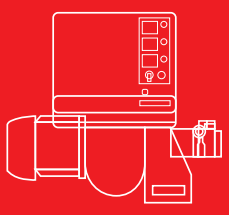
TECHNICAL DATA LEAFLET

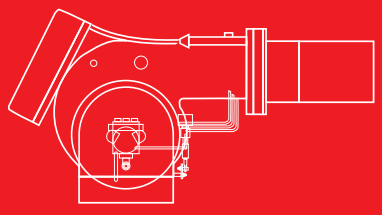
LIGHT OIL

PRESS T/G Series

Three Stage Light Oil Burners

P 140 T/G	380/830	÷ 1660	kW
P 200 T/G	557/1186	÷ 2372	kW
P 300 T/G	712/1779	÷ 3560	kW
P 450 T/G	890/2670	÷ 5340	kW





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RIELLO

Energy For Life

The PRESS T/G series of burners covers a firing range from 830 to 5340 kW.
Available in 4 different models, this burners are particularly well suited for matching with pressurized chamber boilers.
For their characteristics, they find application in big civil plants for domestic heating or in industrial applications where thermal load is repetitive and predictable.
An hydraulic ram exclusive system, with 3 adjustable positions, regulates dampers opening, allowing air passage in relation to output required: in this way flame stability is optimized in every working point, with micro-regulation available.
The burners are fitted with a microprocessor-based burner safety control box which supplies indication of operation and diagnosis of fault cause.

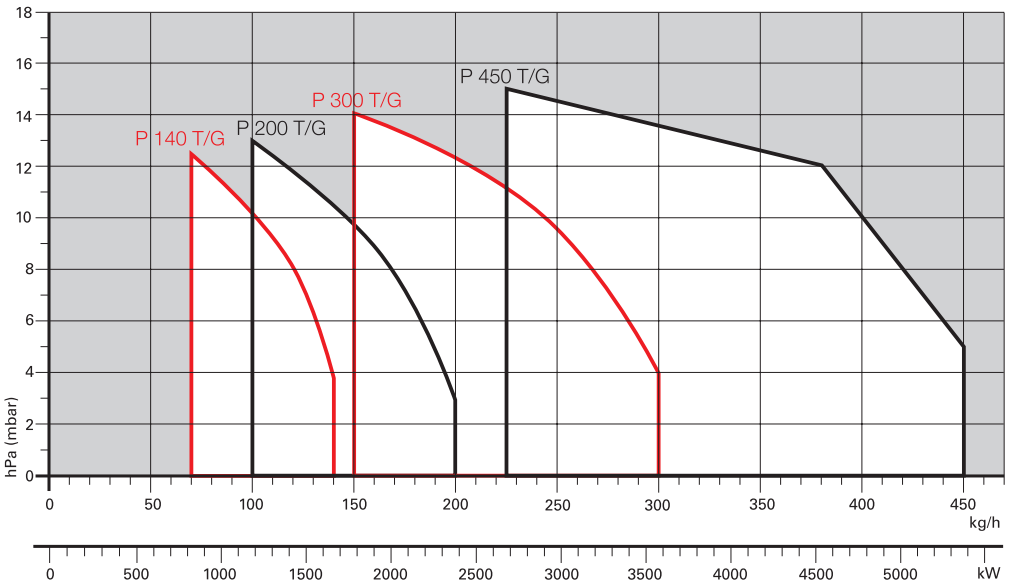
A RIELLO burner (Heat Generator), where it is matched with a water-based boiler (Heater Housing) with a nominal output ≤400 kW, providing heat for heating purposes and heat to deliver sanitary hot water, can be installed:
- With boilers (heater housings) already in service in the field, for replacement, in conformity to Article 1, paragraph 2, point (G) of the EU Regulation No. 813/2013;
- With boilers (heater housings) on a new installation, put on the market after 26th of September 2015;
- With all new boilers (heater housings), where placed on the market before 26th of September 2015.

Technical Data

Model			P 140 T/G	P 200 T/G	P 300 T/G	P 450 T/G
Burner operation mode				Three stage		
Modulation ratio at max. output				3 : 1		
Servomotor		type		--		
	run time	s		--		
Heat output		kW	380/830÷1660	557/1186÷2372	712/1779÷3560	890/2670÷5340
		Mcal/h	327/714÷1428	479/1020÷2040	612/1530÷3062	765/2296÷4592
		kg/h	32/70÷140	47/100÷200	60/150÷300	75/225÷450
Working temperature		°C min./max.		0/40		
FUEL/AIR DATA						
Light oil	Net calorific value	kWh/kg		11,86		
		kcal/kg		10200		
	Viscosity	mm^2/s (cSt)		4 ÷ 6 (at 20°C)		
Pump	type		J7	J7	TA2	TA3
	delivery	kg/h	190 (20 bar)	190 (20 bar)	340 (20 bar)	525 (20 bar)
Atomised pressure		bar		12		
Fuel temperature		max. °C		50		
Fuel pre-heater				NO		
Fan		type		Centrifugal with forward curve blades		
Air temperature		max. °C		60		
ELECTRICAL DATA						
Electrical supply		Ph/Hz/V		3N/50/400~(±10%) ⅄ 3/50/230~(±10%) △		
Auxiliary electrical supply		Ph/Hz/V		1/50/230 (±10%)		
Control box		type		RMO		
Total electrical power		kW	4,5	5,5	10	18
Auxiliary electrical power		kW	1,5	1,5	2,5	3
Heaters electrical power		kW		--		
Protection level		IP		40		
Pump motor electrical power		kW		--		
Rated pump motor current		A		--		
Pump motor start up current		A		--		
Pump motor protection level		IP		--		
Fan motor electrical power		kW	3	4	7,5	15
Rated fan motor current		A	8/13,5	9,5/16,4	17,5/30	29/50,2
Fan motor start up current		A	51/86	48/83	113/195	167/291
Fan motor protection level		IP		55		
Ignition trasformer		type				
		V1 - V2		230 V - 2x6 kV		
		I1 - I2		2,3 A - 35 mA		
Operation				Intermittent (at least one stop every 24 h)		
EMISSIONS						
Sound pressure		dBA	86,5	85,5	89,5	90
Sound power		W		--		
CO emission		mg/kWh		< 70		
Grade of smoke indicator		NO Bacharach		< 2		
CxHy emission		mg/kWh		--		
NOx emission		mg/kWh		< 230		< 340
APPROVAL						
Directive				2009/142/EC - 2014/30/UE - 2014/35 UE		
Conforming to				EN 267		
Certification				CE-0441/B		CE-1002/R

Reference conditions:
Temperature: 20°C - Pressure: 1013,5 mbar - Altitude: 0 m a.s.l. - Noise measured at a distance of 1 meter.
Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler and at maximum rated output. The sound power is measured with the "Free Field" method, as per EN 15036, and according to an "Accuracy: Category 3" measuring accuracy, as set out in EN ISO 3746.

Firing Rates



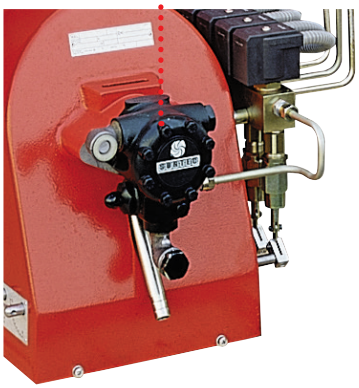
Useful working field
for choosing the burner

Test conditions
conforming to EN267
Temperature: 20°C
Pressure: 1013,5 mbar
Altitude: 0 m a.s.l.

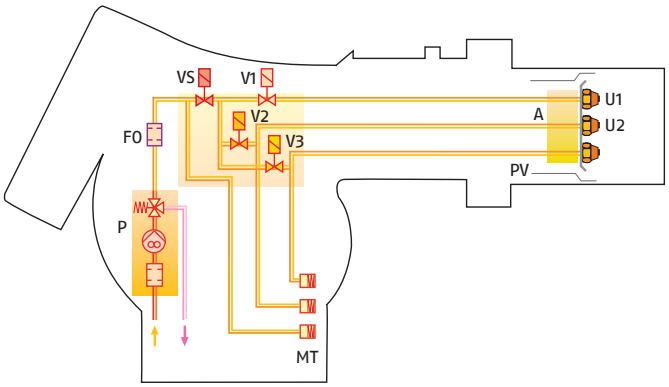
Fuel Supply

HYDRAULIC CIRCUIT

The burners are fitted with four valves (a safety valve and three oil delivery valves) and an oil filter along the oil line from the pump to the nozzle. A thermostat, on the basis of required heat, regulates oil delivery valves opening, allowing or not the light oil passage through the valves. Delivery valves opening supplies the three stage hydraulic ram which regulates air delivery in relation to fuel burnt. The pumping group is fitted with a pump, an oil filter and a regulating valve, that adjusts atomised pressure. This value is factory-set at 12 bar but it can be changed by adjusting pressure regulator fitted on the pump.



Example of the hydraulic circuit on PRESS 200 T/G

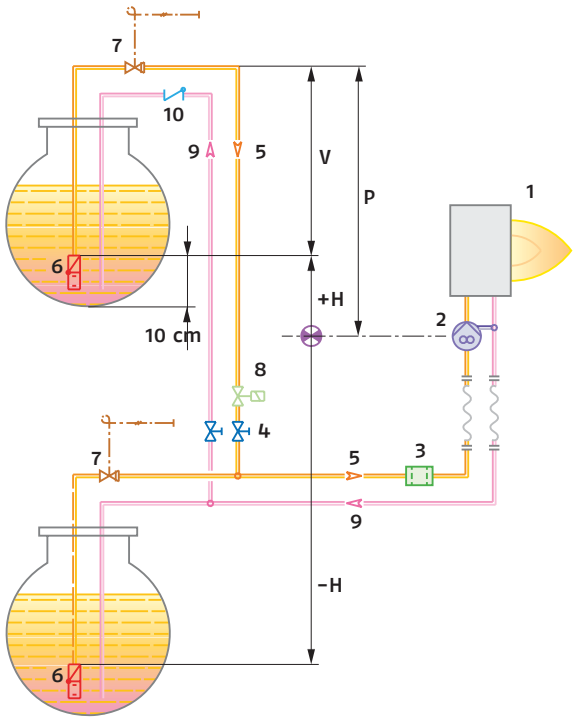


P	Pump with oil filter and pressure regulator
FO	Oil filter
V1 - V2 - V3	Delivery oil valves
VS	Safety valve
MT	3 stage hydraulic ram
U1 - U2 - U3	Nozzles
PV	Nozzle holder
A	Atomizer

Dimensioning Of The Fuel Supply Lines

The fuel feed must be completed with the safety devices required by the local norms.
The table shows the choice of piping diameter for the various burners, depending on the difference in height between the burner and the tank and their distance.

H	Difference in height pump-foot valve
0	Internal pipe diameter
P	Max. height 10 m
V	Height 4 m
1	Burner
2	Burner pump
3	Filter
4	Manual shut off valve
5	Suction pipework
6	Bottom valve
7	Remote controlled rapid manual shut off valve (compulsory in Italy)
8	Type approved shut off solenoid valve (compulsory in Italy)
9	Return pipework
10	Check valve

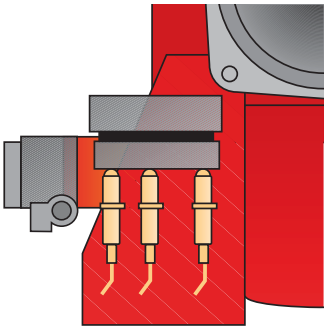


MAXIMUM EQUIVALENT LENGTH FOR THE PIPING L[m]								
Model	P 140 T/G		P 200 T/G		P 300 T/G		P 450 T/G	
Diameter piping	Ø14mm	Ø16mm	Ø16mm	Ø18mm	Ø16mm	Ø18mm	Ø16mm	Ø18mm
+H, -H (m)	Lmax (m)	Lmax (m)	L max (m)	L max (m)	L max (m)	Lmax (m)	Lmax (m)	L max (m)
+2,0	71	118	84	132	57	90	40	60
+1,5	66	110	78	123	53	83	35	55
+1,0	61	102	72	114	49	77	32	50
+0,5	55	94	66	105	44	70	30	48
0	50	86	60	96	40	64	27	43
-0,5	45	78	54	87	36	58	18	35
-1,0	40	69	48	78	31	51	15	30
-1,5	35	61	42	69	27	45	13	25
-2,0	29	53	36	60	23	39	10	20
-3,0	20	38	25	43	15	27	5	10

With ring distribution oil systems, the feasible drawings and dimensioning are the responsibility of specialised engineering studios, who must check compatibility with the requirements and features of each single installation.

Ventilation

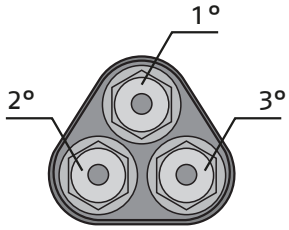
The ventilation circuit is provided with forward curve blades centrifugal fan, which guarantees high pressure levels at the required air deliveries and permits installation flexibility.
In spite of the remarkable output power and of the very high pressure performances, structures of PRESS models are extremely compact.
A variable profile cam connects fuel and air setting, ensuring fuel efficiency in all firing rates.



Example of three stage hydraulic ram

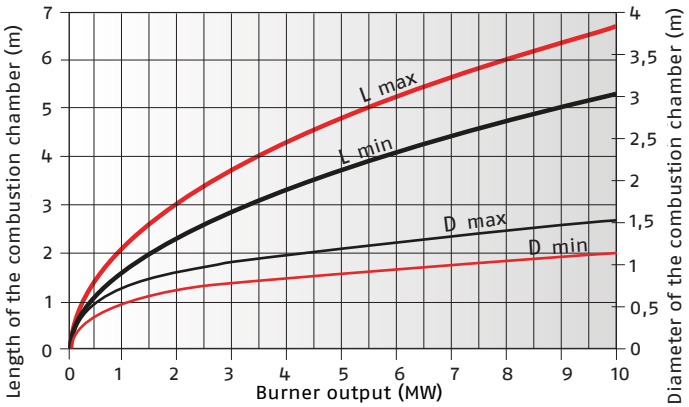
Combustion Head

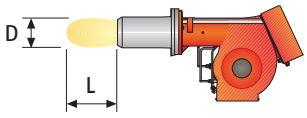
Two different lengths of the combustion head can be chosen for the various models of the PRESS T/G series of burners. The choice depends on the thickness of the front panel and the type of the boiler.
Depending on the type of heat generator, it is necessary to check the correct head penetration into the combustion chamber. The internal position of the combustion head can easily be adjusted on the basis of required output. flame dimensions in relation to the burner output.
The length and diameter shown in the diagram below should be employed preliminary check: it is required a more careful investigation if combustion chamber dimensions are much different from the reported values.



Example of a PRESS T/G burner combustion head

SUGGESTED COMBUSTION CHAMBER DIMENSIONS





Example:
Burner thermal output = 3500 kW;
L Combustion Chamber (m) = 3,5 m (medium value);
D Combustion Chamber (m) = 1 m (medium value)

Operation

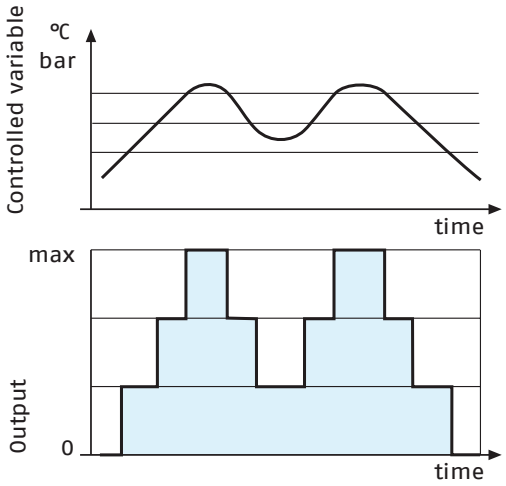
BURNER OPERATION MODE

With three stage operation, the PRESS T/G burners can follow the temperature load requested by the system. A ratio between maximum and minimum working output of 3:1 is reached, thank to a three-hydraulic ram system: the air delivery is proportional to required output. On three stage operation, the burner gradually adjusts output to the requested level, by varying between the three pre-set levels (see picture A).

In the following table, are listed maximum output and fuel deliveries of the burners.

Model	Stage	Max output (kW)	Max delivery (kg/h)
P140T/G	1st	545	46
	2nd	1103	93
	3rd	1660	140
P 200T/G	1st	794	67
	2nd	1576	133
	3rd	2372	200
P 300 T/G	1st	1186	100
	2nd	2372	200
	3rd	3558	300
P 450 T/G	1st	1780	150
	2nd	3560	300
	3rd	5340	450

Three stage operation



All PRESS T/G series burners are fitted with a new microprocessor control panel for the supervision during intermittent operation.

For helping the commissioning and maintenance work, there are two main elements:

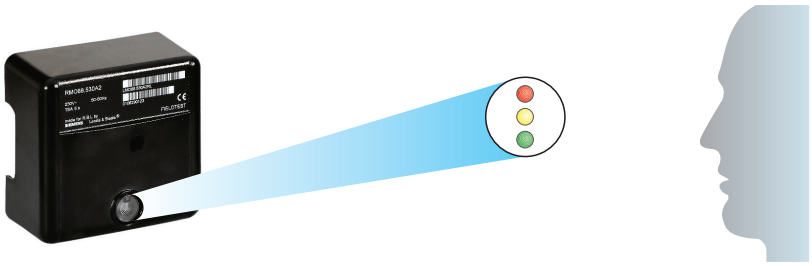
The lock-out reset button is the central operating element for resetting the burner control and for activating / deactivating the diagnostic functions.

The multi-color LED is the central indication element for visual diagnosis and interface diagnosis.

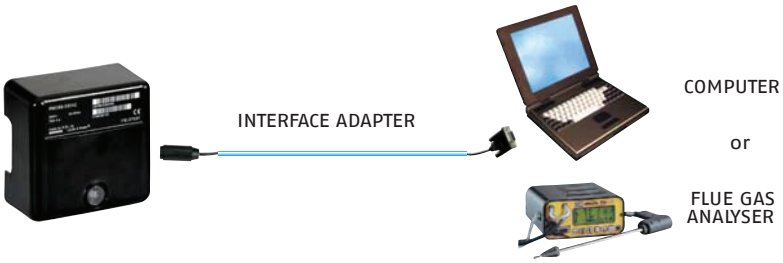
Both elements are located under the transparent cover of lock-out reset button, as showed below.

There are two diagnostic choices, for indication of operation and diagnosis of fault cause:

- visual diagnosis :



- interface diagnosis :



by the interface adapter and a PC with dedicated software or by a predisposed flue gas analyzer (see paragraph accessories).

Indication of operation:

In normal operation, the various status are indicated in the form of colour codes according to the table below.
The interface diagnosis (with adapter) can be activated by pressing the lock-out button for > 3 seconds.

Color code table	
Operation status	Color code table
Stand-by	○ ○ ○ ○ ○ ○ ○ ○
Pre-purging	☼ ☼ ☼ ☼ ☼ ☼ ☼ ☼
Ignition phase	☼ ○ ☼ ○ ☼ ○ ☼ ○
Flame OK	● ● ● ● ● ● ● ●
Poor flame	● ○ ● ○ ● ○ ● ○
Undervoltage, built-in fuse	☼ ● ☼ ● ☼ ● ☼ ●
Fault, alarm	● ● ● ● ● ● ● ●
Extraneous light	● ● ● ● ● ● ● ●

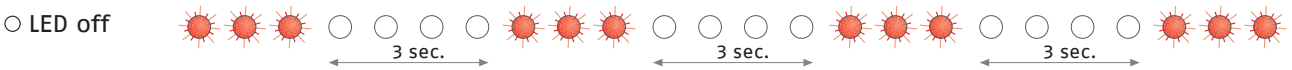
○ LED off

Diagnosis of fault causes:

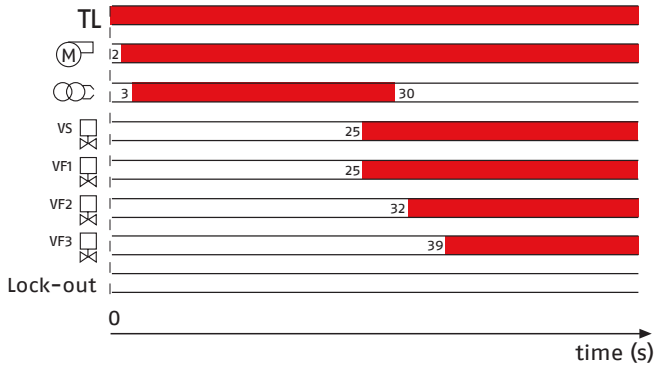
After lock-out has occurred, the red signal lamp is steady on. In this status, the visual fault diagnosis according to the error code table can be activated by pressing the lock-out reset button for > 3 seconds. The interface diagnosis (with adapter) can be activated by pressing again the lock-out button for > 3 seconds.

The flashes of red LED are a signal with this sequence :

(e.g. signal with n° 3 flashes - faulty air pressure monitor)



Error code table		
Possible cause of fault		Flash code
No establishment of flame at the end of safety time :	- faulty or soiled fuel valves - faulty or soiled flame detector - poor adjustment of burner, no fuel - faulty ignition equipment	2 flashes
Faulty air pressure monitor		3 flashes
Extraneous light or simulation of flame on burner start up		4 flashes
Loss of flame during operation :	- faulty or soiled fuel valves - faulty or soiled flame detector - poor adjustment of burner	7 flashes
Wiring error or internal fault		10 flashes



START UP CYCLE

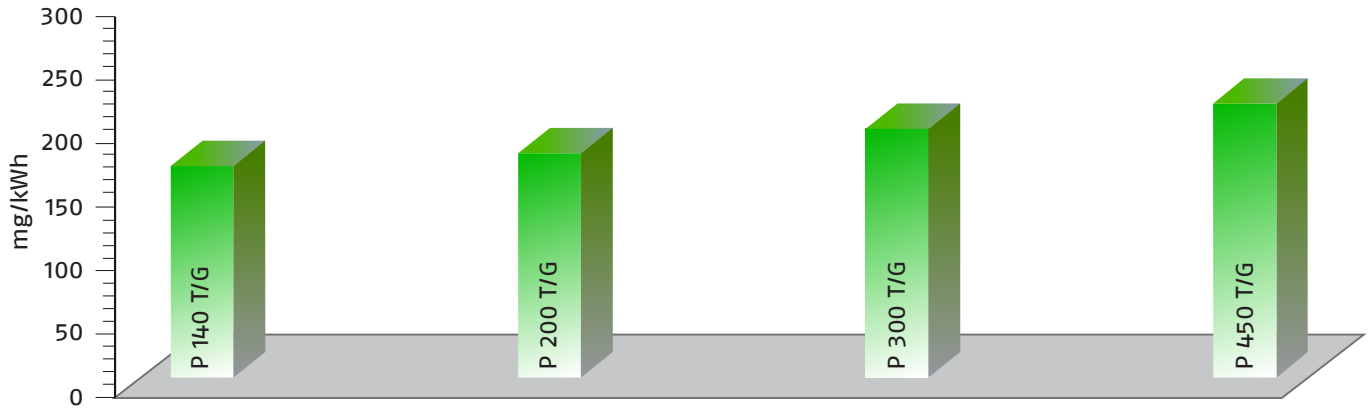
Start up procedure is referred to a three stage operation

0s The burner begins the firing cycle.
2s The motor starts: pre-purge phase.
3s Ignition electrode sparks.
25s Safety valve VS and 1st stage valve VF1 open. 30s The spark goes out.
32s 2nd stage valve VF2 opens.
39s 3rd stage valve VF3 opens, start up cycle is concluded.

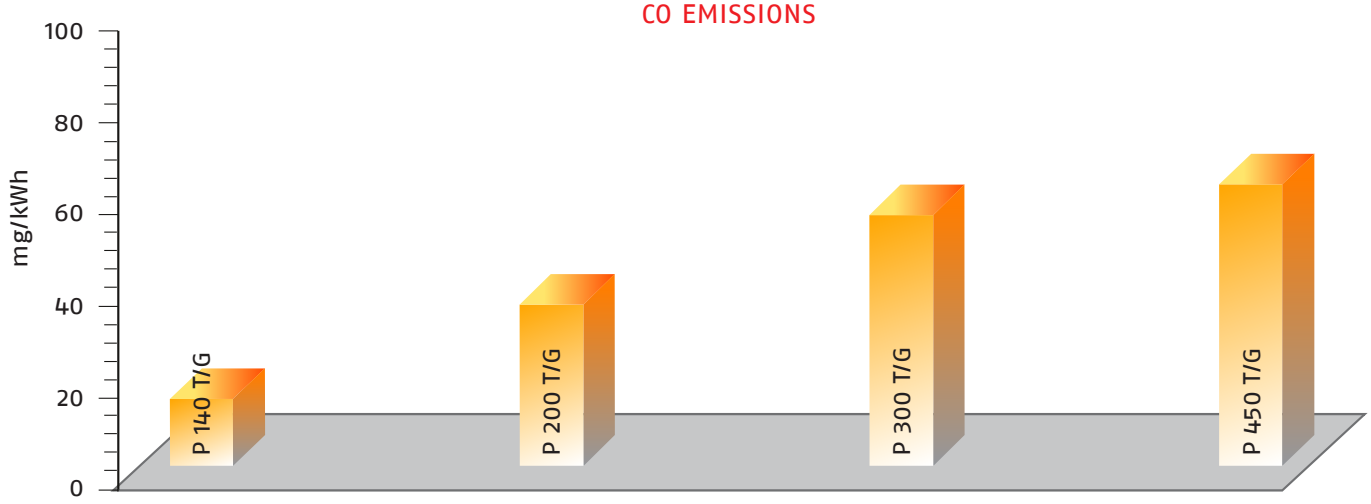
Emissions

The emission data has been measured in the various models at maximum output, according to EN 267 standard.

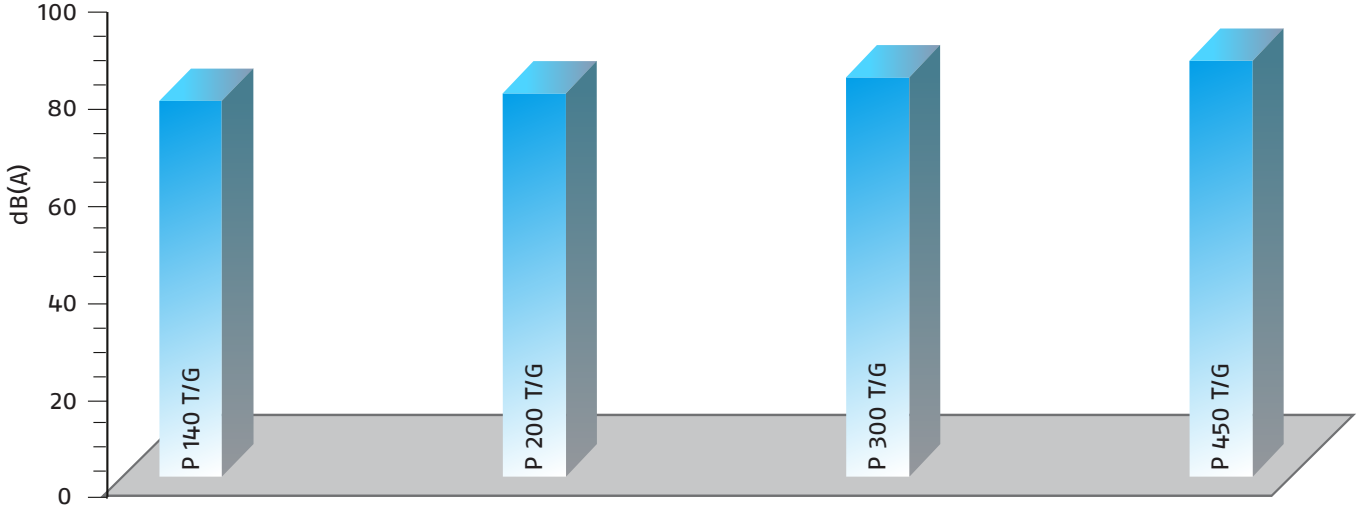
NO2 EMISSIONS



CO EMISSIONS

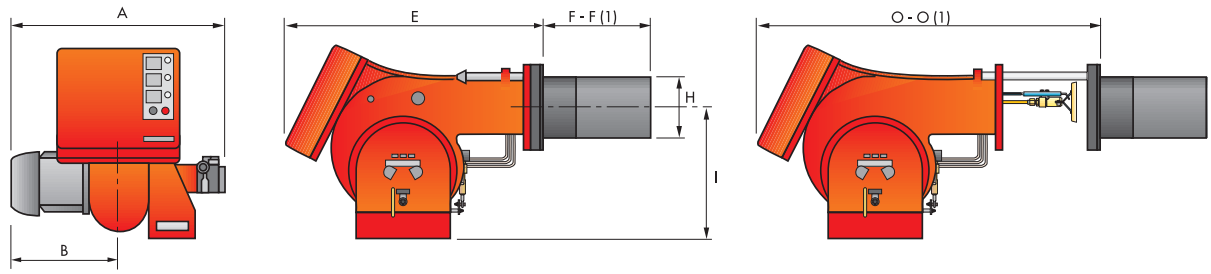


NOISE EMISSIONS



Overall Dimensions (mm)

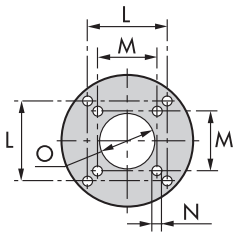
BURNER



MODEL	A	B	E	F – F (1)	H	I	O – O (1)
P 140 T/G	765	365	890	363 – 473	222	467	1250 – 1360
P 200 T/G	796	396	890	391 – 501	250	467	1280 – 1390
P 300 T/G	858	447	1000	444 – 574	295	496	1440 – 1570
P 450 T/G	950	508	1070	476 – 606	336	525	1546 – 1676

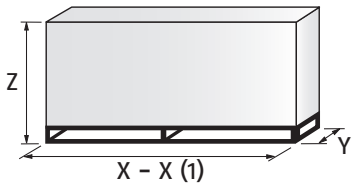
(1) Length with extended combustion head.

BURNER – BOILER MOUNTING FLANGE



MODEL	L	M	N	O
P 140 T/G	260	230	M14	225
P 200 T/G	260	–	M16	255
P 300 T/G	260	–	M18	300
P 450 T/G	310	–	M20	340

PACKAGING



MODEL	X – X (1)	Y	Z	kg
P 140 T/G	1740	990	950	130
P 200 T/G	1740	990	950	220
P 300 T/G	2040	1180	1125	238
P 450 T/G	2040	1180	1125	300

(1) Length with extended combustion head.

Installation Description

Installation, start-up and maintenance must be carried out by qualified and skilled personnel.
All operations must be performed in accordance with the technical handbook supplied to the burner.

BURNER SETTING

- All the burners have slide bars, for easier installation and maintenance.
- After removing the cover, the split pin and the pin, the nuts and the screws, dismantle the blast tube from the burner and fix it to the boiler.
- Adjust the combustion head.
- Refit the burner casing to the slide bars.
- Install the nozzles, choosing it on the basis of the maximum boiler output and following the diagrams included in the burner instruction handbook.
- Check the position of the electrodes.
- Close the burner, fasten the screws, the nuts, the split pin and the pin.

HYDRAULIC AND ELECTRICAL CONNECTIONS AND START-UP

- The burners are supplied for connection to two pipes fuel supply system.
- Connect the ends of the flexible pipes to the suction and return pipework using the supplied nipples.
- Make the electrical connections to the burner following the wiring diagrams included in the instruction handbook.
- Prime the pump by turning the motor (after checking rotation direction).
- On start up, check:
  - Pressure pump and valve unit regulator (to max. and min.)
  - Combustion quality, in terms of unburned substances and excess air.

Burner accessories

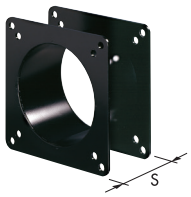
Nozzles

The following list shows the features and codes on the basis of the maximum required fuel output.

NOTE: each burner needs N° 3 nozzles.

BURNER	GPH	RATED OUTPUT [kg/h]			NOZZLE CODE
		at 10 bar	at 12 bar	at 14 bar	
P 140 T/G	3,50	13,5	14,8	16,1	3042162
P 140 T/G	4,00	15,4	17	18,4	3042172
P 140 T/G	4,50	17,3	19,1	20,7	3042182
P 140 T/G - P 200 T/G	5,00	19,2	21,2	23	3042192
P 140 T/G - P 200 T/G	5,50	21,1	23,3	25,3	3042202
P 140 T/G - P 200 T/G	6,00	23,1	25,5	27,7	3042212
P 140 T/G - P 200 T/G	6,50	25	27,6	30	3042222
P 140 T/G - P 200 T/G	7,00	26,9	29,7	32,3	3042232
P 140 T/G - P 200 T/G	7,50	28,8	31,8	34,6	3042242
P 140 T/G - P 200 T/G	8,00	30,8	33,9	36,9	3042252
P 140 T/G - P 200 T/G	8,50	32,7	36,1	39,2	3042262
P 140 T/G - P 200 T/G	9,50	36,5	40,3	43,8	3042282
P 140 T/G - P 200 T/G	10,00	38,4	42,4	46,1	3042292
P 140 T/G - P 200 T/G	11,00	42,3	46,7	50,7	3042312
P 200 T/G	12,00	46,1	50,9	55,3	3042322
P 200 T/G	13,00	50	55,1	59,9	3042332
P 200 T/G - P 300 T/G	14,00	53,8	59,4	64,5	3042352
P 200 T/G - P 300 T/G	15,00	57,7	63,6	69,2	3042362
P 300 T/G	16,00	61,5	67,9	73,8	3042382
P 300 T/G	17,00	65,4	72,1	78,4	3042392
P 300 T/G - P 450 T/G	18,00	69,2	76,4	83	3042412
P 300 T/G - P 450 T/G	19,00	73	80,6	87,6	3042422
P 300 T/G - P 450 T/G	20,00	76,9	84,8	92,2	3042442
P 300 T/G - P 450 T/G	22,00	84,6	93,3	101,4	3042462
P 300 T/G - P 450 T/G	24,00	92,2	101,8	110,6	3042472
P 450 T/G	26,00	99,9	110,3	119,9	3042482
P 450 T/G	28,00	107,6	118,8	129,1	20018051
P 450 T/G	30,00	110,4	122	132,4	3042502
P 450 T/G	32,00	117,8	130,1	150,1	3042512
P 450 T/G	35,00	128,8	142,1	154,5	3042522

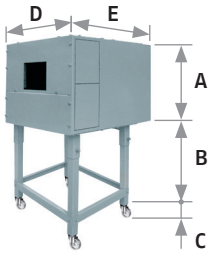
Spacer kit



If burner head penetration into the combustion chamber needs reducing, varying thickness spacers are available, as given in the following list.

Burner	Spacer thickness S (mm)	Kit code
P 140 T/G	102	3000722
P 200 T/G	102	3000722
P 300 T/G	130	3000723
P 450 T/G	130	3000751

Sound proofing box

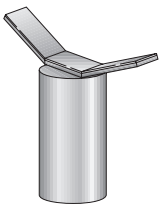


If noise emission needs reducing even further, sound-proofing boxes are available. In case of generator heights, where a lower dimension "B" is required, ask for the Box Support Kit code 20065135. The useful dimensions are 40 mm less than the total dimensions indicated in the table (A, D, E). Not suitable for outdoor use.

Burner	Box type	A (mm)	B (mm) min-max	C (mm)	D (mm)	E (mm)	[dB(A)] (*)	Box code
P 140 T/G P 200 T/G	C4/5	850	160 - 980	110	980	930	10	3010404
P 300 T/G P 450 T/G	C7	1255	160 - 980	110	1140	1345	10	3010376

(*) Average noise reduction according to EN 15036-1 standard

Burner support



For easier maintenance, a mobile burner support has been designed, which means the burner can be dismantled without the need of forklift trucks.

Burner	Support code
P 300 T/G - P 450 T/G	3000731

PC Interface kit

To connect the control box to a personal computer for the transmission of operation, fault signals and detailed service information, an interface adapter with PC software are available.

BURNER	KIT CODE
P 140 T/G - P 200 T/G - P 300 T/G - P 450 T/G	3002719

Protection kit (electromagnetic interferences)

When the burner is installed in a room particularly subject to electromagnetic interference (signals emitted over 10 V/m) due for example to INVERTER presence or in systems where the lengths of the thermostat connections is over 20 meters, this specific protection kit is available as an interface between the thermostatic controls and the burner.

BURNER	KIT CODE
All models	3010386

Specification

DESIGNATION OF SERIES

Series : PRESS

Size : 140 ... 450

Operation : T/G Three stage
P/G Modulating

Emission : ... Class 1 EN267

Head : TC Standard head
TL Extended head

Flame control system : FS1 Standard (1 stop every 24 h)
FS2 Continuous working (1 stop every 72 h)

Electrical supply to the system : 3/230/50 3/230V/50Hz
3/400/50 3N/400V/50Hz
3/230-400/50 3/230V/50Hz - 3N/400V/50Hz
3/220-380/60 3/220V/60Hz - 3N/380V/60Hz
3/200/50-60 3/200V/50-60Hz

Auxiliary voltage : 230/50 230V/50Hz
220/60 220V/60Hz
110/50-60 110V/50-60Hz

PRESS	140	T/G		TC	FS1	3/230-400/50	230/50

BASIC DESIGNATION

EXTENDED DESIGNATION

AVAILABLE MODELS

PRESS 140 T/G	TC	FS1	3/230-400/50	230/50
PRESS 140 T/G	TL	FS1	3/230-400/50	230/50
PRESS 140 T/G	TC	FS1	3/220-380/60	220/60
PRESS 140 T/G	TL	FS1	3/220-380/60	220/60
PRESS 200 T/G	TC	FS1	3/230-400/50	230/50
PRESS 200 T/G	TL	FS1	3/230-400/50	230/50
PRESS 200 T/G	TC	FS1	3/220-380/60	220/60
PRESS 200 T/G	TL	FS1	3/220-380/60	220/60
PRESS 300 T/G	TC	FS1	3/230-400/50	230/50
PRESS 300 T/G	TL	FS1	3/230-400/50	230/50
PRESS 300 T/G	TC	FS1	3/230/50	230/50
PRESS 300 T/G	TL	FS1	3/230/50	230/50
PRESS 300 T/G	TC	FS1	3/400/50	230/50
PRESS 300 T/G	TL	FS1	3/400/50	230/50
PRESS 300 T/G	TC	FS1	3/220-380/60	220/60
PRESS 300 T/G	TL	FS1	3/220-380/60	220/60
PRESS 450 T/G	TC	FS1	3/230/50	230/50
PRESS 450 T/G	TL	FS1	3/230/50	230/50
PRESS 450 T/G	TC	FS1	3/400/50	230/50
PRESS 450 T/G	TL	FS1	3/400/50	230/50

STATE OF SUPPLY

Monoblock forced draught oil burner with three stage operation, fully automatic, made up of:
- Air suction circuit lined with sound-proofing material
- Fan with forward curved blades high performance pressure levels
- Air dampers for air setting controlled by a three stage hydraulic ram
- Starting motor at 2850 rpm, three-phase 400 V with neutral, 50 Hz
- Combustion head, that can be set on the basis of the combustion output, fitted with:
    - stainless steel end cone, resistant to corrosion and high temperatures
    - ignition electrodes
    - flame stability disk
- Gears pump for high pressure fuel supply, fitted with:
    - filter
    - pressure regulator
    - connections for installing a pressure gauge and vacuometer
    - internal by-pass for single pipe installation
- Valve unit with a oil safety valve and three oil delivery valves on the output circuit;
- Photocell for flame detection
- Microprocessor based burner safety control box, with diagnostic function
- Burner on/off switch
- Flame inspection window
- Slide bars for easier installation and maintenance
- Protection filter against radio interference
- IP X0D (IP 40) electric protection level.

Standard equipment:
- 2 flexible pipes for connection to the oil supply network
- 2 nipples for the connection to the pump
- 4 wiring looms fittings for electrical connections
- 4 screws for fixing the burner flange to the boiler
- 2 slide bar extensions (for the extended model of P 300 T/G and P 450 T/G)
- Gasket for flange
- 1 Star Delta starter (On models where provided)
- Diffuser disk (P 450 T/G)
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

NOTES

Riello Burners a world of experience in every burner we sell.

06/2016
TS0038UK04

[1]

[2]

[1] BURNERS PRODUCTION PLANT
S. PIETRO, LEGNAGO (VERONA) – ITALIA

[2] HEADQUARTER BURNERS DIVISION
S. PIETRO, LEGNAGO (VERONA) – ITALIA

Across the world, Riello sets the standard in reliable and high efficiency burner technology.
With burner capacity from 5 kW to 48 MW, Riello gas, oil, dual fuel and Low Nox burners deliver unbeatable performance across the full range of residential and commercial heating applications, as well as in industrial processes.
With headquarter in Legnago, Italy, Riello has been manufacturing premium quality burners for over 90 year.
The manufacturing plant is equipped with the most innovative systems of assembling lines and modern manufacturing cells for a quick and flexible response to the market.
Besides, the Riello Combustion Research Centre, located in Angiari, Italy, represents one of the most modern facility in Europe and one of the most advanced in the world for the development of the combustion technology.
Today, the company's presence on worldwide markets is distinguished by a well-constructed and efficient sales network, alongside many important Training Centres located in various countries to meet its customers' needs.
Riello has 13 operational branches abroad (in Europe, America and Asia), with customers in over 60 countries.

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