection does not short totally between lines or directly to earth as some other types of loads, e.g. heater bands. In a failing motor there will always be some part of a winding to limit the fault current. If the motor is installed in an environment where the supply to the motor cannot be damaged, the short circuit protection can be considered to be acceptable if the controller is protected by a 3-pole thermal-magnetic overload relay (see table below).

If the risk of short circuit of the motor cable, the controller or the load exists, then the con-troller must be protected by ultrafast fuses, e.g. for a 3 A type: Ferraz 6.9 gRB 10-10, for an 12 A type: Ferraz 6.9 gRB 10-25. Fuseholder type CMS10 1P.

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A 3-phase induction motor with correctly installed and adjusted overload protection does not short totally between lines or directly to earth as some other types of loads, e.g. heater bands. In a failing motor there will always be some part of a winding to limit the fault current. If the motor is installed in an environment where the supply to the motor cannot be damaged, the short circuit protection can be considered to be acceptable if the controller is protected by a 3-pole thermal-magnetic overload relay (see table below).

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