

MODULATING HEAVY OIL BURNERS

► PRESS P/N – P/N ECO SERIES

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▶ P 140 P/N	400/800 ÷	1600 kW
▶ P 200 P/N	570/1140 ÷	2280 kW
▶ P 300 P/N	683/1710 ÷	3420 kW
▶ P 450 P/N	1140/2615 ÷	5130 kW
▶ P 140 P/N ECO	400/800 ÷	1600 kW
▶ P 200 P/N ECO	570/1140 ÷	2280 kW
▶ P 300 P/N ECO	683/1710 ÷	3420 kW
▶ P 450 P/N ECO	1140/2615 ÷	5130 kW



The PRESS P/N series of burners covers a firing range from 400 to 5130 kW. They have been designed in three versions for use in commercial and industrial installation, to burn different oil viscosity from 7 up to 60°E @ 50°C.

Operation can be "two stage progressive" or, alternatively, "modulating" with the installation of a PID logic regulator and respective probes, which guarantees a turn down ratio of 3:1. The versatility of this range makes the burner well suited for use on steam boilers where the load factor is subject to wide variations, on thermal oil boilers and on boilers for particular heating plants, as hospitals or similar.

Simplified maintenance is achieved by the Riello designed slide bar system, which allows easy access to all of the essential components of the combustion head.



TECHNICAL DATA

	Model			▼ P 140 P/N	▼ P 200 P/N	▼ P 300 P/N	▼ P 450 P/N		
	Wodel			▼ F 140 F/1V	▼ 1 20017N	¥ 1 3001714	▼ F 450 F/N		
	Setting	type		Modulating (with regulator and probes accessories) or Two stage progressive					
	Modula	tion ratio to max. out	put		4 :	1			
	Servo-	type			SQN	/I 10			
	motor run time s				4:	2			
			kW	400/800÷1600	570/1140÷2280	683/1710÷3420	1140/2615÷5130		
	Heat ou	tput	Mcal/h	344/788÷1376	490/980÷1753	587/1471÷2941	980/2249÷4412		
	Heavy o	oil delivery	kg/h	35/70÷140	50/100÷200	60/150÷300	100/225÷450		
	Working	g temperature	°C min./max.		0/4	40			
			kcal/kg		98	00			
	NCV Heavy Oil		kWh/kg		11	.4			
			MJ/kg	41					
	Low vis	cosity version	mm²/s (cSt)		50 @	50°C			
	_	type		SUNTEC E7	SUNTECTA2	SUNTECTA3	SUNTECTA4		
	Pump	delivery	kg/h at 25 bar	340	470	750	940		
ruei / air uata	Medium	n viscosity version	mm²/s (cSt)	2	200 @ 50°C (with heavy oil ki	t already installed in factory	1)		
		type		SUNTEC E7	SUNTECTA2	SUNTECTA3	SUNTECTA4		
	Pump	delivery	kg/h at 25 bar	340	470	750	940		
	High vis	scosity version	mm ² /s (cSt)	450 @ 50°C (separate 1	1400 rpm pump + heavy oil ki	t + pipes heating cable alre	ady installed in factory)		
	_	type		SUNTECTA3	SUNTECTA4	SUNTECTA5	HP NVBHR M		
	Pump	delivery	kg/h at 25 bar	380	480	690	1150		
	Atomise	ed pressure	bar	25					
	Fuel temperature Max. °C			140					
	Fan type			Centrifugal - curved forward blades					
	Air tem	perature	Max. °C	60					
	Electrica	al supply	Ph/Hz/V	3N/50/400-230 (+10% -15%) $人$ or 3/50/230 (+10% -15%) $△$					
	Electrical p	Electrical power consumption Max. kW		18,5	19,5	32	37		
	Electrica	Electrical motor kW		3	4	7,5	15		
	Motor s	tart current	Α	86/51	83/48	195/113	301/174		
	Motor ru	unning current	Α	13,5/8	16,4/9,5	30/17,5	50,2/29		
2	Motor ele	ectrical protection	IP		5	5			
5	Pump me	otor electrical power (*)	kW	0,55	0,75	1,1	2,2		
5	Rated pu	mp motor current (*)	Α	1,8/3,1	2,1/3,7	2,7/4,7	5,5/9,5		
בופכונוכמו ממומ	Auxiliary	electrical supply	Ph/Hz/V		1/50/230) (±10%)			
ש	Heaters e	electrical power	kW	14	14	19,6	19,6		
	Auxiliary	electrical power	kW	1,5	1,5	2,9	2,4		
	Electrica	al protection	IP		4	0			
	Control	box	type		LANDIS	LAL 1.25			
	Ignition		V1 - V2		230 V -				
	transfor	mer	l1 - l2		2,3 A -	35 mA			
	Operati	on			Intermittent (at least				
	Sound p	pressure	dB (A)	86,2	85,4	89,5	90		
2	Sound p		W						
	CO emis		mg/kWh	< 130	<1		< 170		
"		smoke indicator	N° Bacharach	<	6	< 5	< 4		
í	C _X H _y er		mg/Nm³		-				
		nission level	mg/kWh	< 780		< 550			
Approva	Directiv					73/23 EEC			
2	Conforn				EN:				
(Certifica	ation							

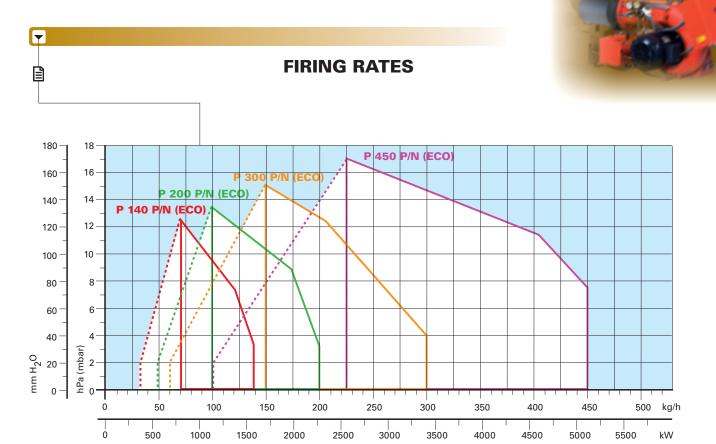
^(*) For High viscosity versions only.

Reference conditions:

Ambient temperature: 20°C
Barometric pressure: 1000 mbar Altitude: 100 meters a.s.l.

Sound pressure level measured in manufacturers combustion laboratory, with burner operating on test boiler and at maximum rated output.

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Useful working field for choosing the burner

Modulation range

Test conditions conforming to EN 267: Temperature: 20°C Pressure: 1013.5 mbar Altitude: 100 m a.s.l.



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FUEL SUPPLY

HYDRAULIC CIRCUITS

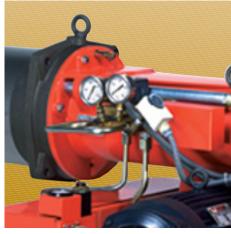
Various hydraulic circuits are available, depending on fuel output asset according to local norms of steam generators.

The burners are fitted with two valves and an oil preheater with thermostats along the oil line from the pump to the nozzle, where the opening is regulated from a needle valve.

A pressure regulator on the return circuit from the nozzle allows to vary the quantity of fuel burnt.

For heavy oil preheating, a special kit with three electrical heaters at the pump, at the regulator and at the nozzle can be used.

The models are fitted with a maximum pressure switch on the oil return circuit.



Example of the hydraulic circuit on PRESS 200 P/N

VU VS1 VS2 MM RO RO RO

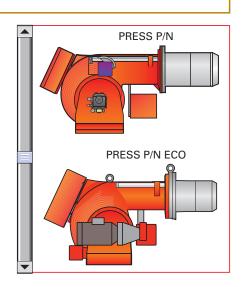
Р	Pump with filter, heater and pressure regulator on the output circuit
S	Oil preheater with maximum, minimum and regulation thermostat
Т	Thermometer
MM	Oil delivery gauge
SM	Servomotor
RO	Pressure regulator on the return circuit
РО	Oil pressure switch on the return circuit
U	Nozzle
MR	Pressure gauge on the return circuit
VU	Nozzle needle valve
VSn	Delivery oil valves

VISCOSITY

prEN 267 > 100 Kg/h

The modulating burner P/N series can burn different heavy oil types from 50 up to 450 cSt @ 50°C (7 up to 60°E @ 50°C). For different viscosity levels Riello recommends 3 different configurations:

- 1) Press P/N version for viscosity up to 50 cST (7°E) @ (50°C: basic version with 2800 rmp oil pump installed directly on fan motor shaft
- 2) Press P/N version for viscosity up to 200 cST (25°E) @ 50°C: as basic version + heavy oil cartridges factory installed on nozzles, pump and valves group
- 3) Press P/N ECO version for viscosity up to 450 Cst (60°E) @ 50°C:
 - with separate 1400 rpm low speed pump
 - heavy oil cartridges factory installed on nozzles, pump and valves group
 - pipes heating cable factory installed.



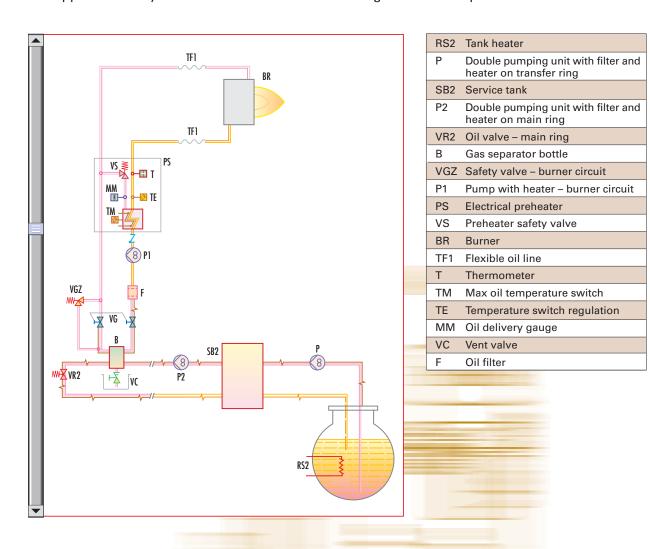


DIMENSIONING OF THE FUEL SUPPLY LINES

The fuel feed must be completed with the safety devices required by the local norms.

IMPORTANT NOTES

- The oil could easily flow through the pipes if those are properly sized, protected and heated (by electricity, steam or hot water)
- In order to limit gas or steam production the oil pressure into the gas separator shall be set in function of the supply temperature, see instructions manual.
- The forwarding pump should have at least a double capacity than that one of the burner. For several burners supplied through the same ring supply line, the forwarding pump should have a capacity of approximatively 30% more than the sum of the single burners outputs.





VENTILATION

The ventilation circuit is provided with a forward 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.

The use of sound proofing boxes helps in reducing the noise level.

A variable profile cam connects fuel and air setting, ensuring fuel efficiency in all firing rates.



Example of servomotor for air/light oil setting



COMBUSTION HEAD

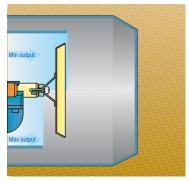
Two different lengths of the combustion head can be chosen for the various models of the PRESS P/N series of burners.

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.

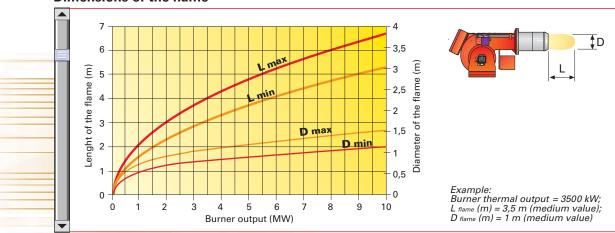
The internal position of the combustion head can easily be adjusted: refer to the burner instruction manual for the complete procedure.

The following diagram shows the 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 above reported values.



Example of a PRESS P/N burner combustion head

Dimensions of the flame



Y

ADJUSTMENT



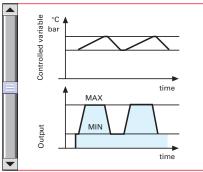


BURNER OPERATION MODE

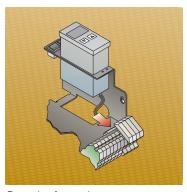
The PRESS P/N series of burners can have "two stage progressive" or "modulating" operation.

On "two stage progressive" operation, the burner gradually adapts the output to the requested level, by varying between two pre-set levels (see picture A).

"Two stage progressive" operation



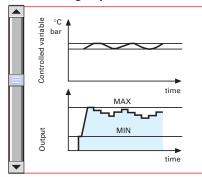
Picture A



Example of a regulator

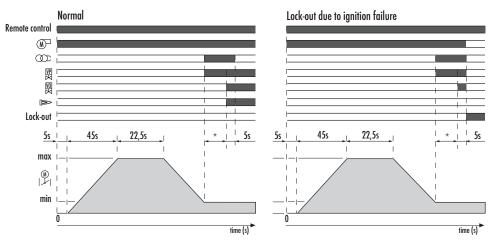
On "modulating" operation, normally required in steam generators, in superheater boilers or diathermic oil burners, a specific regulator and probes are required. These are supplied as accessories that must be ordered separately. The burner can work for long periods at intermediate output levels (see picture B).

"Modulating" operation



Picture B

FIRING



0" The burner begins the start-up cycle: the motor starts turning. 5"-50" The servomotor opens the air damper at the maximum position.

50"-72,5" Chamber pre-purge phase with air damper open.

72,5" The servomotor takes the fire damper to the firing position.

92,5" Ignition transformer turns on. Pre-purge valves opens and oil circuit pre-purge phase takes place.

95" Ignition valve opens and flame rilevation with P.E. cell is activated. (*)

After a safety time of 7,5" the ignition transformer turns down if there is the flame otherwise lockout happens.



^{*} Time adjustable with timer.



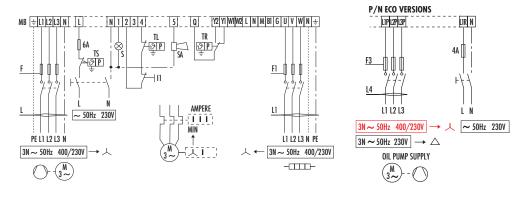
WIRING DIAGRAMS

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Electrical connections must be made by qualified and skilled personnel, according to the local norms.

"TWO STAGE PROGRESSIVE" OPERATION

Direct start-up version P 140-200-300 P/N



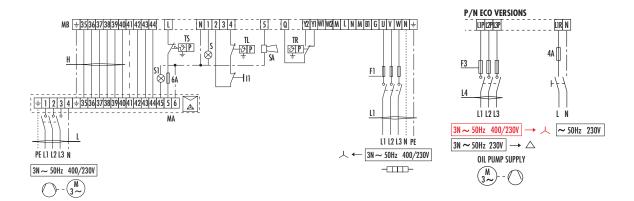
MB - Burner terminal board
L, L1, L4 - Lead section (see table A)
TS - Safety thermostat
S - External look
TL - The

High/low flame setting thermostat

TR T6A F, F1, F3 - 6A fuse - Fuse (see table A)

Manual switchHigh temperature oil alarm

Star delta start-up version P 300-450 P/N



MB - Burner terminal board
L, L1, L4, H - Lead section (see table A)
TS - Safety thermostat
S, S2 - External lock-out signal
TL - Threshold thermostat
TR - High/low flame setting the

- High/low flame setting thermostat - 6A fuse - Fuse (see table A)

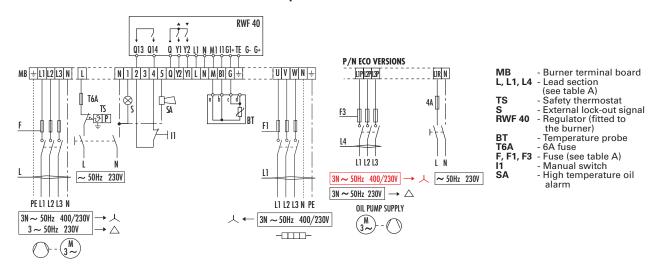
T6A F, F1, F3 ΜA - Star delta starter - Manual switch

I1 SA - High temperature oil alarm

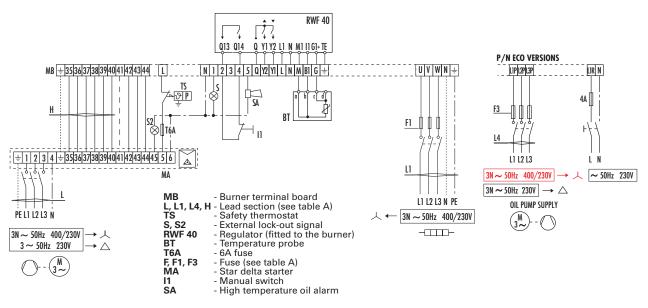


"MODULATING" OPERATION - temperature probe

Direct start-up version P 140-200-300 P/N

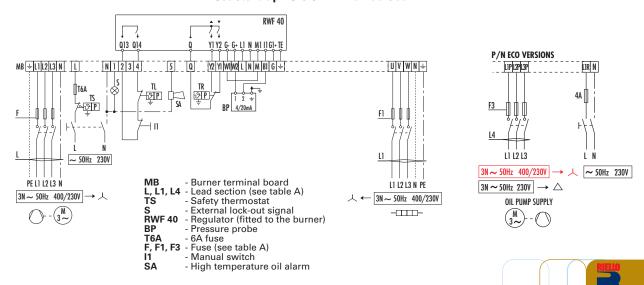


Star delta start-up version P 300-450 P/N



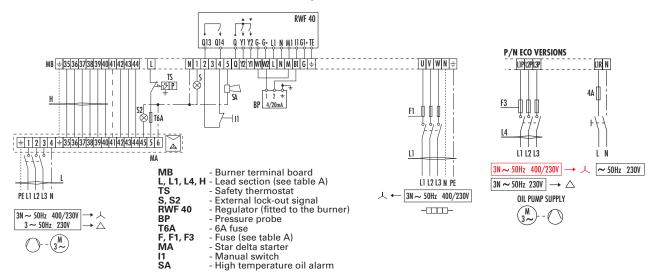
"MODULATING" OPERATION - pressure probe

Direct start-up version P 140-200-300 P/N



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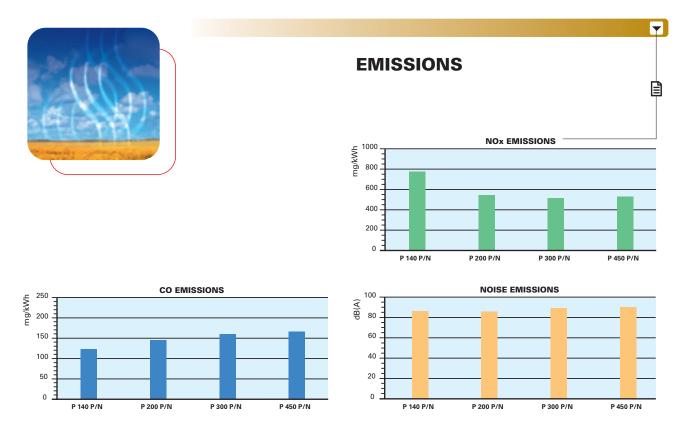
Star delta start-up version P 300-450 P/N



The following table shows the supply lead sections and the type of fuse to be used.

		Direct						Star	delta	
Model	▼ P 140 P/N		▼ P 200 P/N		▼ P 300 P/N		▼ P 300 P/N		▼ P 450 P/N	
	230V	400V	230V	400V	230V	400V	230V	400V	230V	400V
FA	T25	T25	T35	T25	T63	T50	T50	T35	-	-
F1 A	T50	T35	T50	T35	T63	T50	T63	T50	T63	T50
F3 A	T10	T6	T10	T6	T10	T6	T10	T6	T10	T6
L mm ²	2,5	2,5	4	2,5	6	4	6	4	10	6
L1 mm ²	10	6	10	6	10	6	10	6	10	6
L4 mm ²	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
H mm ²	-	-	-	-	-	-	4	2,5	6	4

Table A



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

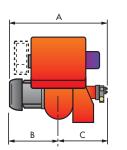
OVERALL DIMENSIONS (mm)

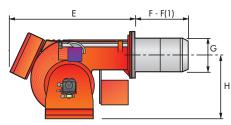


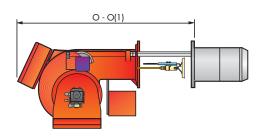
BURNERS

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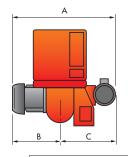
PRESS P/N

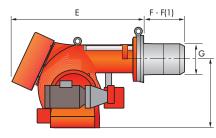


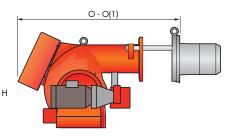




PRESS P/N ECO



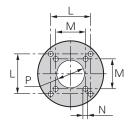




Model	А	В	С	Е	F - F(1)	G	Н	O - O(1)
▶ P 140 P/N	796	396	400	910	323 - 433	222	467	1390 - 1390
▶ P 200 P/N	796	396	400	910	352 - 462	250	467	1390 - 1390
▶ P 300 P/N	858	447	411	1020	376 - 506	295	496	1535 - 1685
▶ P 450 P/N	950	508	442	1090	435 - 565	336	525	1665 - 1820
▶ P 140 P/N ECO	900	396	504	890	323 - 433	222	467	1370 - 1370
▶ P 200 P/N ECO	900	396	504	890	352 - 462	250	467	1370 - 1370
▶ P 300 P/N ECO	984	447	537	1000	376 - 506	295	496	1515 - 1665
▶ P 450 P/N ECO	1100	508	592	1090	435 - 565	336	525	1665 - 1820

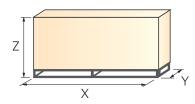
⁽¹⁾ Length with extended combustion head

BURNER - BOILER MOUNTING FLANGE



Model	L	М	N	Р
▶ P 140 P/N (ECO)	260	230	M 14	225
▶ P 200 P/N (ECO)	260	-	M 16	255
▶ P 300 P/N (ECO)	260	-	M 18	300
▶ P 450 P/N (ECO)	310	_	M 20	350

PACKAGING



Model	X	Υ	Z	kg
▶ P 140 P/N (ECO)	1500	930	900	180
▶ P 200 P/N (ECO)	1500	930	900	220
▶ P 300 P/N (ECO)	1780	1085	990	238
▶ P 450 P/N (ECO)	1780	1085	990	300





INSTALLATION DESCRIPTION

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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 SETTINGS

- ▶ 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 form the burner of approximatively 100-120mm and fix it to the boiler.
- Adjust the combustion head.
- ▶ Refit the burner casing to the slide bars.
- Install the nozzle, 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 if it is a three phase motor).
- On start up, check:
 - Pressure pump and valve unit regulator (to max. and min.)
 - Combustion quality, in terms of not-burnt substances and excess air.







Nozzles

The nozzles must be ordered separately. The following table shows the features and codes on the basis of the maximum required output.



NOTE: each burner needs N° 1 nozzle.

		Nozzles	
Burner	Rated output kg/h	Nozzles Bergonzo B5 45° - with "AA" needle code	Nozzles Fluidics W2 45° - with "AA" needle code
P 140 P/N	70	3009203	3045426
P 140 P/N	80	3009205	3045427
P 140 P/N	90	3009207	3045428
P 140 P/N - P 200 P/	N 100	3009209	3045430
P 140 P/N - P 200 P/	N 125	3009211	3045432
P 200 P/N - P 300 P/	′N 150	3009213	3045434
P 200 P/N - P 300 P/	/N 175	3009215	3045436
P 200 P/N - P 300 P/	′N 200	3009800	3045438
P 200 P/N - P 300 P/	N 225	3009801	3045440
P 300 P/N - P 400 P/	N 250	3009802	3045442
P 300 P/N - P 400 P/	N 275	3009803	3045444
P 300 P/N - P 400 P/	/N 300	3009804	3045446
P 450 P/N	325	3009805	3045448
P 450 P/N	350	3009806	3045450
P 450 P/N	375	3009807	3045452
P 450 P/N	400	3009808	3045454
P 450 P/N	425	3009809	3045455
P 450 P/N	450	3009810	3045456

Spacers kit

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



	Spacers	
Burner	Spacer thickness S (mm)	Kit code
P 140 P/N - P 200 P/N	110	3000722
P 300 P/N	130	3000723
P 450 P/N	130	3000751

Sound proofing box

If noise emissions need reducing, sound proofing hoods are available, as given in the following table.



Sound proofing box						
Burner	Box type	Average noise reduction [dB(A)] (*)	Box code			
P 140 P/N - P 200 P/N	C4/5	10	3010404			
P 300 P/N - P 450 P/N	C7	10	3010376			

^(*) 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.



Support	
Burner	Code
P 300 P/N - P 450 P/N	3000731

Accessories for modulating operation

To obtain modulating operation, the PRESS P/N series of burners require a regulator, with three point outlet control. The relative temperature or pressure probes fitted with the regulator must be chosen on the basis of the application.

The following table lists the accessories for modulating setting with their application range.



REGUL	ATOR	PROBES		
Туре	Code	Туре	Range (°C) (bar)	Code
RWF 40	3010211	Temperature PT 100	-100 ÷ 500°C	3010110
		Pressure 4 ÷ 20 mA	0 ÷ 2,5 bar	3010213
		Pressure 4 ÷ 20 mA	0 ÷ 16 bar	3010214

Analog control signal

Depending on the servomotor fitted to the burner, a three-pole potentiometer (0÷1000 W) can be installed to check the servomotor position. The kits available for the various burners are listed below:



Potentiometer kit				
Burner	Kit code			
P 140 P/N - P 200 P/N - P 300 P/N - P 450 P/N	3010021			

Gas separator bottle

It allows to recover heat in excess by discharge of the gas from the return circuit.



Gas separator bo	ottle
Burner	Degaser code
P 140 P/N - P 200 P/N	3000748
P 300 P/N - P 450 P/N	3010012

Heavy oil kit

Equipped with electrcal heaters, it permits the employment of PRESS P/N burners with fuel oil of max. viscosity 25°E at 50°C.



Heavy oil kit				
Burner	Kit code			
P 140 P/N - P 200 P/N - P 300 P/N - P 450 P/N	3000721			



Heavy oil precirculation kit

This kit, used with oil with high viscosity, in maintains fuel circulation in the ol circuit for avoiding system stop at start up.



Heavy oil precirculatio	n kit
Burner	Code
P 140 P/N - P 200 P/N	3000749
P 300 P/N - P 450 P/N	3000750

Selfcleaning filter

For cleaning heavy oil from dirty particles and impurities, it is equipped with a thermostatic heater for oil with 60°E viscosity at 50°C.



FILTE	R	HEATTERS AND THERMOSTATS			
Туре	Code	Туре	Code		
Ø=1"1/2	3010022	Thermostatic heater with LED	3010060		
(60°E - 50°C)		Heater	3010061		
		Thermostat (two-stage / regulalable)	3010062		

Cartridge filter

For cleaning heavy oil from dirty particles and impurities, it is equipped with a cartridge system for oil with 7°E viscosity at 50°C.



Cartridge filter				
Burner	Filter code			
P 140 P/N - P 200 P/N - P 300 P/N - P 450 P/N	3005209			



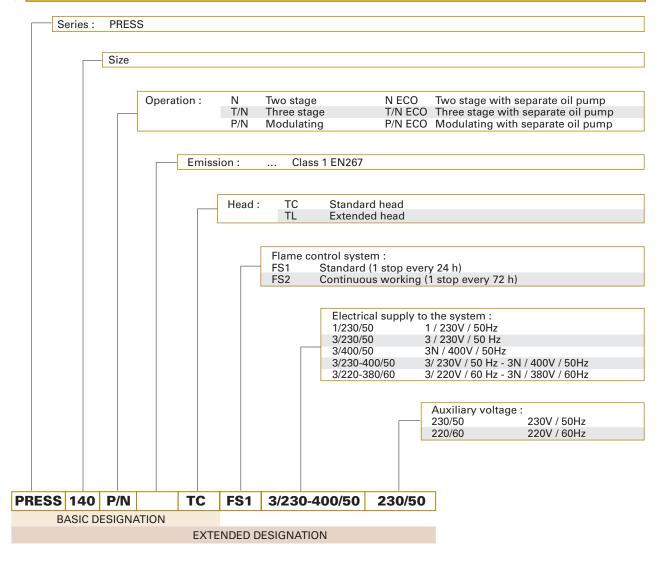




SPECIFICATION

A specific index guides your choice of burner from the various models available in the PRESS P/N series. Below there is a clear and detailed specification description of the product.

DESIGNATION OF SERIES PRESS HEAVY OIL BURNERS



LIST OF AVAILABLE MODELS

			3/230-400/50 3/230-400/50	230/50 230/50			P/N (ECO) P/N (ECO)	TL TC	3/230/50 3/400/50	230/50 230/50
Р	200 P/N (ECO)	TC	3/230-400/50	230/50	1		P/N (ECO)	ŤĽ	3/400/50	230/50
Р	200 P/N (ECO)	TL	3/230-400/50	230/50	Р	450	P/N (ECO)	TC	3/230/50	230/50
Ρ	300 P/N (ECO)	TC	3/230-400/50	230/50	P	450	P/N (ECO)	TL	3/230/50	230/50
Ρ	300 P/N (ECO)	TL	3/230-400/50	230/50	P	450	P/N (ECO)	TC	3/400/50	230/50
Ρ	300 P/N (ECO)	TC	3/230/50	230/50	P	450	P/N (ECO)	TL	3/400/50	230/50

Ask for specific code for ECO models. Other models are available on request.



PRODUCT SPECIFICATION

Burner:

Monoblock forced draught oil burner with two-stage progressive or modulating operation, with a specific kit, fully automatic, made up of:

- Air suction circuit lined with sound-proofing material
- Fan with forward curved blades high performance pressure levels
- Air damper for air setting and automatic oil output regulator controlled by a servomotor with variable cam
- Fan motor at 2850 rpm, three-phase 400V with neutral, 50Hz
- 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
- Heavy oil kit cartridges (for P/N version viscosity 7°E @ 50°C and for P/N ECO version)
- Pipes heating cable (P/N ECO version)
- Oil pump motor at 1400 rpm (P/N ECO version)
- Valve unit with a double oil safety valve on the output circuit
- Electrical preheater for heavy oil
- Safey oil pressure switch
- Photocell for flame detection
- Flame control panel, fitted with control function for the correct positioning of the servomotor and possibility of post-ventilaton by just changing the electric wiring
- Flame inspection window
- Slide bars for easier installation and maintenance
- Protection filter against radio interference
- IP 40 electric protection level.

Conforming to:

- 89/336/EC directive (electromagnetic compatibility)
- 73/23/EEC directive (low voltage).

Standard equipment:

- 2 flexible pipes for connection to the oil supply network
- 2 nipples for the connection to the pump
- Wiring looms fittings for electrcial connections
- 4 screws for fixing the burner flange to the boiler
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue
- 2 slide bar extensions (for the extended head models of P 300 P/N e P 450 P/N)
- Gasket for flange
- Starter³
- * for versions with star-delta starting

Available accessories to be ordered separately:

- Return nozzles
- Head lenght reduction kit (spacer)
- Sound-proofing box
- RWF 40 output regulator
- Pressure probe 0-2,4 bar
- Pressure probe 0-16 bar
- Temperature probe –100-500°C
- Potentiometer kit for the servomotor
- Burner support
- Gas separator bottle
- Selfcleaning filter
- Heavy oil kit
- Heavy oil precirculation kit
- Cartridge filter.













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