Meridian Vortex Ltd

At The Cutting Edge Of Biomass Heating

MADE IN IRELAND

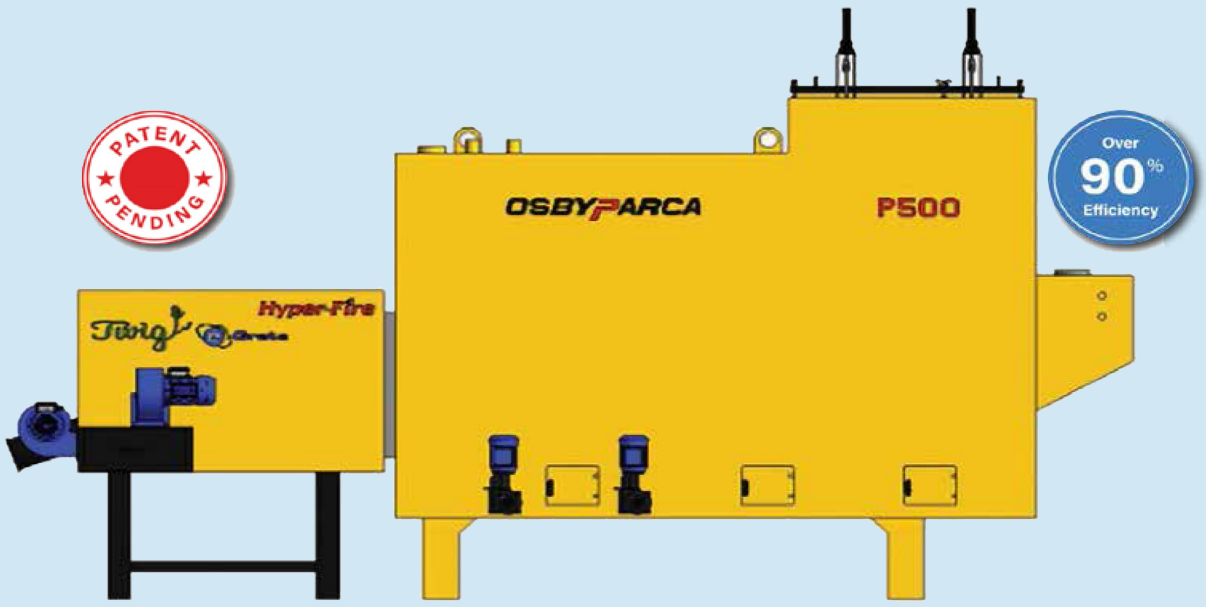
eco design

THE NEXT GENERATION OF
BIOMASS BOILERS

Twig

e-Grate
Movement Made Easy

Hyper-Fire



5 Years Warranty

A MODERN BIO-HEATING SYSTEM THAT OFFERS
OUR CUSTOMERS SOLOUTIONS TAILORED
TO THEIR NEEDS AND REQUIREMENTS

CE

Meridian Vortex Ltd
At The Cutting Edge Of Biomass Heating

LEADING THE WAY

BIOMASS HEATING TECHNOLOGY MADE IN IRELAND

Meridian Vortex is an innovative Irish company committed to providing high quality bio-heating boilers using our unique Patent protected innovative combustion grate technology known as the e-Grate.

We are convinced that real innovations and ideas arise where there is a need- in practice.

For this reason, we work very closely with our customers. By doing so, a remarkable range of products has evolved arising from four years Research & Design.

Our product has been put through a rigorous testing process with emphasis on such values as Durability, Safety, Reliability and Craftsmanship, this in turn has given rise to a company offering you the **'Next Generation of Biomass Boilers'**

WHAT MAKES US UNIQUE

The e-Grate Hyper-Fire is extremely exible and can be adapted to many boiler types depending on your working parameters and thermal output demand. This in turn means we can offer you a 'one-stop-shop' so you can select the solution that best ts:

- Your requirements for the thermal energy demand you have.
- Your required working parameters and operating within its safety limits.
- Most importantly of all meets the economic budget for size and output of your enterprise

WE CAN OFFER YOU OUR PREMIUM RANGE OF BIO-HEATING SYSTEMS WITH AN OUTPUT RANGE FROM 100kW TO 2000kW

These systems can be used to provide the following:

- Low Temperature Hot Water (LTHW)
- High Temperature Steam
- Thermal Oil
- Combined Heat & Power (CHP)

Our company's ongoing co-operation with its partners who are specialists in the biomass boiler market and between them has over 95 years' experience in this sector. We are keen to stay ahead with developments in this rapidly growing and changing renewable energy sector and we are continually researching the products market for innovative solutions.

Our experience will support our customers in planning their system and provide you with the long-term solution for your bio-heating system.

INCREASED PERFORMANCE

CREATING BEST VALUE

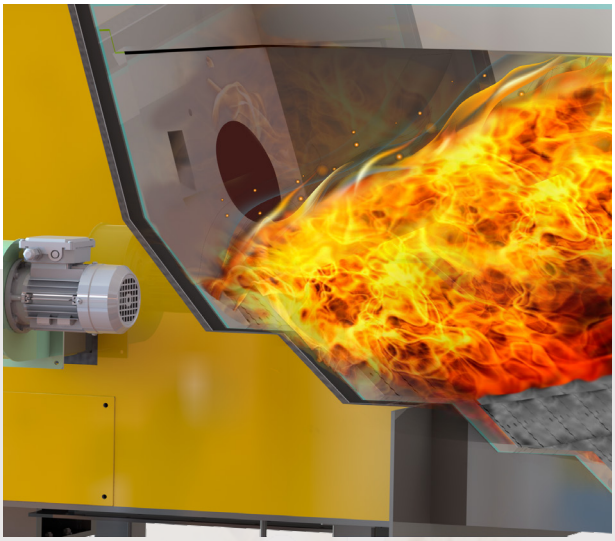
The Twig e-Grate Hyper-Fire is a top quality fabrication that assures high yield performance. The combustion zone in the e-Grate provides an atmosphere whereby combustion of biomass fuels can take place in a controlled environment.

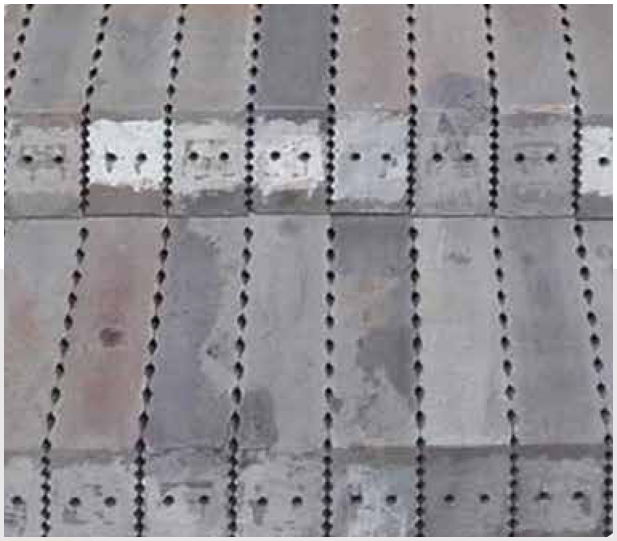
Inherent in the design of the e-Grate is the delivery of combustion air to the burning chamber. The combustion air (Primary Air) is supplied underneath the fuel grate. Routing air in this way effectively cools the grate elements and pre-heats the combustion air at the same time which has a positive effect on the combustion process.

Accurately Lambda controlled (Secondary Air) and (Tertiary Air) is added to ensure optimal combustion.

The e-Grate is most versatile (in terms of exibility and tolerance), this is achieved by delivering fuel form the intermediate hopper which maintains a measured level of fuel to the burner so no disparaging gaps in fuel supply take place while boiler is in operation.

A Frequency Inverter Controlled feed-in stoker auger ensuring consistent metering of fuel to the bed thus achieving stable combustion temperatures resulting in low CO and NOx.





The Twig e-Grate Hyper-Fire combustion technology has reached a new quality, eciency and safety levels.

The system is built from well tested high-level raw materials with strict quality control in place.

The Twig can be adapted to many high quality boilers and each design is customised to meet the specic requirements of each customer.

Our experience will support our customer's in planning their system to provide you with the best long-term solution for your bio-heating plant.

The Twig Hyper-Fire burner can be adapted to the Right – Left or Rear of the boiler depending on customers' needs in order to simplify designing the boiler room and installing the boiler

INCREASED PERFORMANCE

THE BENEFITS OF THE e-GRATE AT A GLANCE

The e-Grate design ensures absolute low emissions with a high degree of eciency even with variable fuel characteristics. The geometric design of the combustion chamber allows for adequate retention time to allow for clean and ecient combustion of the fuel.

Thanks to the in-built Lambda Sensor which continuously monitors the ue gas values and reacts to changes to Secondary Air supply ensuring complete combustion even at partial load operation. The results are high eciency low fuel consumption and extremely low emission values.

We offer two seasonal settings in our controller for both **Winter** and **Summer** operation. Adjusting the boiler settings during the summer period will reduce the strain on the boiler and will minimise energy consumption and add years to the lifetime of the boiler.

REFRACTORY PERFORMANCE

The combustion zone is refractory lined throughout to meet the high temperature environment.

The excellent thermos-mechanical properties and contraction factors are negligible thus resulting in high resistance to thermal shock.

This results in a decrease in wall and roof heat losses within the combustion chamber leading to improved energy eciency.

REFRACTORY LINED BOILER FLOOR

Heat retention within the boiler is crucial to provide stable temperatures and aid combustion.

Our boiler oors are fully lined with refractory cement to provide optimum heat storage even at part load operation, this minimises ignition starts and reduces emissions.

IMPROVED OUTPUT

INTERIMIDATE HOPPER

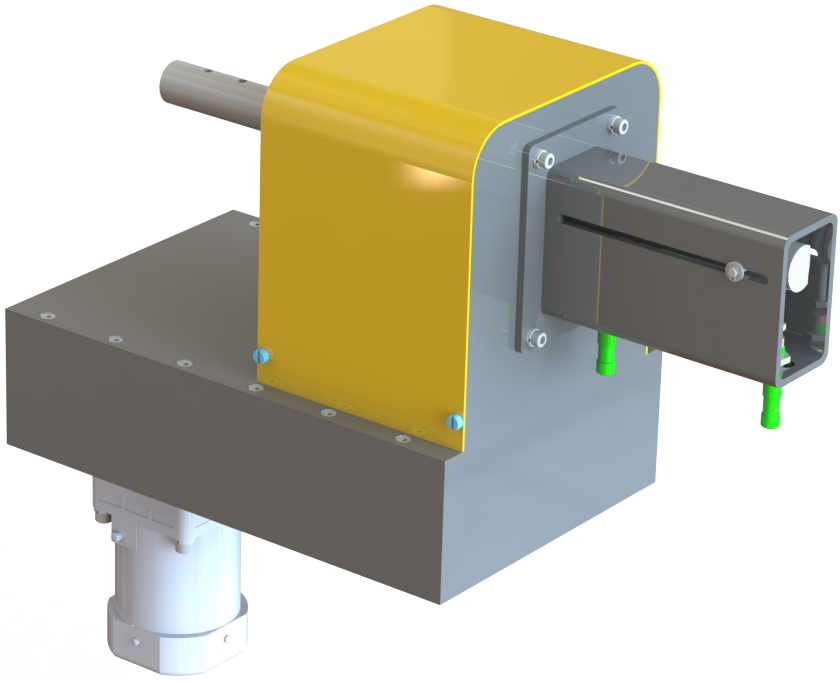
With our intermediate hopper which is fitted between the boiler and fuel store. The hopper is fitted with a motorised guillotine valve which acts as an airlock between the boiler and fuel store.
The hopper is fitted with an Ultrasonic Level Sensor which continuously measures the fuel level in the hopper and rells the hopper when it low level threshold has been reached.

STABLE COMBUSTION

Fuel is transported to the combustion chamber via a Variable Speed (VSD) controlled robust spiral stoker auger. This allows a measured stable supply of fuel to the burner achieving stable combustion..

ULTRASONIC LEVEL SENSOR

E-GRATE DRIVE SYSTEM



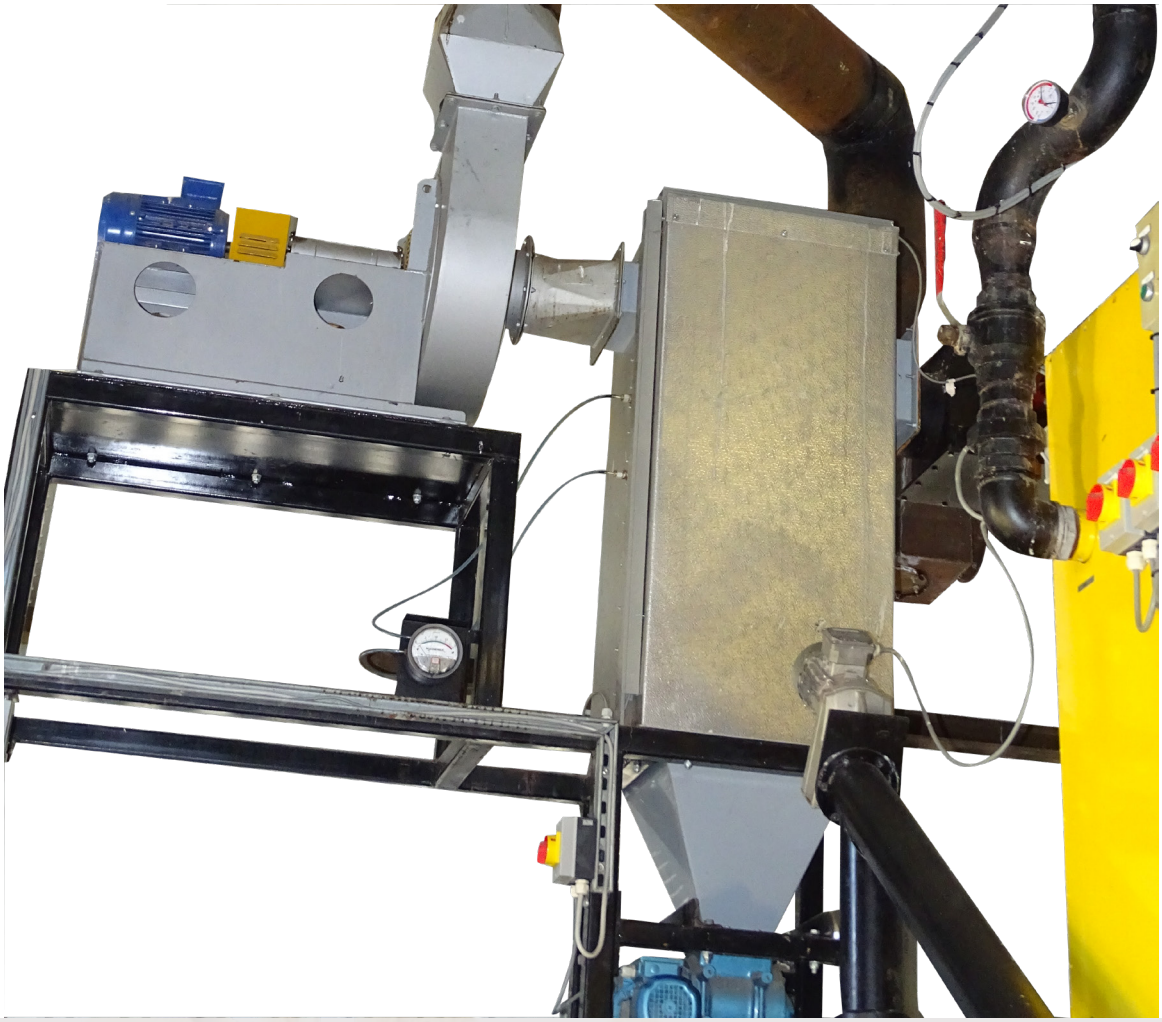
MOVEMENT MADE EASY

One of the unique features of the e-Grate is the degree of control over the operation of the grate movements.
The grate drive speed spectrum is controlled over our specially designed electromechanical grate drive gearbox that provides an effortless mobility over grate movements.
The present design of our grate drive guarantees low disturbance of the fuel bed and even distribution of combustion air to the fuel bed.
With our specially designed overlapping low-ware, heat resistant re grate bars ensure little dust fragments enter underneath to grate carriage area

Our tried and tested cutting edge design heavy duty application e-Grate Drive Unit. This is a robust construction design that will achieve the following:

- Compact
- Robust construction
- Fewer moving parts
- Extremely low friction design creates minimal wear on components.
- More precise movements.
- Reduced torque required.
- Less maintenance costs.
- Grate drive designed to match load.

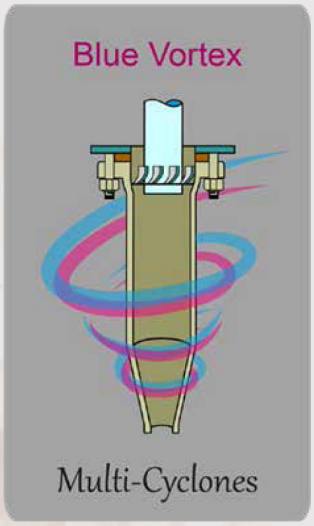
BLUE VORTEX MULTI-CYCLONE



BLUE VORTEX MULTI-CYCLONE

The performance of the complete boiler system is considerably inuenced by the quality and performance of its supplementary components. All our boiler systems can be filtted with our individually designed Blue Vortex Multi-Cyclone. The multi-cyclone is an important element in a bio-heating plant and this device should be designed to the mass ue gas ow calculations.

The Blue Vortex multi-cyclone creates the correct centrifugal force and buoyancy to allow separation of particles from gases exiting the ue pipe resulting in minimum emissions



BLUE VORTEX MULTI-CYCLONE

MAGNEHELIC GAUGE

The Blue Vortex multi-cyclone is fitted with a Magnehelic Gauge which provides continuous visual reading on cyclone performance.

SICLONE CERAMIC CONES

High performance multicyclone fitted with SiClone ceramic cones

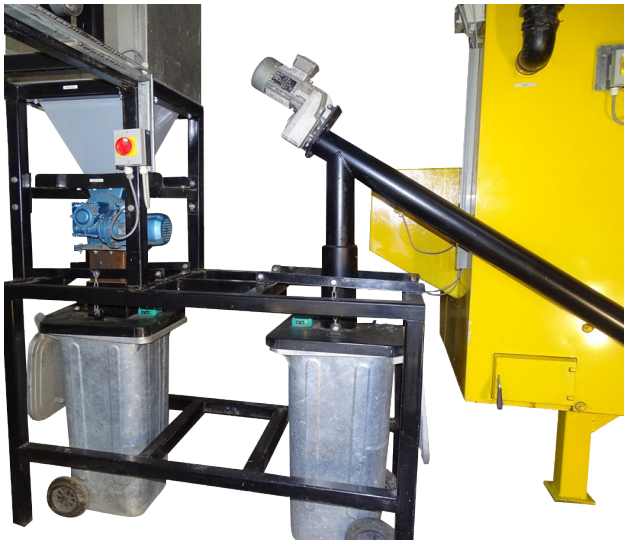
The success story of our SiCone ceramic cones in our multi-cyclone comes from the excellent high temperature properties compared to conventional steel cones.

- Combined with the ceramic recuperators, will achieve a high energy saving as the ceramic cones hold the heat for long period of time and can maintain temperature during boiler cycling times.
- Other advantages include the lower specic weight and no more cleaning procedure for removal of oxidation layers and lower maintenance costs.
- Depending on size of boiler plant the unit is supplied with and Air Lock Rotary Dust Valve which is fitted between multi-cyclone and ash bin.

ADVANTAGES OF THE BLUE VORTEX CYCLONE ARE:

- Sustainable and energy-ecient.
- Higher application temperatures are possible with lower energy consumption.
- Long lasting product with very high mechanical strength.
- Excellent oxidation resistance, resulting in higher eciency.
- Outstanding corrosion resistance and very high thermal conductivity that guarantees long life

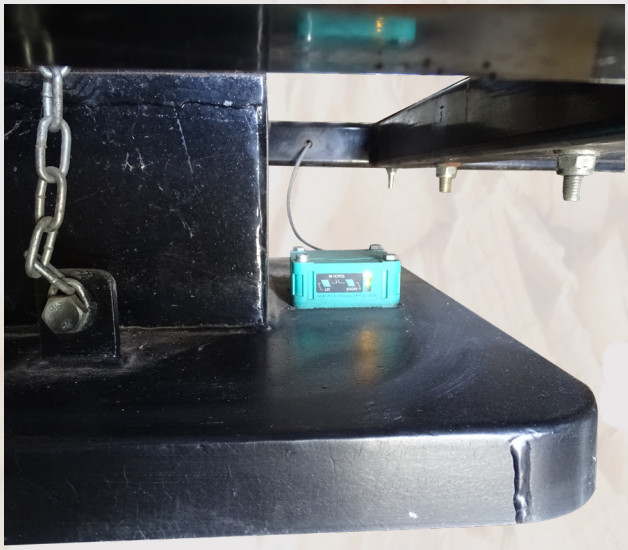
AUTOMATIC DE-ASHING SYSTEM

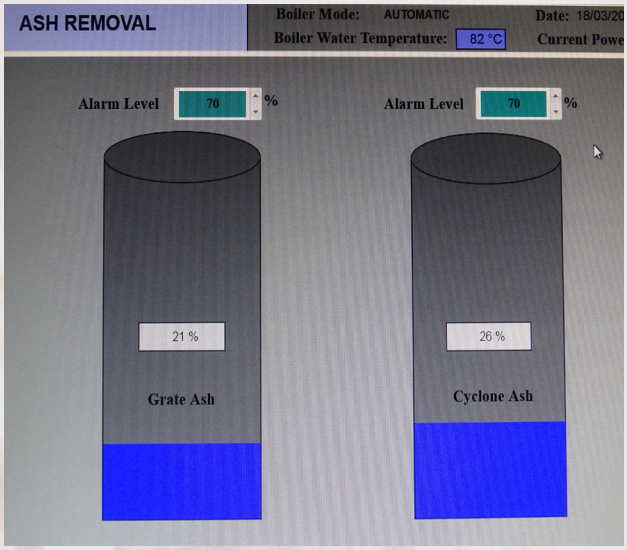


FROM FUEL TO ASH

Twin auger system conveys ash from the combustion chamber. Combustion grate ash is conveyed via twin auger system to external ash bin. The cyclone ash is automatically conveyed to separate ash bin placed under the multi-cyclone and y ash dust is metered into bin via an air lock rotary valve.

Both ash bins are fitted with ultrasonic level sensors which illustrate the ash level on main controller and when as bin is full a SMS text and Email will be sent to relevant personnel to notify that ash bin requires emptying.





AUTOMATIC BOILER TUBE CLEANING SYSTEM

HYDRAULIC BOILER TUBE CLEANING

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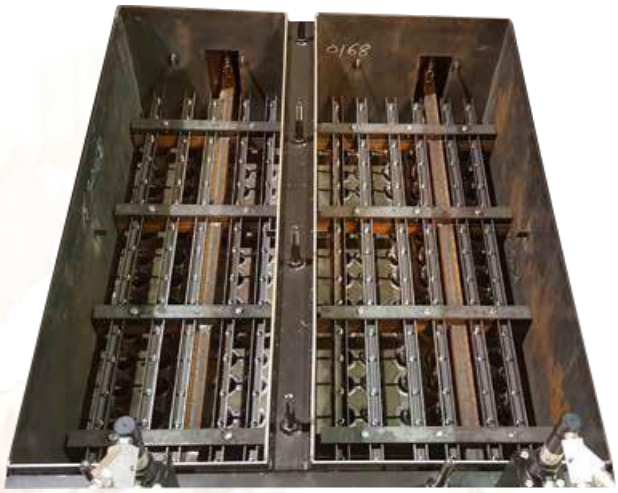
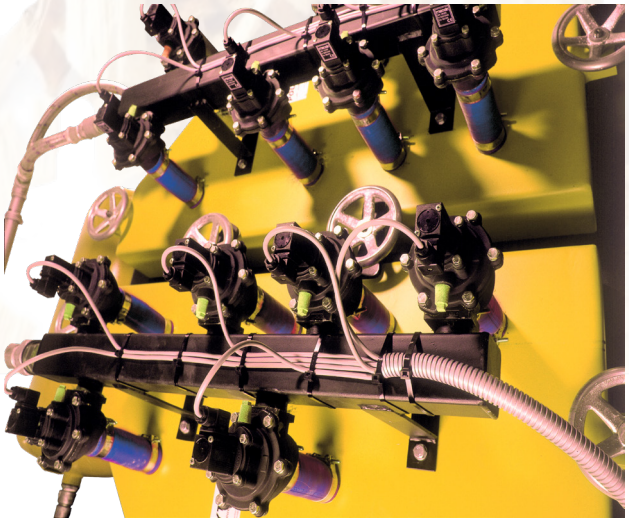


PNEUMATIC TUBE CLEANING

The option for compressed air pneumatic cleaning system is also available. Compressed air is stored in a compressed air tank. This system generates a large volume of air under high pressure that is blown through a special pneumatic valve in a fraction of second and removes sediments in the boiler tubes.

Automatic valve control cleaning intervals can be set according to quality of fuel been consumed



HIGHEST DEGREE OF SAFETY

SAFETY THE NUMBER ONE PRIORITY

Operators can rest assured that we have incorporated the highest standard of safety currently available on a biomass boiler system.
We have installed a back-re recognition system detection by using our 'Smart Sensor' which can detect back-re and overcome this by a program installed in control system which is activated when back-re alarm is set off.

INTERMEDIATE HOPPER

With our intermediate hopper which sits between the boiler and fuel store, this hopper is tted with a motorised guillotine valve which opens when the hopper is been filled and then closes and creates an airlock between fuel store and boiler

AVTA SAFETY VALVE

As a secondary safety system we t an AVTA temperature control thermostatic sprinkler valves are tted on stoker auger and in event of power cut will activate if high temperature setting is exceeded.
The AVTA valve is connected directly to mains water supply and pressurised with a 24 litre stainless steel expansion vessel in event of pressure drop in mains water supply

REDUCED COSTS

SERVICE

One of the many advantages of the e-Grate technology is its inherent service-friendly sturdy design. The system is extremely easy to service as all components have been chosen for long life and easily assessable and inexpensive to replace.

HEATING WITH THE INTERNET OF THINGS (IOT)

The nexus of the e-Grate is its ultra-modern control system. The entire system is controlled by a well proven microprocessor PLC (Programmable Logic Controller).
Our control system is fully compliant with open standard IEC 61131-3.
Incorporated within this controller is our 'Green Cloud' Total Tracking Program (T.T.P.) using the latest technology and software that allows for virtually endless opportunities to monitor your boiler system.

REMOTE MONITORING WITH EASY TOUCH TOTAL TRACKING PROGRAM

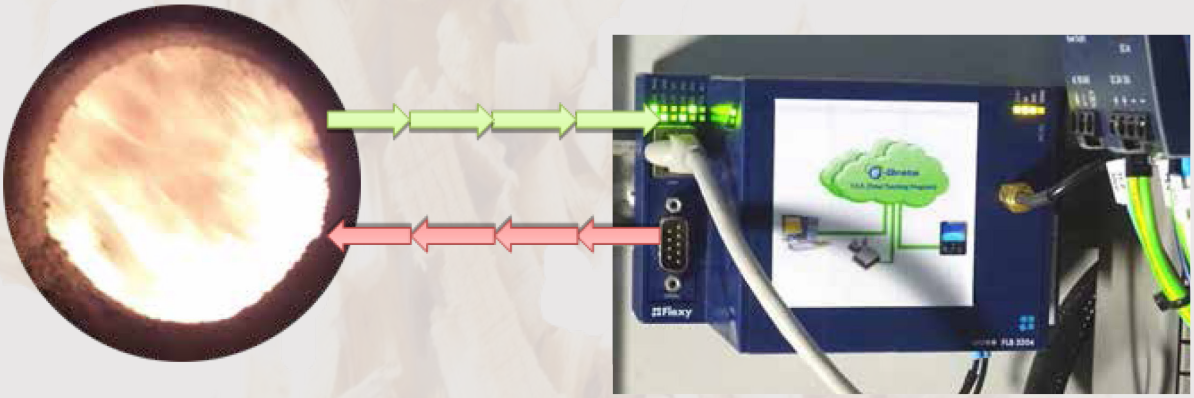
We make connectivity easy and secure through our Easy Touch app that connects you to our T.T.P.
The T.T.P. allows you to collect data on the boiler performance to recording and storing your Heat Meter readings. With our Easy Touch remote access this means you can operate the boiler system around the clock safely and with minimum supervision. Within our T.T.P. we have a cloud-based platform whereby you can store all Manuals, Parts List, Heat Meter readings and all service records. You can access the system through your Smartphone, Laptop or Tablet.

EASY TOUCH

easy Touch

EASY TOUCH

- Our Ultra-Modern control system is equipped with a remote monitoring facility.
- Remote connection to the boiler is via a VPN (Virtual Private Network) tunnel offering full security.
- This interface ecosystem gives you the tools to streamline the system to your needs.
- If a problem arises, the T.T.P. is able to send notications via email and SMS text so user can quickly address the issues and minimise the downtime.



THE BENEFITS OF THE 'GREEN CLOUD' T.T.P

★ Total control over boiler access.

★ The T.T.P. can report what is going on at all times.

★ Smart devise which uses communications hardware to collect and send data.

★ Saves you Time and Money and reduces downtime.

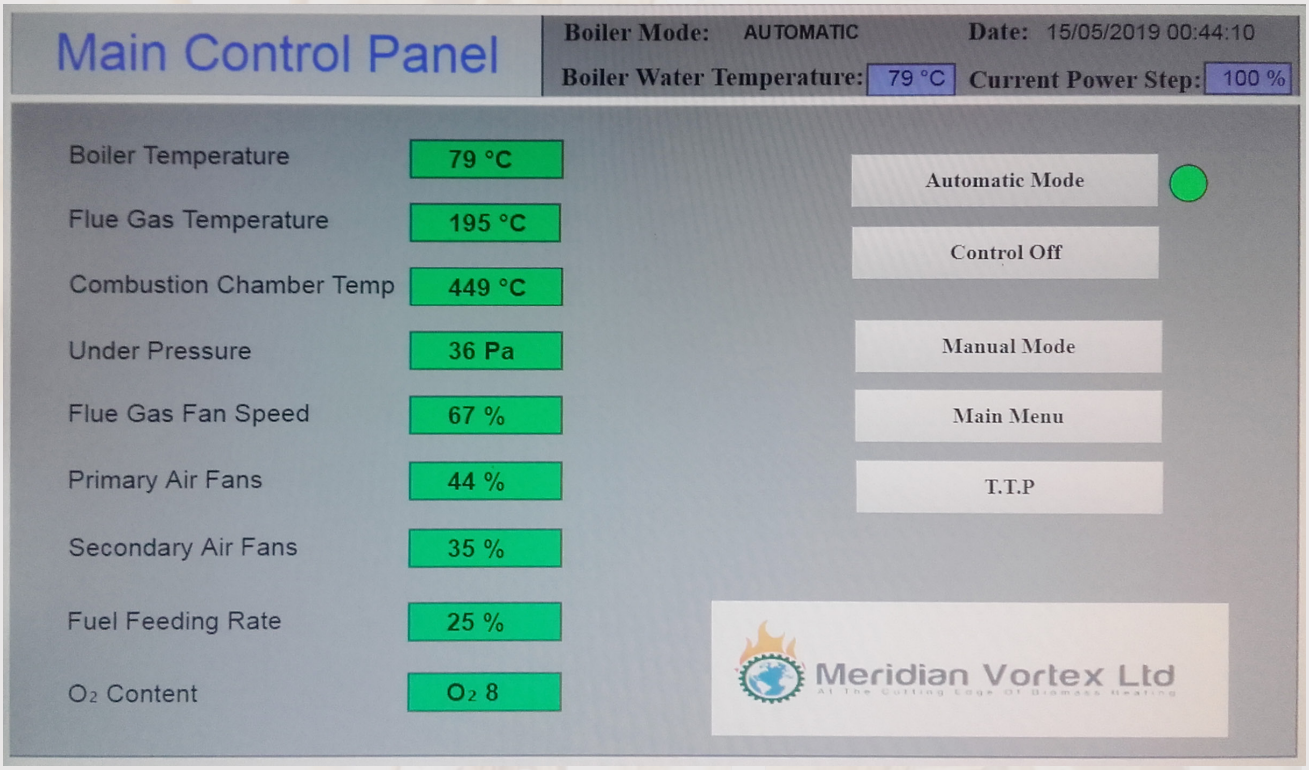
★ System is programed to send notications when schedule maintenance is due.

★ Cloud based storage facility where all les and records can be stored for the bio-heating plant.

ULTRA-MODERN CONTROL

- Thanks to the in-built Lambda Sensor which continuously monitors the ue gas values and reacts to changes to
- Secondary Air supply ensuring complete combustion even at partial load operation.
- The results are high eciency low fuel consumption and extremely low emission values.

- We offer two seasonal settings in our controller for both Winter and Summer. Adjusting the boiler settings during the summer period will reduce the strain on the boiler and will minimise energy consumption and add years to the lifetime of the boiler



MAKE LIFE EASY

- Our Easy Touch control system can be customised to the customers' requirements and our cloud platform is geared up to be completely convenient so storing all control system data can be easily accessed from anywhere in the world.

- The convenience of online storage enables you to concentrate on your work without getting stressed about data loss, such as heat meter readings etc.
- All data can be accessed from your mobile phone, tablet, or computer.

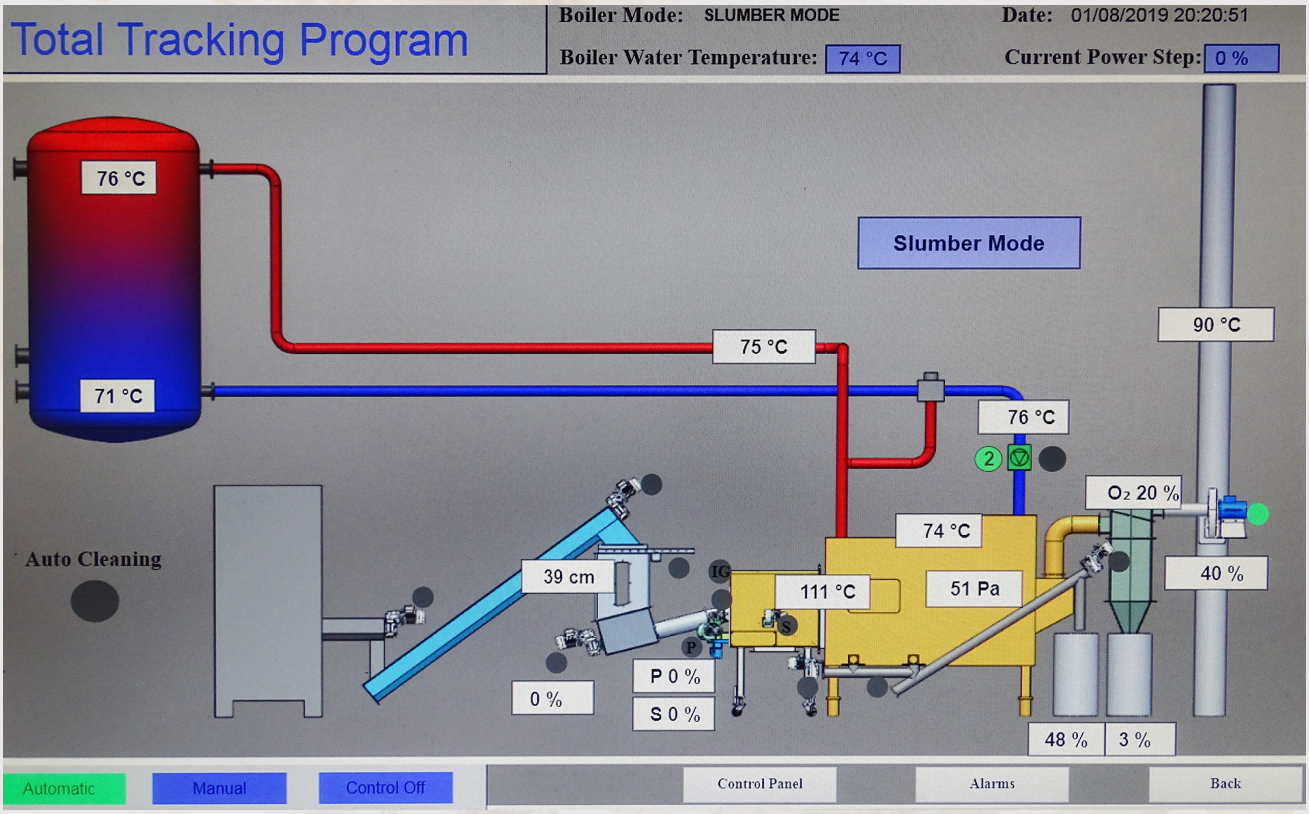
ULTRA-MODERN CONTROL

The HMI is a touch screen designed as an easy to use graphical display of the complete boiler system. It assists the boiler operator to congure parameters for various biomass aggregates and adapt the process within safe limits.

The HMI is designed as an easy to use graphical display of the boiler system.

It allows the operator congure various parameters and adapt the process to the correct values for fuel being used.

Additional features are the extended trend and archiving function as well as the alarm and error logging



THE MANY BENEFITS OF T.T.P.

The T.T.P. remote monitoring solution has many benets, it allows you manage your system from any location. You get secure access via a VPN tunnel (Virtual Private Network). You can monitor all critical data so your boiler system is not only more ecient it can pride itself on quick response times of malfunction and notications are sent out via SMS text and email so you can quickly address the issue and minimise the downtime. The system can also be programmed to send notications when ash bins are full or when fuel store is near empty and when scheduled maintenance on the boiler is due.

"ONE STOP SHOP"

The unique thing about Meridian Vortex is we have a company policy where the customer is the centre of everything we do.
With this "Customer First" strategy we have the exibility to customise the solution that meets:

- ★ Best design layout for the bio-heating system.
- ★ Your required design working parameters.
- ★ That the installation meets your required budget.

WHAT COMES AS STANDARD

- ★ Innovative Patent Pending combustion e-Grate technology.
- ★ Robust construction and high quality design.
- ★ Fully refractory lined combustion zone and boiler oor to aid combustion and reduce thermal losses.
- ★ Optimum use of space and exible in-situ installation options for burner to boiler.
- ★ Unique electro-mechanical Rack & Pinion grate drive unit.
- ★ Automatic ignition, with ignition fan protection plate.
- ★ Modulating output power (15-100%), with Summer & Winter operation, dependant on actual demand.
- ★ High performance SiClone, multi-cyclone.
- ★ Automatic de-ashing system.
- ★ Smart sensor, back-re multi-level safety system.
- ★ Automatic boiler tube cleaning system with
- ★ Hydraulic actuator system or Pneumatic compressed air cleaning.
- ★ Consistent High Eciency (over (90%)
- ★ Super low emissions.
- ★ Boiler circulation pumps control.
- ★ Ultra-modern control system with our Green Cloud Total Tracking Program (T.T.P.) with access via our
- ★ Easy Touch through your Smartphone, PC or Tablet. Cloud based archiving platform to store all manuals,
- ★ service records, heat meter reading etc.
- ★ Boilers can be supplied as ready to use containerised soluion

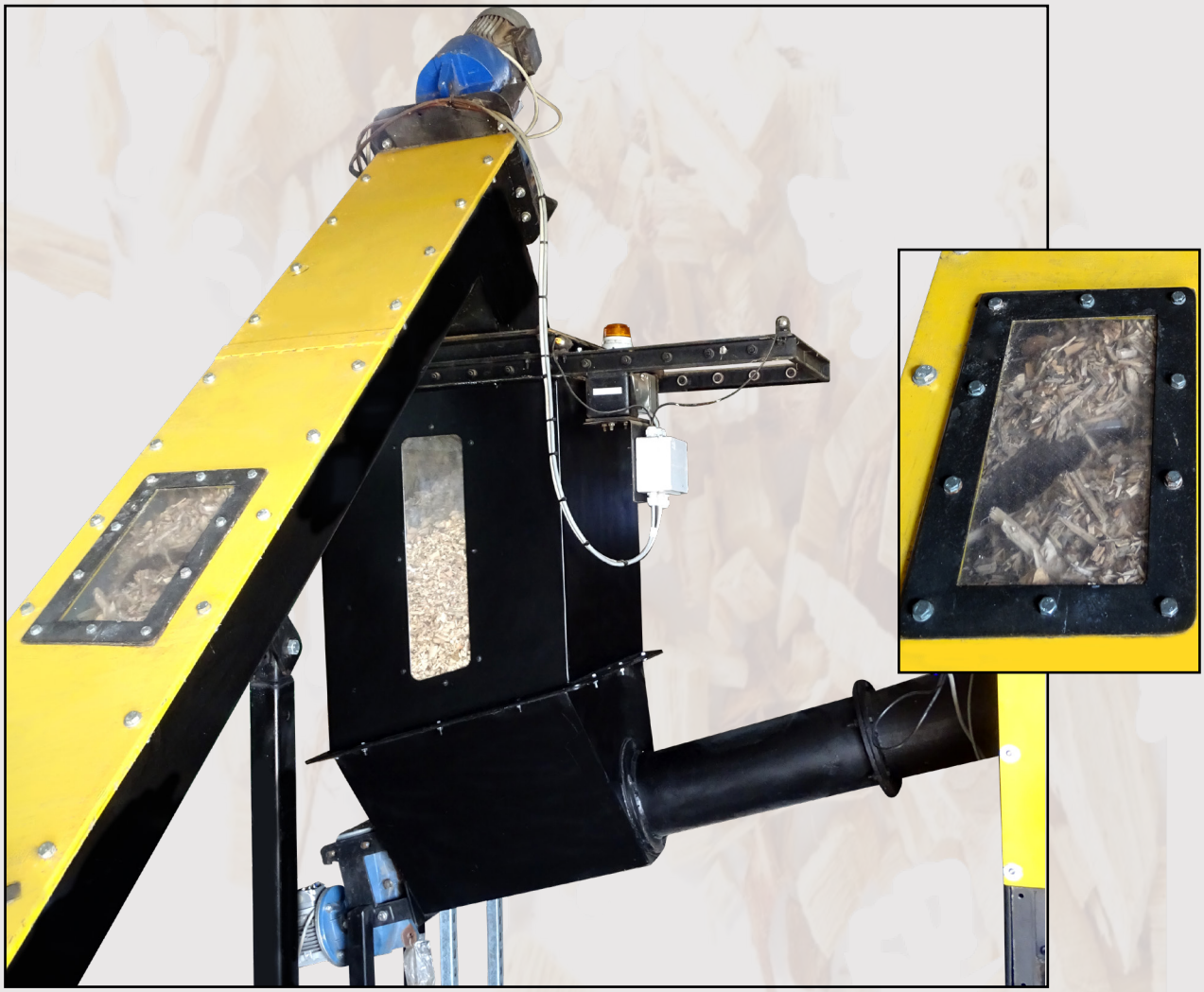
FUEL STORAGE SUPPLY OPTIONS

Meridian Vortex offers a complete fuel feed package to support your boiler installation engineered to give you a turn-key project.

We off we high quality sweeper arm agitators, modular walking oors and customised feeding systems can be delivered and integrated to your unique design.

Robust construction fuel feed-in systems designed for course bulky fuels up to:

(G100 According to O-Norm/P63 DIN/TS14961)



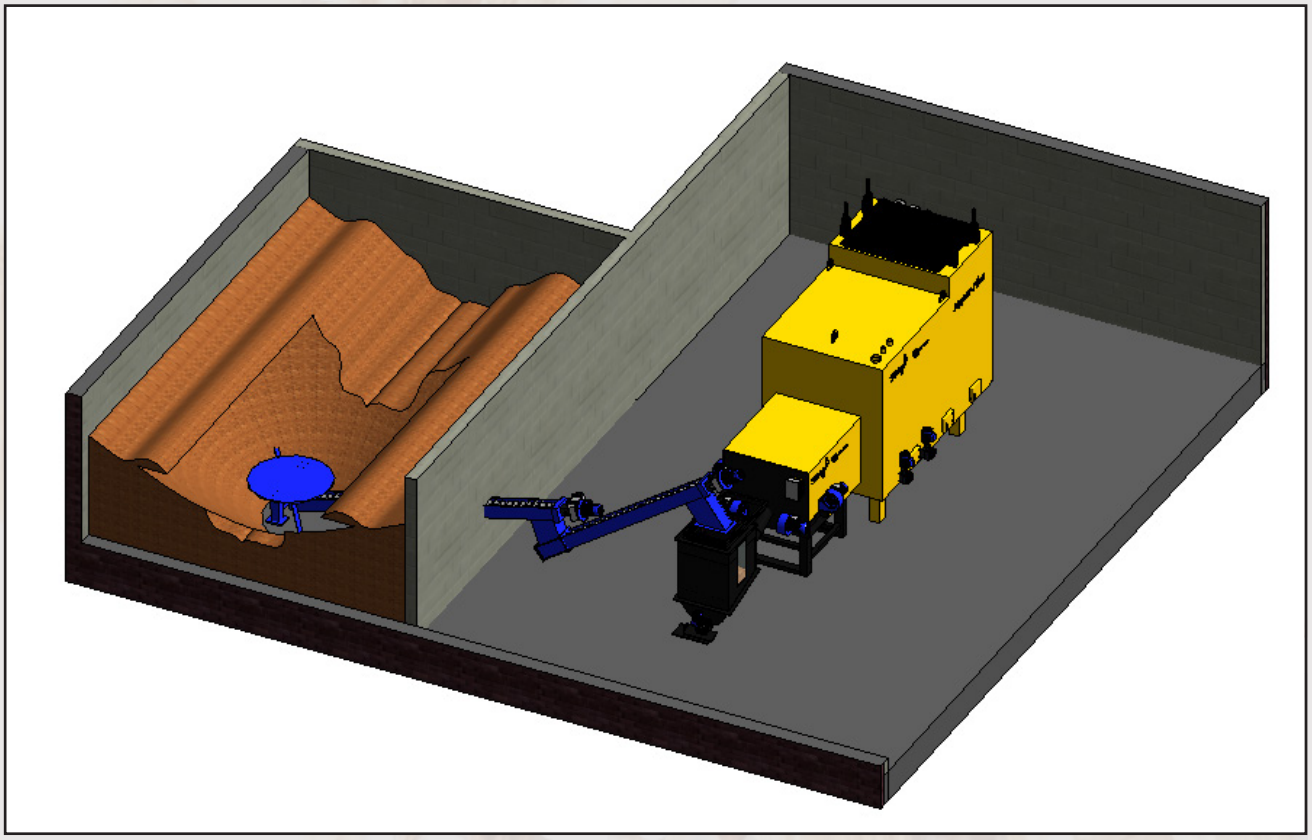
TRIED AND TESTED

All fuel feed-in systems are of robust construction and we use tried and tested screw auger motors and gearboxes.

SWEEPER ARM DISCHARGE SYSTEM

Our maintenance free sturdy and robust sweeper arm discharge system can be supplied with working diameters of up to 6.0 meters, with designs for both wood pellet and wood chip fuels and can cope with G30/G50 wood chip size. The rotary agitator is powered by its own independent geared motor and is tted with inspection hatch and limit switch.

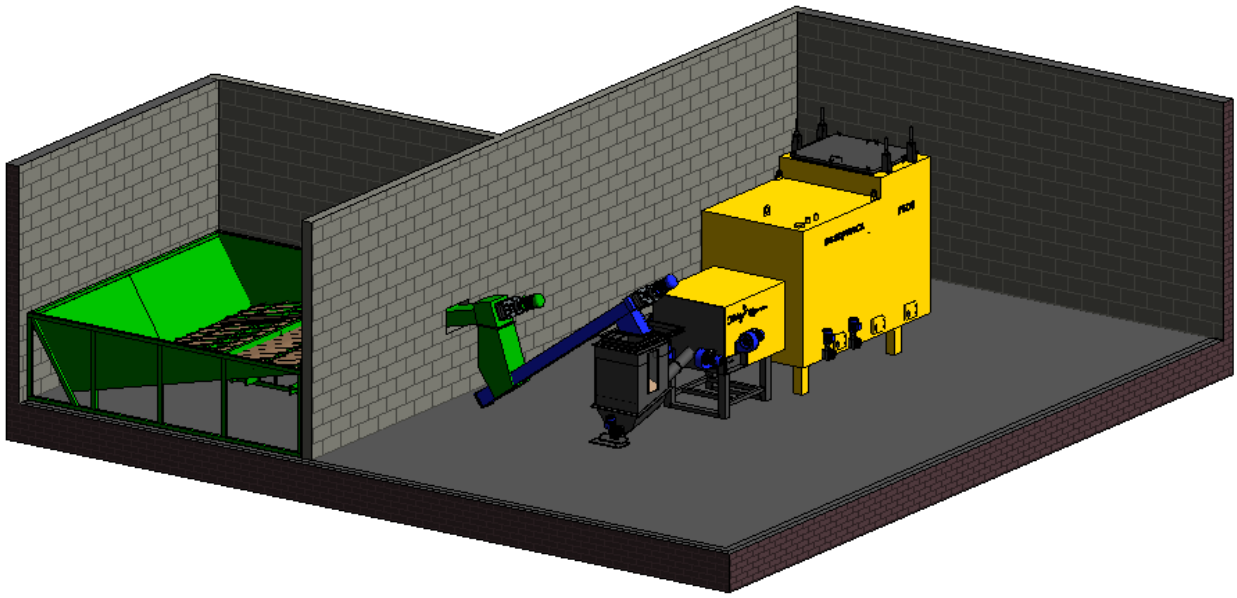
Maximum lling height of 5mt @ 20% fuel moisture.

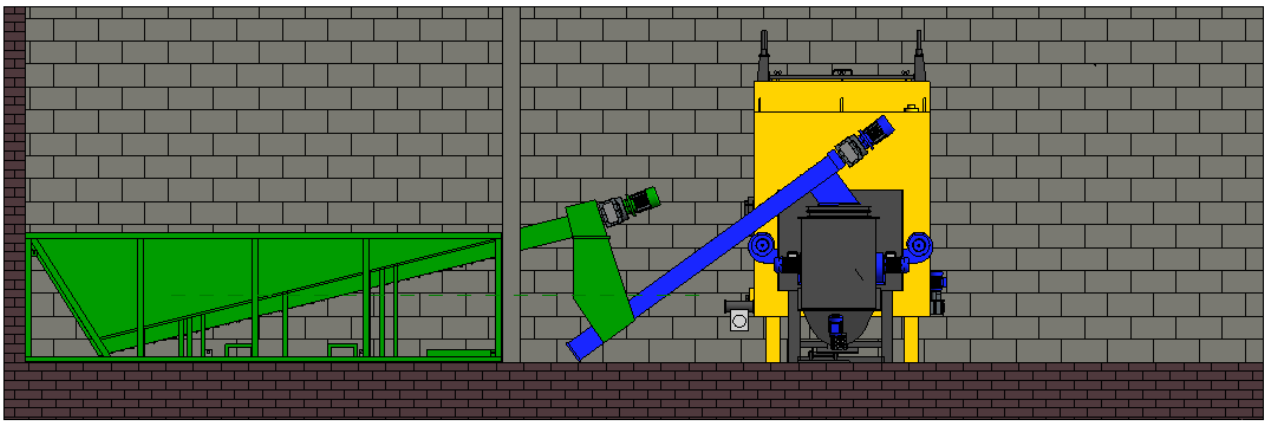


MODULAR WALKING FLOORS

- We offer a number of prefabricated modular walking oor discharge systems.
- All modules have hydraulically operated push bars and come with their own independent hydraulic pack.

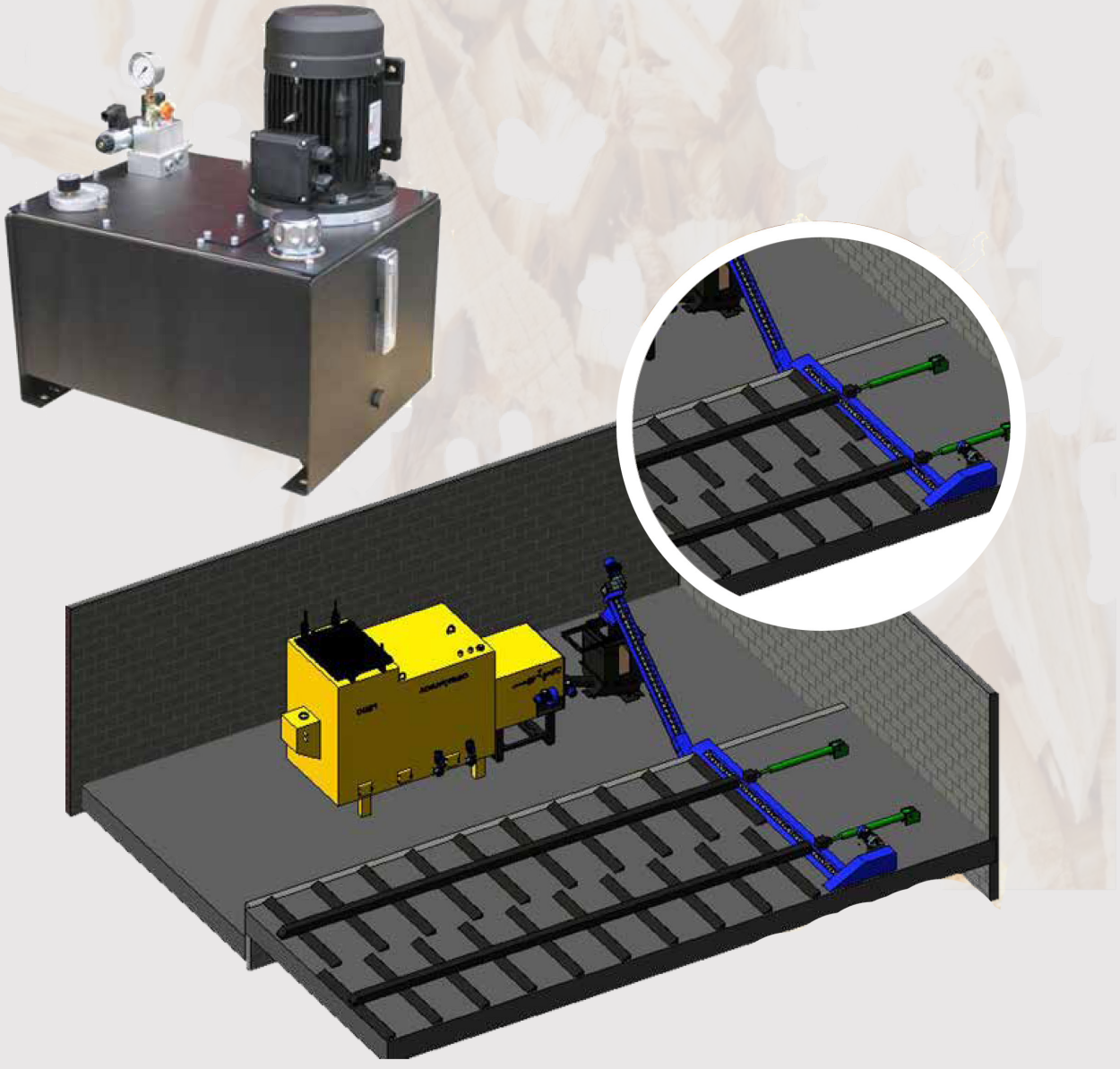
- These walking oors can be supplied in sizes from 2mt x 2mt to 4mt x 5.8mt. Each module has inspection hatch tted in auger tube with limit switch and AVTA valve adaptor.
  Maximum lling height 5mt @20% moisture content.





HYDRAU HYDRAULIC LIC WALKING FLOORS WALKING FLOORS

- The hydraulic walking oor discharger is suitable for coping with a wide range of fuel types.
- The powerful hydraulic rams move along the bunker oor, pushing or pulling fuel to a cross auger that feeds fuel to the intermediate hopper that in-turn feeds the boiler.
- The system is operated via a standard hydraulic power pack.
- The moving oor is especially suitable for handling heavy, wet and occasionally oversized fuels.
- Bunkers can be located above or below ground level. The base area capacity of the oor discharger can up to 200 m^3



START SAVING ON YOUR HEATING BILLS

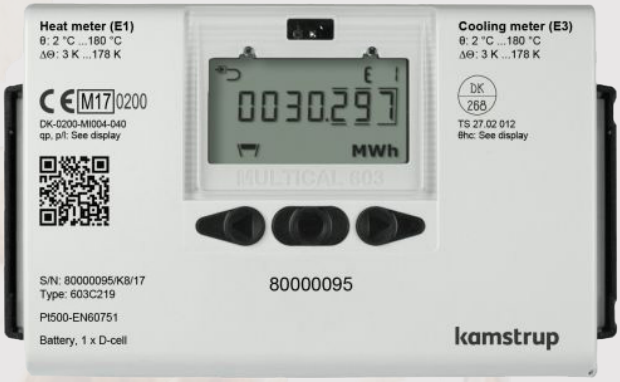
Renewable heat is simply heat from renewable sources. This is where you decide that instead of using traditional fossil fuel systems such as (Oil, Gas, Coal) you will use renewable technology for your heat needs. Renewable fuels from biomass include wood chip or wood pellets. These biomass fuels are classified as Carbon Neutral and do not contribute to global warming.

TRIED AND TESTED

The Support Scheme For Renewable Heat (SSRH), is a government led scheme introduced to help kick-start the transition to low carbon heating in Ireland, giving help to Commercial and Industrial businesses to move away from fossil fuels such as (Gas and Oil).

The scheme provides financial incentives to businesses including public sector bodies to help bridge the gap between the cost of renewable heating systems and those of conventional alternatives.

This scheme will enable Ireland move towards low carbon alternatives and to minimise the effects of climate change, as well as being the main driver towards Ireland's goal to reduce its dependence on fossil fuels and increase the energy generated from renewable sources in the heat sector by approximately 3%, this is equivalent to 200,000 tonnes of oil equivalent.



The SSRH pays consumers for meter heat on a 15 year contract so you generate an income for the life of the contract.

Tier	Lower Limit (MWh/yr)	Upper Limit (MWh/yr)	Biomass Heating Systems	Anerobic Digestion
			Tarriff (c/kWh)	Heating Systems (c/kWh)
1	0	300	5.66	2.95
2	300	1,000	3.02	2.95
3	1,000	2,400	0.5	0.5
4	2,400	10,000	0.5	0
5	10,000	50,000	0.37	0
6	50,000	N/A	0	0

Meridian Vortex Ltd
At The Cutting Edge Of Biomass Heating

HOW TO CHOOSE A BIO-HEATING BOILER

There are plenty of bio-heating plants on the market today all with pros and cons.
In order to help you nd the right t for your bio-heating project.
A bio-heating installation comprises of a number of components that must be married together to give you a complete solution.
Meridian Vortex has researched many of the current boiler suppliers from a wide range of manufacturers so you don't have to.
Having accumulated signicant experience from our partners we have developed a unique technology for burning biomass fuels. Each one of our products is the result of intensive research, testing and hard work.
This allows us to deliver to you high quality product equipped with the most modern technologies combined with the highest safety, offering you considerable savings and incredibly convenient bio-heating boilers.

OUR SERVICES INCLUDE

- ★ **Energy Audits**
- ★ **Turnkey installation on a design/build basis.**
- ★ **24 Hour/365 Operational Support**

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OUR PHILOSOPHY FROM THE BEGINNING HAS BEEN TO MAINTAIN SIMPLICITY WITH EXCEPTIONAL PERFORMANCE AND QUALITY. THE PRODUCT WE ARE BUILDING TODAY REFLECTS THAT QUALITY

IT'S TIME TO SEE THIS FOR YOURSELF'

Meridian Vortex Ltd
At The Cutting Edge Of Biomass Heating

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