

**GAS TRANSMISSION  
HEATING TECHNOLOGY**

**Heating Systems  
for Natural Gas Pre-Heating**

UP TO 68MBTU/hr

**SOLUTION OUTLINE**

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DATE: MAY 2016

SUPERSEDES: NEW  
DATE: NEW



# GLOBALLY RECOGNIZED

## INTELLIGENT HEATING SOLUTIONS

With more than 1000 employees worldwide, operating seven manufacturing facilities on three continents, Armstrong Fluid Technology is known around the world as a leader and innovator in design,

engineering and manufacturing of integrated solutions within the building oriented fluid-flow equipment industry. Armstrong products are internationally recognized for design quality, long service life, and operating economy.

## AVAILABLE UP TO

# 68 MBTU

### GAS TRANSMISSION HEATING TECHNOLOGY

**A**rmstrong is the market leader in design and construction of off site manufactured heating systems. With over 25 years experience in heating systems utilized in the natural gas transmission infrastructure, Armstrong has manufactured over 600 successful installations with outputs up to 68MBTU.

To compliment the off site manufactured boiler house solutions, Armstrong have developed a modular boiler system for installation into existing enclosures.



# DEVELOPED SPECIFICALLY

T

he Armstrong Modular Boiler System is designed for new and replacement boiler applications and is available with the option of a factory fitted integral enclosure.

Where the boiler system is to be connected to an existing heat exchanger, an optional intermediate water to water heat exchanger module can be incorporated to hydraulically separate the new boilers from the old system.

## Key features of the Gas Pre-Heat Modular Boiler System

Modular format - the system is supplied in individual modules to allow easy manual handling into existing enclosures at site.

The compact and flexible design of the GPH Modular Boiler System minimizes site space required for installation and allows installation into enclosures of various configuration.

Available for use with open and room sealed flue systems with horizontal and vertical balanced flue systems available.

Manufactured from corrosion resistant materials including galvanized mounting frames and zinc plated pipe work to ensure whole life benefits.

Intelligent pumping - electronic pumps provide soft start and allows flow rate to be adjusted to match system requirements.

Proven product, backed by extensive experience and expertise and supported by our in house service organization.

The Armstrong Modular Boiler System is a complete heating system - including boilers, pumps, valves, pressurization system, controls, electrical isolators and electrical containment.

Manufactured in a factory environment to ISO 14001

Armstrong Registered Design

3D modeled mechanical design for accurate on time manufacture

Manufactured to ISO 9001 quality systems - with documentation & certification

## THE CONTROL SYSTEM FEATURES

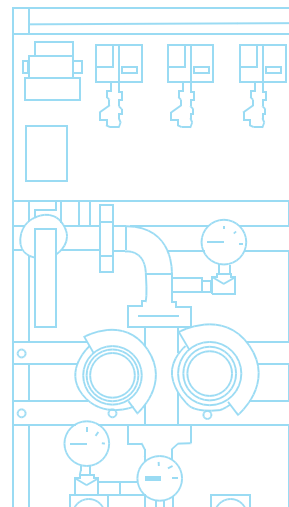
Fully automatic operation - automatic rotation of boilers and pumps with built in redundancy.

Minimal maintenance and supervision required with auto inhibit when no heating demand to maximize operating efficiency.

P.I.D control system - efficient, accurate gas temperature control throughout the load range within  $\pm 2^{\circ}\text{F}$  minimizing operational costs and emissions.

Extra low voltage or 24vdc control system - allows online maintenance and fault finding.

Alarm system - integral monitoring of system with alarm annunciation giving local and remote alarms with remote system status available by Modbus communication.





# MINIMIZE CONSTRUCTION ON-SITE

## Site installation and assembly

The installation of the GPH is completed by the following simple steps:

1. Positioning of individual modules and connection of pipe work headers.
2. Connection of electrical equipment and controls to control panel. The control panel has a cable harness supplied for connection of all equipment.
3. Installation of the flue with options of horizontal and vertical balanced flue systems available.
4. Piping of safety valve discharge and condensate drain external to enclosure.

## Commissioning

Following connection of the site interfaces, the system is ready for commissioning. This requires only the following simple steps:

Filling the system via the integral pressurization unit.

Commissioning of the gas fired modulating condensing boilers.

Adjustment of pump duty to match the installation where required.

## Site interfaces

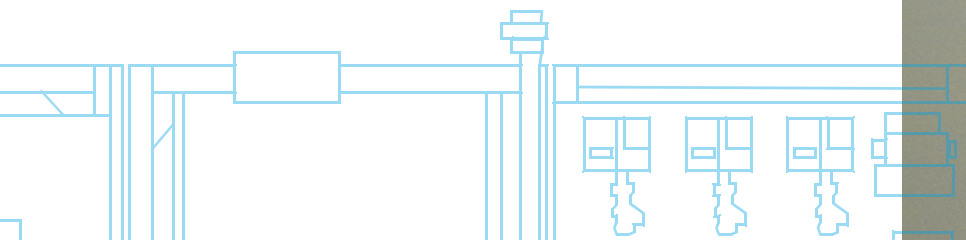
After the installation of the modular boiler system the following minimal system interfaces are required to complete the heating system:

Connection of hot water flow and return pipes to water to common boiler headers.

Connection of boiler fuel gas supply.

Connection of power supply and telemetry to control panel.

Connection of gas temperature sensor to control panel.



The Armstrong Modular Boiler System has been developed in conjunction with gas transporters to:

Minimize operating and maintenance costs

Provide a low carbon solution for natural gas heating applications

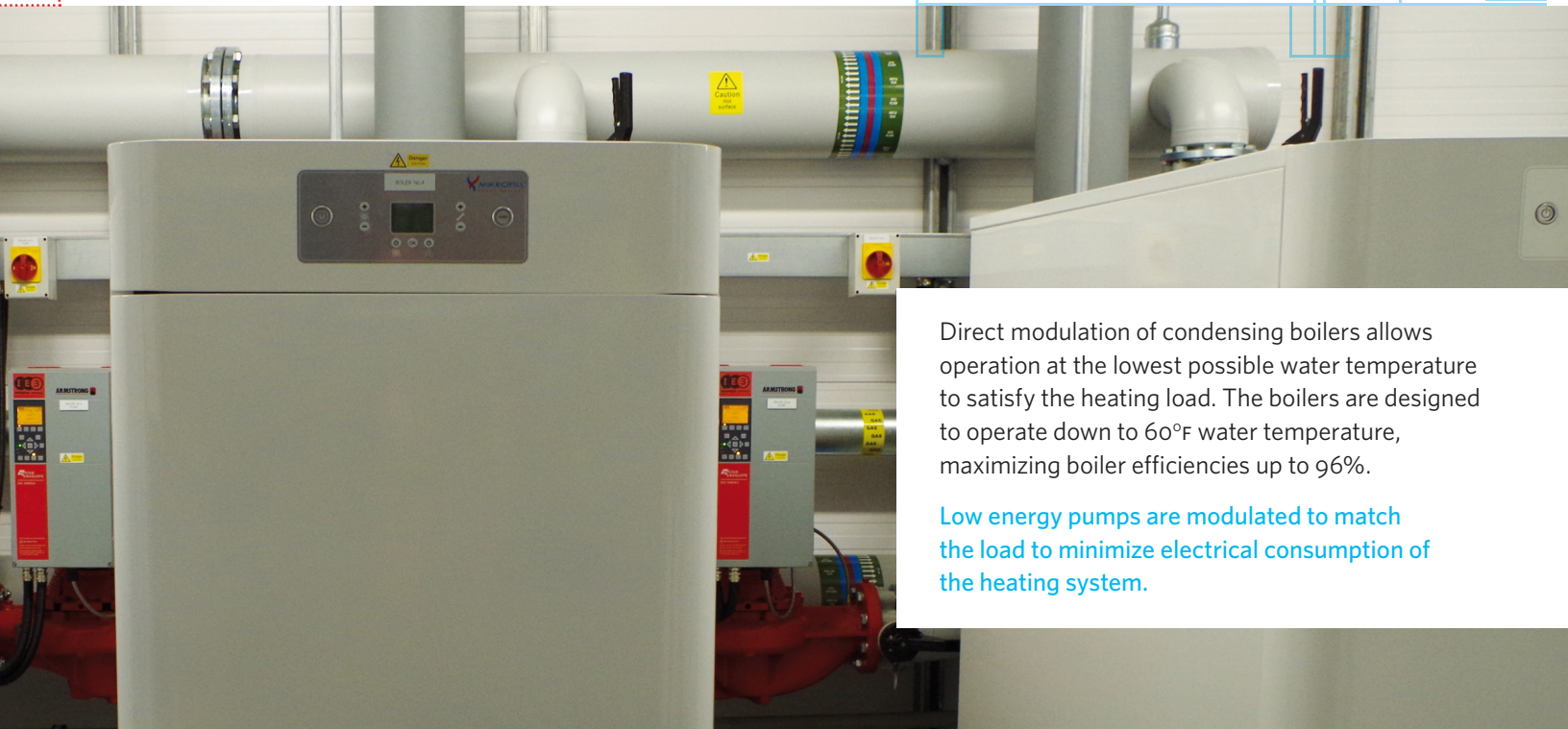
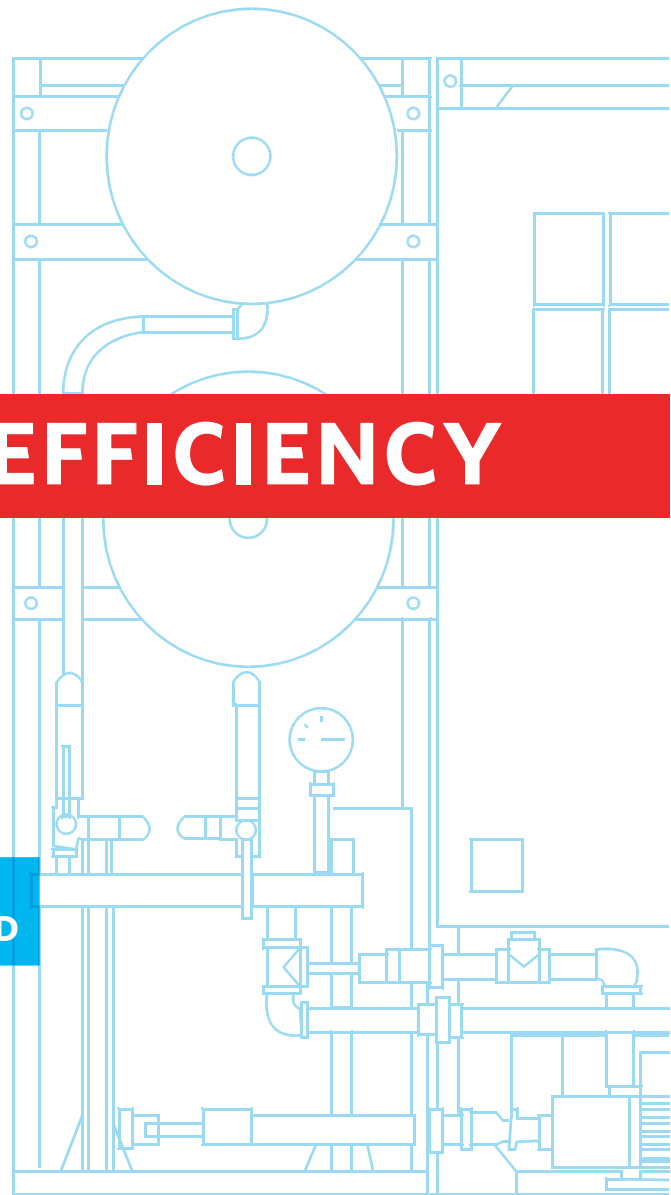
Simple and reliable operation

Annual average plant efficiency:

>90%

ACHIEVED

**SYSTEM EFFICIENCY**



Direct modulation of condensing boilers allows operation at the lowest possible water temperature to satisfy the heating load. The boilers are designed to operate down to 60°F water temperature, maximizing boiler efficiencies up to 96%.

Low energy pumps are modulated to match the load to minimize electrical consumption of the heating system.

# MAINTENANCE

# BENEFITS

## AUTOMATIC/MANUAL CONTROL OF ALL EQUIPMENT BY INTEGRAL CONTROL PANEL

**T**he Armstrong Gas Transmission heating systems have been specifically designed for simple operation and maintenance. This is achieved by the following features:

Galvanized heavy duty mounting frames and zinc plated pipe work and fittings.

Low voltage instrument panel for online maintenance.

Duplex expansion vessels with integral drain back facility for online maintenance and inspection.

Easily accessible flow and pressure switches with isolating valves and test points to allow calibration.

Individual boiler pumps allows standardization and easy replacement.

Plug and socket connections for all electrical equipment to allow isolation and replacement.

The control panel has automatic / manual control of all equipment.

ARMSTRONG  
REGISTERED  
DESIGN

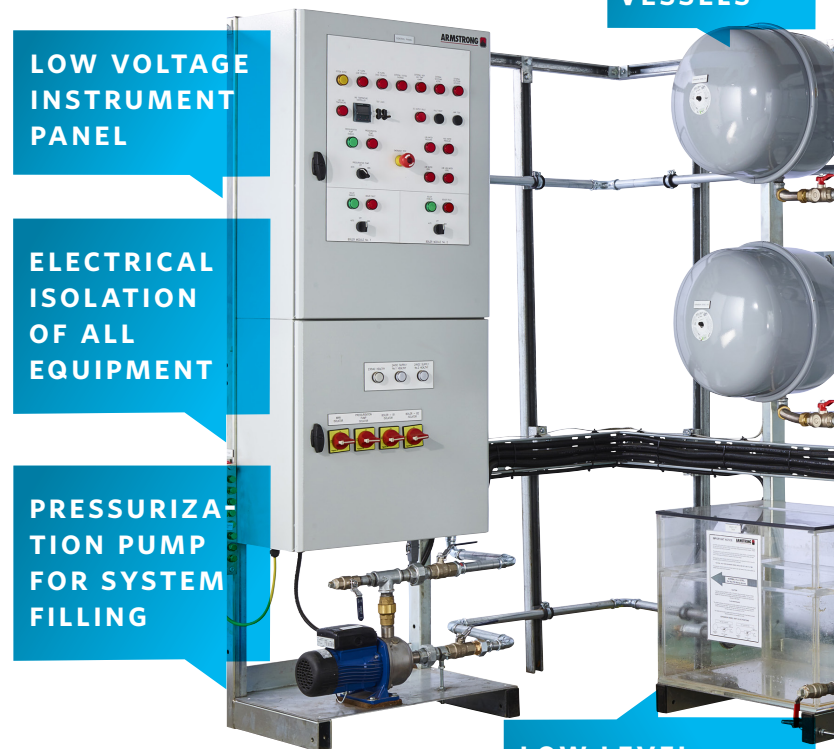
2 × 100%  
EXPANSION  
VESSELS

LOW VOLTAGE  
INSTRUMENT  
PANEL

ELECTRICAL  
ISOLATION  
OF ALL  
EQUIPMENT

PRESSURIZA  
TION PUMP  
FOR SYSTEM  
FILLING

LOW LEVEL  
HEADER TANK  
FOR SYSTEM  
FILLING AND  
SYSTEM DOSING





The Armstrong gas transmission heating systems can be provided in a standard modular format from 2 to 6 boilers with individual boiler outputs from 50BTU to 130BTU, larger heating systems can be supplied to bespoke designs.

# SUSTAINABILITY

The modulating condensing boiler systems provide operating efficiencies of up to 96% giving CO<sub>2</sub> emissions of <0.207kg / BTU output providing a reduction of >30% on non condensing heating systems.

The low temperature operation minimize standing losses from the heating system and reduces the risk of damage to soft parts on the pressure reduction system.

The auto inhibit control strategy when no heating demand is present reduces standing losses and fuel consumption optimizing the use of energy and reducing emissions.

## ARMSTRONG REGISTERED DESIGN

The modular boiler system was developed by Armstrong from extensive experience in the supply of off site manufactured heating systems.

The system is manufactured and functionally tested off site.

The design provides fast assembly at site for installation in a range of configurations to suit the existing enclosure.

**MODULATING  
CONDENSING  
BOILERS**

**ELECTRICAL  
HARNESS FOR  
COMPONENT  
CONNECTION**

**PRESSURE & FLOW  
SWITCHES EASILY  
ACCESSIBLE**

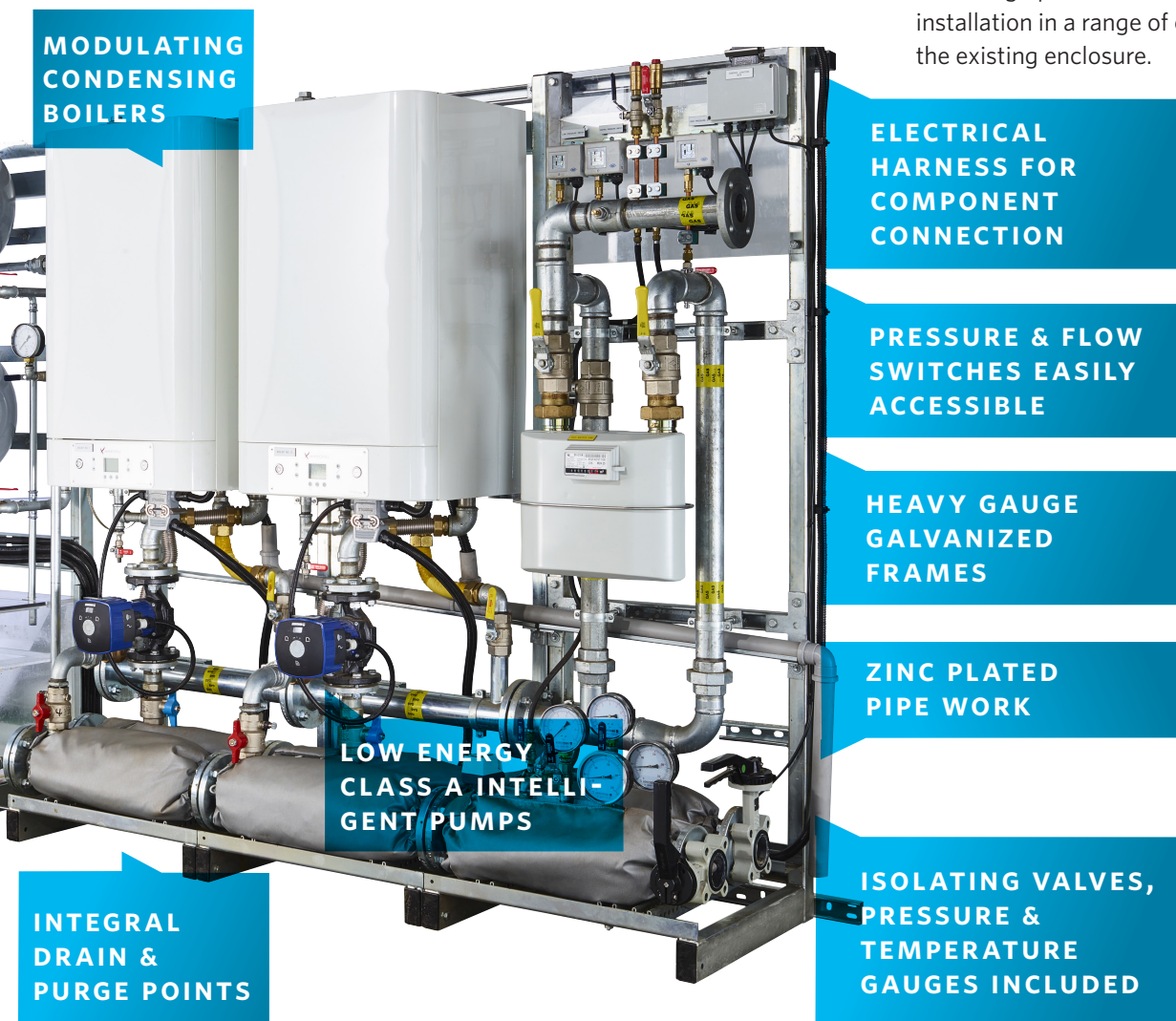
**HEAVY GAUGE  
GALVANIZED  
FRAMES**

**ZINC PLATED  
PIPE WORK**

**LOW ENERGY  
CLASS A INTELLI-  
GENT PUMPS**

**INTEGRAL  
DRAIN &  
PURGE POINTS**

**ISOLATING VALVES,  
PRESSURE &  
TEMPERATURE  
GAUGES INCLUDED**



# PROVEN DESIGN AND

# SERVICE SUPPORT

# 24/7 TECHNICAL SUPPORT



**P**roven product design - backed by the extensive experience and expertise of our mechanical and electrical design engineers.

Dedicated mechanical and electrical field support engineers from our service organization provide commissioning, service and maintenance on the complete pre-heating system to maintain maximum system efficiency and reliability throughout the life of the installation.

## CONTRACTS AVAILABLE

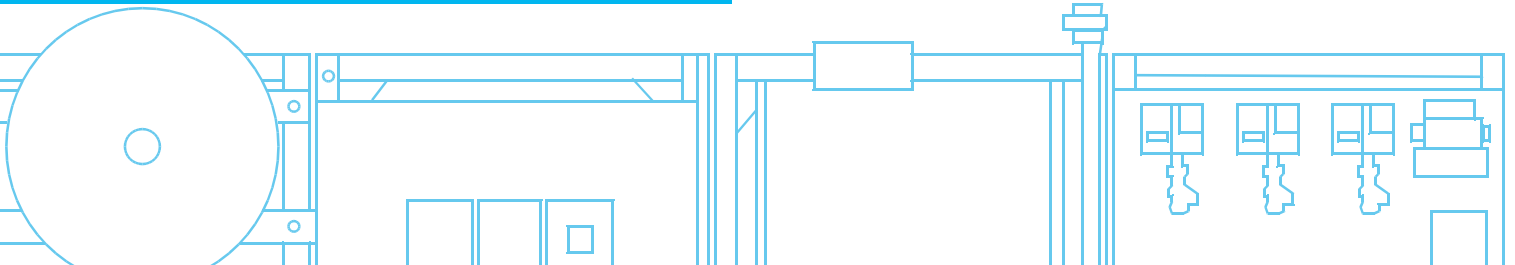
Full technical support package - comprehensive operating manual and operator training provided and round-the-clock technical support contracts available.

## Installation Package

Armstrong can provide a full installation service for the heating system including supply of the water to gas heat exchanger, interconnecting pipe work, flue system and commissioning.

## Bespoke Designs

Our in-house design team and project engineers are able to design and deliver bespoke heating solutions up to 20MBTU to meet your specific requirements.





# THE FLEXIBLE SOLUTION

## Supply options

**The heating systems can be supplied with the following standard options:**

Gas Fired generator for provision of standby power for the site

Combined Heat and Power systems for emission reduction

Gas fired heat pump technology for low carbon solutions

Security systems; gas and fire detection systems, integral instrument compartment with the option of welfare facilities (wc & basin)

Compartmental battery room for ups applications

Wind turbine and solar panels for eco friendly power systems

## Key Features

Versatile configuration allows standard heating system to be orientated to suit a wide variety of enclosure layouts.

Comprehensive documentation including operating manual, parts list and as built construction drawings.

Cost savings over traditional on-site construction and installation of heating equipment.

Fast-track off site manufacturing minimizes risk associated with on-site construction.

Pre-delivery factory testing and inspection in a controlled manufacturing environment.

Accurate gas temperature control maximizes operating efficiency.

## COST SAVINGS OF UP TO

# 40%

## ON ALTERNATIVE HEATING SYSTEMS



# ENCLOSURE

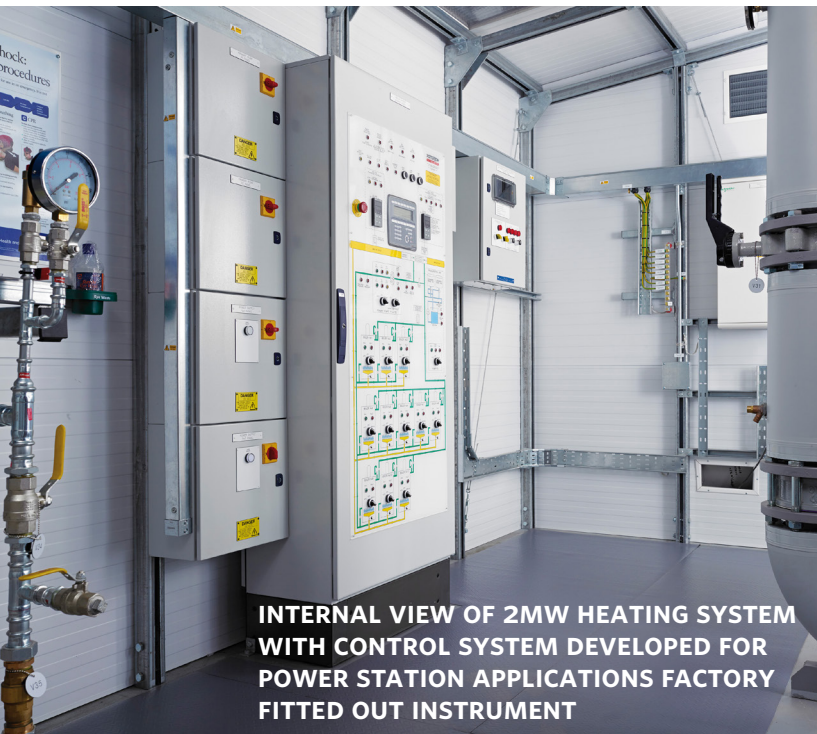
# OPTIONS

The heating systems can be supplied and delivered to site in a factory fitted enclosure

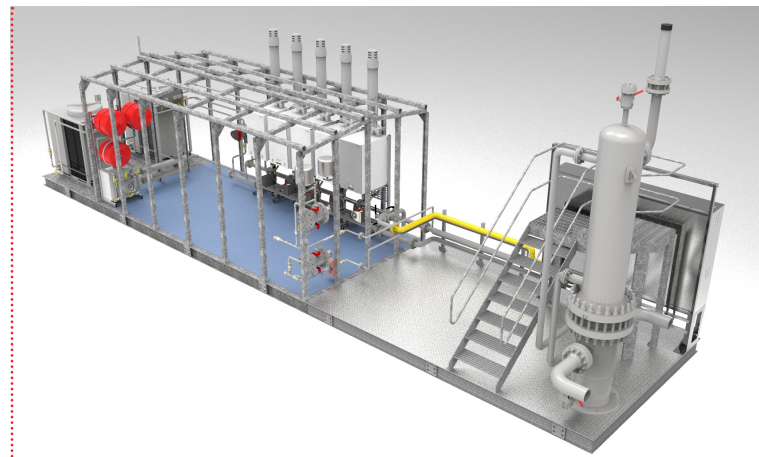
Architectural steel building panels or GRP building options

Integral or stand alone instrument room

Integral generator



INTERNAL VIEW OF 2MW HEATING SYSTEM WITH CONTROL SYSTEM DEVELOPED FOR POWER STATION APPLICATIONS FACTORY FITTED OUT INSTRUMENT



COMBINE BOILER HOUSE HEAT EXCHANGER SYSTEM

EXTERNAL VIEW OF 10ft x 13ft ARCHITECTURAL CLAD BOILER HOUSE



## Structure

Fully galvanized superstructure.

Hot dipped galvanized base to be EN1461.

Unique slotted superstructure system for rapid assembly and providing integral fixture system for installed equipment.

## Cladding system

Architectural composite insulated cladding panels.

Warranted for up to 30 years.

Thermal transmittance value of  $0.43 \text{ W/m}^2\text{K}$  HCFC free urethane foam core. Ozone Depletion Potential (ODP) of zero.

Fire retardant inner and outer surfaces.





**Sustainable energy  
production**

**Off grid power  
generation**

**Internal battery  
storage**

**Low carbon  
generation**

**Solar PV**

**Wind turbine**



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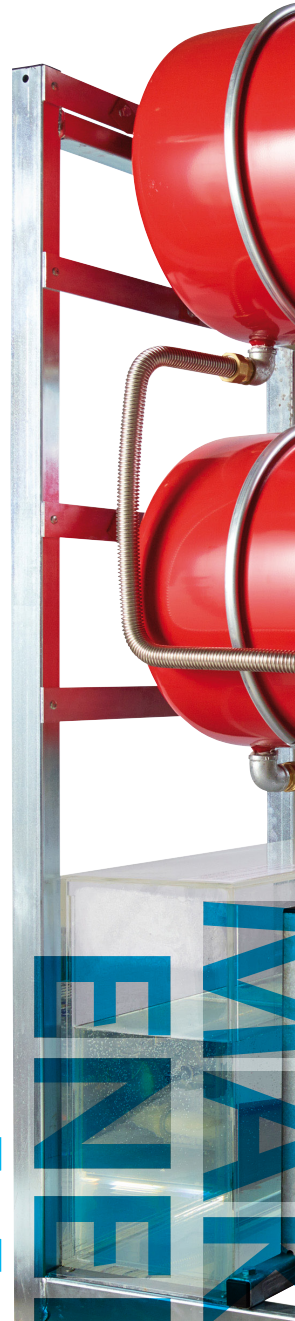
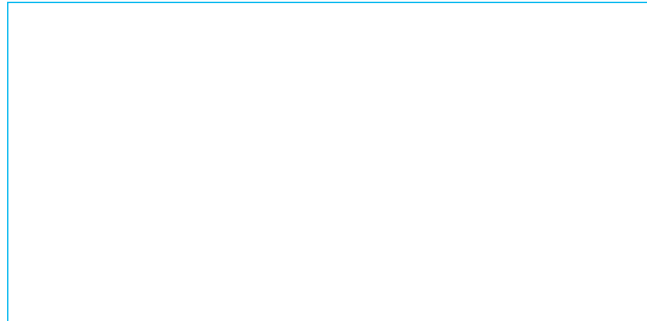
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View your savings and ROI using real data  
from your installation.

Ask your Armstrong team.



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