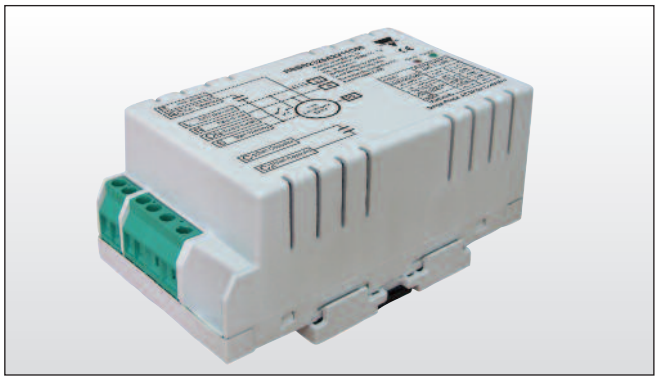
Motor Controller
AC Semiconductor Motor Controller
Type RSBS2325A2V11Cxx



- Soft starting of 1-Phase Scroll Compressors
- Enclosed solution
- Integrated current limit
- Rated operational voltage: 230 VACrms, 50 Hz
- Rated operational current: 25A: AC-53b
- Integral bypassing of semiconductors
- Built-in transient overvoltage protection
- Undervoltage protection
- DIN rail or panel mount

Product Description

This motor controller, intended to be used with single-phase scroll compressors can limit inrush currents to 40A ACrms. Upon applying the control signal, soft starting is achieved within a 600ms interval. At the end of the soft-start function, the semiconductors are bypassed by electromechanical relays. The device rating is based on a maximum of 12 starts per hr.

Application of supply voltage is indicated by a green LED in the full ON state. A flashing green LED indicates a fault in the internal power supply circuit. A red LED is used for alarm indication.

Short circuit and Overload protection are not provided with this controller and must be procured separately. Starting and running capacitors are required for controller to operate as intended.
All versions, apart from RSBS2325A2V11C00, have an integrated starting capacitor.

Ordering Code

RSB S 23 25 A2 V11 C24

- Board level Motor Controller
- Scroll Compressor
- Rated operational voltage
- Rated operational current
- Control voltage
- Options
- Starting Capacitor

Type Selection

Type	Rated operational voltage Ue	Rated operational Current I_e	Control Voltage Uc	Options	Starting Capacitor
RSBS: 1-Phase Soft Starter for Scroll Compressors	23: 230VACrms, 50 Hz	25: 25AAC	A2: 230VACrms, 50 Hz	V11: Enclosed	C00: No capacitor C10: 88 - 108 µF C17: 145 - 175 µF C24: 200 - 240 µF

Input Specifications (Control Input)

Control voltage (Uc), ON	230 VACrms ± 15%
Input current	< 1 mA
Pick up voltage	90 VAC
Drop out voltage	25 VAC
Rated AC frequency	50 Hz ± 5Hz
Rated insulation voltage	250 V rms
Response time Input to output	≤ 200 ms

General Specifications

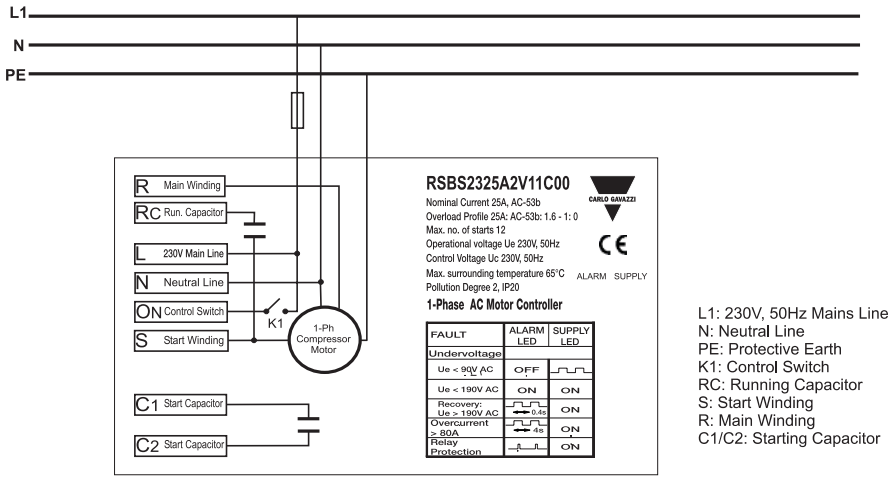
Ramp up	< 0.6 sec
Operating temperature	-20° to +65°C (-4° to +149°F)
Storage temperature	-30° to +70°C (-22° to +158°F)
Degree of protection	IP20
Pollution Degree	2
Relative humidity	< 95% non condensing @ 40°C
Altitude*	1000m

* Above 1000m derate linearly by 1% of unit FLC per 100m to a maximum altitude of 2000m

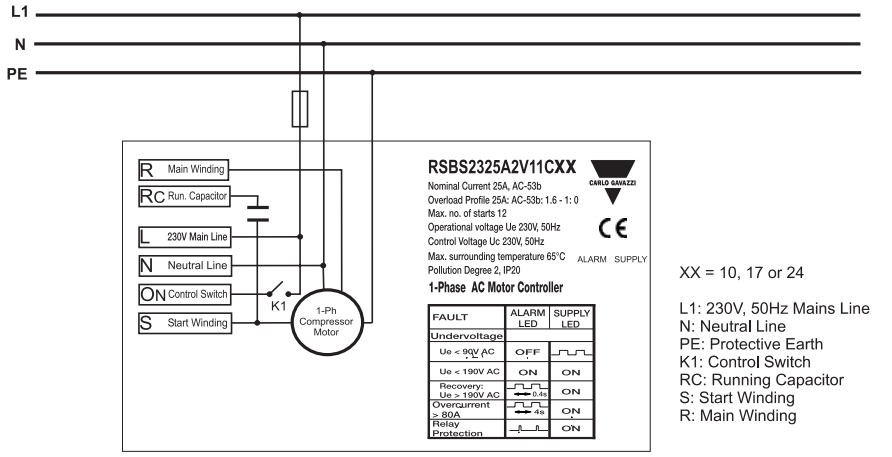
Output Specifications

Rated operational current	25A AC-53b
Max. starting current	40A ACrms
Overload profile	25A: AC-53b: 1.6 - 1: 0
No. of starts/hr.	12 (evenly distributed)
I^2t for fusing t=10ms	1200 A^2s

Connection Diagram



L1: 230V, 50Hz Mains Line
N: Neutral Line
PE: Protective Earth
K1: Control Switch
RC: Running Capacitor
S: Start Winding
R: Main Winding
C1/C2: Starting Capacitor



XX = 10, 17 or 24

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Standards

Approvals	UL (E172877 Vol 2 Sec 4), cUL
CE Marking LVD	IEC/ EN 60947-4-2
EMCD : Immunity	IEC/ EN 61000-6-3
Emission	IEC/ EN 61000-6-1
Electrostatic Discharge ESD Immunity	IEC/ EN 61000-4-2 8kV, PC2
Electrical fast transient/ Burst Immunity	IEC/ EN 61000-4-4
Output	2kV, PC2
Input	1kV, PC2
Electrical Surge Immunity	IEC/ EN 61000-4-5, PC2
Outpt, line to line	1kV
Output, line to earth	2kV
Input, line to line	500V
Input, line to earth	1kV
Radiated Radio Frequency	EN 61000-4-3, PC1 3V/m, 80-1000MHz
Conducted radio-frequency immunity	IEC/ EN 61000-4-6, PC1 3V/m, 0.15-80MHz
Voltage dips & interruptions	IEC/ EN 61000-4-11 100% Ue dip, 20ms, PC2 60% Ue dip, 200ms, PC2 30% Ue dip, 500ms, PC3 100% Ue interruption, 5000ms, PC3
Radio interference field emissions (radiated)	CISPR 11 IEC/ EN 55011, Class B
Radio interference voltage emissions (conducted)	CISPR 11 IEC/ EN 55011, Class B
Discontinous disturbance	CISPR 14 IEC/ EN 55014-1
Harmonics	IEC/ EN 61000-3-2 IEC/ EN 61000-3-12
Flicker (Load Conditions apply)	IEC/ EN 61000-3-11

Housing Specifications

Dimensions (L x B x H)	135 x 81.4 x 60.4 mm
Weight	approx. 450 g
Terminal tightening screws	M3.5 (x6)
RSBS_C00	M3.5 (x8)
Material	Polyamide
Max. tightening torque	0.8Nm
Max. cross sectional area of cable (solid)	1 x 6mm^2 (10 AWG)
Max. cross sectional area of cable (stranded)	1 x 4mm^2 (10 AWG)
Stripping length	7 - 8mm

Supply Specifications

Rated operational voltage (Ue) L - N	230 VAC ± 15%
Rated AC frequency	50 Hz ± 5 Hz
Rated insulation voltage	250 VACrms
Supply indication	Green LED
Undervoltage alarm	< 190 VACrms for ≥ 1 sec
Overcurrent alarm	> 80 A for ≥ 1 sec. during soft start
Alarm indication	Red LED
Current at no load	≤ 15mA

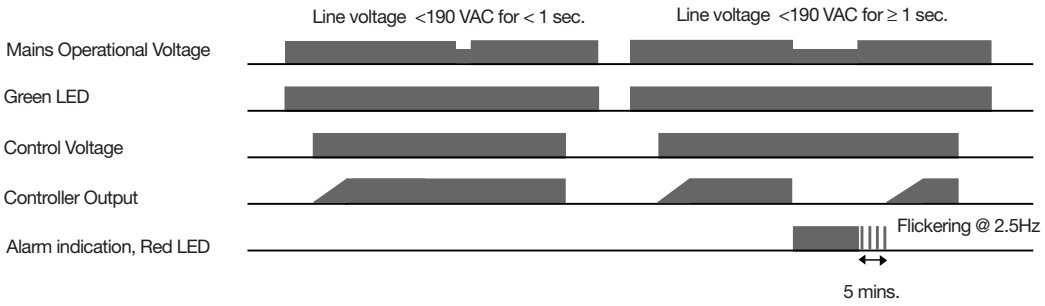
Short Circuit Protection

Type of coordination	2
Short circuit current rating	10kA
Fuse model	6.9xx Cp gRC 14.51/ 40A Ferraz Shawmut (xx = 00 or 21)

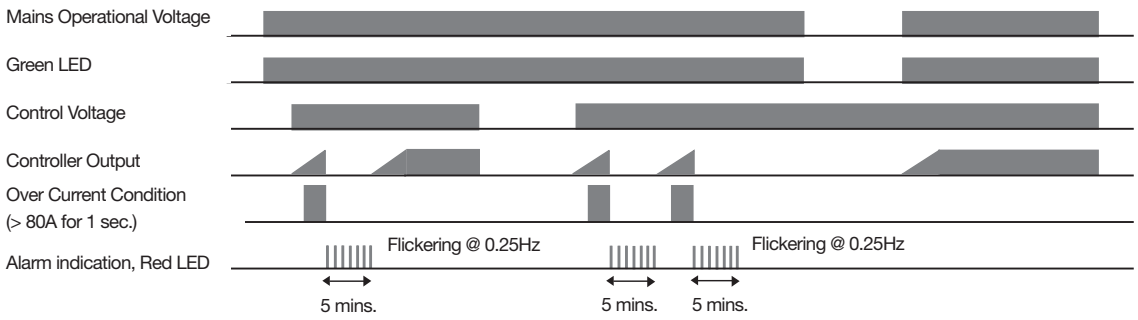
Mode of Operation

Normal Condition

Undervoltage Condition



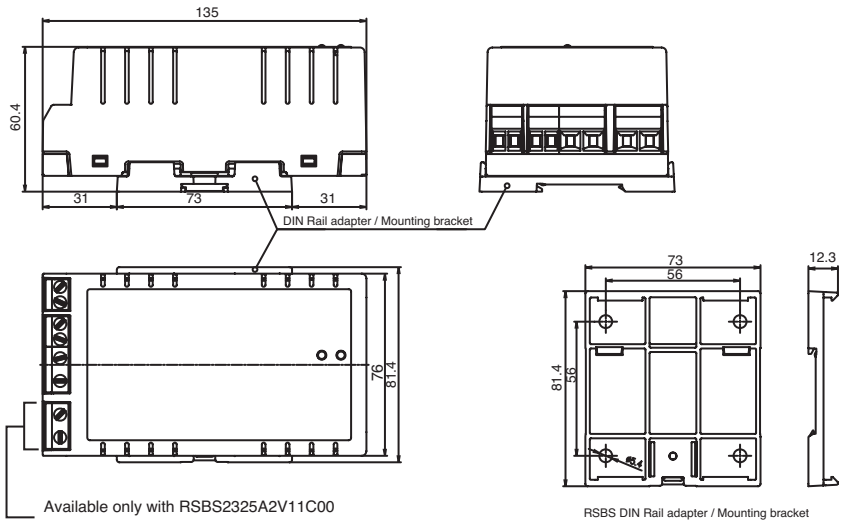
Locked Rotor Condition during softstart



Notes:

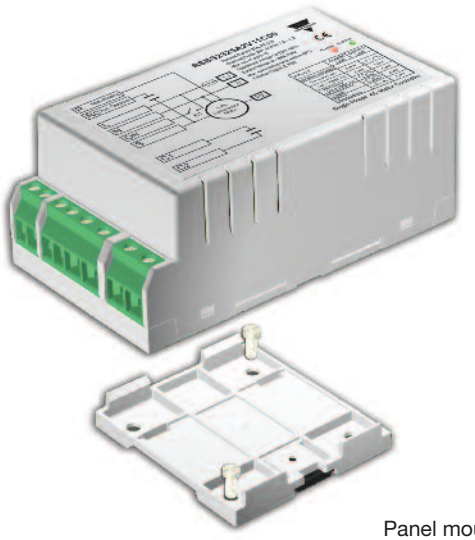
1. The RSBS has 2 indication LEDs on board. The green LED indicates the status of the on-board power supply, whilst the red LED indicates an alarm condition.
2. Once the mains voltage is present, the green LED will be fully ON. In case the mains voltage is < 90VAC, the green LED will be flashing. In case mains voltage is >90VAC and green LED is flashing, then this may indicate that the on-board power supply is faulty.
3. Upon closing K1, the RSBS will start ramping, duration of which is < 600ms. When opening K1, the RSBS will stop without any ramp down. The RSBS will not start if a subsequent start is attempted before 1 minute has elapsed from the end of the previous start.
4. In the case of an undervoltage (<190VAC for 1 sec.), the RSBS will shut down and the red LED will be fully ON as long as the undervoltage is present. Once the mains voltage is restored the red LED will flash at a rate of 2.5Hz for 5 minutes. Following these 5 minutes, the RSBS will start ramping function in the case K1 is closed. The device can be reset at any time by removing power on L1 - N connection. When the power is reapplied, the soft starter will start ramping up as soon as K1 is closed.
5. If during the ramping an overcurrent (>80A for 1 sec.) is sensed, the RSBS will shut down and the red LED will flash at a rate of 0.25Hz indicating an overcurrent situation. This continues for 5 minutes before the RSBS tries to ramp up again. In the case that the overcurrent is still present at the second attempt, user intervention is required to reset the controller by cycling power for the device to operate again as this implies that there are problems in the system.
6. A detection circuitry provides protection in terms of controller shutdown in case of a faulty starting capacitor EMR. In such a situation, the red LED will flash once every 2 seconds.

Dimensions



All dimensions in mm

Mounting



Panel mounting

DIN rail mounting