

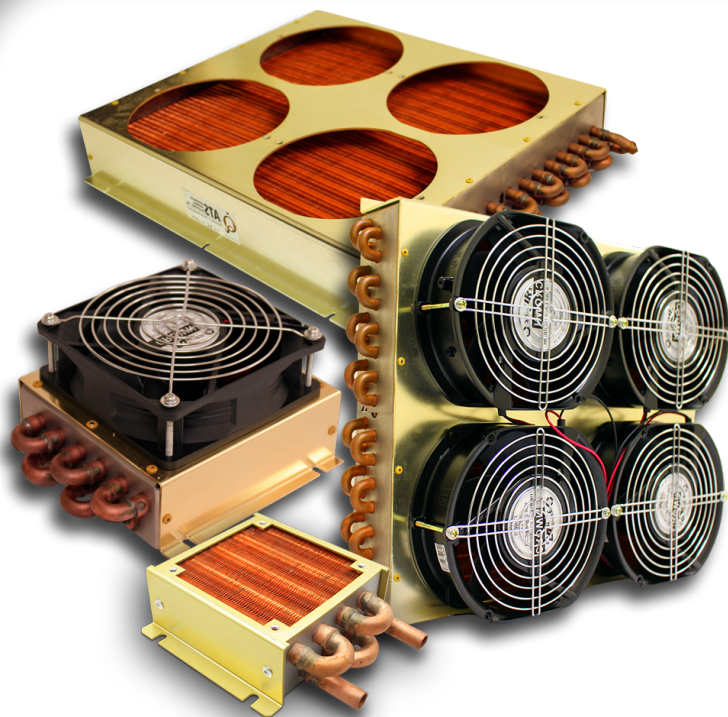


Heat Exchangers

TUBE TO FIN, LIQUID-TO-AIR HEAT EXCHANGERS

ATS tube-to-fin, liquid-to-air heat exchangers are made with the industry's highest density fins to maximize heat transfer from liquid to air, allowing the liquid to be cooled to lower temperatures than other heat exchangers on the market. The heat exchanger fins and tubes are made of copper to be suitable for a variety of fluids, including water, dielectric fluids, and custom designed heat transfer fluids.

Each of the eight heat exchanger sizes is available with or without a fan. ATS heat exchangers can be used in laser cooling, medical equipment and imaging devices, compressor cooling, semiconductor processing, HVAC, food and beverage processing, and other liquid cooling applications.

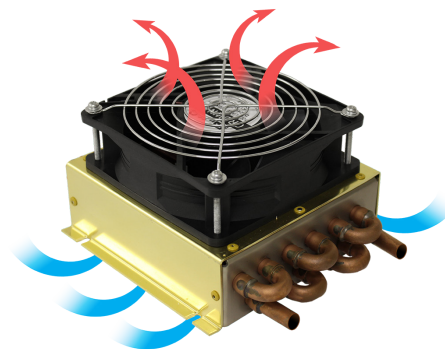


GENERAL FEATURES

- » Length: 3.35" to 21.9"
- » Width: 3.35" to 14"
- » Height: 1.18" to 2.6"
- » Tube diameter: 0.375" and 0.5"
- » Copper tubes
- » Copper fins
- » High-efficiency and high density fin design
- » Silver-solder brazed joints
- » Internally cleaned and corrosion protected
- » Externally coated for corrosion protection
- » Can be customized for different fans
- » 100% pressure tested

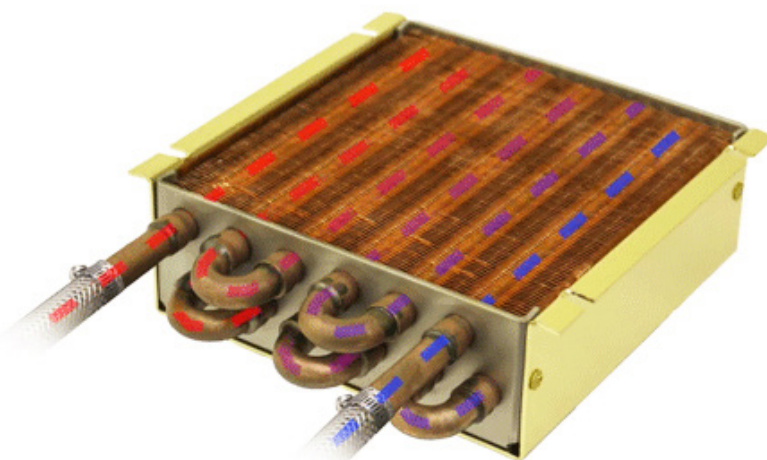
APPLICATIONS

- » Automotive
- » Aerospace
- » Medical
- » Laser cooling
- » Electronics Cooling
- » Compressor Cooling
- » Semiconductor Processing
- » HVAC



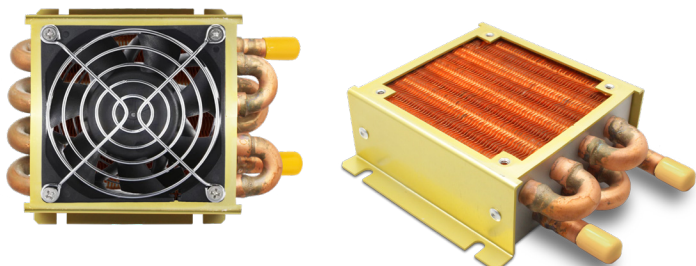
Air is pulled through the heat exchanger when a fan is attached

For further information, please contact
Advanced Thermal Solutions, Inc. at
1-781-769-2800 or www.qats.com



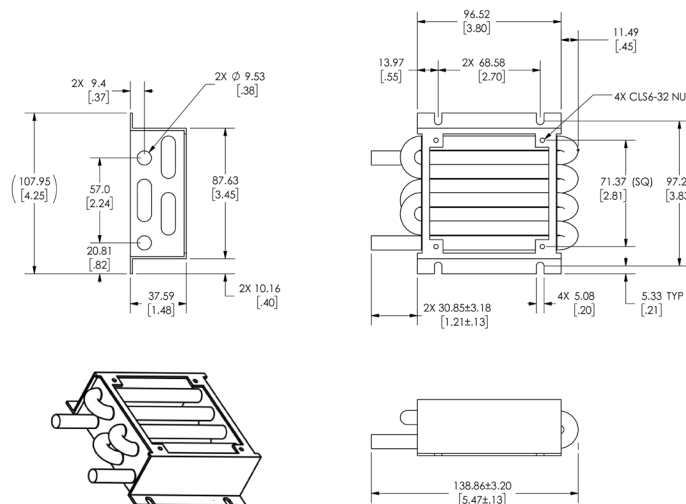


ATS-HE54 SERIES

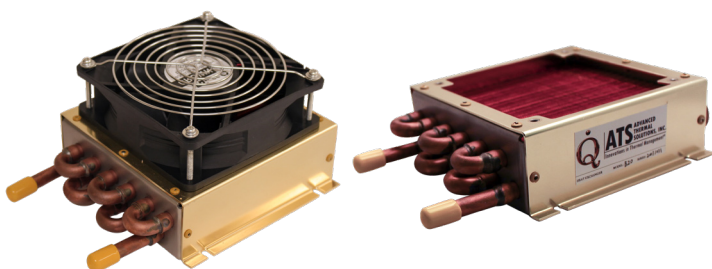


MPN	FAN TYPE	# OF FANS	FAN SIZE (inches)
ATS-HE54-C1-R0	NO FAN	0	N/A
ATS-HE54-C2-R0	12V	1	3.15 Square
ATS-HE54-C3-R0	12V PWM	1	3.15 Square
ATS-HE54-C4-R0	24V	1	3.15 Square
ATS-HE54-C5-R0	24V PWM	1	3.15 Square
ATS-HE54-C6-R0	48V	1	3.15 Square
ATS-HE54-C7-R0	48V PWM	1	3.15 Square

- » Heat transfer capacity up to 10W per $\Delta T = 1^\circ\text{C}$
- » ΔT = inlet liquid temperature - inlet air temperature
- » 3.35" x 3.35" x 1.18" core size (L x W x H)
- » Weight: 400g (0.88 lbs); Weight w/fan: 486g (1.07 lbs)
- » Maximum pressure: 100 psi

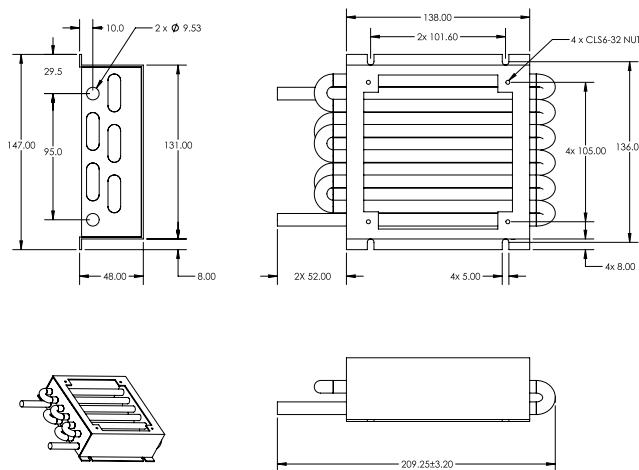


ATS-HE20 SERIES



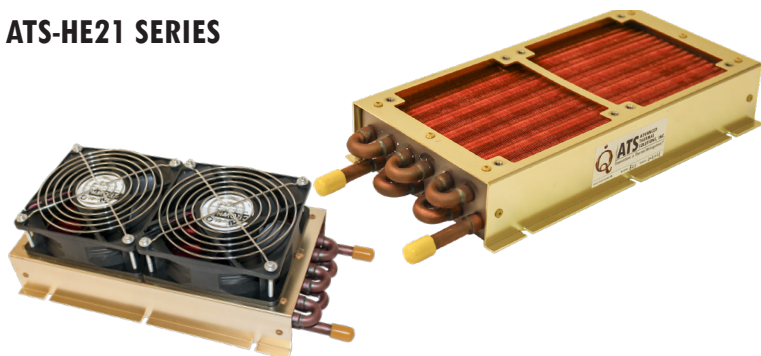
MPN	FAN TYPE	# OF FANS	FAN SIZE (inches)
ATS-HE20-C1-R0	NO FAN	0	N/A
ATS-HE20-C2-R0	12V	1	4.25 Square
ATS-HE20-C3-R0	12V PWM	1	4.25 Square
ATS-HE20-C4-R0	24V	1	4.25 Square
ATS-HE20-C5-R0	24V PWM	1	4.25 Square
ATS-HE20-C6-R0	48V	1	4.25 Square
ATS-HE20-C7-R0	48V PWM	1	4.25 Square

- » Heat transfer capacity up to 22W per $\Delta T = 1^\circ\text{C}$
- » ΔT = inlet liquid temperature - inlet air temperature
- » 5.8" x 5.8" x 1.8" core size (L x W x H)
- » Weight: 1077g (2.4 lbs), Weight w/fan: 1411g (3.1 lbs)
- » Maximum pressure: 100 psi



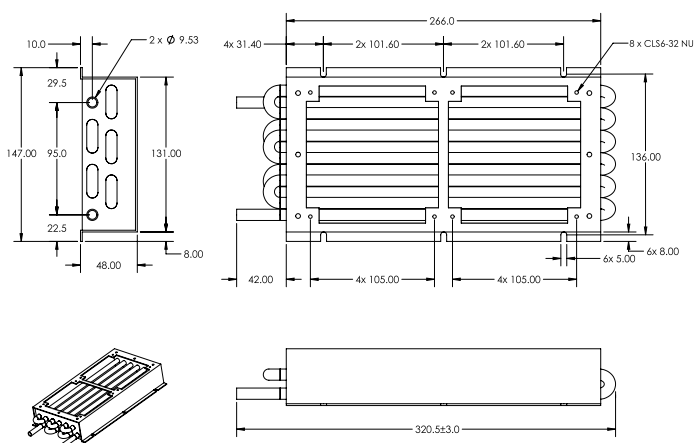


ATS-HE21 SERIES



- » Heat transfer capacity up to 46W per $\Delta T = 1^{\circ}\text{C}$
- » $\Delta T = \text{inlet liquid temperature} - \text{inlet air temperature}$
- » 10.5" x 5.8" x 1.8" core size (L x W x H)
- » Weight: 1759g (3.9 lbs); Weight w/fan: 2405g (5.3 lbs)
- » Maximum pressure: 100 psi

MPN	FAN TYPE	# OF FANS	FAN SIZE (inches)
ATS-HE21-C1-R0	NO FAN	0	N/A
ATS-HE21-C2-R0	12V	2	4.25 Square
ATS-HE21-C3-R0	12V PWM	2	4.25 Square
ATS-HE21-C4-R0	24V	2	4.25 Square
ATS-HE21-C5-R0	24V PWM	2	4.25 Square
ATS-HE21-C6-R0	48V	2	4.25 Square
ATS-HE21-C7-R0	48V PWM	2	4.25 Square

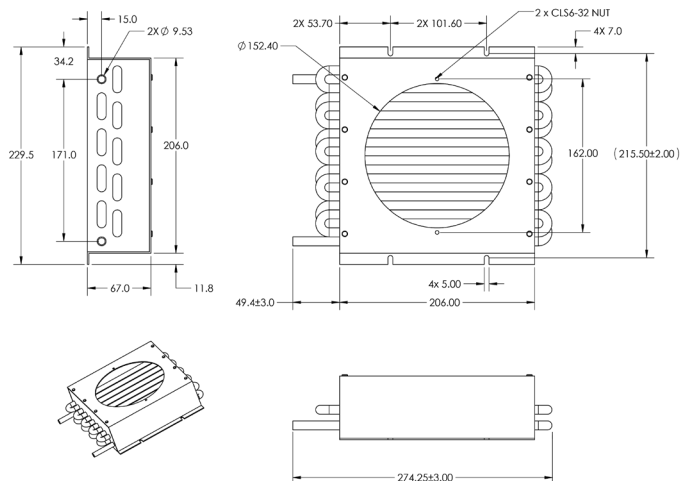


ATS-HE22 SERIES



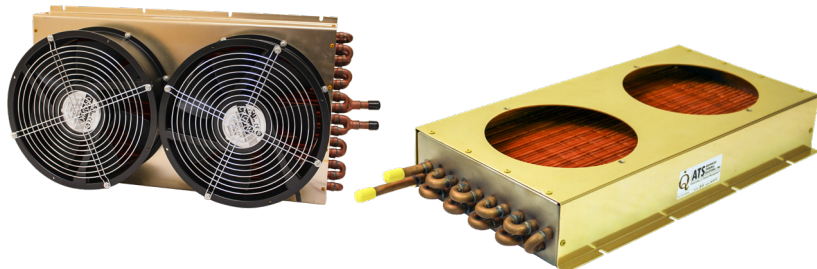
- » Heat transfer capacity up to 64W per $\Delta T = 1^{\circ}\text{C}$
- » $\Delta T = \text{inlet liquid temperature} - \text{inlet air temperature}$
- » 9.5" x 9.0" x 2.5" core size (L x W x H)
- » Weight: 2211g (4.9 lbs); Weight w/fan: 2854g (6.23 lbs)
- » Maximum pressure: 100 psi

MPN	FAN TYPE	# OF FANS	FAN SIZE (inches)
ATS-HE22-C1-R0	NO FAN	0	N/A
ATS-HE22-C2-R0	12V	1	6.75 Round
ATS-HE22-C3-R0	12V PWM	1	6.75 Round
ATS-HE22-C4-R0	24V	1	6.75 Round
ATS-HE22-C5-R0	24V PWM	1	6.75 Round
ATS-HE22-C6-R0	48V	1	6.75 Round
ATS-HE22-C7-R0	48V PWM	1	6.75 Round



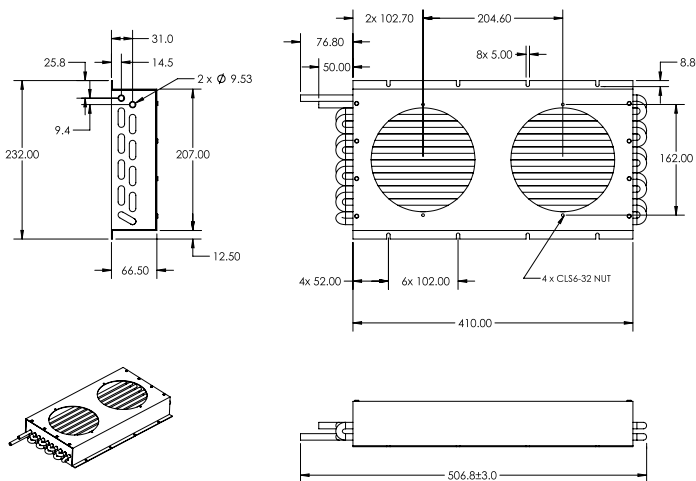


ATS-HE23 SERIES

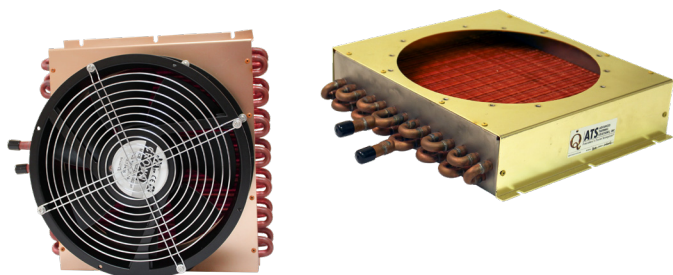


- » Heat transfer capacity up to 117W per $\Delta T = 1^{\circ}\text{C}$
- » ΔT = inlet liquid temperature - inlet air temperature
- » 17.5" x 9.0" x 2.5" core size (L x W x H)
- » Weight: 7000g (15.4 lbs); Weight w/fan: 7600g (16.8 lbs)
- » Maximum pressure: 100 psi

MPN	FAN TYPE	# OF FANS	FAN SIZE (inches)
ATS-HE23-C1-R0	NO FAN	0	N/A
ATS-HE23-C2-R0	12V	2	6.75 Round
ATS-HE23-C3-R0	12V PWM	2	6.75 Round
ATS-HE23-C4-R0	24V	2	6.75 Round
ATS-HE23-C5-R0	24V PWM	2	6.75 Round
ATS-HE23-C6-R0	48V	2	6.75 Round
ATS-HE23-C7-R0	48V PWM	2	6.75 Round

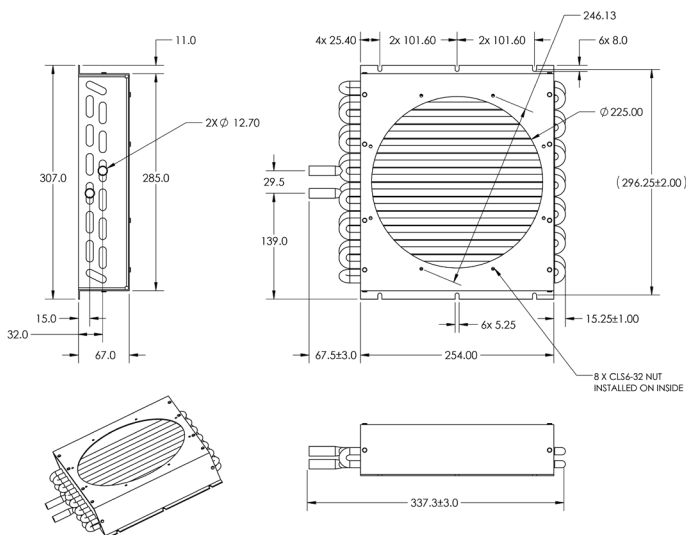


ATS-HE24 SERIES



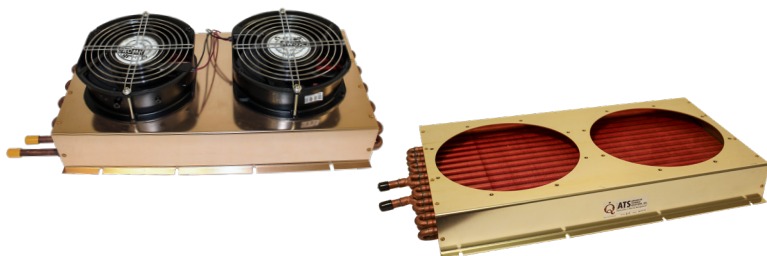
- » Heat transfer capacity up to 97W per $\Delta T = 1^{\circ}\text{C}$
- » ΔT = inlet liquid temperature - inlet air temperature
- » 11.5" x 12.0" x 2.12" core size (L x W x H)
- » Weight: 4018g (8.9 lbs); Weight w/fan: 5791g (12.8 lbs)
- » Maximum pressure: 100 psi

MPN	FAN TYPE	# OF FANS	FAN SIZE (inches)
ATS-HE24-C1-R0	NO FAN	0	N/A
ATS-HE24-C2-R0	12V	1	10.0 Round
ATS-HE24-C3-R0	12V PWM	1	10.0 Round
ATS-HE24-C4-R0	24V	1	10.0 Round
ATS-HE24-C5-R0	24V PWM	1	10.0 Round
ATS-HE24-C6-R0	48V	1	10.0 Round
ATS-HE24-C7-R0	48V PWM	1	10.0 Round



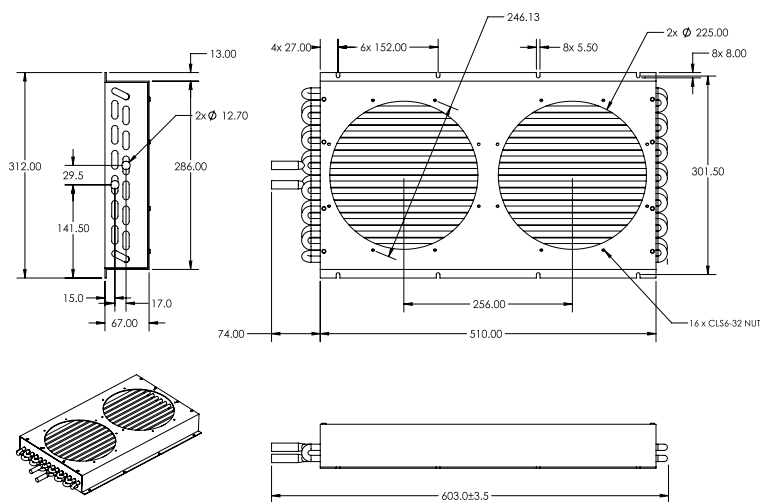


ATS-HE25 SERIES

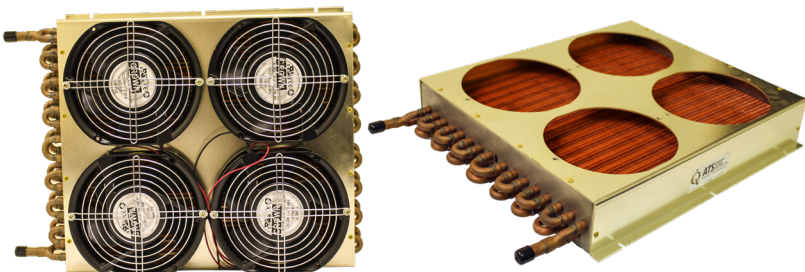


MPN	FAN TYPE	# OF FANS	FAN SIZE (inches)
ATS-HE25-C1-R0	NO FAN	0	N/A
ATS-HE25-C2-R0	12V	2	10.0 Round
ATS-HE25-C3-R0	12V PWM	2	10.0 Round
ATS-HE25-C4-R0	24V	2	10.0 Round
ATS-HE25-C5-R0	24V PWM	2	10.0 Round
ATS-HE25-C6-R0	48V	2	10.0 Round
ATS-HE25-C7-R0	48V PWM	2	10.0 Round

- » Heat transfer capacity up to 177W per $\Delta T = 1^{\circ}\text{C}$
- » $\Delta T =$ inlet liquid temperature - inlet air temperature
- » 21.58" x 12.0" x 2.12" core size (L x W x H)
- » Weight: 7422g (16.4 lbs); Weight w/fan: 11012g (24.23 lbs)
- » Maximum pressure: 100 psi

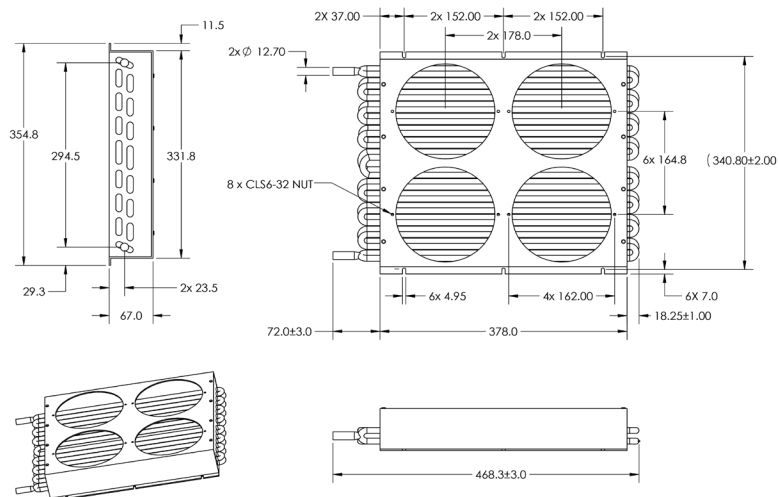


ATS-HE26 SERIES



MPN	FAN TYPE	# OF FANS	FAN SIZE (inches)
ATS-HE26-C1-R1	NO FAN	0	N/A
ATS-HE26-C2-R0	12V	4	6.75 Round
ATS-HE26-C3-R0	12V PWM	4	6.75 Round
ATS-HE26-C4-R0	24V	4	6.75 Round
ATS-HE26-C5-R0	24V PWM	4	6.75 Round
ATS-HE26-C6-R0	48V	4	6.75 Round
ATS-HE26-C7-R0	48V PWM	4	6.75 Round

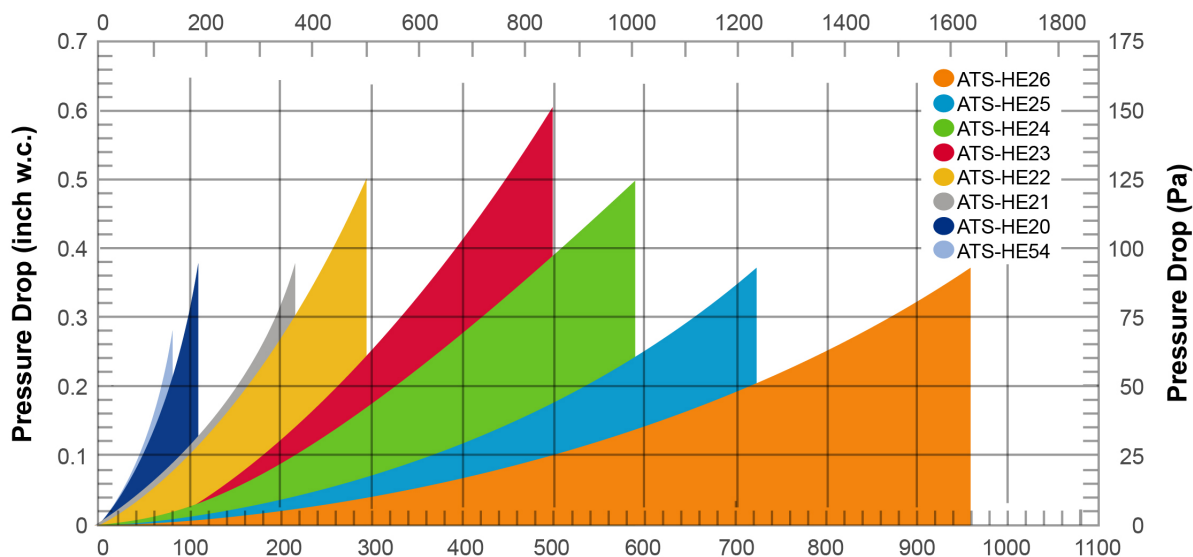
- » Heat transfer capacity up to 250W per $\Delta T = 1^{\circ}\text{C}$
- » $\Delta T =$ inlet liquid temperature - inlet air temperature
- » 17.52" x 14.0" x 2.63" core size (L x W x H)
- » Weight: 4018g (8.9 lbs); Weight w/fan: 5791g (12.8 lbs)
- » Maximum pressure: 100 psi





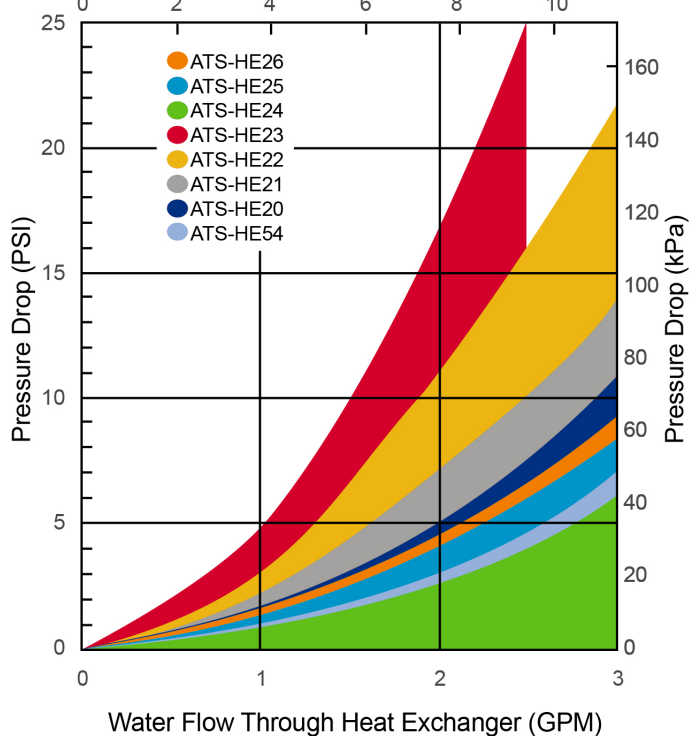
Heat Exchangers (cont'd)

Air Flow Through Heat Exchanger (CMH)

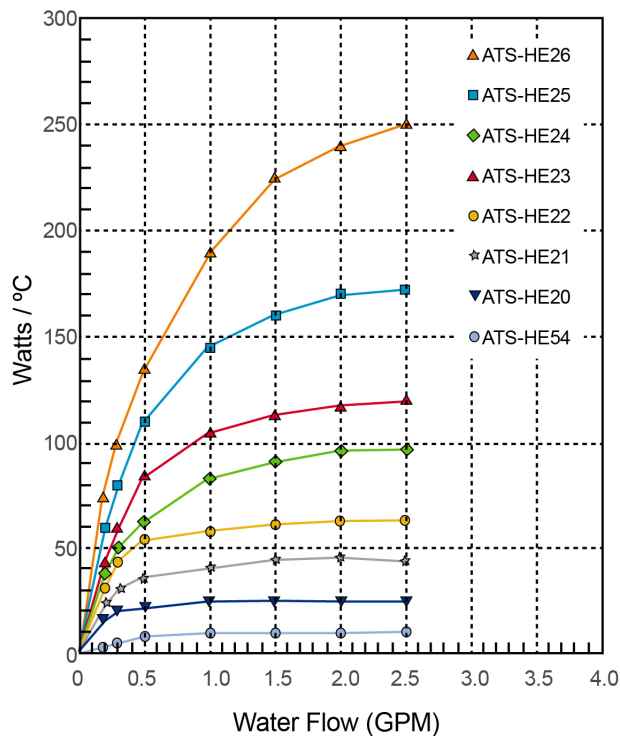


Air Flow Through Heat Exchanger (CFM)

Pressure Drop vs Water Flow
Water Flow Through Heat Exchanger (LPM)



ATS Heat Exchanger Family Performance
Water & Air (Standard Fans)



Note: Performance curves are per $\Delta T = 1^\circ C$ | $\Delta T = \text{inlet liquid temperature} - \text{inlet air temperature}$