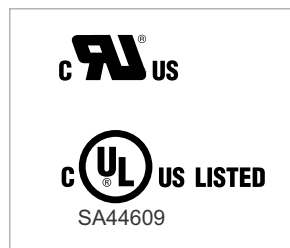




ADVANCED COOLING TECHNOLOGIES, INC.

Innovations in Action

ACT-HSC SERIES HEAT SINK COOLERS SEALED ENCLOSURE COOLING INSTALLATION GUIDE



ACT-HSC-22



ACT-HSC-45



ACT-HSC-68

- SEALED ENCLOSURE COOLERS KEEP THE INSIDE OF YOUR ENCLOSURE FREE OF DIRT & DEBRIS
- NEMA 1 2, 4, 4X AND 3R MODELS AVAILABLE
- OPERATING VOLTAGES: 1 2VDC, 24VDC, 48VDC, 1 15 VAC AND 230VAC
- DUAL AXIAL BALL BEARING FANS FOR YEARS OF MAINTENANCE FREE OPERATION
- 1-YEAR WARRANTY

CAUTION

BEFORE INSTALLING AND USING THE ACT-HSC PRODUCT, IT IS IMPORTANT THAT THIS MANUAL BE READ AND UNDERSTOOD THOROUGHLY

ACT-HSC Series Heat Sink Cooler Operation

The ACT Heat Sink Cooler (HSC) is a conduction based enclosure cooling product that is available in three sizes to address a large range of enclosure sizes and heat loads. The HSC design features two high performance heat sinks bonded to a center mounting plate. The center plate is designed in a way that prevents water or dust from passing between the opposing sides where the heat sinks are bonded. The center plate has an embedded gasket groove around its perimeter flange that contains a weatherproof gasket that ensures a quality seal with the enclosure that the HSC is being mounted to.

ACT-HSC units can be mounted to the side, door or roof of electrical enclosures. Installation requires a square cutout in the wall of the enclosure for the HSC to stick through. A bolt pattern around the perimeter secures the HSC to the enclosure and compresses the perimeter gasket, making a seal that prevents dirt or water from entering the cabinet.



Typical Installation location for an ACT-HSC-22 Unit

ACT-HSC units operate by exchanging the heat from the air inside of the electronics enclosure with the ambient air outside of the enclosure without allowing the two air streams to mix. see Figure 1.

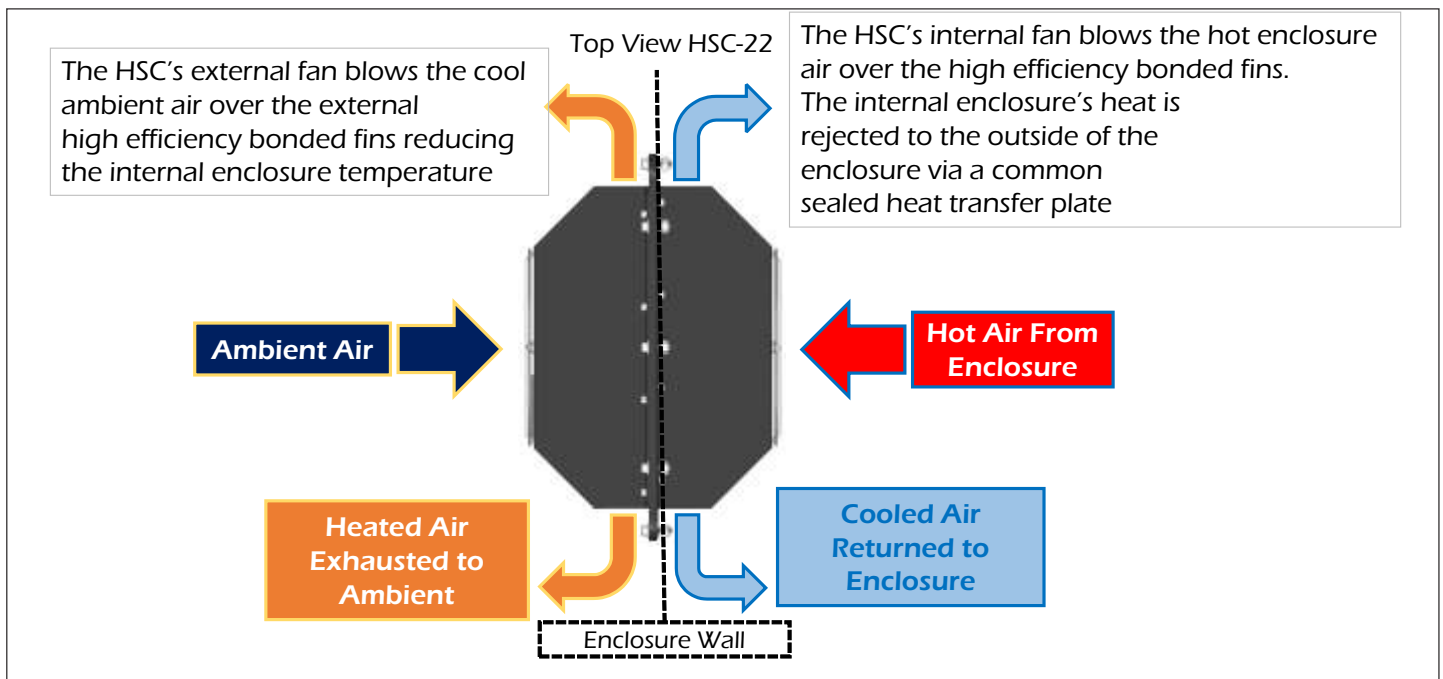


Figure 1 : Top View of ACT-HSC-22 with arrows showing the airflow patterns of the internal and external air streams

WARNING

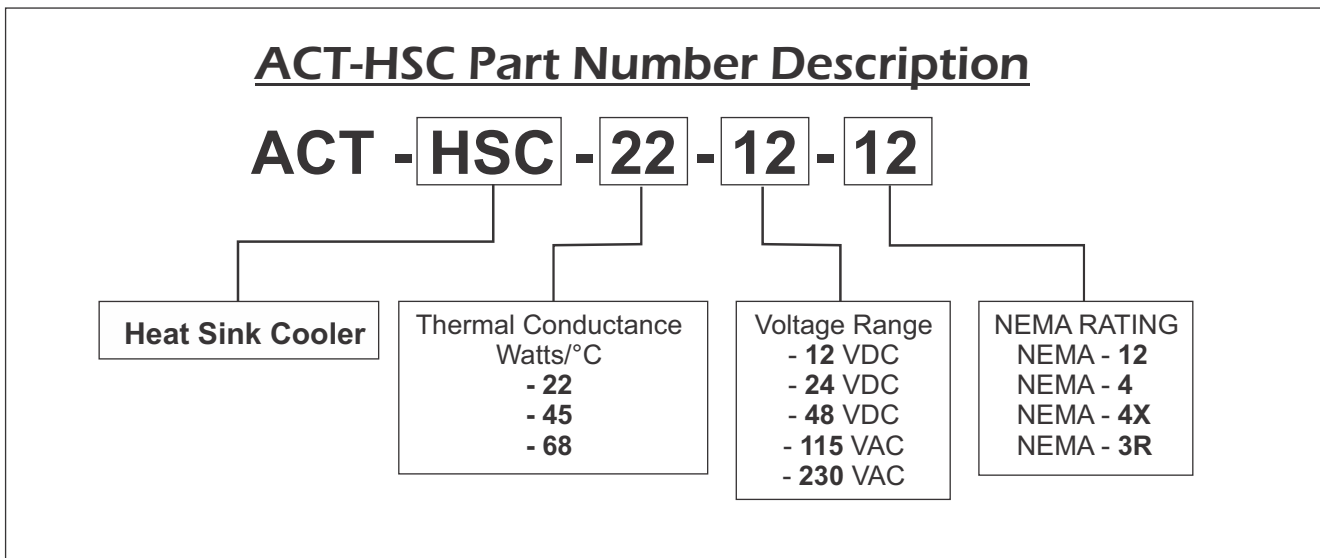
TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK OR INJURY, PLEASE OBSERVE THE FOLLOWING:

Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.

ACT-HSC Series Heat Sink Cooler Operation

The number that has been assigned to each of the ACT-HSC models corresponds to its thermal conductance in Watts/°C. For example, the ACT-HSC 22 is capable of dissipating 22 Watts of heat for every 1°C temperature difference between the inside air and the ambient air outside of the enclosure. The ACT-HSC-68 is capable of dissipating 68 Watts of heat for every 1°C temperature difference

If an electrical cabinet has 1000W of internal heat, a maximum ambient condition of 40°C and a maximum cabinet air temperature of 60°C, the enclosure designer needs to specify a heat exchanger with greater than $[1000W/(60°-40°C)] = 50W/°C$ conductance to keep the cabinet air from exceeding the 60°C limit. A complete product part number description can be reviewed below.



Product Warranty Policy

In the event of a performance issue, please contact the factory before troubleshooting the unit. Removal of the cover prior to contacting the factory will void the warranty. ACT provides a one-year warranty against defects in materials and workmanship in its products. For more information, refer to ACT's exclusive terms and conditions of online sales at:

www.1-ACT-com/enclosure-cooling/act-exclusive-terms-conditions/

All returns must be pre-approved and issued an RMA number. The RMA number must be included in the box with the returned product documentation.

ACT-HSC Series Models, Capacities & Dimensions

Part Number	Thermal Conductance Watts/°C	Thermal Capacity Watts @ 20°C ΔT	Weight (lbs.)	H (in")	W (in")	D* (in")
ACT-HSC-22	22.0	440	17.0	12.00	12.00	7.88
ACT-HSC-45	45.0	900	35.0	22.75	12.00	7.88
ACT-HSC-68	68.0	1,360	51.0	31.38	12.00	7.88

* Extends 3.70" into the cabinet

ACT-HSC Series Features and Options

Environment.....	Indoor or Outdoor Use
Electrical Configuration.....	115VAC, 230VAC, 12VDC, 24VDC and 48VDC - AC units arrive with 6ft. long 3-pronged plug - DC units arrive with bare lead wires
NEMA Options.....	12, 3R, 4 and 4X, UL50E Certified
Fans.....	UL Listed 6.0" dual ball bearing type axial fans (dry & wet locations)
Mounting Plate.....	Aircraft quality 6061 aluminum
HSC Housing.....	Powder coated aluminum, Optional: stainless steel
Mounting Options.....	Top, side, front or back
Accessories.....	Rain guards and removable filters
Approvals.....	cUL:115VAC units. cUR:12VDC,24VDC, 48VDC, 230VAC units

ACT-HSC Maximum Current Draw By Model

	Model	ACT-HSC-22	ACT-HSC-45	ACT-HSC-68
NEMA Rating	Voltage	Maximum Operation Current (Amps)	Maximum Operation Current (Amps)	Maximum Operation Current (Amps)
(4, 4X, 3R)	12VDC	3.60	7.20	10.80
12	12VDC	3.90	7.80	11.70
(4, 4X, 3R)	24VDC	1.64	3.28	4.92
12	24VDC	1.66	3.32	4.98
(4, 4X, 3R)	48VDC	0.88	1.76	2.64
12	48VDC	0.92	1.84	2.76
(4, 4X, 3R, 12)	115VAC	0.72	1.44	2.16
(4, 4X, 3R, 12)	230VAC	0.38	0.76	1.14

ACT-HSC Series Installation Procedure

Pre-Installation Procedure:

Check for any damage to the box that the unit was shipped in. Remove all shipping foam and inspect the unit for external damage. Any sign of damage should be documented and reported to the carrier.

Assuming there is no visible damage, stand the unit up vertically so that both air streams are clear and plug the unit into a power source to verify that the internal and external fan(s) are operational. After successfully completing this quick test, the ACT- HSC unit is ready for installation.

The following assembly procedure details the installation of a sealed enclosure cooler to the wall of an electronics enclosure. The procedure applies to each of the products in the ACT-HSC line. The three Heat Sink Cooler models (ACT-HSC-22, ACT-HSC-45 and ACT-HSC-68) are very similar in design and therefore have a similar assembly process. The major difference between the models is the size of the cutout in the wall of the enclosure and the hole pattern used to fasten the enclosure cooler to the wall of the enclosure.

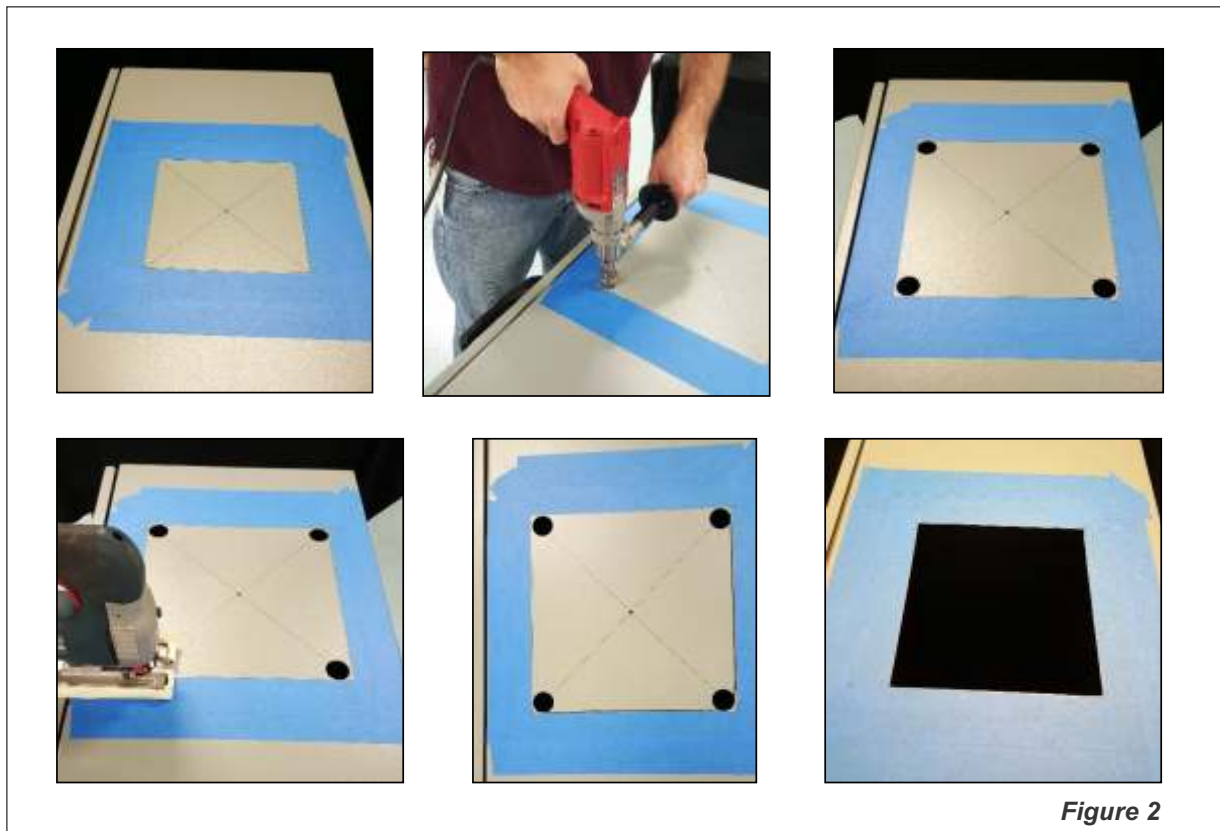
The size and weight of the ACT-HSC-22 is manageable for one person to install alone. The ACT-HSC-45 and ACT-HSC-68 are larger in size and heavier, so it is recommended that two people work together to install these units.

Step 1: Determine the location of the cooler on the enclosure. The ACT-HSC models can be top or side mounted. Ensure that you have at least 6” of open space between the fan intake and the next closest enclosure or wall. When you have decided on a location, use masking tape to outline the square cutout, see figure 2. The cutout dimensions are shown in the drawings in Appendix A and are available for download in .DXF or SOLIDWORKS® format from the ACT- Enclosure Cooling Resources area of our website. Start by using a hole saw to establish holes in each corner. Use a reciprocating saw to make straight cuts between the corner holes, using the masking tape as a reference edge and to minimize damage to the enclosures surface.

CAUTION

The risk of fire, electric shock or injury exists when installing, cleaning or performing maintenance on the ACT-HSC unit. **ALWAYS DISCONNECT** the ACT-HSC from the power supply during installation or prior to servicing.

ACT-HSC Series Installation Procedure



Step 2: Use the edge of the cutout as a reference edge and plot out the perimeter hole locations according to the drawing shown below in (*Appendix A*). Once the holes have been marked, drill the remaining mounting holes at the correct location.

Step 3: Deburr the edges of the cutout using a file. Deburr the holes using a countersink bit.

Risk of injury

Carefully deburr all drilled holes and cut-outs to prevent injuries caused by sharp edges.

Step 4: Remove the masking tape and clean any excess cutting oil from the surface/internals of the enclosure.

Step 5: Place the HSC in position on the wall of the enclosure. The electrical cord should be passed through the opening in the enclosure prior to inserting the HSC body through the cutout. The ACT-HSC should be oriented so the gasket contacts the outside surface of the enclosure. Ensure that the gasket surface is free of dust, dirt, and imperfections and that it makes consistent contact with the external surface of the enclosure.

Step 6: With the HSC held in place, install the fastening bolts around the perimeter flange of the ACT-HSC. The ACT-HSC-22 has 12 bolts, the ACT-HSC-45 has 16 bolts, and the ACT-HSC-68 has 22 bolts. Make sure the sealing washer is properly located on the bolt as shown in below. The sealing washer is meant to seat on the external face of the ACT-HSC (the face opposite the gasket).

ACT-HSC Series Installation Procedure

Caution

ACT recommends applying an anti-seize lubricant to the threads of the mounting hardware to prevent galling.

For the HSC-22 model this step can be completed by one person. For the HSC-45 and HSC-68 models, it is recommended that two people work together to complete this step (one person can hold the HSC in place while the other person installs the hardware).



Figure 3: Perimeter bolt with sealing washer and locking nut (left) perimeter bolts installed on enclosure after being torqued down.

Step 7: Torque the perimeter bolts evenly, alternating between bolts in a diagonal pattern so that the gasket is compressed in an even fashion. The bolts will draw the metal flange nearly in contact with the outside surface of the enclosure so that the gasket is barely visible (as shown in Figure 4). Ensure that every bolt is torqued to at least 20 in-lbs.

ACT-HSC Series Installation Procedure



Figure 4

Figure 4: ACT-HSC-22 installed on the wall of an enclosure. Notice that the gasket is barely visible having been compressed in the groove by the perimeter bolts.

Step 8: Provide electrical power to the heat sink unit and verify that all fans are functioning properly. Double check that the fan air intake is clear and that no enclosure walls or hardware are within 6.0" of the intake or exhaust portion of the heat exchanger.

CAUTION

ACT-HSC units are available in a wide range of operating voltages. Make sure the supply voltage matches the stated voltage on the ACT factory label. An improper input voltage connection will void the product's warranty



Figure 5

Figure 5: An ACT-HSC-45 installed on an electrical enclosure with the door open (left) and door closed (right)

ACT-HSC Series Installation Procedure

CAUTION

Do not operate the ACT-HSC units without the fan guard properly in place.

CAUTION

For proper operation make sure that the fan air intake is clear and that no enclosure walls or hardware are within 6.0" of the intake or exhaust portion of the ACT-HSC heat exchanger.

Step 9. (Optional): If a rain guard has been selected, it is recommended that the rain guard be installed prior to mounting the ACT-HSC to the enclosure wall. The rain guard comes with four (4) self tapping screws. Simply place the rain guard over the fan opening as shown in below, mark each of the hole locations, temporarily remove the rain guard and drill a pilot hole (0.136" diameter) at each mark. Finally, place the rain guard in the original location and fasten it to the cover using the four self tapping screws.

You have successfully completed the installation of the ACT-HSC unit.

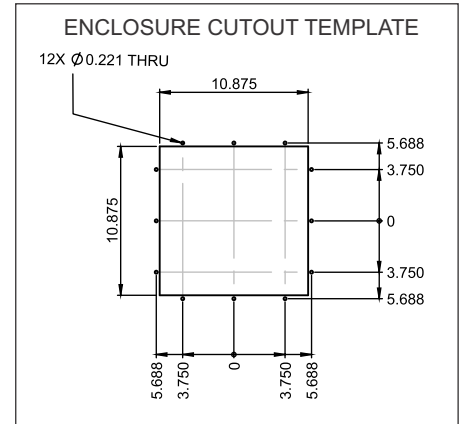
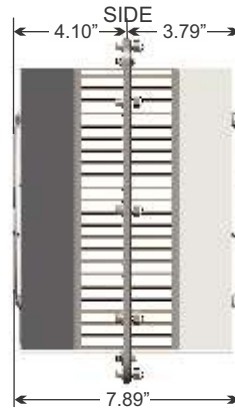
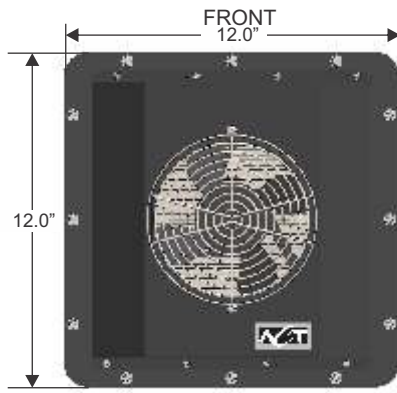


Figure 6

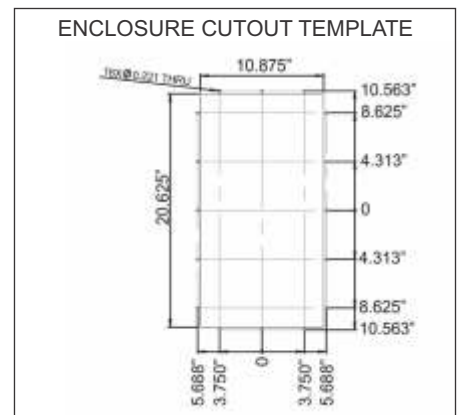
Figure 6 : An ACT-HSC-45 with option rain guards installed. See Appendix B for all Rain Qguard, Fan and Filter Options

APPENDIX A: ACT-HSC Heat Sink Cooler Series - Dimensions & Installation

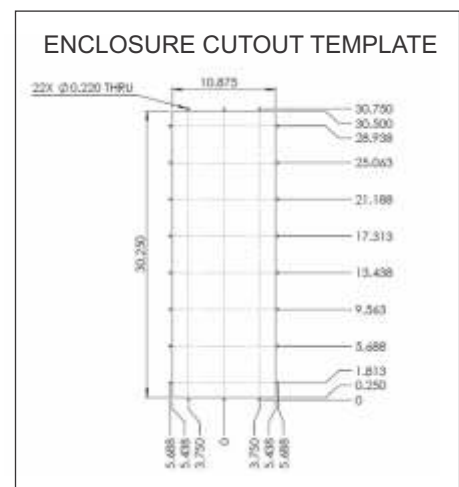
ACT-HSC-22



ACT-HSC-45



ACT-HSC-68



Ordering an ACT-HSC Replacement Fan



ACT - HSC - 22 - 24 - 12 - I

Heat Sink Cooler

Thermal Conductance
Watts/°C
- 22
- 45
- 68

Voltage Range
- 12 VDC
- 24 VDC
- 48 VDC
- 115 VAC
- 230 VAC

NEMA RATING
NEMA - 12
NEMA - 4
NEMA - 4X
NEMA - 3R

FAN LOCATION
I = Inside Fan
O = Outside Fan

To order any of these items please visit:

<https://www.1-act.com/product-category/act-hsc-enclosure-coolers-heat-sink-coolers/>

Ordering an ACT-HSC Rain Hood

ACT - HSC - 22 - Rain Hood Spare

Heat Sink Cooler

Thermal Conductance
Watts/°C
- 22
- 45
- 68



To order any of these items please visit:

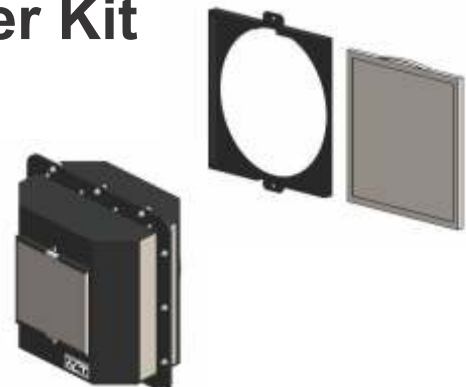
<https://www.1-act.com/product-category/act-hsc-enclosure-coolers-heat-sink-coolers/>

Ordering an ACT-HSC Filter Kit

ACT - HSC - 22 - Filter Kit

Heat Sink Cooler

Thermal Conductance
Watts/°C
- 22
- 45
- 68



To order any of these items please visit:

<https://www.1-act.com/product-category/act-hsc-enclosure-coolers-heat-sink-coolers/>

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