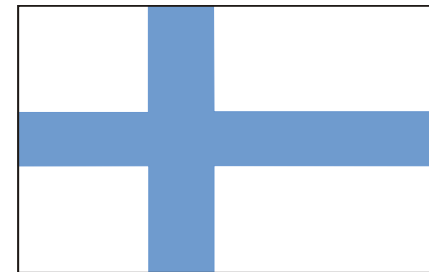




WELCOME TO OILON OY

JUKKA JAATINEN

Export Manager



SUOMI FINLAND

INFORMATION ABOUT FINLAND



- INDEPENDENCY 1917 (PARLIAMENTARY REPUBLIC)
- CAPITAL CITY HELSINKI
- POPULATION 5,5 MILLION
- LANGUAGES: FINNISH AND SWEDISH
- TOTAL AREA 337.030 SQ KM
- MORE THAN 180.000 LAKES
- GDP PER CAPITA EUR 36.000
- MEMBER OF EUROPEAN UNION 1995

SOME ITEMS WHICH FINLAND IS FAMOUS OF:

- SAUNA
- HOT SUMMERS AND COLD WINTERS, TEMPERATURE DIFFERENCE HUGE -50 ... +37 C !
- BEST COUNTRY TO LIVE 2010, BEST COUNTRY 2012
- NO CORRUPTION (TRANSPARENCY INTERNATIONAL)
- SANTA CLAUS

FACTS ABOUT OILON

- **A private shareholder company, established in Lahti, Finland 1961**
- **Turnover: 60 million EUR, over 60 % comes from export, industrial burners over 90 % export**
- **Personnel: >340**
- **Products:**
 - **oil, gas and multifuel burners, cap. 12 kW - 90 MW**
 - **burner control and regulation systems**
 - **filtering, pumping and preheating units for HFO & LFO**
 - **Geopro ground source heat pumps**
 - **Scancool cooling & heat recovery systems**
- **ISO 9001 Quality system,**
- **ISO 14001 Environmental management system**

Oilon - Locations

-  Oilon offices
-  Distributors



We are Global & Local!



LAHTI, FINLAND



OILON, USA



WUXI, CHINA



KOKKOLA, FINLAND

Energon – Modern training facility





**Oilon Wuxi,
China**

Oilon US Inc

- **Sales to USA since 1997,**
- **Founded in July 2014, Thomasville, Georgia**
- **100 % owned by Oilon Group**
- **Activities**
 - **110V/460 60HZ CSA/UL production center**
 - **Sales and Marketing in North**
 - **and Central America**
 - **Customer Service**
 - **Technical support**
 - **Spare parts**
 - **Warranty**
 - **Technical trainings**
 - **Local warehouse**



Thomasville, USA



**Scancool,
Kokkola,
Finland**

Cooling and
heat pump
technology for
industry and
energy
production

Oilon Burners 12 – 90.000 kW



BURNER SERIES

1

Junior burners 17 - 82 kW

2, 2C

6 - 26 burners 42 - 400 kW
50 – 90 burners 200 - 1540 kW

3

130 – 280 burners 390 – 3500 kW
350 – 450 burners 880 – 5500 kW

4, 4A

300 – 700 burners 770 - 9700 kW
Monox 1000, 1200 M 1800 – 13300 kW

5

400 - 2500 ME, 1200 - 29500 kW

6

Power Plant and Process Burners, 2 - 90 MW



2

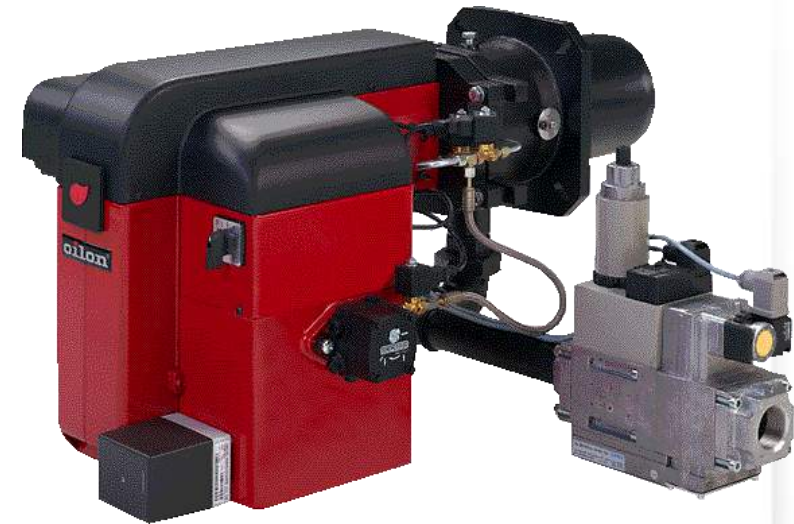
Series 6, 24, 26, 42-400 kW and 50, 90, 200-1540 kW



OIL BURNER



GAS BURNER



OIL / GAS BURNER

APPLICATIONS: Heating of larger dwellings, paint and glass ovens, tea and grain dryers, steam and hot water boilers, green houses, cooking, etc.

3 Series 130 – 150, Series 250, 280, 390-3500 kW



MCR
WD 33 – 34
WD 100 & 200

FUELS: LFO (KP), HFO (RP), GAS (GP), GAS/LFO (GKP), GAS/HFO (GRP)

APPLICATIONS: District heating plants, hospitals, transportation and shipping (sludge utilization in ships, tank heating), textile industry, food industry, metal industry, hot air generators, glass and ceramic industry, paper and chemical industry, process industry, etc.

4

Series 300 - 700. 770-10500 kW

Series *Monox* 1000 M and 1200 M, 1800–13300 kW



integrated combustion air fan

FUELS: LFO (KP), HFO (RP), GAS (GP), GAS/LFO (GKP), GAS/HFO (GRP)

APPLICATIONS: District heating plants, hospitals, transportation and shipping (sludge utilization in ships), textile industry, food industry, metal industry, hot air generators, paper and chemical industry, process industry, etc.

5 Series 400 – 2500 ME Duoblock Burners, 1200–29500 kW



**Separate
control panel**



Separate pumping unit

Separate combustion air fan

FUELS: LFO (KP), HFO (RP), GAS (GP), GAS/LFO (GKP), GAS/HFO (GRP).

HOT COMBUSTION AIR UP TO 250 C

APPLICATIONS: District heating plants, hospitals, textile industry, food industry, hot air generators, paper and chemical industry, process industry, asphalt drums, etc.



For ME-Burners:

HFO Pumping & preheating unit
PKYR:

- capacities up to 1950 kg/h
- viscosity max 650 cSt @ +50C
- electric heaters 18 – 60 kW

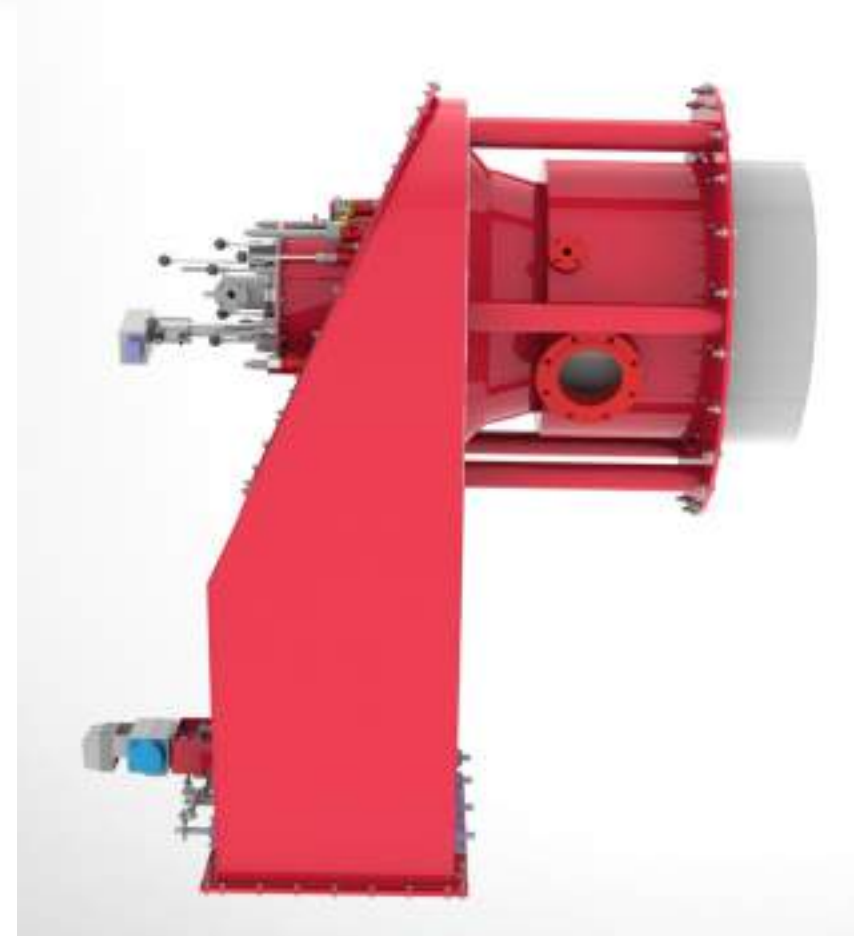
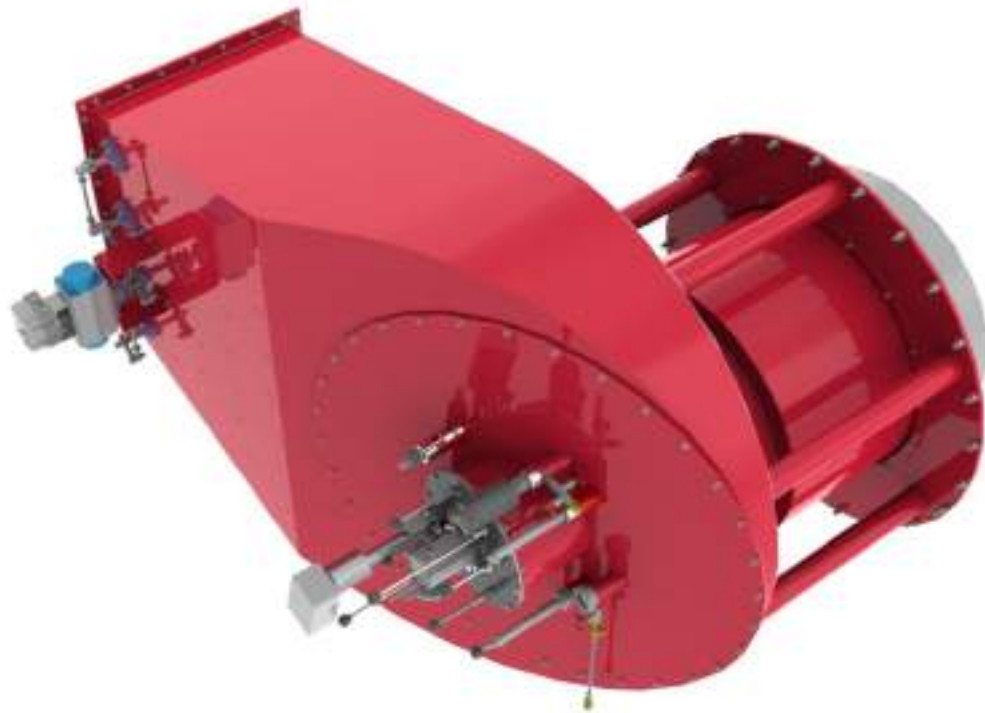


RP-1000 ME
12 MW

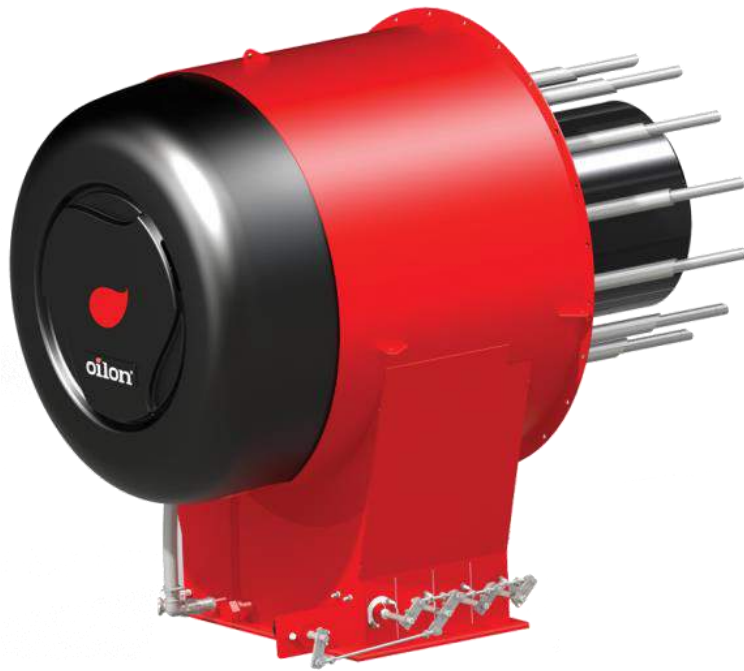
ULTRAX, Ultra Low NOx Burner Capacity range 2...90 MW

Low NOx solution for:

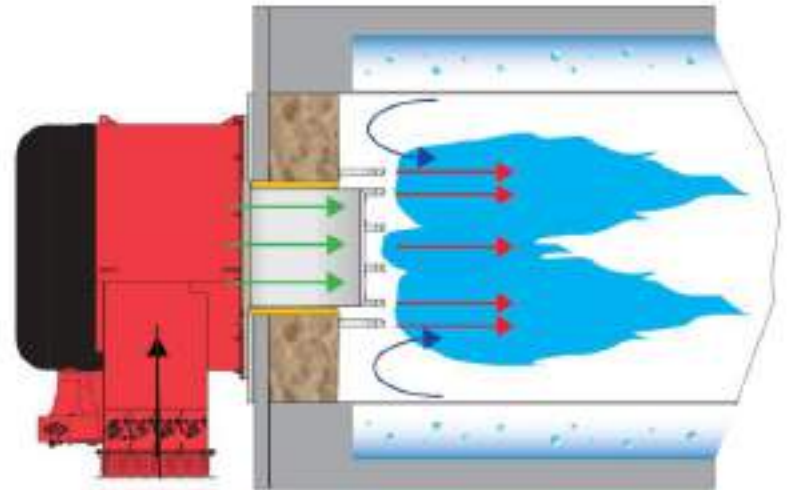
- steam boilers
- hot water boilers



Oilon ACE 0,8 – 90 MW

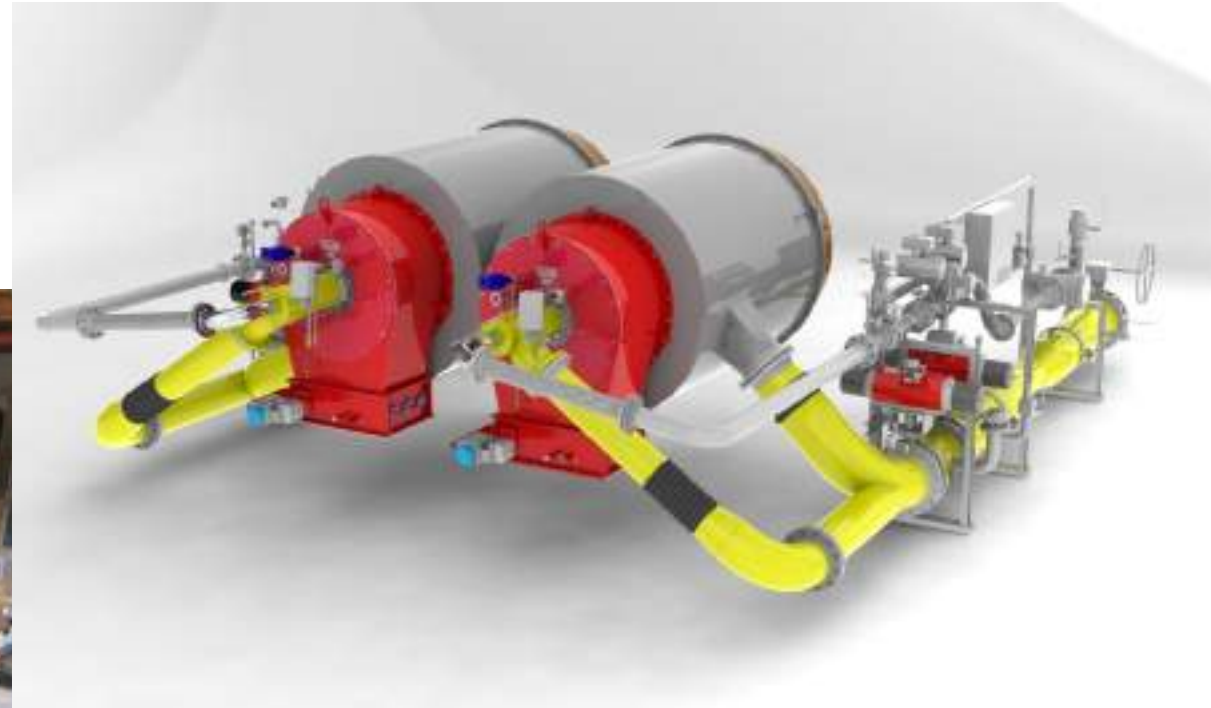


- Latest low emission technology
- Nox <60 mg/nm³, O₂ 3%
- Nox <30 mg/nm³ with external FGR
- Air & Fuel distribution & Staging
- Internal FGR



Combustion Solutions for Low-Heating-Value Gases

Example: A steel factory:
Burner + pre-combustion chamber



Blast furnace gas: Heat value 3 – 4 MJ/nm³
No supporting fuel required

Waste Incineration

Hazardous Waste Incineration Plant

 WASTE INCINERATION



Ekokem – Riihimäki, Finland

Pulp and Paper Industry

An aerial photograph of a large industrial pulp and paper mill. The facility is situated near a body of water with a forested shoreline. A tall, slender chimney stands prominently on the left. The mill's complex includes numerous buildings, pipes, and storage tanks. In the foreground, there are large piles of yellowish-brown material, likely wood chips or bark. Three blue callout boxes with white text and red leaf icons point to specific parts of the mill: 'RECOVERY BOILER' points to a central building, 'LIME KILN' points to a structure on the left, and 'ODOROUS GAS INCINERATION' points to a building on the right. The UPM logo is visible on one of the central buildings.

RECOVERY BOILER

LIME KILN

ODOROUS GAS INCINERATION

UPM / WISA Pietarsaari, Finland

Fluidized Bed Boilers

 FLUIDIZED BED BOILER

Kymin Voima Oy - Kuusankoski, Finland

Photo: Kvaerner Power

Oilon Marine Burners



- Main supplier of pressure jet burners for Kangrim Industries and Alfa Laval
- Deliveries all over the world (containers, tankers, cruise ships, river boats, etc.)
- Shipyards: Hyundai, STX, Samsung, Mipo, Daewoo, etc.
- Deliveries according to the rules of 10 classification societies
- HFO up to 700 cSt/50 ° C with pressure jet burner
- Sludge combustion
- LNG



Oilon LNG marine burners

CONTINUOUS DEVELOPMENT OF BURNERS

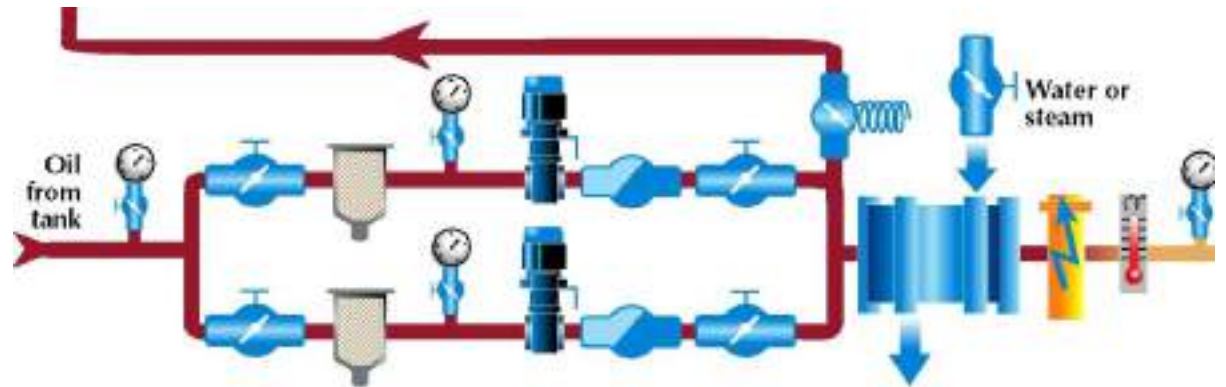
R&D CENTER

- **fulfilling EU-standard**
- **testing facility for burners up to 50 MW**
- **combustion tests and precise measurements with oils and gas**
- **computer modelling of combustion processes, using computational fluid dynamics (CFD)**
- **min. 5 % of Oilon's turnover is invested in product development**



8

HOT BOX PUMPING AND PREHEATING UNIT FOR HFO

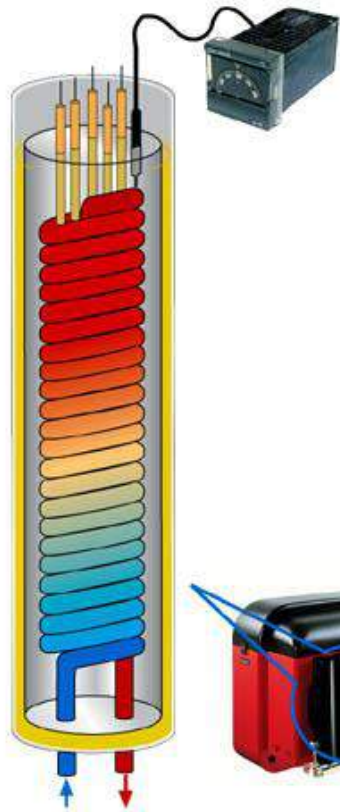


HB 500 ... 2000 R Series

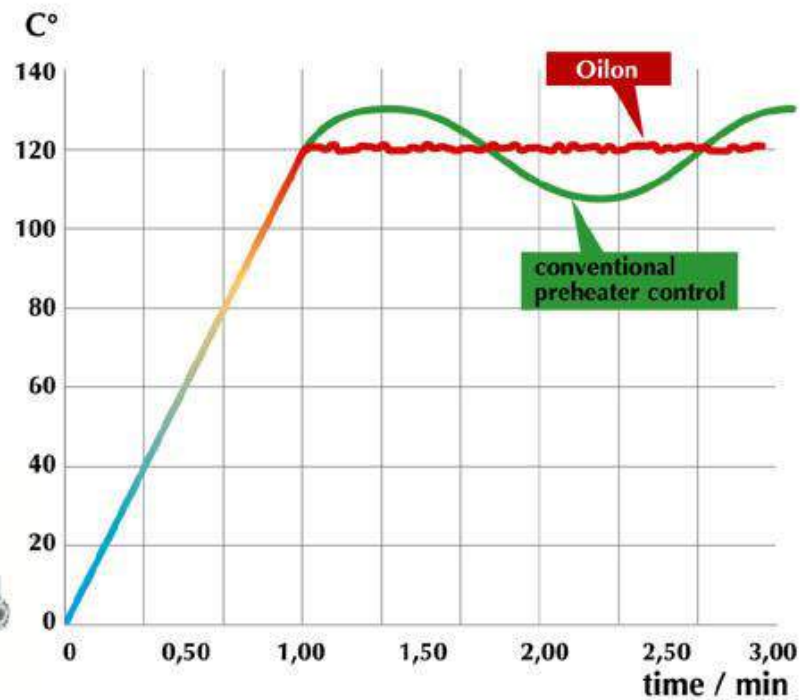
Heating capacity 500 - 2000 kg/h



Heavy Oil Preheater



OIL TEMPERATURE / VISCOSITY OPTIMIZER



- Electric mass preheater with an electronic temperature regulating system
- Accuracy $\pm 1^{\circ}\text{C}$
- Ensures optimal burning conditions -> better efficiency.

Standard Components



+ Oilon Plus



+ Pressure gauges



+ Gas valves



+ Solenoid valve



+ Thermostats and pressure controls



+ Burner controller



+ Nozzles



+ Oil pumps



+ Electric motors



+ Leakage tester



+ Servomotors



+ Plug Connector



+ Capacity controller



+ Pressure Switches

Range of applications of Oilon

HEATING APPLICATIONS



One family houses, larger dwellings, hospitals and hotels district heating plants

GREEN HOUSES



Heating of premises and soil
CO₂ production

FOOD INDUSTRY



Bakery ovens, Steam boilers in breweries, Roasters, Spray dryers

GLASS AND CERAMIC INDUSTRY



Drying of sand and brick works, Building dryers, Glass ovens

PAPER AND CHEMICAL INDUSTRY



Producing of process steam
Cooking of cellulose
Different chemical industrial processes

AGRICULTURE



Grain, grass, rice and fodder drying. Tea drying
Sterilisation of raw material
Cooking

METAL INDUSTRY



Lacquer drying,
Smelting ovens,
Paint ovens,
Galvanising and electroplating

TEXTILE INDUSTRY



Cleaning and ironing,
Drying of fabric and yarn

TRANSPORTATION AND SHIPPING



Steam and hot water boilers in ships
Heating of tanks, Sludge utilisation in ships, Asphalt drums,
Heating of train carriages

OTHER APPLICATIONS



Incineration of different waste
Ignition burners, Sludge burning equipment,
Incineration of animal remains,
Utilisation of tall oil

Low NO_x
Environmentally Friendly Combustion
Technology



Nox Classes, limit values acc. to EN267 and EN676 for Low Nox burners

	Natural gas / ppm	LPG /ppm	Light fuel oil / ppm	CO / mg/kWh
Class 1	83	113	116	110
Class 2	59	88	86	110
Class 3	39	69	56	60

Nox-values should always be compared at reference circumstances determined by EN 267 and EN 676

Oilon Low-NO_x Natural Gas Burners

Available in series 2C, 3A, 3B, 4 and 5 (200 kW - 25,000 kW)

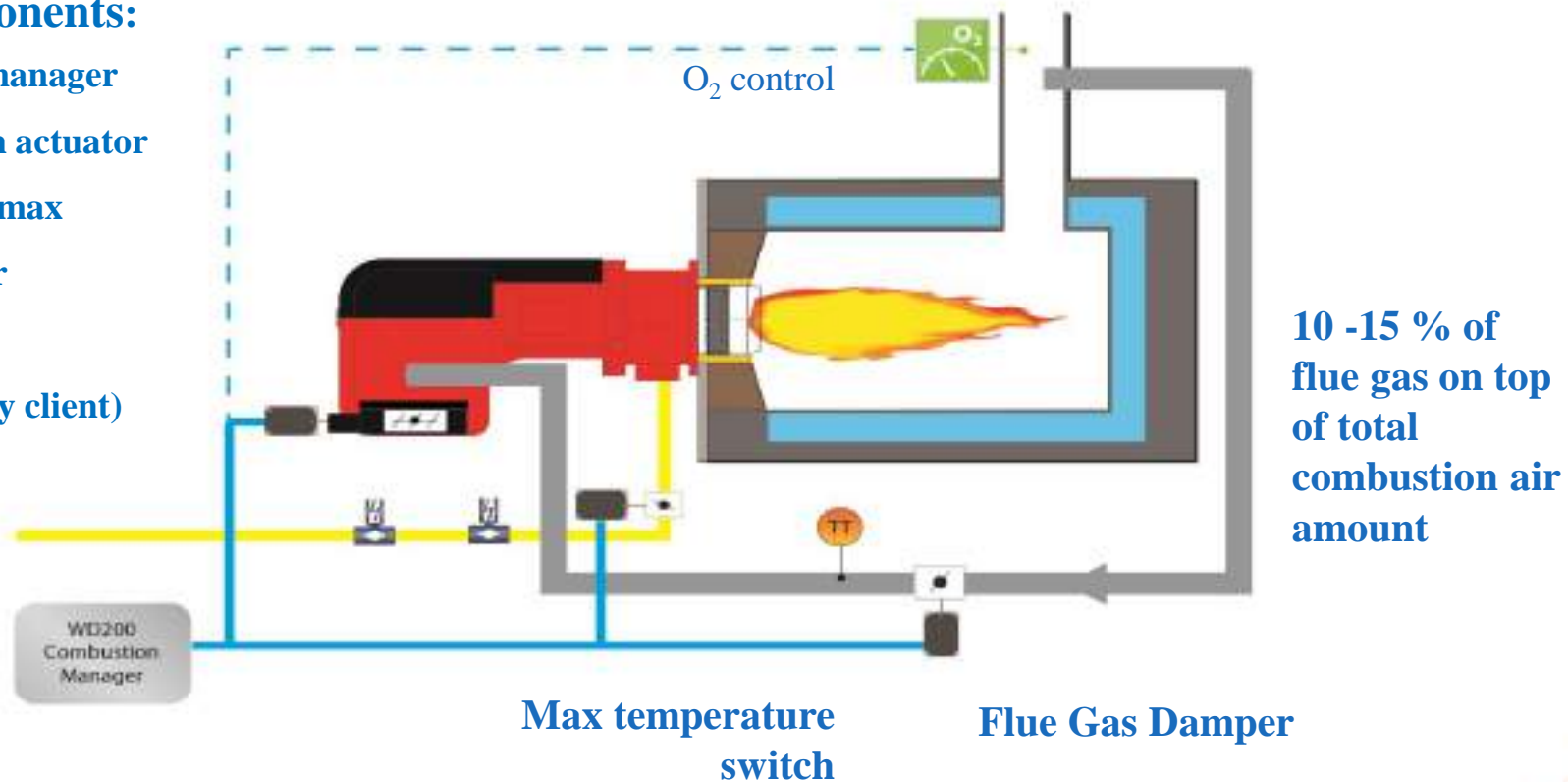


With O₂ 3%

Flue Gas Recirculation on Monoblock Burners

Required components:

- Special combustion manager
- Flue gas damper with actuator
- Temperature sensor, max
- Flue gas inlet adapter
- O₂ sensor
- Recirculation pipe (by client)



FGR – Industrial Burners, 1 – 24 MW

Natural Gas

- **Monoblock version, group 3 and 4 (capacities 1 – 11 MW)**
- **Duoblock version, group 5 (capacities 6 – 24 MW)**
- **Recirculated flue gas amount normally 10 – 15 %**
- **Reachable NO_x-level < 60 mg/m³n (O₂ = 3 %)**
- **Gas mixture temperature < +55° C (when flue gas temperature < 160° C)**
- **Burner capacity reduced 15 – 20 %**
- **Boiler efficiency affected**

Example of FGR



Product Training

- **For all products**
- **All fuels, HFO, LFO, NG**
- **Can be suited for your demands**
- **Skilled personel**
- **Small groups 10-15 persons – efficient!**
- **Training facilities in Lahti & Wuxi**
- **Training at customer's site**
- **App. 1000 customers trained every year**



Training Facilities



Class room



Domestic burners

Burners tested to match performance...

Manufactured Burner testing facility at Oilon factory



- all burners tested
- individual manufacturing card for each burner

VALMISTUSKORTTI
TECHNICAL PASSPORT
ЗАВОДСКОЙ ПАССПОРТ

Polinimi/Number type /Имя/тип RP-140 M	Valmistusnumero /Сборочный №: 06067309
Laatu/Qualification Classification Code /Классификационное общество ABS	Valmistuspaikka /Место A+B TU 725 293 07 06
Tuotaja/Orderer/Заказчик KANGRIM INDUSTRIES CO LTD CHANGWON CITY, KOREA	Valmistaja/Assigning Company/Исполнитель
Merkin/Marka/Бренд/наименование CHINA SHIPBUILDING H-856 ABS	Projekti no/Proj. No./Work No./Проект №: 81918/A033880
Toimitus/pun. Delivery date/Дата поставки 12.7.2006	Line lista/lin no/Packing list No./N.: упаковка/лист 110240
Piirradiagrammi/Схема КИП B-483T.v0	Tehoalue/Power range/Диапазон мощности 560 - 2040 kW
Kokoonpanokuva/Assembly drawing/Сборочный чертёж C-432H.v0	Punallinnoitus/Assembly/Сборка 250x82x28 34367050
Polinimen moottori/Number motor /Имя/тип/номер 4.6kW 440V 60Hz 3460r/min NO. CSN05-162849	Kytkin/Coupling/Муфта -A434J/34479014 / -A432J02 / 34479036 / -A434J
Öljypumppu/Oil pump /Топливный насос TA2 C 34024180	
Öljypumppu moottori/Oil pump motor/Двигатель топливного насоса	
Relais/Relay/Умный выключатель/реле XCK-M510 37177010	
Paloputkimus/Combustion head/Головка/головка -A482H	Paloputkimus/Combustion head extension/Удлинение головки/головка -A420J02 240*120
Ulkofilter/Filter disc/Диск/диск -A441J 165*60	Kaasuulini/Car nozzle/Газовый сопло
Suutin/Fiiter/Filter/Фильтр 12-W2-115-60 34031248	Suutin/Fiiter/Filter/Фильтр/Фильтр
Säätömoottori/Regulator/Регулятор SQM 50.480A1 110V/50-60HZ 36962076 + A.G.A58.1	Potentiaali/Potential/Потенциал/метр
Suutinjärjestelmä/Nozzle valve/Клапан/клапан RPL-1-300 34029046	
Syöttömuunnos/Inverter/Преобразователь/преобразователь ZM 20/12 115V 50-60HZ 36432021	
Painemittari/Pressure gauge/Манометр 06702-BQ 0-60BAR R1/4 150C 34021180 2 PCS	Syöttöelektriikka/Inverter/Преобразователь -A434Y
Ohjainlaite/Control unit/Управляющее реле (LAE 10 36106007 / LAL 2.25 36106011)	
Valokäsi/Photoresistor/Свет. датчик/датчик	Valokäsi/Photoresistor/Photoresistor RAR 7 36215004 2 PCS
Magneettinilaukkaus/Edendil valaus/Магнитное клапан, управление 121K8423 R1/4 110V 60Hz 36751116 122K8321 R1/4 110V 60Hz 36751117	Magneettinilaukkaus/Edendil valaus/Магнитное клапан 321H2522 R1/2 110V 60Hz 36751112 2 PCS
Säätökäyttö/Compound regulator/Регулятор/регулятор □ 509V / 509V/4K	



Manufacturing number

Back to spare parts

Why Oilon Burners ?

- Wide product range, more than 600 different options
- Tailor-made planning and flexibility
- Long lifetime and easy service, designed from operator's point of view
- High quality components and manufacturing
- Experience of special fuels & bio fuels
- Experience with low quality Heavy Fuel Oil
- Constant research and development activities
- Efficient maintenance and training services
- Global service network
- Excellent customer care and after sales services



LAHTI Skiing Stadium

Torch burner designed and delivered by OILON

Bio Gas

- Bio Gas energy, readily available, cheap and decentralized**
- Bio gas emissions big environmental problem in landfills, waste water plants etc.**
- Advantages: free energy, environmental protection, less odours, volume of waste decreases, BG plant waste is good fertilizer**
- Carbohydrates & Proteins, agricultural and animal wastes are good sources to produce bio gas**
- Bio gas yield 0,25...0,88 m³/kg (no water & ash)**

PROPERTIES OF BIO GAS

- **Energy content (EC) app 15...24 MJ/Nm³**

NOTE:

- **delivery pressure sometimes low <200 mbar**
- **water & impurities**
- **NO_x emission: 18 – 25 ppm**
- **Energy content must be >10 MJ/kg**



Anwendungshinweise Application hints

January 2006

Übersicht buntmetallfreie Geräte für Biogas-Anlagen Survey brass metal free controls for biogas applications			
Gerät / Product Produktgruppe / Product group	Kurzbezeichnung Short cut	Buntmetallfrei Brass metal free	H ₂ S
Doppelmagnetventil Double solenoid valve	DMV-.../11	ja / yes	max. 0,1 vol. % H ₂ S trocken / dry
Doppelmagnetventil Double solenoid valve	DMV-.../12		
Einzelmagnetventil Single solenoid valve	MV...S02		
Einzelmagnetventil Single solenoid valve	SV...		
Leckgasventil Vent valve	LGV...		
Gasdruckregelgeräte Gas pressure regulators	FR...		
Gasdruckwächter Gas pressure switches	GW...		
Gasfilter	GF...		
Kugelhahn geflanschte Version Ball valve flanged version	KH 16...		
Luftdruckwächter Air pressure switches	LGW...A4 nur Überdruckwächter- ausführung only overpressure switch version		
Motorklappe Motor butterfly valve	DMK...		
GasMultiBloc „C“	MBC...; W-MF...		
Ventilprüfsystem Valve proving system	VPS...		
2-stufiges Einzelmagnetventil 2-stage single solenoid valve	ZR...		
Einzelmagnetventil Single solenoid valve	MV...		
GasMultiBloc „B“	MB-(D, Z, VEF)...-Box		
Handabsicherungsventil Manual shut-off valve	HSW...		
Kugelhahn geschraubte Version Ball valve threaded version	KH 5...		
Luftdruckwächter Air pressure switches	LGW...		

Zur Sicherstellung der Anlagenverfügbarkeit empfehlen wir bei Biogasanlagen eine ½ jährliche Überprüfung der eingesetzten Gasarmaturen. To secure the operational availability of biogas applications we recommend a half year inspection of the gas controls.

Application hints:

- max 0,1 vol-% H₂S dry
- max H₂O < 5 %
- gas controls inspection every 6 months
- good dewatering and dirt separation ensures carefree operation for many years with biogas

Tapioca Starch Factory, Thailand



Biogas & boiler plant



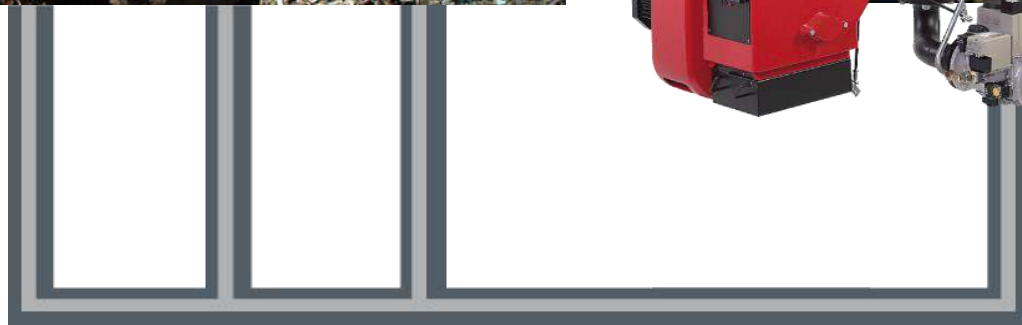
Tapioca Starch Factory, Thailand



Oilon GP-400 M-I

Gaseous and Liquid Bio Fuels

Waste to Energy



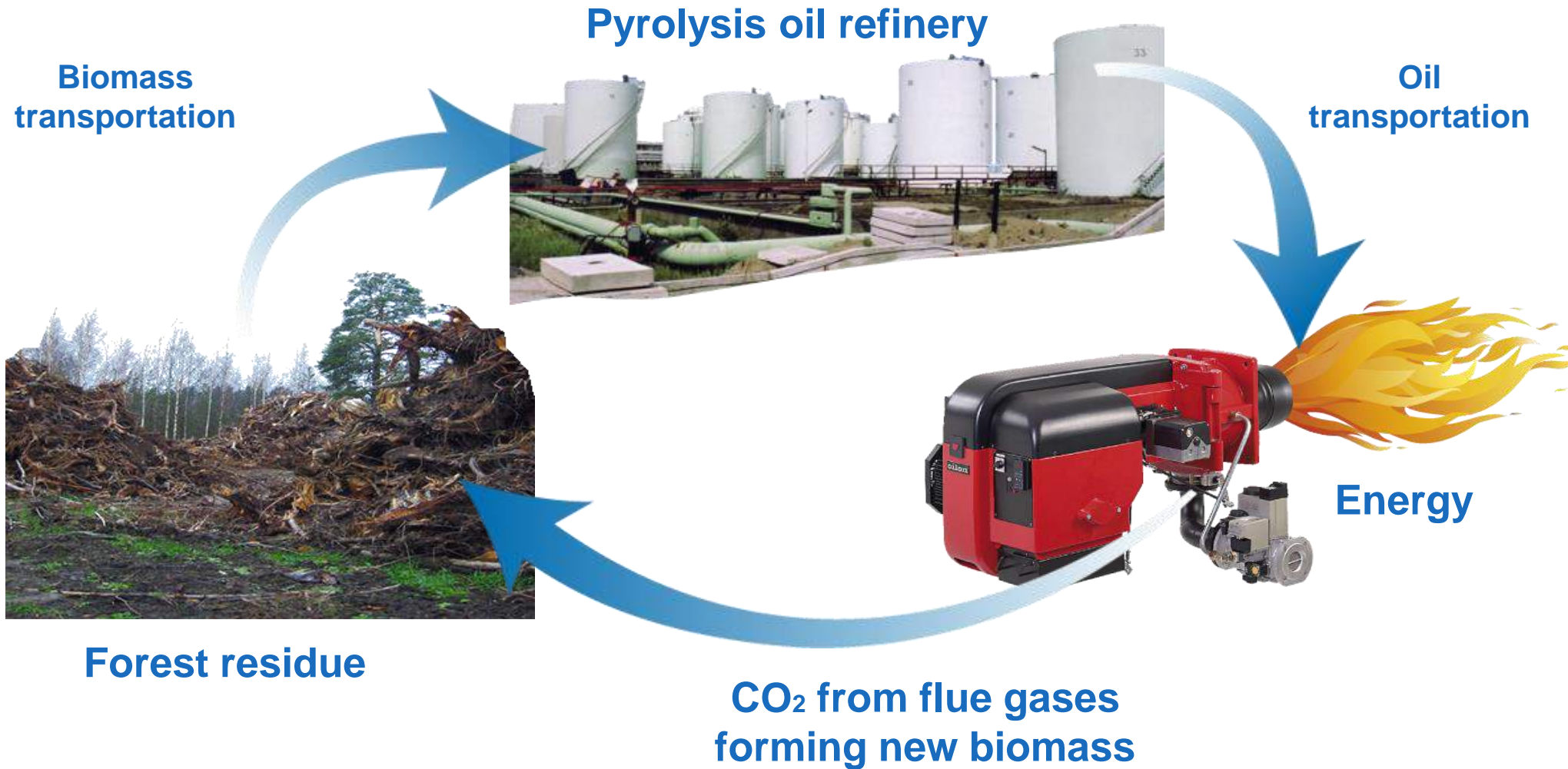
Gas Collection Pipe

Brewery, Lahti Finland, 3 x 10 t/h

- 3 pcs GKP-700 M
 - 1 pc GP – 300 M II
- 5 t/h biogas



Liquid Bio Fuels Pyrolysis Oil Concept



SOME OILON INSTALLATIONS...

District Heating with Liquid and Gaseous Fuels





Finland...



Container boilerplant, Finland



Thermax LTD,
India
OILON's
Partner
Since 2005

More than 1500
deliveries

More than 800 deliveries
to Thailand...



Poland...



Lithuania



Russia...





Tanzania



**Coca Cola,
Mozambique**

Romania...





New Zealand



KARIBU TEXTILE MILLS
Dar Es Salaam, TZ

Oilon references in China

- Over 8000 burner units in China
- Oilon burner capacity in Beijing > 9000 MW
- Production, customer service and training centre in Wuxi

-
- **Latest deal:** 83 pcs Low-NOx burners, total capacity ~2000 MW,



Oilon Home

Oilon Hybrid Heating Solutions



**Ground Source
Heat Pumps**



**Solar Heat
Collectors**



**Oil and Bio Oil
Burners**



**Gas and Bio Gas
Burners**



**Air to Water Heat
Pumps**



The background of the advertisement features a man with short brown hair, wearing a green t-shirt and dark jeans, sitting on a grassy hill. He is looking off to the right with a slight smile. The sky is a vibrant blue with scattered white clouds. The overall mood is peaceful and natural.

oilon[®]
the warm way

**IT CONCERNS US.
WE HAVE MEANS TO IMPROVE.
WE WANT TO START WITH YOU.**

www.oilon.com

Representative in Serbia & Macedonia:

- **Macedonia:**
- **MACEF-MACEF INT G.m.b.h.**
- **Mr. Goran Kapac**
St. Nikola Parapunov 3, A/52, 1000 SKOPJE
phone: +389 2 3090 130
fax: +389 2 3090 179
mobitel: +389 70 221 214
- **e-mail: teking@t.mk / www.macef.org.com**



Bio oil and bio gas burner
laboratories





Heat pump laboratory

GRP - 700 M



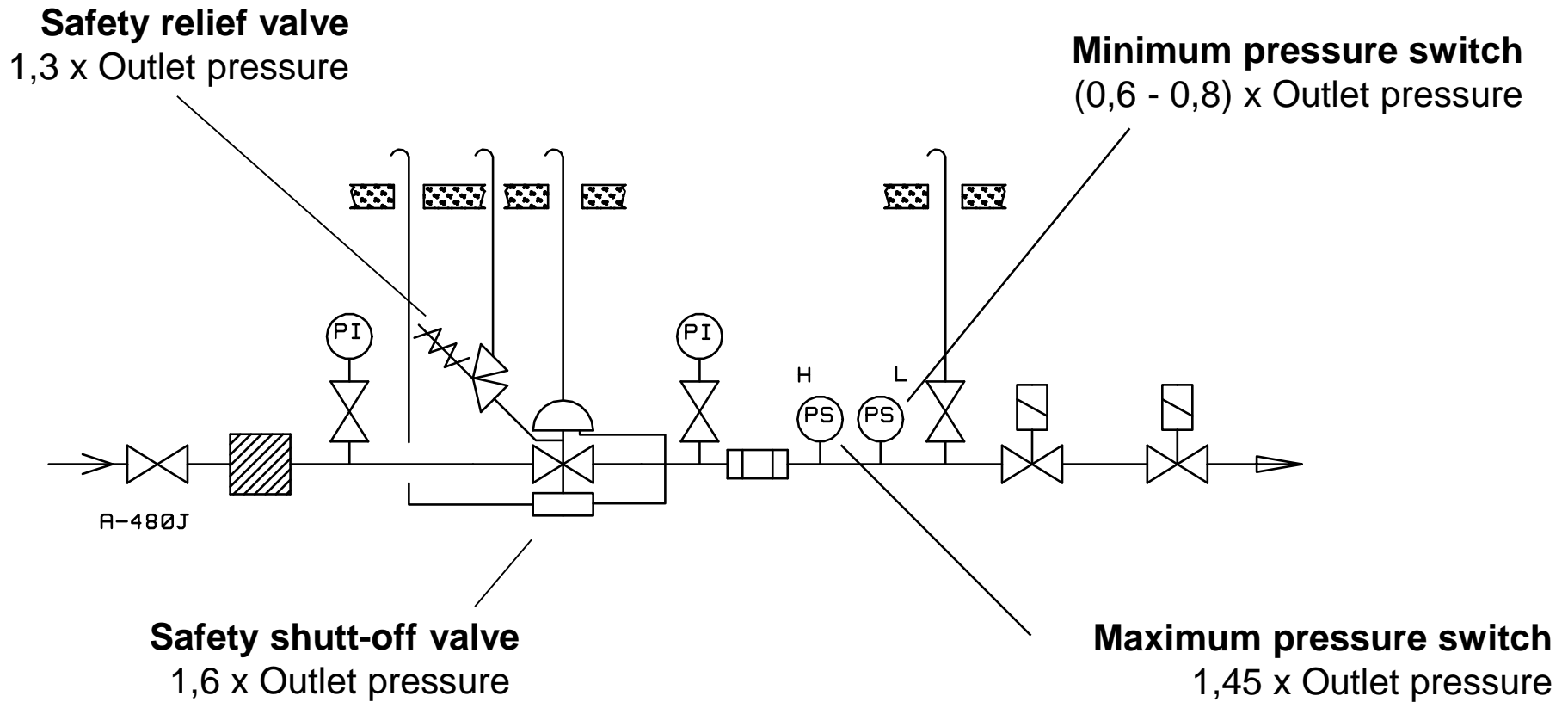
GAS PRESSURE REGULATION ASSEMBLY

Required when gas pressure is higher than operation pressure of the burner.



- 6 5 4 3 2 1
1. BALL VALVE, 2. GAS FILTER, 3. PRESSURE GAUGE WITH BALL COCK VALVE, 4. PRESSURE REGULATOR WITH SAFETY SHUT-OFF VALVE AND BLOW-OUT VALVE, 5. PRESSURE GAUGE WITH PUSH BUTTON COCK, 6. BELLOW COMPENSATOR

Gas pressure set point recommendations



BURNER SELECTION

5,5 MW

Boiler 5,5 MW
Efficiency 90 %
Burner 6,1 MW

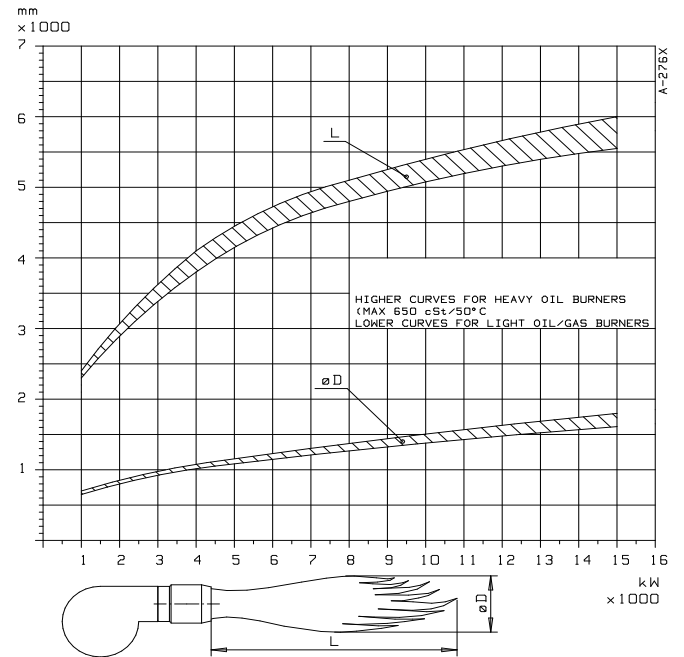
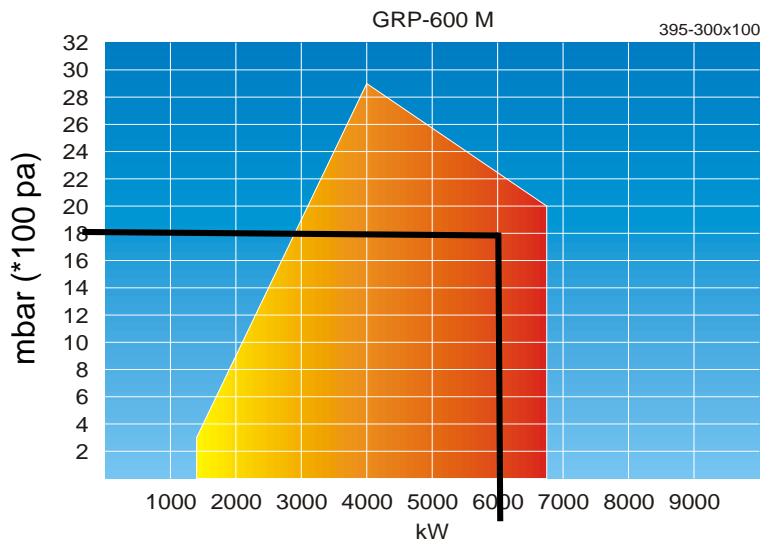
18 mbar (backpressure)

delivery pressure 3 bar

150 mbar (reduced pressure)

6,1 MW

Gas flow capacity control



Oilon WiseDrive

Digital combustion management

CONTROL SYSTEMS	WD33	WD34	WD100	WD200
Operation principle	Electronic fuel/air	Electronic fuel/air	Electronic fuel/air	Electronic fuel/air
Control unit	Lamtec BT320	Lamtec BT340	Siemens LMV 51	Siemens LMV 52
Available for fuels	LFO (KP) - GAS (GP) - -	LFO (KP) - GAS (GP) GAS/LFO (GKP) -	LFO (KP) HFO (RP) GAS (GP) GAS/LFO (GKP) GAS/HFO (GRP)	LFO (KP) HFO (RP) GAS (GP) GAS/LFO (GKP) GAS/HFO (GRP)
O ₂ control	Optional	Optional	Not available	Standard
CO control	Optional	Optional	Not available	Not available
VSD control	Optional	Optional	Not available	Standard
Control panel interface	Symbol display	Symbol display	Text display	Text display
External communication	Hardwired + Profibus (Optional)	Hardwired + Profibus (Optional)	Hardwired + Modbus Profibus (Optional)	Hardwired + Modbus Profibus (Optional)
Capacity control	Lamtec LCM100 4...20 mA signal	Lamtec LCM100 4...20 mA signal	Built in LMV51 4...20 mA signal	Built in LMV52 4...20 mA signal

Cost savings using O₂ control

Example calculation

- Boiler capacity	5 MW
- Average use time	4000 h/year
- Average capacity	60 %
- Price of light fuel oil	0.55 €/l
- Price of natural gas	0.30 €/m ³ n
- Price of electricity	0.10 €/kWh

1. Effect of O₂ control on the combustion efficiency

In a traditional burner, the O₂ level of flue gases is usually adjusted to about 4 %. When using WD200, a 2 % O₂ level can be reached. Two percent reduction in O₂ level means 1 % rise in efficiency.

The resulting annual savings are:

- with light fuel oil 6550 €
- with natural gas 3600 €

2. Effect of VSD in fan motor on electricity consumption

Burner without VSD:

- electricity consumption 31600 kWh/year
- cost 3160 €

Burner equipped with VSD:

- electricity consumption 9600 kWh/year
- cost 960 €

Savings/year 3160 € - 960 € = 2200 €

3. When using O₂ control and VSD in fan motor the annual cost savings are:

- with light fuel oil 8750 €
- with natural gas 5800 €



Oilon Selection Tool

Oilon Selection Tool simplifies choosing the right product and optional accessories from our extensive range of products.

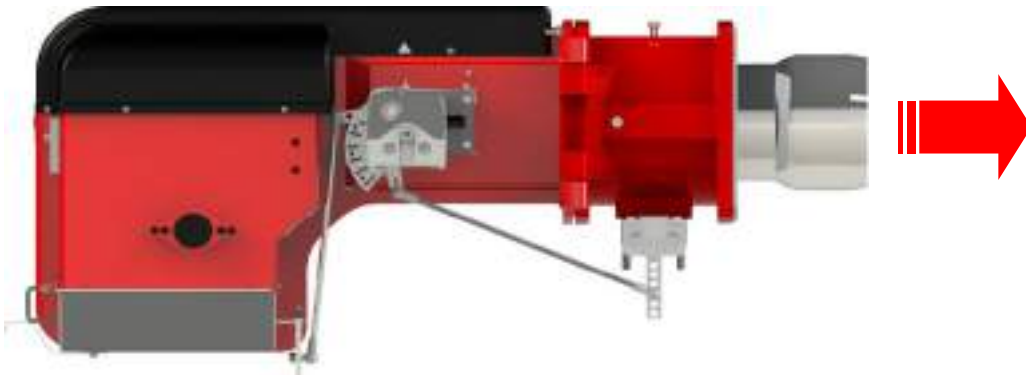
You can make quick selections and advanced system calculations with the user friendly software, available in several languages. Oilon Selection Tool allows you to access an extensive range of product information, calculation results, and enables you to form technical specifications and pre-filled quotations.

Oilon Selection Tool is continuously updated as new products, features, functionalities and improvements will be added. Automatic software updates ensure that you always have access to the latest features and product information.

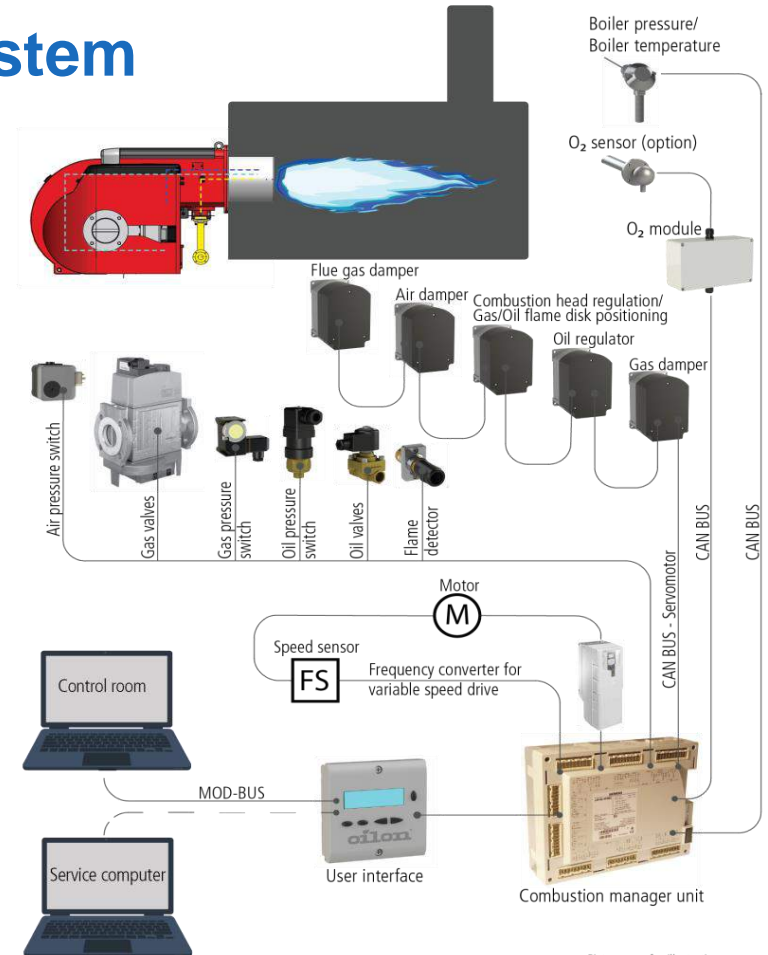
Oilon Selection Tool can be downloaded from www.oilon.com and can be installed locally to your Windows, Mac or Linux computer.

WISE DRIVE Energy and Cost Saving

Electronic fuel / air ratio control system



Mechanical Ratio Control System



Pictures are for illustration purpose.

Electronic Ratio Control System

Main functions in Electronic WiseDrive control system

- Burner Control and Security Functions
- Electronic Fuel/Air Ratio Control
- Boiler Cold-Start Protection
- Boiler Temperature Limitation
- Communication with External Systems
- PID Controller for Capacity Control
- O₂ Control, with O₂ Module
- Fan Motor Variable Speed Drive Control
- Reading the Fuel Flow Meter
- Combustion efficiency calculator



**ACCURATE
BURNER CONTROL**



**FUEL
SAVINGS**

Oilon Wise Drive

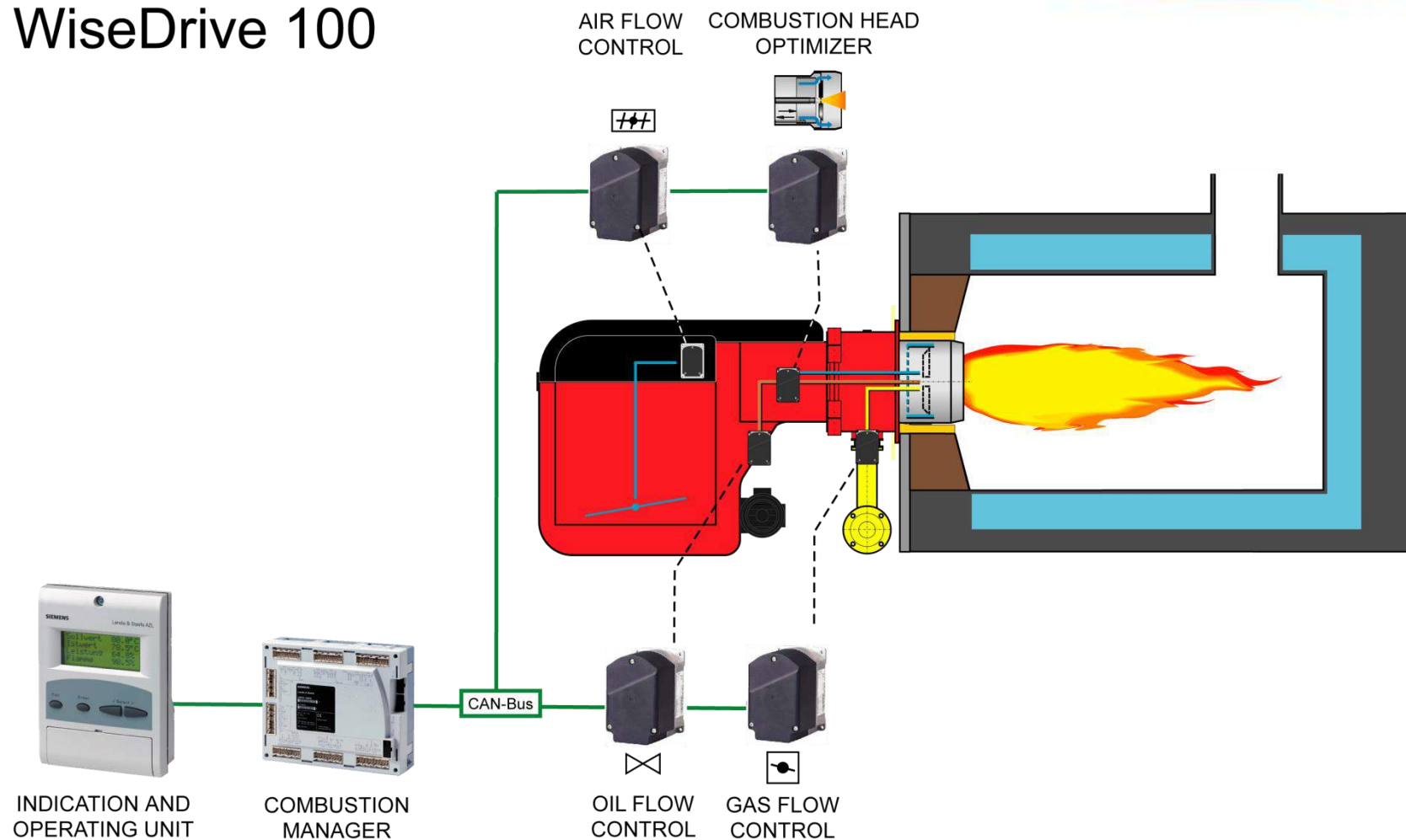


Mechanical cam

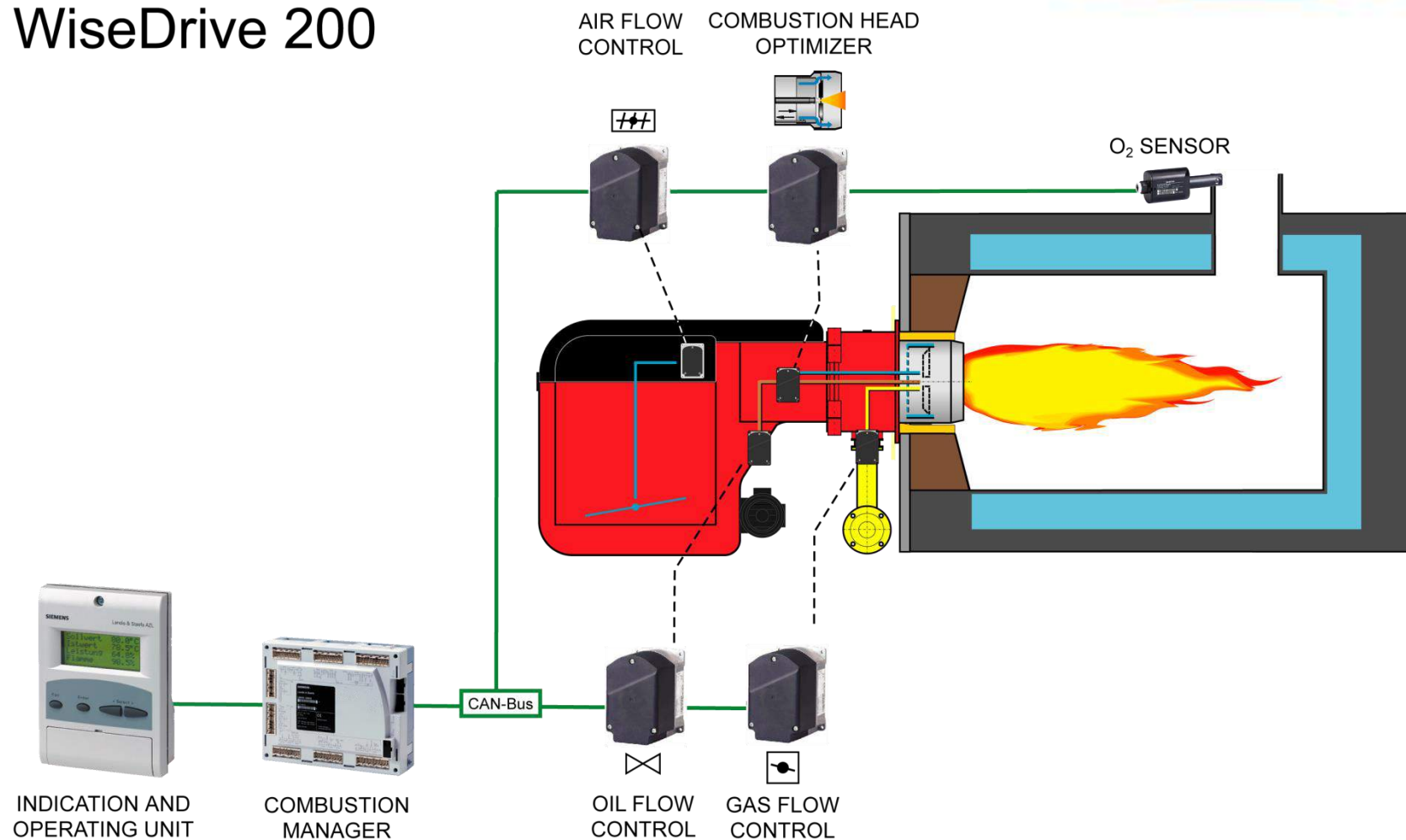


Digital combustion management
with servomotors

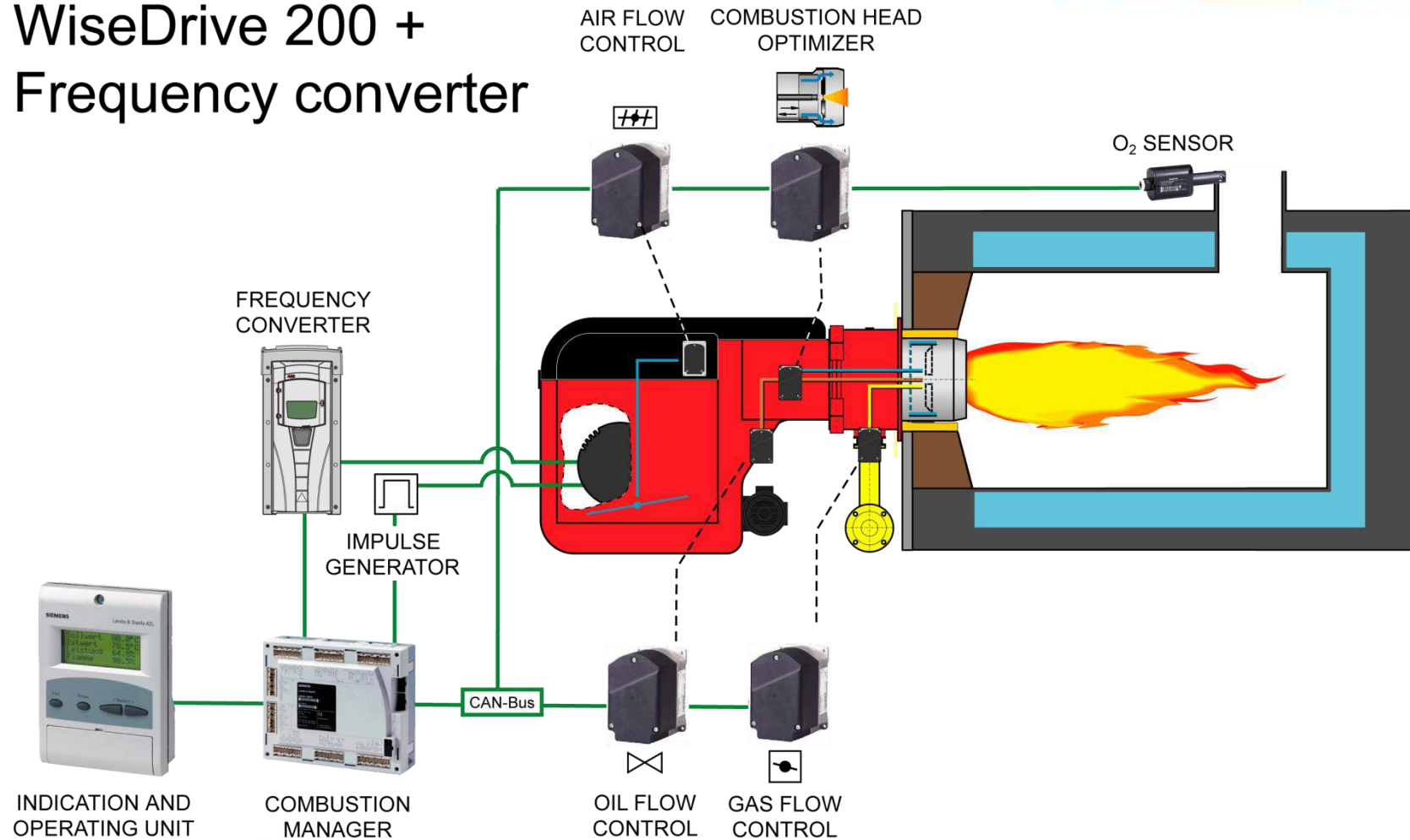
WiseDrive 100



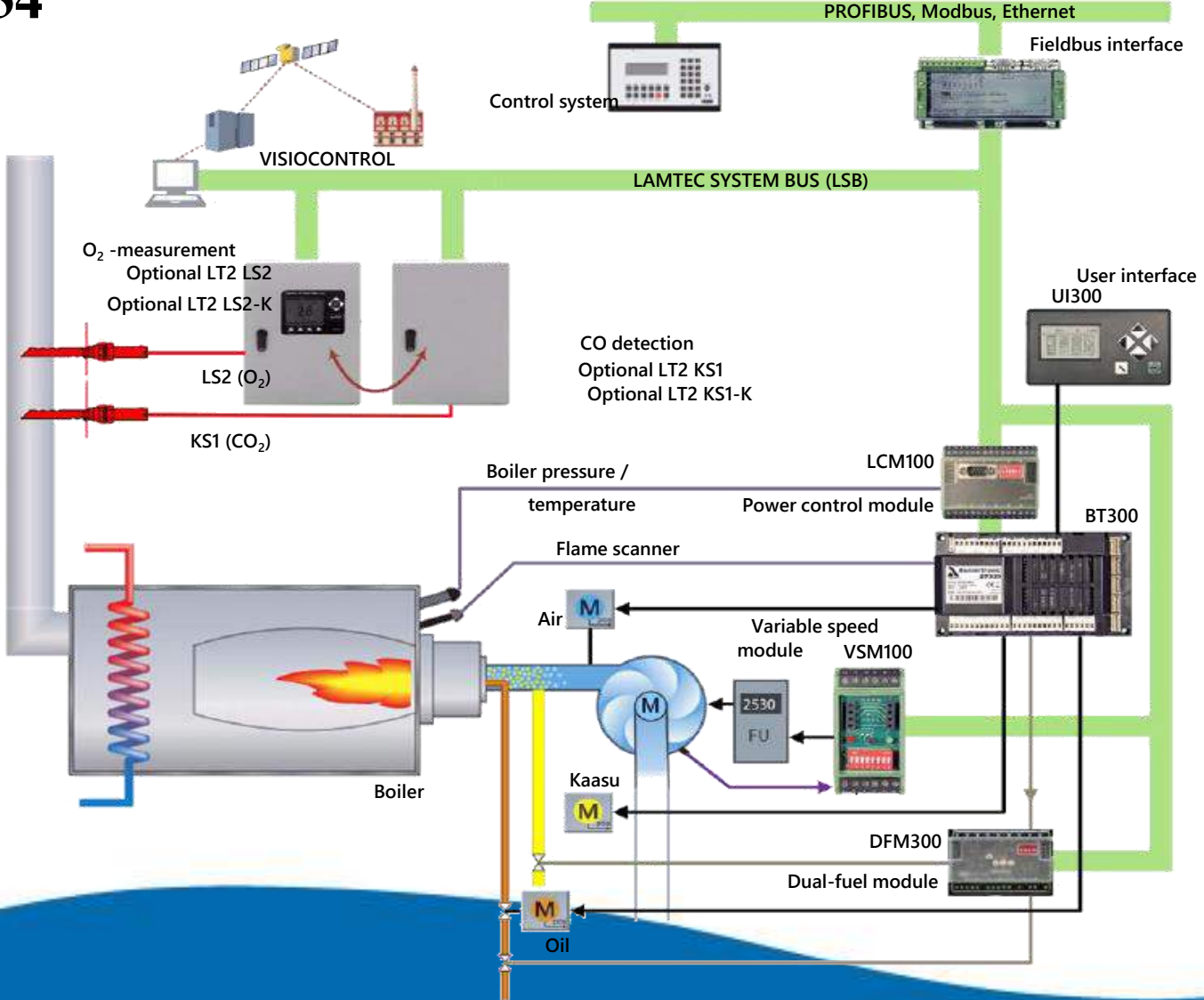
WiseDrive 200



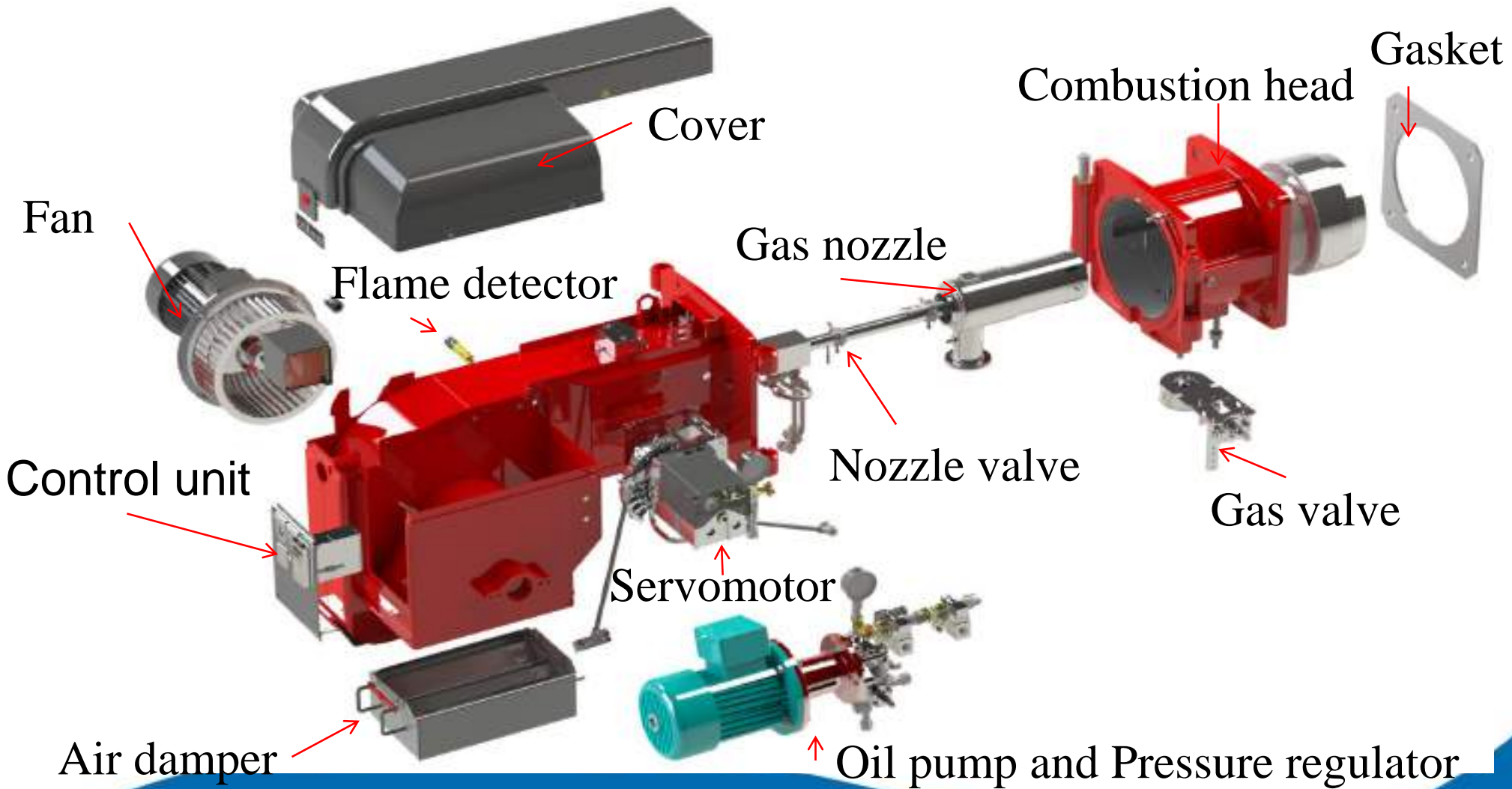
WiseDrive 200 + Frequency converter



WD 33-34



Burner main components



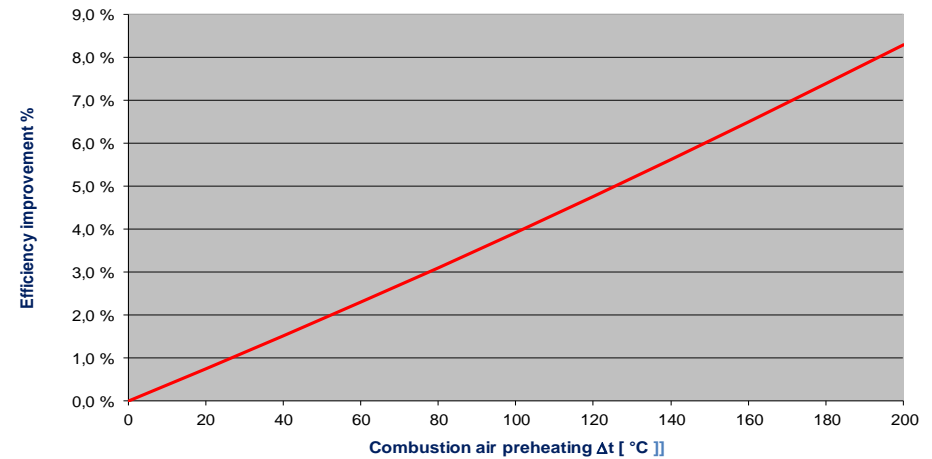
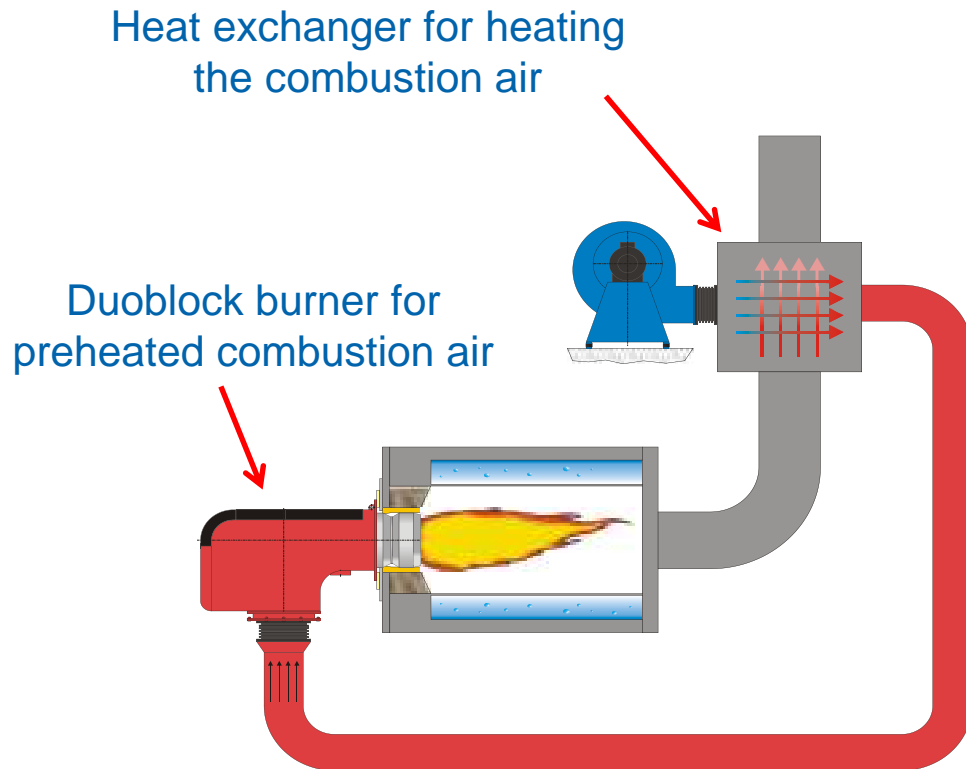
Higher efficiency with O₂ control and variable speed drive Example:

- O₂ level from 4 % to 2 % with WiseDrive, which equals roughly 1 % higher efficiency
- **10 ton/h** steam boiler **without** O₂ control and variable speed drive
 - Average power 6 ton/hour, 18 hours/day
 - Efficiency 87.5 % with 4 % O₂ level
 - Fuel: natural gas
 - Gas consumption ~8071 m³/day, 2421300 m³/year
 - Fan motor electric consumption 89100 kWh/year
- **10 ton/h** steam boiler **with** O₂ control and variable speed drive
 - O₂ level in flue gas is set from 4 % to 2 %, which equals 1 % higher efficiency
 - Efficiency 88.5 %
 - Gas consumption ~7635 m³/day, 2394000 m³/year
 - Fan motor electric consumption with VSD 41700 kWh/year

Higher efficiency with O₂ control and variable speed drive

- Yearly savings with O₂ control and VSD
 - Natural gas price ~0,2 €/m³n
 - 2421300 m³n/year – 2394000 m³n/year = 27300 m³n/year
 - 27300 m³n/year x 0,2 €/m³n = 5460 €/year
 - Electric price ~0.1 € /kWh
 - 89100 kWh/year – 41700 kWh/year = 47400 kWh/year
 - 47400 kWh/year * 0.15 € /kWh = 4740 € /year
 - Total savings 5460 € /year + 4740 € /year = 10200 € /year

Efficiency Increase by Preheated Combustion Air



100°C Combustion Air Preheating
equals ~ 4% HIGHER EFFICIENCY

- Liquids and gases, which earlier have been considered as wastes, have been and will be utilised as combustible fuels
- Many processes have side streams, which can be utilised.
 - Bio gases in breweries
 - Coke Oven Gas (COG) in steel factories
 - Blast Furnace Gas (BFG) in steel factories
 - Town gas
 - Odorous gases in paper mills
 - Lubrication oils
 - Hydraulic oils
 - Gases from oil refinery
 - Gases from chemical industry
 - Gases from mines



Efficiency of the plant will increase with less harmful emissions.

Thank you for your attention!

Happy to
answer your
QUESTIONS

