

Condensing Economizers

Stainless steel secondary heat exchangers

Various design patterns for different heat recovery systems in commercial and industrial applications.



E-Line

High Efficiency Condensing Economizers

for boiler nominal power input

150–6000 kW
500–20000 MBTU/h

20%

Increase of heat recovery
and system efficiency.

Typically used with hot water
boilers or configured with older
types of heating boilers,
condensing economizers improve
the overall heat recovery system
and boost boiler efficiencies.

Secondary heat exchangers have been
part of AIC product portfolio for many
years. Over this time, AIC has provided its
customers with a great number of heat
transfer solutions, which were
transformed into condensing products.

As your typical OEM suppliers who deliver
tailor-made products, AIC has engineered
and built a range of free-standing uniform

economizers, for commercial and
industrial applications. Implementation of
efficiencies in thermal processes is a vital
element in streamlining rising energy
costs. Installation of condensing
economizers can help companies improve
overall heat recovery and steam system
efficiency by up to 20% (in standard
applications).

Economizers benefits

Increased system efficiency

Energy and cost savings

Converts standard boilers into condensing boilers

Unique tube design for optimal thermal performance

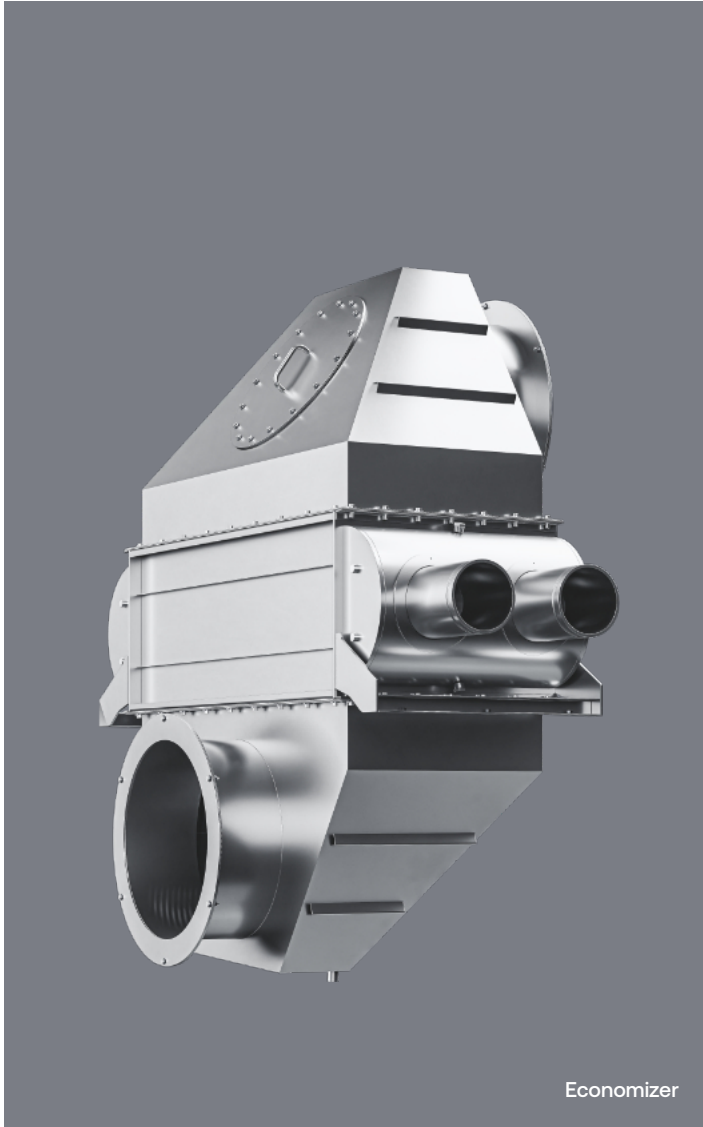
Easy installation, low maintenance



Design

Economizer

The durable stainless steel construction is designed to withstand the corrosive effects of condensing exhaust gases. The unique design of the tube packet provides maximum heat transfer surface contact with the flue gas and optimized thermodynamics process which allows for improved recovery of wasted energy.

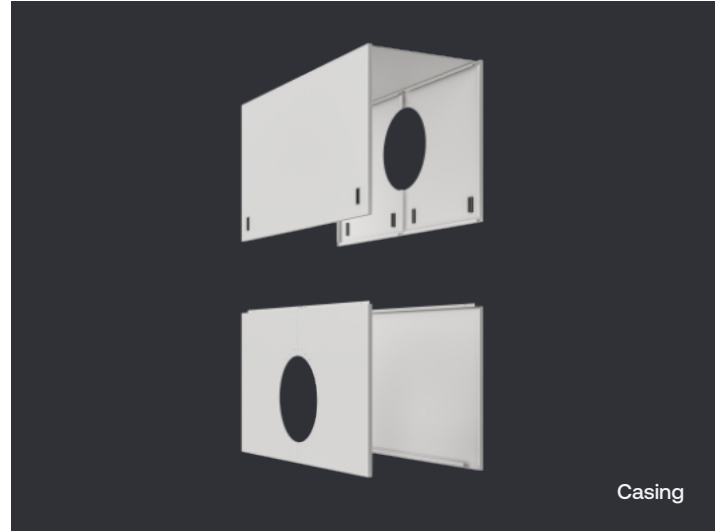


Casing

The housing is made of galvanized steel, powder-coated provides excellent corrosion protection, and has an elegant appearance. In addition, the casing is protected with insulating material, protecting against excessive heating of the housing walls. The modular design allows easy assembling and disassembling to make service work fast and easy.

Frame

The supporting structure is made of galvanized steel to ensure corrosion resistance and a stable base for the heat exchanger.



E-Line economizers are featured with a unique, developed by AIC and widely proven diamond shape tube design that stands behind the outstanding condensing efficiency.

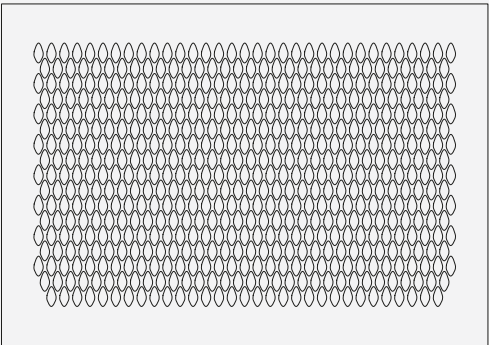
First of all, the diamond shape enhances the turbulence effect on water and gas side streams. Why is turbulence so significant? Because it determines the overall efficiency of heat transfer phenomena that is taking place between working agents. Simplifying, the heat exchangers where more turbulent flow occurs require less heat transfer area to provide effective heat exchange.

Secondly, a specific geometry allows for a strategic, alternate arrangement of tubes in tube bundle. Such an arrangement requires less space to provide the required heat transfer area (compared with round tubes) and extends the contact paths between the medium and tube surface on the gas side.

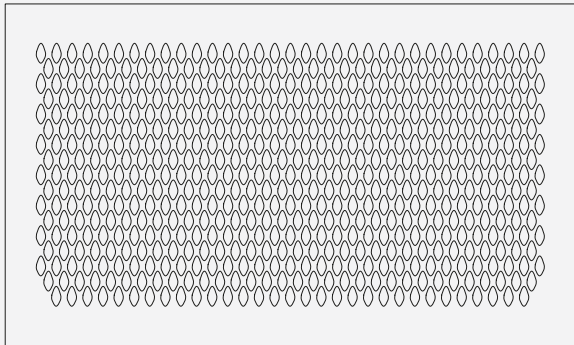
By using the numerous CFD analysis and field/laboratory tests, we've proven that AIC's diamond shape tube design reduces the overall size of heat exchanger up to 20% compared to standard, round tubes featuring the same hydraulic diameter.

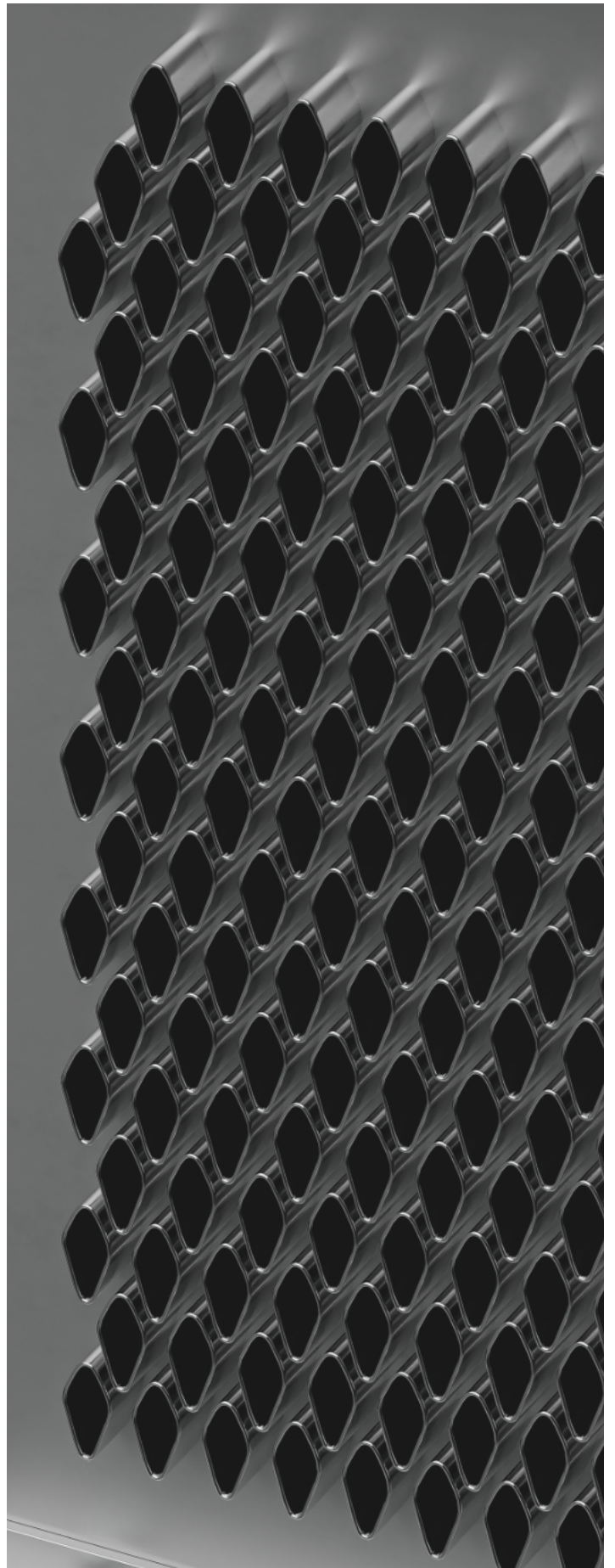
The new design of the E-Line meets the expectations of our customers and enables the heat exchanger to be adapted to their needs.

16,5 mm



20 mm



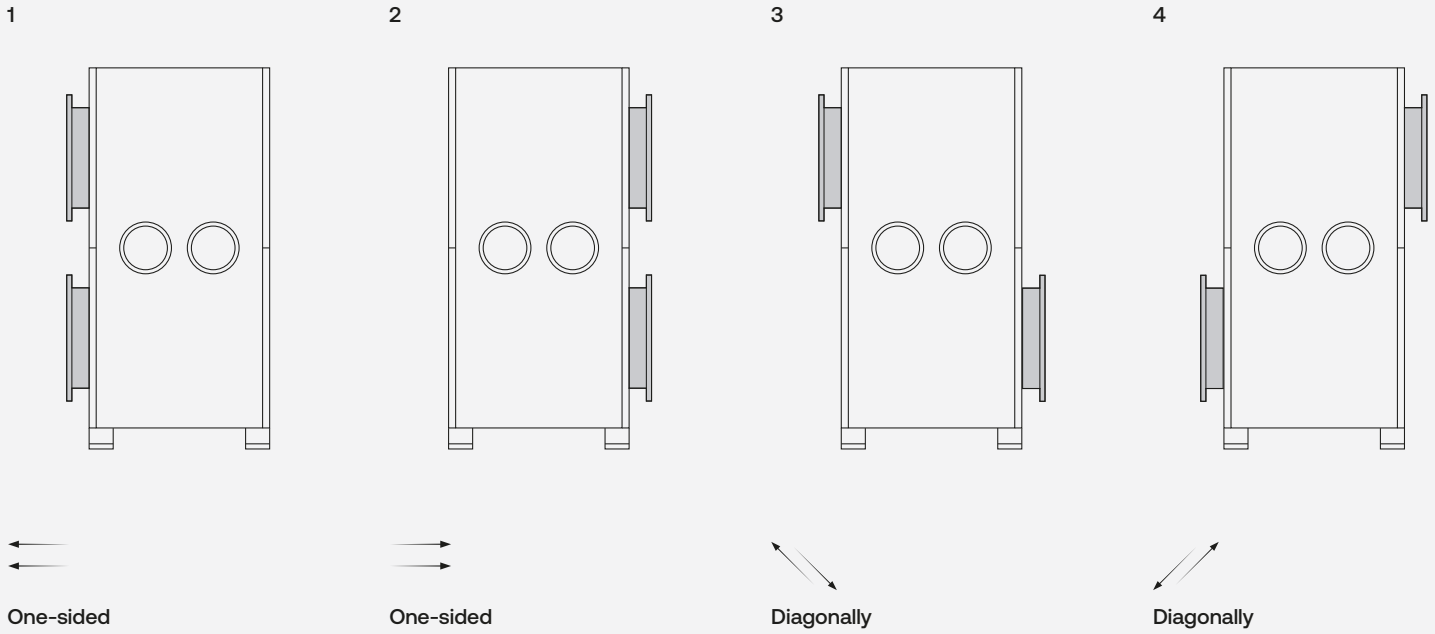




Customization

Connection positioning

Appropriate accessories have been designed that will allow you to change the type of water connections, taking into account such connections as flanges or threads. Therefore, anyone who will be interested in this product will be able to adjust the device to their needs.



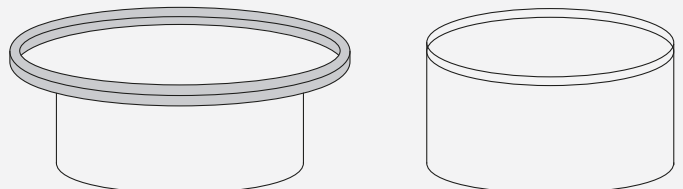
Water connection positioning

Another possibility the new structure provides is the location of the water connection. It can be located on the left or right side of the device, which will allow it to best fit into the existing installation.

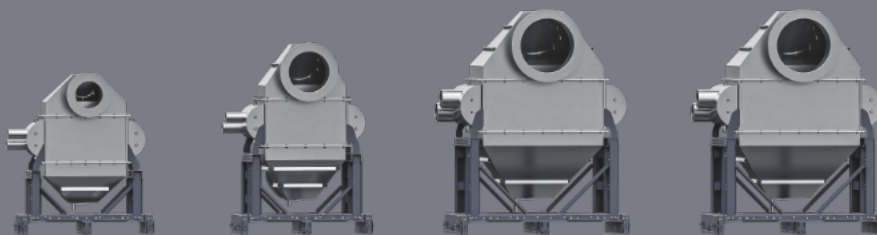
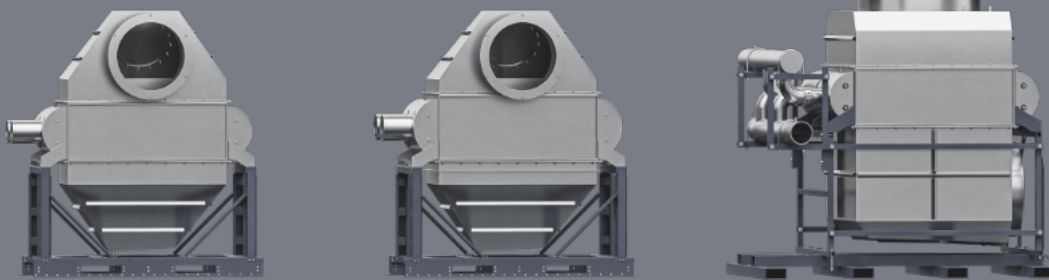
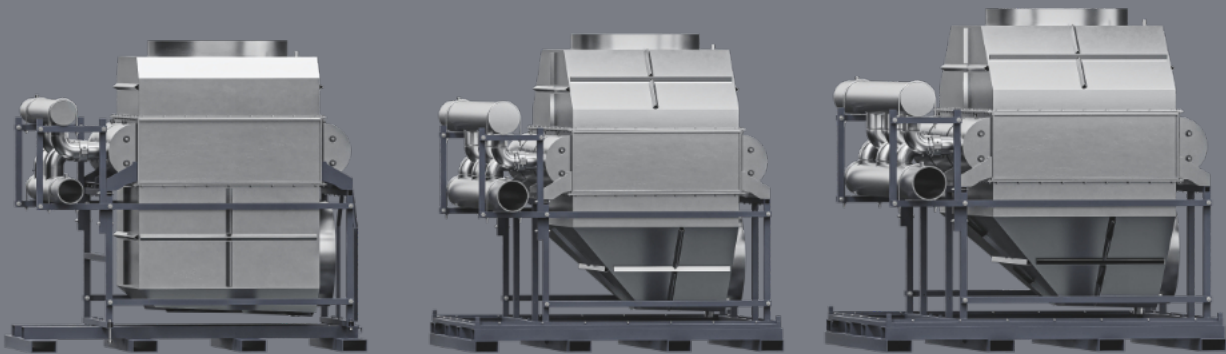


Flange

In addition, it allows you to choose the type of gas connection with or without a flange, as well as its location on the exchanger, such as the front or back.



E-Line family



The series has been extended with 3 additional models with a larger spacing of pipes, so that it can be used in applications where low flow resistance of the hot gaseous medium is of key importance. In the boiler room E-Line economizers transfer their waste heat to either the feed water or combustion air pre-heaters, essentially converting standard boilers into condensing boilers.

Covering a wide range of boiler sizes from From 150 kW to 6000 kW (500–20000 MBTU/h), the E-Line delivers real energy and cost savings for commercial and industrial installations.

Applications

Typical economizer applications

Greenhouses

District heating systems

Food processing plants

Pulp and paper mills

Textile plants

Dairy processing facilities

Hospitals

Non-condensing boilers

Retrofit commercial projects

Industrial Energy saving

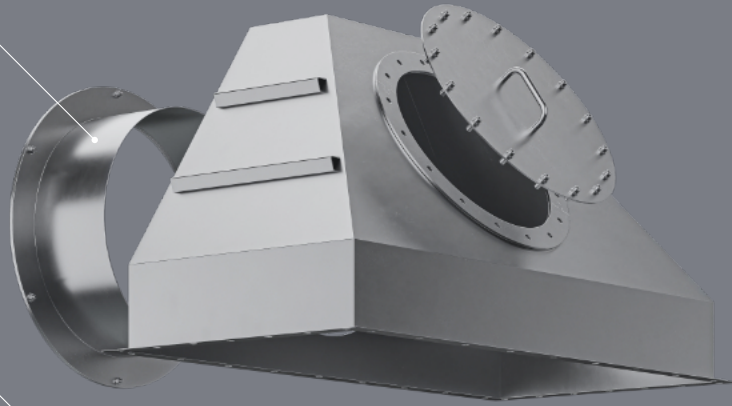
Pharmaceutical processes

Chemical processes



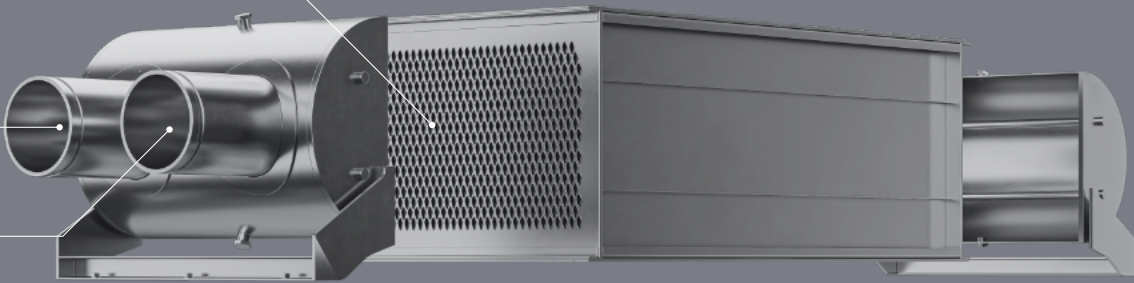
Flue gas inlet

Hot flue gases enter the economizer (between the tubes)



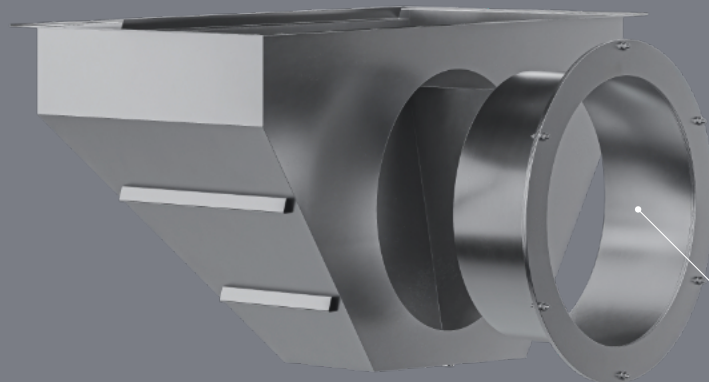
Heat exchanger

Unique "tear drop" shape tube pattern



Water inlet

Water outlet

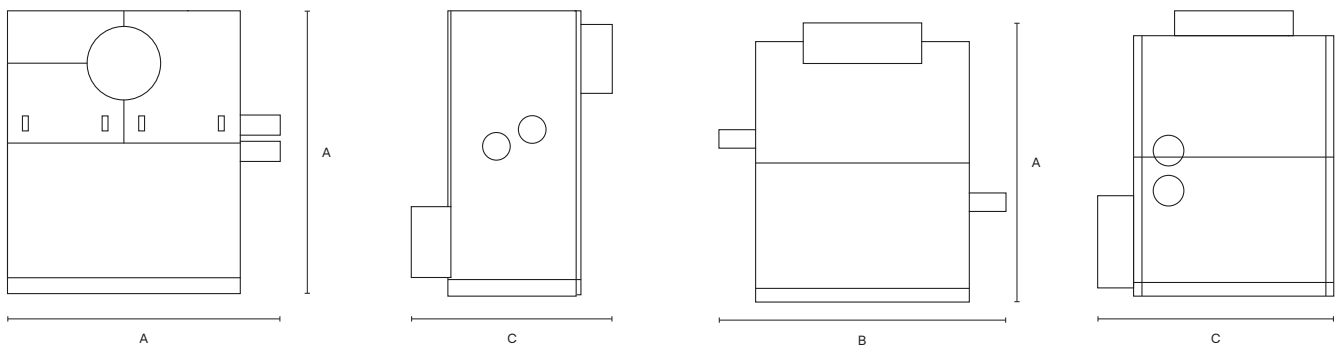


Flue gas outlet

Technical Specification

Model	Nominal Boiler Input		Exhaust Inlet		Exhaust Outlet		Water Inlet		Water Outlet		Drain Nozzle	
	kW	MBTU/h	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
E 8.3-16.5	150-250	500-850	200	8	200	8	DN65	2 1/2	DN65	2 1/2	DN20	3/4
E 12.3-16.5	200-500	650-1700	300	12	300	12	DN65	2 1/2	DN65	2 1/2	DN20	3/4
E 15.3-16.5	450-1200	1500-4100	400	16	400	16	DN100	4	DN100	4	DN20	3/4
E 16.3-16.5	1100-1500	3750-5100	400	16	400	16	DN125	5	DN125	5	DN20	3/4
E 20.3-20	1200-1700	4100-5800	500	20	500	20	DN150	6	DN150	6	DN20	3/4
E 20.3-16.5	1400-2000	4800-6850	500	20	500	20	DN150	6	DN150	6	DN20	3/4
E 28.3-20	2550-3400	8700-11600	700	28	700	28	DN150	6	DN150	6	DN50	2
E 28.3-16.5	3000-4000	10240-13650	700	28	700	28	DN150	6	DN150	6	DN50	2
E 35.3-20	3825-5100	13050-17400	900	35	700	28	DN150	6	DN150	6	DN50	2
E 35.3-16.5	4500-6000	13650-20475	900	35	700	28	DN150	6	DN150	6	DN50	2

Model	Weight		A		B		C	
	kg	lbs	mm	in.	mm	in.	mm	in.
E 8.3-16.5	171	377	1257	49,5	1139	44,9	580	34,7
E 12.3-16.5	243	536	1457	57,4	1139	44,9	755	29,9
E 15.3-16.5	410	904	1697	66,8	1419	55,9	956	33,8
E 16.3-16.5	437	963	1697	66,8	1419	55,9	956	33,8
E 20.3-20	640	1411	1997	78,6	1874	73,8	963	34
E 20.3-16.5	600	1323	1997	78,6	1874	73,8	1083	38,8
E 28.3-20	1506	3320	2166	85,3	1862	73,3	2318	91,3
E 28.3-16.5	1416	3122	2166	85,3	1632	64,3	2318	91,3
E 35.3-20	2274	5013	2286	90,0	2764	108,8	2254	88,7
E 35.3-16.5	2147	4733	2286	90,0	2354	92,7	2254	88,7



Ventura Eco

High-temperature, Fire-tube,
heat recovery economizer

Heat absorption

100–450 kW
350–1500 MBTU/h

1000 °C
Maximum temperature
of exhaust gas

11 bar
Maximum allowable
working pressure

A new range of condensing stainless steel fire-tube heat exchangers. Ventura ECO main features are high thermal efficiency, durability, and corrosion resistance. Covering a wide range of outputs, it provides 100 kW–450 kW (350–1500 MBTU/h) heat absorption. Ventura ECO, utilizing AIC's patented fire-tube design, is the perfect solution for a variety of commercial and industrial applications.

Ventura ECO is suitable for high temperature applications – up to 1000 °C (1832 °F).

Ventura ECO is certified according to both ASME and PED requirements. The tube bundle, a critical part of Ventura ECO, is manufactured on a fully automated line. Robotic welding ensures the excellent quality and longevity of the product.

Main features

Stainless steel construction

Small footprint

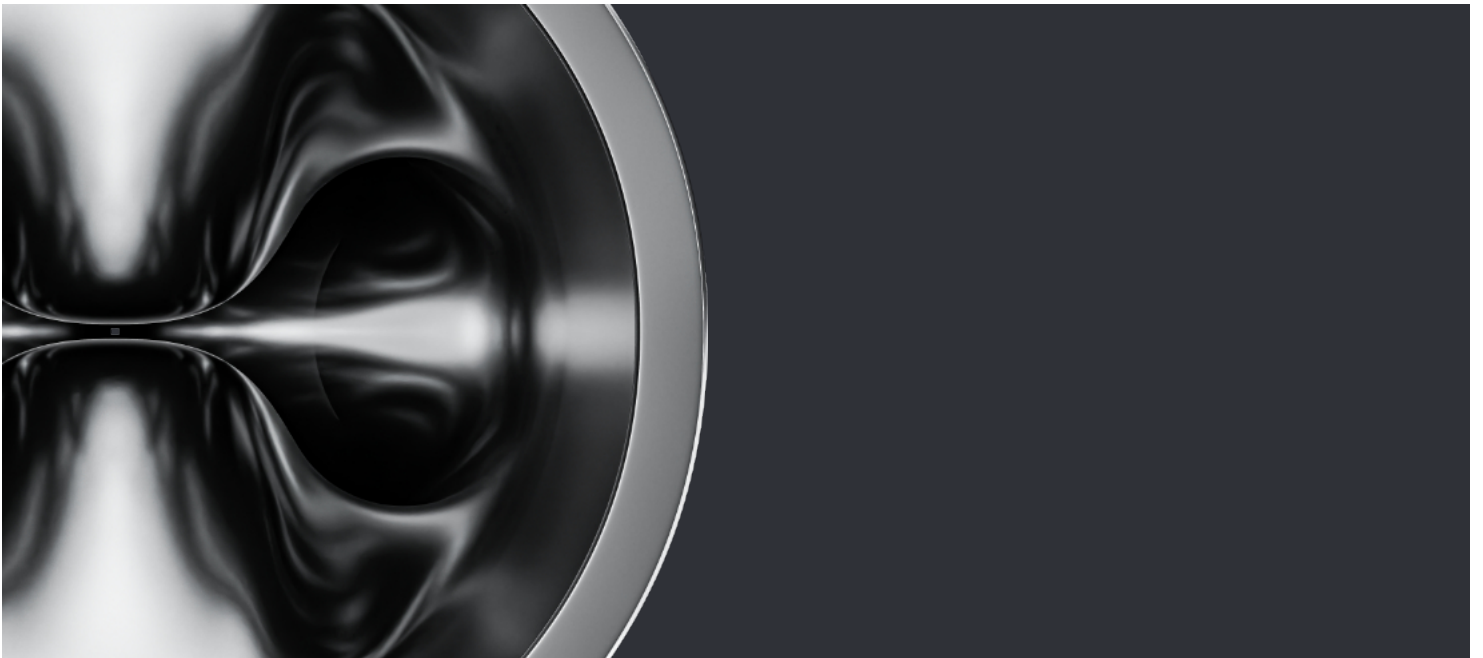
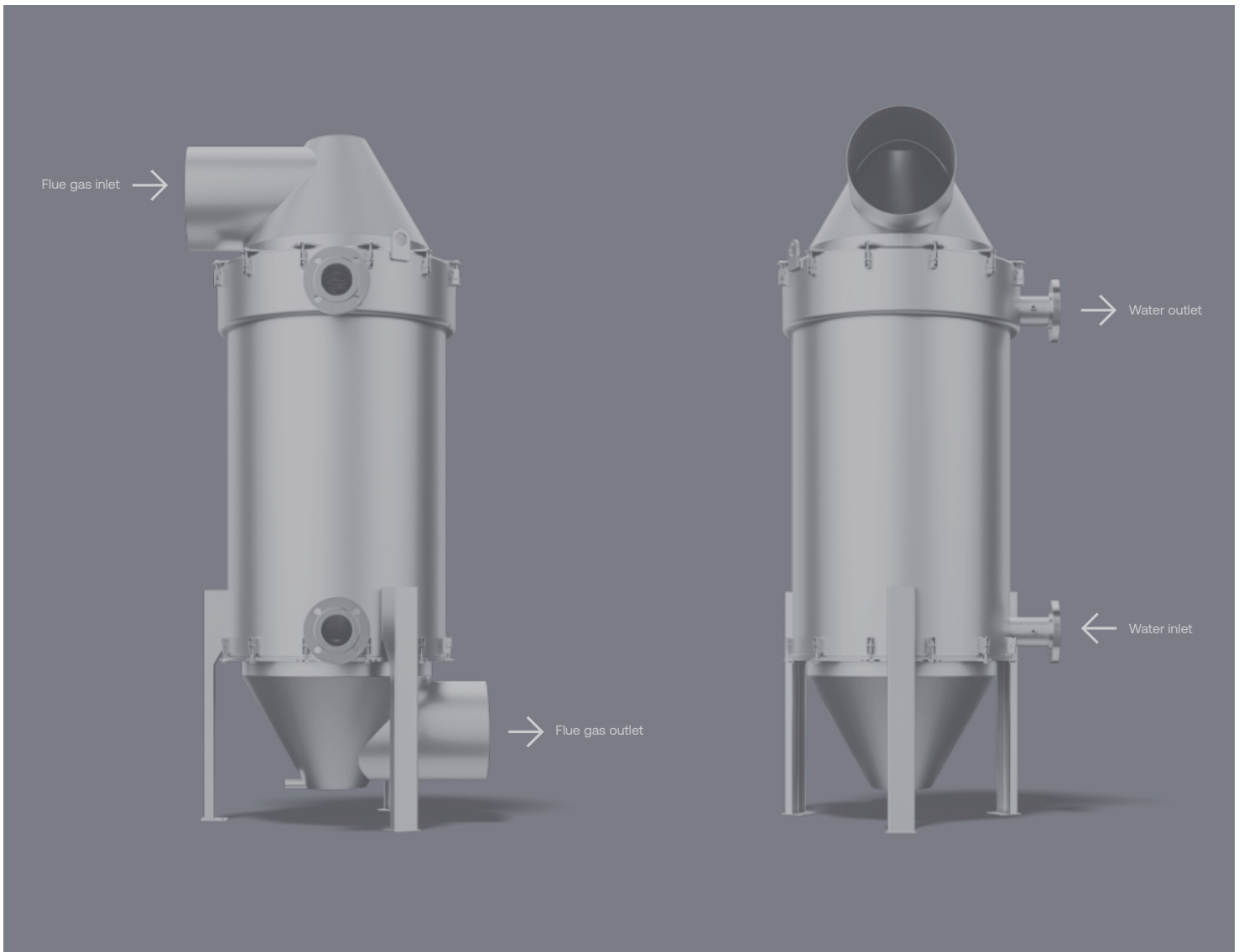
Proven fire-tube technology

Easy maintenance

Customizable position of the flue gas inlet and outlet

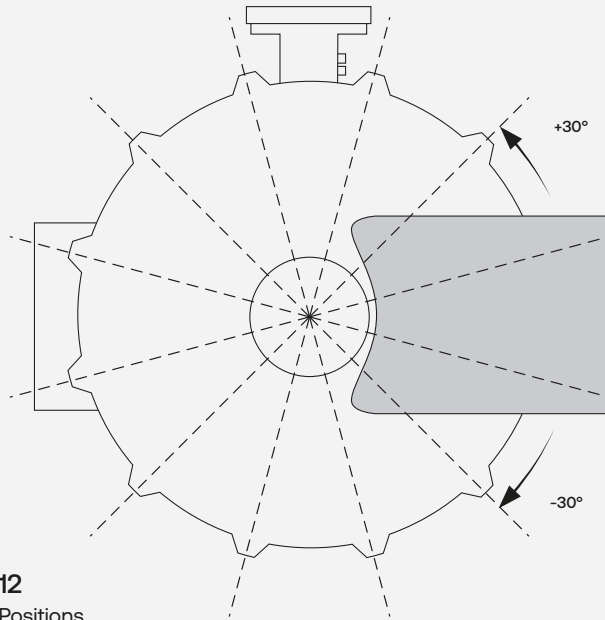
Wide range of water connections





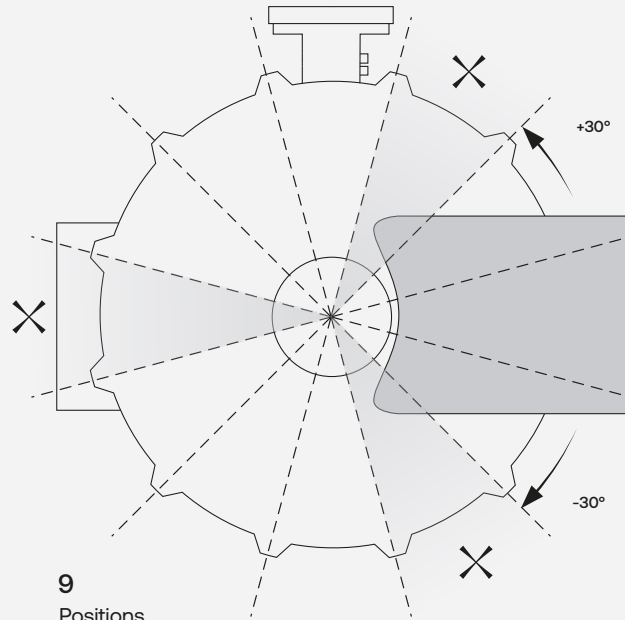
Customize

Top inlet



12
Positions
of inlet rotation

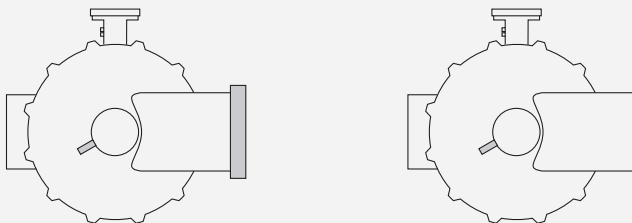
Bottom inlet



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Positions
of outlet rotation

Types of exhaust connections

The cylindrical shape of the device allows the upper and lower manifolds to be rotated in multiple positions to best fit the existing installation. When designing a new installation, it allows you to set the device in such a way as to save space and the length of the media supply channels.



Types of exhaust connections

Design allows you to choose the type of gas connection with or without a flange.

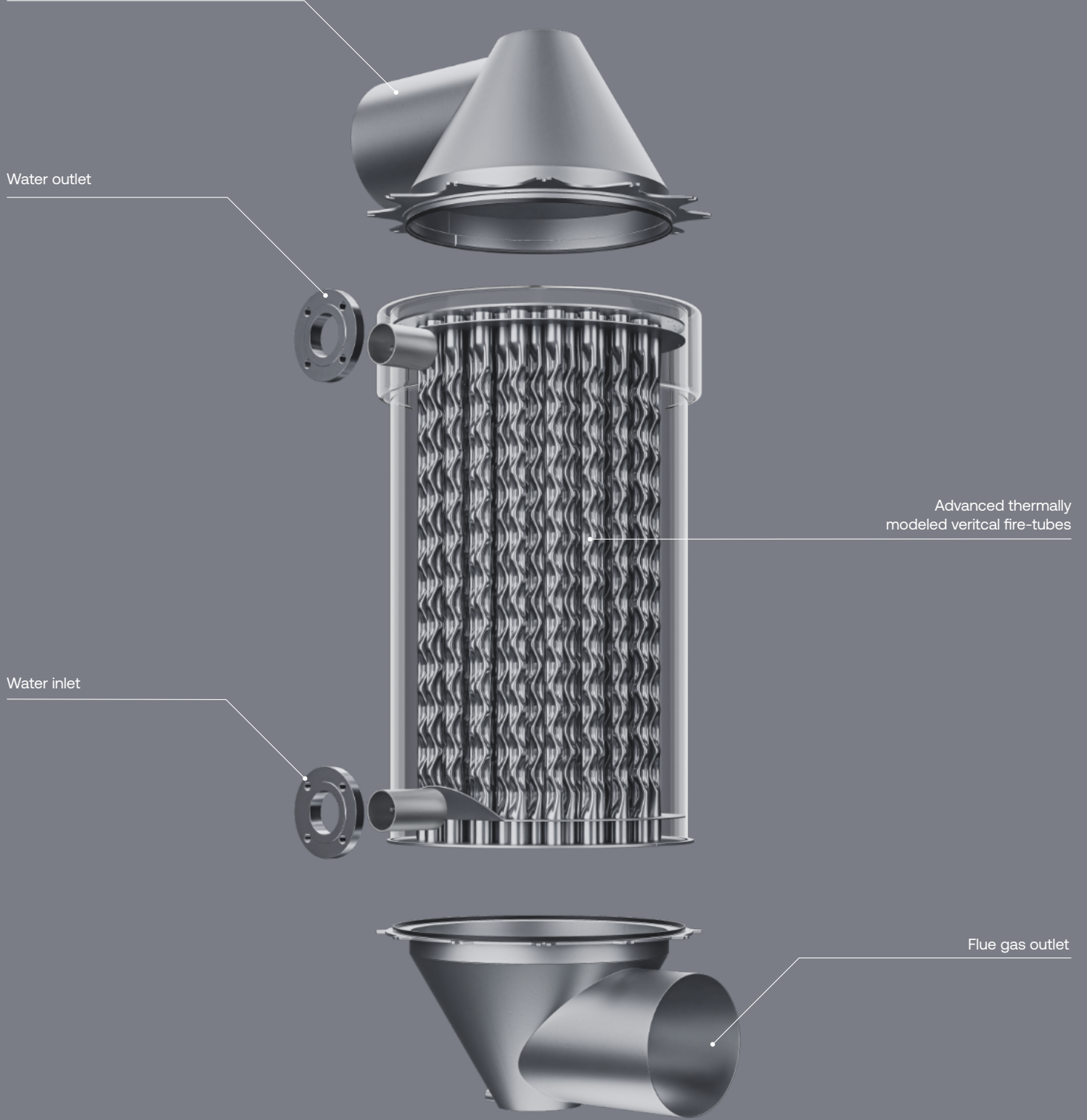
Flue gas inlet

Water outlet

Water inlet

Advanced thermally modeled vertical fire-tubes

Flue gas outlet

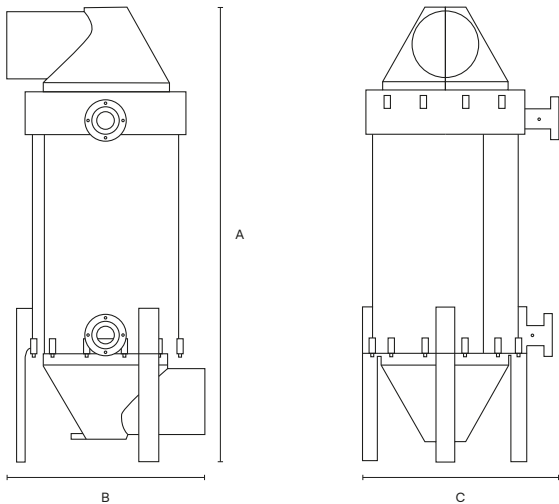


Technical Specification

Model	Heat Absorption*		Exhaust Inlet		Exhaust Outlet		Water Inlet		Water Outlet		Drain Nozzle	
	kW	MBTU/h	Ø mm	Ø in.	Ø mm	Ø in.	mm	in.	mm	in.	mm	in.
1M	100	350	300	12	300	8	89	3	89	3	26,7	1
1,5M	175	600	300	12	300	12	89	3	89	3	26,7	1
2M	200	700	500	20	500	12	89	3	89	3	26,7	1
3M	280	950	500	20	500	12	89	3	89	3	26,7	1
5M	450	1500	700	27	700	27	152	6	152	6	33,4	1 1/2

Model	A		B		C		Shell	
	mm	in.	mm	in.	mm	in.	Ø mm	Ø in.
1M	1950	77	900	35	800	32	590	23
1,5M	2100	82	900	35	850	34	670	26
2M	2600	102	1050	41	910	36	730	29
3M	2600	102	1050	41	1000	39	822	32
5M	2700	106	1300	51	1250	49	1050	41

*Pressure drop below on hot side <1000 Pa, exhaust speed v <14 m/s, exhaust temperature 600 °C—each case is determined individually.



Types of water connctions

3" G Threaded

3" Flanged ASTM

3" NPT Threaded

3" Flanged PN-EN

3" Groove*

OEM Solutions

Custom-built heat exchangers

30–1500 kW
100–5000 MMBTU/h

96%+

maximize heat transfer boiler efficiency range.

From the design stage, through engineering, product validation all the way to manufacturing, AIC technical team has provided their clients with complete solutions that meet the most rigorous technical requirements. Custom-built AIC products are a blend of ingenious heat transfer designs and high-precision manufacturing technologies.

AIC economizers are able to increase efficiencies by recouping heat energy normally wasted when vented

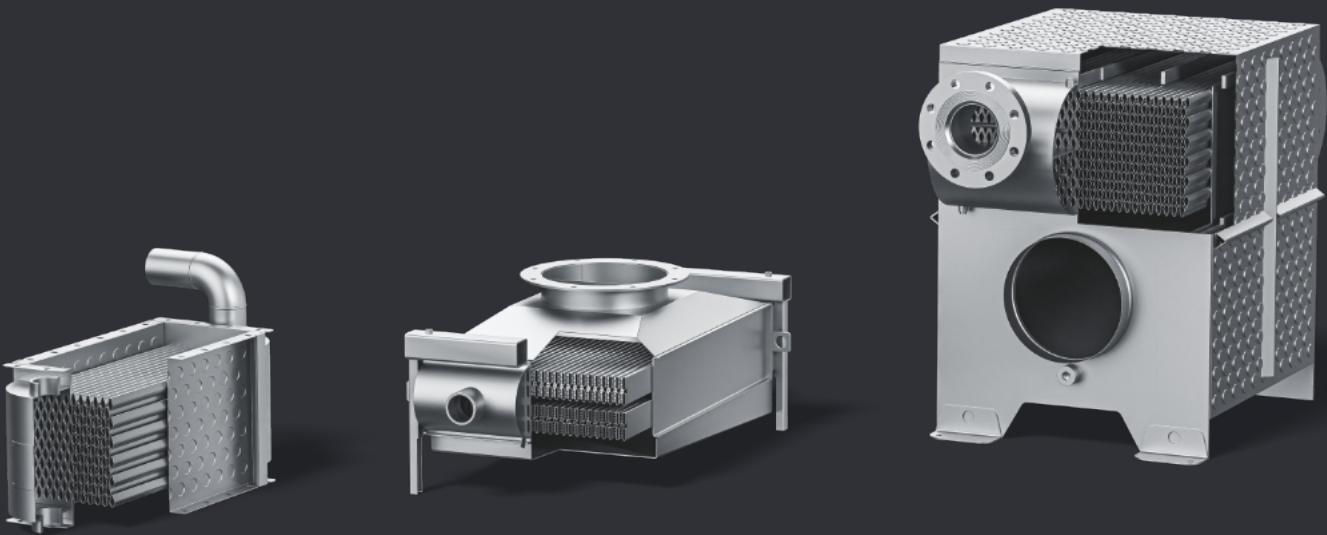
from buildings. Built from most efficient and dependable heat transfer materials available, economizers are designed to maximize heat transfer boiler efficiency into 96%+ range.

AIC has always focused on new technologies and advanced designs while developing heat exchangers and heat recovery products for OEM applications.



AIC unique tube design, the so-called “tear drop shape”, provides maximum heat transfer surface contact with the flue gas.

Economizer tubes are strategically positioned to optimize the thermodynamics process and allow for the improved recovery of wasted energy.



Design concept proven by thousands of heat exchangers in the field. The distinctive geometry of fire tubes enhances the heat transfer by creating a turbulent flow of flue gases. Built from high-grade stainless steel alloys. Stainless-steel advanced thermally modeled vertical fire tubes are perfect AIC patented solution for high temperatures up to 1000 °C.

Brazed fin and tube construction with stainless steel ribbon channels provide increased heat transfer. Easily scalable modular concept with tightly packed fins results in reduced footprint and heightened thermal conductivity.

AIC is an acclaimed designer and provider of heat transfer solutions for heating and cooling applications, used in a variety of industries worldwide.

Established in 2001, AIC fairly soon reached the status of specialists in the field of design, engineering, and manufacture of heat exchangers and pressure vessels. In just over 20 years, a small engineering office that initially focused on conceptual designs of heat exchangers, transformed into a large organization, with innovative products, sophisticated manufacturing technologies, and a strong R&D center. Today AIC has three manufacturing facilities in Europe, sales offices in North America and Asia, and a distribution center in the U.S. AIC is leading the way in heat transfer design solutions, working with industry leaders and embarking on the most demanding projects.

We are certified in accordance with renowned international codes and standards. Our quality process and management systems fulfill the requirements of ISO 9001 Quality Management System. AIC heat exchangers are designed, manufactured and inspected in accordance with ASME Boiler and Pressure Vessel Code (BPVC) Sections IV, VIII-1 and PED 2014/68/EU regulations.

