

Unical

XC-K



BREVETTO
Unical
PATENT

smoke pipes

CONDENSING STEEL BOILER

OUTPUT RANGE

from 124 kW (116 kW input) to 2160 kW

OPERATION TEMPERATURE

no limit on the return temperature

SUPPLY

Natural Gas or LPG fed pressure jet burners

MODELS

124

200

290

400

480

570

700

900

1140

1420

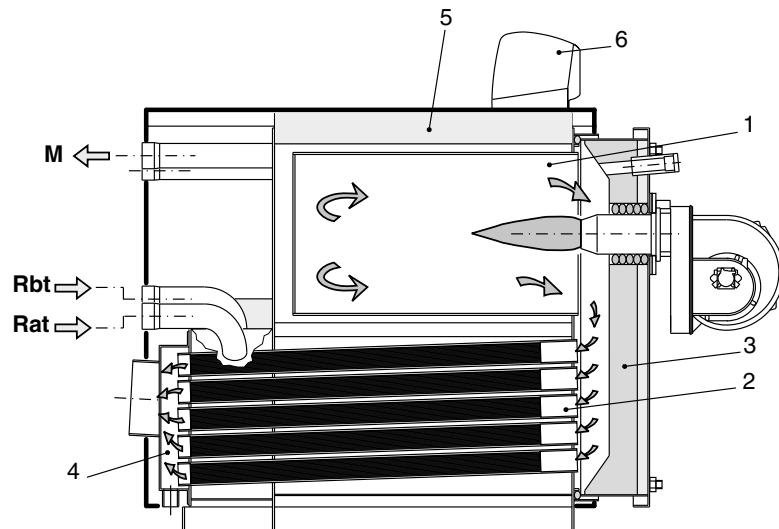
1820

2160

large water content
special smoke pipes in stainless steel AISI 316L with aluminium profiles

MAIN COMPONENTS

1. Furnace
 2. Smoke pipes with smoke diverters
 3. Door with flame sight glass
 4. Smoke chamber
 5. Body insulation
 6. Board panel
- M Flow
Rbt Low temperature return
Rat High temperature return



PRODUCT PLUS VALUES

■ VERY HIGH QUALITY OF THE EMPLOYED METALS

Outer shell in high resistance carbon steel: smoke chamber in stainless steel AISI 316L

■ PROGRESSIVE SMOKE PIPES (patented)

With very high thermal exchange, stainless steel special progressive pipes, armoured on the outside, with inside multi-fin aluminium turbulators

■ SELF-CLEANING OF THE TUBE BUNDLE

thanks to the natural washout that the condensate produces for gravity

■ COMMAND AND CONTROL PANEL (optional)

electronic type with Ufly P thermoregulation, which allows the management of the one-stage, two-stage or modulating burners.

■ Arrangement for battery with control panel CASCATA UFLY P (optional)

Up to 8 XC-K managed

■ LEAST THERMAL LOSSES

XC-K is insulated with a layer of 100 mm of thermal and acoustic mineral wool insulation material. Carbon steel door with thermal insulation in light cement

■ MAXIMIZATION OF THE THERMAL EXCHANGE

Outer shell with reversed flame structure: in the blind cylindrical furnace the first two passes of the combustion gases are completed; subsequently they take the particular tube bundle used for the third pass.

■ VERY HIGH SAVING AND SEASONAL EFFICIENCY

Thanks to the adoption of fan assisted modulating burners and to the hydraulic connection prearranged for two return connections (high / low temperature)

■ CERTIFIED EFFICIENCY 109%

at 30% part load

■ SIMPLIFIED INSTALLATION

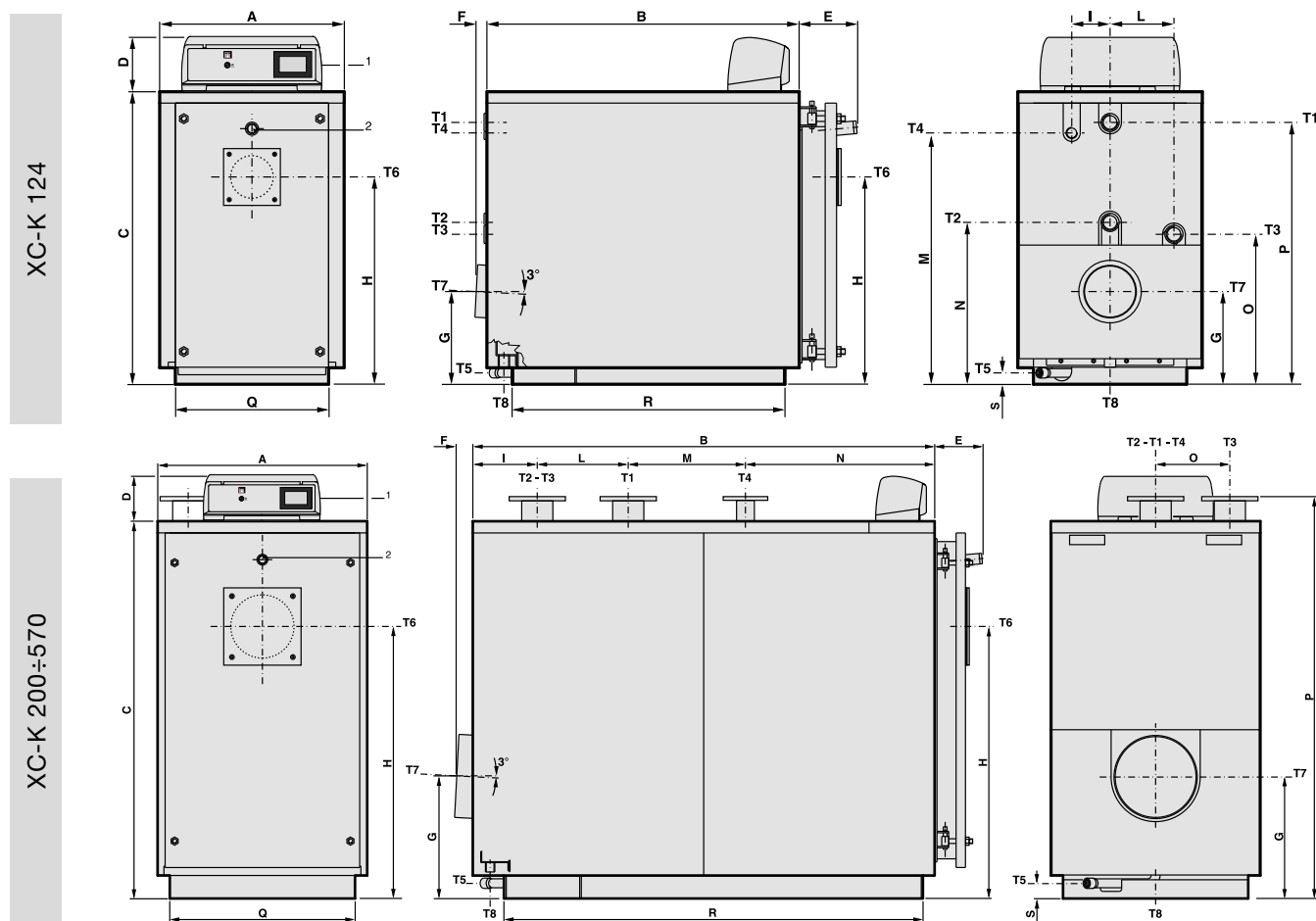
- Single smoke evacuation
- No hydraulic interface between boiler and C.H. system

■ WIDE RANGE OF REGULATION ACCESSORIES

- Temperature sensor for mixed zone flow connection
- Sensor PT 1000 for management of solar panels with E8



DIMENSIONS XC-K 124÷570



- 1 Panel board
 2 Flame sight glass
 T1 C.H. flow
 T2 Low temperature C.H. return

- T3 High temperature C.H. return
 T4 Expansion vessel connection
 T5 Boiler drain
 T6 Burner connection

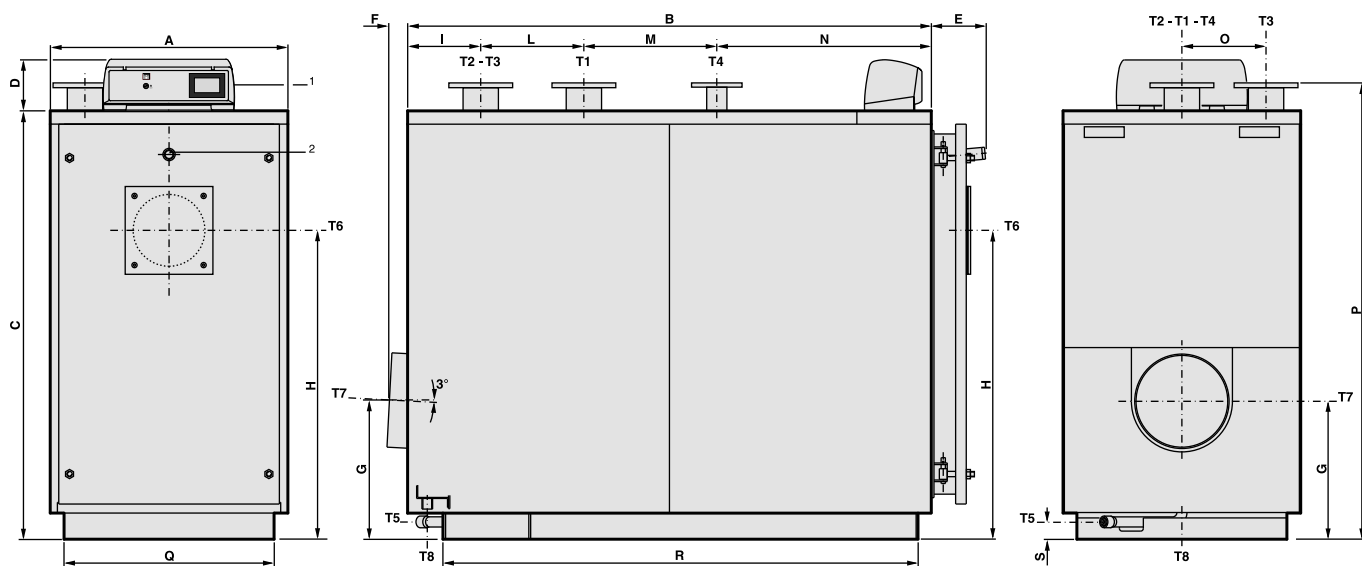
- T7 Chimney connection
 T8 Condensation drain

XC-K	CONNECTIONS							Weight
	T1 - T2	T3	T4	T5	T6	T7	T8	
	ISO 7/1 UNI 2276 PN6	ISO 7/1 UNI 2276 PN6	ISO 7/1	ISO 7/1	Ø mm	Øi mm	Øe mm	
124	Rp 2	Rp 2	Rp 1¼	Rp ¾	150	182	40	365
200	DN 65	DN 65	Rp 1½	Rp ¾	180	202	40	525
290	DN 80	DN 80	Rp 2	Rp 1	180	252	40	660
400	DN 80	DN 80	Rp 2	Rp 1	180	252	40	800
480	DN 100	DN 100	Rp 2	Rp 1	220	302	40	1007
570	DN 100	DN 100	Rp 2	Rp 1	220	302	40	1137

XC-K	A	B	C	D	E	F	G	H	I	L	M	N	O	P*	Q*	R*	S
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
124	650	1100	1032	190	205	37	329	730	135	225	885	570	528	922	540	961	40
200	720	1450	1132	190	205	48	374	790	255	320	250	625	255	1248	610	1311	45
290	790	1465	1282	190	235	55	402	900	231	359	250	625	275	1385	680	1314	60
400	790	1755	1282	190	235	65	402	900	271	379	450	655	275	1385	680	1614	60
480	854	1770	1472	190	270	67	494	1062	306	358	500	606	306	1585	750	1606	65
570	854	1940	1472	190	270	67	494	1062	306	358	500	776	306	1585	750	1776	65

(*) Minimum dimensions for boiler room access.

DIMENSIONS XC-K 700÷2160



- 1 Panel board
 2 Flame sight glass
 T1 C.H. flow
 T2 Low temperature C.H. return

- T3 High temperature C.H. return
 T4 Expansion vessel connection
 T5 Boiler drain
 T6 Burner connection

- T7 Chimney connection
 T8 Condensation drain

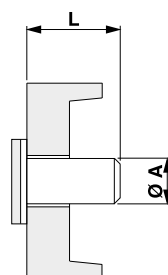
XC-K	CONNECTIONS							Weight
	T1 T2	T3	T4	T5	T6 Ø	T7 Øi	T8 Øe	
	UNI 2276 PN6	UNI 2276 PN6	UNI 2276 PN6	ISO 7/1	mm	mm	mm	kg
700	DN 125	DN 125	DN 65	Rp 1	270	352	40	1376
900	DN 125	DN 125	DN 65	Rp 1	270	352	40	1613
1140	DN 150	DN 150	DN 80	Rp 1½	320	402	40	2158
1420	DN 150	DN 150	DN 80	Rp 1½	320	402	40	2443
1820	DN 200	DN 200	DN 100	Rp 1½	320	452	40	3458
2160	DN 200	DN 200	DN 100	Rp 1½	320	452	40	3765

XC-K	A	B	C	D	E	F	G	H	I	L	M	N	O	P*	Q*	R*	S
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
700	894	1970	1612	190	292	65	523	1161	275	388	500	807	316	1715	790	1787	65
900	894	2340	1612	190	292	65	523	1161	405	388	500	1047	316	1715	790	2157	65
1140	1064	2360	1802	190	317	57	551	1287	289	624	900	547	390	1911	960	2157	55
1420	1064	2740	1802	190	317	57	552	1287	459	624	900	757	390	1911	960	2537	55
1820	1204	2980	2052	190	387	53	681	1493	372	563	785	1260	432	2165	1100	2752	95
2160	1204	3204	2052	190	387	54	681	1493	371	563	1010	1260	432	2165	1100	2977	95

(*) Minimum dimensions for boiler room access.

BURNER BLAST TUBE DIMENSIONS

BOILER TYPE	øA mm	L mm
XC-K 124	150	230
XC-K 200	180	230
XC-K 290÷400	180	270
XC-K 480÷570	220	300
XC-K 700÷900	270	320
XC-K 1140÷1420	320	350
XC-K 1820÷2160	320	420



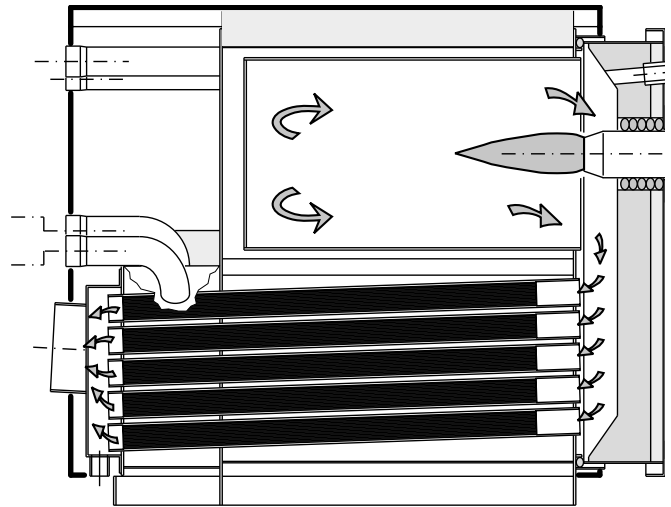
TYPE AND SHAPE OF FURNACE

XC-K boilers are equipped with a blind cylindrical furnace, in which the central flame of the burner is reversed peripherally towards the front.

When the combustion gases have reached the front part, they are sent through the door into the tubes of the third pass to reach the rear flue gas chamber and then the chimney.

The combustion chamber is always pressurised while the burner is operating within the power range of the boiler.

The chimney must be calculated so that no positive pressure is detected at its base.



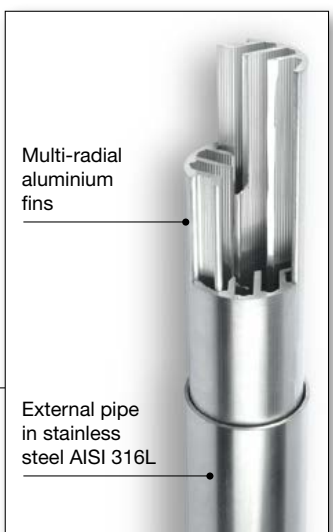
SPECIAL SMOKE PIPES (patented)

SMOKE PIPES:

- Exceptional thermal exchange
- Functional outflow of the condensate
- Absence of wet acidic deposits
- Washout, for gravity, of the smooth exchange surfaces
- Greater duration



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TECHNICAL DATA

ELECTRICAL, HYDRAULIC, INSTALLATION DIAGRAMS AND CONTROLLERS can be unloaded from the web site www.unical.eu at the page of the product

XC-K (Gas fired)		124	200	290	400	480	570
Nominal heat output (80°-60°C)	kW	112.8	182.7	265.6	367.1	440.7	523.3
Nominal heat output (50°-30°C)	kW	124	200	290	400	480	570
Nominal heat input	kW	115.9	186.9	271	373.8	448.6	532.7
Heat efficiency at nominal load (80°-60°C)	%	97.3	97.72	98.2	98.2	98.23	98.23
Heat efficiency at nominal load (50°-30°C)	%	107	107	107	107	107	107
Heat efficiency at 30% load	%	109	109	109	109	109	109
Combustion efficiency (80°-60°C)	%	98.06	98.1	98.23	98.37	98.37	98.37
Combustion efficiency (50°-30°C)	%	99	99	99	99	99	99
Boiler capacity	l	140	260	305	332	544	515
Heat loss at shell (80°-60°C)	%	0.76	0.38	0.23	0.17	0.14	0.14
Heat loss at shell (50°-30°C)	%	0.68	0.34	0.21	0.15	0.12	0.12
Heat loss at chimney with burner on (80°-60°C)	%	1.94	1.90	1.77	1.63	1.63	1.63
Heat loss at chimney with burner on (50°-30°C)	%	1.03	1.03	1.03	1.03	1.03	1.03
Heat loss at chimney with burner off	%	0.05	0.05	0.05	0.05	0.05	0.05
Maximum boiler working pressure	bar	6	6	6	6	6	6
Water pressure drops (*)	kPa	1.5	3.8	2.5	3.2	2	2.9
Flue gas pressure drop	daPa	9.8	18.6	25.4	32.3	34.3	39.2
Flue gas temperature tf-ta (80°-60°C)	°C	44	43	40	37	37	37
Flue gas temperature tf-ta (50°-30°C)	°C	22	22	22	22	22	22
CO ₂ content	%	10.3	10.3	10.3	10.3	10.3	10.3
Flue gas mass flow rate	kg/h	166.9	269.1	390.2	538.3	645.9	767
Maximum condensation production (natural gas)	l/h	19.61	31.62	45.85	63.24	75.89	90.12

XC-K (Gas fired)		700	900	1140	1420	1820	2160
Nominal heat output (80°-60°C)	kW	642.6	826.2	1046.6	1303.6	1670.8	1983
Nominal heat output (50°-30°C)	kW	700	900	1140	1420	1820	2160
Nominal heat input	kW	654.2	841.1	1065.4	1327.1	1700.9	2018.7
Heat efficiency at nominal load (80°-60°C)	%	98.23	98.23	98.23	98.23	98.23	98.23
Heat efficiency at nominal load (50°-30°C)	%	107	107	107	107	107	107
Heat efficiency at 30% load	%	109	109	109	109	109	109
Combustion efficiency (80°-60°C)	%	98.37	98.37	98.37	98.37	98.37	98.37
Combustion efficiency (50°-30°C)	%	99	99	99	99	99	99
Boiler capacity	l	625	664	1107	1157	1936	1904
Heat loss at shell (80°-60°C)	%	0.14	0.14	0.14	0.14	0.14	0.14
Heat loss at shell (50°-30°C)	%	0.12	0.12	0.12	0.12	0.12	0.12
Heat loss at chimney with burner on (80°-60°C)	%	1.63	1.63	1.63	1.63	1.63	1.63
Heat loss at chimney with burner on (50°-30°C)	%	1.03	1.03	1.03	1.03	1.03	1.03
Heat loss at chimney with burner off	%	0.05	0.05	0.05	0.05	0.05	0.05
Maximum boiler working pressure	bar	6	6	6	6	6	6
Water pressure drops (*)	kPa	3	3.7	3.5	4	3.9	5.5
Flue gas pressure drop	daPa	46	58.8	73.5	88.2	90.2	98
Flue gas temperature tf-ta (80°-60°C)	°C	37	37	37	37	37	37
Flue gas temperature tf-ta (50°-30°C)	°C	22	22	22	22	22	22
CO ₂ content	%	10.3	10.3	10.3	10.3	10.3	10.3
Flue gas mass flow rate	kg/h	941.9	1211.1	1534	1910.8	2449	2906.6
Maximum condensation production (natural gas)	l/h	110.68	142.3	180.24	224.52	287.76	341.52

(*) Pressure drops corresponding to a thermal variation of 15K.

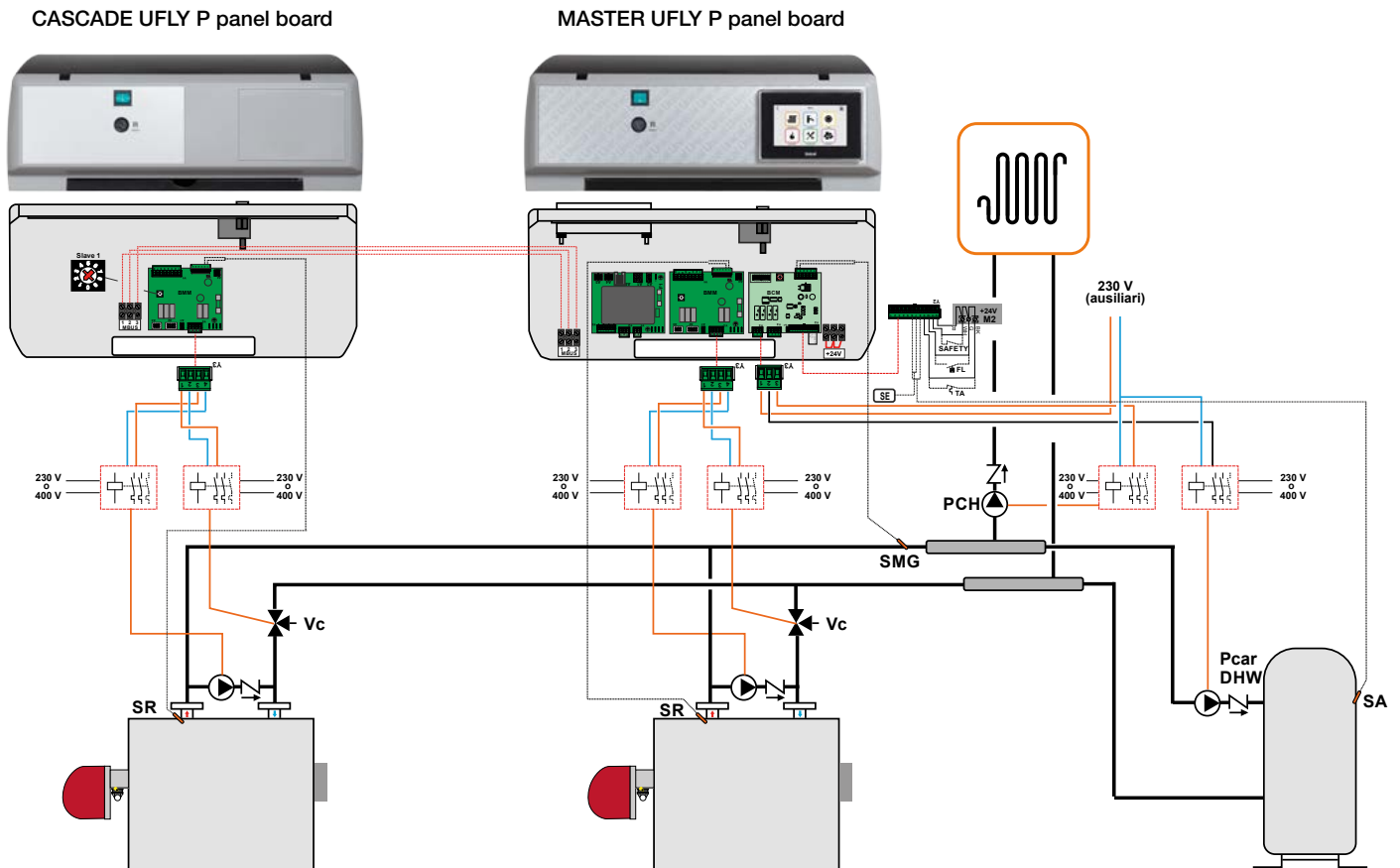
TECHNICAL DATA ACCORDING TO ErP DIRECTIVE

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XC-K (Gas fired)			124	200	290	400
EFFECTIVE NOMINAL OUTPUT	P_n	kW	113	183	266	367
SEASONAL ENERGY EFFICIENCY TO HEAT THE ROOM	η_s	%	93	93	93	93
SEASON EFFICIENCY CLASS TO DISCHARGE			A	A	A	A
FOR BOILERS TO HEAT THE ROOM AND MIXED BOILERS: USEFUL HEAT OUTPUT						
USEFUL HEAT OUTPUT with high temperature capacity (Tr 60 °C / Tm 80 °C)	P_4	kW	112.8	182.6	266.1	367.1
RATED HEAT OUTPUT EFFICIENCY with high temperature capacity (Tr 60 °C / Tm 80 °C)	η_4	%	87.7	88.0	88.5	88.5
USEFUL POWER AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	P_1	kW	97.9	61.1	88.6	122.6
PERFORMANCE AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	η_1	%	98.2	98.2	98.2	98.8
BOILER WITH OUTPUT RANGE ADJUSTMENT: YES / NO			NO	NO	NO	NO
AUXILIARY ELECTRICITY CONSUMPTION						
WITH A FULL LOAD	$e_{l_{max}}$	kW	0.35	0.35	0.7	0.6
STANDBY MODE	P_{SB}	kW	0.050	0.050	0.050	0.050
OTHER ELEMENTS						
HEAT DISPERSION ON STAND-BY	P_{stby}	kW	0.058	0.093	0.136	0.187
NITROGEN OXIDES EMISSIONS referred to NCV & (GCV)	NO_x	mg/kWh	57 (51)	55 (50)	55 (50)	55 (50)

The models with an Output higher than 400 kW are not covered by the Directive 2009/125/CE

BASIC SCHEME OF SYSTEM OPERATION



SMG	Global Flow sensor
SR	Heating sensor
PRC	Boiler recirculation pump (connect to BMM)
SA	DHW storage temperature sensor
P.car DHW	Cylinder charging pump (connect on BCM)
P. CH	Heating circuit pump (connect to BCM)
PCL	2-way valve Boiler

For condensing boilers, no boiler recirculation pump (PRC) is required.