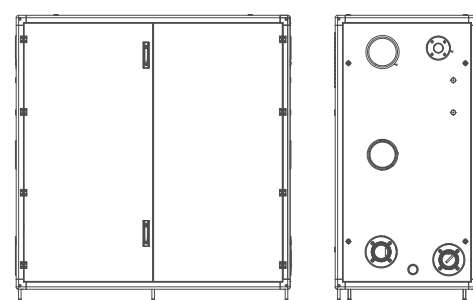


Condensing generators

Power Max BOX

Indoor and Outdoor condensing
pre-assembled gas fired boilers



CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

Power Max Box

PRODUCT OVERVIEW

Power Max Box is the new Beretta condensing modular system, specifically designed and developed to reach very high energy energetic efficiency values, while minimising the occupied space.

The system, ready for a simple and quick installation, consists of apparatus cabinets designed according to the modularity principles, consisting of an assembled anodised aluminium frame and painted panels.

The standard product is suitable for indoor installation, with open chamber combustion; it can be converted to sealed combustion or to a version for outdoor installation by fitting specific accessory kits.

The cabinets are equipped with 2, 3 or 4 heating elements of 57 to 131 kW, with a total power from 114 to 524 kW and are available in the versions that associate to each thermal module low consumption circulators ("P" models) or 2-way valves ("V" models); the standard supply also includes management and control electronic adjustment, hydraulic delivery and return manifolds, gas, flue gas and condensate drain manifolds. The heat exchangers, with patented geometries, consist of two plain concentric stainless steel tubes, with a pentagonal section inside and circular section outside; they have been specifically designed to maximize the exchange surface, offer maximum corrosion resistance and minimum pressure drops. These characteristics allow operation with high ΔT , allowing the reduction of the times needed to reach the system steady state.

The models with 131 kW heat exchanger (300-450-600) are designed for cascade installation, with side by side coupling, up to a total maximum number of 10 units and a power of 1310 kW.

The control electronics, compatible with the MOD-BUS protocol, allows the climatic regulation with cascade management of the thermal modules, the automatic summer / winter switching, the possibility of remote management by means of 0..10V input and alarm output signal. The control system manages the heat distribution on the secondary circuit, controlling: a direct zone, one or more mixed zones (from 1 to 3, depending on the model) and the storage cylinder circuit. Through specific accessories, there is also the possibility to manage additional mixed zones (up to max. 16). The optimal combustion management and the high modulation ratios (up to 1:50) allow high yields and low pollutant emissions (Class 6 according to UNI EN 15502).

Continuity of service is guaranteed by system modularity: even in the event of fault of a module, overall operation will not be compromised. Accessories designed to guarantee a simple, rapid and complete installation of the thermal power station are also available. Maximum operating pressure 6 bar.

TECHNICAL DATA 130-2 P/V - 300-2 P/V

POWER MAX MODELS			U.M.	130-2 P/V		160-2 P/V		200-2 P/V		260-2 P/V		300-2 P/V	
				G20	G31	G20	G31	G20	G31	G20	G31	G20	G31
APPLIANCE TYPE													
Type				Condensing heating B23, B53; B53P									
Fuel				G20-G25-G30-G31									
Combustion chamber				Vertical									
Flue gases discharge type-approval				B23, B23P, B53P, C13(*), C33(*), C53(*), C63(*)									
Appliance category according to UNI 10642				II2H3P									
OUTPUTS AND EFFICIENCY													
Rated heat input NCV			kW	114,00		136,00		180,00		223,20		262,00	
Rated heat input GCV			kW	126,0		152,0		200,0		248,0		292,0	
Nominal heat output max. 80-60°C			kW	111,4		134,0		176,6		219,6		258,0	
Nominal heat output max. 60-40°C			kW	119,2		142,8		187,6		232,4		274,6	
Nominal heat output max. 50-30°C			kW	123,8		147,8		194,8		242,2		284,2	
Minimum heat input NCV			kW	13,7		13,7		19,4		22,4		26,3	
Minimum heat input GCV			kW	15,0		15,0		21,6		24,9		29,0	
Minimum heat output 80/60°C			kW	13,5		13,5		19,2		22,1		26,0	
Minimum heat output 50/30°C			kW	14,9		14,9		21,1		24,5		28,9	
Useful efficiency at nominal heat output 80-60°C (NCV)			%	97,72		98,53		98,11		98,40		98,47	
Useful efficiency at minimum heat output 80-60°C (NCV)			%	98,90		98,90		98,80		99,20		99,10	
Useful efficiency at nominal heat output 50/30°C (NCV)			%	108,60		108,10		108,30		108,60		108,30	
Useful efficiency at minimum heat output 50/30°C (NCV)			%	109,30		109,30		109,20		110,00		110,00	
Useful efficiency 30% 50/30°C GCV (NCV)			%	98,94 (109,36)		97,81 (109,31)		98,00 (108,89)		98,39 (108,93)		98,17 (109,41)	
Combustion efficiency			%	99,0		99,3		99,3		99,3		99,3	
Chimney losses with the burner off			%	0,10		0,10		0,10		0,10		0,10	
Chimney losses with the burner on P. max 80-60°C			%	2,30		2,30		2,50		2,50		2,60	
Chimney losses with the burner on at 30% Pn 50-30°C			%	0,50		0,50		0,60		0,50		0,60	
Chimney losses with the burner on P. min 80-60°C			%	0,12		0,11		0,22		0,10		0,10	
Heat losses at the appliance casing with average temperature of 70°C and burner on			%	0,50		0,50		0,50		0,50		0,50	
Heat losses at the appliance casing with average temperature of 70°C and burner off			%	0,50		0,50		0,50		0,50		0,50	
Flue gas temperature at max. power and min. power 80-60°C			°C	71 - 61		72 - 61		76 - 62		75 - 61		77 - 61	
Flue gas temperature at max. power and min. power 50-30°C			°C	45 - 33		46 - 33		47 - 35		45 - 33		48 - 35	
Air index λ at max. power			no.	1,27	1,29	1,27	1,29	1,27	1,29	1,27	1,29	1,27	1,29
Air index λ at min. power			no.	1,27	1,29	1,27	1,29	1,27	1,29	1,27	1,29	1,27	1,29
Mass flue gas flow rate at max-min output			g/s	53 - 6	51 - 6	64 - 6	62 - 6	84 - 9	82 - 9	104 - 10	101 - 10	122 - 12	119 - 12
Flue gases residual discharge head at min. power			Pa	35,00		35,00		32,00		30,00		28,00	
Flue gases residual discharge head at max. power			Pa	510,00		630,00		560,00		500,00		353,00	
ELECTRICAL DATA													
Voltage supply			V - Hz	230-50									
Electrical protection level			IP	IPX4D									
Electric power consumption with the boiler at max. power			W	198		264		460		706		964	
Electric power consumption with the boiler at min. power			W	92		96		126		198		220	
Pumps electric power consumption at max. power			W	100		110		160		296		360	
Pumps electric power consumption at min. power			W	40		44		64		118		144	
HEATING OPERATION													
Water temperature selection range (with plate heat exchanger)			°C	20-80/(85)*									
Lockout thermostat activation temperature			°C	95									
Maximum operating temperature			°C	100									
Maximum operating pressure			bar	6									
Minimum operating pressure			bar	0,7									
Water content			l	45,00		45,00		50,00		60,00		75,00	
Pressure drops water side with ΔT 20°C "V versions"			mbar	102		135		168		356		526	
Residual discharge head water side with ΔT 20°C "P versions"			mbar	400		280		450		300		500	
Maximum condensation production at maximum output 50-30°C			l/h	17,80		20,20		27,20		35,00		39,60	
Noise levels (sound power)			dB(A)	56		58		58		60		61	
GAS FEEDING DATA													
Gas feeding maximum pressure			mbar	60	60	60	60	60	60	60	60	60	60
Gas feeding nominal pressure			mbar	20	37	20	37	20	37	20	37	20	37
Gas feeding minimum gas pressure			mbar	17	25	17	25	17	25	17	25	17	25
SIZE DATA													
Heating delivery diameter			ø DN	3" DN80 PN6		3" DN80 PN6		3" DN80 PN6		3" DN80 PN6		5" DN125 PN6	
Heating return diameter			ø DN	3" DN80 PN6		3" DN80 PN6		3" DN80 PN6		3" DN80 PN6		5" DN125 PN6	
Gas input diameter			ø DN	2" DN50 PN6		2" DN50 PN6		2" DN50 PN6		2" DN50 PN6		3" DN80 PN6	
Condensate drain diameter			ø (mm)	50		50		50		50		50	
Casing height			mm	1800		1800		1800		1800		1800	
Casing width			mm	900		900		900		900		900	
Casing depth			mm	890		890		890		890		890	
Flue gases exhaust diameter			ø (mm)	DN160		DN160		DN160		DN160		DN300	
Air suction diameter (optional)			ø (mm)	DN160		DN160		DN160		DN160		DN300	
Empty weight			kg	270		270		280		300		350	

(*) Configurations possible only with the installation of dedicated accessories (available separately).

(**) Weights calculated according to standard EN 15502.

(***) Values referred to atmospheric pressure at sea level.

CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

TECHNICAL DATA 330-3 P/V - 600-4 P/V

POWER MAX MODELS		U.M.	330-3 P/V		390-3 P/V		450-3 P/V		520-4 P/V		600-4 P/V	
			G20	G31	G20	G31	G20	G31	G20	G31	G20	G31
APPLIANCE TYPE												
Type			Condensing heating B23, B53; B53P									
Fuel			G20-G25-G30-G31									
Combustion chamber			Vertical									
Flue gases discharge type-approval			B23, B23P, B53P, C13(*), C33(*), C53(*), C63(*)									
Appliance category according to UNI 10642			II2H3P									
OUTPUTS AND EFFICIENCY												
Rated heat input NCV		kW	291,00		336,00		393,00		446,40		524,00	
Rated heat input GCV		kW	324,0		372,0		438,0		496,0		584,0	
Nominal heat output max. 80-60°C		kW	285,9		329,4		387,0		439,2		516,0	
Nominal heat output max. 60-40°C		kW	303,3		348,6		411,9		464,8		549,2	
Nominal heat output max. 50-30°C		kW	315,3		363,6		426,3		484,4		568,4	
Minimum heat input NCV		kW	19,4		22,4		26,3		22,4		26,3	
Minimum heat input GCV		kW	21,6		24,9		29,0		24,9		29,0	
Minimum heat output 80/60°C		kW	19,2		22,1		26,0		22,1		26,0	
Minimum heat output 50/30°C		kW	21,1		24,5		28,9		24,5		28,9	
Useful efficiency at nominal heat output 80-60°C (NCV)		%	98,25		98,4		98,47		98,40		98,47	
Useful efficiency at minimum heat output 80-60°C (NCV)		%	98,80		99,20		99,10		99,20		99,10	
Useful efficiency at nominal heat output 50/30°C (NCV)		%	108,20		108,60		108,30		108,60		108,30	
Useful efficiency at minimum heat output 50/30°C (NCV)		%	109,20		110,00		110,00		110,00		110,00	
Useful efficiency 30% 50/30°C GCV (NCV)		%	97,84 (108,93)		98,39 (108,93)		98,17 (109,41)		98,39 (108,93)		98,17 (109,41)	
Combustion efficiency		%	99,0		99,0		99,0		99,3		99,3	
Chimney losses with the burner off		%	0,10		0,10		0,10		0,10		0,10	
Chimney losses with the burner on P. max 80-60°C		%	2,60		2,50		2,60		2,50		2,60	
Chimney losses with the burner on at 30% Pn 50-30°C		%	0,60		0,50		0,60		0,50		0,60	
Chimney losses with the burner on P. min 80-60°C		%	0,20		0,10		0,10		0,10		0,10	
Heat losses at the appliance casing with average temperature of 70°C and burner on		%	0,33		0,33		0,33		0,25		0,25	
Heat losses at the appliance casing with average temperature of 70°C and burner off		%	0,33		0,33		0,33		0,25		0,25	
Flue gas temperature at max. power and min. power 80-60°C		°C	78 - 62		75 - 61		77 - 61		75 - 61		77 - 61	
Flue gas temperature at max. power and min. power 50-30°C		°C	49 - 35		45 - 33		48 - 35		45 - 33		48 - 35	
Air index λ at max. power		no.	1,27	1,29	1,27	1,29	1,27	1,29	1,27	1,29	1,27	1,29
Air index λ at min. power		no.	1,27	1,29	1,27	1,29	1,27	1,29	1,27	1,29	1,27	1,29
Mass flue gas flow rate at max-min output		g/s	136 - 9	132 - 9	156 - 10	152-10	183-12	179-12	208-10	203-10	245-12	238-12
Flue gases residual discharge head at min. power		Pa	32,00		30,00		28,00		30,00		28,00	
Flue gases residual discharge head at max. power		Pa	610,00		500,00		353,00		500,00		353,00	
ELECTRICAL DATA												
Voltage supply		V - Hz	230-50									
Electrical protection level		IP	IPX4D									
Electric power consumption with the boiler at max. power		W	951		1059		1446		1412		1928	
Electric power consumption with the boiler at min. power		W	228		297		330		396		440	
Pumps electric power consumption at max. power		W	342		444		540		592		720	
Pumps electric power consumption at min. power		W	135		177		216		236		288	
HEATING OPERATION												
Water temperature selection range (with plate heat exchanger)		°C	20-80/(85)*									
Lockout thermostat activation temperature		°C	95									
Maximum operating temperature		°C	100									
Maximum operating pressure		bar	6									
Minimum operating pressure		bar	0,7									
Water content		l	80,00		100,00		120,00		120,00		150,00	
Pressure drops water side with ΔT 20°C "V versions"		mbar	230		356		526		356		526	
Residual discharge head water side with ΔT 20°C "P versions"		mbar	300		300		500		300		500	
Maximum condensation production at maximum output 50-30°C		l/h	45,00		52,50		59,40		70,00		79,20	
Noise levels (sound power)		dB(A)	60		61		62		63		64	
GAS FEEDING DATA												
Gas feeding maximum pressure		mbar	60	60	60	60	60	60	60	60	60	60
Gas feeding nominal pressure		mbar	20	37	20	37	20	37	20	37	20	37
Gas feeding minimum gas pressure		mbar	17	25	17	25	17	25	17	25	17	25
SIZE DATA												
Heating delivery diameter		ø DN	3" DN80 PN6		3" DN80 PN6		5" DN125		3" DN80 PN6		5" DN125	
Heating return diameter		ø DN	3" DN80 PN6		3" DN80 PN6		5" DN125		3" DN80 PN6		5" DN125	
Gas input diameter		ø DN	2" DN50 PN6		2" DN50 PN6		3" DN80 PN6		2" DN50 PN6		3" DN80 PN6	
Condensate drain diameter		ø (mm)	50		50		50		50		50	
Casing height		mm	1800		1800		1800		1800		1800	
Casing width		mm	1800		1800		1800		1800		1800	
Casing depth		mm	890		890		890		890		890	
Flue gases exhaust diameter		ø (mm)	DN160		DN160		DN300		DN160		DN300	
Air suction diameter (optional)		ø (mm)	DN160		DN160		DN300		DN160		DN300	
Empty weight		kg	450		490		540		560		600	

(*) Configurations possible only with the installation of dedicated accessories (available separately).

(**) Weights calculated according to standard EN 15502.

(***) Values referred to atmospheric pressure at sea level.

ERP DATA 130-2 P/V - 300-2 P/V

POWER MAX MODELS	U.M.		130-2 P/V		160-2 P/V		200-2 P/V		260-2 P/V		300-2 P/V	
Seasonal ambient heating energy efficiency class			-		-		-		-		-	
Nominal output	kW		114,0		136,0		180,0		224,0		262,0	
Seasonal ambient heating energy efficiency η_s	%		94 / 94		93 / 93		93 / 93		93 / 93		93 / 93	
EFFECTIVE HEAT OUTPUT												
At nominal heat output and in high temperature mode P4	kW		114,0	-	134,0	-	176,6	-	219,6	-	258,0	-
At 30% of nominal heat output and in low temperature mode P1	kW		37.4	-	44.6	-	58,8	-	73,2	-	86.6	-
EFFICIENCY												
At nominal heat output and in high temperature mode η_4 (GCV)	%		88,41		88,16		88,30		88,55		88,36	
At 30% of nominal heat output and in low temperature mode η_1 (GCV)	%		98,94		97,81		98,00		98,39		98,17	
AUXILIARIES ELECTRICITY CONSUMPTION												
With full load Elmax	W		198 / 98		264 / 154		460 / 300		706 / 410		964 / 604	
With partial load Elmin	W		92 / 52		96 / 52		126 / 62		198 / 80		220 / 76	
In standby mode PSB	W		26 / 15		26 / 15		12 / 12		12 / 12		16 / 16	
OTHER PARAMETERS												
Heat losses in Pstby standby mode	W		159,16		194,47		255,56		316,64		374,47	
Energy consumption of the Pign pilot flame	W		-		-		-		-		-	
Annual energy consumption QHE	GJ		236,0		282,0		364,0		384,0		532,0	
Sound power level indoors LWA	dB(A)		56,00		58,00		58,00		60,00		61,00	
Nitrogen oxide emissions Nox (**)	mg/kWh		34,20		36,40		38,10		39,30		46,10	
NOx class	n°		6		6		6		6		6	
Emission values at maximum and minimum output (**)			G31	G20	G31	G20	G31	G20	G31	G20	G31	G20
Maximum	p.p.m.	CO s.a. lower than	79,0	142,0	90,0	147,0	81,0	153,0	89,0	177,0	91,5	185
	%	CO2 (***)	9,0	10,4	9,0	10,4	9,0	10,4	9,0	10,4	9,0	10,4
	p.p.m.	NOx s.a. lower than	30,0	40,0	30,0	40,0	30,0	40,0	30,0	40,0	30,0	40,0
	°C	T flue gases	71,0		72,0		76,0		75,0		77,0	
Minimum	p.p.m.	CO s.a. lower than	6,5	11,0	6,5	11,0	7,5	12,0	4,6	14,0	5,6	16,0
	%	CO2 (***)	9,0	10,4	9,0	10,5	9,0	10,4	9,0	10,4	9,0	10,4
	p.p.m.	NOx s.a. lower than	30,0	40,0	30,0	40,0	30,0	40,0	30,0	40,0	30,0	40,0
	°C	T flue gases	61,0		61,0		62,0		61,0		61,0	
FOR COMBINED HEATING APPLIANCES												
Water heating energy efficiency η_{wh}	%		-	-	-	-	-	-	-	-	-	-
Daily electrical energy consumption Qelec	kWh		-		-		-		-		-	
Daily fuel consumption Qfuel	kWh		-		-		-		-		-	
Annual electrical energy consumption AEC	kWh		-		-		-		-		-	
Annual fuel consumption AFC	GJ		-		-		-		-		-	

(**) Weights calculated according to standard EN 15502.

(***) Values referred to atmospheric pressure at sea level.

CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

ERP DATA 330-3 P/V - 600-4 P/V

POWER MAX MODELS		U.M.	330-3 P/V		390-3 P/V		450-3 P/V		520-4 P/V		600-4 P/V	
Seasonal ambient heating energy efficiency class	%		-	-	-	-	-	-	-	-	-	-
Nominal output	kW		291,0		336,0		393,0		448,0		524,0	
Seasonal ambient heating energy efficiency η_s	%		93 / 93		93 / 93		93 / 93		93 / 93		93 / 93	
EFFECTIVE HEAT OUTPUT												
At nominal heat output and in high temperature mode P4	kW		285,9	-	329,4	-	387,0	-	439,2	-	516,0	-
At 30% of nominal heat output and in low temperature mode P1	kW		95,1	-	109,8	-	129,0	-	146,4	-	172,0	-
EFFICIENCY												
At nominal heat output and in high temperature mode η_4 (GCV)	%		88,24		88,55		88,36		88,55		88,36	
At 30% of nominal heat output and in low temperature mode η_1 (GCV)	%		97,84		98,39		98,17		98,39		98,17	
AUXILIARIES ELECTRICITY CONSUMPTION												
With full load Elmax	W		951 / 609		1059 / 615		1446 / 906		1412 / 820		1928 / 1208	
With partial load Elmin	W		228 / 93		297 / 120		330 / 114		396 / 160		440 / 152	
In standby mode PSB	W		18 / 18		18 / 18		24 / 24		24 / 24		32 / 32	
OTHER PARAMETERS												
Heat losses in Pstby standby mode	W		414,19		474,96		561,71		636,09		748,95	
Energy consumption of the Pign pilot flame	W		-		-		-		-		-	
Annual energy consumption QHE	GJ		588,0		678,0		798,0		904,0		1064,0	
Sound power level indoors LWA	dB(A)		60,00		61,00		62,00		63,00		64,00	
Nitrogen oxide emissions Nox (**)	mg/kWh		38,70		39,30		46,10		39,30		46,10	
Nox class	n°		6		6		6		6		6	
Emission values at maximum and minimum output (**)			G31	G20	G31	G20	G31	G20	G31	G20	G31	G20
Maximum	p.p.m.	CO s.a. lower than	91,5	163,0	89,0	177,0	91,5	185,0	89,0	177,0	91,5	185,0
	%	CO2 (***)	9.0	10.4	9.0	10.4	9.0	10.4	9.0	10.4	9.0	10.4
	p.p.m.	NOx s.a. lower than	30.0	40.0	30.0	40.0	30.0	40.0	30.0	40.0	30.0	40.0
	°C	T flue gases	78,0		75.0		77.0		75.0		77.0	
Minimum	p.p.m.	CO s.a. lower than	7.5	12.0	4.6	14.0	5.6	16.0	4.6	14.0	5.6	16.0
	%	CO2 (***)	9.0	10.4	9.0	10.4	9.0	10.4	9.0	10.4	9.0	10.4
	p.p.m.	NOx s.a. lower than	30.0	40.0	30.0	40.0	30.0	40.0	30.0	40.0	30.0	40.0
	°C	T flue gases	62.0		61,0		61,0		61,0		61,0	
FOR COMBINED HEATING APPLIANCES												
Water heating energy efficiency η_{wh}	%		-		-		-		-		-	
Daily electrical energy consumption Qelec	kWh		-		-		-		-		-	
Daily fuel consumption Qfuel	kWh		-		-		-		-		-	
Annual electrical energy consumption	kWh		-		-		-		-		-	
Annual fuel consumption AFC	GJ		-		-		-		-		-	

(**) Weights calculated according to standard EN 15502.

(***) Values referred to atmospheric pressure at sea level.

OVERALL DIMENSIONS AND COUPLINGS

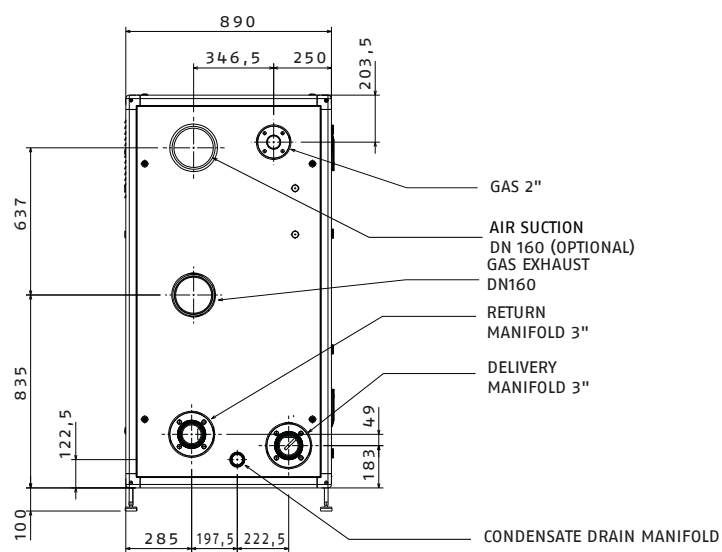
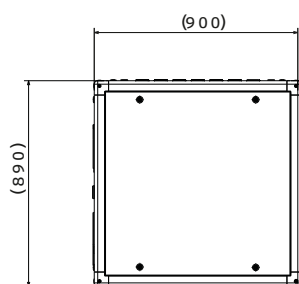
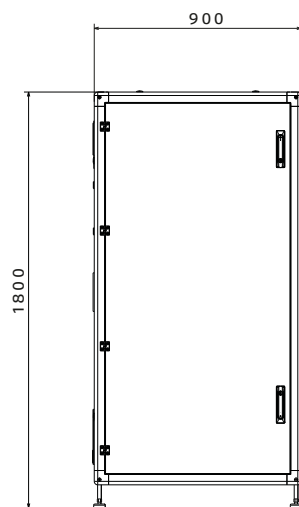
MODELS

130-2 P/V

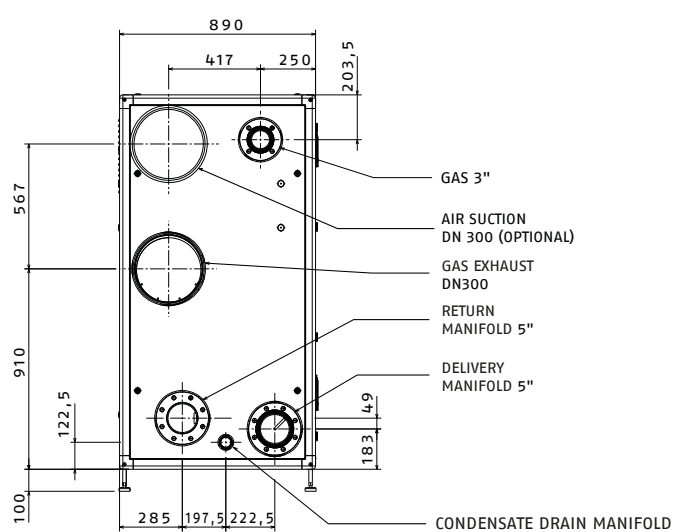
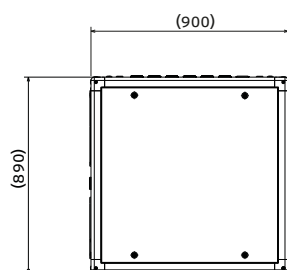
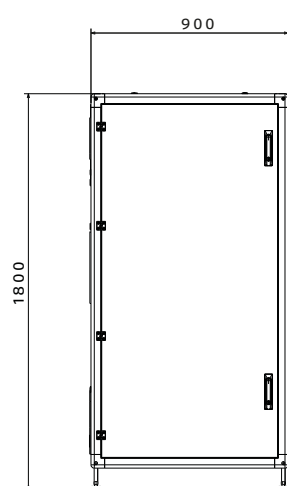
160-2 P/V

200-2 P/V

260-2 P/V



MODELS 300-2 P/V



CONDENSING GENERATORS

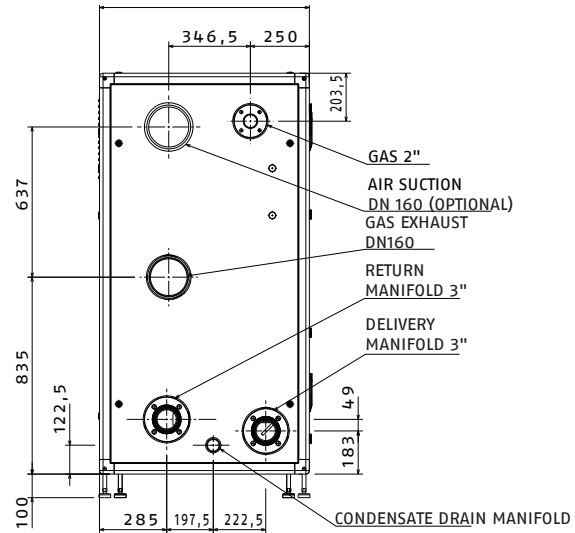
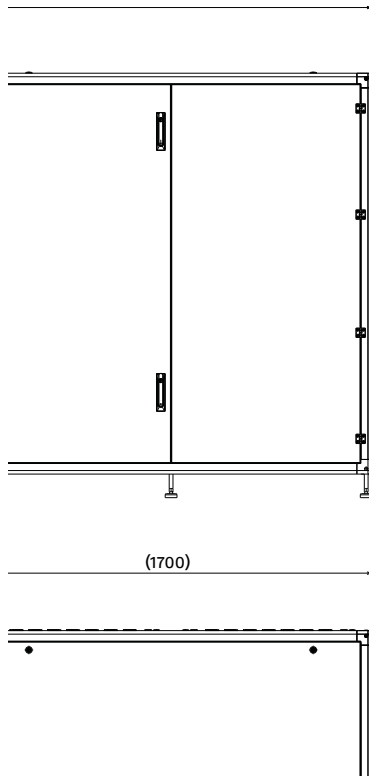
Indoor and Outdoor condensing pre-assembled gas fired boilers

MODELS

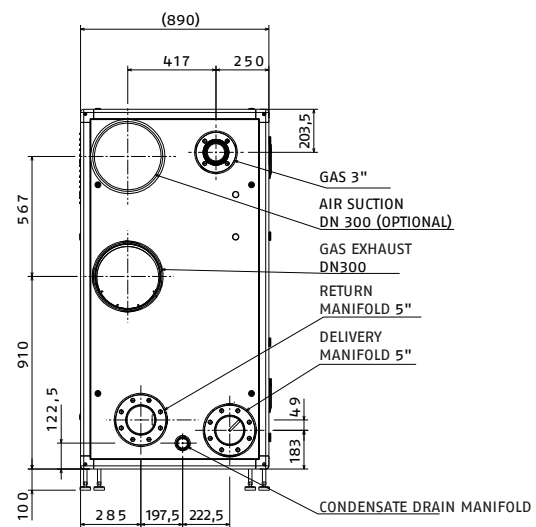
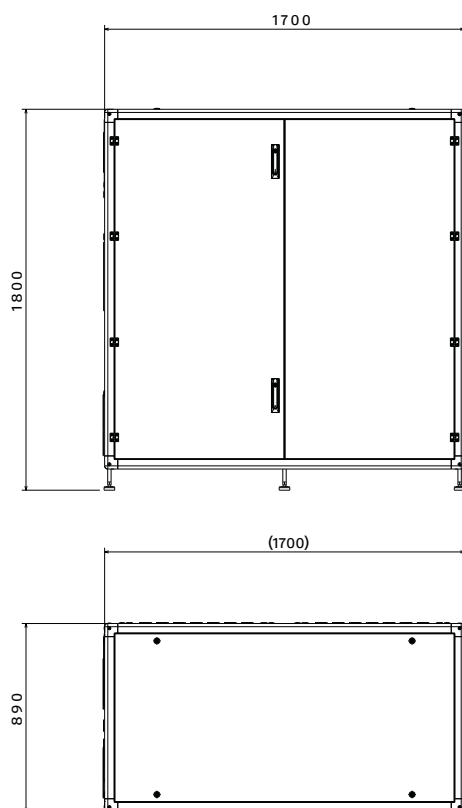
330-3 P/V

390-3 P/V

520-4 P/V



MODELS 450-3 P/V - 600-4 P/V



	U.M.	POWER MAX BOX 130-2 P/V	POWER MAX BOX 160-2 P/V	POWER MAX BOX 200-2 P/V	POWER MAX BOX 260-2 P/V	POWER MAX BOX 300-2 P/V
Heating delivery diameter	ø DN	3" DN80 PN6	3" DN80 PN6	3" DN80 PN6	3" DN80 PN6	5" DN125 PN6
Heating return diameter	ø DN	3" DN80 PN6	3" DN80 PN6	3" DN80 PN6	3" DN80 PN6	5" DN125 PN6
Gas input diameter	ø DN	2" DN50 PN6	2" DN50 PN6	2" DN50 PN6	2" DN50 PN6	3" DN80 PN6
Condensate drain diameter	ø (mm)	50	50	50	50	50
Casing height	mm	1800	1800	1800	1800	1800
Casing width	mm	900	900	900	900	900
Casing depth	mm	890	890	890	890	890
Flue gases exhaust diameter	ø (mm)	DN160	DN160	DN160	DN160	DN300
Air suction diameter (optional)	ø (mm)	DN160	DN160	DN160	DN160	DN300
Empty weight	kg	270	270	280	300	350

	U.M.	POWER MAX BOX 330-3 P/V	POWER MAX BOX 390-3 P/V	POWER MAX BOX 450-3 P/V	POWER MAX BOX 520-4 P/V	POWER MAX BOX 600-4 P/V
Heating delivery diameter	ø DN	3" DN80 PN6	3" DN80 PN6	5" DN125	3" DN80 PN6	5" DN125
Heating return diameter	ø DN	3" DN80 PN6	3" DN80 PN6	5" DN125	3" DN80 PN6	5" DN125
Gas input diameter	ø DN	2" DN50 PN6	2" DN50 PN6	3" DN80 PN6	2" DN50 PN6	3" DN80 PN6
Condensate drain diameter	ø (mm)	50	50	50	50	50
Casing height	mm	1800	1800	1800	1800	1800
Casing width	mm	1800	1800	1800	1800	1800
Casing depth	mm	890	890	890	890	890
Flue gases exhaust diameter	ø (mm)	DN160	DN160	DN300	DN160	DN300
Air suction diameter (optional)	ø (mm)	DN160	DN160	DN300	DN160	DN300
Empty weight	kg	450	490	540	560	600

MODELS AND CASCADE OUTPUTS STRUCTURE RANGE

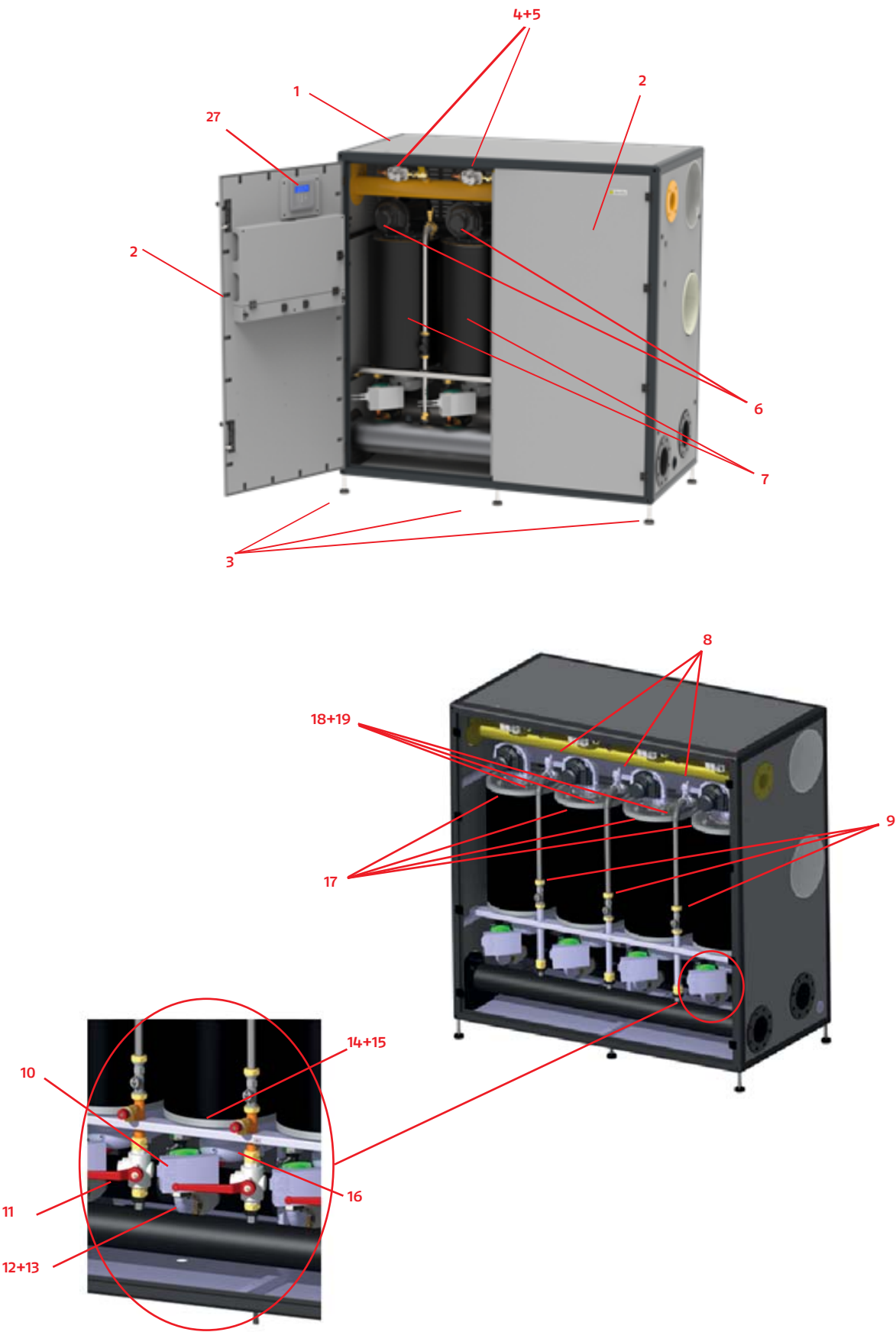
6 possible configurations for cascade systems with powers from 655 up to 1310 kW

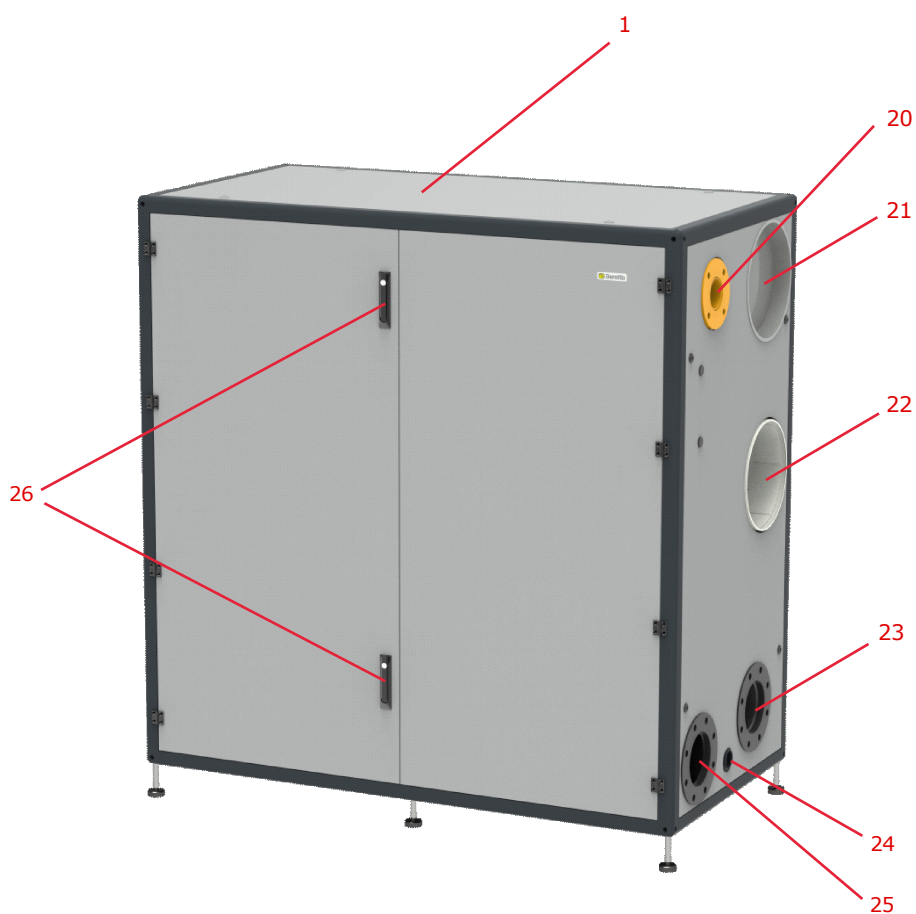
POWER MAX BOX 750 System	393	262	655	
POWER MAX BOX 900 System	524	262	786	
POWER MAX BOX 1050 System	524	393	917	
POWER MAX BOX 1200 System	524	524	1048	
POWER MAX BOX 1350 System	524	393	262	1179
POWER MAX BOX 1500 System	524	524	262	1310

CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

COMPONENT OVERVIEW





1. Cabinet with support frame
2. Cabinet doors with boiler boards panel
3. Support legs
4. Gas valve
5. Gas tap
6. Fan
7. Boiler body
8. Automatic venting valve
9. Flow-meter
10. Circulator ("P" versions) or 2-way valve ("V" versions)
11. Train kit with 3-way valve and safety EC type-approved CE (optional kit replacing the standard manifold)
12. Check valve
13. System return tap

14. Return probe
15. Minimum water pressure switch (0.7 bar)
16. Flue gas probe
17. Ignition electrode
18. Flow sensor
19. Safety thermostat
20. Gas manifold
21. Air suction manifold (optional)
22. Flue gas exhaust manifold with built-in check valves
23. Return manifold
24. Condensate drain manifold
25. Delivery manifold
26. Handles with locks
27. Display

CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

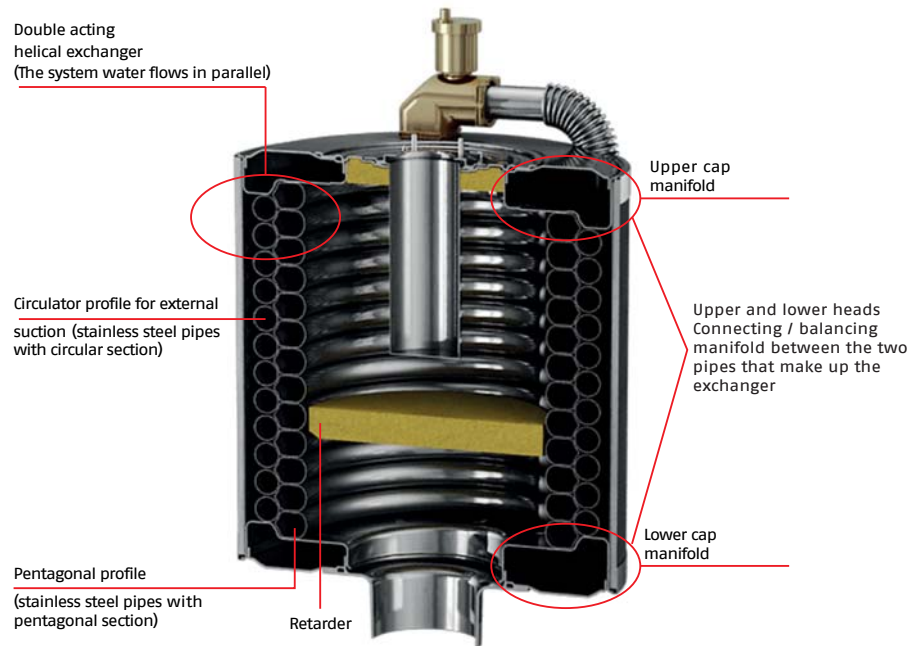
HEAT EXCHANGER CHARACTERISTICS

The heat exchanger consists of two stainless steel caps that act also as flow and return hydraulic manifolds; between the two caps two 316-mm austenitic stainless steel coils are connected, with a thickness of 1.2 mm in which the system water flows in parallel.

The first is made of a plain tube with a pentagonal section (innermost) and a second one with a circular section (outermost).

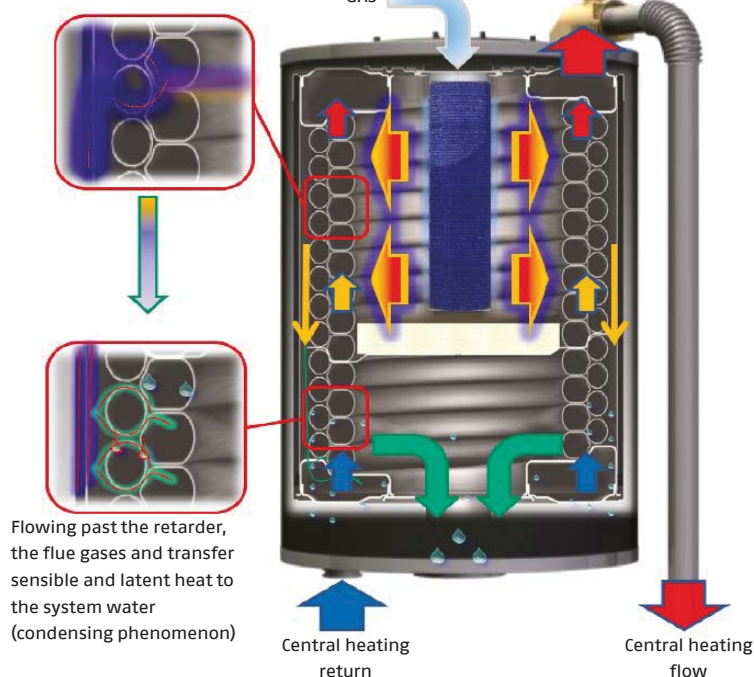
The hot flue gases leave the burner (driven by the fan) and they first reach the surface of the pentagonal pipe and then of the circular pipe, allowing a rapid reduction of the flue gas temperature and an efficient heating of the water, which flows in parallel from the lower cap (upwards) inside the two coils and is sent to the utility from the upper cap.

The drawing shows the main water, gas, condensate and flue gas flows inside the heat exchanger.



FUNCTIONING PRINCIPLE

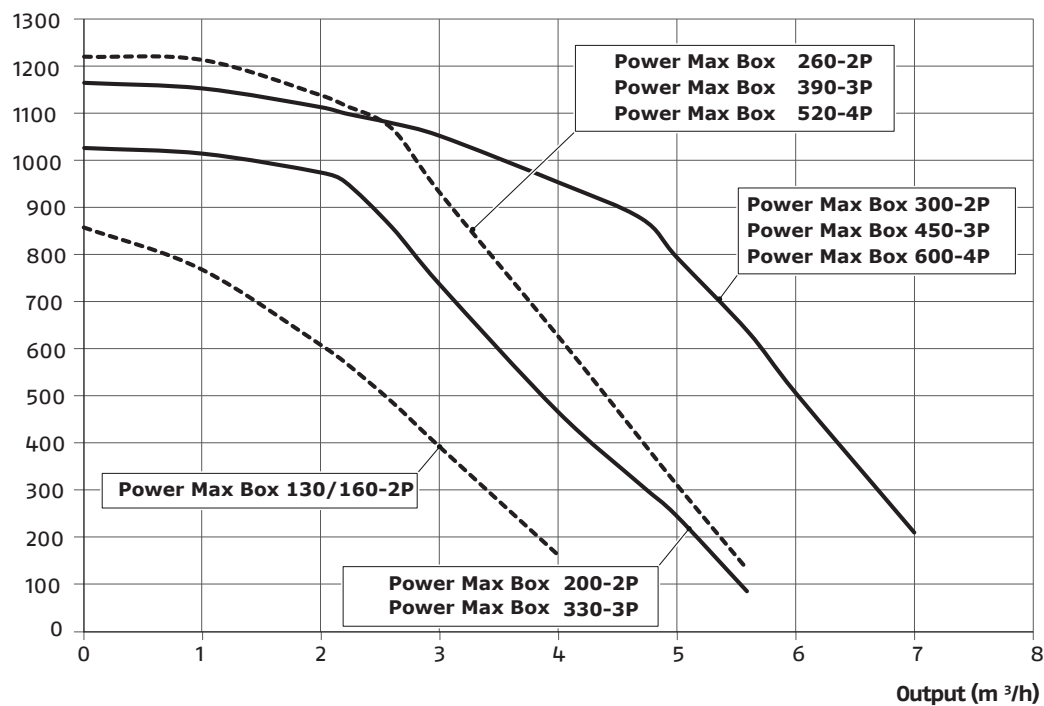
The combustion products flow along the double acting helical exchanger and transfer sensible heat to the water



RESIDUAL DISCHARGE HEAD

Maximum residual discharge head curve related to one module

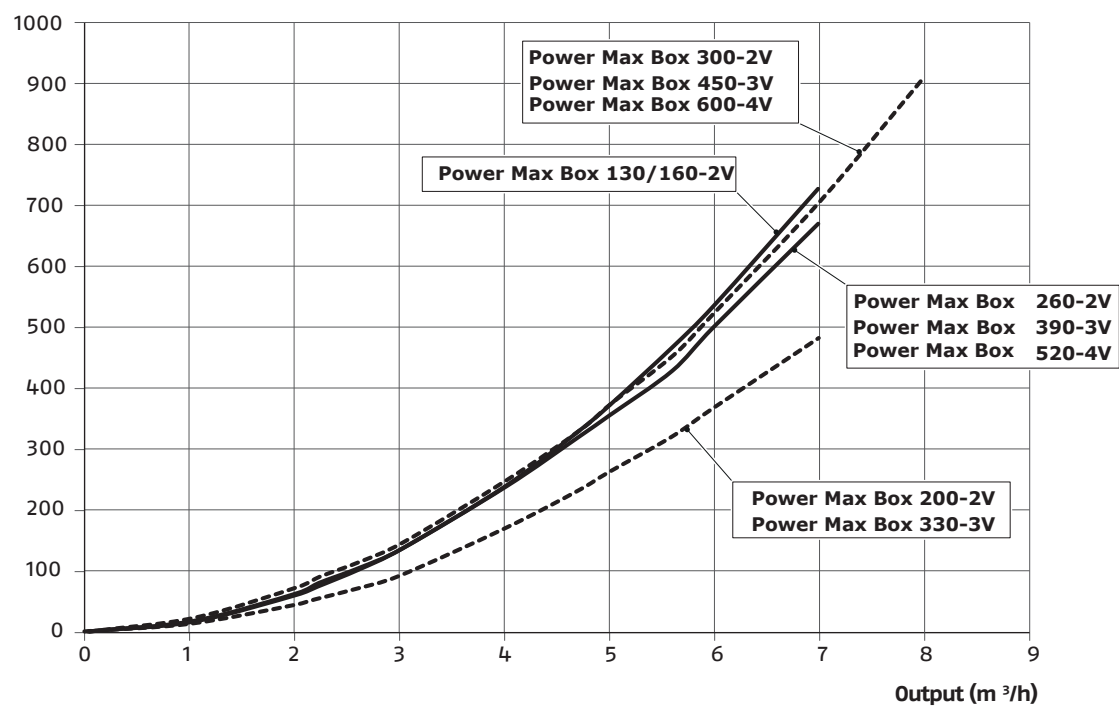
Residual discharge head (mbar)



HEAT EXCHANGER PRESSURE DROPS

Maximum performance curve related to one module

Pressure drop (mbar)



CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

FLUE GAS COLLECTOR

All POWER MAX BOX models are equipped with a flue gas check valve located inside the flue gas conveyor, at the bottom of each thermal module.



A: Exhaust for condensate produced within the heat exchanger
B: Exhaust for residual condensate within the exhaust pipe, (stops the condensate from accumulating above the check valve preventing its correct opening)

EXTERNAL PROBE CONNECTION SINGLE UNIT

The correct positioning of the external probe is key for the good operation of climatic control.

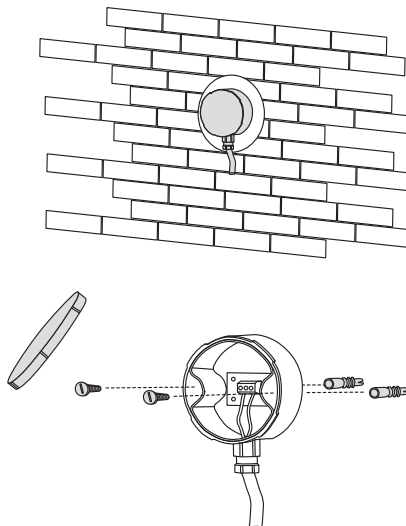
The sensor must be installed outside the building to be heated, at approx. 2/3 the height of the NORTH or NORTH WEST façade and far from flues, doors, windows and sunny areas.

The maximum length of the connection between the external probe and the control panel is 50 m. In case of connections with a cable longer than 50 m, check that the value read from the board corresponds to a real measurement and use parameter 39 for any corrections that may be required.

The connection cable between the external probe and the control panel cannot have any joints; if these are required, they should be tinned and suitably protected.

Any pipes for connection cables should be separated from live cables (230V AC).

If the external probe is not connected, parameters 14 and 22 should be set to "0".



ACCESSORIES

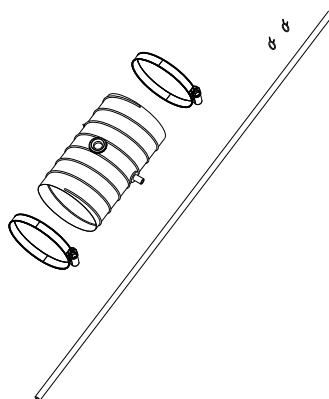
SEALED COMBUSTION AND AIR SUCTION

SEALED COMBUSTION CONVERSION KIT ("C" TYPE)

The kit is composed of:

- A combustion air suction pipe to connect the fan suction line to the air manifold (essential accessory to complete the "C" type conversion)
- A compensation pipe for the pneumatic gas valve (connection between air suction and the gas valve) to allow correct modulation
- Clamps, screws and necessary gaskets

The accessory is dedicated for a single unit, therefore to ensure that a cabinet is sealed, it is necessary to order as many kits as there are units in the cabinet.

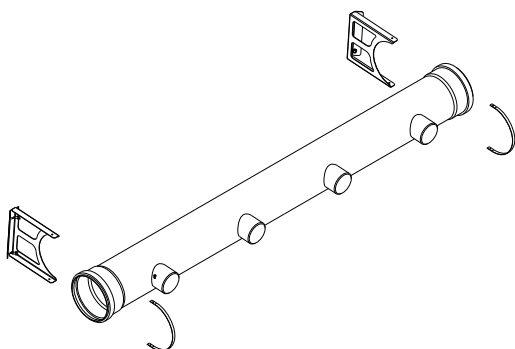


AIR MANIFOLD

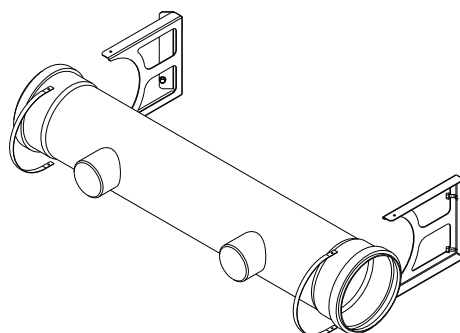
The accessory, which can be ordered together with the kit above, allows sealing the POWER MAX BOX cabinets. The manifold must be installed inside the cabinet and is available in 4 models (2 and 4 units, DN160 and DN300), depending on the characteristics of the cabinet chosen.

The kit includes the brackets and clamps necessary for the installation.

The 4 unit manifold is equipped with a plug to also be combined with cabinets containing only 3 units.



Air manifold for models with 3-4 units (DN160 and DN300)



Air manifold for models with 2 units (DN160 and DN300)

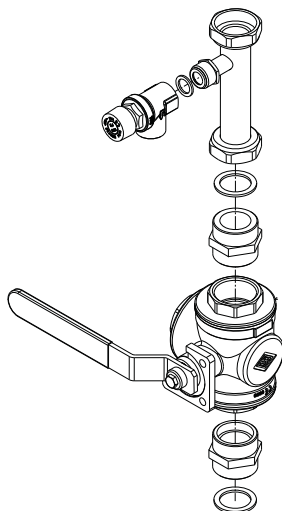
CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

ADDITIONAL HYDRAULIC SAFETY DEVICES

HYDRAULIC SHUT-OFF KIT

the kit is designed to facilitate the maintenance and cleaning operations of each unit, without stopping the operation of the whole cabinet; the specific design allows the kit to be installed in place of the standard manifold (without any shut-off valve) located on the unit delivery line, and consists of a 3-way valve (with discharge into the atmosphere) and an EC type-approved safety valve.

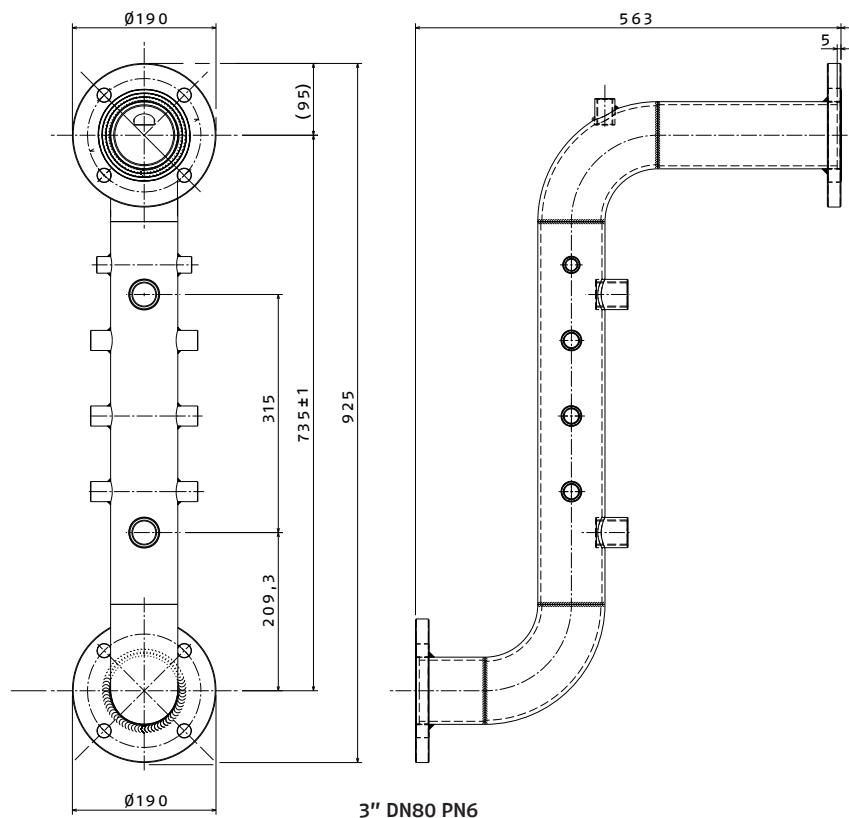


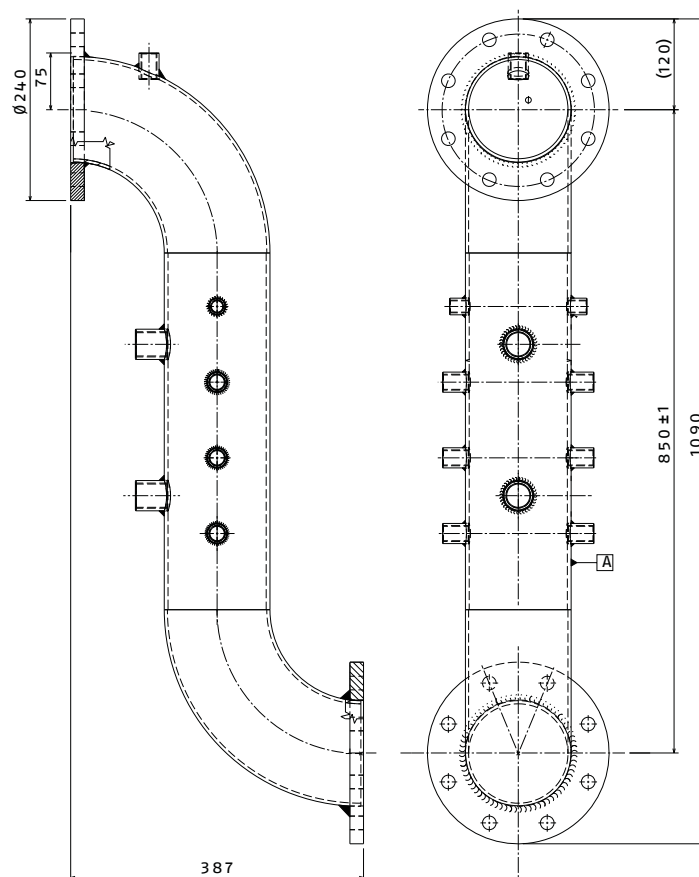
DELIVERY MANIFOLD KIT FOR HOUSING THE SAFETY DEVICES

The kit consists of:

- A manifold for housing safety devices;
- Manifold insulation
- Gaskets and bolts for the installation

The kit can be mounted on both sides and therefore is suitable for installation both to the left and to the right of POWER MAX BOX and is available in two different sizes:





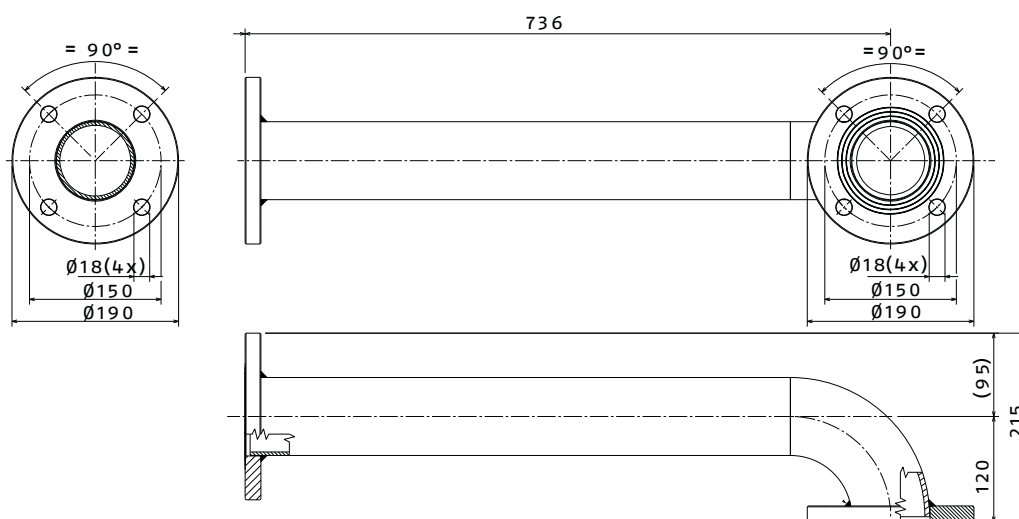
5" DN125 – PN6

RETURN MANIFOLD

The kit consists of:

- A return manifold (complementary to the delivery manifold for safety devices)
- Manifold insulation
- Gaskets and bolts for the installation

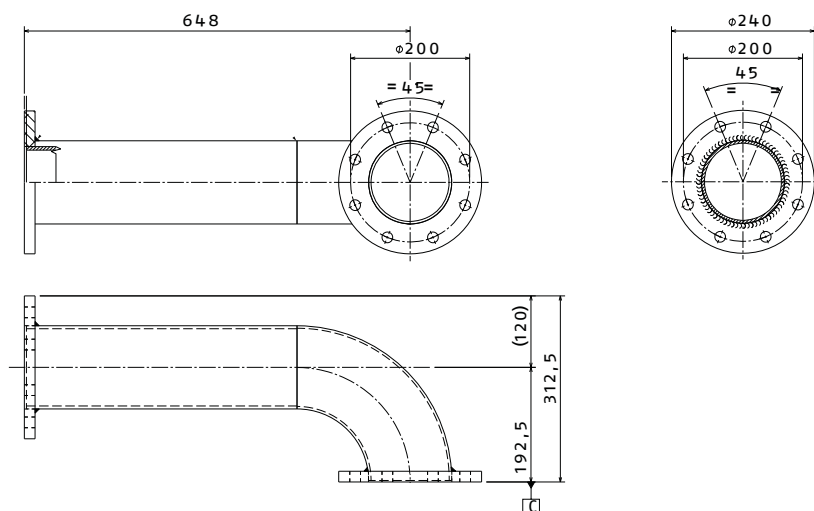
The kit can be mounted on both sides and therefore is suitable for installation both to the left and to the right of POWER MAX BOX and is available in two different sizes:



3" DN80 PN6

CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers



5" DN125 – PN6

ADDITIONAL SAFETY COMPONENTS

SAFETY DEVICES KIT

The kit is composed of:

- Maximum pressure switch (characteristics shown in the table below)
- 0-10 bar pressure gauge with damper coil and tap
- Thermometer 0 -120°C

The safety / lock pressure switch (maximum pressure) meets the requirements of point 1.7 of the R File, Chap. R.2.B (2009 Edition) and point 10.3 of the R File Cap. R.1.B (2009 Edition) and has the following characteristics:

Model	PMR5
Type	Manual reset safety / block pressure switch (maximum pressure)
Maximum pressure	5 bar
Adjustment field	2,0 ÷ 4.5 bar
Calibration pressure (factory)	3,0 bar
Factory tolerance	± 0,15 bar
Ambient temperature range	55°C
Max. operating temperature	20°C to 110°C
Hydraulic connections	G 1/4" F

The remaining components are installed in the boiler and type-approved with it, in particular:

- Lock thermostat (calibrated at 95°C): installed on each thermal module
 - Adjustment thermostat: consists in the climate control unit installed as standard on the boiler (control panel)
 - Minimum pressure switch: installed on each thermal module (calibration pressure 0.7 bar)
 - Flow-meter: automatically interrupts the heat input in case there is no circulation and is installed on the delivery of each thermal module
- The kit must be completed with the safety valve (1 or 2 depending on the power of the generator) and with the fuel shut-off valve (separate accessories).

SAFETY VALVE

The safety valves have the following characteristics:

- CE marking: the safety VST series valves meet the requirements of the Directive 97/23 / EC (PED) regarding pressure equipment. The valves fall into category IV, considered the maximum risk category since they are safety devices and bear the CE marking followed by the number 1115 which identifies the approval body.

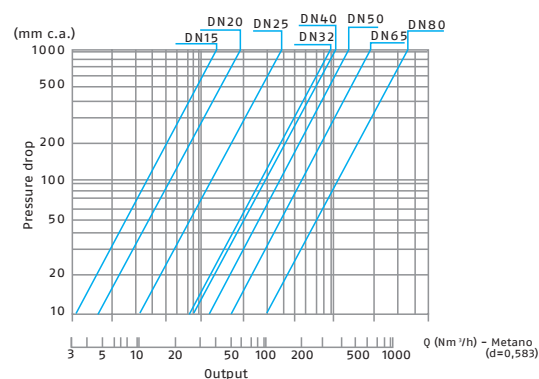
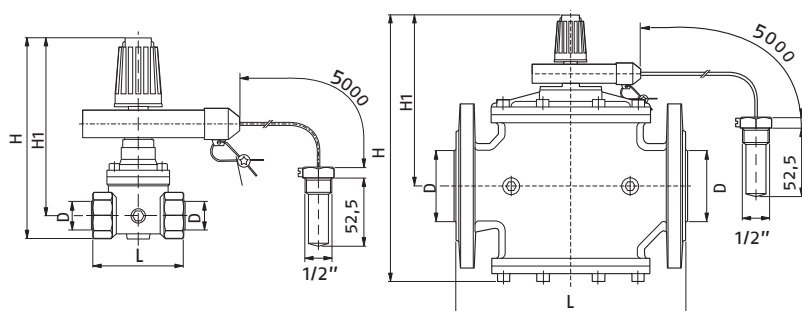
Catalogue reference	up to 460 kW (3/4" F)	up to 580 kW (1" F)
Model	VST 20 3/4" x 1" 5.4 bar	VST 25 1" x 1" 1/4 5.4 bar
Body and cover	brass CW617N	brass CW617N
membrane and sealing gaskets	EPDM	EPDM
Nominal pressure	PN10	PN10
Overpressure	10%	10%
Closure deviation	< 20%	< 20%
Max. operating temperature	-10°C/+ 120°C	-10°C/+ 120°C
PED category	IV	IV
Hydraulic connections	3/4" F input / 1" F discharge	1" F input / 1" 1/4 F discharge
Opening pressure	5,4 bar	5,4 bar
Discharge pressure	5,94 bar	5,94 bar
Closing pressure	4,32 bar	4,32 bar
Discharge hole diameter	20 mm	25 mm
Discharge hole section	3.1416 cm ²	4.9087 cm ²
Discharge coefficient (K)	0.80	0.71
Discharge output	804,25 kg/h	1.120,24 kg/h
Generator nominal output	466,50 kW	649,79 kW

Total heat input of the cascade (kW)	0-460	461-580	581-920	921-1310
Quantity and type of the valve	1 x 460 kW (3/4" F)	1 x 580 kW (1" F)	2 x 460 kW (3/4" F)	2 x 580 kW (1" F) + 1 x 460 460 kW (3/4" F)

FUEL SHUT-OFF VALVE (FSV)

The shut-off valves have the following characteristics:

Catalogue reference	ø G 1"	ø G 1" 1/2	ø G 2"	ø G 3"
Body	Die-cast aluminium			Molten aluminium
Temperature sensor	With liquid expansion			
Connections	Gas threaded FF (ISO 228/1)			
Pressure test points	2 of 1/4"			4 of 1/4"
Temperature sensor sheath connection	G 1/2" M (ISO 228/1)			Flanged PN16 (UNI 2223)
Calibration temperature	97°C (±3 °C)			
Sensor side max. temperature	120°C			
Valve side max. temperature	50°C			
Max operating pressure	6 bar	1 bar		
Reference	Recommended for maximum outputs of 131 kW (20 mbar gas supply)	Recommended for maximum outputs of 230 kW (20 mbar gas supply)	Recommended for maximum outputs of 580 kW (20 mbar gas supply)	Recommended for outputs up to 1310 kW (20 mbar gas supply)
DN	G 1" F	G 1" 1/2 F	G 2" F	DN80 - PN16
L [mm]	90	150	170	310
H [mm]	196	204	222	351
H1 [mm]	169	169	179	234
Capillary length [mm]	5000	5000	5000	5000



CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

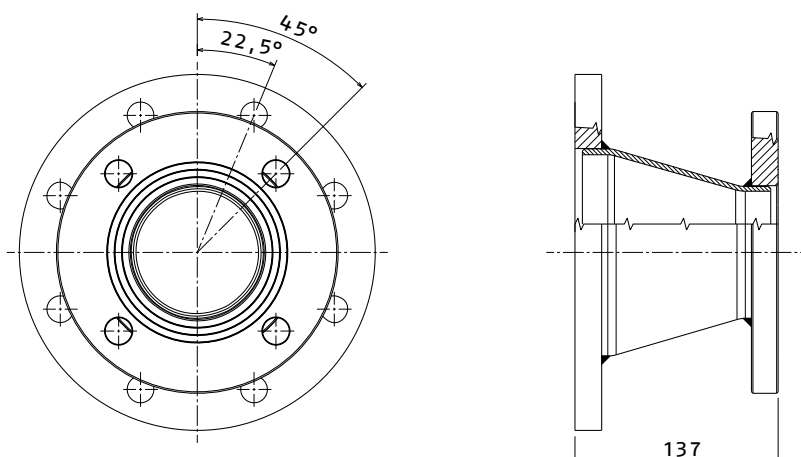
PRIMARY HYDRAULICS

REDUCER KIT

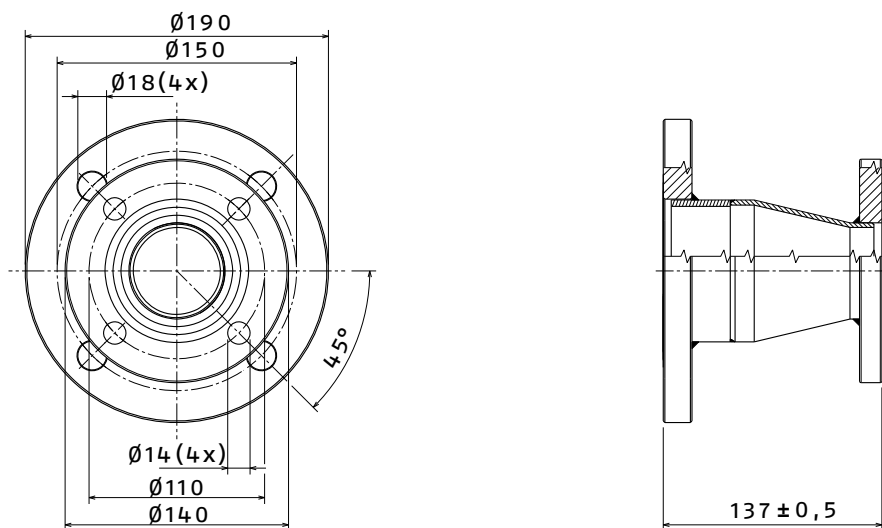
The kit consists of:

- One flanged diameter reducer
- Insulation
- Gaskets and bolts for the installation
- The kit can be mounted on both sides and therefore is suitable for installation both to the left and to the right of POWER MAX BOX and is available in two different sizes:

The kit can be mounted on both sides and therefore is suitable for installation both to the left and to the right of POWER MAX BOX and is available in two different sizes



5"/3" (DN125 – PN6 / DN80 – PN6)



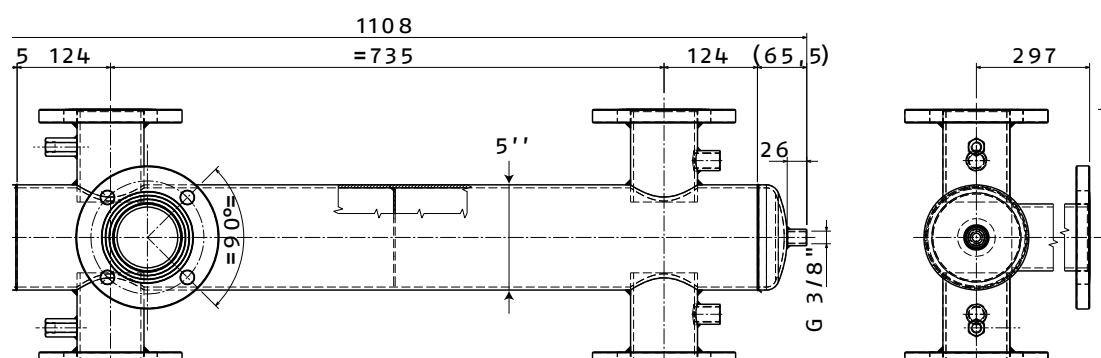
5"/2" (DN80 – PN6 / DN50 – PN6)

HYDRAULIC COUNTERACTING DEVICE KIT

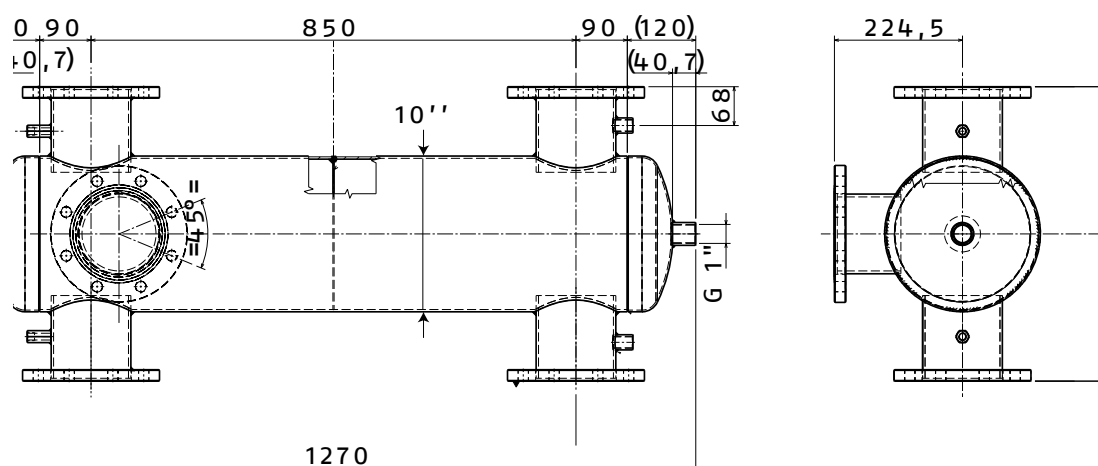
The kit consists of:

- A hydraulic counteracting device kit with 5 flanged connections
- Insulation
- Blind flange (to close the hydraulic connection that is not used)
- Support leg
- Hose-end valve, automatic air bleed valve and probe / thermostats holders
- Gaskets and bolts for the installation

The kit can be mounted on both sides and therefore is suitable for installation both to the left and to the right of POWER MAX BOX and is available in two different sizes:



UP TO 485 kW



UP TO 1310 kW

CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

3" AND 5" CLOSING PLUGS KIT

The kits allow the closing of the gas and water manifolds (delivery and return) and of the condensate drain.

They consist of:

- Blind flanges with the suitable size for the manifolds to which they are associated
- Plug for condensate drain pipe
- Gaskets and bolts for the installation

3" AND 5" FEED-THROUGH FLANGES

The kits allow the manifolds (delivery and return) to be connected to the rest of the hydraulic system; the kit consists of 1 counter-flange to be welded (3" DN 80 – PN6 or 5" DN 125 – PN6), gasket and bolts for installation and therefore, for a complete supply, it is necessary to have 2 kits (delivery and return manifolds).

3" AND 5" BLIND FLANGE ISOLATION KIT

The kits allow insulating the blind flanges (both of the water and gas manifolds); the kit is essential for outdoor installations, but it is also recommended for installations in a thermal power station.

PRIMARY CIRCUIT PUMP KIT (SIMPLE OR TWIN)

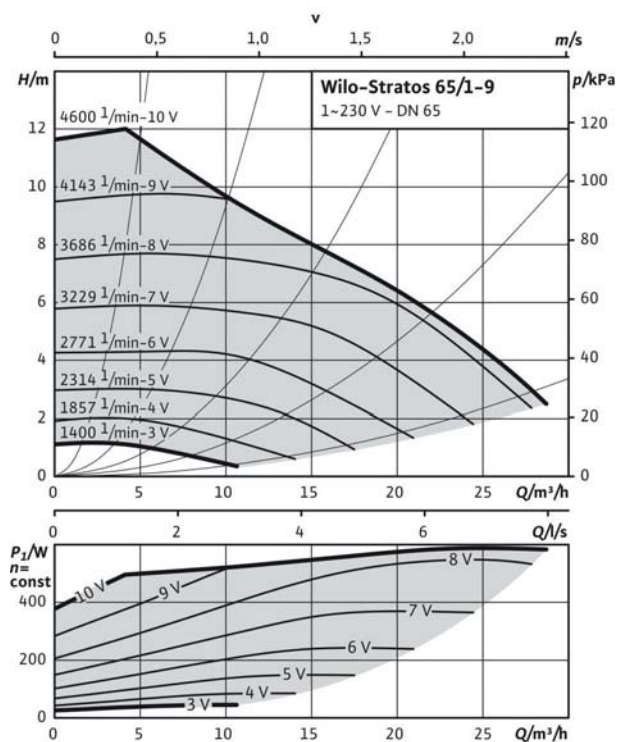
The kits consist of a return manifold supplied with flanged reducers and a primary pump (single or twin). The kits are exclusively dedicated to POWER MAX BOX versions equipped with two-way valves (which can be recognised by the "V" mark) and require the communication module (accessory) to be able to receive the 0-10 V output signal from the boiler board in order to work at constant ΔT . The communication modules to be provided are:

1. pc for single pumps
2. pc for twin pumps (in this case, the cascade function and the emergency function can be used in case of malfunctions of one of the motors)

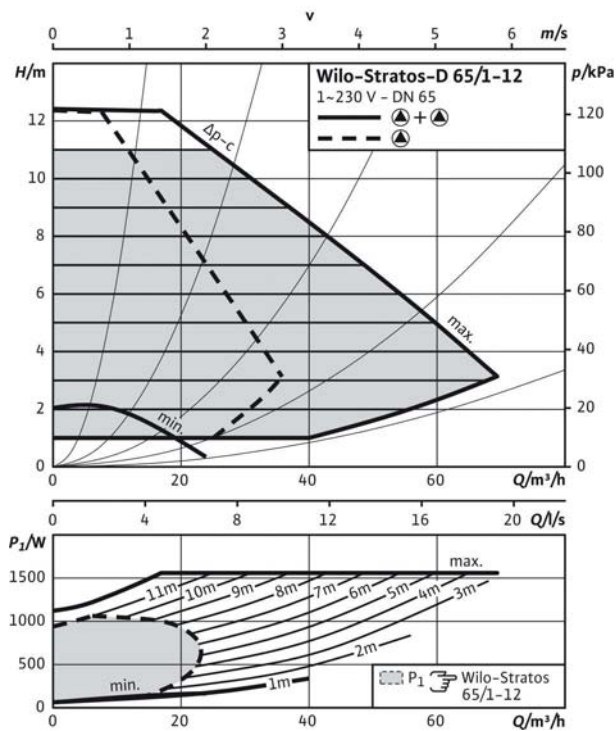
Primary circuit pump kit up to 230 kW

Pipes with flanged attachment DN 80 PN6. The supplied pumps are:

Kit with single pump



Kit with twin pump



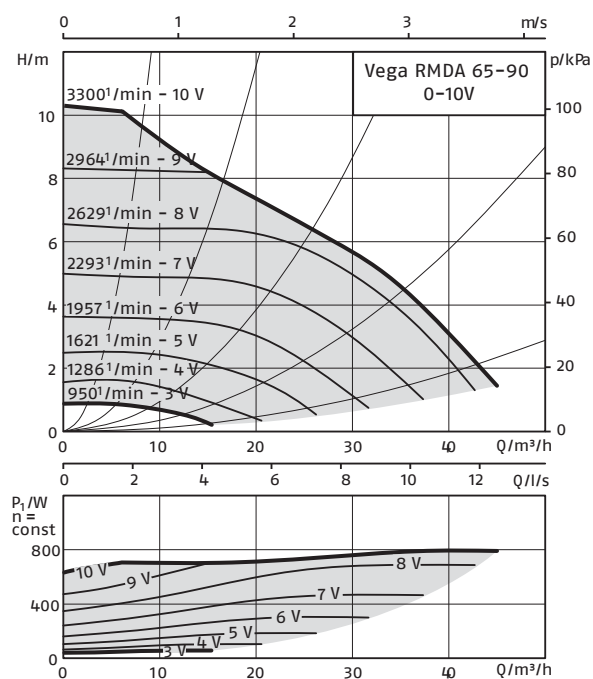
Frequency of start-up::

- Activation/deactivation with mains voltage $\leq 20 / 24$ h
- Activation/deactivation with communication module (1 for each electrical motor) $\leq 20 / h$

Primary circuit pump kit up to 485 kW and 580 kW

Pipes with flanged attachment DN 80 PN6 for the version up to 485 kW and DN125 PN6 for the 580 kW version. The supplied pumps are:

Kit with single pump



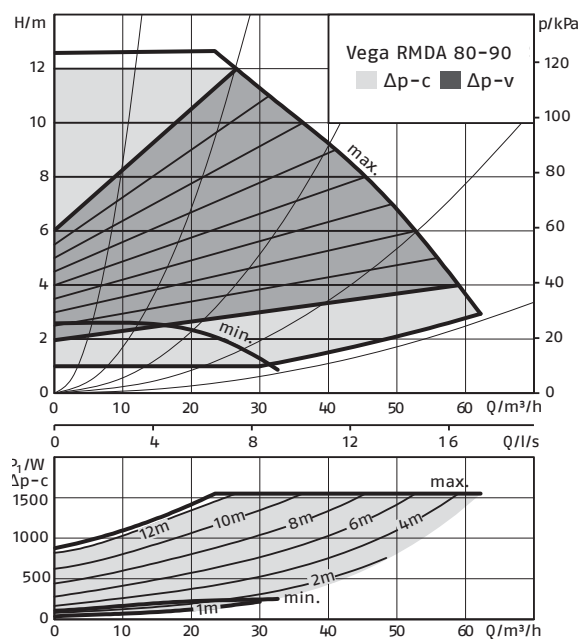
Frequency of start-up::

- Activation/deactivation with mains voltage $\leq 20 / 24$ h
- Activation/deactivation with communication module (1 for each electrical motor) $\leq 20 / \text{h}$

Primary circuit pump kit up to 1310 kW

Pipes with flanged connection DN125 PN6. The supplied pumps are:

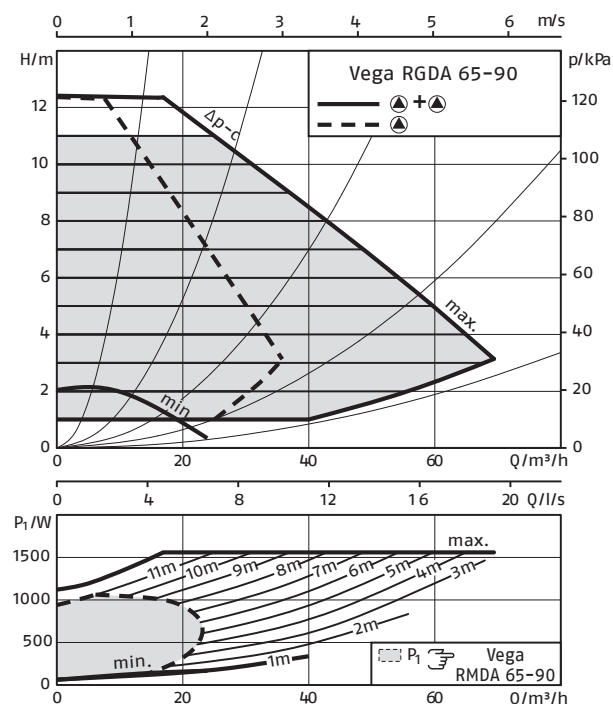
Kit with single pump (suitable only for use with hydraulic counteracting device)



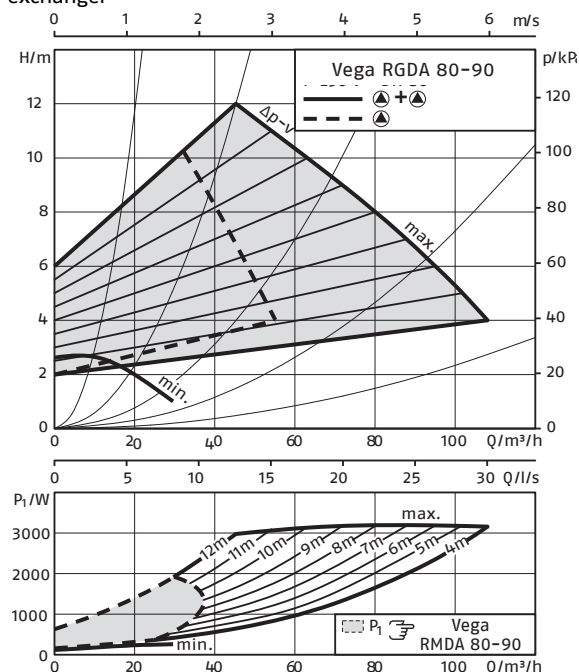
Frequency of start-up::

- Activation/deactivation with mains voltage $\leq 20 / 24$ h
- Activation/deactivation with communication module (1 for each electrical motor) $\leq 20 / \text{h}$

Kit with twin pump



Kit with twin pump, which is also suitable for use with plate heat exchanger



CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

CONNECTION KIT FOR PLATE HEAT EXCHANGER

The kits allow connecting the manifolds to the accessible plate heat exchangers from the HEATgate range and include:

- Piping (delivery and return) for connecting manifolds to the plate heat exchangers from the HEATgate range and are available in 3 versions:
 - 3" DN80 – PN6 / 2" DN50 (HEATgate, SP 35 plates family)
 - 5" DN125 – PN6 / 2" 1/2 DN65 (HEATgate, SP 40 plates family)
 - 5" DN125 – PN6 / 4" DN100 (HEATgate, SP 60 plates family)
- Thermal insulation
- Plate heat exchanger support frame

PRIMARY CIRCUIT APPARATUS CABINET WITH HYDRAULIC SEPARATOR FOR PLATE HEAT EXCHANGER

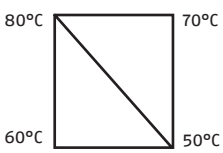
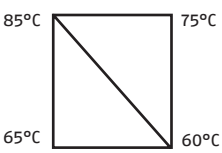
The apparatus cabinets composed of the same cabinets that characterize POWER MAX BOX but which differ in terms of content; they are actually designed to house the primary circuit organs and create a visual continuity effect of the boiler and of the accessories related to it. With a specific cover kit (accessory) they can also be installed outdoors.

When desired, the cabinets allow installing inside the extension of the flue gases and air manifolds (both are accessory kits) if the flue gases exhaust and air suction are designed on the same side of the hydraulic connections. The available pre-cut pieces are DN160 for versions up to 485 kW and respectively DN300 for versions up to 800 kW and up to 1310 kW.

The available cabinets are the following:

- Cabinets with hydraulic counteracting device: enclose the manifold, the primary pump kit (accessory), if any and the hydraulic counteracting device. The available versions are the following:
 - RH apparatus cabinet with hydraulic separator up to 485 kW: cabinet with a length of 900 mm and 3" flanged hydraulic connections DN80 – PN6, designed to be installed to the right of POWER MAX BOX (with reference to the boiler front view)
 - LH apparatus cabinet with hydraulic separator up to 485 kW: cabinet with a length of 900 mm and 3" flanged hydraulic connections DN80 – PN6, designed to be installed to the left of POWER MAX BOX (with reference to the boiler front view)
 - RH apparatus cabinet with hydraulic separator up to 1310 kW: cabinet with a length of 900 mm and 5" flanged hydraulic connections DN125 – PN6, designed to be installed to the right of POWER MAX BOX (with reference to the boiler front view)
 - LH apparatus cabinet with hydraulic separator up to 1310 kW: cabinet with a length of 900 mm and 5" flanged hydraulic connections DN125 – PN6, designed to be installed to the left of POWER MAX BOX (with reference to the boiler front view)
- Cabinets for plate heat exchanger: enclose the manifold, the primary pump kit (accessory), if any, the plate heat exchanger connection but not the heat exchanger itself (which will be selected based on the desired technical program, together with the related insulation kit). The available versions are the following:
 - RH apparatus cabinet for plate heat exchanger up to 485 kW: cabinet with a length of 1800 mm and 3" flanged hydraulic connections DN80 – PN6, designed to accept heat exchangers from the HEATgate range, SP 35 plate family. The cabinet is designed to be installed to the right of POWER MAX BOX (with reference to the boiler front view)
 - LH apparatus cabinet for plate heat exchanger up to 485 kW: cabinet with a length of 1800 mm and 3" flanged hydraulic connections DN80 – PN6, designed to accept heat exchangers from the HEATgate range, SP 35 plate family. The cabinet is designed to be installed to the left of POWER MAX BOX (with reference to the boiler front view)
 - RH apparatus cabinet for plate heat exchanger up to 800 kW: cabinet with a length of 1800 mm and 5" flanged hydraulic connections DN125 – PN6, designed to accept heat exchangers from the HEATgate range, SP 40 plate family. The cabinet is designed to be installed to the right of POWER MAX BOX (with reference to the boiler front view)
 - LH apparatus cabinet for plate heat exchanger up to 800 kW: cabinet with a length of 1800 mm and 5" flanged hydraulic connections DN125 – PN6, designed to accept heat exchangers from the HEATgate range, SP 40 plate family. The cabinet is designed to be installed to the left of POWER MAX BOX (with reference to the boiler front view)
 - RH apparatus cabinet for plate heat exchanger up to 1310 kW: cabinet with a length of 1800 mm and 5" flanged hydraulic connections DN125 – PN6, designed to accept heat exchangers from the HEATgate range, SP 60 plate family. The cabinet is designed to be installed to the right of POWER MAX BOX (with reference to the boiler front view)
 - LH apparatus cabinet for plate heat exchanger up to 1310 kW: cabinet with a length of 1800 mm and 5" flanged hydraulic connections DN125 – PN6, designed to accept heat exchangers from the HEATgate range, SP 60 plate family. The cabinet is designed to be installed to the left of POWER MAX BOX (with reference to the boiler front view)

HIGH TEMPERATURE COMBINATIONS

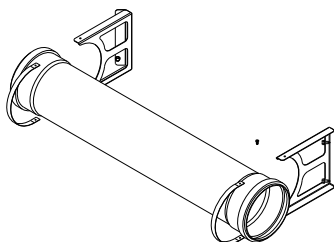
				$\Delta T_{ml} = 10^{\circ}\text{C}$		$\Delta T_{ml} = 7.2^{\circ}\text{C}$	
							
Number of cascade generators	Model	Useful output [kW]	Output [kW]	Exchanger	DN	Exchanger	DN
1	POWER MAX BOX 130-2	114	114	SP 35 - DN50 25 (25A) N	DN 50	SP 35 - DN50 35 (35A) N	DN 50
	POWER MAX BOX 160-2	140	136	SP 35 - DN50 25 (25A) N	DN 50	SP 35 - DN50 39 (39A) N	DN 50
	POWER MAX BOX 200-2	180	180	SP 35 - DN50 31 (31A) N	DN 50	SP 35 - DN50 49 (49A) N	DN 50
	POWER MAX BOX 260-2	230	224	SP 35 - DN50 39 (39A) N	DN 50	SP 35 - DN50 65 (65A) N	DN 50
	POWER MAX BOX 300-2	270	262	SP 35 - DN50 45 (45A) N	DN 50	SP 35 - DN50 75 (75A) N	DN 50
	POWER MAX BOX 330-3	300	291	SP 35 - DN50 49 (49A) N	DN 50	SP 35 - DN50 81 (81A) N	DN 50
	POWER MAX BOX 390-3	345	336	SP 35 - DN50 57 (57A) N	DN 50	SP 35 - DN50 93 (93A) N	DN 50
	POWER MAX BOX 450-3	405	393	SP 35 - DN50 65 (65A) N	DN 50	SP 35 - DN50 105 (105A) N	DN 50
	POWER MAX BOX 520-4	460	448	SP 35 - DN50 75 (75A) N	DN 50	SP 35 - DN50 121 (121A) N	DN 50
2	POWER MAX BOX 600-4	540	524	SP 40 - DN65 59 (59A) N	DN 65	SP 40 - DN65 99 (99A) N	DN 65
	POWER MAX BOX 750 system	675	655	SP 40 - DN65 75 (75A) N	DN 65	SP 40 - DN65 121 (121A) N	DN 65
	POWER MAX BOX 900 system	810	786	SP 40 - DN65 93 (93A) N	DN 65	SP 40 - DN65 145 (145A) N	DN 65
	POWER MAX BOX 1050 system	945	917	SP 60 - DN100 51 (51A) N	DN 100	SP 60 - DN100 73 (73A) N	DN 100
	POWER MAX BOX 1200 system	1080	1048	SP 60 - DN100 59 (59A) N	DN 100	SP 60 - DN100 85 (85A) N	DN 100
3	POWER MAX BOX 1350 system	1215	1179	SP 60 - DN100 65 (65A) N	DN 100	SP 60 - DN100 97 (97A) N	DN 100
	POWER MAX BOX 1500 system	1350	1310	SP 60 - DN100 73 (73A) N	DN 100	SP 60 - DN100 97 (97A) N	DN 100

VARIOUS ACCESSORIES

APPARATUS CABINET AIR/FLUE GASES MANIFOLD DN160/DN300

The extensions of the flue gases and air manifolds, if the flue gas exhaust and air intake are on the same side of the hydraulic connections, allow passing through the apparatus cabinet. The available pre-cut pieces are DN160 for versions up to 485 kW and respectively DN300 for versions up to 800 kW and up to 1310 kW.

The accessory is supplied with support brackets for installation inside the cabinet



OUTDOOR INSTALLATION ROOF KIT

The kits are composed of an anti-aging printed and UV-resistant ABS roof and allow the outdoor installation of the POWER MAX BOX cabinets and the apparatus cabinets for the primary circuit. The kit must be combined with the IPX5D kit for display coverage (accessory) and makes the whole generator suitable for open air installation with IPX5D electrical protection degree.

The following two sizes are available:

- For cabinets with a length of 900 mm (2 modules)
- For cabinets with a length of 1800 mm (3 -4 modules)

DISPLAY COVERAGE IPX5D KIT

The kit is intended to cover the display and protect it from rain and atmospheric events, making the boiler suitable for outdoor installation and thus raising the electrical protection degree to IPX5D.

LIFTING KIT

The kit consists of moulded-in corner brackets to be installed in the part below the generator / apparatus cabinet (at the 4 corners) to allow the insertion of the lifting straps (and to keep them "guided").

WHEELS KIT FOR HANDLING DURING INSTALLATION

The kit consists of corner brackets with wheels to be installed in the part below the generator / apparatus cabinet (at the 4 corners) to allow handling the generator / cabinet during installation.

CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

ELECTRONIC ACCESSORIES

BOILER REMOTE CONTROL KIT WITH 7" TOUCH SCREEN DISPLAY

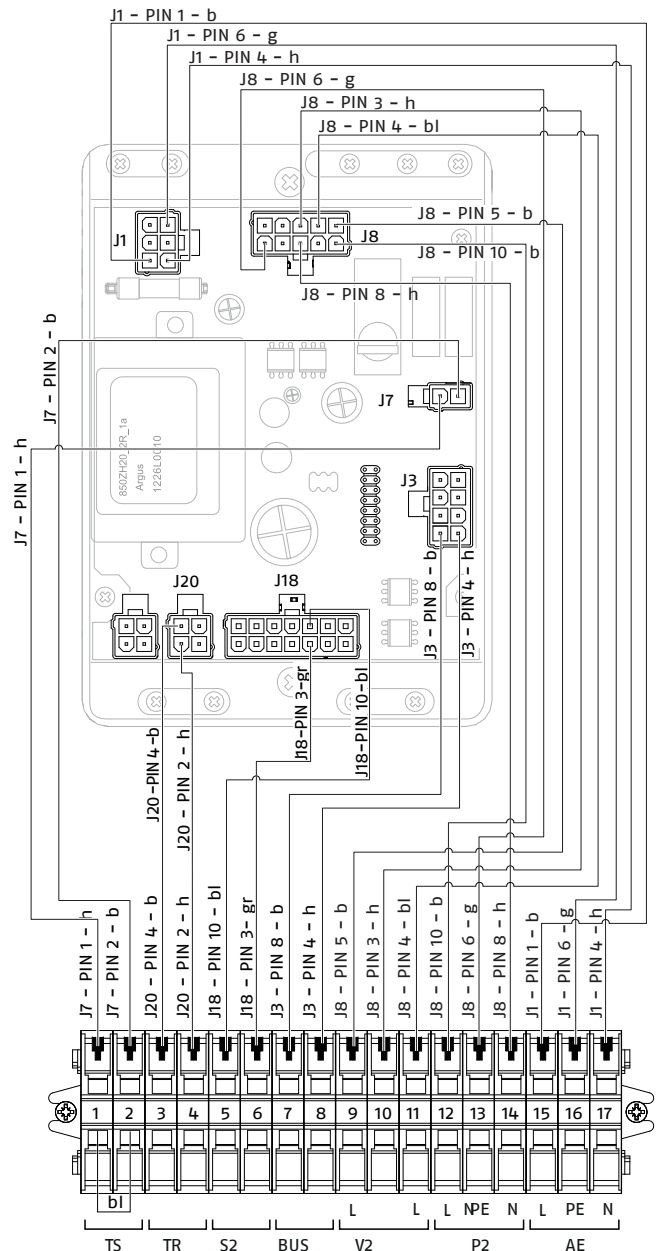
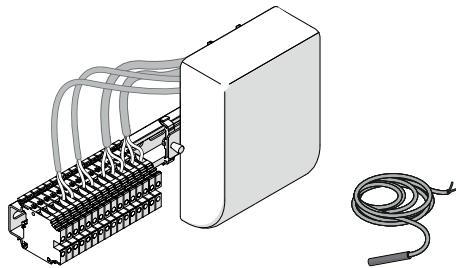
The kit allows controlling remotely all the functions of the generator in a more convenient position for its supervision, through a 7" touch screen display.

SECONDARY PROBE/STORAGE CYLINDER KIT

The kit is composed of 2 NTC immersion probes 10 kOhm at 25 ° C

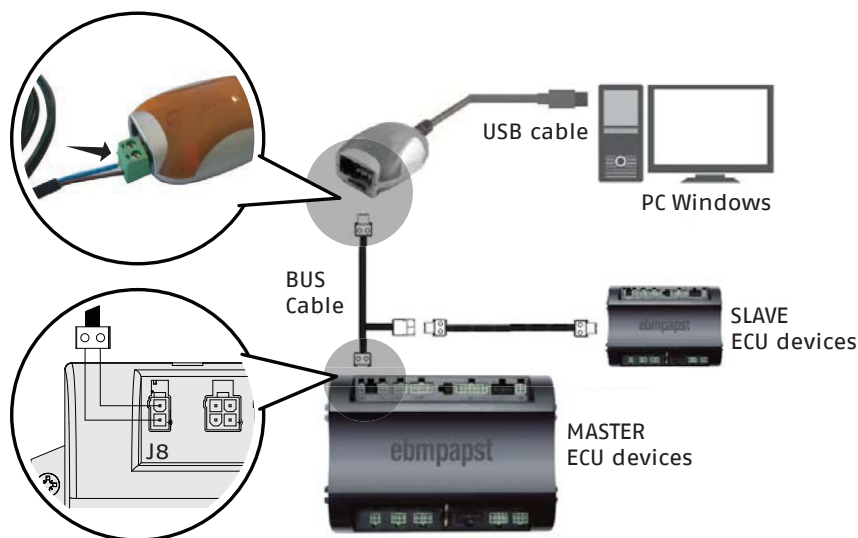
DIRECT OR COMBINED ZONE MANAGEMENT ELECTRONIC KIT

The kit allows managing an additional zone with a dedicated climatic curve. It must be installed inside a system electrical panel or in a dedicated electric box. Once connected to the bus of the electronic control of the attached thermal module, it allows you to manage an additional zone or a mixed zone (for the electrical wiring see the combined system). It is possible to connect up to 16 zone management devices to the thermal module. In the event of a mixed zone the regulator controls the zone mixing valve and the circulator. In the vent of an additional direct zone the regulator controls just the circulator of the zone.



PC INTERFACE KIT

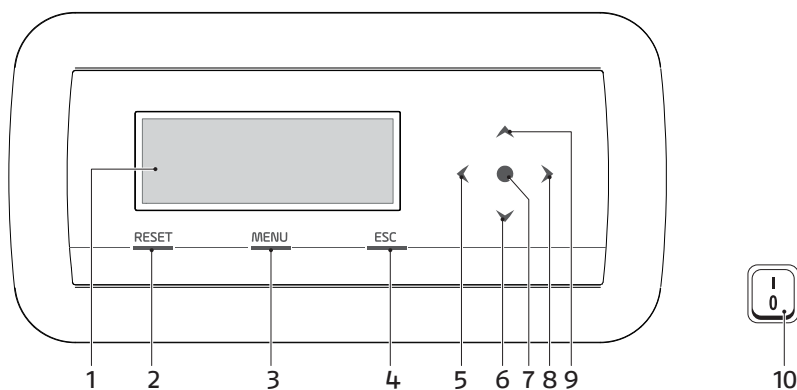
The kit allows monitoring the boiler and record the operating status history on the PC.



EMERGENCY AND OPERATION INTERNAL LIGHT KIT

The kit allows installing a LED ceiling light to facilitate the maintenance operations inside the cabinet. The light acts as an emergency lamp as well.

CONTROL PANEL

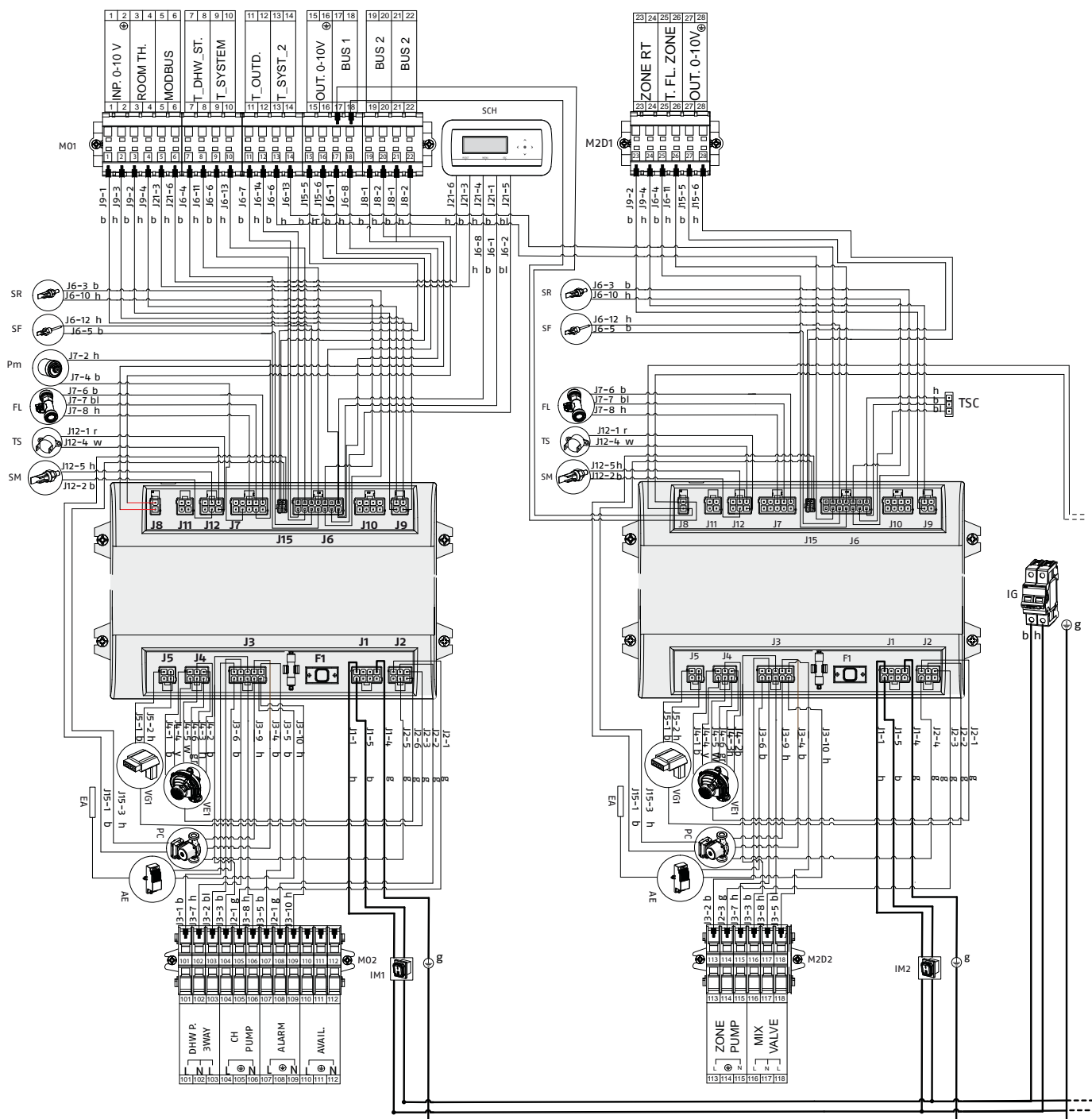


- | | | |
|---|--|--|
| 1. 255x80 point backlit display (106.4x39.0mm) | 4. ESC key: in menu navigation, it enables you to exit a menu item and go back to the previous one | 9. Navigation key ▲ |
| 2. RESET key: restores normal operations after a safety shut-down | 5. Navigation key ◀ | 10. Main switch (located on the lower part of the appliance) |
| 3. MENU key: switches on the main menu | 6. Navigation key ▼ | |
| | 7. Navigation key • | |
| | 8. Navigation key ▶ | |

CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

ELECTRICAL WIRING



alle altre schede (se presenti :
armadi con 3 o 4 gruppi termici)

DESCRIPTION FOR SPECIFICATIONS

PRODUCT DESCRIPTION FOR SPECIFICATIONS SUMMARY

POWER MAX BOX is a heat generator composed of a cabinet (which can be installed in an internal thermal power station, or outdoors with an optional kit) that contains 2, 3 or 4 premixed and modulating thermal modules, with powers from 57 kW up to 131 kW per each furnace, with a total cabinet output ranging from 114 kW to 524 kW per furnace.

The range is divided into 10 power sizes, each of which offered either with injection circulators ("P") or with 2-way valves ("V").

The optimal combustion management supports high yields, over 109% (value calculated over NVC), with condensation, and low polluting emissions – Class 6 pursuant to UNI EN 15502-1.

LPG conversion kit supplied.

POWER MAX BOX can aspirate the air for combustion directly into the installation room or (through appropriate accessories) can be completely sealed.

The appliance in a standard configuration is designed for indoor installation to guarantee an IPX4D protection level. The appliance may also be installed outdoors by fitting special accessories that raise its electric protection to the IPX5D degree.

Maximum operating pressure 6 bar.

PRODUCT DESCRIPTION FOR SPECIFICATIONS

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POWER MAX BOX can be used either in "stand alone" mode (single boiler) or in cascade mode, until reaching the maximum power of 1.31 MW per furnace.

The main technical characteristics of the appliance are:

- Containment cabinet composed of:
 - Robust frame, made of "Anticorodal" aluminium drawn support tails AW 6060 joined through penetrating tripod joint, weather resistant (suitable for both indoor and outdoor installation), saltiness and aggressive marine environments
 - Aluminate and painted metal sheet panels for maximum resistance to outdoor installation, salinity and aggressive marine environments
 - Internal insulation to guarantee reduced casing losses and high thermal efficiency, made of high density open-cell expanded polyurethane resin with high insulating power (both thermal and acoustic), impermeable to water and oils and self-adhesive
 - Support legs and height adjustment, sized to support the weight of the generators and accessories installed inside the cabinet
 - Door (configuration with 2 modules) / doors (configuration with 3 and 4 modules) equipped with robust hinges that are weather resistant and UV rays resistant, with retractable handles (to prevent injury from protruding bodies) with lock (to prevent tampering and ensure the safety). The internal side of the door supports the electrical panel containing the boiler boards
 - High volume that allows housing the thermal modules, the gas valves, the water manifolds, the gas manifold, the flue gas and air manifolds and air manifolds (the latter is accessory) to protect them against uv rays
- Condensing modules consisting of:
 - Heat exchangers with patented geometries (patent owned by Riello Group) characterised by:
 - Double acting helical structure to reduce pressure drops and increase the exchange surface, consisting of two plain stainless steel austenitic (316L) pipes, with pentagonal section inside and circular outside, designed to maximize the exchange surface, offer maximum resistance to corrosion and the possibility of working with high ΔT (up to 40 °C) reducing the time needed for reaching the steady state
 - Water cooled heads to increase yields, which act as a connecting / balancing manifold between the two pipes that make up the exchanger
 - Retarder inside the heat exchanger that allows the flue gases, pushed by the fan, to cross the diffuser discs consisting of the two side-by-side coils forming, in fact, two distinct chambers inside the heat exchanger and increasing the condensation and the average seasonal yield
 - Output of each 57 kW, 68 kW, 90 kW, 97 kW, 112 kW and 131 kW module at the furnace
 - Very high yields up to more than 109% in condensing mode (50–30°C)
 - Maximum flue gases output temperature 78°C (at maximum output and high temperature) and very low flue gas–water Δt (containing up to 1°C)
 - Flue gas exhaust made of plastic material, resistant to uv rays, equipped with check valve to avoid the combustion products reflux
 - Maximum operating pressure 6 bar.
- Total pre-mixing burner characterized by:
 - Stainless steel combustion head operating with micro-flames to obtain very low NOx values (Class 6 according to UNI EN 15502-1) and CO values
 - Continuous fan modulation with very low energy consumption (modulation range up to 1:5)

CONDENSING GENERATORS

Indoor and Outdoor condensing pre-assembled gas fired boilers

- High discharge head fan to facilitate the discharge of the flue gases under pressure
- Fan safety achieved by a Hall effect tachometer device so that the rotation speed is always monitored
- Pneumatic gas valve with high modulation ratio designed for "type C" operation with air pressure test point
- Gas tap
- Operation ensuring full safety and very low gas supply pressures
- Operation with a constant CO₂ percentage value in the flue gases throughout the modulation range
- Flame ignition and detection electrode
- LPG conversion kit supplied
- Preparation for the conversion of the boiler to "type C" (with the dedicated accessory)
- internal hydraulics consisting of:
 - Flanged and insulated delivery and return manifolds
 - Bleeding of the each module, equipped on the return pipe with a two-way gate valve to facilitate maintenance; a check valve is mounted on the same pipe
 - Flow-meter to control of the water circulation of each module
 - Minimum pressure switch to monitor the circuit pressure (minimum pressure 0.7 bar)
 - Manifold (located on the delivery pipes of each thermal module) prepared for the installation of a 2-way gate valve and CE safety valve (train available as an accessory)
 - Version with high efficiency circulator and high residual discharge head, controlled by PWM to guarantee constant ΔT between delivery and return or version with two-way electrically operated module shut-off valve, to be combined with the primary (single or twin) pump kit, controlled at 0-10V to guarantee constant ΔT between delivery and return
- Control interface and electronics characterised by:
 - Anti-freeze mode
 - Outdoor temperature sensor that enables the climatic control function
 - Pre-fitting for room thermostat / heat request for the heating zones
 - Option to manage a direct heating circuit and a domestic hot water circuit with storage tank (either circulator or 3-way valve)
 - Option to manage up to 16 additional heating zones (mixed or direct) by means of an appropriate electronic expansion (accessory), each with a dedicated and independent climatic curve

The main functions of POWER MAX BOX are the following:

- Date and time setting
- Setting heating system with 5 modes:
 - Operation with room thermostat/heat request and fixed set-point;
 - Operation with room thermostat/heat request and variable set-point depending on the outdoor temperature;
 - Climatic operation with attenuation controlled by room thermostat/heat request)
 - Continuous fixed set-point operation with attenuation controlled by room thermostat/heat request;
 - Set-point adjustment based on a 0-10V analogue input
- Setting DHW production in 3 modes:
 - No production of domestic hot water
 - Domestic hot water production with storage tank controlled by a storage cylinder probe
 - Domestic hot water production with storage tank controlled by a thermostat
- Anti-legionella function
- DHW-heating priority setting
 - On: priority allocated to the DHW circuit
 - Off: priority given to the heating circuit
 - Time: timed priority between the two circuits
 - Parallel: contemporaneous operation with priority on heating until the setpoint is reached.
 - Timer programme: seasonal, holiday, groups of homogeneous zones
- Screen displays:
 - Delivery temperature
 - Return temperature
 - DHW temperature
 - Outdoor temperature
 - Flue gas temperature
 - System temperature (common delivery)
 - Fan speed
 - Ionization
 - Status
 - Error
- Control interface and motherboard with the following functions:
 - Integrated master (managing) / Slave (depending) management
 - Boiler circulator and system control by means of a signal chosen from::
 - Digital low voltage PWM (pulse width modulation) with 100-4000 Hz frequency range
 - Analogue 0-10V
 - Standard 230 VAC
 - External 0-10V analogue input for supervision through the external BMS system
 - Door with ModBus protocol for the communication with the external BMS system

- Input for room \ door thermostat with Open Therm protocol (room probes belonging to class V, VI)

SAFETY DEVICES

All appliance functions are electronically controlled by a dual processor technology board approved for safety functions. Any malfunction results in the appliance being shut down and the automatic closure of the gas valve.

The following are installed on the water circuit:

- Safety thermostat;
- Flow sensor capable of monitoring the main circuit's flow on an ongoing basis and of stopping the appliance in the event of insufficient flow;
- Temperature probes on delivery and return that continually measure the temperature difference between input and output fluids and enable the control to be activated;
- Minimum pressure switch calibrated at 0.7 bar.

The following are installed on the combustion circuit:

- Gas solenoid valve in class B+C, with pneumatic gas flow compensation depending on the suction line's air flow rate;
- Ionisation electrode for flame ignition and detection;
- Flue gases temperature probe. In case the maximum admissible temperature is exceeded, the module is stopped.

COMPLIANCE

The POWER MAX BOX thermal modules comply with:

- EU Regulation 2016/426
- Efficiency Directive 92/42/EEC and Annex E of Presidential Decree 26 August 1993 no.412 (***)
- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Ecodesign Directive for energy-related products 2009/125/EC
- Energy Consumption Labelling Directive 2010/30/EU
- Delegated regulation (EU) N. 811/2013
- Delegated regulation (EU) N. 813/2013
- Boiler standards for gas heating – General requisites and EN 15502-1 tests
- Specific regulations for type C appliances and type B2, B3 and B5 appliances with a rated heat output lower than 1000 kW EN 15502-2/1
- SSIGA Gas Appliance Directive G1
- AICAA Fire prevention requirements
- CFST LPG Directive Part 2
- VARIOUS cantonal and communal provisions on air quality and energy saving.

BURNER EQUIPMENT

The POWER MAX BOX thermal module is shipped on a pallet, packaged and protected with cardboard. The following material is supplied in a plastic envelope inside the package:

- Instruction booklet
- LPG conversion kit
- Hydrostatic test certificate

**Sede commerciale: Via Risorgimento, 23 A
23900 - Lecco**

www.berettaheating.com

The company is constantly working to perfect the features of its entire production range, so the design and size, technical data, equipment and accessories may be subject to change.

