

MECHANICAL INSTALLATION

CHAPTER 1



NOTE: SR44 soft starters have been discontinued. Please consider SR55 soft starters as a replacements.

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Manual Overview

Overview of this Publication

The SR44 Soft Starter User Manual describes the installation, configuration, and methods of operation of the SR44 Soft Starter.

Who Should Read This Manual

This manual contains important information for those who will install, maintain, and/or operate any of the SR44 Soft Starters.

Supplemental Publications

The National Electrical Manufacturers Association (NEMA) publishes many different documents that discuss standards for industrial control equipment. Global Engineering Documents handles the sale of NEMA documents. For more information, you can contact Global Engineering Documents at:

**15 Inverness Way East
Englewood, CO 80112-5776
1-800-854-7179 (within the U.S.)
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Technical Support

By Telephone: 770-844-4200
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Our technical support group is glad to work with you in answering your questions. If you cannot find the solution to your particular application, or, if for any reason you need additional technical assistance, please call technical support at **770-844-4200**. We are available weekdays from 9:00 a.m. to 6:00 p.m. Eastern Time.

We also encourage you to visit our web site where you can find technical and non-technical information about our products and our company. Visit us at **www.automationdirect.com**.

Special Symbols



When you see the “notepad” icon in the left-hand margin, the paragraph to its immediate right will be a special note.



When you see the “exclamation mark” icon in the left-hand margin, the paragraph to its immediate right will be a WARNING. This information could prevent injury, loss of property, or even death (in extreme cases).

1 – Mechanical Installation

1.1 – Mounting

Mount the unit to a flat, vertical surface using the mounting holes (or slots) on its base-plate. The mechanical outline diagrams, shown in the “Mechanical Outline” section (1.9), give the dimensions and mounting hole positions for each model. Ensure that:

- The orientation of the unit has the “TOP” uppermost .
- The location allows adequate front access.
- You can view the alphanumeric display.

1.2 – Requirements for an Enclosure

For a typical industrial environment, an enclosure should provide the following:

- A single location for the unit and its protection/isolation switch-gear.
- The safe termination of cabling and/or bus-bars.
- Means to effect proper air flow through the enclosure.

1.3 – Ventilation

The installer must ensure that the enclosure can maintain the operating temperature below 40 °C (104 °F), or with derating 60 °C (140 °F). To ensure that the unit operates within a suitable temperature range, periodically measure the internal temperature of the enclosure. If you situate the unit above equipment that generates a significant amount of heat, reduce the unit full load rating.

1.4 – Storage and Derating

Above 40 °C (104°F), derate linearly by 2% of unit FLC / °C to maximum of 40% at 60 °C (140°F).

| Temperature | Minimum | Maximum |
|-------------------------------------|-----------------|-----------------|
| Storage, continuous | -25 °C [-13 °F] | +60 °C [140 °F] |
| Storage, not exceeding 24 hours | -25 °C [-13 °F] | +75 °C [167 °F] |
| Operating (without derating) * | 0 °C [32 °F] | +40 °C [104 °F] |
| Operating (with maximum derating) * | 0 °C [32 °F] | +60 °C [140 °F] |

* Above 40 °C (104°F), derate linearly by 2% of unit FLC / °C to maximum of 40% at 60 °C (140°F). [Unit FLC = Soft Starter rated Full Load Current; NOT motor Full Load Current.]

| Humidity |
|--|
| Max. 85% non-condensing, not exceeding 50% at 40 °C [104 °F] |

1.5 – Altitude

| Condition | Maximum Height Above Sea Level |
|--|--------------------------------|
| Operating (without derating) | 1000m [3281 ft] |
| Operating (with maximum derating) | 2000m [6562 ft] |
| <i>Derating: Above 1000m (3281 ft), derate linearly by 1% Unit FLC per 100m to a maximum of 2000m (6562 ft).</i> | |

1.6 – Assisted Flow

An enclosure may need additional fans to maintain the required air temperature immediately surrounding the unit. This temperature is referred to as the Ambient Temperature. Use the following formula to determine whether or not fan(s) are required. An allowance has been incorporated into the formula so that the figure for “Q” should be the air delivery quoted in the fan supplier’s data.

$$Q = (4 \times Wt) / (t_{max} - t_{amb})$$

- Q = required volume of air in cubic meters per hour (m³/h)
- Wt = heat produced by the unit and all other heat sources within the enclosure in Watts (W)
- t_{max} = maximum permissible temperature within the enclosure (°C)
- t_{amb} = temperature of the air entering the enclosure (°C)

(If you prefer to work in CFM, substitute °F for °C.)

Refer to the table in section 1.7 for the heat produced by the SR44, and note that the heat figure (Wt) is the total heat produced by everything within the enclosure.

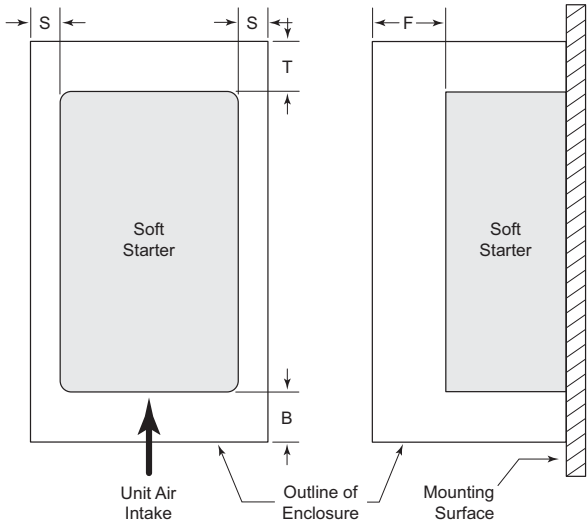
1.7 – Heat Output of Units

[At rated operational current, I_e, unit Full Load Current (FLC).]

| SR44 Approximate Heat Output (non-bypass) | | | |
|---|-----------------|----------------|-----------------|
| Chassis Size 1 | | Chassis Size 2 | |
| Model # | Heat Output (W) | Model # | Heat Output (W) |
| SR44-9 | 30 | SR44-174 | 520 |
| SR44-16 | 45 | SR44-202 | 610 |
| SR44-23 | 60 | SR44-242 | 650 |
| SR44-30 | 90 | SR44-300 | 850 |
| SR44-44 | 120 | SR44-370 | 970 |
| SR44-59 | 155 | | |
| SR44-72 | 210 | | |
| SR44-85 | 220 | | |
| SR44-105 | 275 | | |
| SR44-146 | 440 | | |

1.8 – Clearance

To maintain adequate ventilation, each model of SR44 Soft Starter requires a minimum clearance to adjacent equipment and partitions. These clearances are specified in the following diagram and table.

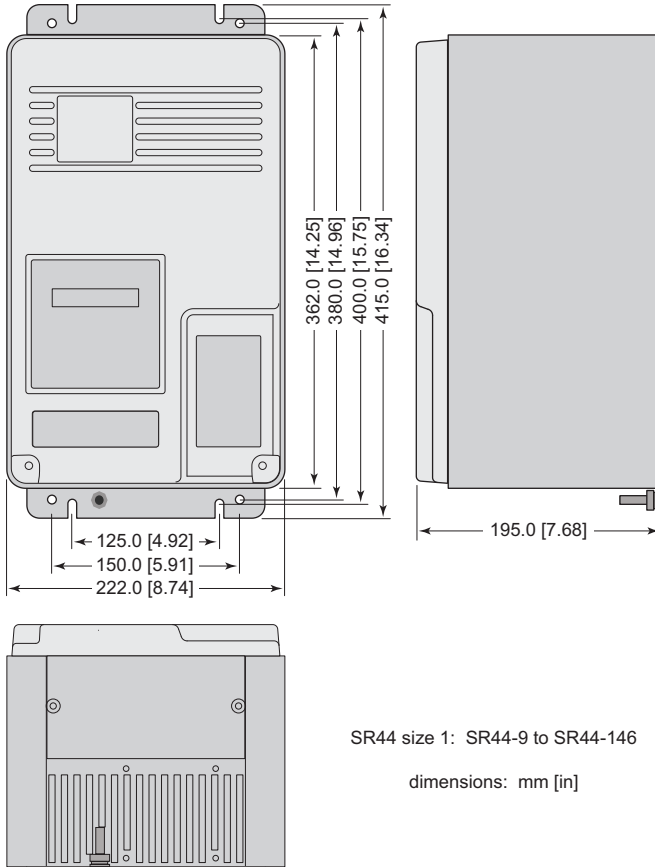


Minimum Clearance for Heat Dissipation

| SR44 Mounting Clearances | | | | | |
|--------------------------|--|-----------------------------|------------|-----------|-----------|
| Model Number | Unit Cooling Method | Minimum Clearance (mm [in]) | | | |
| | | Top (T) | Bottom (B) | Side (S) | Front (F) |
| SR44-9 to SR44-23 | Natural Convection | | | | |
| SR44-30 to SR44-370 | Forced Air with internal cooling fan inside each starter | 75 [2.95] | 75 [2.95] | 15 [0.59] | 25 [0.98] |

1.9 – Mechanical Outline – Chassis Size 1

SR44-9 to SR44-146



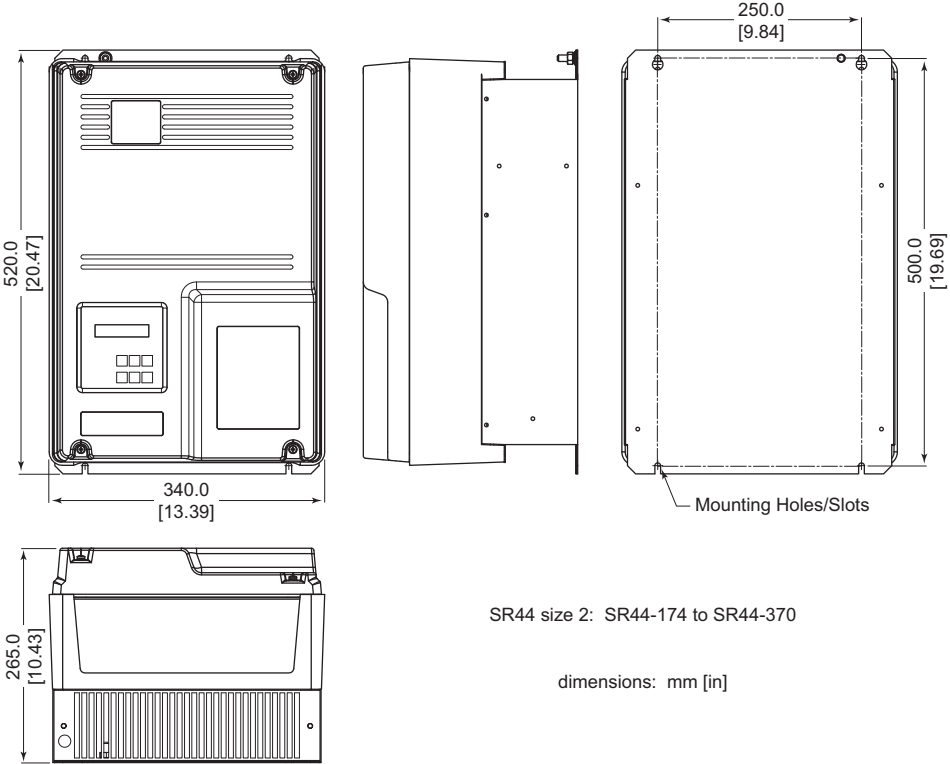
SR44 size 1: SR44-9 to SR44-146

dimensions: mm [in]

| SR44 Chassis Size 1 Mounting Specifications | | | |
|---|--------------------------|---|---|
| Model Number | Mass/Weight (kg [lb]) | Unit Mounting Holes | |
| | | Top | Bottom |
| SR44-9 to SR44-44 | 7.3 [16] | (2) holes & (2) slots suitable for M6 or 1/4" fittings | (2) holes & (2) slots suitable for M6 or 1/4" fittings |
| SR44-59 to SR44-146 | 8.3 [18] | | |

1.10 – Mechanical Outline – Chassis Size 2

SR44-174 to SR44-370



SR44 size 2: SR44-174 to SR44-370

dimensions: mm [in]

| SR44 Chassis Size 2 Mounting Specifications | | | |
|---|--------------------------|--|--|
| Model Number | Mass/Weight (kg [lb]) | Unit Mounting Holes | |
| | | Top | Bottom |
| SR44-174 to SR44-202 | 16 [35] | (2) keyholes suitable for M6 or 1/4" fittings | (2) open slots suitable for M6 or 1/4" fittings |
| SR44-242 to SR44-370 | 22 [49] | | |

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