

Liquid Cooling Systems



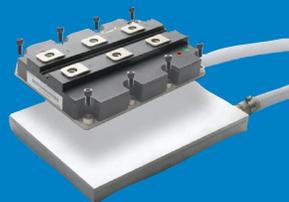
Precision Temperature Control



Integrated Liquid-Air Cooling Systems



Integrated Cooling Systems



Liquid Cold Plates



Thermal Tester



Liquid-Air Heat Exchangers



Stand-Alone Hydraulic Modules



AAVID THERMALLOY

Celebrating 50 Years of Innovation | 1964-2014

About Aavid

With nearly 50 years of product development, engineering innovation and manufacturing expertise, Aavid has been the world leader in thermal management solutions and the partner of choice for electronics companies focused on introducing next generation products to market faster, with greater reliability and increased functionality.

Industries Served

- » *Traction Drives*
- » *UPS*
- » *Green/Renewable Energies*
- » *Electric and Hybrid Vehicles*
- » *Motor Drive Controls*
- » *Medical Equipment*
- » *Mining*
- » *Semi-conduct Equipment*

World Class Quality

Aavid Thermalloy ensures consistent quality of all its products by following the documented processes and procedures within Aavid's ISO 9001:2008 Certified Quality Management System (QMS). Key elements that ensure consistent product quality include:

- » Design Innovation
- » Design Control
- » New Product/Process Introduction
- » Process Monitoring & Control
- » Effective Inspection & Testing

Broad Product Offering

Aavid provides the industry's broadest product offering, ranging from the smallest board level cooling solution to hundreds of thousands of kilowatt industrial applications.

World Wide Manufacturing

Aavid supports product development cycles with dedicated sales engineering resources and factory locations that deliver on time, anywhere in the world.

Aavid delivers innovative, quality products to market cost effectively using global resources and a broad portfolio of manufacturing processes and capabilities.

Engineering Excellence

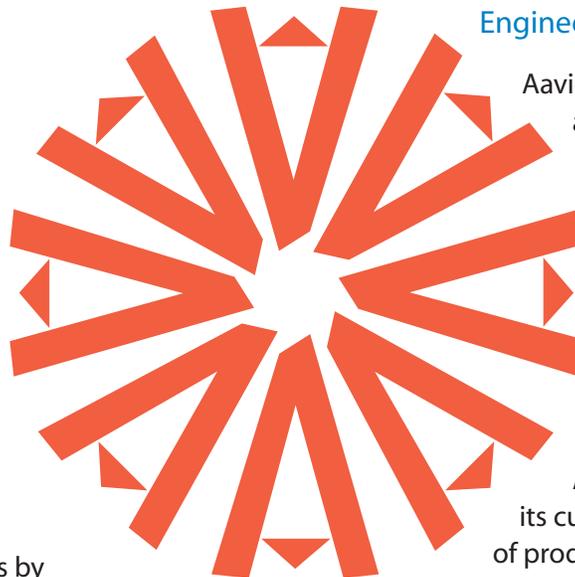
Aavid is unique by offering state-of-the-art engineering and design services to customers who value collaboration in solving difficult and complex design management problems. These design services may be offered as part of a product solution or through specialized engineering and design centers throughout the world.

Aavid Design partners closely with its customers early in the design phase of product development in order to assist with modeling and simulation and to develop innovative product solutions. By employing recognized, market-leading design & engineering expertise, coupled with investment in the latest technological design tools and backed by its own test laboratories, Aavid Design is able to develop, test and verify its own designs for its customers.

Global Account Management

Dedicated Global Account Management (GAM) Teams comprising of Sales, Engineering and Manufacturing personnel provide key customer focus and enable hassle free, co-ordinated project roll out on a worldwide basis.

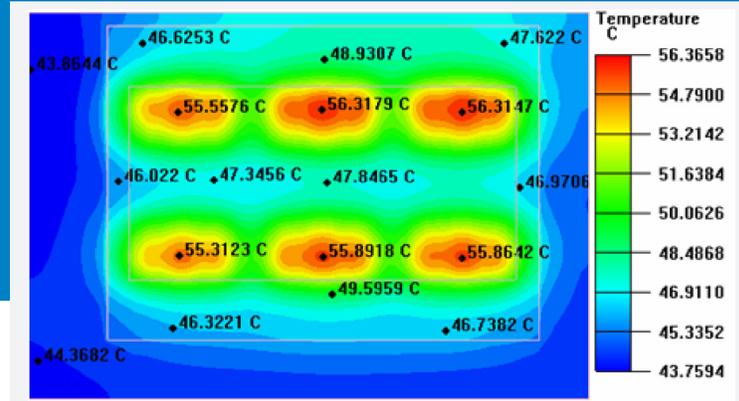
Our mission is total customer satisfaction. We are committed to continuous improvement through the application of world class business principles.



Advantages of Aavid Liquid Cooling Systems

Optimized System Design

Aavid is the only company that designs and manufactures both Liquid Cold Plates (LCP) and Liquid Cooling Systems (LCS) and is thus able to optimize overall system performance. No competitors have this capability. Simulation has been performed to optimize components and system performance.



Liquid Cold Plate Simulation

Modular Structure

Typically, individual components are assembled and mounted into a cabinet. Aavid's system adopts a modular structure with the hydraulic module and controller module built first and then assembled into a cabinet. This modular structure ensures fast installation and easy repair and replacement. In addition, modular structures provide an extra layer of protection for the controller.

Complete Product Line

Aavid's vast product line can accommodate virtually any heat load, ranging from 33W up to 100kW. Our dedication to satisfying customer demands and deep understanding of thermal design allow for precision cooling and/or monitoring of your specific systems. We carry products for complex systems with flexible capacity and varying load requirements.

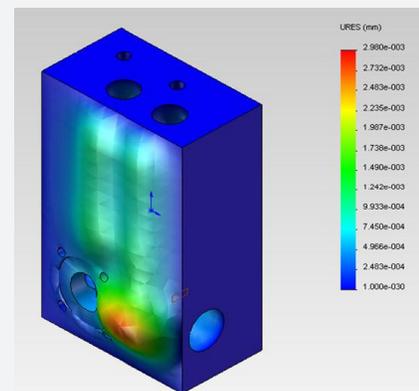
Intelligent Controller

The controller is the brain of a liquid cooling system. Aavid LCS has a sophisticated and intelligent controller which has the functions of controlling operation logics, warning and protection, automatic diagnoses, and trouble shooting. In addition, each controller can form a network and coordinate with up to 8 similar systems.

Air vs Liquid

Liquid cooling has become the choice of designers striving to manage the rising heat loads of high power electronics in the most demanding applications.

Whether it's wind or solar energy, lasers, power generation and conditioning, medical equipment, transportation or military electronics, liquid cold plates offer performance advantages over air-cooled solutions.



Cooling System Valve Block Simulation

Aavid Liquid Cooling Systems Product Offerings

Integrated Hydraulic System with Controller

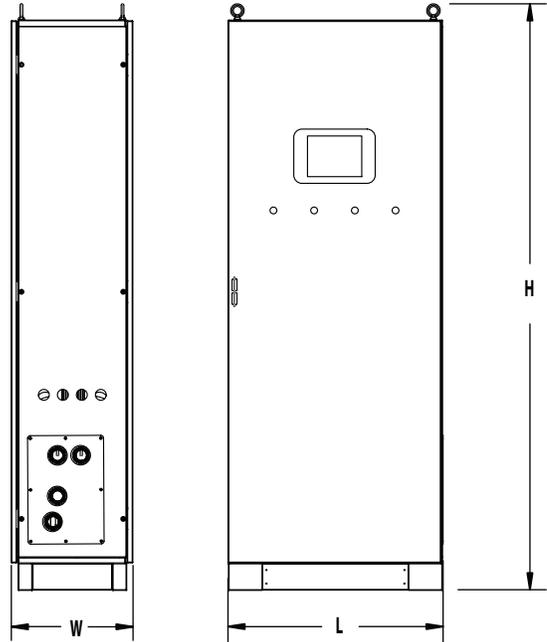


Minimum Cabinet Size (mm)

Model	L	W	H
ACS010:	800	450	1600
ACS020:	800	450	1600
ACS040:	800	450	1600
ACS060:	900	500	1600
ACS080:	800	450	1600
ACS120:	900	500	1600



Controller



Product Specification

Model	Unit	ACS010AA	ACS020AA	ACS040AA	ACS060AA	ACS080AA	ACS120AA
Cooling Capacity ⁱ	kW	10	20	40	60	80	120
Liquid Inlet/Outlet Temperature Difference	°C	5	5	5	5	10	10
Nominal Coolant Flow Rate	m ³ /h	2	4	8	12	8	12
Nominal Coolant Flow Rate	LPM	33	67	133	200	133	200
Coolant Connector Size		G3/4"	G1"	G1-1/2"	G2"	G1-1/2"	G2"
Power Supply	kW	1.4	2.6	4.4	7	6.6	11
Maximum Liquid Pressure	bar	≤ 10					
Coolant pH Range		6 - 9					
Ambient Air Temperature Range	°C	-40 - 50					
Altitude ⁱⁱ	m	≤ 1000					
Power		3x380-415V, 50/60Hz					
Hydraulic System Dim. (L x W x H)	mm	625x250x655	655x340x755	690x390x730	730x450x800	690x390x730	730x450x800
Liquid-Air Heat Exchanger Dim. (L x W x H)	mm	600x560x660	869x684x875	1250x1200x1065	1450x1350x1295	2x1250x1200x1065	2x1450x1350x1295
Minimum Cabinet Size (L x W x H)	mm	800x450x1600	800x450x1600	800x450x1600	900x500x1600	800x450x1600	900x500x1600

NOTES

- i: Using 50% glycol-water mixture
- ii: Options are available for applications with altitude up to 5000m

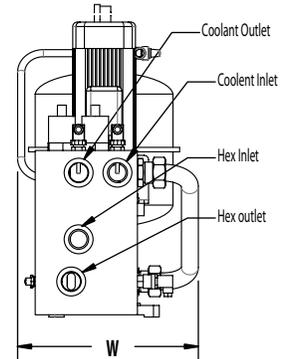
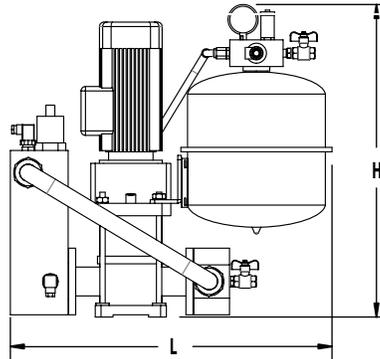
Aavid Liquid Cooling Systems Product Offerings

Stand-alone Hydraulic Module



Hydraulic System Dimension (mm)

Model	L	W	H
ACS010-HM:	625	250	655
ACS020-HM:	655	340	755
ACS040-HM:	690	390	730
ACS060-HM:	730	450	800
ACS080-HM:	690	390	730
ACS120-HM:	730	430	770

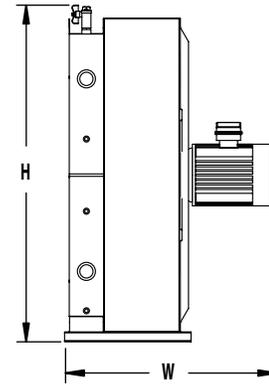
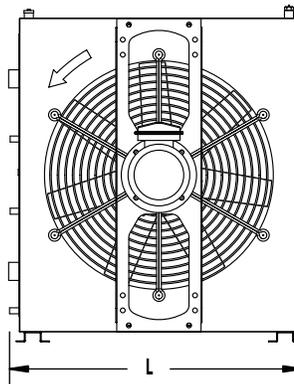


Liquid-Air Heat Exchanger



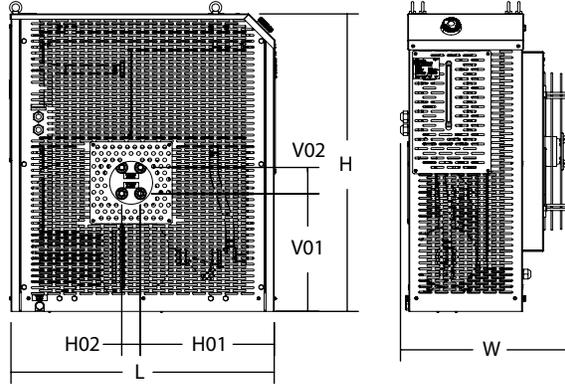
Liquid-Air Heat Exchanger Dimension (mm)

Model	L	W	H
ACS010-HX:	600	560	660
ACS020-HX:	869	684	875
ACS040-HX:	1250	1200	1065
ACS060-HX:	1450	1350	1295
ACS080-HX:	2 X ACS040-HX		
ACS120-HX:	2 X ACS060-HX		



Aavid Liquid Cooling Systems Product Offerings

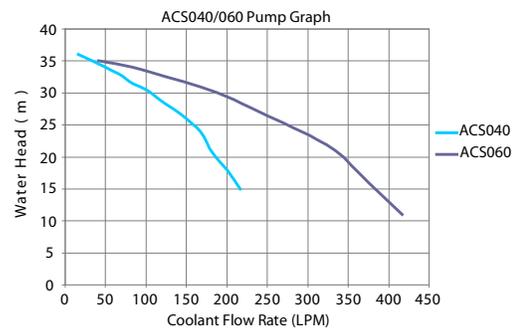
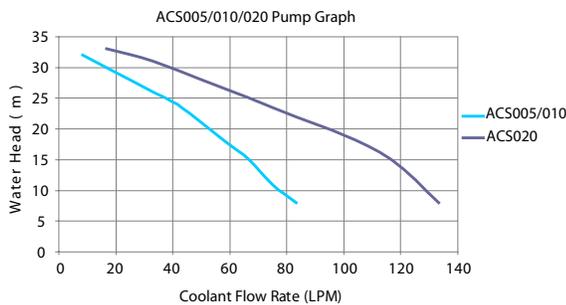
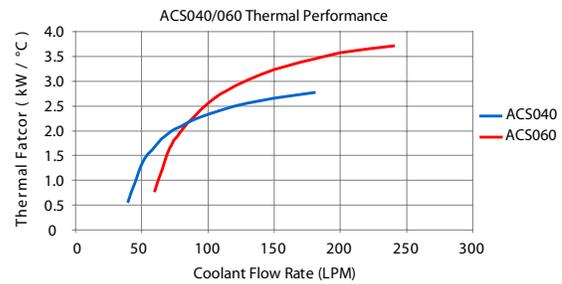
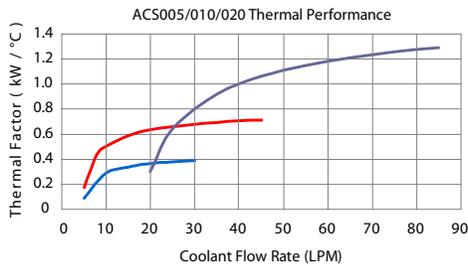
Integrated Liquid-Air Cooling Systems



Product Specification

Model	Unit	ACS005BA	ACS010BA	ACS020BA	ACS040BA
Cooling Capacity ⁱ	kW	5	10	20	40
Nominal Coolant Flow Rate	m ³ /h	1	2	4	8
Nominal Coolant Flow Rate	LPM	17	33	67	133
Reservoir Capacity	L	10	10	20	20
Coolant Connector Size		G1/2"	G3/4"	G1"	G1-1/2"
Power Supply	kW	0.6	1.4	2.6	4.4
Maximum Liquid Pressure	bar	≤ 10			
Coolant pH Range		6 – 9			
Ambient Air Temperature Range	°C	-10 - 50			
Altitude ⁱⁱ	m	≤ 1000			
Power		3x380V/50Hz or 3x460V /60Hz			
Hydraulic System Dim. (L x W x H)	mm	750x800x485	750x800x485	1050x950x750	1250x1200x970

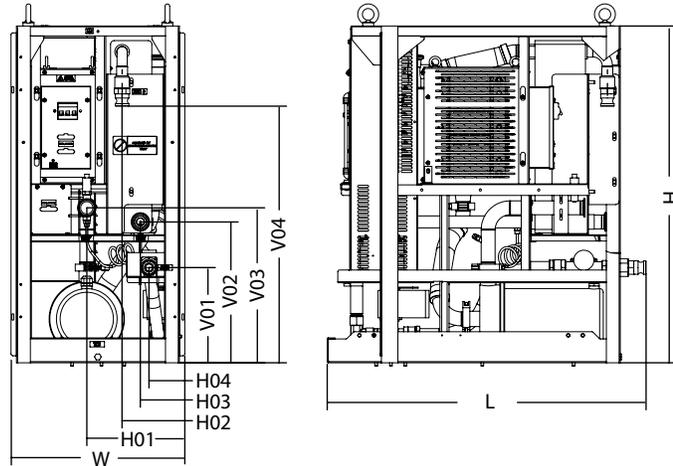
Thermal Performance



Thermal Factor: Cooling Capacity / (Coolant supply temperature-air inlet or facility water inlet temperature)

Aavid Liquid Cooling Systems Product Offerings

Precision Temperature Control Liquid Cooling System



Model Number	L	W	H	H01	H02	H03	H04	V01	V02	V03	V04
ACS020/040/060	875	475	922	268.1	171.5	121.5	97.9	260.6	385.6	424.2	702.7

Product Specification

Basic Configuration

Model	Unit	ACS020LA	ACS040LA	ACS060LA
Max Cooling Capacity ⁱ	kW	20	40	60
Temp Set Range	°C	5-55	5-55	5-55
Pressure Set Range ⁱⁱ	PSI	20-55		
Flow Control Range	LPM	0-62	0-135	0-180
Coolant Connector Size		G3/4"	G1-1/2"	G2"
Facility Water Connector Size		G1/2"	G1"	G1-1/2"
Power Supply	kW	1.1	3.7	3.7
Reservoir Capacity	L	20		
Maximum Liquid Pressure	bar	16		
Coolant Ph Range		6 – 9		
Ambient Temperature Range	°C	0 – 45		
Altitude	m	1000		
Power		3 x 380V/50Hz or 3 x 460V /60Hz or 208V/60Hz		
Hydraulic System Dim. (L x W x H) ⁱⁱⁱ	mm	810 x 510 x 905		

- i. Cooling capacity may vary with application requirements.
- ii. External pressure can be adjusted once an application is specified.
- iii. The dimensions are without cabinet.

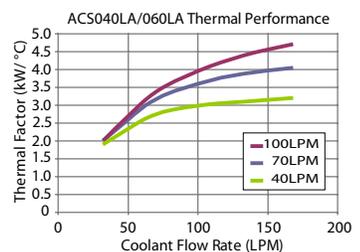
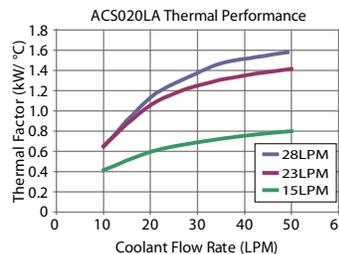
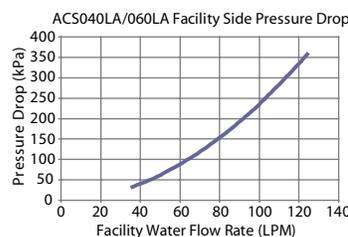
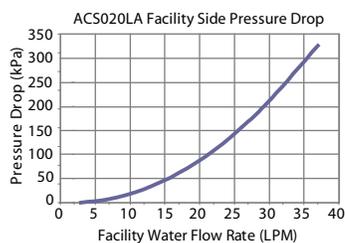
Aavid's LCS comes with a sophisticated and intelligent controller which is the brain of a liquid cooling system. The key functions of a controller are:

- » Operation Logic
- » Protection
- » Warning
- » Automatic diagnoses and trouble shooting

Components options

- External Pressure Regulator
- Coolant Filter (120 mesh)
- High Purity Plumbing
- Communication Protocols
- Three Way Control Valve
- Quick Connect Coupling
- Immersion Heater
- Cabinet
- PLC Controller

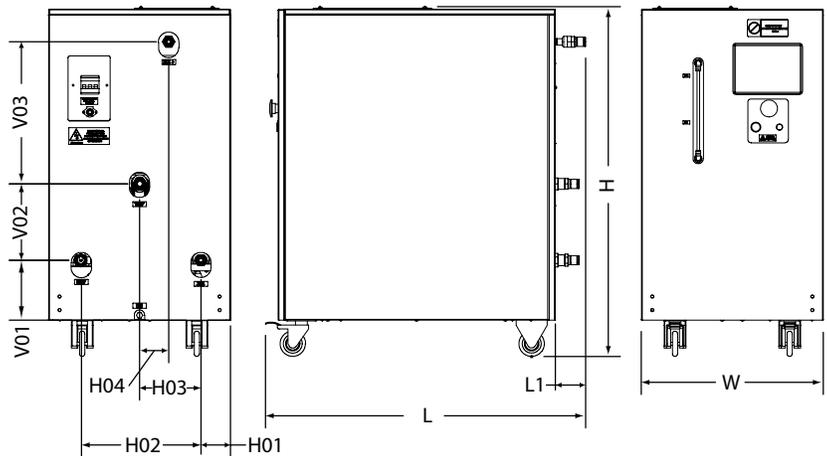
Precision Temperature Control Liquid Cooling System Thermal Performance



Thermal Factor: Cooling Capacity / (Coolant supply temperature-air inlet or facility water inlet temperature)

Aavid Liquid Cooling Systems Product Offerings

Thermal Tester



Model	L	W	H	H01	H02	H03	H04	V01	V02	V03	L1
ACS015TA	947	537	1104	87	355	181	86	177	226	421	89
ACS040TA	1085	568	1118	86	439	182	171	181	203	356	230

Product Specification

Basic Configuration

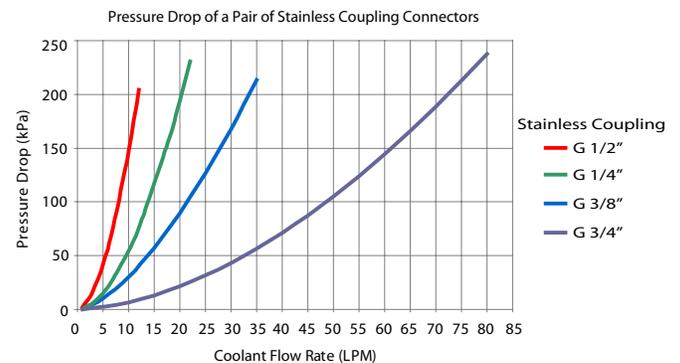
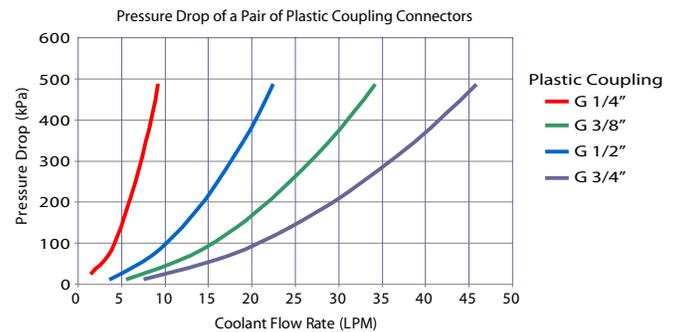
Model	Unit	ACS015TA	ACS040TA
Max Cooling Capacity ⁱ	kW	15	40
Temp Set Range	°C	10-55	10-55
Pressure Set Range	PSI	0-55	
Flow Control Range ⁱⁱ	LPM	0-62	0-135
Coolant Connector Size		G3/4"	G1-1/2"
Facility Water Connector Size		G1/2"	G1"
Power Supply	kW	1.1	3.7
Heater Capacity ⁱⁱⁱ	kW	3	3
Reservoir Capacity	L	20	
Maximum Liquid Pressure	bar	≤ 16	
Coolant pH Range		6 - 9	
Ambient Temperature Range	°C	0 - 45	
Altitude	m	≤ 1000	
Power		3 x 380V / 50Hz or 3 x 460V / 60Hz	
Hydraulic System Dimension (L x W x H)	mm	980 x 540 x 1035	

- i. Cooling Capacity will vary with test settings.
- ii. Tests can be under either constant pressure or constant flow rate.
- iii. Heater is optional.

Components options

External Pressure Regulator Data Logging Software
 Coolant Filter Three Way Control Valve
 High Purity Plumbing Quick Connect Coupling

Quick Connect Coupling Pressure Drop





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