XC-K oil (oil/gas)

BREVETTO Unical PATENT
smoke pipes

VERY LOW TEMPERATURE, CONDENSING, PRESSURIZED BOILER							
OUTPUT RANGE	From 69 kW Output (67 kW Input) to 1550 kW Output (1520 kW Input)						
OPERATION TEMPERATURE	no limit on the return temperature						
SUPPLY	Pressure jet oil burner, in version two stage, two stage progressive and modulating, biodiesel or dual fuel (gas / oil)						
MODELS	69	100	150	230	300	350	400
	500	650	850	1000	1300	1550	-

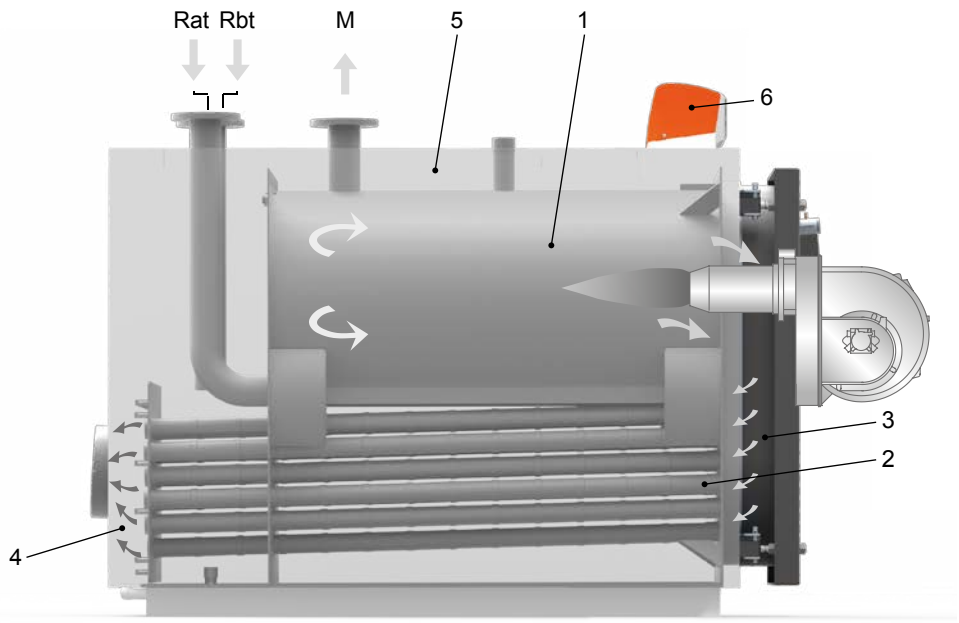
Large water content
special smoke pipes in AISI 316L, with inserts and turbulators in AISI 304

MAIN COMPONENTS

1. Furnace
2. Smoke pipes with smoke diverters
3. Door with flame sight glass
4. Smoke chamber
5. Body insulation
6. Panel board

M Flow
Rbt Low temperature return
Rat High temperature return

(Burner isn't supplied with)

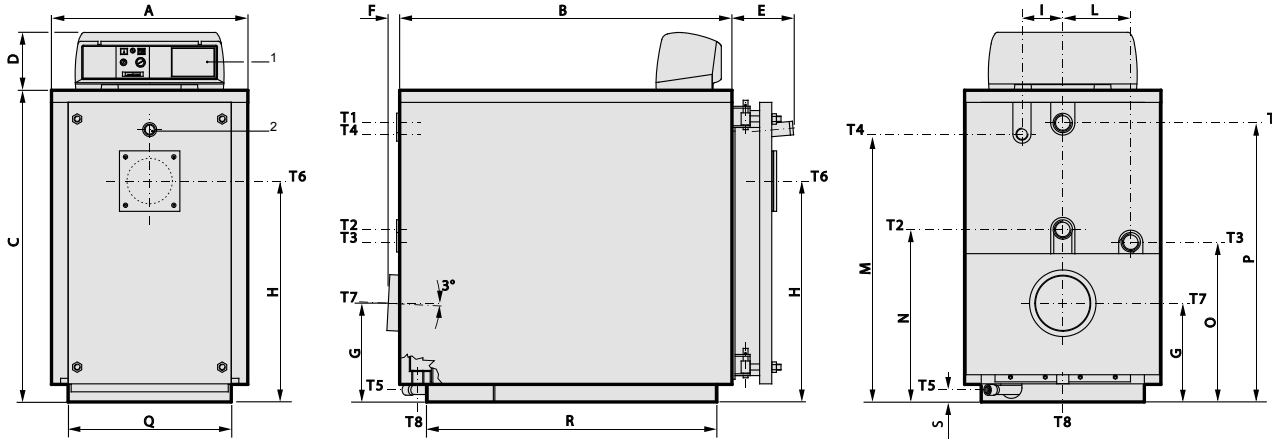


PLUS PRODOTTO

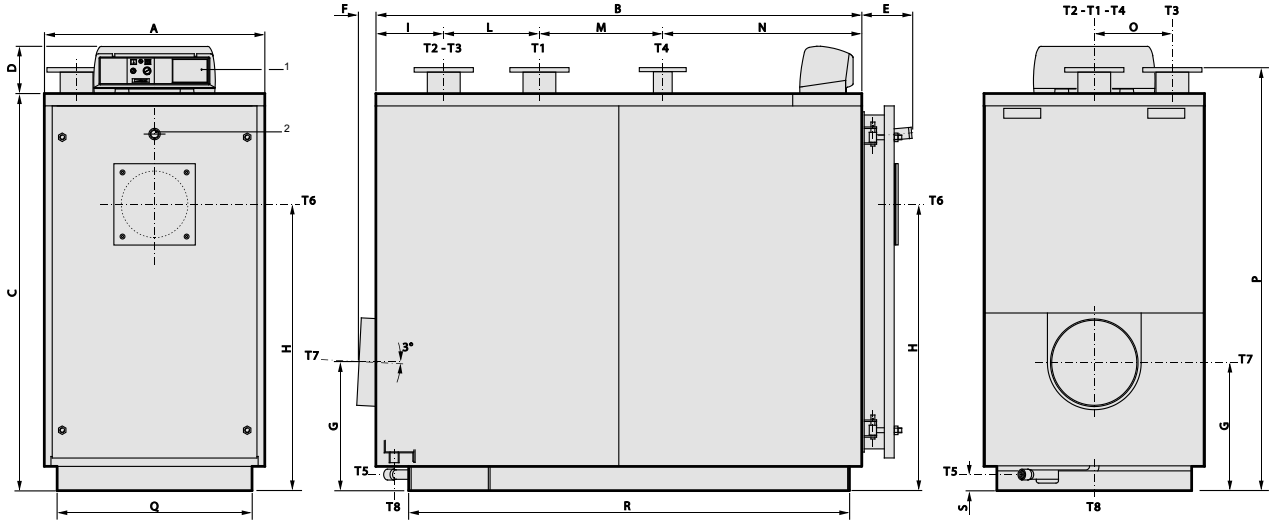
- **EFFICIENCY**
  102% at full load
  104% at part load in condensation mode
- **COMBUSTION CHAMBER** in stainless steel AISI 316L, entirely water cooled, above the tube bundle, so that the assembly could form a structure apt to favour the thermal exchange and the evacuation of the condensate.
- **WATER RUN**
  guided and braked inside the body
- **Special "progressive" and PATENTED SMOKE PIPES**
  in stainless steel AISI 316L with, inside, 6 special sectorial pipes and turbulators in AISI 304, that guarantee a very high heat exchange and resistance to the condensate.
  Tube bundle slightly inclined towards the smoke chamber in order:
  - to let the condensate to be collected over there
  - to avoid the acidic wet deposits remain in the pipes
  - to clean, thanks to the gravity, the exchange surfaces
- **OPTIMUM QUIETNESS** of operation thanks to the low counter-pressure in the smoke side
- **FRONT DOOR IN STEEL** with insulation in special superlight refractory cement (able to reduce more than 30% the heat losses by radiation)
- C.H. Flow connection placed on the rear upper part and two return connections, for low and high temperature, in the lower part. For models 69 and 100 the Flow and Return connections are towards the back side; for models 250 to 1550 Flow and Return connections are towards the upper side (as shown in the picture)
- The high temperature return connection is placed so that it doesn't interfere with the low temperature return connection
- The low temperature return connection is placed on the extension of the lower outer shell to that it can exploit at the maximum the heat recover
- **ADJUSTABLE DOOR**
  with reversible opening (from RH side or from LH side: standard execution with the hinges on the LH side)
- **CONTROL PANEL BOARD**
  with electronic thermoregulation E8, that allows the control of modulating burners
- **PRESETTING FOR CASCADE OPERATION** up to 8 boilers, with an additional optional E8
- Easy installation of the burner through burner supporting plate, pre-drilled on request
- Two bulb holders ½", with internal dia. 15 mm for temperature sensors and thermostat bulbs (3 bulbs each)
- **REAR SMOKE CHAMBER** in stainless steel AISI 304, with connection for condensate drain
- **VERY STRONG INSULATION** of the boiler body in fabric-finish mineral wool, 100 mm thick
- **CONSTRUCTION** according to EN 303-1
- **CLEANING AND SERVICING** made easy by the self-drain of the condensate in the smoke pipes, inclined towards the smoke chamber
- **LIFTING HOOKS** for transport and handling
- Option: Acidic condensate inhibitor, specific for oil

DIMENSIONS XC-K oil 69÷400

XC-K oil 69÷100



XC-K oil 150÷400



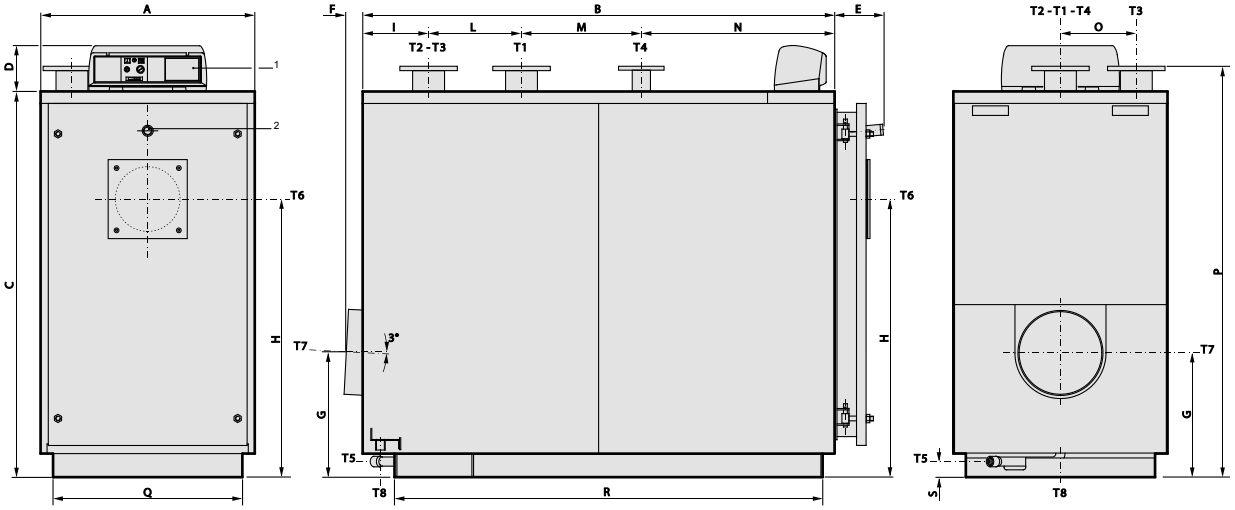
1 Panel board
2 Flame sight glass
T1 C.H. flow
T2 Low temperature C.H. return
T3 High temperature C.H. return
T4 Expansion vessel connection
T5 Boiler drain
T6 Burner connection
T7 Chimney connection
T8 Condensation drain

XC-K oil	Max Temperature allowable	Boiler capacity	Maximum operating pressure boiler	Weight	CONNECTIONS						
					T1 - T2	T3	T4	T5	T6 Ø	T7 Øi	T8 Øe
	°C	l	bar	kg	ISO 7/1 UNI 2276 PN6	ISO 7/1 UNI 2276 PN6	ISO 7/1	ISO 7/1	mm	mm	mm
69	100	140	6	365	Rp 2	Rp 2	Rp ¼	Rp ¼	150	182	40
100	100	140	6	365	Rp 2	Rp 2	Rp ¼	Rp ¾	150	182	40
150	100	260	6	525	DN 65	DN 65	Rp 1 ½	Rp ¾	180	202	40
230	100	305	6	660	DN 80	DN 80	Rp 2	Rp 1	180	252	40
300	100	332	6	800	DN 80	DN 80	Rp 2	Rp 1	180	252	40
350	100	544	6	1007	DN 100	DN 100	Rp 2	Rp 1	220	302	40
400	100	515	6	1137	DN 100	DN 100	Rp 2	Rp 1	220	302	40

XC-K oil	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
69	650	1100	1032	190	205	37	329	730	135	225	885	570	528	922	540	961	40
100	650	1100	1032	190	205	37	329	730	135	225	885	570	528	922	540	961	40
150	720	1450	1132	190	205	48	374	790	255	320	250	625	255	1248*	610	1311	45
230	790	1465	1282	190	235	55	402	900	231	359	250	625	275	1385*	680	1314	60
300	790	1755	1282	190	235	65	402	900	271	379	450	655	275	1385*	680	1614	60
350	854	1770	1472	190	270	67	494	1062	306	358	500	606	306	1585*	750	1606	65
400	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 oil 500÷1550



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

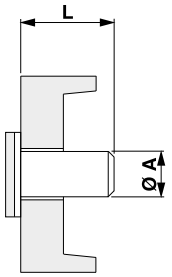
XC-K oil	Max Temperature allowable	Boiler capacity	Maximum operating pressure boiler	Weight	CONNECTIONS						
					T1 - T2	T3	T4	T5	T6 Ø	T7 Øi	T8 Øe
	°C	l	bar	kg	UNI 2276 PN6	UNI 2276 PN6	UNI 2276 PN6	ISO 7/1	mm	mm	mm
500	100	625	6	1376	DN 125	DN 125	DN 65	Rp 1	270	352	40
650	100	664	6	1613	DN 125	DN 125	DN 65	Rp 1	270	352	40
850	100	1107	6	2158	DN 150	DN 150	DN 80	Rp 1 ½	320	402	40
1000	100	1157	6	2443	DN 150	DN 150	DN 80	Rp 1 ½	320	402	40
1300	100	1936	6	3458	DN 200	DN 200	DN 100	Rp 1 ½	320	452	40
1550	100	1904	6	3765	DN 200	DN 200	DN 100	Rp 1 ½	320	452	40

XC-K oil	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
500	894	1970	1612	190	292	65	523	1161	275	388	500	807	316	1715	790	1787	65
650	894	2340	1612	190	292	65	523	1161	405	388	500	1047	316	1715	790	2157	65
850	1064	2360	1802	190	317	57	551	1287	289	624	900	547	390	1911	960	2157	55
1000	1064	2740	1802	190	317	57	552	1287	459	624	900	757	390	1911	960	2537	55
1300	1204	2980	2052	190	387	53	681	1493	372	563	785	1260	432	2165	1100	2752	95
1550	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

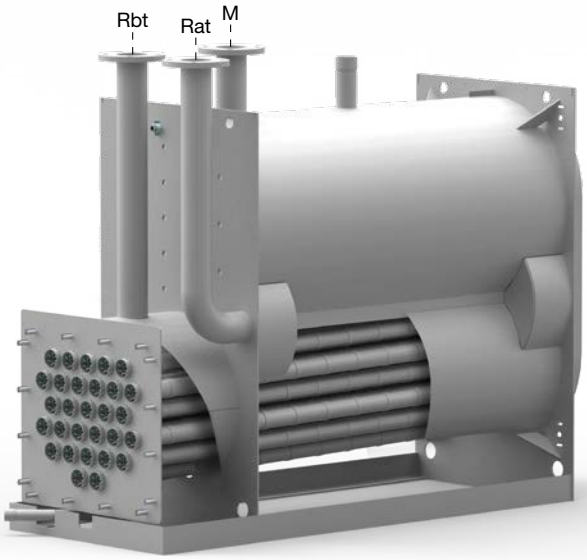
BOILER TYPE	øA mm	L mm
XC-K oil 69÷100	150	230
XC-K oil 150	180	230
XC-K oil 230÷300	180	270
XC-K oil 350÷400	220	300
XC-K oil 500÷650	270	320
XC-K oil 850÷1000	320	350
XC-K oil 1300÷1550	320	420

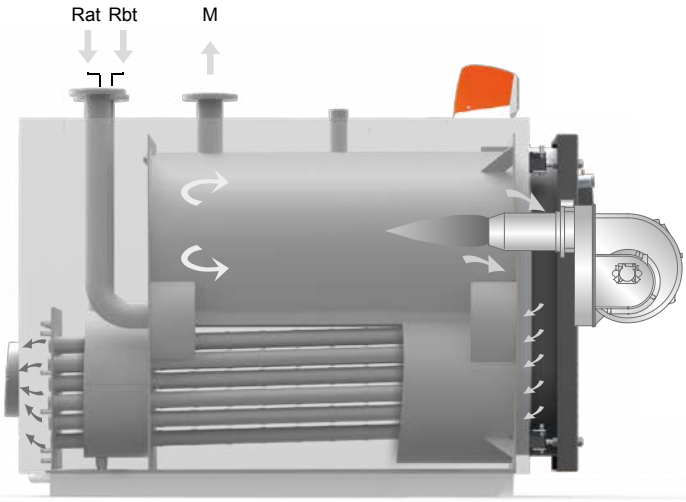


TYPE AND SHAPE OF FURNACE

XC-K oil 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.

DETAIL OF THE OUTER SHELL





M	Flow
Rbt	Low temperature return
Rat	High temperature return

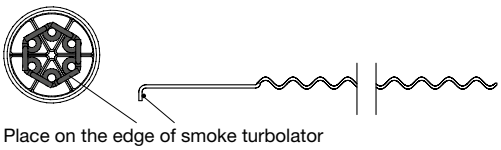
The combustion chamber is always pressurised while the burner is operating, within the power range of the boiler.
The chimney must be calculated so that no positive pressure is detected at its base.

SPECIAL SMOKE PIPES (patented)

Smoke pipes made in stainless steel AISI 316L, completely rolled on the six internal 60° sectorial pipes in AISI 304, with turbulators in AISI 304, assuring very high thermal exchange and resistance to the acidic condensate.

- The tube bundle is slightly inclined towards the smoke chamber, in order:
  - to let the condensate to be collected over there
  - to avoid the acidic wet deposits remain in the pipes
  - to clean, thanks to the gravity, the exchange surfaces.

Smoking section tubes with placed turbulators



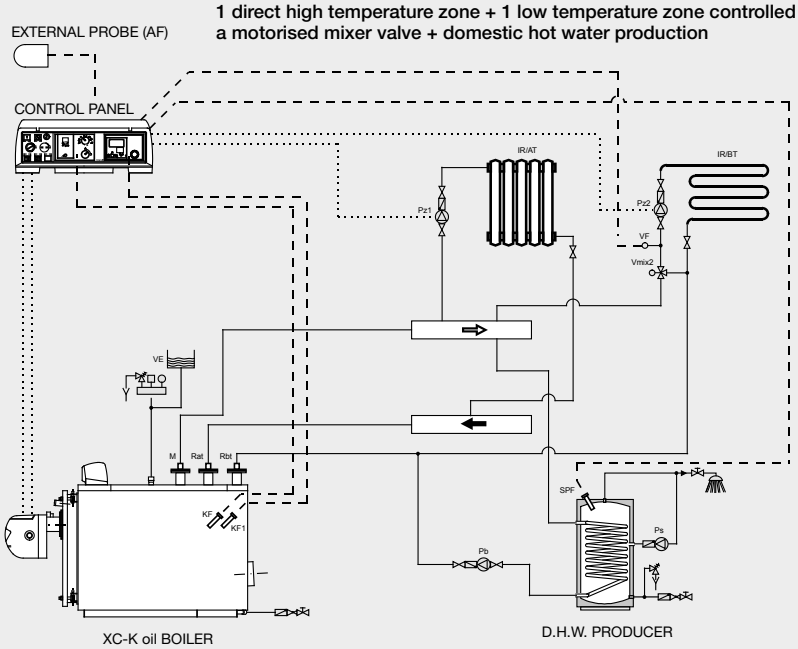
Place on the edge of smoke turbolator

Note: Smoke turbolator are long as flue pipe

BREVETTO Unical PATENT

BASIC SCHEMES OF SYSTEM OPERATION

1 direct high temperature zone + 1 low temperature zone controlled by a motorised mixer valve + domestic hot water production

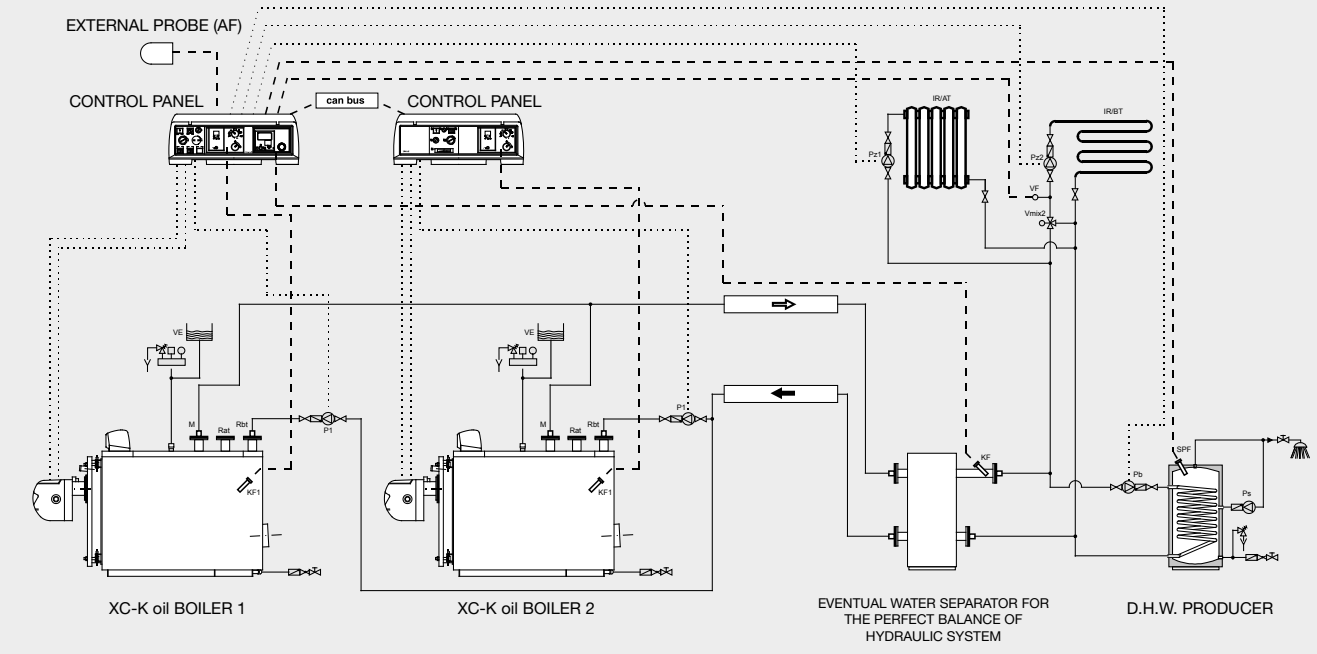


Key:

M	flow
Rat	HIGH temperature return
Rbt	LOW temperature return
Vmix2	zone mixer valve (motorised)
Pz1	HIGH TEMPERATURE zone heating system pump
Pz2	LOW TEMPERATURE zone heating system pump
VE	expansion vessel
IR/AT	HIGH TEMPERATURE heating system distribution
IR/BT	LOW TEMPERATURE heating system distribution
Ps	DHW recirculation pump
Pb	DHW production charge pump
SPF	storage tank probe
KF	E8.5064 heat control boiler probe
KF 1	Lago Basic 0201 RV 1 heat control boiler probe
VF	flow probe
AF	external probe

BASIC SCHEMES OF SYSTEM OPERATION WITH BOILERS IN BATTERY

2 boilers in cascade serving 1 high temperature zone + 1 low temperature zone controlled by a motorised mixer valve + domestic hot water production.



Key:

M	flow
Rat	HIGH temperature return (NOT USED)
Rbt	LOW temperature return
Vmix2	zone mixer valve (motorised)
Pz1	HIGH TEMPERATURE zone heating system pump
Pz2	LOW TEMPERATURE zone heating system pump
VE	expansion vessel
IR/AT	HIGH TEMPERATURE heating system distribution
IR/BT	LOW TEMPERATURE heating system distribution
Ps	DHW recirculation pump
P1	circulation pump
Pb	DHW production charge pump
SPF	storage tank probe
KF	E8.5064 heat control boiler probe
KF 1	Lago Basic 0201 RV 1 heat control boiler probe
VF	flow probe
AF	external probe

Note: the references of these and further schemes are better described in the installation manuals that can be unloaded from the web site www.unical.eu

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 oil (oil Fired)		69	100	150	230	300	350	400	500	650	850	1000	1300	1550
Nominal heat output (80°-60°C)	kW	66	86	134	202	278	327	385	482	626	789	963	1252	1492
Nominal heat output (50°-30°C)	kW	69	90	140	210	290	340	400	500	650	820	1000	1300	1550
Nominal Heat input	kW	67	88	137	206	284	333	392	491	637	804	980	1275	1520
Heat efficiency full load (80°-60°C)	%	97.8	97.8	97.8	97.9	97.9	98.0	98.2	98.2	98.2	98.2	98.2	98.2	98.2
Heat efficiency full load (50°-30°C)	%	102.5	102	102	102	102	102	102	102	102	102	102	102	102
Heat efficiency partial load 30% (retourn 30°C)	%	104	104	104	104	104	104	104	104	104	104	104	104	104
Flue gas temperature 80°C - 60°C (Tf - Ta)	°C	36	36	36	35	35	35	33	33	33	33	33	33	33
Flue gas temperature 50°C-30°C (Tf - Ta)	°C	22	22	22	22	22	22	22	22	22	22	22	22	22
CO_2 content	%	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1
Flue gas mass	kg/h	97	132	206	308	426	499	587	735	954	1204	1468	1908	2275
Combustion Efficiency 80°C-60°C	%	98.4	98.4	98.4	98.4	98.4	98.4	98.5	98.5	98.5	98.5	98.5	98.5	98.5
Combustion Efficiency 50°C-30°C	%	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
Heat loss at shell 80-60°C	%	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Heat loss at shell 50-30°C	%	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Heat loss at chimney with burner ON 80-60°C	%	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Heat loss at chimney with burner ON 50-30°C	%	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Heat loss at chimney with burner OFF	%	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Maximum condensation production	l/h	5.5	5.5	8.6	12.8	17.7	20.8	24.4	30.6	39.7	50.1	61.1	79.5	94.7
Maximum boiler pressure from standard	mm c.a.	8.4	8.4	16.0	25.7	33.4	37.2	41.1	47.9	56.2	63.5	69.9	78.1	83.7
Boiler pressure	mm c.a.	5.8	5.8	11.2	13.0	25.0	29.7	37.0	43.1	50.6	52.7	62.8	70.3	75.3
Head losses H_20 Δt 15	kPa	1.3	1.5	3.8	2.5	3.2	2.0	2.9	3.0	3.7	3.5	4.0	3.9	5.5
CO (0% O_2)	mg/kWh	3.1	3.2	4.7	3.1	4.7	4.7	4.7	3.1	4.7	4.7	4.7	4.7	4.7

XC-K oil (gas Fired)		69	100	150	230	300	350	400	500	650	850	1000	1300	1550
Nominal heat output (80°-60°C)	kW	66	86	134	202	279	327	385	482	626	790	963	1252	1493
Nominal heat output (50°-30°C)	kW	72	94	147	220	304	357	420	525	682	860	1049	1364	1626
Nominal Heat input	kW	67	88	137	206	284	333	392	491	637	804	980	1275	1520
Heat efficiency full load (80°-60°C)	%	97.8	97.8	97.8	97.9	98.0	98.1	98.2	98.2	98.2	98.2	98.2	98.2	98.2
Heat efficiency full load (50°-30°C)	%	107	107	107	107	107	107	107	107	107	107	107	107	107
Heat efficiency partial load 30% (retourn 30°C)	%	109	109	109	109	109	109	109	109	109	109	109	109	109
Flue gas temperature 80°C - 60°C (Tf - Ta)	°C	34	34	34	34	32	31	31	31	31	31	31	31	31
Flue gas temperature 50°C-30°C (Tf - Ta)	°C	22	22	22	22	22	22	22	22	22	22	22	22	22
CO_2 content	%	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Flue gas mass	kg/h	97	127	198	296	409	480	565	707	918	1158	1412	1835	2188
Combustion Efficiency 80°C-60°C	%	98.4	98.4	98.4	98.4	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5
Combustion Efficiency 50°C-30°C	%	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
Heat loss at shell 80-60°C	%	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Heat loss at shell 50-30°C	%	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Heat loss at chimney with burner ON 80-60°C	%	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Heat loss at chimney with burner ON 50-30°C	%	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Heat loss at chimney with burner OFF	%	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Maximum condensation production	l/h	11.4	14.9	23.2	34.8	48.1	56.4	66.3	83.0	107.8	136.0	165.9	215.6	257.1
Maximum boiler pressure from standard	mm c.a.	8.4	8.4	15.0	23.4	30.0	33.3	36.7	41.2	51.4	61.1	69.4	80.4	87.8
Boiler pressure	mm c.a.	5.8	5.8	11.0	13.0	24.8	29.5	36.7	42.7	50.1	56.7	62.4	69.9	74.9
Head losses H_20 Δt 15	kPa	1.3	1.5	3.8	2.5	3.2	2.0	2.9	3.0	3.7	3.5	4.0	3.9	5.5
CO (0% O_2)	mg/kWh	3.1	3.2	4.7	3.1	4.7	4.7	4.7	3.1	4.7	4.7	4.7	4.7	4.7

TECHNICAL DATA ACCORDING TO ErP DIRECTIVE

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

XC-K oil (oil fired)			69	100	150	230	300	350	400
EFFECTIVE NOMINAL OUTPUT	P_n	kW	66	86	134	202	278	327	385
SEASONAL ENERGY EFFICIENCY TO HEAT THE ROOM	η_s	%	93	93	93	93	93	93	93
SEASON EFFICIENCY CLASS TO DISCHARGE			**A**	**A**	**A**	**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	66	86	134	202	278	327	385
RATED HEAT OUTPUT EFFICIENCY with high temperature capacity (Tr 60 °C / Tm 80 °C)	η_4	%	91.3	91.3	91.3	91.4	91.4	91.5	91.7
USEFUL POWER AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	P_1	kW	20.9	27.5	42.8	64.23	88.7	104	122.4
PERFORMANCE AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	η_1	%	93.7	93.7	93.7	93.7	93.7	93.7	93.7
BOILER WITH OUTPUT RANGE ADJUSTMENT: YES / NO			NO	NO	NO	NO	NO	NO	NO
AUXILIARY ELECTRICITY CONSUMPTION									
WITH A FULL LOAD	el_{max}	kW	0.390	0.390	0.470	0.600	0.600	0.600	1.400
WITH A PARTIAL LOAD	el_{min}	kW	0	0	0	0	0	0	0
STANDBY MODE	P_{SB}	kW	0.050	0.050	0.050	0.050	0.050	0.050	0.050
OTHER ELEMENTS									
HEAT DISPERSION ON STANDBY	P_{stby}	kW	0.0335	0.0440	0.0690	0.1030	0.1420	0.1670	0.1960
NITROGEN OXIDES EMISSIONS	NO_x	mg/kWh	114	114	114	114	114	114	114

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

XC-K oil (gas fired)			69	100	150	230	300	350	400
EFFECTIVE NOMINAL OUTPUT	P_n	kW	66	86	134	202	279	327	385
SEASONAL ENERGY EFFICIENCY TO HEAT THE ROOM	η_s	%	94	94	94	94	94	94	94
SEASON EFFICIENCY CLASS TO DISCHARGE			**A**	**A**	**A**	**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	66	86	134	202	279	327	385
RATED HEAT OUTPUT EFFICIENCY with high temperature capacity (Tr 60 °C / Tm 80 °C)	η_4	%	88.1	88.1	88.1	88.2	88.3	88.4	88.5
USEFUL POWER AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	P_1	kW	21.9	28.9	44.9	67.3	93.0	109.0	128.2
PERFORMANCE AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	η_1	%	98.2	98.2	98.2	98.2	98.2	98.2	98.2
BOILER WITH OUTPUT RANGE ADJUSTMENT: YES / NO			NO	NO	NO	NO	NO	NO	NO
AUXILIARY ELECTRICITY CONSUMPTION									
WITH A FULL LOAD	el_{max}	kW	0.350	0.350	0.350	0.530	0.600	0.600	0.700
WITH A PARTIAL LOAD	el_{min}	kW	0	0	0	0	0	0	0
STANDBY MODE	P_{SB}	kW	0.050	0.050	0.050	0.050	0.050	0.050	0.050
OTHER ELEMENTS									
HEAT DISPERSION ON STANDBY	P_{stby}	kW	0.0335	0.0440	0.0690	0.1030	0.1420	0.1670	0.1960
NITROGEN OXIDES EMISSIONS	NO_x	mg/kWh	64	64	64	64	64	64	64

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