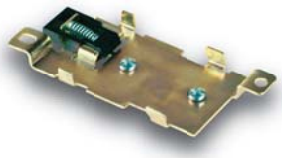
THE GLOBAL EXPERT IN SOLID STATE RELAY TECHNOLOGY

Heat Sinks



Accessories

Assemblies

CST
CUSTOM SENSORS & TECHNOLOGIES

crydom®

Heat Sinks & SSR Assemblies

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crydom®

Crydom has a distinguished record of providing advanced, high quality products with timely delivery and competitive pricing. Your success in today's fastpaced global markets hinges on working with suppliers who respond quickly and appropriately to your every need.

In addition to an extensive selection of catalog off-the-shelf items, Crydom offers custom-designed solid state relays. Fact is we specialize in satisfying the most demanding environmental and performance requirements our customers can devise. Give us your specs, and watch us exceed your expectations!

At Crydom's custom-built **100,000 square foot manufacturing facility,** virtually everything is accomplished in-house to assure complete control over delivery, production, and above all quality. With design, development, manufacturing and management personnel under one roof, we're geared for fast response to your requirements.

In **Design Engineering**, we focus on pushing performance, reliability and quality standards ever higher. Working under a conservative design and rating philosophy, Crydom's seasoned engineering team makes extensive use of CAD to optimize design of mechanical parts.

As a result of these efforts, Crydom has acquired an impressive list of patents in solid state relay technology, while continuing to create new circuit and technology-related inventions as part of our ongoing R & D programs.

Once the design is solidified, **Production Engineering** is responsible for the engineering control of the techniques used throughout manufacturing. This department works closely with our design engineering group, establishes assembly processes, and oversees a comprehensive on-premises machine shop which fabricates our assembly fixtures.

As the work progresses, **Material and Production Control** employ our advanced computer system, upgraded with our customized software to keep manufacturing operations humming. The computer system employs integral MRP and MSP capabilities to generate detailed scheduling and planning information.

Ceramic Hybrid Manufacturing also is performed in-house. Crydom manufactures all metallized ceramic substrates used in our relays — a major factor in product performance and reliability, including direct bond copper substrates.

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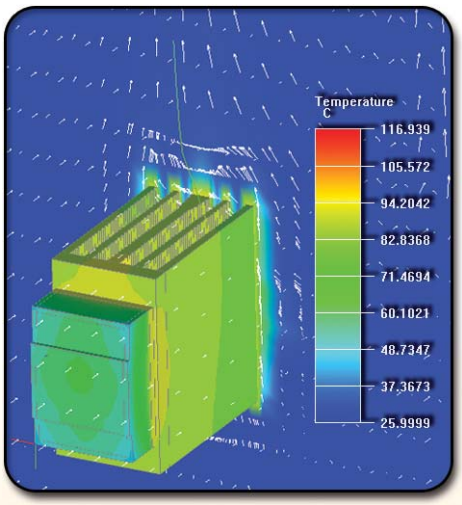
Quality Assurance conducts ongoing product reliability verification tests, gathering precise data on the quality of our power semiconductor vendors and the silicon chips they provide. Additional tests are performed to meet specific customer burn-in requirements.

Crydom tests are exhaustive, including **100% verification** at final test. After units are completely assembled, they must pass a complete set of electrical tests, which are performed twice, once prior to encapsulation and then again afterward.

Because of our dedication to quality, Crydom was one of the first American companies to achieve full certification to the demanding standards of ISO 9001. In addition, most Crydom products are approved by UL, CSA, VDE, TUV and carry the CE Mark signifying conformance with the latest European directives. Certain panel mount and din rail mount relays carry UL 508A SCCR ratings.

Learn how an alliance with the world leader in solid state relays can pay off for you. For details, call your authorized Crydom distributor today.

SSR/Heat Sink Assembly Thermal Simulation



Heat Sinks & SSR Assemblies

Crydom HS Series Heat Sinks

Thermal Management is of prime importance in the application and use of Panel Mount Solid State Relays due to their internal power dissipation of approximately 1 watt/amp of switched load current. Crydom's HS Series of heat sinks, designed with "state of the art" thermal design software, offers optimized thermal performance, size and cost for a variety of single, dual and three phase Solid State Relay applications.

Designed to accept industry standard SSRs, the HS series includes heat sinks with ratings from 5 °C per watt to 0.5 °C per watt which are suitable for combined loads from 10 amps to 100 amps. With models accepting one, two or three SSRs, the HS series heat sinks can be either panel mounted or DIN rail mounted when combined with optional DIN rail mounting bracket kits.

Crydom also offers a variety of accessories which make it easier for the user to select, configure and install SSRs and heat sinks for your application including Thermal Interface pads, clear touch safe SSR covers, SSR mounting hardware and Heat Sink mounting hardware including DIN rail brackets.

For more information on Heat Sink selection and available calculation tools from Crydom, see page 4 of this catalog or go to www.crydom.com/en/HSseries.

Crydom SSR and Heat Sink Assemblies

Crydom offers a variety of its world class standard off-the-shelf single, dual and three phase Solid State Relays mounted on the new Crydom HS series Heat Sinks. Our expertise in both SSR design and thermal management enables us to offer optimized pre-assembled solutions for SSR applications from 5 to 80+ amps. Each Assembly is ready-to-use thus reducing procurement activities, secondary machining, and assembly labor.

The standard Crydom SSR/Heat Sink assemblies are either DIN rail mounted or Panel mounted depending upon model selected, and are available with either one pre-installed single channel SSR, dual SSR or three phase SSR . Customer installed options available for the assemblies include clear plastic touch safe SSR covers and copper terminal lugs suitable for up to 6 AWG wire.

If you don't find the exact combination of Crydom SSRs and Heat Sinks that you need, Crydom offers custom adapted assemblies for applications where further optimization is required for cost, size or performance.

For more information on SSR/Heat Sink selection and available selection tools from Crydom, see page 9 of this catalog or go to www.crydom.com/en/HSseries.

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Heat Sink Selection

Why Heat Sinks are required for Reliable Solid State Relay operation

Heat Sinks are required to insure the proper operation and long term reliability of Solid State Relays because they provide a means to dissipate the power that is normally developed internally in the SSR into the surrounding ambient air and maintain a safe operating temperature.

All SSRs in their conduction state create thermal energy in the output semiconductor at the rate of approximately 1 to 1.5 watts per ampere of load current for AC output SSRs, and 0.2 to 1.5 watts per ampere of load current for DC output SSRs depending upon their design. This power dissipation raises the Solid State Relay's operating temperature above the surrounding ambient.

Solid State Relays can operate reliably with out heat sinks up to approximately 5 amps of load current depending upon model, duty cycle and ambient temperature. Free air ratings of traditional panel mount SSRs may be as high as 8 to 10 amps, but this rating relies on the SSRs exposed metal base plate acting as a heat sink, meaning that it must be exposed to ambient air.

Heat Sinks are made of high thermal conductive material such as aluminum. Not only is aluminum's thermal conductivity high, its cost is relatively low. Although other materials such as steel may provide a limited measure of heat sinking, thermal conductivity of these materials are relatively low compared to aluminum and therefore far less effective as a **Heat Sink**. Coatings also tend to diminish the thermal dissipation effectiveness of most materials and except anodizing, should be avoided.

Heat Sink performance is rated by thermal impedance, measured in °C per watt (°C/W) (thermal impedance is the inverse of thermal conductivity). Thermal impedance represents the resistance to the transfer of thermal energy, therefore lower numerical thermal impedance ratings mean more efficient heat transfer.

Thermal Impedance ratings of **Heat Sinks** are based upon natural convection air flow. To achieve this performance, the **Heat Sink** must be oriented such that air flow over its finned surface is maximized. Generally this means the fins should be orientated vertically.

Significant improvement in **Heat Sink** performance can be achieved by providing forced air flow over the **Heat Sink's** surface area. Fans delivering relatively small volumes of air can reduce the Heat Sink's thermal impedance substantially, thereby improving its efficiency and consequently the SSRs reliability.

Selecting a Heat Sink for a given Solid State Relay application

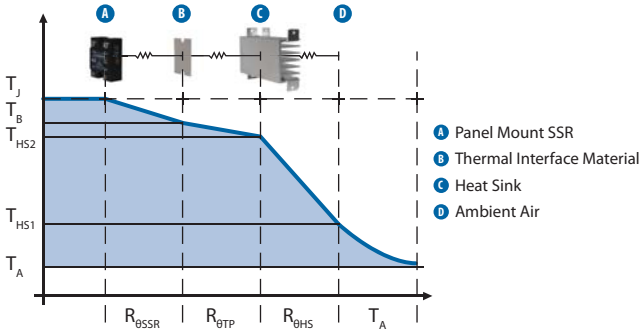
Crydom offers technical assistance selecting a heat sink for any given SSR application through its Applications Engineering Department and on its web site. Available "White Papers" and a selection "tool" to calculate a heat sink rating based upon load current and ambient temperature are available at www.crydom.com.

How to calculate and select a Heat Sink for a given Solid State Relay application

The basic structure of a Solid State Relay includes an internal power semiconductor mounted to an electrical insulator which in turn is mounted to the Solid State Relay's base plate. To form an assembly, the SSR with an accompanying thermal interface material placed on its base plate is then torque mounted to the **Heat Sink**.

The thermal model representing the above configuration includes the following elements:

- **A** The selected SSR with specified thermal impedance ($R_{\Theta ssr}$), forward voltage drop (V_f), and maximum allowed internal operating temperature (T_j).
- **B** The thermal interface material placed between the SSR and the **Heat Sink** and its specified thermal impedance ($R_{\Theta tp}$).
- **C** The calculated minimum **Heat Sink** thermal impedance rating ($R_{\Theta hs}$) required for proper SSR operation.
- **D** The operating environment's max ambient air temperature in °C (T_A).



Solid State Relay - Heat Sink Assembly Thermal Model

To determine the minimum Heat Sink rating ($R_{\Theta hs}$) required for a particular application, the SSRs internal power dissipation must first be calculated. The power developed in the SSR will be the product of the actual load current in amps times the SSRs specified on state voltage drop at that current ($P_d = I_f \times V_f$). Note: Manufacturers generally specify 'maximum forward voltage drop' in their data sheets. Typical voltage drops are often much lower.

For this example, assume that a 25 amp AC output SSR is selected to switch an AC load current of 18 amps with forward voltage drop specified to be 1.25 volts. Therefore the power generated in the SSR is 18 amps times 1.25 volts = 22.5 watts.

Next, determine the Solid State Relay's specified thermal impedance and allowed maximum internal temperature (if the max internal temperature is not specified by the manufacturer, assume 125 °C as this is a common value for many AC power semiconductors). For this example, assume $R_{\Theta ssr}$ of 0.3 °C/W and T_j of 125 °C.

The next step is to determine the maximum operating ambient temperature (T_A) in °C that the SSR will be expected to operate in its application. The ambient value should be the ambient air temperature of the local environment such as the interior of a control cabinet where the SSR and Heat Sink are to be mounted. In this example, assume T_A of 55 °C.

Finally, the thermal impedance of the interface material ($R_{\Theta tp}$) must be determined. These materials will vary from 0.02 to 0.1 °C per watt depending upon the type and thickness selected. For this example, assume that the thermal impedance of the selected interface material $R_{\Theta tp}$ is 0.05 °C/W.

The first calculation is to determine the temperature span (Δt) that the SSRs power must be dissipated into in order to maintain its proper operation. This will be the difference between the SSRs maximum allowed internal temperature and the local ambient temperature. $\Delta t = T_j \text{ max} - T_A$. In this example the result would be: $\Delta t = 125 - 55 = 70$ °C.

The maximum allowed temperature rise noted above, Δt, must then be less than or equal to the combined sum of temperature rises across the three impedances times the power being developed in the SSR. $\Delta t < (R\Theta \text{ ssr} + R\Theta \text{ tp} + R\Theta \text{ hs})$ times Pd. For this example it would be $70 < (0.3 + 0.05 + R\Theta \text{ hs}) \times 22.5$. Therefore the Heat Sink thermal impedance is $R\Theta \text{ hs} < (\Delta t / Pd) - (R\Theta \text{ ssr} + R\Theta \text{ tp})$ or $70/22.5 - 0.35$, equaling 2.76 °C/W.

Therefore in this example, a 2.75 °C/W or larger (lower numerical value) Heat Sink should be used with the Solid State Relay in the application as described above.

Questions? Call or e-mail **Americas** +1 (877) 502 5500 sales@crydom.com
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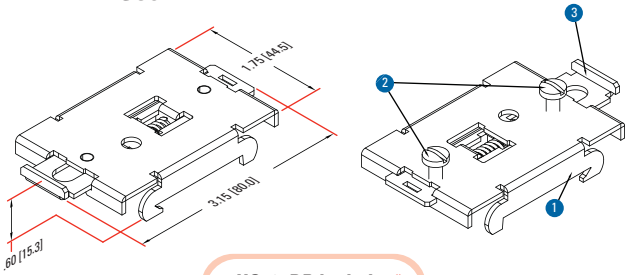
HS501DR

New

- 5.0°C/W Thermal resistance
- Suitable for 1 single or dual SSR
- DIN rail mounting

Size (W x L x H) [in]	1.75 x 3.15 x .60
Size (W x L x H) [mm]	44.5 x 80.0 x 15.3
Surface Area [square inches/square cm]	19.0/122
Heat Sink Material	Steel
Heat Sink Surface Finish	Yellow zinc
Weight [lbs/grs]	.12/52
SSR Mounting Holes, Screw Torque [in lbs/Nm]	Two M4, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	No

HS501DR



HS501DR includes*

1. DIN Mounting Bracket
2. M4 Mounting Screws
3. Latch Release

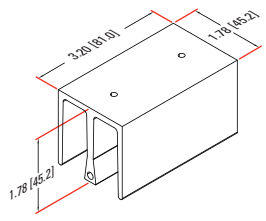
HS351, HS351DR

New

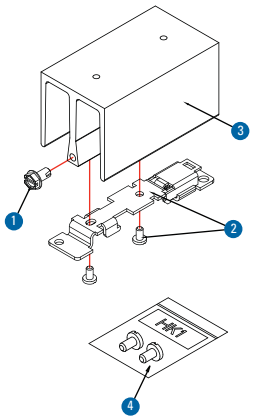
- 3.5°C/W Thermal resistance
- Suitable for 1 single or dual SSR
- DIN rail or panel mounting

Size w/o Bracket (W x L x H) [in]	1.78 x 3.20 x 1.78
Size w/o Bracket (W x L x H) [mm]	45.2 x 81.0 x 45.2
Surface Area [square inches/square cm]	44.9/290
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Natural Aluminum
Weight w/o DIN Bracket [lbs/grs]	.28/128
SSR Mounting Holes, Screw Torque [in lbs/Nm]	Two 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	No

HS351



HS351DR



HS351DR includes*

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 2 (DRK2)
3. Heat Sink (HS351)
4. One Hardware Kit 1 (HK1)

* HSxxxDR components are pre-installed at the factory prior to shipment.

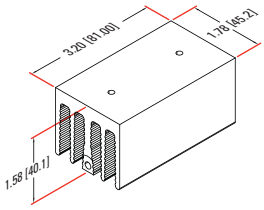
HS301, HS301DR

New

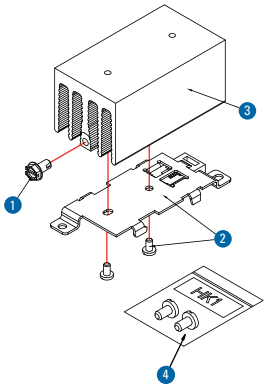
- 3.0°C/W Thermal resistance
- Suitable for 1 single or dual SSR
- DIN rail or panel mounting

Size w/o Bracket (W x L x H) [in]	1.78 x 3.20 x 1.58
Size w/o Bracket (W x L x H) [mm]	45.2 x 81.0 x 40.1
Surface Area [square inches/square cm]	59.0/381
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Black Anodized
Weight w/o DIN Bracket [lbs/grs]	.40/178
SSR Mounting Holes, Screw Torque [in lbs/Nm]	Two 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	Yes/one 40

HS301



HS301DR



HS301DR includes*

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS301)
4. One Hardware Kit 1 (HK1)

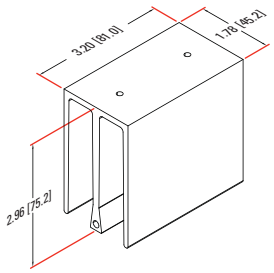
HS271, HS271DR

New

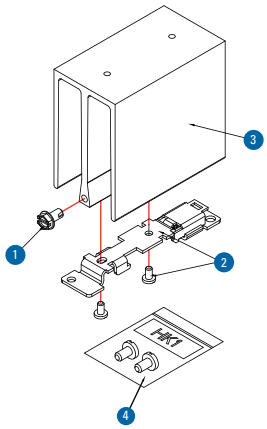
- 2.7°C/W Thermal resistance
- Suitable for 1 single or dual SSR
- DIN rail or panel mounting

Size w/o Bracket (W x L x H) [in]	1.78 x 3.20 x 2.96
Size w/o Bracket (W x L x H) [mm]	45.2 x 81.0 x 75.2
Surface Area [square inches/square cm]	68.5/442
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Natural Aluminum
Weight w/o DIN Bracket [lbs/grs]	.45/204
SSR Mounting Holes, Screw Torque [in lbs/Nm]	Two 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	No

HS271



HS271DR



HS271DR includes*

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 2 (DRK2)
3. Heat Sink (HS271)
4. One Hardware Kit 1 (HK1)

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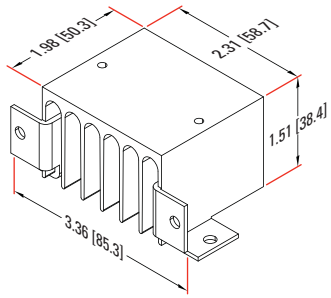
HS251

New

- 2.5°C/W Thermal resistance
- Suitable for 1 single or dual SSR
- Panel mounting

Size w/o Brackets (W x L x H) [in]	2.31 x 1.98 x 1.51
Size w/o Brackets (W x L x H) [mm]	58.7 x 50.3 x38.4
Surface Area [square inches/square cm]	52.1/336
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Natural Aluminum
Weight [lbs/grs]	.22/99
SSR Mounting Holes, Screw Torque [in lbs/Nm]**	Two 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	No

** HS251 requires a hardware kit (HK1) to mount the SSR.



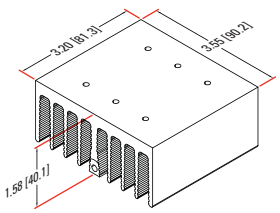
HS202, HS202DR

New

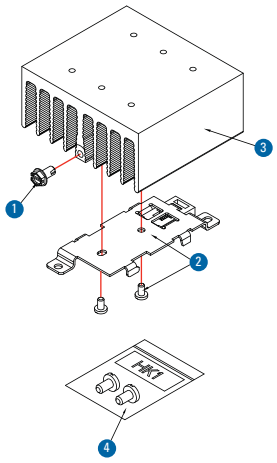
- 2.0°C/W Thermal resistance
- Suitable for 1 or 2 single or dual SSRs
- DIN rail or panel mounting available

Size w/o Bracket (W x L x H) [in]	3.55 x 3.20 x 1.58
Size w/o Bracket (W x L x H) [mm]	90.2 x 81.3 x 40.1
Surface Area [square inches/square cm]	106.7/688
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Black Anodized
Weight w/o DIN Bracket [lbs/grs]	.70/319
SSR Mounting Holes, Screw Torque [in lbs/Nm]	Six 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	Yes/one or two 40

HS202



HS202DR



HS202DR includes*

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS202)
4. Two Hardware Kits 1 (HK1)

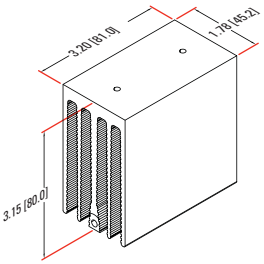
HS201, HS201DR

New

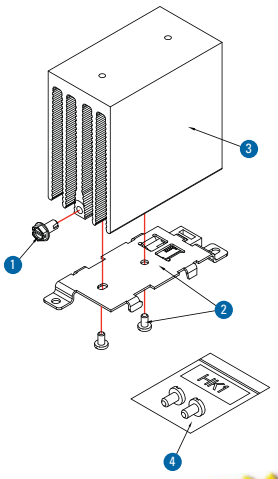
- 2.0°C/W Thermal resistance
- Suitable for 1 single or dual SSR
- DIN rail or panel mounting available

Size w/o Bracket (W x L x H) [in]	1.78 x 3.20 x 3.15
Size w/o Bracket (W x L x H) [mm]	45.2 x 81.0 x 80.0
Surface Area [square inches/square cm]	116.3/750
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Black Anodized
Weight w/o DIN Bracket [lbs/grs]	.71/322
SSR Mounting Holes, Screw Torque [in lbs/Nm]	Two 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	Yes/one 40

HS201



HS201DR



HS201DR includes*

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS201)
4. One Hardware Kit 1 (HK1)

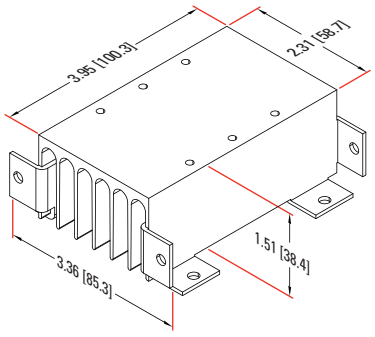
HS172

New

- 1.7°C/W Thermal resistance
- Suitable for 1 or 2 single or dual SSRs
- Panel mounting

Size w/o Brackets (W x L x H) [in]	2.31 x 3.95 x 1.51
Size w/o Brackets (W x L x H) [mm]	58.7 x 100.3 x 38.4
Surface Area [square inches/square cm]	102.2/659
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Natural Aluminum
Weight [lbs/grs]	.43/196
SSR Mounting Holes, Screw Torque [in lbs/Nm]***	Six 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	No

*** For HS172 heat sink, we recommend the HK1 hardware kit for SSR mounting.
The number of kits required depends upon the number and type of SSRs to be mounted.



* HSxxxDR components are pre-installed at the factory prior to shipment.

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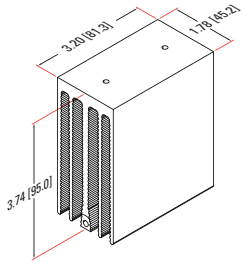
HS151, HS151DR

New

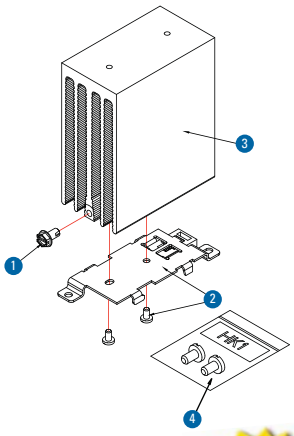
- 1.5°C/W Thermal resistance
- Suitable for 1 single or dual SSR
- DIN rail or panel mounting available

Size w/o Bracket (W x L x H) [in]	1.78 x 3.20 x 3.74
Size w/o Bracket (W x L x H) [mm]	45.2 x 81.3 x 95.0
Surface Area [square inches/square cm]	138.0/891
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Black Anodized
Weight w/o DIN Bracket [lbs/grs]	.85/319
SSR Mounting Holes, Screw Torque [in lbs/Nm]	Two 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	Yes/one 40

HS151



HS151DR



HS151DR includes*

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS151)
4. One Hardware Kit 1 (HK1)

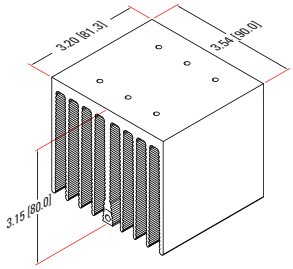
HS122, HS122DR

New

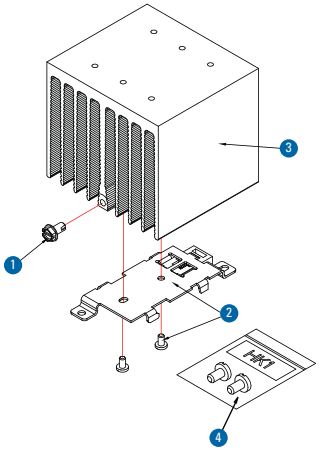
- 1.2°C/W Thermal resistance
- Suitable for 1 or 2 single or dual SSRs
- DIN rail or panel mounting available

Size w/o Bracket (W x L x H) [in]	3.54 x 3.20 x 3.15
Size w/o Bracket (W x L x H) [mm]	90.0 x 81.3 x 80.0
Surface Area [square inches/square cm]	210.3/1360
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Black Anodized
Weight w/o DIN Bracket [lbs/grs]	1.17/532
SSR Mounting Holes, Screw Torque [in lbs/Nm]	Six 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	Yes/one 60

HS122



HS122DR



HS122DR includes*

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS122)
4. Two Hardware Kits 1 (HK1)

* HSxxxDR components are pre-installed at the factory prior to shipment.

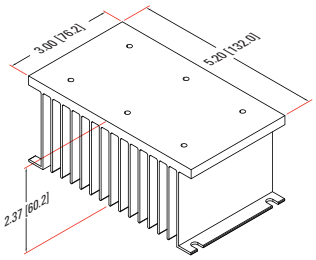
HS103, HS103DR

New

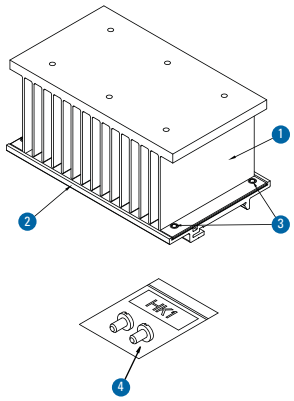
- 1.0°C/W Thermal resistance
- Suitable for 1, 2, or 3 single or dual SSRs; one 3 Phase SSR
- DIN rail or panel mounting available

Size w/o Bracket (W x L x H) [in]	5.20 x 3.00 x 2.37
Size w/o Bracket (W x L x H) [mm]	132.0 x 76.2 x 60.2
Surface Area [square inches/square cm]	227.2/1470
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Black Anodized
Weight w/o DIN Bracket [lbs/grs]	.97/439
SSR Mounting Holes, Screw Torque [in lbs/Nm]	Six 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	Yes/one or two 40

HS103



HS103DR



HS103DR includes*

1. Heat Sink (HS103)
2. Extruded DIN Rail Bracket
3. Fasteners
4. Three Hardware Kits 1 (HK1)

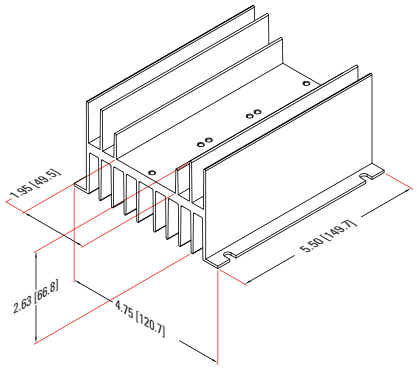
HS072

New

- 0.7°C/W Thermal resistance
- Suitable for 1 or 2 single or dual SSRs
- Panel mounting

Size (W x L x H) [in]	4.75 x 5.50 x 2.63
Size (W x L x H) [mm]	120.7 x 149.7 x 66.8
Surface Area [square inches/square cm]	253.6/1640
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Natural Aluminum
Weight [lbs/grs]	1.16/526
SSR Mounting Holes, Screw Torque [in lbs/Nm]***	Six 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	No

*** For HS072 heat sinks, we recommend the HK1 hardware kit for SSR mounting. The number of kits required depends upon the number and type of SSRs to be mounted.



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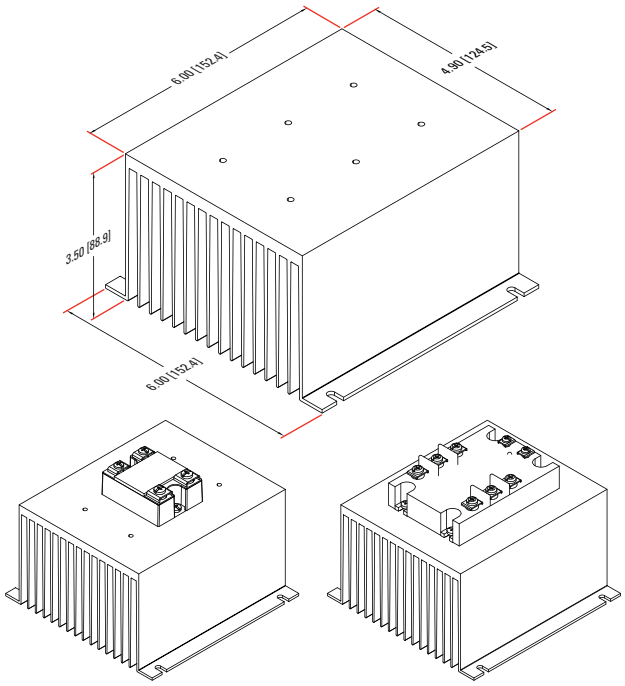
HS053

New

- 0.5°C/W Thermal resistance
- Suitable for 1, 2, or 3 single or dual SSRs; one 3 Phase SSR
- Panel mounting

Size (W x L x H) [in]	6.00 x 6.00 x 3.50
Size (W x L x H) [mm]	152.4 x 152.4 x 88.9
Surface Area [square inches/square cm]	694.3/4480
Heat Sink Material	Aluminum
Heat Sink Surface Finish	Black Anodized
Weight [lbs/grs]	3.14/1423
SSR Mounting Holes, Screw Torque [in lbs/Nm]***	Six 8x32, 15 to 20/1.7 to 2.2
Accepts fan(s)/qty & size [mm]	Yes/one 80

*** For HS053 heat sink, we recommend the HK1 hardware kit for SSR mounting. The number of kits required depends upon the number and type of SSRs to be mounted.



Product/Accessories Index

Page	Part number	HK1	HK2	HSP1 TP01	HSP3 TP03	KS100	KS300	TRM6	DRK1	DRK2
5	**HS501DR**	✓		✓		✓		✓		
5	**HS351**	✓	✓	✓		✓		✓		✓
5	**HS301**	✓	✓	✓		✓		✓	✓	
5	**HS271**	✓	✓	✓		✓		✓		✓
6	**HS251**	✓		✓		✓		✓		
6	**HS202**	✓		✓		✓		✓	✓	
6	**HS201**	✓	✓	✓		✓		✓	✓	
6	**HS172**	✓	✓	✓		✓		✓		
7	**HS151**	✓	✓	✓		✓		✓	✓	
7	**HS122**	✓	✓	✓		✓		✓	✓	
7	**HS103**	✓		✓	✓	✓	✓	✓		
7	**HS072**	✓		✓		✓		✓		
8	**HS053**	✓		✓	✓	✓	✓	✓		

Accessories

Hardware Kits
HK1, HK2

Hardware Kit 1
Part no.: HK1
Bag with 2 SSR mounting screws 8-32 x 3/8.

Hardware Kit 2
Part no.: HK2
Bag with 1 ground screw 10-32 x 3/8 and 2 bracket screws 6-32 x 1/4.

Thermal Pads
HSP1, HSP3, TP01, TP03

TP01

Single Phase Heat Transfer Pads
Part no.: HSP1
2.3x1.8 in or 58.4 x 45.7 mm Non-adhesive thermal pad for single phase and dual panel mount SSRs (25 pack).

Part no.: TP01
2.1x1.6 in or 53.3x40.6 mm Thermal pad for single phase or dual panel mount SSRs. Includes adhesive on one side.

TP03

Three Phase Heat Transfer Pads
Part no.: HSP3
4.1x2.9 in or 104.1x73.7 mm Thermal pad for three phase panel mount SSRs.

Part no.: TP03
3.9x2.8 in or 99.1x71.1 mm Thermal pad for three phase panel mount SSRs. Includes adhesive on one side.

KS Covers
KS100, KS300

Single Phase SSR Cover
Part no.: KS100
Clear plastic cover for standard single phase SSRs.

Three Phase SSR Cover
Part no.: KS300
Clear plastic cover for three phase SSRs.

Wire Lug Terminal
TRM6

Copper wire lug for SSR Output Terminals
Part no.: TRM6
Accepts AWG 14 to AWG 6 wire size.
Mounts with #8 ,#10, M4 or M5 screws.

DIN Rail Bracket Kits
DRK1, DRK2

DIN Rail Kit 1
Part no.: DRK1
Weight 0.8lbs/34grs.
Spring, Retaining clip, 45mm DIN Rail bracket and 2 screws 6-32 x 1/4.

DIN Rail Kit 2
Part no.: DRK2
Weight 0.7lbs/31grs.
Spring, DIN Rail Latch, 22.5mm DIN Rail bracket and 2 screws 6-32 x 1/4.

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Solid State Relay/Heat Sink Assembly Selection

Why Select a SSR/Heat Sink Assembly versus a Solid State Relay and a Heat Sink?

Assemblies offer the advantage of eliminating the calculations and heat sink selection during the design phase of a project, and they eliminate the assembly process during the production phase of a project. Thermal derating curves for each SSR/Heat Sink combination make the selection of the best possible solution significantly easier. The SSRs and Heat Sinks arrive fully assembled with thermal interface material and mounting screws torqued to the correct values and are "ready to use". Optional available DIN rail mounting brackets can also be ordered pre-installed on the heat sink, further easing mounting.

Selecting a Solid State Relay/Heat Sink Assembly for an Application

Crydom offers technical assistance selecting a SSR/Heat Sink Assembly for any given SSR application through its Applications Engineering Department and on its web site. Available "White Papers" and a selection "tool" to determine the optimum SSR/Heat Sink Assembly for an application based upon load current & voltage, control voltage and ambient temperature are available at www.crydom.com/en/HSseries.

How to Select a Solid State Relay/Heat Sink Assembly from the catalog

Each Assembly carries a maximum load current rating verses ambient temperature, line voltage rating and control voltage rating. There are load current ratings available up to 80+ amps AC, line voltage ratings available up to 660 VAC and all models are available with DC control voltage.

Selection of the best assembly can be accomplished as follows:

1. Determine what maximum line voltage is required for the application.
2. Determine the input control voltage required or voltage range available.
3. Determine the maximum load current and maximum ambient temperature that the Assembly is expected to operate in.
4. Establish the preferred mounting method, panel or DIN rail.
5. Once the above information is gathered, examine each Assembly's derating chart in the catalog and select models with suitable combined rating for the required load current at the required ambient temperature.
6. From this group of Assemblies, select a model with the correct combination of line voltage, control voltage and required mounting.
7. Order the Crydom SSR/Heat Sink assembly from your preferred Crydom Distributor or contact your local Crydom Representative or Regional Sales Office for more information or technical assistance.

You may choose to go to our website at www.crydom.com/en/HSseries and use the assembly selection tool available there. The selection tool requires the same parameters as noted above to select an SSR/Heat Sink Assembly.

Don't find the combination of ratings you need?

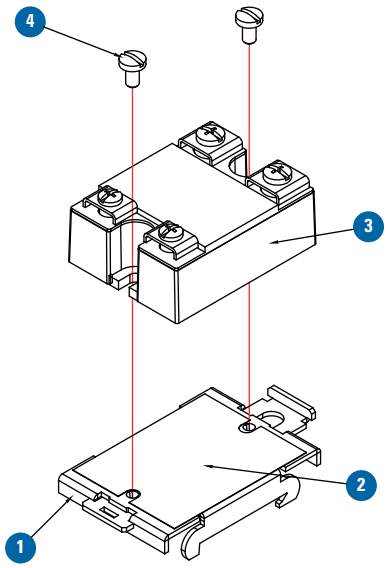
Crydom markets a broad selection of class leading Solid State Relays. We not only offer the customer the ability to select among a wide range of standard panel mount power SSR products, including AC output or DC output, random or zero turn on, single, dual or 3 phase SSRs mounted to any of our available heat sinks, but we can adapt the design of the Solid State Relay and even the **Heat Sinks** themselves to precisely meet your application requirements. Consult your local Crydom Representative for more information and assistance.

HS501DR Assemblies

- *10 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel output*
- *3 to 32 VDC input control voltage*
- *DIN Rail mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input

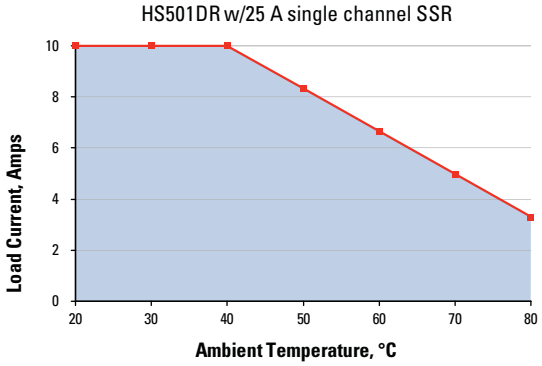
	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS501DR-D2425	1	24-280	.04-10	3-32	3.4 @ 5Vdc
HS501DR-HD6025	1	48-660	.04-10	3-32	2.0 @ 5Vdc



Assembly includes

1. DIN Mounting Bracket (HS501DR)
2. Thermal Pad (TP01)
3. SSR (See table above for options)
4. M4 Mounting Screws

Derating Curve



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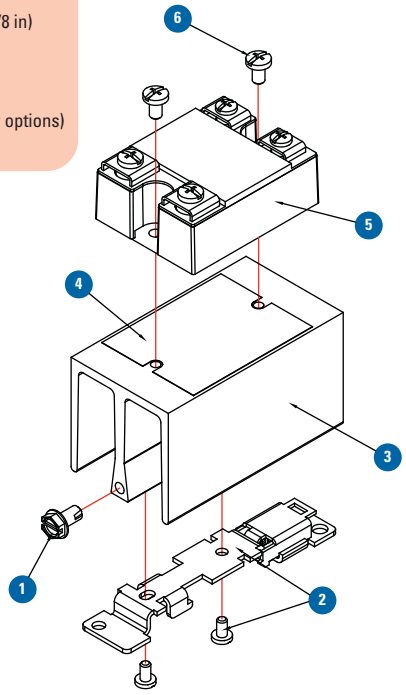
HS351DR Assemblies

- *20 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel output*
- *3 to 32 VDC input control voltage*
- *DIN Rail mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS351DR-D2425	1	24-280	.04-20	3-32	3.4 @ 5Vdc
HS351DR-HD6025	1	48-660	.04-20	3-32	2.0 @ 5Vdc

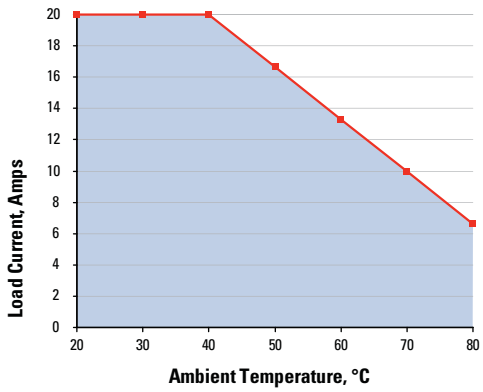
Assembly includes

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 2 (DRK2)
3. Heat Sink (HS351)
4. Thermal Pad (TP01)
5. SSR (See table above for options)
6. Hardware Kit 1 (HK1)



Derating Curve

HS351DR w/25 A single channel SSR



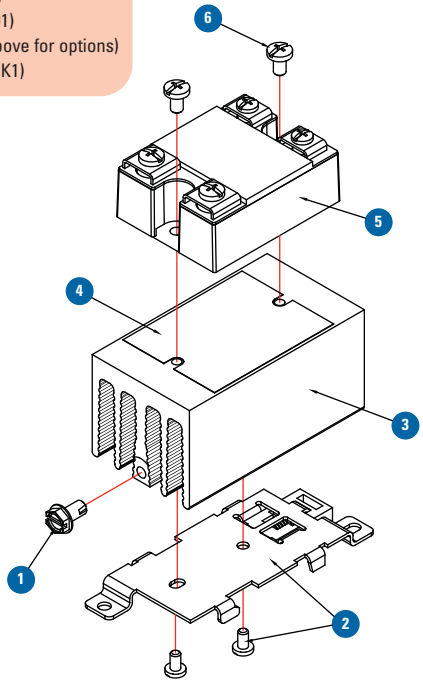
HS301DR Assemblies

- *24 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel output*
- *3 to 32 VDC input control voltage*
- *DIN Rail mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS301DR-D2425	1	24-280	.04-24	3-32	3.4 @ 5Vdc
HS301DR-HD6025	1	48-660	.04-24	3-32	2.0 @ 5Vdc

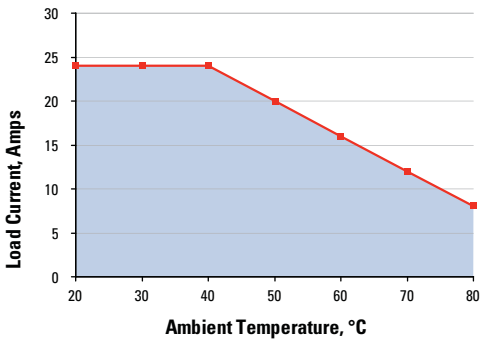
Assembly includes

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS301)
4. Thermal Pad (TP01)
5. SSR (See table above for options)
6. Hardware Kit 1 (HK1)



Derating Curve

HS301DR w/25 A single channel SSR



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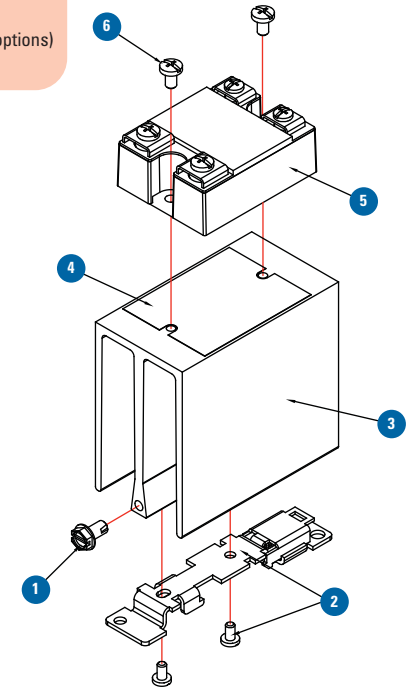
HS271DR Assemblies

- *25 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel output*
- *3 to 32 VDC input control voltage*
- *DIN Rail mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS271DR-D2425	1	24-280	.04-25	3-32	3.4 @ 5Vdc
HS271DR-HD6025	1	48-660	.04-25	3-32	2.0 @ 5Vdc

Assembly includes

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 2 (DRK2)
3. Heat Sink (HS271)
4. Thermal Pad (TP01)
5. SSR (See table above for options)
6. Hardware Kit 1 (HK1)



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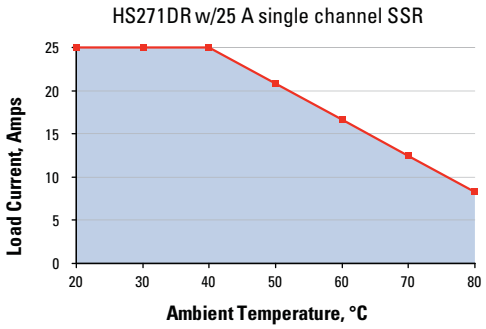
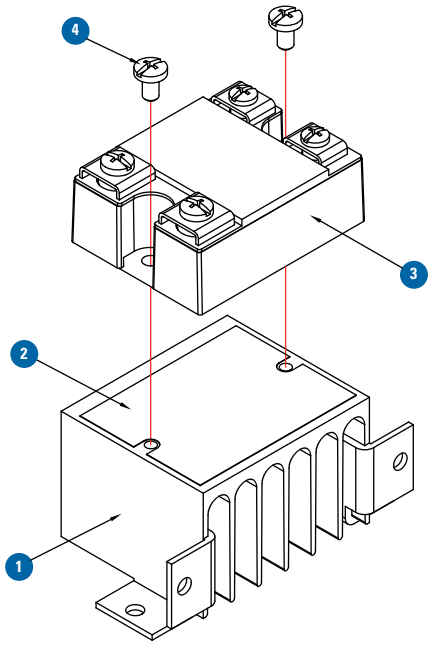


HS251 Assemblies

- *28 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel output*
- *3 to 32 VDC input control voltage*
- *Panel mounted*
- *UL, CSA, VDE, CE approved SSRs*

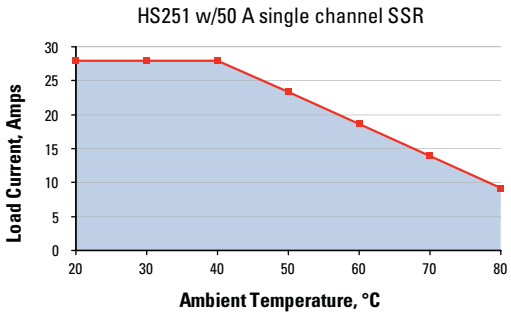
dc input	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS251-D2450	1	24-280	.04-28	3-32	3.4 @ 5Vdc
HS251-HD6050	1	48-660	.04-28	3-32	2.0 @ 5Vdc



Assembly includes

1. Heat Sink (HS251)
2. Thermal Pad (TP01)
3. SSR (See table above for options)
4. Hardware Kit 1 (HK1)

Derating Curve



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HS202DR Assemblies

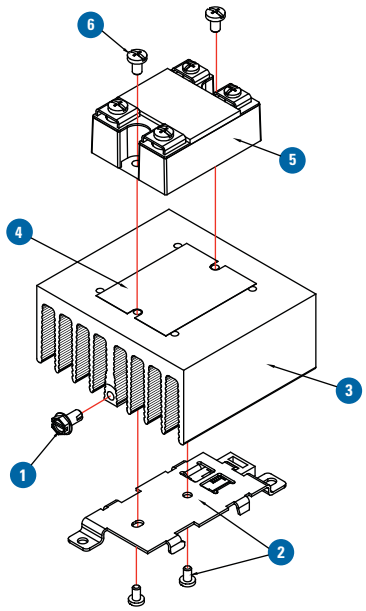
- *35 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel output*
- *3 to 32 VDC input control voltage*
- *DIN Rail mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input

	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS202DR-D2450	1	24-280	.04-35	3-32	3.4 @ 5Vdc
HS202DR-HD6050	1	48-660	.04-35	3-32	2.0 @ 5Vdc

Assembly includes

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS202)
4. Thermal Pad (TP01)
5. SSR (See table above for options)
6. Hardware Kit 1 (HK1)



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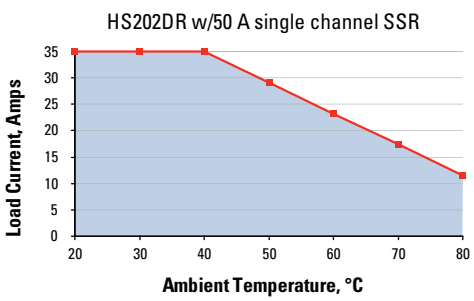


HS201DR Assemblies

- *35 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single or Dual channel outputs*
- *3 to 32 VDC input control voltage*
- *DIN Rail mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input

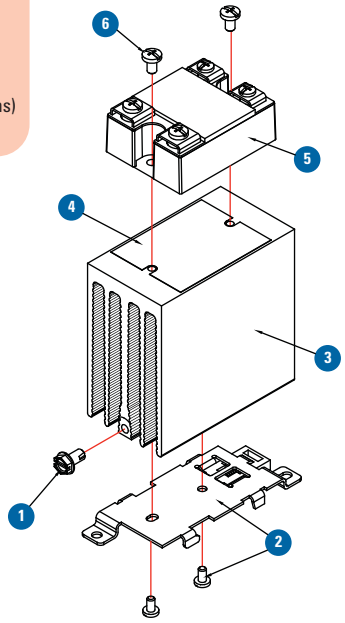
	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS201DR-D2450	1	24-280	.04-35	3-32	3.4 @ 5Vdc
HS201DR-HD6050	1	24-280	.04-35	3-32	2.0 @ 5Vdc

Dual

	Included SSRs	Line Voltage Range Vrms	Load Current Range* Arms	Control Voltage Range Vdc	Control Current mA
HS201DR-CC2425W3U	1	24-280	.15-35	4-32	10 @ 12Vdc

Assembly includes

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS201)
4. Thermal Pad (TP01)
5. SSR (See table above for options)
6. Hardware Kit 1 (HK1)



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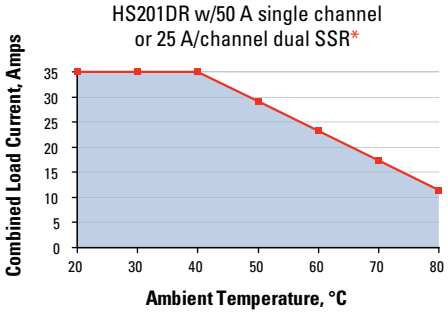

* Output current specification is total combined load current for all conducting channels.

Questions? Call or e-mail **Americas** +1 (877) 502 5500 sales@crydom.com
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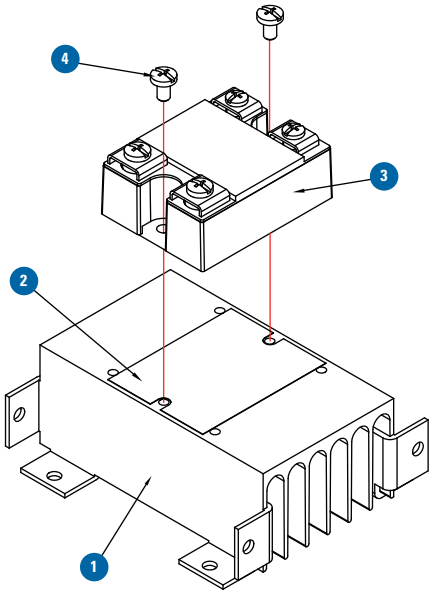
HS172 Assemblies

- *36 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel output*
- *3 to 32 VDC input control voltage*
- *Panel mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input

	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS172-D2450	1	24-280	.04-36	3-32	3.4 @ 5Vdc
HS172-HD6050	1	48-660	.04-36	3-32	2.0 @ 5Vdc

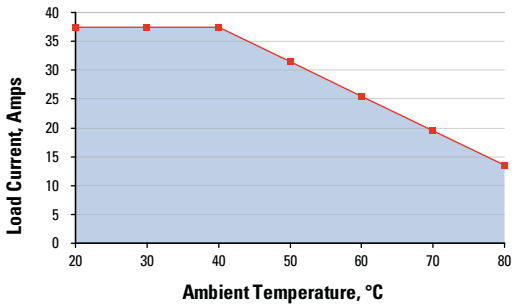


Assembly includes

1. Heat Sink (HS172)
2. Thermal Pad (TP01)
3. SSR (See table above for options)
4. Hardware Kit 1 (HK1)

Derating Curve

HS172 w/50 A single channel SSR



HS151DR Assemblies

- *40 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single or Dual channel outputs*
- *3 to 32 VDC input control voltage*
- *DIN Rail mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input

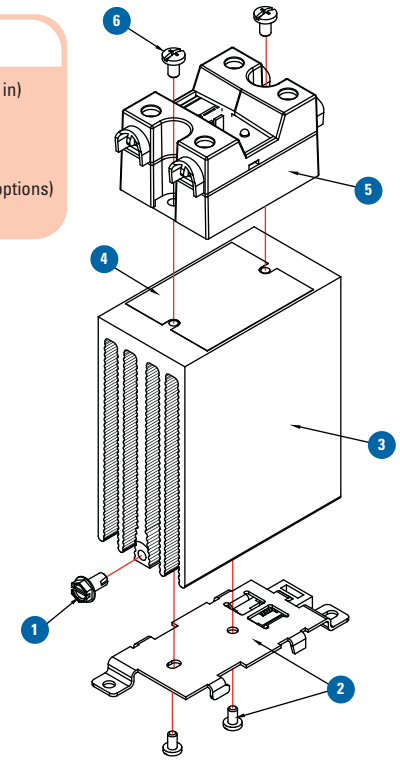
	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS151DR-D2450	1	24-280	.04-40	3-32	3.4 @ 5Vdc
HS151DR-HD6050	1	48-660	.04-40	3-32	2.0 @ 5Vdc

Dual

	Included SSRs	Line Voltage Range Vrms	Load Current Range* Arms	Control Voltage Range Vdc	Control Current mA
HS151DR-CC2450W3U	1	24-280	.15-40	4-32	10 @ 12Vdc

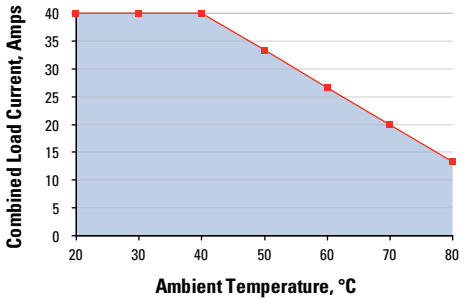
Assembly includes

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS151)
4. Thermal Pad (TP01)
5. SSR (See table above for options)
6. Hardware Kit 1 (HK1)



Derating Curve

HS151DR w/50 A single channel or 50 A/channel dual SSR*



* Output current specification is total combined load current for all conducting channels.

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HS122DR Assemblies

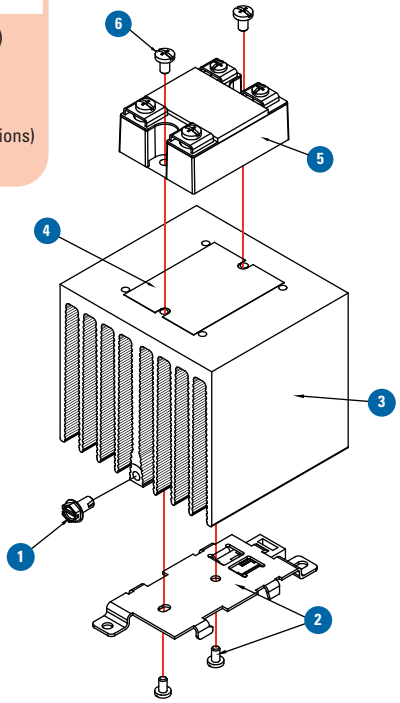
- *45 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single or Dual channel outputs*
- *3 to 32 VDC input control voltage*
- *DIN Rail mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS122DR-D2450	1	24-280	.04-45	3-32	3.4 @ 5Vdc
HS122DR-HD6050	1	48-660	.04-45	3-32	2.0 @ 5Vdc

Dual	Included SSRs	Line Voltage Range Vrms	Load Current Range* Arms	Control Voltage Range Vdc	Control Current mA
HS122DR-CC2450W3U	1	24-280	.15-45	4-32	10 @ 12Vdc

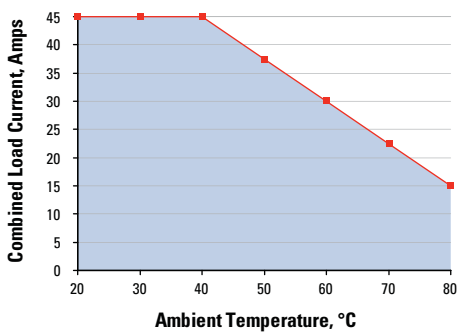
Assembly includes

1. Ground Screw (10-32 x 3/8 in)
2. DIN Rail Kit 1 (DRK1)
3. Heat Sink (HS122)
4. Thermal Pad (TP01)
5. SSR (See table above for options)
6. Hardware Kit 1 (HK1)



Derating Curve

HS122DR w/50 A single channel or 50 A/channel dual SSR



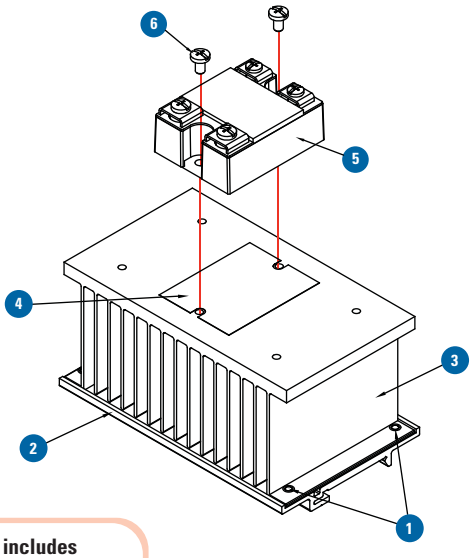
* Output current specification is total combined load current for all conducting channels.

HS103DR Assemblies

- *55 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel or 3 phase outputs*
- *3 to 32 VDC input control voltage*
- *DIN Rail mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input	Included SSRs	Line Voltage Range Vrms	Load Current Range Arms	Control Voltage Range Vdc	Control Current mA
HS103DR-D2490	1	24-280	.04-55	3-32	3.4 @ 5Vdc
HS103DR-HD6090	1	48-660	.04-55	3-32	2.0 @ 5Vdc

3 Phase	Included SSRs	Line Voltage Range Vrms	Load Current Range* Arms	Control Voltage Range Vdc	Control Current mA
HS103DR-D53TP25D	1	48-530	.05-55	3-32	10 @ 5Vdc

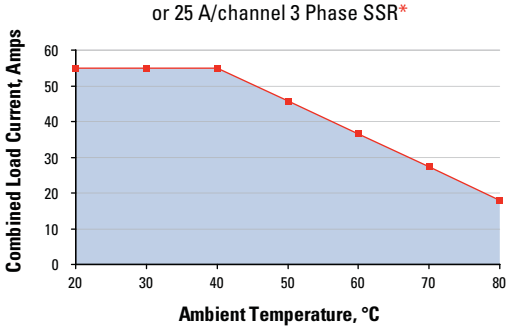


Assembly includes

1. Fasteners
2. Extruded DIN Rail Bracket
3. Heat Sink (HS103)
4. Thermal Pad (TP01/TP03)
5. SSR (See table above for options)
6. Hardware Kit 1 (HK1)

Derating Curve

HS103DR w/90 A single channel or 25 A/channel 3 Phase SSR*



* Output current specification is total combined load current for all conducting channels.

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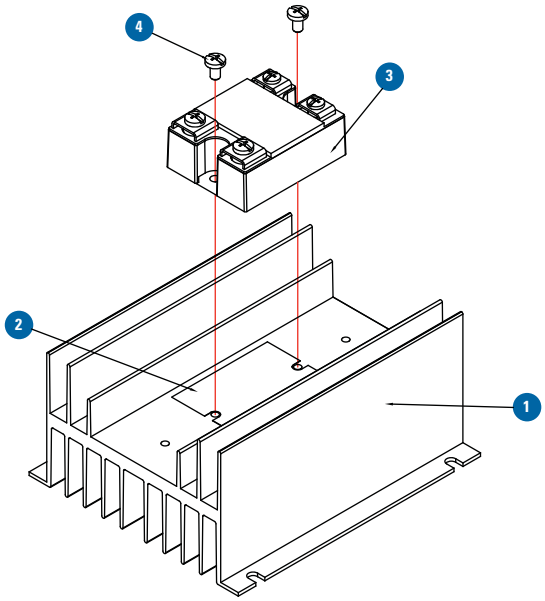
HS072 Assemblies

- *65 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel output*
- *3 to 32 VDC input control voltage*
- *Panel mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input

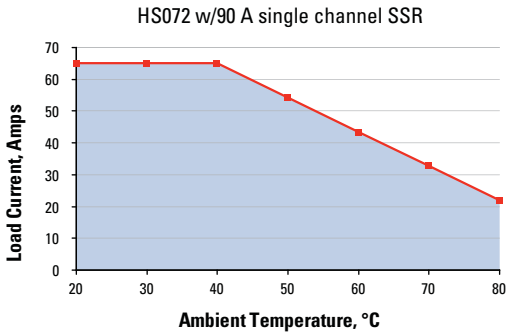
	Included SSRs	Line Voltage Range **Vrms**	Load Current Range **Arms**	Control Voltage Range **Vdc**	Control Current **mA**
HS072-D2490	1	24-280	.04-65	3-32	3.4 @ 5Vdc
HS072-HD6090	1	48-660	.04-65	3-32	2.0 @ 5Vdc



Assembly includes

1. Heat Sink (HS072)
2. Thermal Pad (TP01)
3. SSR (See table above for options)
4. Hardware Kit 1 (HK1)

Derating Curve



HS053 Assemblies

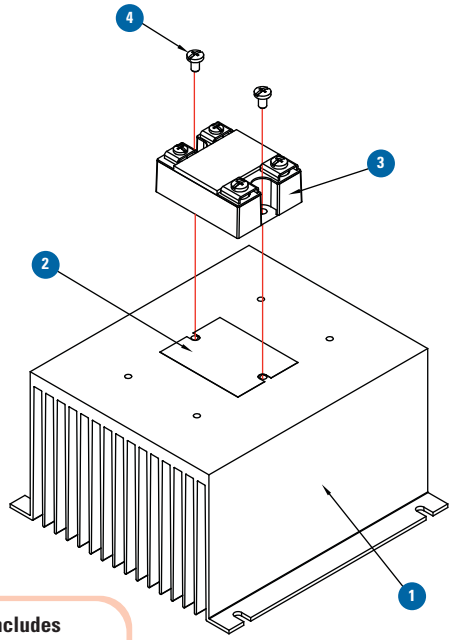
- *82.5 Amp AC output @ 40 °C*
- *24 to 280 or 48 to 660 VAC line voltage range*
- *Single channel or 3 phase outputs*
- *3 to 32 VDC input control voltage*
- *Panel mounted*
- *UL, CSA, VDE, CE approved SSRs*

dc input

	Included SSRs	Line Voltage Range **Vrms**	Load Current Range **Arms**	Control Voltage Range **Vdc**	Control Current **mA**
HS053-D24125	1	24-280	.15-82.5	3-32	3.4 @ 5Vdc
HS053-HD60125	1	48-660	.15-82.5	3-32	2.0 @ 5Vdc

3 Phase

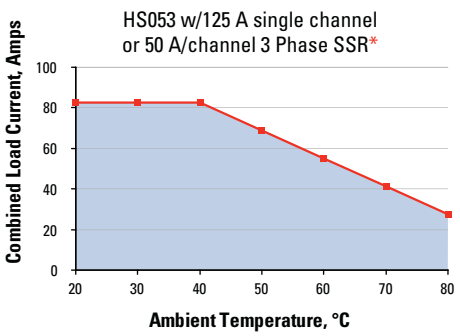
	Included SSRs	Line Voltage Range **Vrms**	Load Current Range* **Arms**	Control Voltage Range **Vdc**	Control Current **mA**
HS053-D53TP50D	1	48-530	.05-82.5	3-32	10 @ 5Vdc



Assembly includes

1. Heat Sink (HS053)
2. Thermal Pad (TP01/TP03)
3. SSR (See table above for options)
4. Hardware Kit 1 (HK1)

Derating Curve



* Output current specification is total combined load current for all conducting channels.

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