



baltur
ECONOMIA GIUSTA PER IL PLANETA

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baltur

TECHNOLOGIES FOR THE CLIMATE

Two progressive stage/
modulating burners

gas
light oil
heavy oil
dual fuel

Series

GI



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The monobloc high-performance industrial burners with separate fans are technologically state of the art in the field of combustion and thermal processes.

There are few companies in the world able to offer competence born from experience to deal with complex complete combustion problems in situations of particular needs, while fully adapting the burner to industrial plant whose success depends on high performance at the lowest possible cost.

Whether water pipe boilers, asphalt furnaces, cereals dryers or smelting ovens, Baltur is proud to be able to put its experience to the service of the process, just as it has been successfully doing since 1950, and is also happy to share its special know-how with you.



Plant and applications

Baltur industrial burners are fired by gas, light oil, heavy oil and dual fuels and are built to satisfy the widest range of needs.

The wide power range and the number of versions available make these the ideal solution for civil and industrial applications such as heating boilers, steam generators, hot air generators, cereal dryers, gravel and similar product dryers, diathermic oil boilers and process plant.

Burner model
GI 350 DSPGN
Natural gas fired.
Installed on hot water boiler for 3.2 MW
heating and industrial process
at Gazzotti - Bologna



Burner model
GI 1000 DSPGN
Natural gas fired.
Installed on steam boiler for 13 MW
industrial use,
at Motim - Hungary

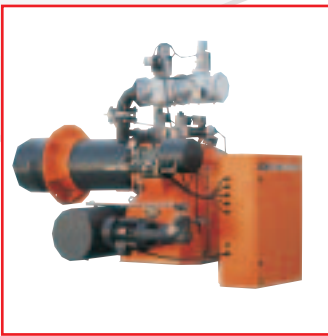


Burner model
GI 510 DSPGN
Natural gas fired.
Installed on hot water boiler for 5.8
MW heating at Seabo - Bologna



Burners model
GI 510 DSPN-D
Dense heavy oil fired.
Installed on over-heated water boiler with
three smoke cycles for 5.8 MW industrial
use, at Licar San Quirino - Pordenone





Product range

SYMBOLS

GI...DSPG

Two progressive stage/modulating light oil burners. Return nozzle with closing by electromagnet control rods.

GI...DSPN-D

Two progressive stage/modulating dense heavy oil burners. Return nozzle with closing by electromagnet control rods.

GI...DSPGN

Two progressive stage/modulating gas burners.

GI MIST...DSPGM

Two progressive stage/modulating dual gas/light oil burners. Alternative operating. Return nozzle with closing by electromagnet control rods.

GI MIST...DSPNM

Two progressive stage/modulating dual gas/heavy oil burners. Alternative operating. Return nozzle with closing by electromagnet control rods.

Fuels

Light oil, maximum viscosity 6.2 cSt (1.5°E) at 20°C.

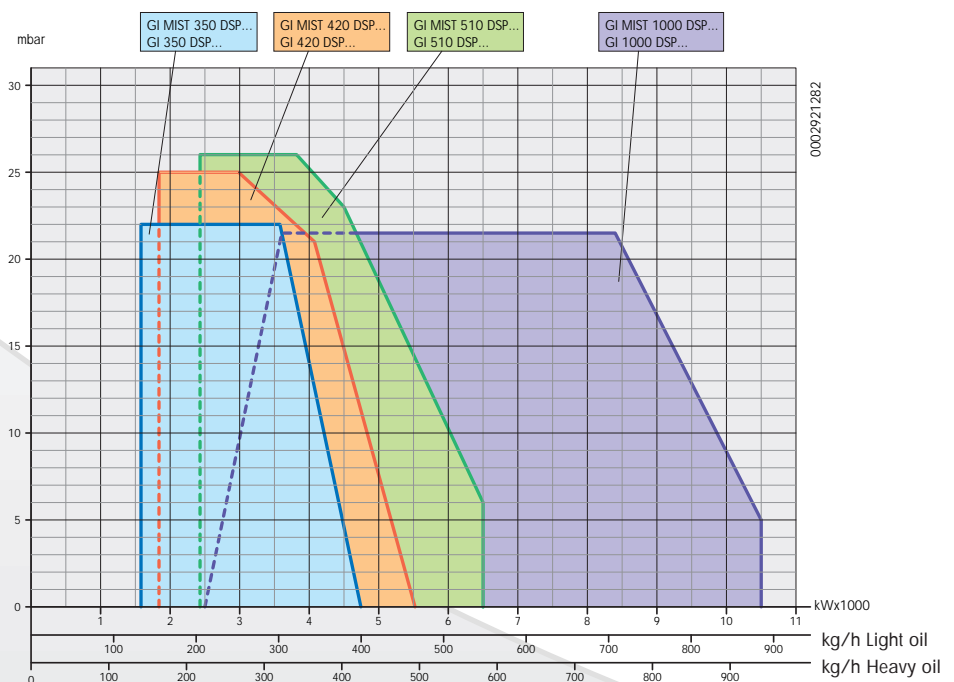
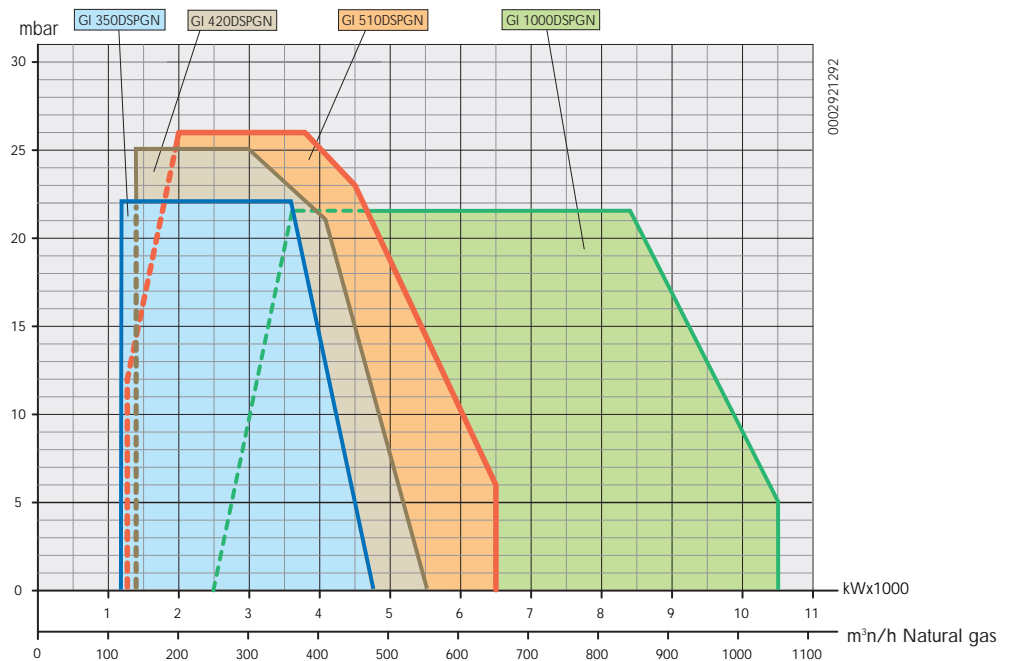
Heavy oil, maximum viscosity 380 cSt (50°E) at 50°C.

Natural gas (G20), pressure 200 mbar (GI 350-420-510 serie), 350 to 1000 mbar (GI 1000 series). Consult our sales offices for different types of gas and pressures.

Gas/light oil mix, light oil maximum viscosity 6.2 cSt (1.5°E) at 20°C, natural gas (G20) pressure 200 mbar (GI 350-420-510 serie), 350 to 1000 mbar (GI 1000 series). Consult our sales offices for different types of gas and pressures.

Gas/heavy oil mix, heavy oil maximum viscosity 53 cSt (1.5°E) at 50°C, natural gas (G20) pressure 200 mbar (GI 350-420-510 serie), 350 to 1000 mbar (GI 1000 series). Consult our sales offices for different types of gas and pressures.

Operating range

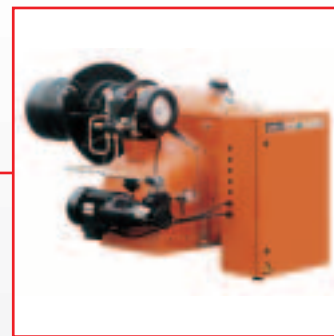


The diagrams are purely illustrative and refer to tests using test boilers as per current standards and legislation. In practice, there may be considerable differences due to the following factors:

- The capacity of the burner to exceed the overpressure when switched ON (not strictly related to the operating pressure) which varies from boiler to boiler.
- The considerable thermal load of the

combustion chamber (ratio between the thermal power of the combustion chamber and the corresponding volume - kcal/h/m³) which means the burner fan might not be operating within the full operating range.

Available models



Light oil model *)	Code	Capacity		Thermal output		Electrical power supply	Motor electrical power	Pump l/h	Notes
		min. kg/h	max. kg/h	min. kW	max. kW				
GI 350 DSPG	6501010	134	402	1581	4743	3N-50Hz 400V	15+2.2	1500	2) 3) 4)
GI 420 DSPG	6506010	156	468	1840	5522	3N-50Hz 400V	18.5+2.2	1500	2) 3) 4)
GI 510 DSPG	6511010	206	548	2430	6500	3N-50Hz 400V	18.5+3	2000	2) 3) 4)
GI 1000 DSPG	6521010	212	890	2500	10500	3N-50Hz 400V	22+4	3000	2) 3) 5)

Heavy oil model *)	Code	Capacity		Thermal output		Electrical power supply	Motor electrical power (heating elements)		Pump l/h	Notes
		min. kg/h	max. kg/h	min. kW	max. kW					
GI 350 DSPN-D	6533010	142	425	1581	4743	3N-50Hz 400V	15+2.2	28.5	1000	2) 3) 4)
GI 420 DSPN-D	6538010	166	497	1840	5522	3N-50Hz 400V	18.5+2.2	28.5	2000	2) 3) 4)
GI 510 DSPN-D	6543010	219	582	2430	6500	3N-50Hz 400V	18.5+3	28.5	2000	2) 3) 4)
GI 1000 DSPN-D	6553010	224	940	2500	10500	3N-50Hz 400V	22+4	57	3000	2) 3) 5)

Gas model *)	Code	Capacity		Thermal output		Pressure natural gas 1)	Electrical power supply	Motor electrical power	Notes
		min. mn ³ /h	max. mn ³ /h	min. kW	max. kW				
GI 350 DSPGN	6647050	120	478	1188	4752	200	3N-50Hz 400V	15	2) 3) 7)
GI 420 DSPGN	6650050	140	558	1386	5544	200	3N-50Hz 400V	18.5	2) 3) 7)
GI 510 DSPGN	6653050	131	654	1300	6500	200	3N-50Hz 400V	18.5	2) 3) 7)
GI 1000 DSPGN	6656010	251	1056	2500	10500	350	3N-50Hz 400V	22	2) 3) 8)

Dual model Gas/Light oil *)	Code	Capacity				Thermal output		Pressure natural gas 1)	Electrical power supply	Motor electrical power	Pump l/h	Notes
		min. mn ³ /h	max. mn ³ /h	min. kg/h	max. kg/h	min. kW	max. kW					
GI MIST 350 DSPGM	6675050	160	402	134	402	1581	4743	200	3N-50Hz 400V	15+2.2	1500	2) 3) 4) 6) 7)
GI MIST 420 DSPGM	6678050	185	555	156	468	1840	5522	200	3N-50Hz 400V	18.5+2.2	1500	2) 3) 4) 6) 7)
GI MIST 510 DSPGM	6681050	244	654	206	548	2430	6500	200	3N-50Hz 400V	18.5+3	2000	2) 3) 4) 6) 7)
GI MIST 1000 DSPGM	6687010	251	1056	212	890	2500	10500	350	3N-50Hz 400V	22+4	3000	2) 3) 5) 6) 8)

Dual model Gas/Heavy oil *)	Code	Capacity				Thermal output		Pressure natural gas 1)	Electrical power supply	Motor electrical power (heating elements)		Pump l/h	Notes
		min. mn ³ /h	max. mn ³ /h	min. kg/h	max. kg/h	min. kW	max. kW						
GI MIST 350 DSPNM	6705050	160	478	142	425	1581	4743	200	3N-50Hz 400V	15+2.2	28.5	1000	2) 3) 4) 6) 7)
GI MIST 420 DSPNM	6708050	185	555	166	497	1840	5522	200	3N-50Hz 400V	18.5+3	28.5	2000	2) 3) 4) 6) 7)
GI MIST 510 DSPNM	6711050	244	654	219	582	2430	6500	200	3N-50Hz 400V	18.5+3	28.5	2000	2) 3) 4) 6) 7)
GI MIST 1000 DSPNM	6717010	251	1056	224	940	2500	10500	350	3N-50Hz 400V	22+4	57	3000	2) 3) 5) 6) 8)

*) Lower calorific output:

- **Natural gas:**
Hi = 35.90 MJ/m³ = 8 570 kcal/m³
under reference conditions 0°C,
1 013 mbar
- **Light oil:**
Hi = 42.70 MJ/kg = 10,200 kcal/kg
- **Heavy oil:**
Hi 40.19 MJ/kg = 9.600 kcal/kg

- 1) Minimum gas train supply pressure to obtain the maximum burner power with zero combustion chamber pressure.
- 2) Fitted with automatic air closing device.
- 3) For modulating mode, complete the burner with the automatic RWF 40 regulator and the modulation kit (see page 27).
- 4) To complete the burner, add the 1:3 ratio nozzle (see page 25).

- 5) To complete the burner, add the 1:5 ratio nozzle (see page 25).
- 6) Set up for automatic fuel change.
- 7) To complete the burner: pressure regulator and filter to comply with European Standard EN676. All the components must be ordered.
- 8) To complete the burner: pressure regulator and filter to comply with European Standard EN676. For the main gas train, the regulator and filter are supplied

separately; for the pilot gas train, the regulator has a built-in filter. All the components must be ordered.



Burners

Gas supply

ACCESSORIES SUPPLIED

Kit for securing to boiler.

TO COMPLETE THE BURNER

Pressure regulator and filter to comply with European Standard EN676 (see page 16)

GI 1000 Series: for the main gas train, the regulator and filter are supplied separately; for the pilot gas train, the regulator has a built-in filter. All the components must be ordered.

ON REQUEST

Modulating functioning

complete the burner with the automatic RWF40 regulator and the modulation kit (see page 27)

Gas accessories

for connection to gas mains (see page 19).

IDENTIFYING THE BURNER

When you place the order use the following symbols, indicate the burner size in the spaces.

GI...DSPGN standard burner.

TECHNICAL AND FUNCTIONAL CHARACTERISTICS

- Natural gas (G20) two progressive stage industrial burner, ideal for 200 mbar gas pressure (GI 1000 series) and 350 to 1000 mbar (for different values contact our sales office).
- Turndown ratio 1:4.
- Suitable for working with every type of combustion chamber (check flame size).
- The variation between minimum and maximum flow is electronically controlled by a servomotor that, using a variable profile cam, changes both the combustion air and the fuel flow. The combustion air reaching the head is adjusted by the main infeed throttle valves and, in the GI 1000 series, also by the automatic deflector disk movement of the diffuser that varies the passage between the head and deflector disk.
- Set up for assembly on the control panel of the automatic RWF 40 regulator (to be ordered separately, together with the appropriate modulation kit).
- Closing of the air flap during pauses to prevent flue heat dispersion.
- Maintenance facilitated by possibility of extracting mixing unit without having to dismantle burner from boiler.
- Fitted with 1 flange and 1 insulating seal for securing to boiler.
- Standard valve seal control equipment to comply with European Standard EN676.
- Air-gas mixing on blast-head.
- Possibility of obtaining excellent combustion values by regulating the combustion air and the blast-head.

CONSTRUCTION CHARACTERISTICS

The burner consists of:

- a light aluminium alloy fan part
- side combustion air intake with multiple flap damper for automatic adjustment of combustion air
- high-performance centrifugal fan
- flame viewer
- sliding flange connected to the generator to adapt the protrusion of the head to the various types of heat generators (GI 350-420-510 series)

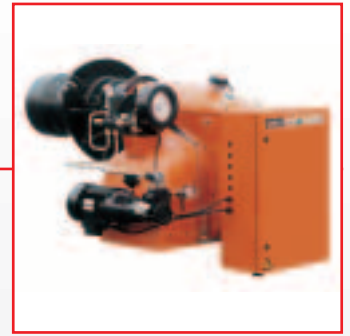
- burner connecting flange connected to the generator with hinge to facilitate dismantling of the mixing unit (GI 1000 series)
- stainless steel adjustable blast-head, nozzle and deflector disk
- three-phase electrical motor for fan
- gas train with throttle operating and safety valve, valve seal control equipment, minimum and maximum pressure switch, pressure regulator and gas filter
- air/fuel continuous modulation assembly consisting of an electrical servomotor, variable profile cams and controlled links to the air flaps, to the air adjustment unit on the blast-head (GI 1000 series) and to the gas throttle valve, with protection guards
- pressure switch to control minimum air pressure
- electrogas pilot ignition (GI 1000 series)
- automatic burner control and command equipment as per EN 230 and EN 298
- UV photocell flame presence control
- drive terminal board for burner electrical and thermostatic power supply, for commanding the second operating stage or for connecting the electronic power regulator
- control panel with start/stop switch, aut/man selector, min/max switch and operating/block state warning light display
- junction box on burner and control panel for separate electrical power supply (GI 1000 series)
- electrical system with protection rating of IP40.



Complies with:
E.M.C. Directive 89/336/CEE
L.V. Directive 73/23/CEE
Reference standard: EN676

Burners

Light oil and heavy oil burning



TECHNICAL AND FUNCTIONAL CHARACTERISTICS

- Light oil/heavy oil 2 progressive stage industrial burner.
- Turndown ratio 1:3.
- Suitable for working with every type of combustion chamber (check flame size).
- The variation between minimum and maximum flow is electronically controlled by a servomotor that, using a variable profile cam, changes both the combustion air and the fuel flow. The combustion air reaching the head is adjusted by the main infeed throttle valves and, in the GI 1000 series, also by the automatic deflector disk movement of the diffuser that varies the passage between the head and deflector disk.
- Set up for assembly on the control panel of the automatic RWF 40 regulator (to be ordered separately, together with the appropriate modulation kit).
- Closing of the air flap during pauses to prevent flue heat dispersion.
- Maintenance facilitated by possibility of extracting atomising unit without having to dismantle burner from boiler.
- Supplied with 2 flexible hoses for the fuel, 1 line filter (self-cleaning model with resistor and thermostat for heavy oil versions), 1 flange and 1 insulating seal for securing to boiler.
- Mechanical high-pressure fuel atomising using nozzle.
- Possibility of obtaining excellent combustion values by regulating the combustion air and the blast-head.
- Resistor on the atomising unit, the pump and the pressure regulator valves (for heavy oil versions only).

CONSTRUCTION CHARACTERISTICS

The burner consists of:

- a light aluminium alloy fan part
- side combustion air intake with multiple flap damper for automatic adjustment of combustion air
- high-performance centrifugal fan
- flame viewer
- sliding flange connected to the

- generator to adapt the protrusion of the head to the various types of heat generators (GI 350-420-510 series)
- burner connecting flange connected to the generator with hinge to facilitate dismantling of the atomising unit and the deflector disk (GI 1000 series)
- stainless steel adjustable blast-head, nozzle and deflector disk
- 2 three-phase electrical motors for fuel pump and fan
- gear pump with pressure regulator
- atomising unit with magnet for commanding nozzle delivery/return pins
- unit with 2 electrical pre-heaters in series with gas valve, self-cleaning filter, electronic temperature adjustment, safety thermostats and thermometer (GI 1000 series)
- fitted with electrical pre-heater with gas valve, filter, adjustment, minimum and safety thermostats and thermometer (GI 350-420-510 series)
- air/fuel continuous modulation assembly consisting of an electrical servomotor, variable profile cams and controlled links to the air flaps, to the air adjustment unit on the blast-head (GI 1000 series) and to the fuel pressure adjustment valve
- direct current electromagnet to open and close fuel supply at nozzle
- fuel pre-circulation atomising unit
- fuel flow adjuster with manometer and tap
- pressure switch to control minimum air pressure
- electrogas pilot ignition (GI 1000 series, excluding light oil version)
- automatic burner flame control and command equipment as per EN 230
- photo resistor flame presence control
- drive terminal board for burner electrical and thermostatic power supply, for commanding the second operating stage or for connecting the electronic power regulator
- control panel with start/stop switch, aut/man selector, power variation, operating/block state warning light display, tank element ON warning light for heavy oil versions
- junction box on burner and control panel for separate electrical power supply (GI 1000 series)
- electrical system with protection rating of IP40.

ACCESSORIES SUPPLIED (light oil version)

Kit for securing to boiler - Line filter and flexible hoses (see page 20).

ACCESSORIES SUPPLIED (heavy oil version)

Kit for securing to boiler - Self-cleaning line filter with resistor and thermostat - Flexible hoses (see page 20).

ON REQUEST

Modulating functioning

Complete the burner with the automatic RWF40 regulator and the modulation kit (see page 27).

1:3 ratio nozzle

GI 350-420-510 Series (see page 25).

1:5 ratio nozzle

GI 1000 Series (see page 25).

Steam pre-heater used, during standard operating, to heat the fuel with the steam of the boiler, which saves electrical energy.

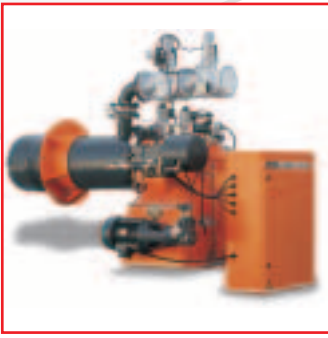
IDENTIFYING THE BURNER

When you place the order use the following symbols, indicate the burner size in the spaces.

GI...DSPG standard burner.

GI...DSPN-D standard burner.

Complies with:
E.M.C. Directive 89/336/CEE
L.V. Directive 73/23/CEE



Burners

Dual gas/light oil fuel and dual gas/heavy oil fuel

ACCESSORIES SUPPLIED (light oil version)

Kit for securing to boiler - Line filter - Flexible hoses (see page 20).

ACCESSORIES SUPPLIED (heavy oil version)

Kit for securing to boiler - Self-cleaning line filter with resistor and thermostat - Flexible hoses (see page 20).

TO COMPLETE THE BURNER

Pressure regulator and filter to comply with European Standard EN676 (see page 16)

GI 1000 Series: for the main gas train, the regulator and filter are supplied separately; for the pilot gas train, the regulator has a built-in filter. All the components must be ordered.

ON REQUEST

Modulating functioning

Complete the burner with the automatic RWF40 regulator and the modulation kit (see page 27).

1:3 ratio nozzle GI 350-420-510 Series (see page 25).

1:5 ratio nozzle GI 1000 Series (see page 25).

Steam pre-heater used, during standard operating, to heat the fuel with the steam of the boiler, which saves electrical energy.

IDENTIFYING THE BURNER

When you place the order use the following symbols, indicate the burner size in the spaces.

GI MIST...DSPGM standard burner.

GI MIST...DSPNM standard burner.

TECHNICAL AND FUNCTIONAL CHARACTERISTICS

- Dual natural gas (G20) and light oil 2 progressive stage industrial burner (GI MIST...DSPGM version), dual natural gas (G20) and heavy oil burner (GI MIST...DSPNM version), ideal for 200 mbar gas pressure, GI 1000 series, 350 to 1000 mbar (for different values contact our sales office).
- Turndown ratio 1:3.
- Suitable for working with every type of combustion chamber (check size flame)
- The variation between minimum and maximum flow is electronically controlled by a servomotor that, using a variable profile cam, changes both the combustion air and the fuel flow. The combustion air reaching the head is adjusted by the main infeed throttle valves and, in the GI 1000 series, also by the automatic deflector disk movement of the diffuser that varies the passage between the head and deflector disk.
- Set up for assembly on the control panel of the automatic RWF 40 regulator (to be ordered separately, together with the appropriate modulation kit).
- Supplied with 2 flexible hoses for the fuel, 1 line filter (self-cleaning model with resistor and thermostat for heavy oil versions), 1 flange and 1 insulating seal for securing to boiler.
- Set up for automatic fuel change.
- Closing of the air flap during pauses to prevent flue heat dispersion.
- Maintenance facilitated by possibility of extracting atomising unit without having to dismantle burner from boiler.
- Standard valve seal control equipment to comply with European Standard EN676.
- Mechanical high-pressure fuel atomising using nozzle.
- Possibility of obtaining excellent combustion values by regulating the combustion air and the blast-head.
- The burner is ideal for supplying gas, light oil or heavy oil (depending on the version) and has a selector for changing the fuel used.
- Resistors on the atomising unit, the pump and the pressure regulator valves (for heavy oil versions only).

CONSTRUCTION CHARACTERISTICS

The burner consists of:

- a light aluminium alloy fan part
- side combustion air intake with multiple flap damper for automatic adjustment of combustion air
- high-performance centrifugal fan
- flame viewer
- sliding flange connected to the generator to adapt the protrusion of the head to the various types of heat generators (excluding GI 1000)
- burner connecting flange connected to the generator with hinge to facilitate dismantling of the atomising unit and the deflector disk (GI 1000 series)
- stainless steel adjustable blast-head, nozzle and deflector disk
- 2 three-phase electrical motors for fuel pump and fan
- gear pump with pressure regulator
- atomising unit with magnet for commanding nozzle delivery/return pins
- unit with 2 electrical pre-heaters in series with gas valve, self-cleaning filter, electronic temperature adjustment, safety thermostats and thermometer (GI 1000 series)
- fitted with electrical pre-heater with gas valve, filter, adjustment, minimum and safety thermostats and thermometer (GI 350-420-510 series)
- gas train with throttle operating and safety valve, valve seal control equipment, minimum and maximum pressure switch, pressure regulator and gas filter
- air/fuel continuous modulation assembly consisting of an electrical servomotor, variable profile cams and controlled links to the air flaps, to the air adjustment unit on the blast-head (GI 1000 series) and to the gas throttle valve, with protection guards
- direct current electromagnet to open and close fuel supply at nozzle
- fuel pre-circulation atomising unit
- fuel flow adjuster with manometer and tap
- pressure switch to control minimum air pressure
- electrogas pilot ignition (GI 1000 series, excluding light oil version)

- automatic burner flame control and command equipment as per EN 230
- UV photocell flame presence control
- drive terminal board for burner electrical and thermostatic power supply, for commanding the second operating stage or for connecting the electronic power regulator
- control panel with start/stop switch, aut/man selector, power variation, operating/block state warning light display, tank element ON warning light for heavy oil versions
- junction box on burner and control panel for separate electrical power supply (GI 1000 series)
- electrical system with protection rating of IP40.

Complies with:
E.M.C. Directive 89/336/CEE
L.V. Directive 73/23/CEE
Reference standard: EN676

Flame

Adjustment of air at blast-head (GI 1000 series)



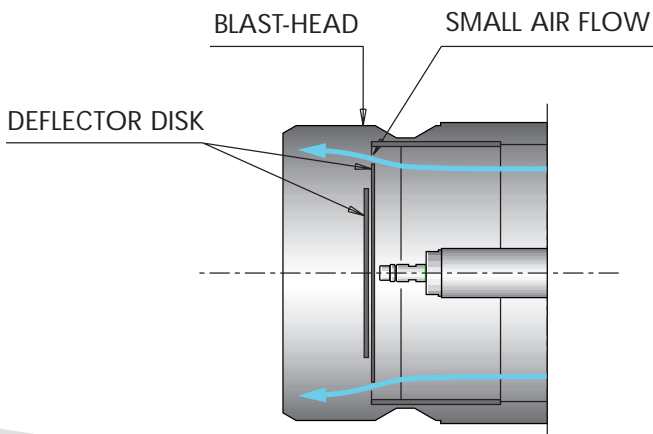
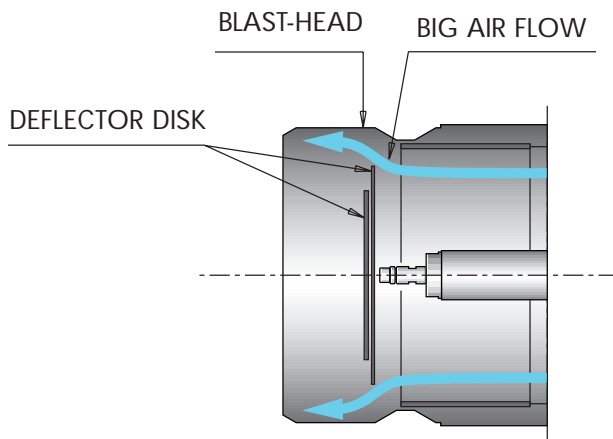
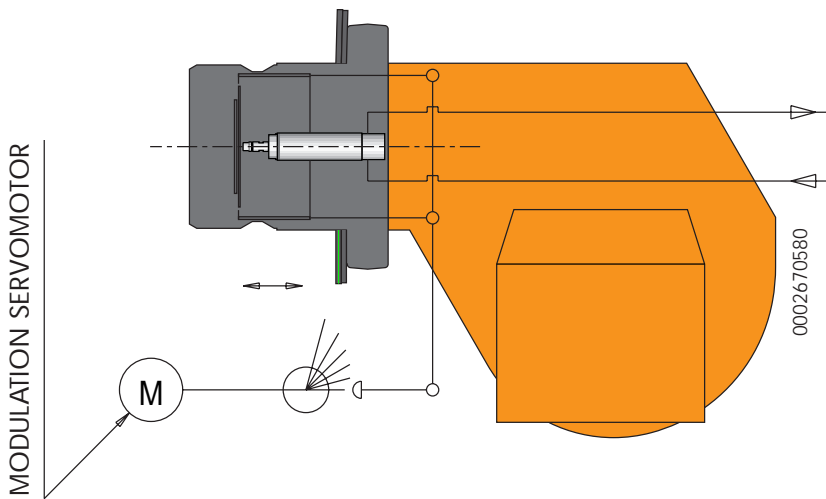
The burners have a device that automatically adjusts the flow of air between the deflector disk and the blast-tube depending on the boiler's required flow.

This narrowing of the air flow creates an

increase in pressure before the deflector disk resulting in high speed air and air turbulence, ideal conditions for optimum mixing with the fuel and good flame stability.

In addition, this high air pressure before

the disk is essential when the burner is combined with a boiler with pressurised combustion chamber and/or high thermal load chamber.

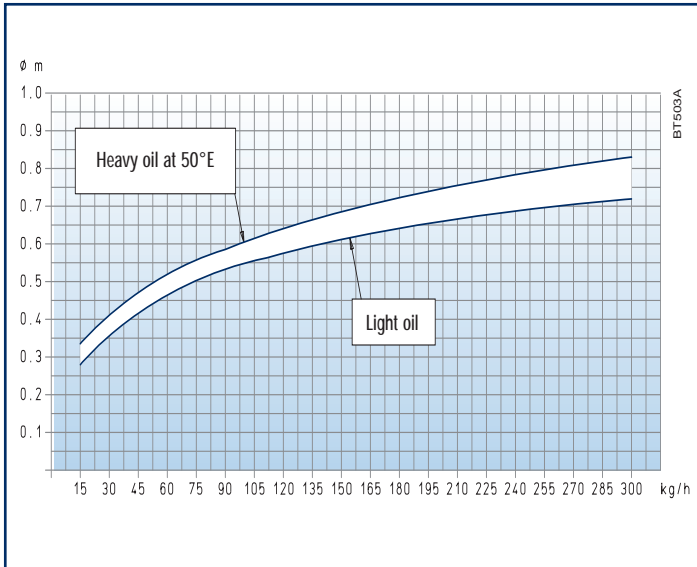




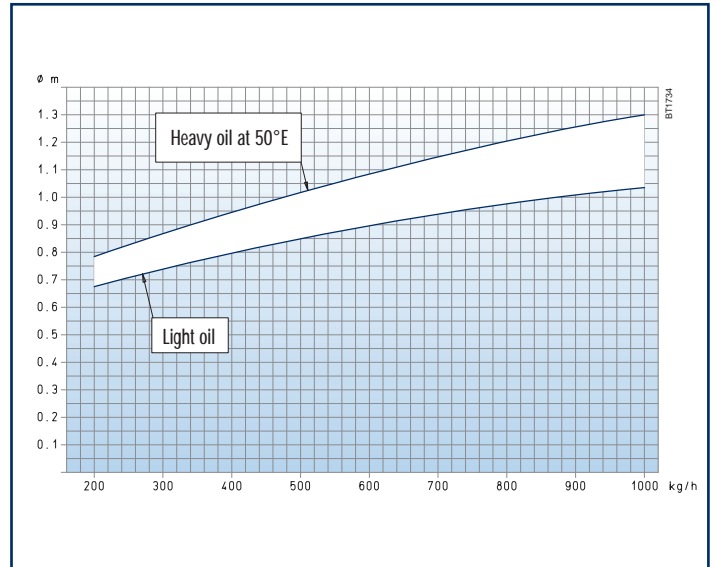
Flame

Diameter

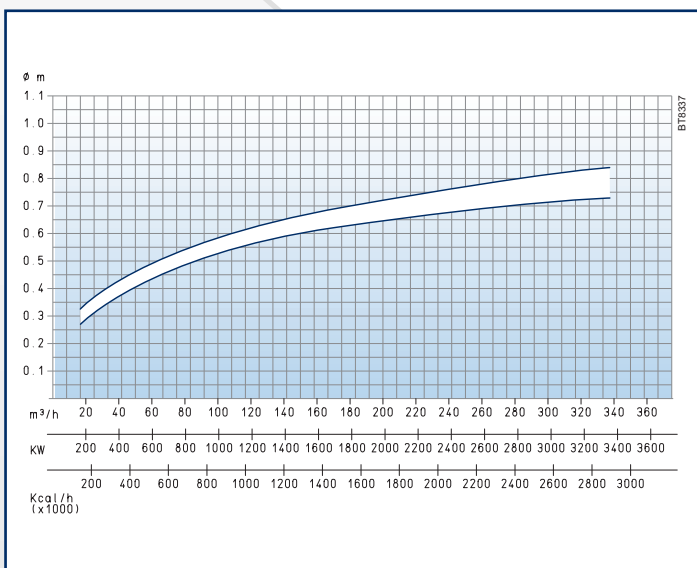
Diameter of the flame depending on of the quantity of heavy oil/light oil burnt (indicative values)



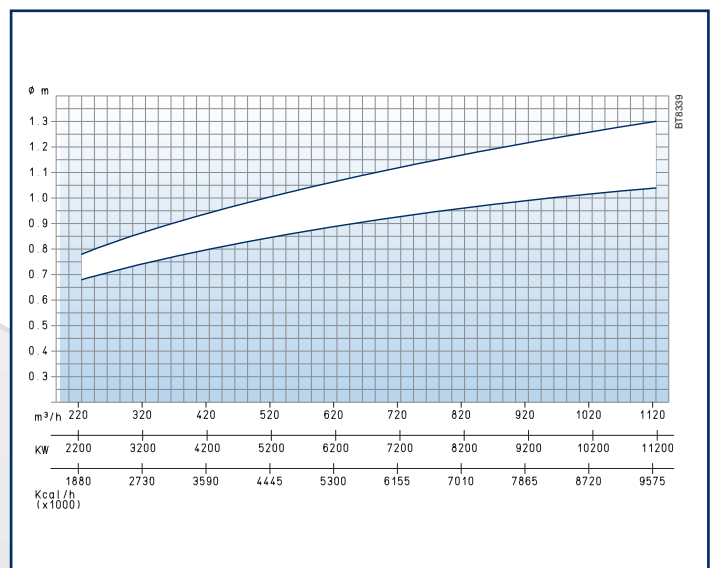
Diameter of the flame depending on of the quantity of heavy oil/light oil burnt (indicative values)



Diameter of the flame depending on of the quantity of gaseous fuel burnt (indicative values)



Diameter of the flame depending on of the quantity of gaseous fuel burnt (indicative values)

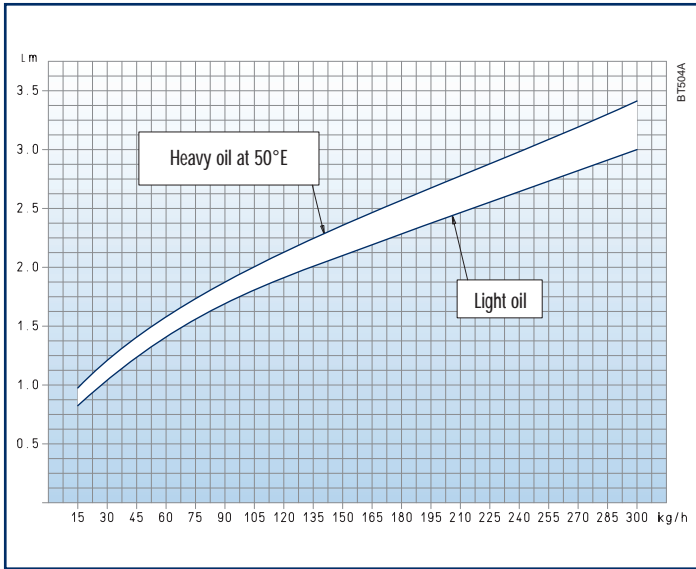


Flame

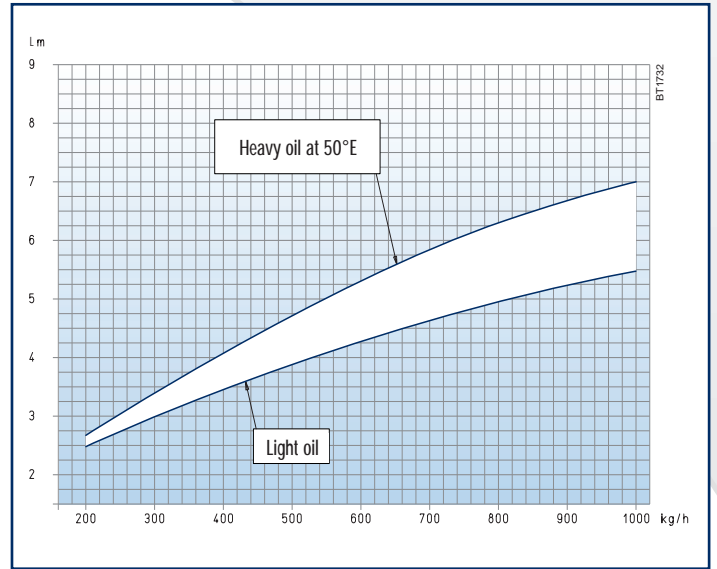
Length



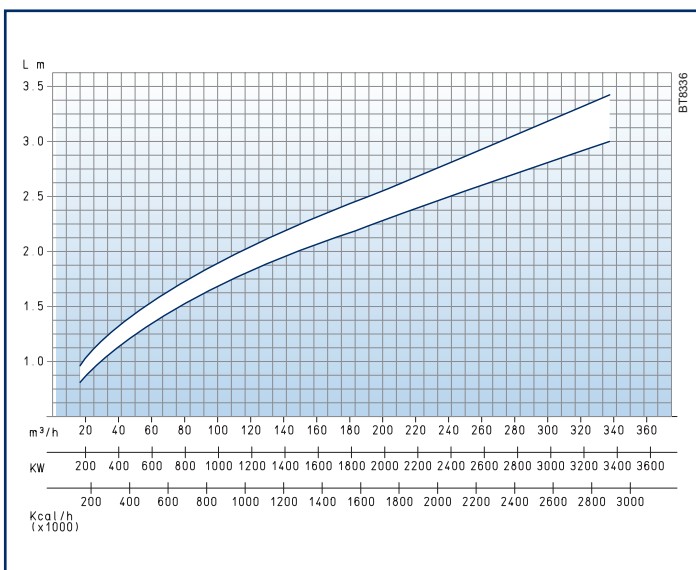
Length of the flame depending on the quantity of heavy oil/light oil burnt (indicative values)



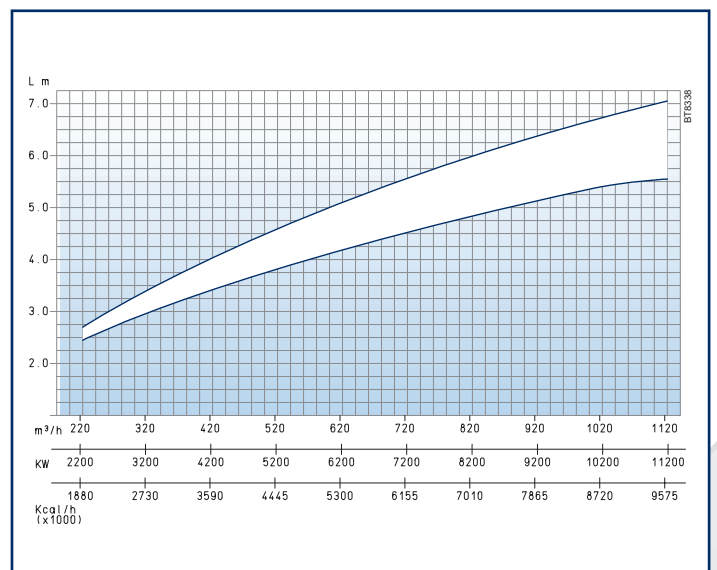
Length of the flame depending on the quantity of heavy oil/light oil burnt (indicative values)

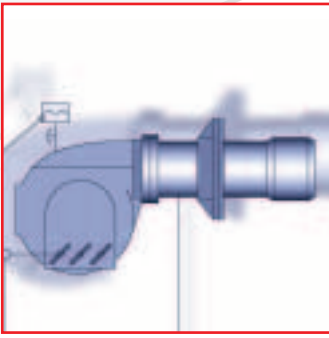


Length of the flame depending on the quantity of gaseous fuel burnt (indicative values)



Length of the flame depending on the quantity of gaseous fuel burnt (indicative values)





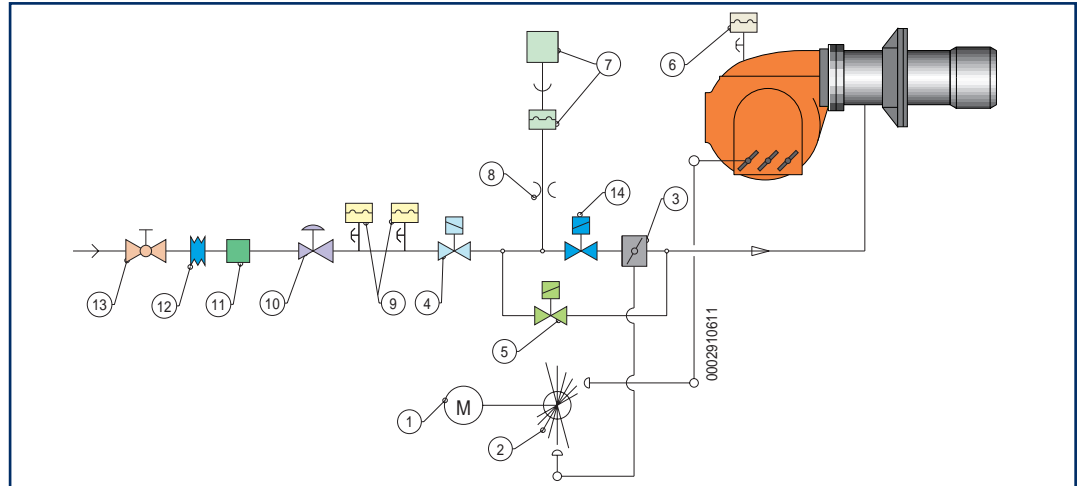
Blast-head

Supply and adjustment GI 350 - 420 - 510 series

Gas

Gas fuel legend

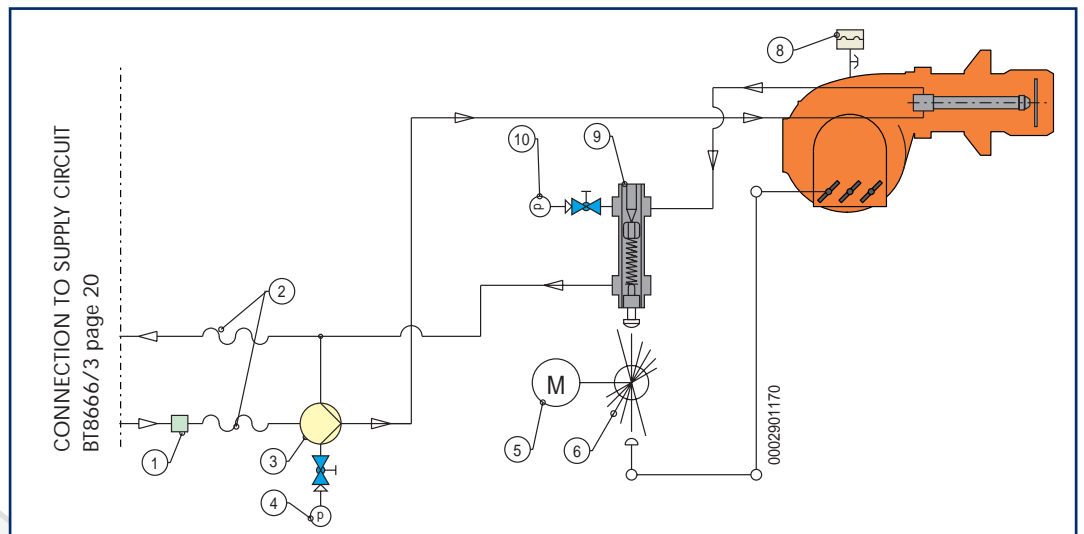
- 1 - Modulation servomotor.
- 2 - Cam with adjustment screws for air and gas feed (modulator).
- 3 - Gas flow modulating throttle valve.
- 4 - Gas safety valve.
- 5 - Pilot gas valve.
- 6 - Air pressure switch.
- 7 - Valve seal control device and corresponding pressure switch (LDU).
- 8 - Connection between main valves for the gas seal control device.
- 9 - Gas maximum and minimum pressure switch with pressure inlets.
- 10 - Gas pressure regulator.
- 11 - Gas filter.
- 12 - Vibration dampening joint.
- 13 - Ball valve.
- 14 - Gas valve for main flame.



Light oil

Light oil fuel legend

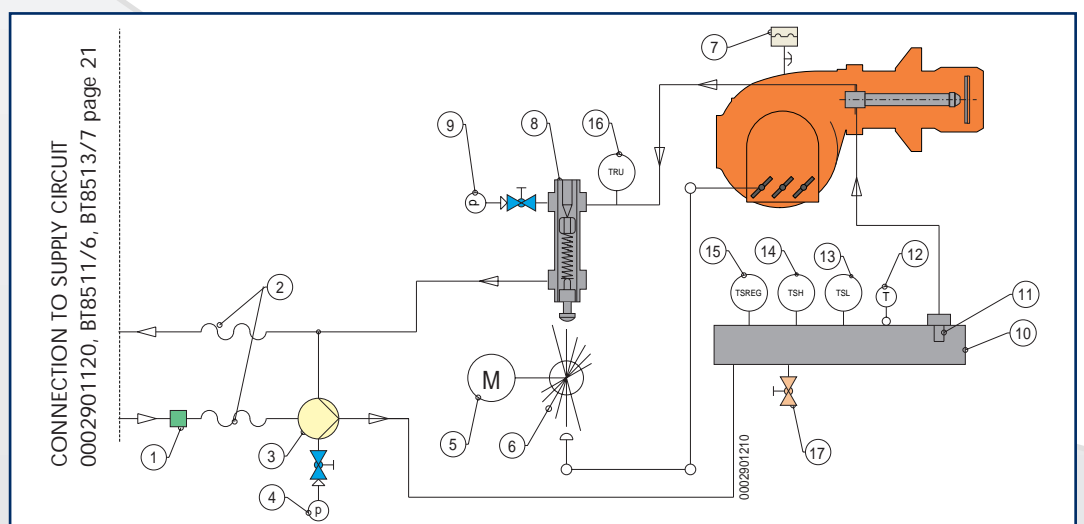
- 1 - Filter.
- 2 - Flexible hose.
- 3 - Burner pump (20-22 bar).
- 4 - Manometer (0-40 bar).
- 5 - Modulation servomotor.
- 6 - Cam with adjustment screws for air/fuel supply.
- 8 - Air pressure switch.
- 9 - Return pressure regulator, min=10-12bar max=18-20 bar.
- 10 - Manometer (0-40 bar).



Heavy oil

Heavy oil fuel legend

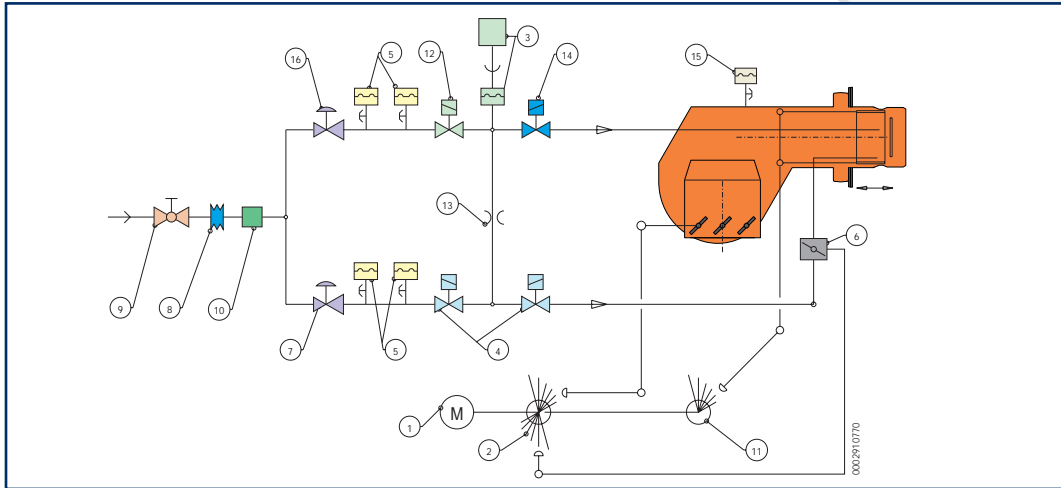
- 1 - Filter.
- 2 - Flexible hose.
- 3 - Burner pump (20-22 bar).
- 4 - Manometer (0-40 bar).
- 5 - Modulation servomotor.
- 6 - Cam with adjustment screws for air/fuel supply.
- 7 - Air pressure switch.
- 8 - Return pressure regulator, min=10-12bar max=18-20 bar.
- 9 - Manometer (0-40 bar).
- 10 - electrical pre-heater.
- 11 - Self-cleaning filter 0.3 mm
- 12 - Thermometer.
- 13 - Minimum pre-heater thermostat, (50-230°C).
- 14 - Safety pre-heater thermostat, (230°C).
- 15 - Adjustment pre-heater thermostat, (50-230°C).
- 16 - Nozzle return thermostat (70-130°C).
- 17 - Water and plant discharging.



Blast-head

Supply and adjustment GI 1000 Series

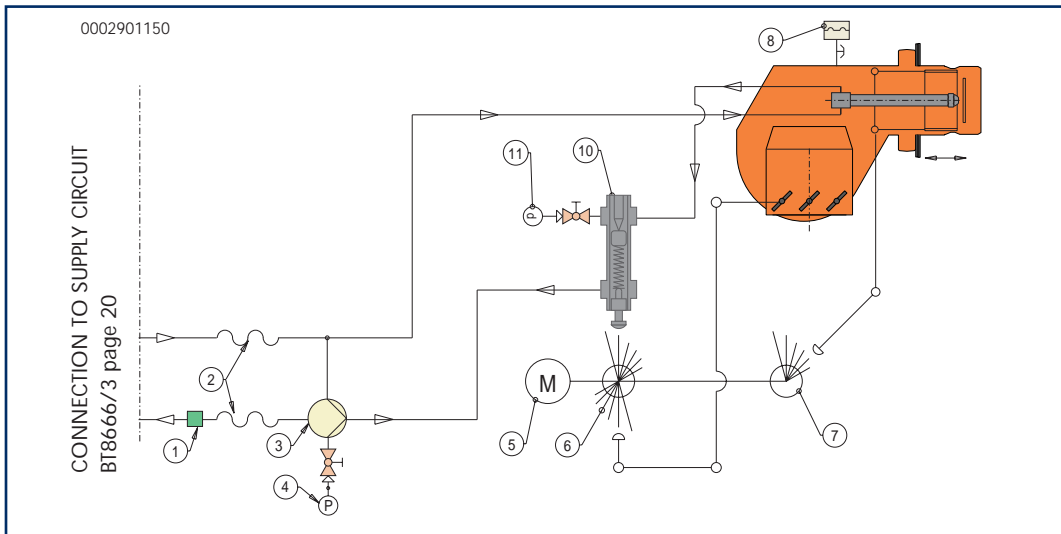
Gas



Gas fuel legend

- 1 - Modulation servomotor.
- 2 - Cam with adjustment screws for air and gas feed (modulator).
- 3 - Valve seal control device and corresponding pressure switch (LDU)
- 4 - Gas valves for main flame.
- 5 - Gas maximum and minimum pressure switch with pressure intakes.
- 6 - Gas flow modulating throttle valve.
- 7 - Main gas train pressure regulator.
- 8 - Vibration dampening joint.
- 9 - Ball valve.
- 10 - Gas filter.
- 11 - Cam with adjustment screws to regulate air to the head.
- 12 - Pilot light gas flame safety valve.
- 13 - Connection between main valves for the gas seal control device.
- 14 - Main gas valve for pilot light with flow regulator.
- 15 - Air pressure switch.
- 16 - Pressure regulator with built-in pilot train filter.

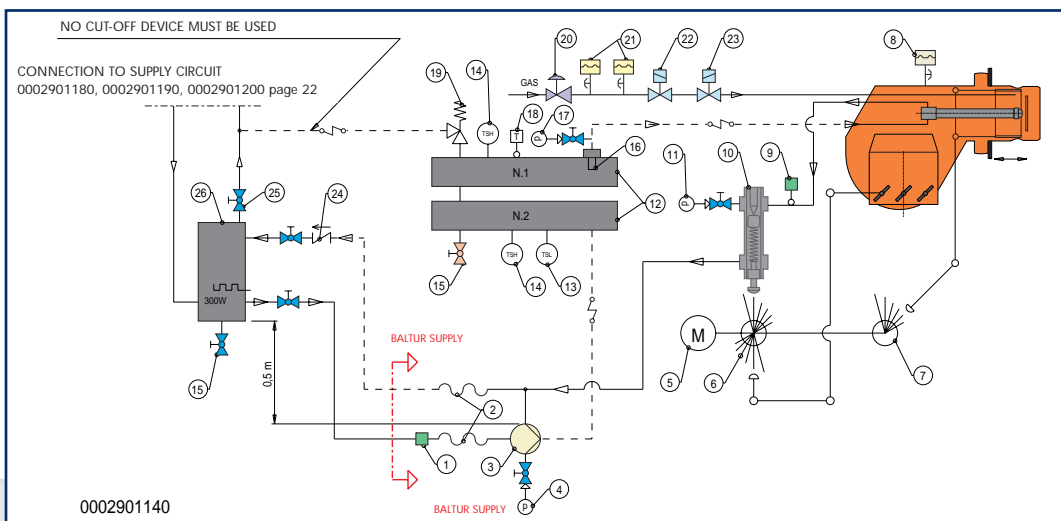
Light oil

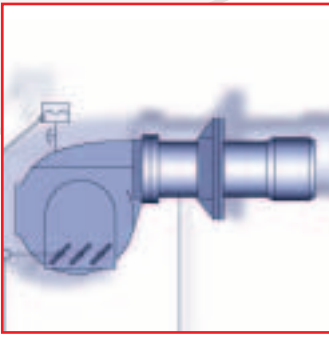


Light oil and heavy oil fuel legend

- 1 - Filter.
 - 2 - Flexible hose.
 - 3 - Burner pump (20-22 bar).
 - 4 - Manometer (0-40 bar).
 - 5 - Modulation servomotor.
 - 6 - Cam with adjustment screws for air/fuel supply.
 - 7 - Cam with adjustment screws to regulate air to the head.
 - 8 - Air pressure switch.
 - 9 - Nozzle return thermostat (70-130°C).
 - 10 - Return pressure regulator, min=10-12bar max=18-20 bar.
 - 11 - Manometer (0-40 bar).
 - 12 - electrical pre-heaters.
 - 13 - Minimum pre-heater thermostat (electronic).
 - 14 - Safety pre-heater thermostat, (230°C).
 - 15 - Water and plant discharging.
 - 16 - Self-cleaning filter 0,3 mm
 - 17 - Manometer (0-40 bar).
 - 18 - Thermostat and thermometer probe.
 - 19 - Safety pre-heater regulator (adjusted to 32 bar).
 - 20 - Reduction unit or (pilot) pressure stabiliser.
 - 21 - Gas maximum and minimum pressure switch with pressure intakes.
 - 22 - Pilot light gas flame safety valve.
 - 23 - Main gas valve for pilot light with flow regulator.
 - 24 - Nonreturn valve.
 - 25 - Normally-closed air/gas discharge valve, to open slightly in case of gas discharge.
 - 26 - Degassing and fuel recovery tank with element.
- Piping work to be carried out by installing technician..
- Electrical heating cable and insulation required for viscosity > 380 cSt (50°C) with reference to fuel temperature in the ring circuit.

Heavy oil



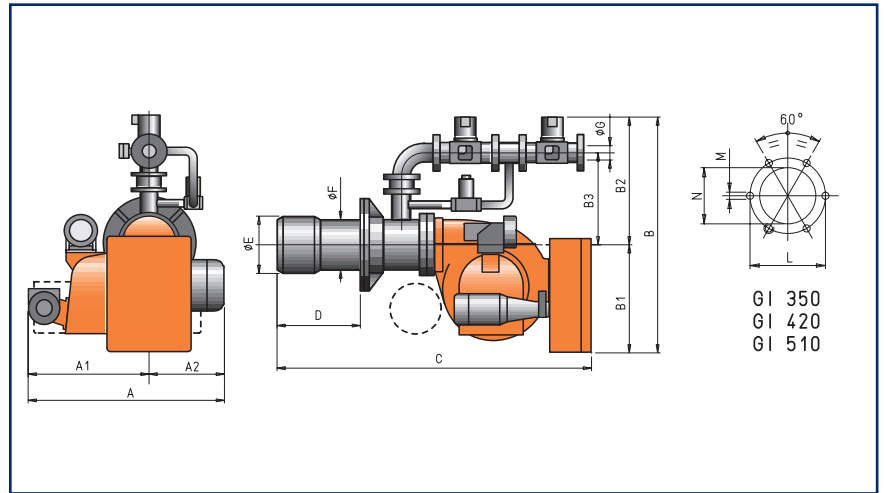


Size

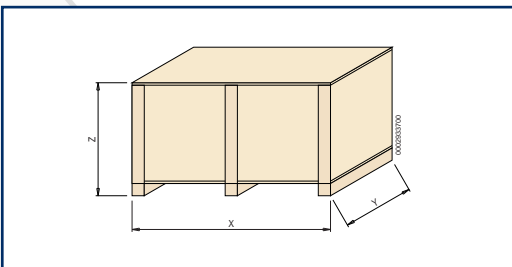
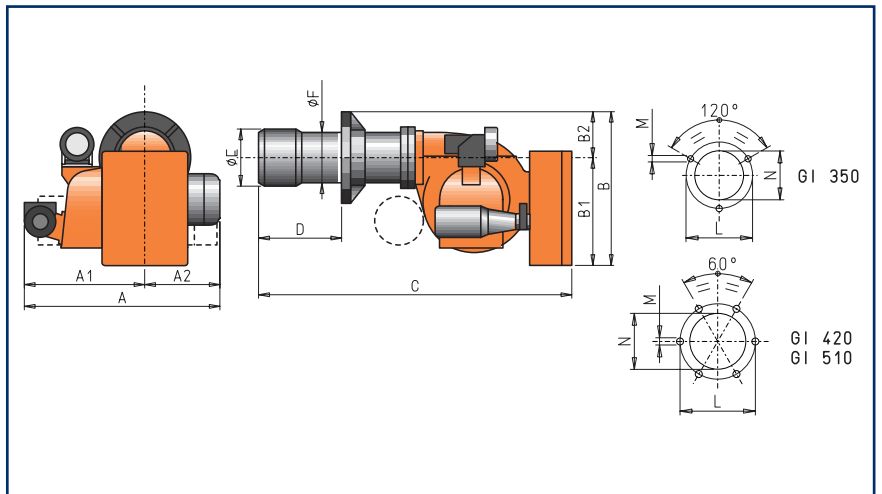
GI 350 - 420 - 510 series

Gas - Dual

Model	Size			Weight including packaging (kg)
	X	Y	Z	
GI 350 DSPG	2260	1520	1200	500
GI 420 DSPG	2260	1520	1200	540
GI 510 DSPG	2260	1520	1200	580
GI 350 DSPN-D	2260	1520	1200	578
GI 420 DSPN-D	2260	1520	1200	672
GI 510 DSPN-D	2260	1520	1200	704
GI 350 DSPGN	2260	1520	1200	363
GI 420 DSPGN	2260	1520	1200	415
GI 510 DSPGN	2260	1520	1200	415
GI MIST 350 DSPGM	2260	1520	1200	640
GI MIST 420 DSPGM	2260	1520	1200	680
GI MIST 510 DSPGM	2260	1520	1200	700
GI MIST 350 DSPNM	2260	1520	1200	802
GI MIST 420 DSPNM	2260	1520	1200	847
GI MIST 510 DSPNM	2260	1520	1200	870



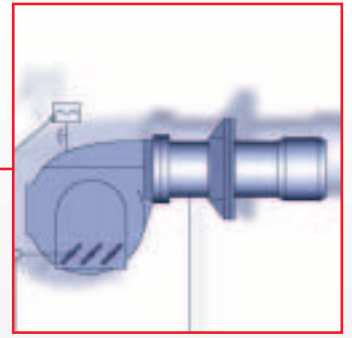
Light oil - Heavy oil



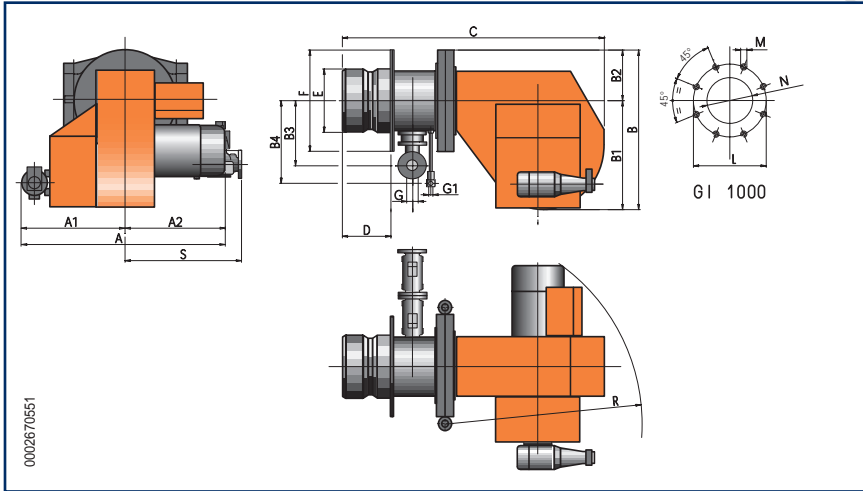
Model	A	A1	A2	B	B1	B2	B3	B4	C	D		E	F	G	G1	I	I1		L	M	N	R	S
										min	max						min	max					
GI 350 DSPG	1345	660	685	1010	750	260	-	-	1900	275	500	360	275	-	-	-			M20	400	-	-	
GI 420 DSPG	1345	660	685	1040	750	290	-	-	2030	275	560	355	355	-	-	-			M20	400	-	-	
GI 510 DSPG	1345	660	685	1040	750	290	-	-	2030	275	560	355	355	-	-	-			M20	420	-	-	
GI 350 DSPN-D	1345	660	685	1010	750	260			1900	275	500	360	275			490			M20	400	-	-	
GI 420 DSPN-D	1345	660	685	1040	750	290	-	-	2030	275	560	400	355	-	-	520			M20	420	-	-	
GI 510 DSPN-D	1345	660	685	1040	750	290	-	-	2030	275	560	400	355	-	-	520			M20	420	-	-	
GI 350 DSPGN	1160	490	670	1585	750	835	545	-	1970	230	600	355	325	DN65	-	480			M20	375	-	-	
GI 420 DSPGN	1175	490	685	1530	750	780	490	-	2030	320	625	400	355	DN65	-	520			M20	420	-	-	
GI 510 DSPGN	1175	490	685	1540	750	790	495	-	2030	320	625	400	355	DN80	-	520			M20	420	-	-	
GI MIST 350 DSPGM	1345	660	685	1585	750	835	545	-	1970	230	600	355	325	DN65	-	480			M20	375	-	-	
GI MIST 420 DSPGM	1345	660	685	1530	750	780	490	-	2030	320	625	400	355	DN65	-	520			M20	420	-	-	
GI MIST 510 DSPGM	1345	660	685	1540	750	790	495	-	2030	320	625	400	355	DN80	-	520			M20	420	-	-	
GI MIST 350 DSPNM	1345	660	685	1585	750	835	545	-	1970	230	600	355	325	DN65	-	480			M20	375	-	-	
GI MIST 420 DSPNM	1345	660	685	1530	750	780	490	-	2030	320	625	400	355	DN65	-	520			M20	420	-	-	
GI MIST 510 DSPNM	1345	660	685	1540	750	790	495	-	2030	320	625	400	355	DN80	-	520			M20	420	-	-	

Size

GI 1000 Series

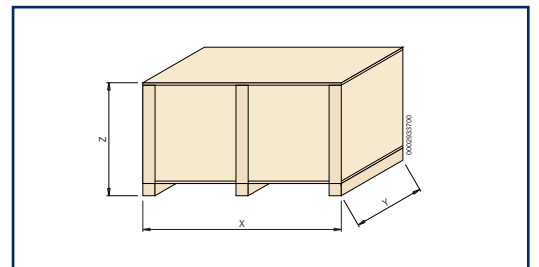
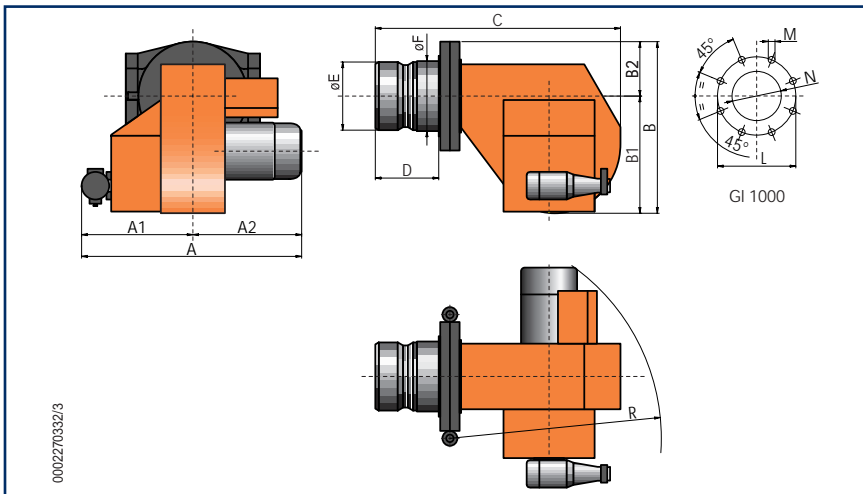


Gas - Dual

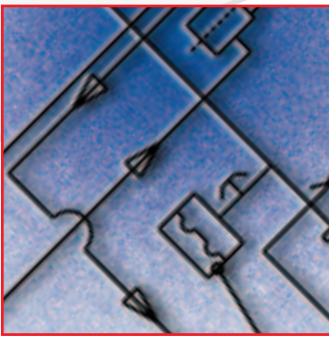


Model	Size			Weight including packaging (kg)
	X	Y	Z	
GI 1000 DSPG	2250	1710	1450	900
GI 1000 DSPN-D	2250	1710	1450	1040
GI 1000 DSPGN	2250	1710	1450	930
GI MIST 1000 DSPGM	2350	1450	1600	980
GI MIST 1000 DSPNM	2250	1710	1450	1450

Light oil - Heavy oil

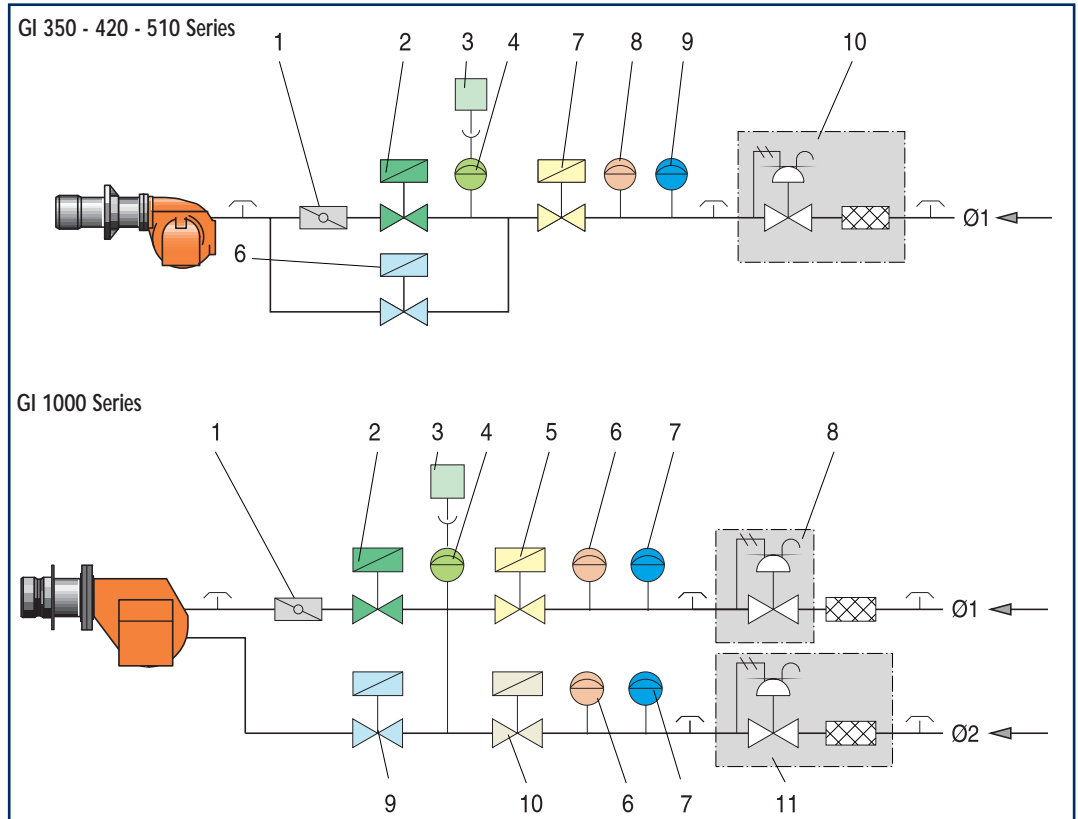


Model	A	A1	A2	B	B1	B2	B3	B4	C	D		E	F	G	G1	I	I1		L	M	N	R	S
										min	max						min	max					
GI 1000 DSPG	1465	800	665	1257	855	402			1710	460	-	480	490	-	-	-	765	-	M16	495	1360	-	
GI 1000 DSPN-D	1465	800	665	1257	855	402			1710	460	-	480	490	-	Rp1/2	-	765	-	M16	495	1360	-	
GI 1000 DSPGN	1235	570	665	1257	855	402	200	275	2060	440	-	480	685	DN100	Rp1/2	-	630	-	M16	495	1360	795	
GI MIST 1000 DSPGM	1465	800	665	1257	855	402	200	275	2060	440	-	480	685	DN80	Rp1/2	-	630	-	M16	495	1360	795	
GI MIST 1000 DSPNM	1465	800	665	1257	855	402	200	275	2060	440	-	480	685	DN80	Rp1/2	-	630	-	M16	495	1350	795	



GI 350 - 420 - 510 series legend

- 1 - Flow throttle valve.
- 2 - Main work valve.
- 3 - LDU valve seal control.
- 4 - Valve seal control pressure switch
- 6 - Pilot valve with flow regulator.
- 7 - Safety valve.
- 8 - Minimum pressure switch.
- 9 - Maximum pressure switch.
- 10 - Pressure regulator with built-in filter.
- Ø1- Reinforcement diameter.



GI 1000 series legend

- 1 - Flow throttle valve.
- 2 - Main work valve.
- 3 - LDU valve seal control.
- 4 - Valve seal control pressure switch
- 5 - Safety valve.
- 6 - Minimum pressure switch.
- 7 - Maximum pressure switch.
- 8 - Main train pressure regulator with separate filter.
- 9 - Pilot work valve with flow regulator.
- 10 - Pilot safety valve.
- 11 - Pressure regulator with built-in pilot train filter.
- Ø1- Main train reinforcement diameter.
- Ø2- Pilot train reinforcement diameter.

Burner/ pressure regulator combination legend

- Carried out by the installing technician.
- * Component supplied separately.
- ** Component required but not supplied. Refer to accessories on page 19.

- 1) Main train regulator.
- 2) Main train filter.
- 3) Pilot regulator with built-in filter.

Gas/dual burner model	1	2	3	4	5	6	7	8	9	10	11	Ø1	Ø2
GI 350 ...	DK50	ø 2"	●	●	●	ø 1 1/2"	DN65	●	●	DN65	-	DN65	-
GI 420 ...	DK65	DN65	●	●	●	ø 1 1/2"	DN65	●	●	DN80	-	DN80	-
GI 510 ...	DK80	DN80	●	●	●	ø 1 1/2"	DN80	●	●	DN80	-	DN80	-
GI 1000 ...	DK80	DN80	●	●	●	DN80	●	●	DN100	ø 1/2"	ø 1/2"	ø 1/2"	DN100 ø 1/2"

Burner/pressure regulator combination

Burner model	Code	Gas type	Gas pr. (mbar)
GI 350 DSPGN	97390074	NATURAL	200
GI 420 DSPGN	97390083	NATURAL	200
GI 510 DSPGN	97390083	NATURAL	200
	97390636 1)		
GI 1000 DSPGN	97439999 2)	NATURAL	350
	97390312 3)		

The supply

The gas train consists of the following:

- throttle valve
- main valve
- main safety valve
- main pilot valve
- pilot safety valve (GI 1000 series)
- minimum pressure switch for main gas train
- maximum pressure switch for main gas train
- minimum pressure switch for pilot TAGgas train (GI 1000 series)
- maximum pressure switch for pilot TAGgas train (GI 1000 series)
- seal control pressure switch.

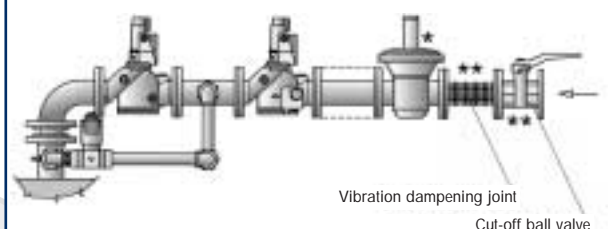
To complete the burner

Pressure regulator and filter to comply with European Standard EN676 (see Table above). For the main gas train, the regulator and filter are supplied separately (GI 1000 series); for the pilot gas train, the regulator has a built-in filter (GI 1000 series). All the components must be ordered.

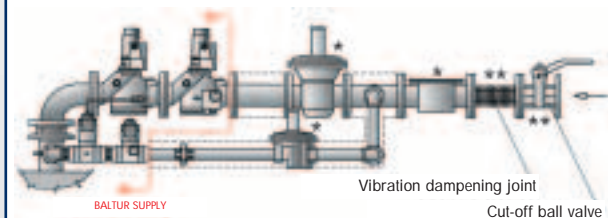
Modulating functioning

Complete the burner with the automatic RWF40 regulator and the modulation kit (see page 27).

GI 350 - 420 - 510 series

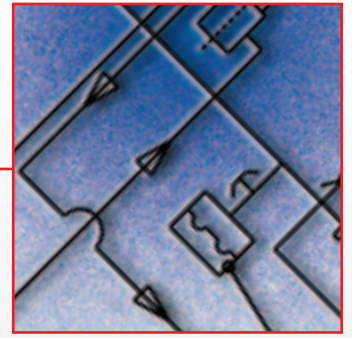


GI 1000 Series



Gas supply

Train



Gas train flow check standard

You can check the supply of the standard gas train in accordance with the gas pressure available, using the diagram below (standard train curve).

The following must first be known:

- The thermal power of the boiler's burner Q_i [kW], identified along the x-axis
- The gas pressure available at the pressure regulator P_g (mbar), identified along the y-axis.

This pressure is obtained from the following formula:

$$P_g = P_a - P_c$$

Where:

P_a = the pressure of the gas in the mains
 P_c = the pressure in the boiler's combustion chamber.

The cross over point of the two lines identifies the working point of the gas train.

The standard gas train is correct if the working point is above the curve (standard ramp); if it is below the curve,

you must request a non-standard train (consult our sales office).

Example of standard train check

GI 350 DSPGN

$Q_i = 3,800$ kW

$P_a = 200$ mbar

$P_c = 14$ mbar

$P_g = 200 - 14 = 186$ mbar

Standard train OK.

operating mode (train curve 1). To check the flow of train 1, do exactly the same as described above.

Example of train 1 check

GI 350 DSPGN

$Q_i = 3,200$ kW

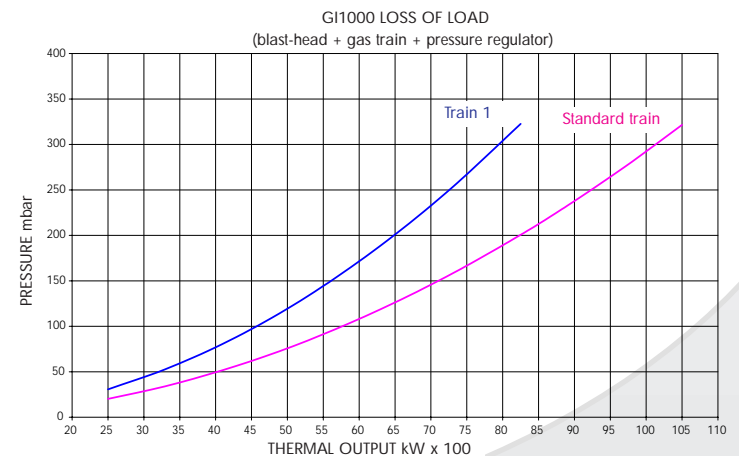
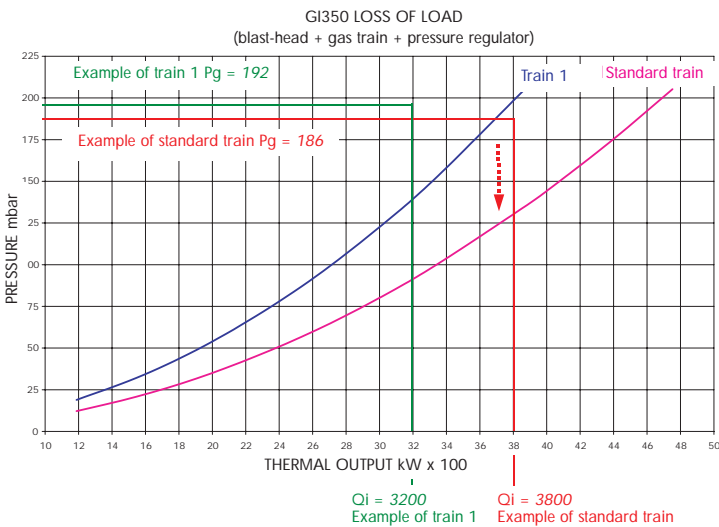
$P_a = 200$ mbar

$P_c = 8$ mbar

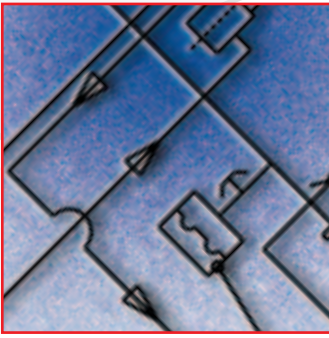
$P_g = 200 - 8 = 192$ mbar

Train 1 OK.

When you do not have to use the burner at full power, there is a more economic



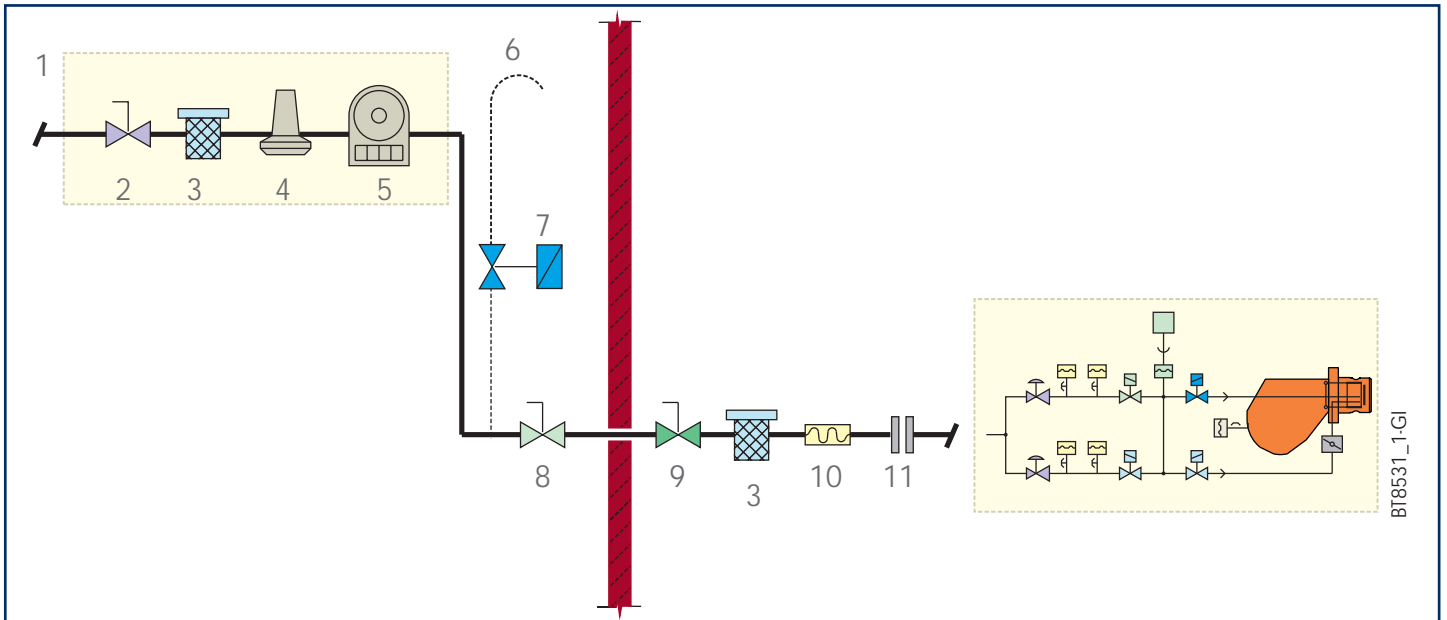
Note: Please contact our sales department for working points not identifiable within the diagram.



Gas supply

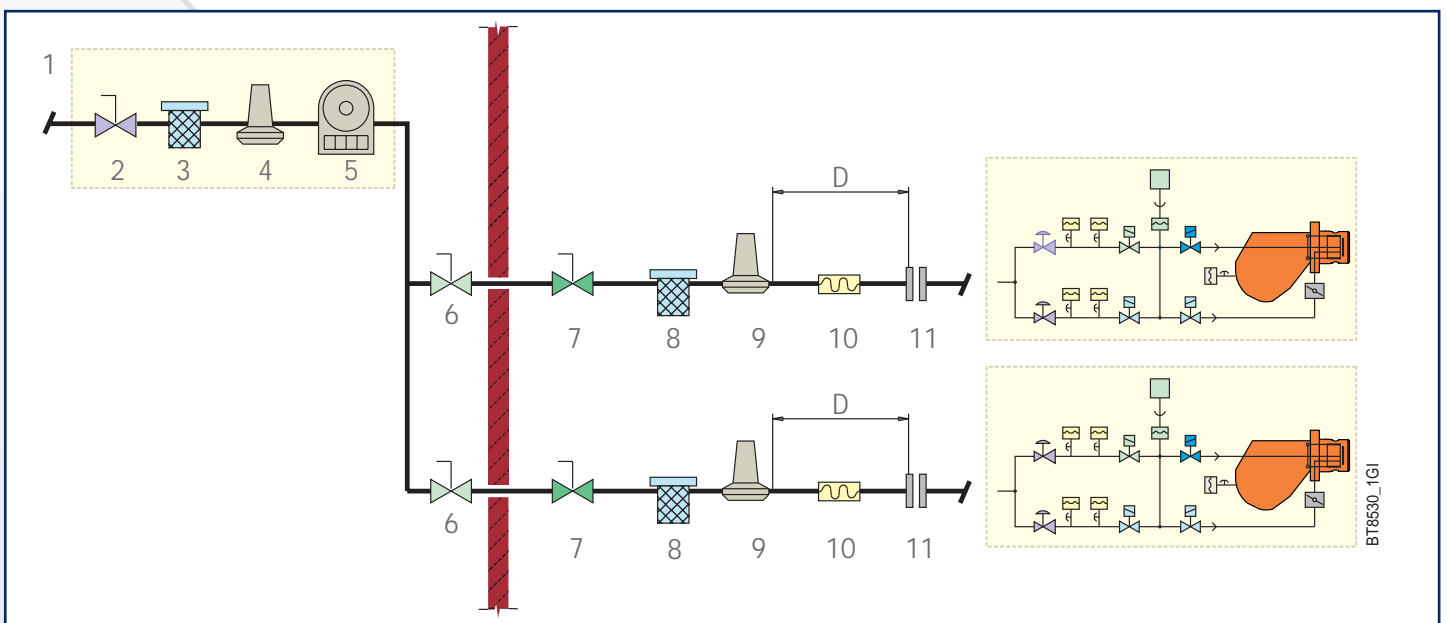
Connection circuit

Diagram for the connection of a burner to the gas mains at average pressure



- Legend**
- | | | | |
|---|--|---|---------------------------------|
| 1 - Central reduction and measurement unit. | 4 - Pressure reducer. | 7 - Possible automatic bleed valve (must discharge externally in suitable place). | 9 - Ball valve. |
| 2 - Ball valve. | 5 - Flow meter. | 8 - Emergency valve. | 10 - Vibration dampening joint. |
| 3 - Gas filter. | 6 - Discharge into the atmosphere with flame trap net. | | 11 - Flange coupling. |

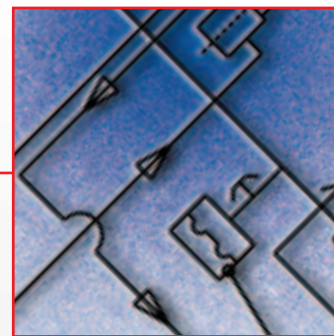
General diagram for the connection of more burners to the gas mains at average pressure



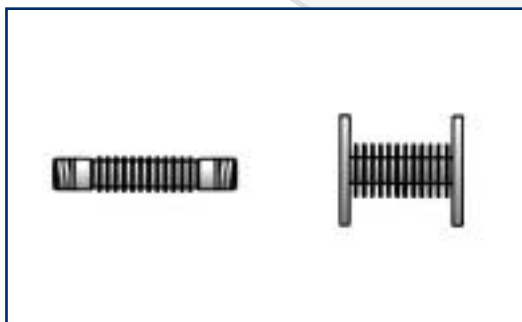
- Legend**
- | | | | |
|---|--------------------------------|---|--|
| 1 - Central reduction and measurement unit. | 5 - Flow meter. | regulator/stabiliser (suited to the specific case). | regulator/stabiliser) and gas valve at least 1.5 - 2 m). |
| 2 - Ball valve. | 6 - Emergency valve. | 10 - Vibration dampening joint. | |
| 3 - Gas filter. | 7 - Ball valve. | 11 - Flange coupling. | |
| 4 - Pressure reducer. | 8 - Gas filter. | D - Distance between stabiliser (or | |
| | 9 - Reduction unit or pressure | | |

Gas supply

Accessories for the connection of burners to gas mains

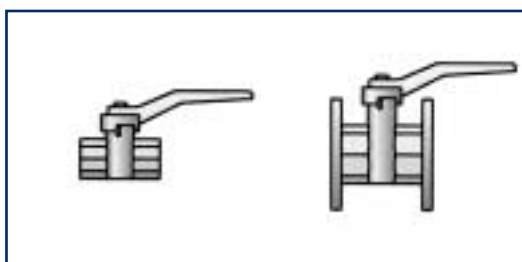


Code	Model	Gas connection
97029999	BTGA	1/2" MM
97089999	BTGA (ref. GAF 65)	DN 65 - PN 16
97099999	BTGA (ref. GAF 80)	DN 80 - PN 16
97109999	BTGA (ref. GAF 100)	DN 100 - PN 16

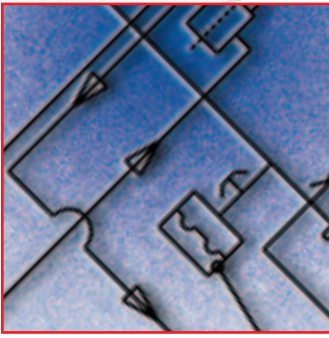


Vibration dampening and compensation joints (stainless steel, as per DIN 80631 standards).

Code	Model	Gas connection
97689999	BTVS	1/2" FF
97749999	BTVS	DN 65
97759999	BTVS	DN 80
97769999	BTVS	DN 100



Ball valves



Light oil supply

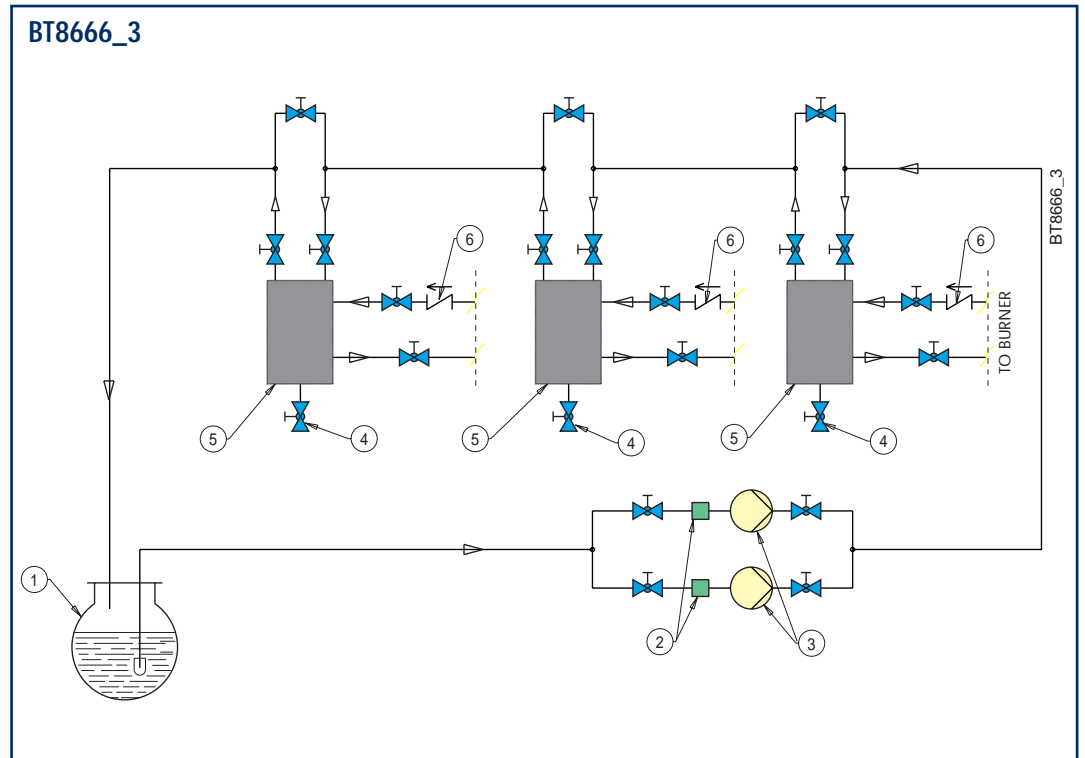
Hydraulic circuit

Hydraulic circuit diagram for feeding one or more two-stage or modulating light oil burners

Legend

- 1 - Main tank.
- 2 - Filter.
- 3 - Circulation pump.
- 4 - Water and plant discharging.
- 5 - Degassing and fuel recovery tank.
- 6 - Nonreturn valve.

N.B.
The fuel recovery tanks (diameter 150 mm, height 400 mm) must be installed as near as possible to the burner at a height of at least 0.5 m above the burner pump.



Note: Please contact our sales department for the size of the supply circuit.

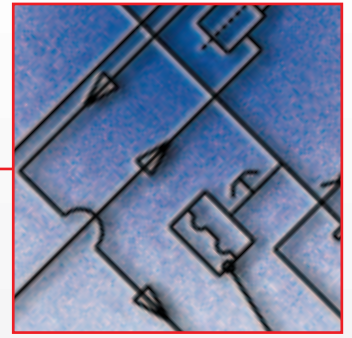
GI series accessories supplied... - Light oil and heavy oil supply

Burner model	Length of flex. hoses	Flexible return hose connection	Self-cleaning filter	Filter connection	Filtering level (filter)
GI 350 DSPG	1500 mm	R1" 1/2	NO	Rp 1" 1/2	100 micron
GI 420 DSPG	1500 mm	R1" 1/2	NO	Rp 1" 1/2	100 micron
GI 510 DSPG	1500 mm	R1" 1/2	NO	Rp 1" 1/2	100 micron
GI 1000 DSPG	1500 mm	R1" 1/2	NO	Rp 1" 1/2	100 micron
GI 350 DSPN-D	1500 mm	R1" 1/2	YES	Rp 1" 1/2	500 micron
GI 420 DSPN-D	1500 mm	R1" 1/2	YES	Rp 1" 1/2	500 micron
GI 510 DSPN-D	1500 mm	R1" 1/2	YES	Rp 1" 1/2	500 micron
GI 1000 DSPN-D	1500 mm	R1" 1/2	YES	Rp 1" 1/2	500 micron
GI MIST 350 DSPGM	1500 mm	R1" 1/2	NO	Rp 1" 1/2	100 micron
GI MIST 420 DSPGM	1500 mm	R1" 1/2	NO	Rp 1" 1/2	100 micron
GI MIST 510 DSPGM	1500 mm	R1" 1/2	NO	Rp 1" 1/2	100 micron
GI MIST 1000 DSPGM	1500 mm	R1" 1/2	NO	Rp 1" 1/2	100 micron
GI MIST 350 DSPNM	1500 mm	R1" 1/2	YES	Rp 1" 1/2	500 micron
GI MIST 420 DSPNM	1500 mm	R1" 1/2	YES	Rp 1" 1/2	500 micron
GI MIST 510 DSPNM	1500 mm	R1" 1/2	YES	Rp 1" 1/2	500 micron
GI MIST 1000 DSPNM	1500 mm	R1" 1/2	YES	Rp 1" 1/2	500 micron

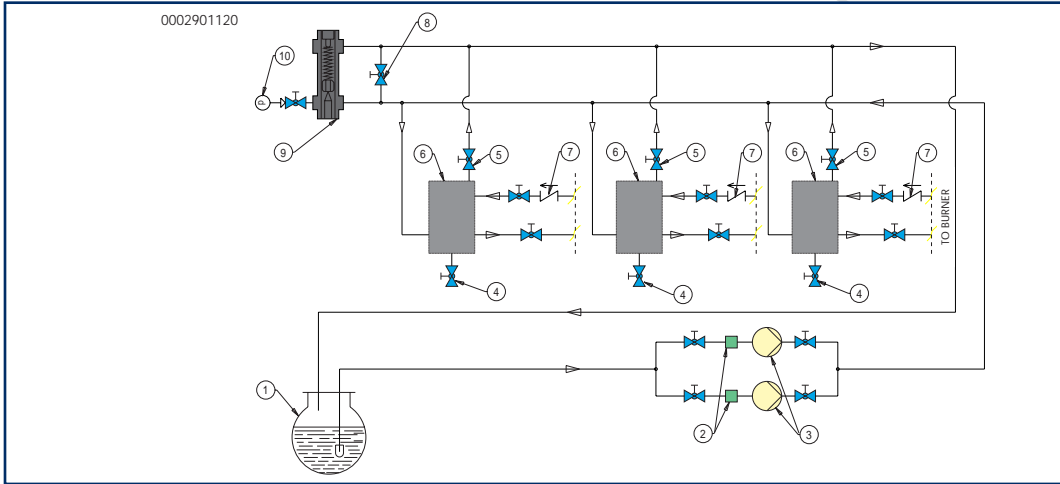
* Self-cleaning filter with 300W resistor and adjustable thermostat (0-90°C)

Heavy oil feed

GI 350 - 420 - 510 series



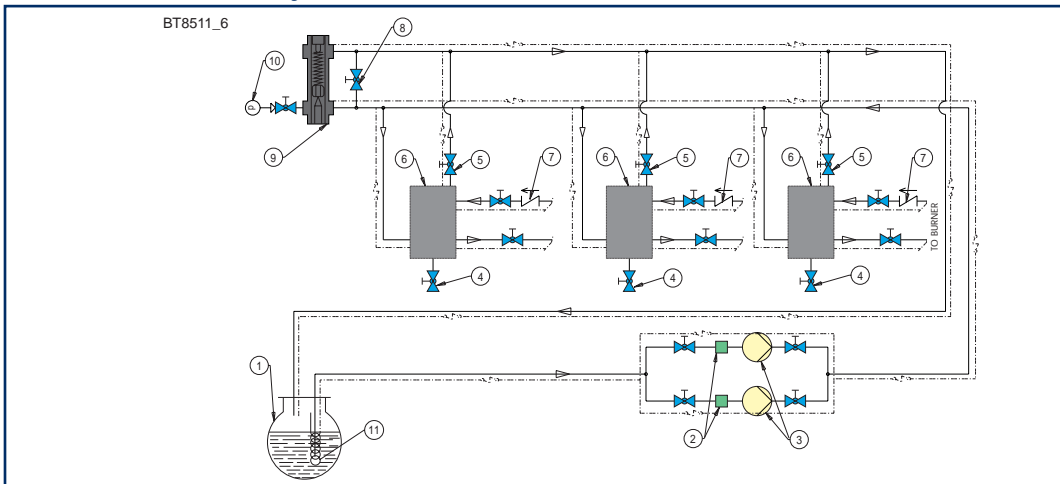
Hydraulic circuit diagram for feeding one or more two-stage or modulating heavy oil burners with nominal max. viscosity 38 cSt (5°E) at 50°C



Legend

- 1 - Main tank.
 - 2 - Filter.
 - 3 - Circulation pump.
 - 4 - Water and plant discharging.
 - 5 - Normally-closed air/gas discharge valve, to open slightly in case of gas discharge.
 - 6 - Degassing and fuel recovery tank.
 - 7 - Nonreturn valve.
 - 8 - By pass (normally closed).
 - 9 - Adjustable pressure regulator from 0.5 to 3 bar.
 - 10 - Manometer (0-4 bar).
 - 11 - Steam or hot water pipe coil for heating heavy oil.
 - 12 - Element.
 - 13 - Auxiliary heater.
 - 14 - Steam or hot water pipe coil for heating oil.
 - 15 - Thermometer.
 - 16 - Tank, diameter 150 mm, height 350 mm.
- Electrical heating cable and insulation required for viscosity > 380 cSt (50°E) with reference to fuel temperature in the ring circuit.

Hydraulic circuit diagram for feeding one or more two-stage or modulating heavy oil burners with nominal max. viscosity 115 cSt (5°E) at 50°C



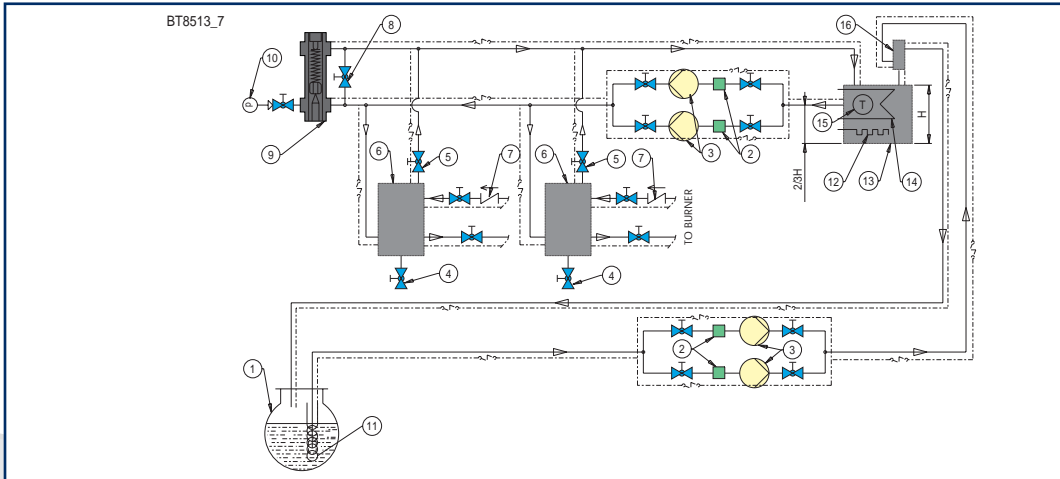
N.B.

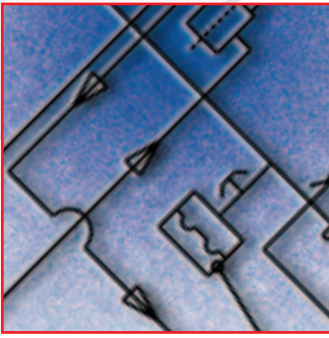
The fuel recovery tanks (diameter 150 mm, height 400 mm) must be installed as near as possible to the burner at a height of at least 0.5 m above the burner pump.

Note:

Please contact our sales department for the size of the supply circuit.

Hydraulic circuit diagram for feeding one or more two-stage or modulating dense heavy oil burners with nominal max. viscosity 380 cSt (50°E) at 50°C, with auxiliary heater





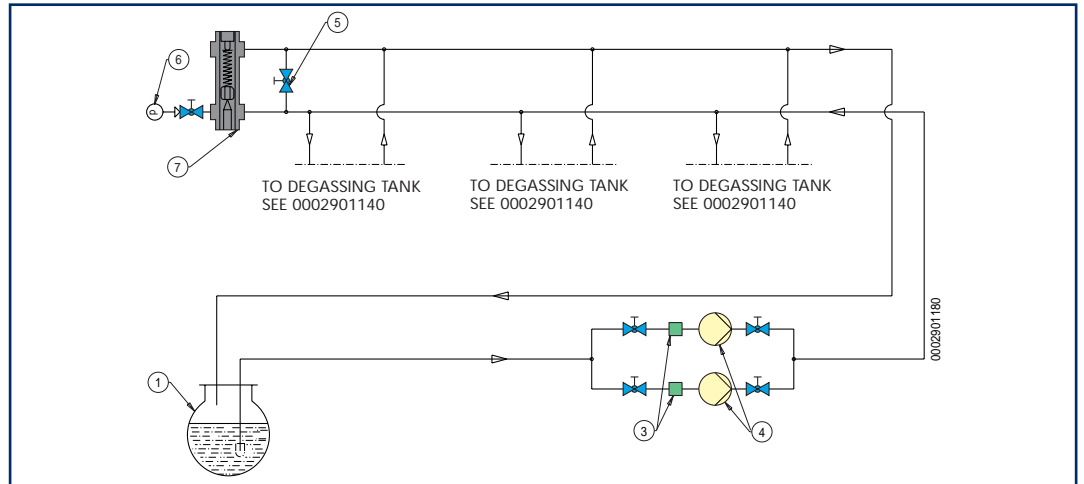
Heavy oil feed

GI 1000 Series

Hydraulic circuit diagram for feeding one or more modulating GI 1000 heavy oil burners with nominal max. viscosity 38 cSt (5°E) at 50°C

Legend

- 1 - Main tank.
- 2 - Steam or hot water pipe coil for heating heavy oil.
- 3 - Filter.
- 4 - Circulation pump.
- 5 - By pass (normally closed).
- 6 - Manometer (0-4 bar).
- 7 - Adjustable pressure regulator from 0.5 to 3 bar.
- 8 - Thermometer.
- 9 - Tank, diameter 150 mm, height 350 mm.
- 10 - Element.
- 11 - Auxiliary heater.
- 12 - Steam or hot water pipe coil for heating electrical heating cable and insulation required for viscosity > 380 cSt (50°E) with reference to fuel temperature in the ring circuit.



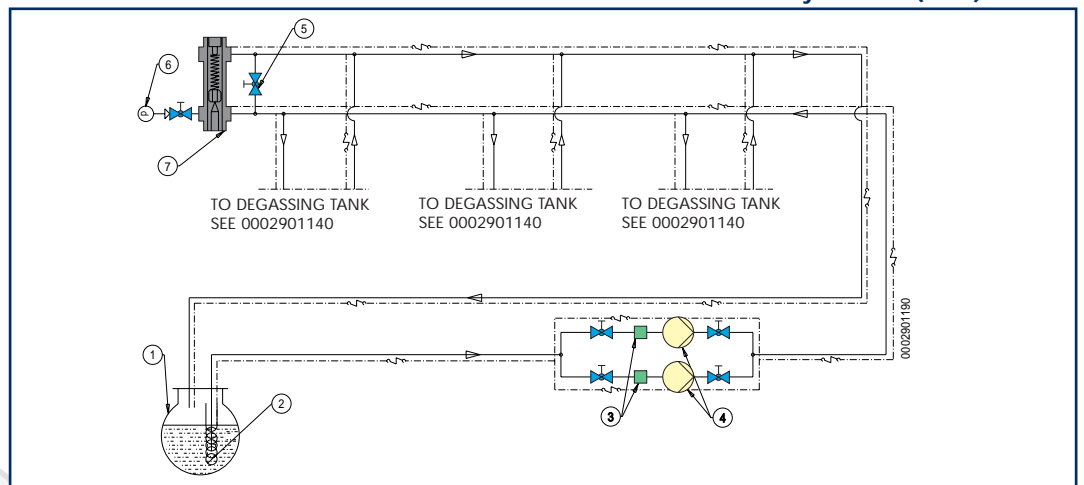
Hydraulic circuit diagram for feeding one or more modulating GI 1000 heavy oil burners with nominal max. viscosity 115 cSt (15°E) at 50°C

N.B.

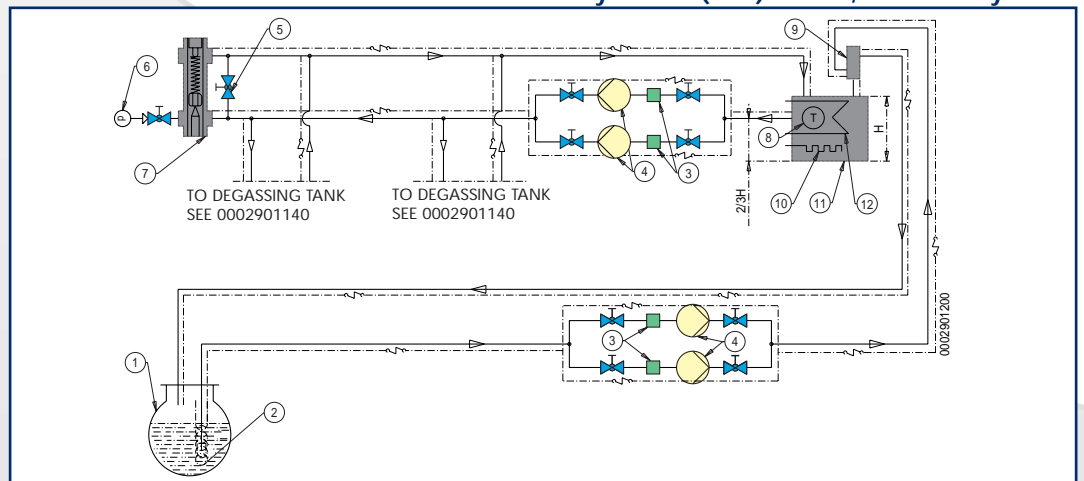
The fuel recovery tanks (diameter 150 mm, height 400 mm) must be installed as near as possible to the burner at a height of at least 0.5 m above the burner pump.

Note:

Please contact our sales department for the size of the supply circuit.

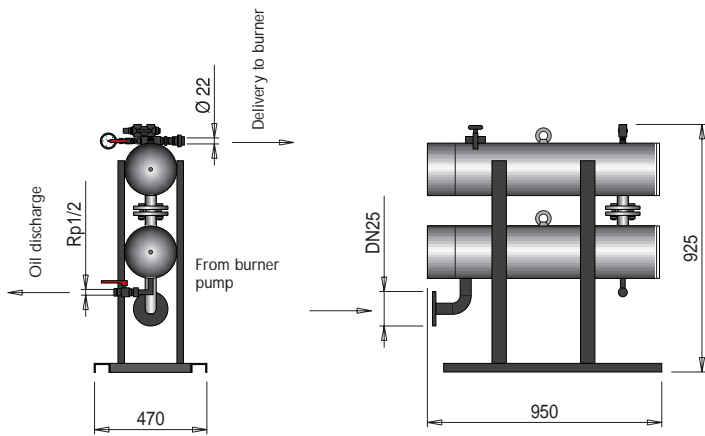
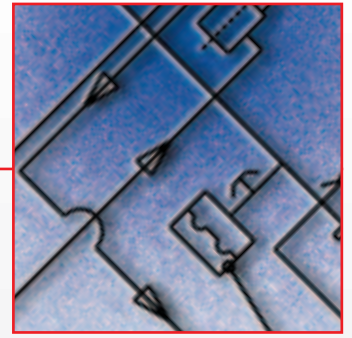


Hydraulic circuit diagram for feeding one or more modulating GI 1000 dense heavy oil burners with nominal max. viscosity 380 cSt (50°E) at 50°C, with auxiliary heater

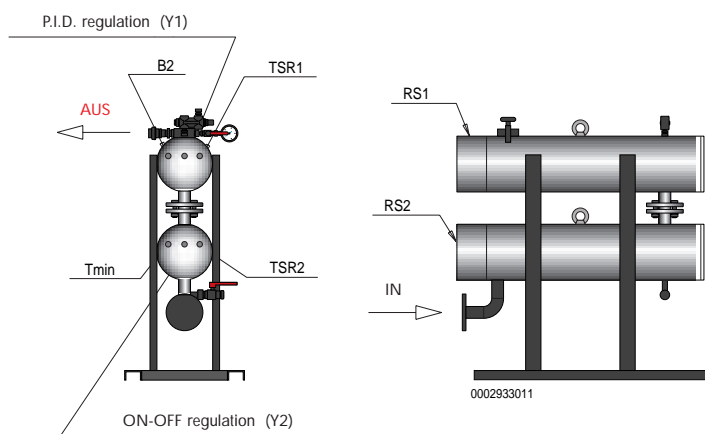


Heavy oil feed

Pre-heaters for GI 1000 series heavy oil
Electronic temperature adjustment



PT 100 thermostat and thermometer probe layout

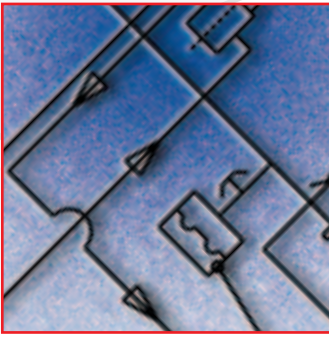


Legend

- RS1..2 - Tank elements
- Tmin - Minimum thermostat
- TSR1..2 - Safety thermostats
- B2 - PT100 heating element

Note

Pre-heaters supplied in burner pack.



Heavy oil feed

Diagram for steam pre-heater fitted on machine for GI 350 - 420 - 510 DSPN-D Series burners

GI 350 - 420 - 510 DSPN-D Legend

- 1 - Ball valve.
- 2 - Condensation indicator.
- 3 - Condensation discharge.
- 4 - Steam filter.
- 5 - Manual by-pass ball valve, open when the steam pre-heater is cold.
- 6 - electrical pre-heater.
- 7 - Self-cleaning filter 0.3 mm
- 8 - Thermometer.
- 9 - Minimum pre-heater thermostat, (50-230°C).
- 10 - Safety pre-heater thermostat, (230°C).
- 11 - Adjustment pre-heater thermostat, (50-230°C).
- 12 - Thermometer.
- 13 - Manometer connection stopper.
- 14 - Steam pre-heater.
- 15 - Steam cut-off ball valve.
- 16 - Adjustable steam pressure regulator from 1 to 8 bar.
- 17 - Steam manometer (0-10 bar).
- A) Min. steam input 12 bar.
- B) Air discharge.
- C) Gravity condensation discharge.

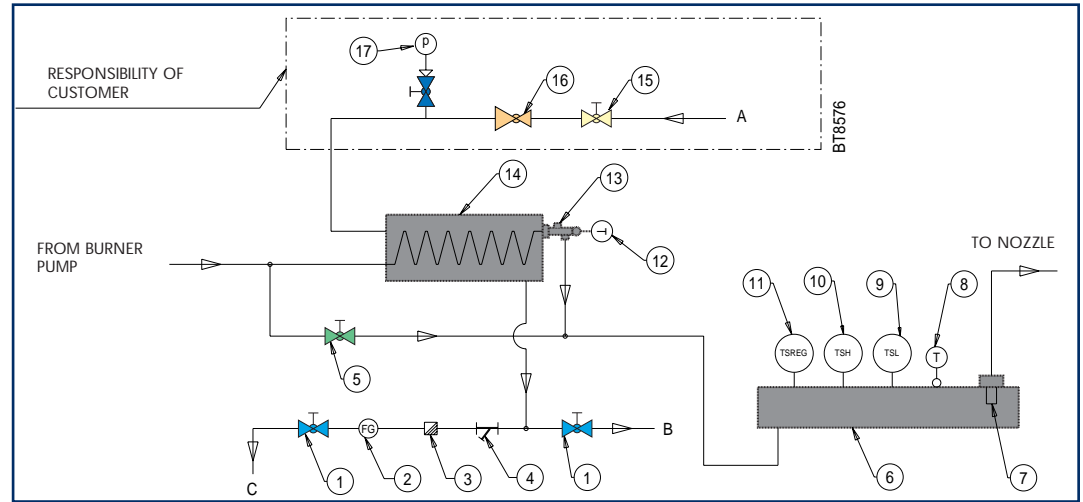
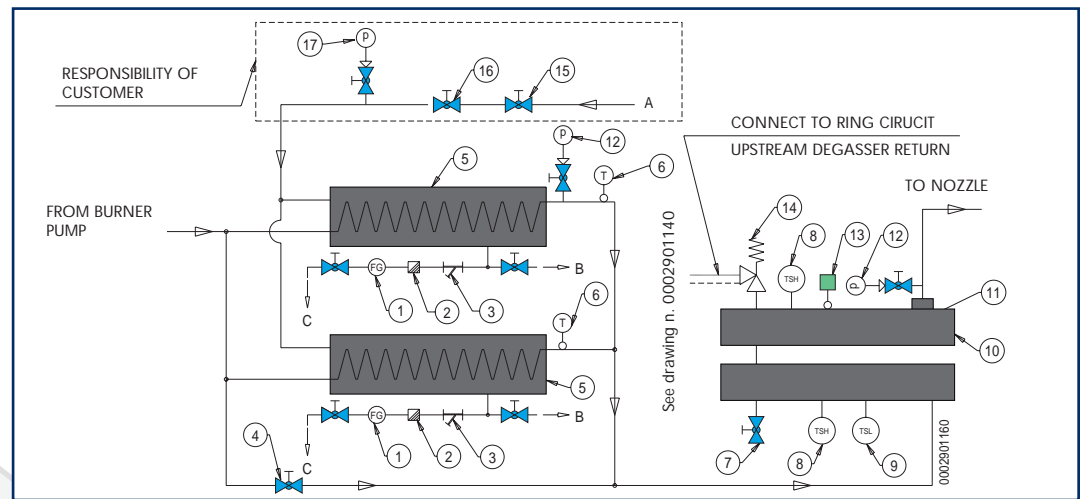


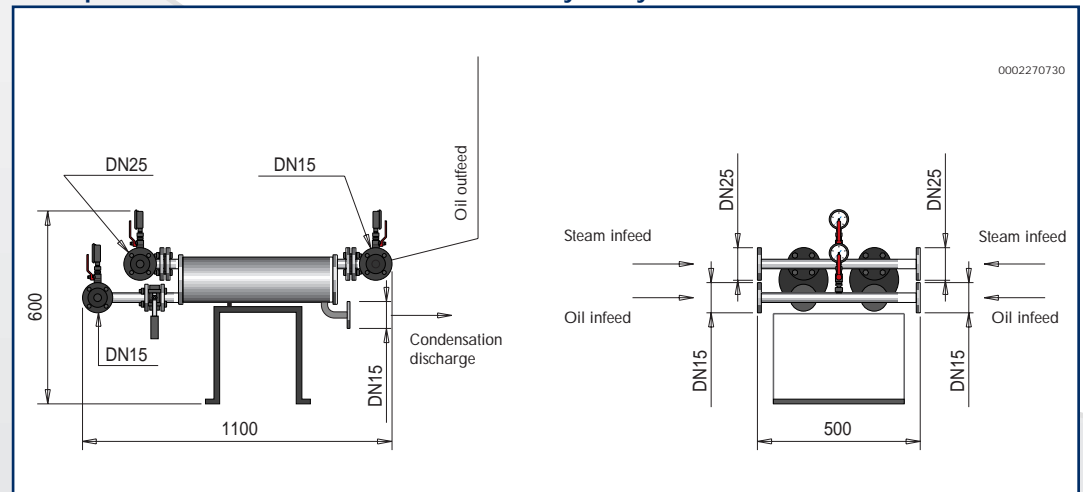
Diagram for steam pre-heaters installed upstream of the electrical pre-heaters for GI 1000 DSPN-D burner

GI 1000 DSPN-D Legend

- 1 - Condensation indicator.
- 2 - Condensation discharge.
- 3 - Steam filter.
- 4 - Manual by-pass ball valve, open when the steam pre-heaters are cold.
- 5 - Steam pre-heaters.
- 6 - Thermometer.
- 7 - Air/gas discharge valve, normally closed, to open slightly only in case of gas discharge.
- 8 - Safety pre-heater thermostat, (230°C).
- 9 - Minimum pre-heater thermostat.
- 10 - electrical pre-heaters.
- 11 - Self-cleaning filter 0.3 mm
- 12 - Manometer (0-40 bar).
- 13 - Thermostat and thermometer probe (PT100).
- 14 - Safety regulator for pre-heater (adjusted to 32 bar).
- 15 - Steam cut-off ball valve.
- 16 - Adjustable steam pressure regulator from 1 to 8 bar.
- 17 - Steam manometer (0-10 bar).
- A) Min. steam input 12 bar.
- B) Air discharge.
- C) Gravity condensation discharge.

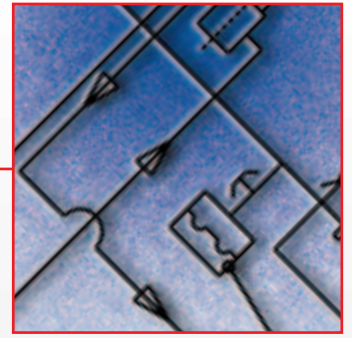


Steam pre-heaters for GI 1000 DSPN-D series heavy oil layout and size



Note
 Steam pre-heaters with double infeed. You can choose either the left side or the right side for the steam infeed and the fuel infeed. Close the infeed not used with a blind flange.

Nozzles



Nozzles for GI 350-420-510 series two progressive stage/modulating light and heavy oil burners (ratio 1:3)

Code	Nominal capacity kg/h	Atomising angle
98000201	50	45°
98000202	60	45°
98000203	70	45°
98000204	80	45°
98000205	90	45°
98000206	100	45°
98000207	125	45°
98000208	150	45°
98000209	175	45°
98000210	200	45°
98000211	225	45°
98000212	250	45°
98000213	275	45°
98000214	300	45°

Code	Nominal capacity kg/h	Atomising angle
98000215	325	45°
98000216	350	45°
98000217	375	45°
98000218	400	45°
98000219	425	45°
98000220	450	45°
98000221	475	45°
98000222	500	45°
98000223	525	45°
98000224	550	45°
98000225	575	45°
98000226	600	45°
98000227	650	45°
98000228	700	45°



ZZ type nozzle with fuel return, modulation ratio 1:3 (ZZ/3) for two progressive stage/modulating light and heavy oil burners. As it maintains the pump pressure constant, this type of nozzle varies the supply of fuel in accordance with the nozzle return pressure.

Nozzles for two progressive stage/modulating light and heavy oil burners (ratio 1:5), for GI 1000 series only

Code	Nominal capacity kg/h	Atomising angle
98000280	700	45°
98000281	750	45°
98000282	800	45°

Code	Nominal capacity kg/h	Atomising angle
98000283	850	45°
98000284	900	45°
98000285	1000	45°



ZZ type nozzle with fuel return, modulation ratio 1:5 (ZZ/5) for two progressive stage/modulating light and heavy oil burners. As it maintains the pump pressure constant, this type of nozzle varies the supply of fuel in accordance with the nozzle return pressure.

Supply:

To be ordered together with the burner in accordance with the power required for the application.

Standard electrical panels

GI 350 - 420 - 510 - 1000 Series



The electrical components e.g. equipment, relays and protection devices are fastened to a metal plate inside the panel, while switches, indicator lights and displays are on the front of the panel.

The electrical panel has protection rating IP54

For modulating burner functioning, the control panel must have a modulation kit to combine with the electronic modulation regulator (RWF40), and

must be chosen according to the type of plant (pressure or temperature).

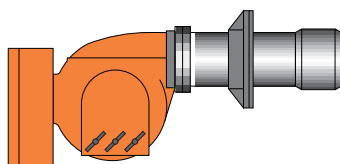
A frequency converter (inverter) can be added to the control panel and located inside the panel itself.

Delivery condition of electrical panel

The electrical panel consists of:

- burner control and command equipment
- gas valve seal control equipment in the

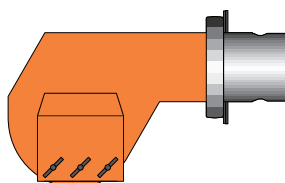
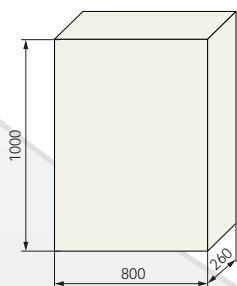
- case only of gas and dual fuel burners
- electronic modulation regulator (optional)
- main switch/disconnector with panel door lock (GI 1000 series)
- command switches
- relay switches
- thermal safety relays
- auxiliary relays
- protection devices with fuses
- indicators for running, lock and control indicators with warning lights; connection terminal board.



GI 350 - 420 - 510 series

Panel fitted on machine, with:

- Standard use
- Use with inverter
- Use with O₂ control
- Use with O₂ control + inverter

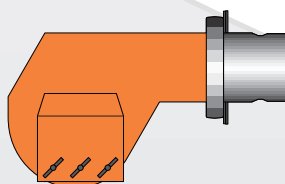
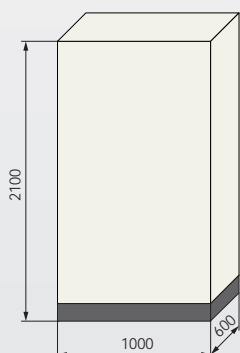


GI 1000 Series

Wall-mounted panel, with:

- Standard use
- Use with inverter
- Use with O₂ control

Control panel supplied in burner pack.



GI 1000 Series

Panel fitted on machine, with:

- Use with O₂ control + inverter

Cabinet panel in separate pack (see page 28).

Electrical control panels

Inverters



FAN SPEED ADJUSTMENT WITH INVERTER

As well-known, a standard configuration burner fan always absorbs, with negligible variations, the same electrical power irrespective of variations in burner output. The air flow is in fact regulated only by the dampers which reduce the section of the air, thus inducing a greater loss that does no more than dissipate the electrical output supplied to the fan motor. Furthermore, in such a configuration the fan always turns at its maximum number of rpm thus making maximum noise at any working output.

It is possible to overcome these configuration limitations by adding a static fre-

quency converter that varies the fan speed according to burner output. The frequency converter thus receives the signal adjusting the revolutions directly from the burner's electronic regulator.

The air gates remain on the burner and act as fine adjusters of air flow and dynamic air pressure to the burner head, especially during transients.

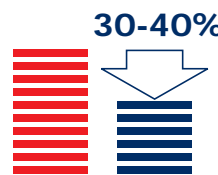
By using a frequency converter substantial savings can be made in electrical energy supplying the fan, with peaks of 70 % at minimum burner output and a weighted annual mean reduction of the order of

For example: a GI 1000 DSPGN gas-fired burner of 10 MW will need a fan with about a 22 kW motor; if we have an installation in

a process plant and a burner running 6.000 hours a year, there will be an annual consumption of about 145.000 kWh without an inverter, while with an inverter this would fall to about 90.000 – 100.000 kWh/year to give a saving of about 4000 Euros (the actual amount of course greatly varies depending local rates applied).



at minimum burner output compared with the standard air control system using only air gates and fan always running at the motor's nominal speed.



The second great advantage of using an inverter to regulate fan revolution speed is that it permits a great reduction in noise with partial burner loads, with peaks up to

AUTOMATIC PROPORTIONAL AND INTEGRAL MODULATION REGULATOR

Code	Model
98000051	RWF 40 Kit

RWF 40 type electronic modulation regulator for all modulating type burners,

used to regulate the boiler steam pressure and temperature.

MODULATION KIT

Code	Model	Probe type	Length (probe)
98000020	Temperature 0-130 °C	NI 1000	100 1)
98000021	Temperature 0-500°C	PT 1000	200 1)
98000022	Temperature 0-1100 °C	Thermocouple	425 1)



Notes

For other modulation values please contact our sales office.
1) Different lengths available on request.

Code	Model
98000025	Steam pressure 0-1 bar
98000026	Steam pressure 0-10 bar
98000027	Steam pressure 0-16 bar
98000028	Steam pressure 0-25 bar
98000029	Steam pressure 0-40 bar



Two progressive stage burners, when the RWF40 regulator and modulation kit are added (see table), become modulating burners; that is, they can offer a variable thermal power and adapt continuously to the specific requirements of the boiler. Clearly, the thermal power variation is only possible within the "minimum" and "maximum" burner limits.

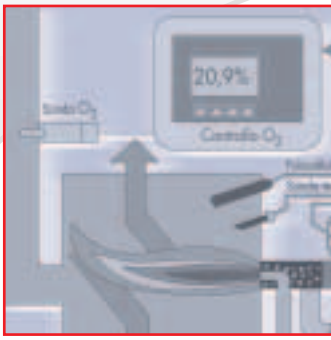
Choice of modulation kit components

Depending on the parameters to be controlled: temperature (°C) or pressure (bars), choose the regulation field that comprises the working parameters. When the value comes within two regulation fields, choose the lower field.

Example:

If you require the water in the boiler to be at a temperature of 100°C, choose the modulation kit in the 0-130°C range. If you require the steam in the boiler to be at a pressure of 8 bar, choose the modulation kit in the 0-10 bar range.





Electrical control panels

O₂ Control and Command (GI 1000 series)

To be able to obtain high performance a plant must have low pollution values. To achieve this there must be a slight

excess of air with respect to the quantity required to fully burn the fuel. Since the air and the fuel do not mix completely together in the burner, a small excess of air is added to ensure that all the fuel present burns completely, thus avoiding unburned fuels, polluting emissions and wastage of fuel. If, however, the excess air is more than a certain amount, the flame cools with an increase in heat dissipation losses to the flue and an increase in polluting emissions. It is clear therefore that air and fuel must be kept at the correct proportions to ensure the maximum combustion efficiency and minimum possible atmospheric pollution. Excess air is measure by controlling the oxygen in the exhaust fumes. The oxygen control system consists of a zirconium oxide probe located at the exit of the combustion chamber or in

the flue stack, and of control and regulation equipment. By means of the probe, the regulator controls the oxygen levels in the flue gases and, controlling a servomotor, changes the quantity of combustion air. This system allows the air/fuel ratio to be continuously and automatically corrected to ensure high performance and low pollution.

To give an example, take the case of a 6MW plant that uses natural gas for 50 weeks a year, 5 days a week, 16 hours a day, with an annual consumption of about 465,000 Euros. Inserting the O₂ control into the plant where the percentage of oxygen can be reduced by 2.5% we will obtain an energy saving of 52EPT (Equivalent Petroleum Tonnes) and 142 tonnes per year of CO₂. In financial terms this represents a saving of about 13,000 Euros (figures as of July 2000).



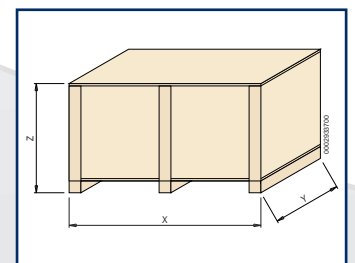
Detail of O₂ control, installed on the front of the panel

Delivery condition of cabinet control panel with O₂ control

The electrical panel consists of:

- burner control and command equipment with built-in electronic modulation regulator
- O₂ control equipment
- gas valve seal control equipment (only for gas and dual fuel burners)
- main switch/disconnector with panel door lock
- command switches
- relay switches
- thermal safety relays
- auxiliary relays
- protection devices with fuses
- running, lock and control indicators with warning lights
- connection terminal board.

Size of pack	X	Y	Z
QA21	2460	1410	835



Electrical control panels

O₂ Control and Command (GI 350 - 420 - 510 series)



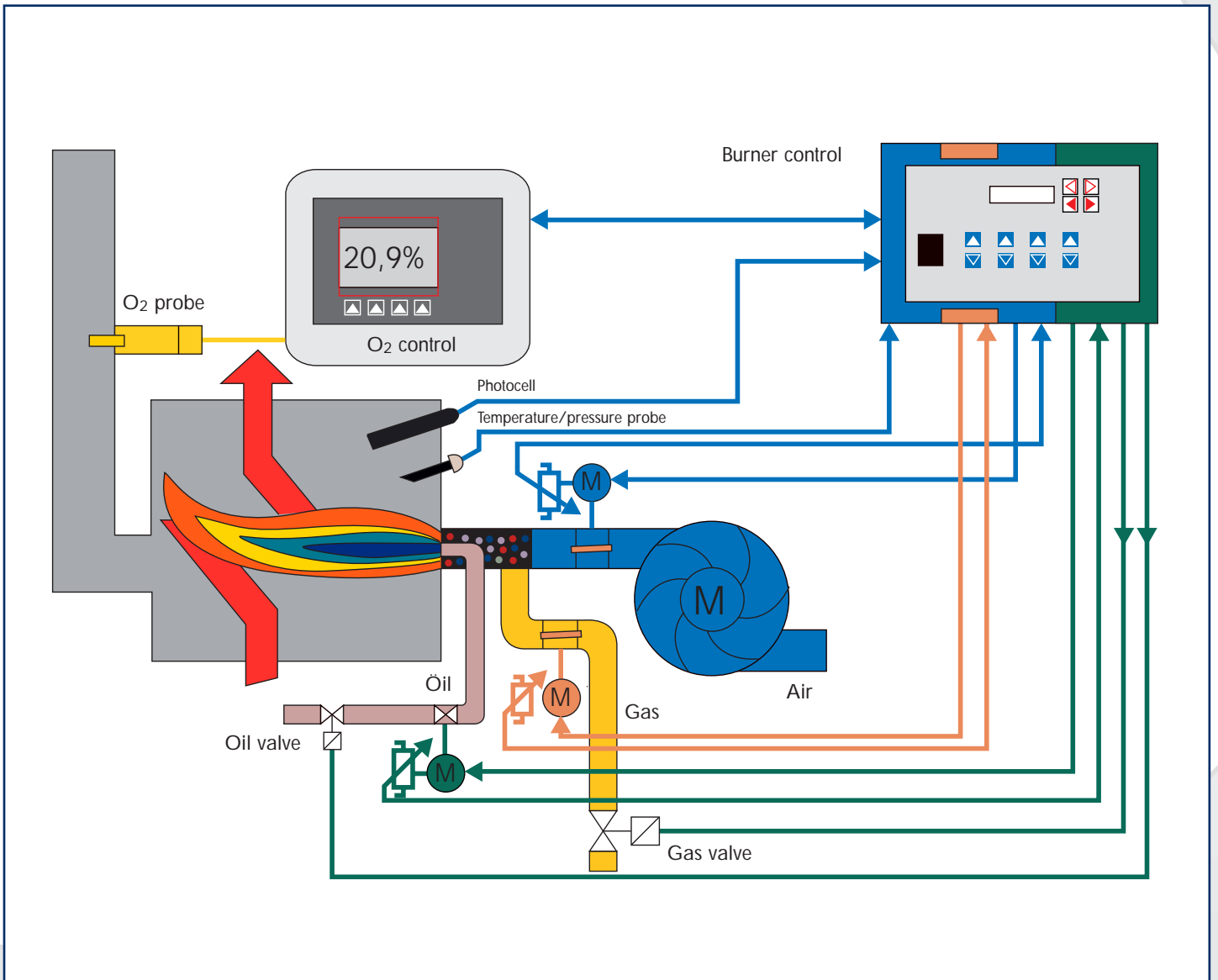
Delivery condition of electrical control panel with O₂ control

The electrical panel consists of:

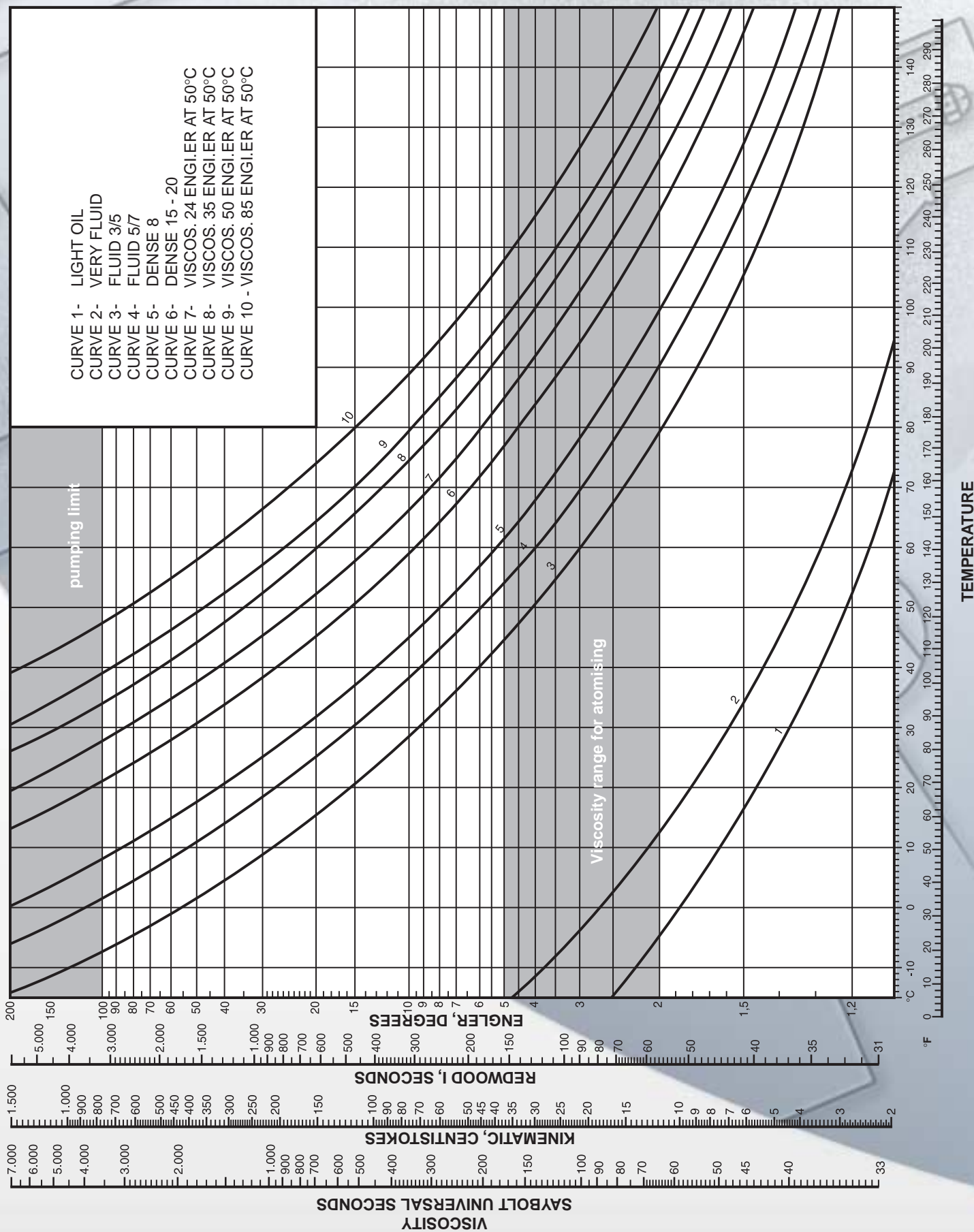
- burner control and command equipment with built-in electronic modulation regulator

- O₂ control and command equipment
- gas valve seal control equipment (only for gas and dual fuel burners)
- command switches
- relay switches
- thermal safety relays
- auxiliary relays
- protection devices with fuses
- running, lock and control indicators with warning lights
- connection terminal board.

Burner with O₂ control operating diagram



Viscosity-temperature curves for heavy oils



Reference list

ITALY

ALSTOM

Savigliano (Turin)

GI 1000 DSPGN

Application: heating

ASM TORINO

Turin

GI 1000 DSPGN

Application: remote heating

CANTIERI MODERNI

Pinerolo

GI 510 DSPN

Application: bituminous aggregates

CEFLA

GI 510 DSPGN

Application: remote heating

CF GOMMA

Turin

GI 350 DSPGN

Application: heating

DUCATI

Bologna

GI 350 DSPGN

Application: heating

GAZZOTTI

Trebbo di Reno (Bologna)

GI 350 DSPGN

Application: heating and industrial process

CIVIL HOSPITAL

Venice

GI 350 DSPGN

Application: hospital use

MESTRE HOSPITAL

Mestre (Venice)

GI 350 DSPNM

Application: hospital use

SOLGECO S.r.l.

San Sepolcro (Arezzo)

GI 510DSPN

Application: heating

TOR VERGATA UNIVERSITY

Rome

GI Mist 350 DSPGM

Application: heating

FOREIGN

AMMANN IMA "ALTAIAVTODOR"

Russia

GI 510 DSPN

Application: dryers for bituminous aggregates

BOGADERIA EMPURDAM

Girona - Spain

GI 350 DSPGN

Application: industrial process

COMMUNICATION DEPT.

SHIJIAZHANG CITY

China

GI 510 DSPG

Application: dryers for bituminous aggregates

MARIAMPOLE

Lithuania

GI MIST 350 DSPNM-D

GI MIST 510 DSPNM

Application: remote heating

METALLIC CONSTRUCTION

Damascus - Syria

GI 510 MNM-D

Application: industrial process

MOTIM

Hungary

GI 510 DSPG

Application: dryers for bituminous aggregates

KABUITO CONTRACTORS

Kenya

GI 510 DSPG

Application: dryers for bituminous aggregates

PESQUERA HAYDUM

Peru

GI MIST 510 DSPNM-D

Application: industrial process

ROAD ENGINEERING NO. 5 CO.

Kunming-China

GI 510 DSPG

Application: dryers for bituminous aggregates

S.C. SPEDITION UMB

Romania

GI 510 DSPN

Application: dryers for bituminous aggregates

YUNNAN NO. 1 HIGHWAY &

BRIDGE

Dali - China

GI 510 DSPG

Application: dryers for bituminous aggregates

JOSE' DE SOUSA BARRA

Portugal

GI 510 DSPN

Application: dryers for bituminous aggregates