



# EXHAUST GAS HEAT EXCHANGERS

SHELL & TUBE · MARINE & INDUSTRIAL · CUSTOM ENGINEERING

**WHERE HEAT MEETS PRECISION**

Engineered for reliability · Built for performance · Trusted worldwide

## HEAT EXCHANGER SYSTEMS

# EXHAUST GAS HEAT EXCHANGERS

These heat exchangers are designed to remove thermal energy from the exhaust gas of natural gas, diesel and bio-fuel engines and transfer it to the water circuit. The extracted heat can be used for space heating, domestic hot water and any industrial process that requires hot water.

- Standard range available for quick delivery.
- Suitable for engines up to 1 MW.
- Suitable for use with engines powered by conventional and alternative fuels.
- Fully welded stainless steel construction for reliability and durability.
- Can also be used to extract energy from gas or air and transfer it to the water circuit.
- Compact and highly efficient design for ease of installation.
- Ideal to reduce the exit temperature of the exhaust gases in hazardous areas.
- Recovering thermal energy equivalent to up to 60% of engine electrical output from exhaust gases alone.
- When installed, BIF units provide free heating and hot water — eliminating the need for auxiliary heating systems.

UP TO

**1 MW**

Engine Capacity

UP TO

**60%**

Waste Heat Recovery

UP TO

**600°C**

Exhaust Temperature

UP TO

**500 kW**

Heat Duty

## TYPICAL APPLICATIONS

Marine Gensets

Industrial Engines

Power Plants

CHP Systems

Biogas Plants

Rail Traction

Mining Equipment

Cement Plants

Steel &amp; Foundry

Glass Manufacturing

Paper &amp; Pulp Mills

Chemical Plants

Textile Dyehouses

Food Processing

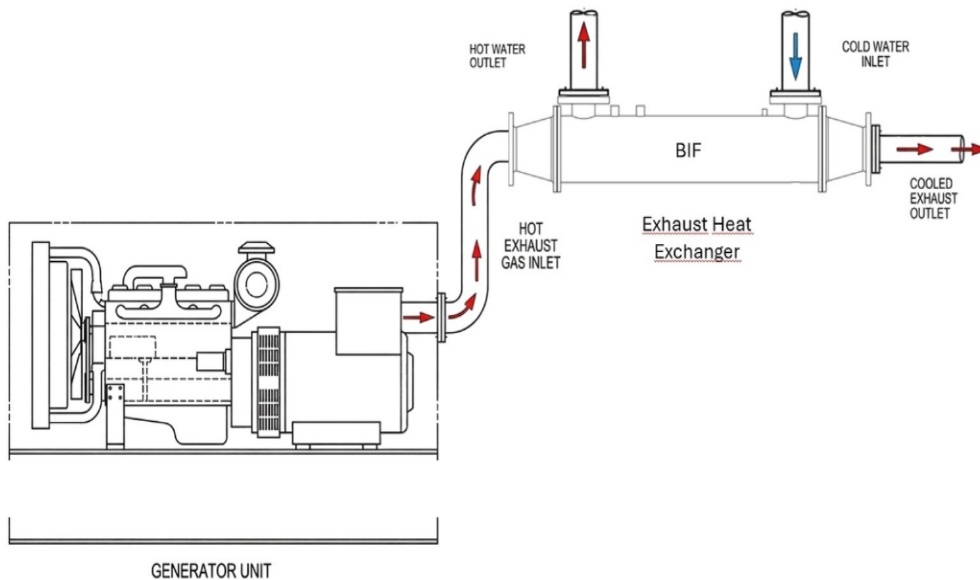
Greenhouse Heating

District Heating

Ceramic Kilns

Commercial Laundries

## HOW IT WORKS



Hot exhaust gases from the engine enter the heat exchanger and pass through the tube bundle. Cold water circulates around the tubes in the opposite direction, absorbing thermal energy from the exhaust gas.

The recovered heat is delivered as hot water for space heating or domestic use — providing FREE energy that would otherwise be wasted.

**60%**

Heat recovered

**FREE**

Hot water

**24/7**

Continuous

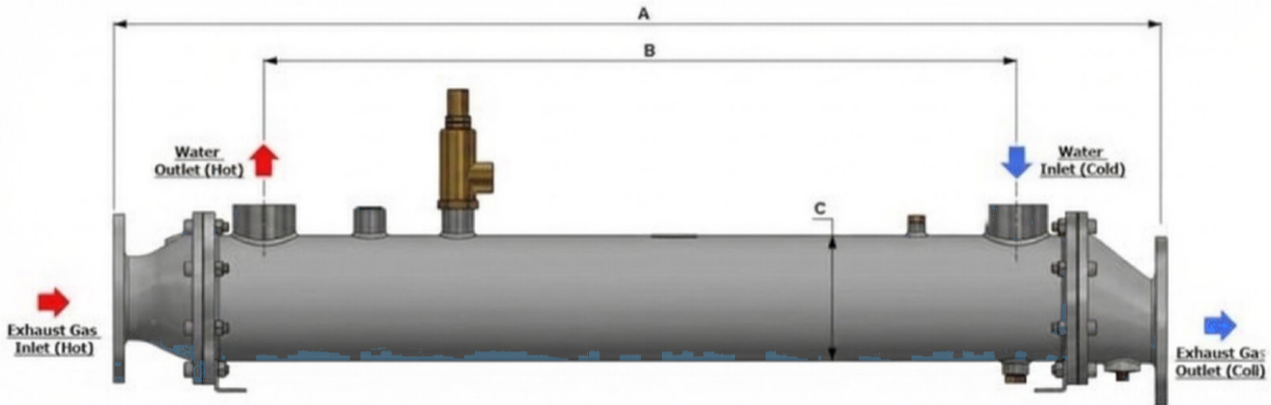
#### HEAT EXCHANGER SYSTEMS

The figures given below are typical examples of the performance of Bif exhaust gas heat exchangers. They are intended as a general guide and are based on a natural gas engine with an exhaust gas temperature of 600°C and a water temperature of 80°C.

In addition to our standard product range, we offer custom design and manufacturing tailored to your specific requirements. Please contact our technical team with your application details for a bespoke solution.

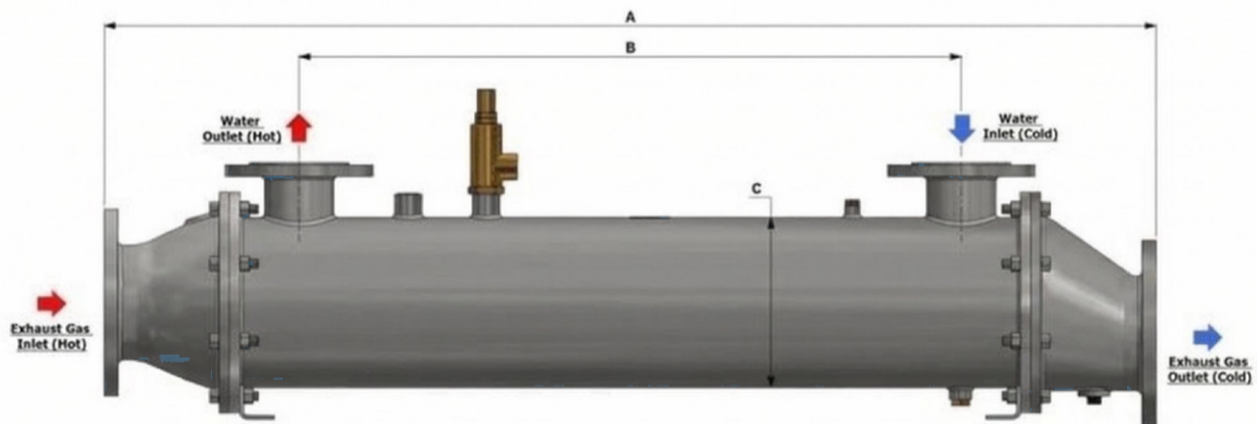
**Note: water temperature must not exceed 110°C at 4 bar and gas inlet should be below 0.5 bar and 700°C.**

#### Model Bif 88 - 168



Model	Engine Power (kW)	Mass Flow (kg/min)	Pressure Drop (kPa)	Gas Outlet (°C)	Heat Rec. (kW)	Dim A (mm)	Dim B (mm)	Dim C (mm)	Weight (kg)
Bif 88	32	2.4	1.3	163	21	1162	920	88.9	20
Bif 114	60	4.5	1.2	164	39	1192	900	114.3	29
Bif 141	90	6.7	1.2	161	59	1232	890	141.3	39
Bif 168	140	10.5	1.2	163	92	1282	870	168.3	55

#### Model Bif 219 - 406



Model	Engine Power (kW)	Mass Flow (kg/min)	Pressure Drop (kPa)	Gas Outlet (°C)	Heat Rec. (kW)	Dim A (mm)	Dim B (mm)	Dim C (mm)	Weight (kg)
Bif 219	250	18.7	1.2	164	163	1352	850	219	98
Bif 273	400	30	1.2	164	262	1432	810	273	146
Bif 324	600	45	1.2	164	392	1532	740	324	208
Bif 406	950	70	1.1	165	610	1670	740	406.4	319

\* Custom sizes and configurations available upon request. Contact our technical team for specific requirements.

# Installation & Operation Guidelines

**IMPORTANT:** Please follow these guidelines when designing an exhaust gas heat recovery installation.

## INSTALLATION GUIDELINES

- 1 Install horizontally and levelled with water connections on top, so units are always full of water.
- 2 Connect for counter flow so the cooling medium flows opposite to the exhaust gas stream.
- 3 Install below cylinder head level so water will not leak into the engine in case of a tube leak.
- 4 **IMPORTANT:** Fully vent the water circuit via the vent plug to prevent air pockets or aeration.
- 5 If ethylene glycol or other cooling medium is used, apply the correct concentration as advised by the engine manufacturer.
- 6 Provide automatic engine shutdown with temperature probes in the heat exchanger and engine.
- 7 Under no circumstances should the pressure relief valve be removed or tampered with.
- 8 Inlet and exit exhaust pipe bore must not be smaller than the heat exchanger connections.

## OPERATION GUIDELINES

- 1 If exhaust gas circuit shuts down, ensure the water circuit continues operating to disperse residual heat and prevent damage.
- 2 Ensure water circuit pumps operate continually whenever the exhaust gas circuit is in operation to prevent overheating.
- 3 Ensure valves or ancillary equipment on the heat exchanger cannot be accidentally turned off, blocking water flow.
- 4 BIF heat exchangers are designed for 'steady state' operation. Do not install on engines in 'transient cycle' mode as thermal variation may cause premature failure.
- 5 Heat exchanger fluid connections must be made in cross-flow configuration, paying attention to the correct flow directions.
- 6 Condensed water vapor must be drained through the hole located under the outlet cap.

If you are in any doubt, please contact our technical team who will be able to provide further information and guidance.

