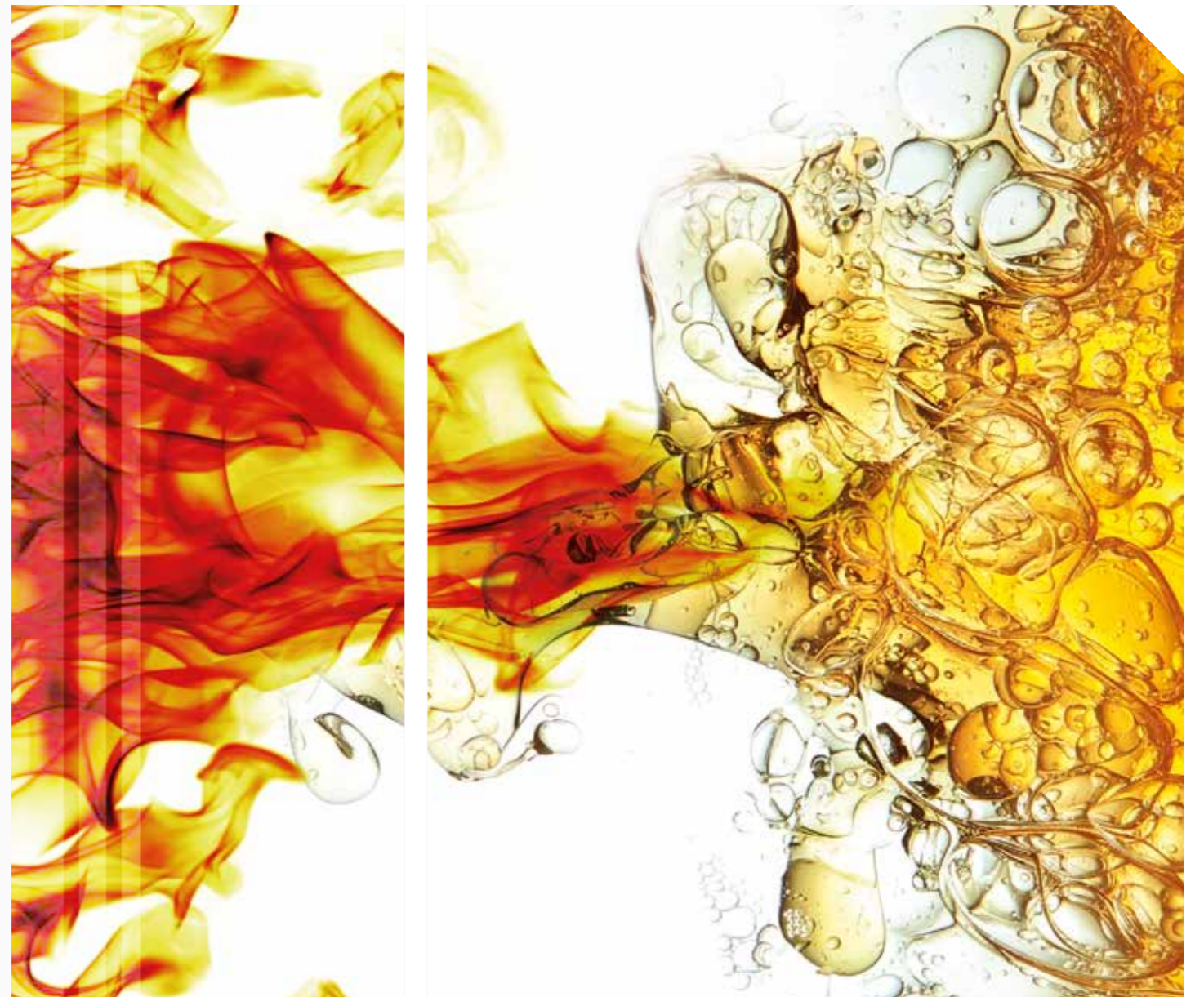


BONO THERMAL OIL HEATERS



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CANNON BONO ENERGIA - Thermal oil heaters

Thermal oil heaters are the right choice when customers require high temperatures and thermal stability. BONO proposes two technologies: multi-coil heaters (OMV) and multi-tubular heaters (OMP, HTH).



Oil & Gas

- Heating of crude oil for transportation in pipelines
- Heating of crude oil in storage tanks
- Refining processes



Chemical industry

- Production of synthetic resins and polyesters
- Production of synthesized and intermediate petroleum products
- Heating inside reactors



Textile industry

- Production of synthetic fibers
- Printing and fixing of colored pattern on the fabric



Metallurgic

- Anodizing, phosphating, hot rolling



Plastics and rubber processing

- Heating of presses, production of PVC and polypropylen



Flexible packaging production

- Heating of molding presses, films
- Heating of applied glue and adhesive layers

Thermal fluids vs steam

Comparing to use of steam for the same application heat transfer fluids (thermal oils) have several distinct advantages:

- › Liquid phase and low pressures (even at very high temperatures) lead to a simpler, less expensive, and safer system that is easier to operate and maintain;
- › No chemical treatments are needed (usually water must be chemically treated-an additional operational cost for the plant);
- › Less mechanical stress due to lower pressure-reducing maintenance requirements;
- › A differenza dei generatori di vapore, nel caso di utilizzo diretto dell'olio diatermico come vettore di scambio termico, l'impianto non richiede il conduttore patentato.

Thermal fluids benefits

- › High boiling point and low vapor pressure in order to avoid pressurized systems.
- › Low viscosity over operating range to ensure proper heat transfer.
- › Low pour point to enable easy start-up at ambient temperatures.
- › Good thermal and oxidation stability to provide long fluid life.
- › No reaction with other chemicals used in the process to reduce hazards in case of internal leakages.
- › Good price-performance ratio to get maximum performance for the money paid.

OMV Multi-coil

KEY FEATURES

- > Thermal capacity from 0.2 to 5.8 MW
- > Fuels: natural gas, LPG, diesel oil, heavy fuel oil
- > Operating temperature: up to 350°C
- > Vertical or horizontal configuration

Design and manufacturing can be realized according to:

- PED Directive 97/23/CE, 2014/68/EU
- ASME Design
- RTN Certifications (Russia)
- SELO (China)

COMPETITIVE ADVANTAGES

- > **High thermal efficiency:** multi-coil structure designed to maximize heat exchange. Efficiency can be further increased with an air pre-heater;
- > **Longer thermal fluid lifetime:** temperature differences between bulk and film are minimized, preventing oil cracking events;
- > **Low thermal stress on pressure parts:** homogeneous heat exchange reduces thermal imbalances and increases the operating life of the heater;
- > **Easy maintenance:** simple access to combustion chamber and coils through the removable upper cover.



OMV series 100-1000

OMV CHARACTERISTICS	Unit	100	150	200	300	400	600	800	1000
Thermal Capacity	kcal/h	100.000	150.000	200.000	300.000	400.000	600.000	800.000	1.000.000
Thermal oil flow rate	m ³ /h	10	10	15	15	30	30	55	55
Δt thermal oil	°C	20	30	27	40	27	40	32	40
Δp thermal oil	bar	1,1	1,1	1,0	1,0	1,3	1,3	2,0	2,0
Efficiency		88 % (with PA until 92%)							

Horizontal Vers.	Vertical Vers.									
Boiler Height	Boiler Width	H mm	1050	1050	1200	1200	1450	1450	1720	1720
Width boiler body		W mm	850	850	1000	1000	1250	1250	1520	1520
Total width		W1 mm	1250	1250	1400	1400	1650	1650	1920	1920
Length	Height boiler body	L mm	1550	1550	1950	1950	2300	2300	2800	2800
Length	Total height	L1 mm	1950	2000	2450	2500	2900	2950	3500	3600

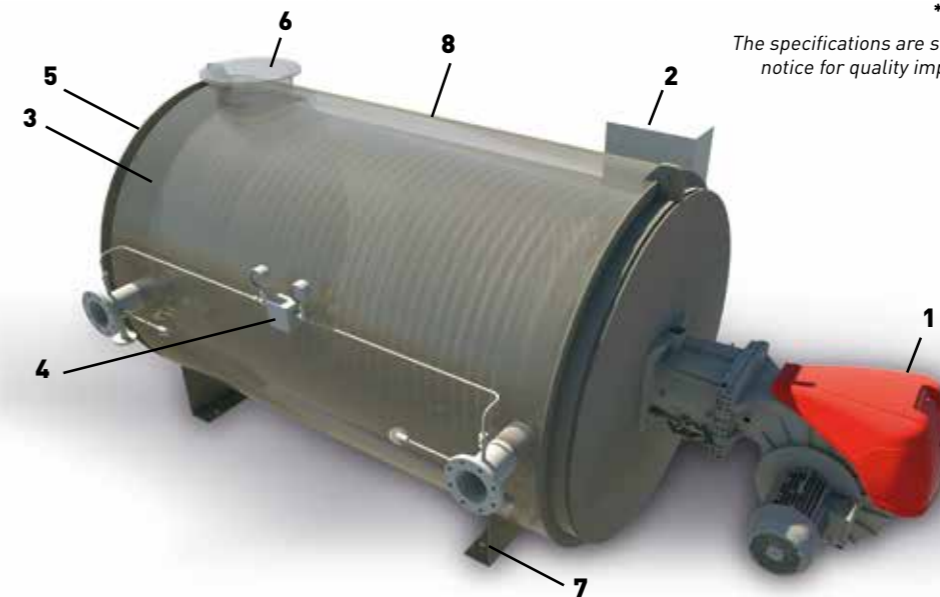
OMV series 1250-5000

OMV CHARACTERISTICS	Unit	1250	1500	2000	2500	3000	4000	5000
Thermal Capacity	kcal/h	1.250.000	1.500.000	2.000.000	2.500.000	3.000.000	4.000.000	5.000.000
Thermal oil flow rate	m ³ /h	75	75	105	130	150	205	205
Δt thermal oil	°C	33	40	40	40	40	40	50
Δp thermal oil	bar	1,1	1,1	0,7	1,3	2,0	1,1	1,3
Efficiency		88 % (with PA until 92%)						

Horizontal Vers.	Vertical Vers.								
Boiler Height	Boiler Width	H mm	1820	1820	2044	2093	2093	2324	2324
Width boiler body		W mm	1620	1620	1744	1893	1893	2174	2174
Total width		W1 mm	2020	2020	2144	2250*	2250*	2250*	2250*
Length	Height boiler body	L mm	3450	3450	3700	4200	4890	5150	6300
Length	Total height	L1 mm	4335	4335	4585	5200	5890	6250	7400

* CP width not installed on board

The specifications are subject to change without any prior notice for quality improvement or customer's request



- 1 Burner:** Low NOx and U-Low NOx options
- 2 Control panel:** innovative automation features with remote control options
- 3 Heater body:** low thermal load
- 4 Instrumentation:** safety devices SIL
- 5 Layout:** vertical or horizontal installation
- 6 Stack:** heat recovery systems (economizer) in option
- 7** Pre-assembled, packaged and tested in our workshop before delivery
- 8 Insulation:** External finishing in stainless steel

OMP Multi Tubular



KEY FEATURES

- > Thermal capacity from 1.7 to 40 MW
- > Fuels: natural gas, LPG, diesel oil, heavy fuel oil, hydrogen
- > Operating temperature: up to 400°C
- > Multi-tubular design composed of convective and radiant sections
- > Integrated combustion air-preheater

Design and manufacturing can be realized according to:

- PED Directive 97/23/CE, 2014/68/EU
- ASME Design
- RTN Certifications (Russia)
- SELO (Cina)

COMPETITIVE ADVANTAGES

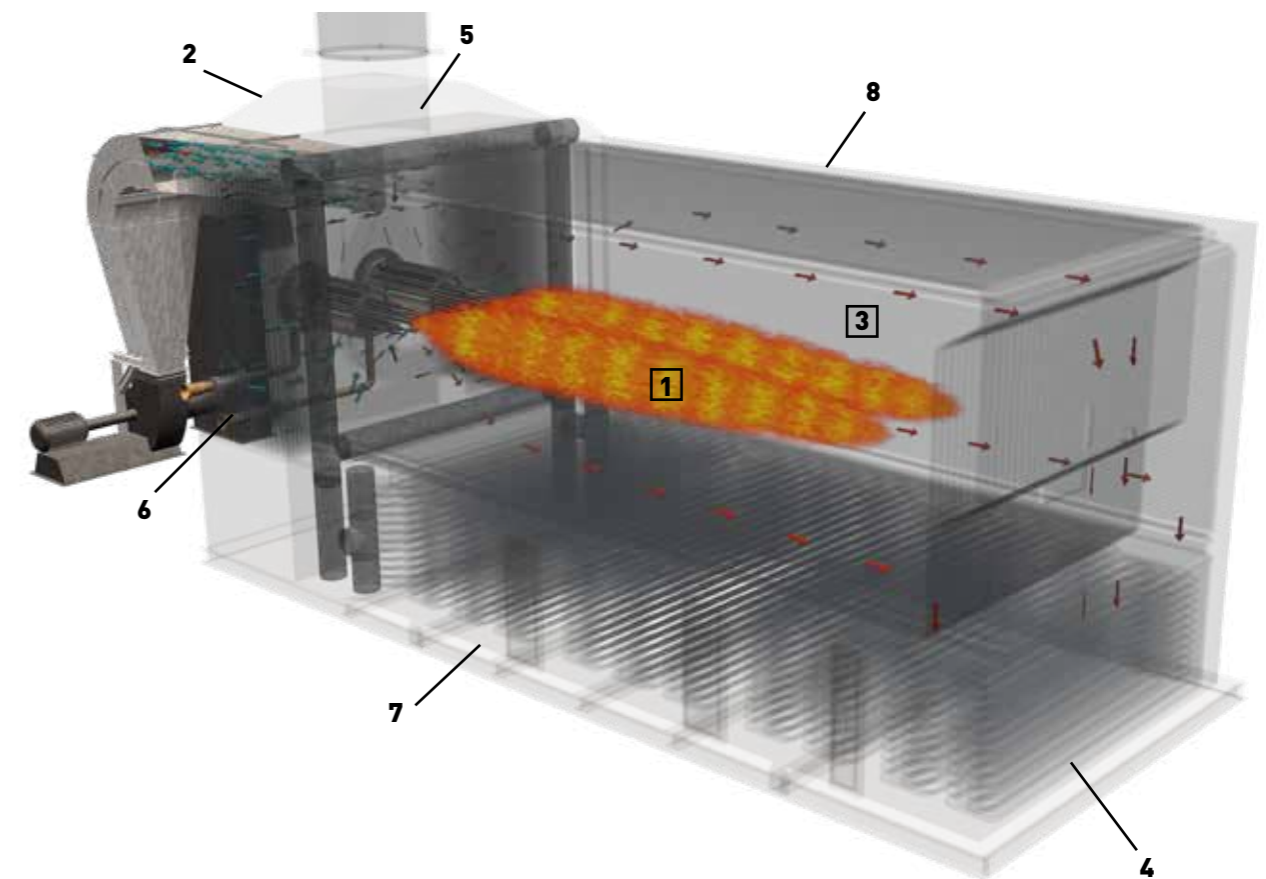
- > **Packaged configuration:** OMP are supplied as complete and assembled units, ready to be connected to utilities, minimizing installation works on site. OMP can reduce space requirement in boilers room;
- > **High thermal efficiency:** the excellent heat exchange in the convective and radiant sections and the integrated combustion air pre-heater combine to achieve efficiency up to 92%;
- > **Counter-flow heat exchange scheme in the convection zone:** it ensures a more efficient heat exchange in the convective area compared to the heaters with parallel flow scheme;
- > **Longer thermal fluid lifetime:** the fluid heats up slowly in convective area, reducing thermal shocks in the radiant section, especially during start-up;
- > **Low emissions:** the wide combustion chamber allows low thermal loads;
- > **Easy maintenance:** Inspection doors ensure easy access for cleaning and maintenance. Automatic soot blowers clean the convective section in cases of heavy fuel oil firing;
- > **Customization:** OMP heaters can be engineered for high temperature or large capacity applications.



OMP series 1500-15000

CHARACTERISTICS OMP	Unit	1500	2000	2500	3000	4000	5000	6000	8000	10000	12500	15000
Thermal capacity	kcal (10 ⁴)/h	15	20	25	30	40	50	60	80	100	125	150
Efficiency		92 %										
Thermal oil flowrate (allowance ±10%)	m ³ /h	110	110	180	180	200	250	300	400	450	480	580
Length	mm	4830	4830	5.550	5.550	6.070	6.630	6.630	7.250	7.770	8.780	9.100
Width	mm	2.400	2.400	2.500	2.500	2.500	3.100	3.100	3.200	3.600	3.700	3.900
Height	mm	2.700	2.700	3.000	3.000	3.000	3.800	3.800	4.000	4.150	4.150	4.400
Thermal oil volume in the boiler	l	1.000	1.000	1.400	1.400	1.600	2.900	2.900	3.700	4.700	5.300	5.900
Boiler empty weight	kg	11.000	11.000	13.000	13.000	14.000	22.000	22.000	27.000	32.000	36.000	45.000
Natural Gas	Nm ³ /h	193	257	322	386	512	640	768	1024	1280	1600	1920
Diesel oil	l/h	185	247	308	370	491	613	736	981	1227	1533	1840
Heavy fuel oil	kg/h	171	228	285	342	454	567	680	907	1134	1417	1701

The specifications are subject to change without any prior notice for quality improvement or customer's request



- 1 Burner:** Low NOx and U-Low NOx options
- 2 Control panel:** innovative automation features with remote control options
- 3 Furnace:** wide combustion chamber for low thermal loads
- 4 Convective section:** counter-flow convective section
- 5 Air Pre-heater:** integrated pre-heater for efficiency optimization
- 6 Instrumentation:** safety devices SIL
- 7 Inspection doors:** very easy accessibility for inspection and maintenance activities
- 8 Insulation:** External finishing in stainless steel

ACCESSORIES

THERMAL OIL PLANT ACCESSORIES

Thermal oil circulation pump skids

- › We can provide complete and packaged skids assembled in our workshops.

Thermal oil expansion tanks:

- › The expansion tank is designed to balance the increasing oil volume due to the thermal expansion. The expansion tank can be vertical or horizontal execution and can be atmospheric or pressurized.

Thermal oil storage tank:

- › Located underground or at ground level, it is commonly designed to contain the total thermal oil content of the plant plus a reasonable safety margin.

Thermal oil gear pump:

- › Thermal oil gear pump is used to fill the plant at first start-up or for integrations.

GAS-FLUID ECONOMIZER

- › A heat exchanger can be used to recover additional heat from combustion flue gases, heating a secondary fluid (example: hot water). These solutions significantly increase the overall efficiency of the thermal plant.

CONTROL SYSTEM

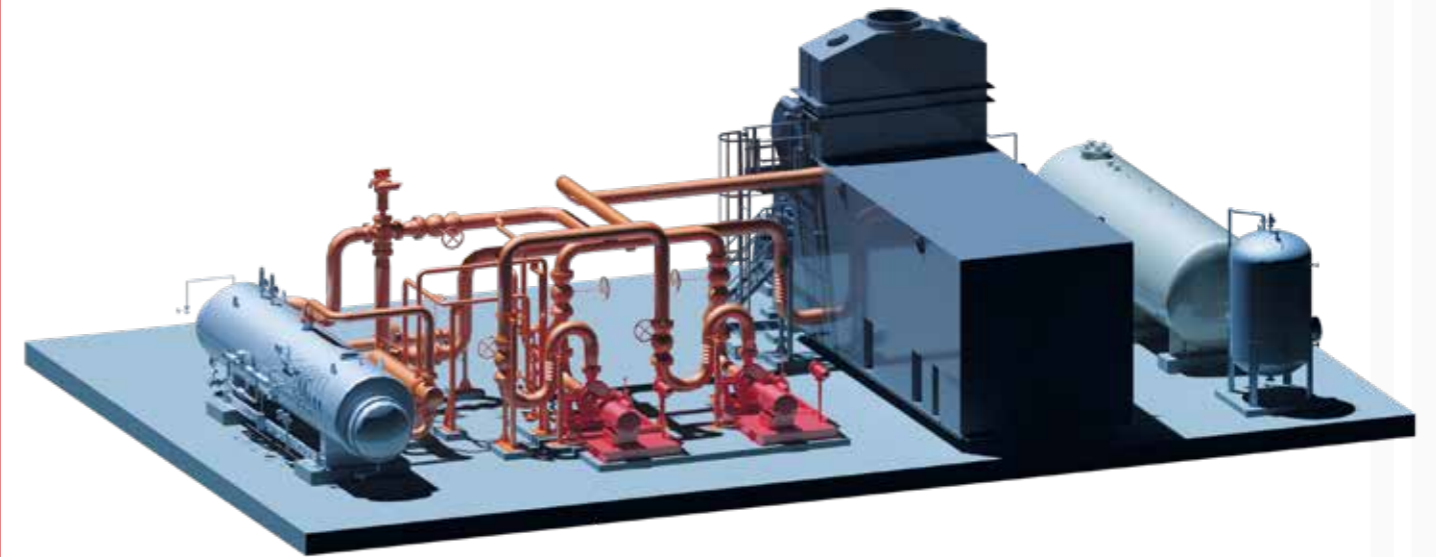
- › **Optispark** is an electronic control system, designed and developed by CANNON BONO ENERGIA that includes **BMS** (burner management system) and **BCS** (boiler control system). It can be interfaced to other SCADA systems via MODBUS or PROFIBUS and includes a high definition touch-screen control panel.



Boiler room

EXAMPLE OF A THERMAL OIL PLANT

- › CANNON BONO ENERGIA is able to provide customized solutions for challenging applications, in compliance with customer needs. Projects have been already implemented in many industries including the Oil& Gas, chemical and pharmaceutical sector. In this page an example of a complete boiler room is displayed: in particular this is a turnkey plant, composed of a thermal oil heater (OMP series), a pump station, a vertical-design expansion tank and a storage tank. The plant also includes a heat exchanger for steam production.



**CANNON
BONO ENERGIA**
in numbers



10.000

Plants installed
worldwide



Countries

70

presence



60

years in business



3

Manufacturing centers
in Italy

