

# 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

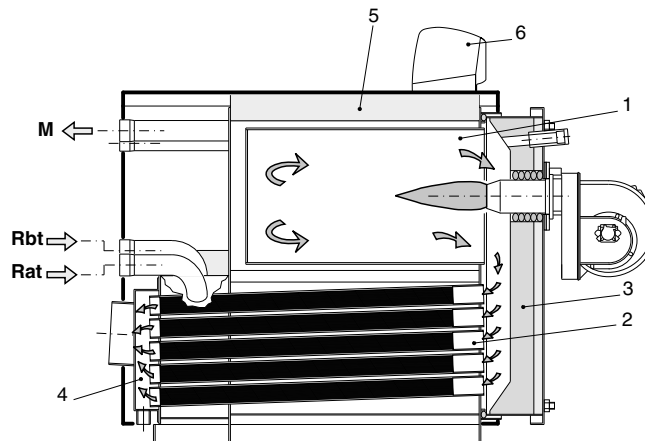
1820

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



## TECHNICAL DATA

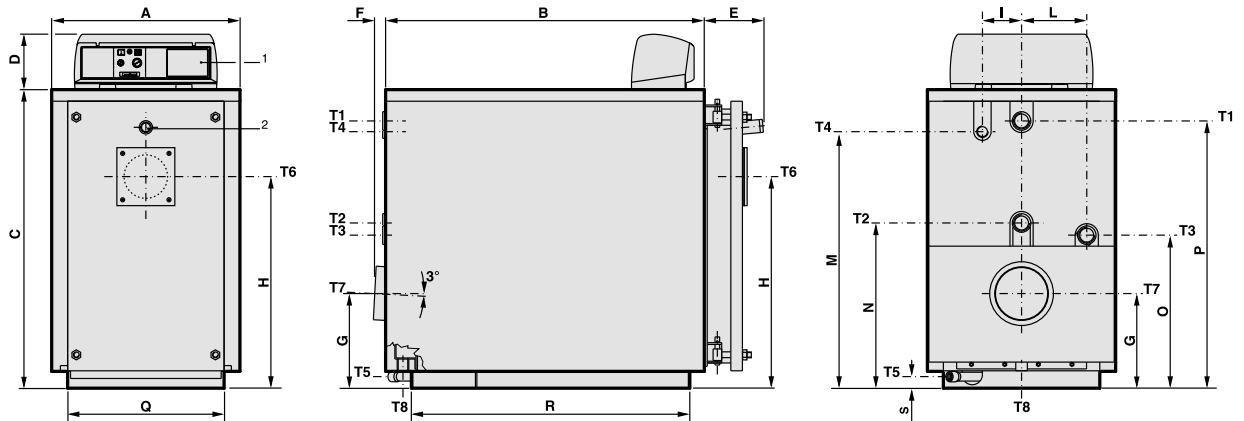
XC-K		124	200	290	400	480	570	700	900	1140	1420	1820	2160
NOMINAL INPUT	kW	115.9	186.9	271	373.8	448.6	532.7	654.2	841.1	1065.4	1327.1	1700.9	2018.7
NOMINAL OUTPUT 50/30°C	kW	124	200	290	400	480	570	700	900	1140	1420	1820	2160
NOMINAL OUTPUT 80/60°C	kW	112.8	182.7	265.6	367.1	440.7	523.3	642.6	826.2	1046.6	1303.6	1670.8	1983
EFFICIENCY AT NOMINAL LOAD in cond.	%	107	107	107	107	107	107	107	107	107	107	107	107
EFFICIENCY AT PART LOAD in cond.	%	109	109	109	109	109	109	109	109	109	109	109	109
EFFICIENCY AT NOMINAL LOAD in std.	%	97.3	97.8	98.2	98.2	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3
HEAT LOSSES THROUGH THE CASING (80/60°C)	%	0.76	0.38	0.23	0.17	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
MAX. CONDENSATE PRODUCTION	l/h	19.7	31.7	45.9	63.3	75.9	90.3	110.7	142.3	180.3	224.6	287.7	341.6
MASSIVE SMOKE FLOW RATE	kg/h	166.9	269.1	390.2	538.9	645.9	767	941.9	1211.1	1534	1910.8	2449	2906.6
MAX. NET SMOKE TEMP. tf-ta (80/60°C)	°C	44	43	40	37	37	37	37	37	37	37	37	37
MAX. NET SMOKE TEMP. tf-ta (50/30°C)	°C	22	22	22	22	22	22	22	22	22	22	22	22
CO <sub>2</sub> 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
WEIGHT	kg	365	525	660	800	1007	1137	1376	1613	2158	2443	3458	3765

## PRODUCT PLUS VALUES

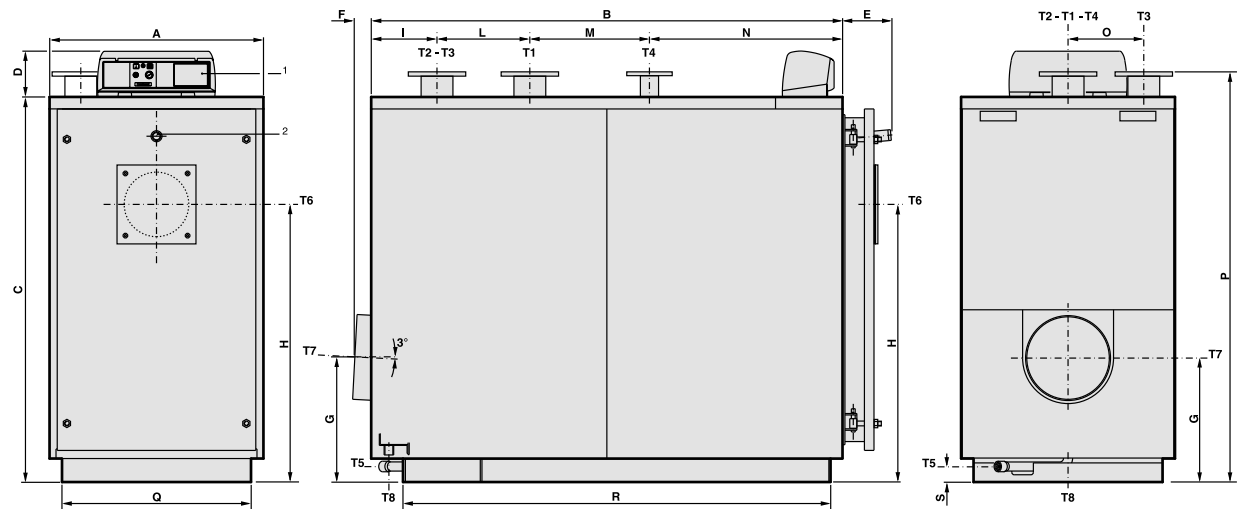
- VERY HIGH QUALITY OF THE EMPLOYED METALS**  
 Outer shell in high resistance carbon steel: smoke chamber in stainless steel AISI 316L
- PROGRESSIVE SMOKE PIPES (patented)**  
 With very high thermal exchange, stainless steel special progressive pipes, armoured on the outside, with inside multi-fin aluminium turbulators
- SELF-CLEANING OF THE TUBE BUNDLE**  
 thanks to the natural washout that the condensate produces for gravity
- ELECTRONIC BOARD MASTERMODUL (optional)**  
 Certified and equipped with:
  - Expandable electronic controller E8
  - Burner manager with modulating operation
- Prearrangement for cascade operation with CASCATAMODUL board panel (optional)**  
 Up to 8 off XC-K, managed by E8
- 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**
  - Zones expansion via E8.1124 controller
  - Temperature sensor for mixed zone flow connection
  - Sensor PT 1000 for management of solar panels with E8
  - Condensate neutralizers

DIMENSIONS XC-K 124÷570

XC-K 124



XC-K 200÷570



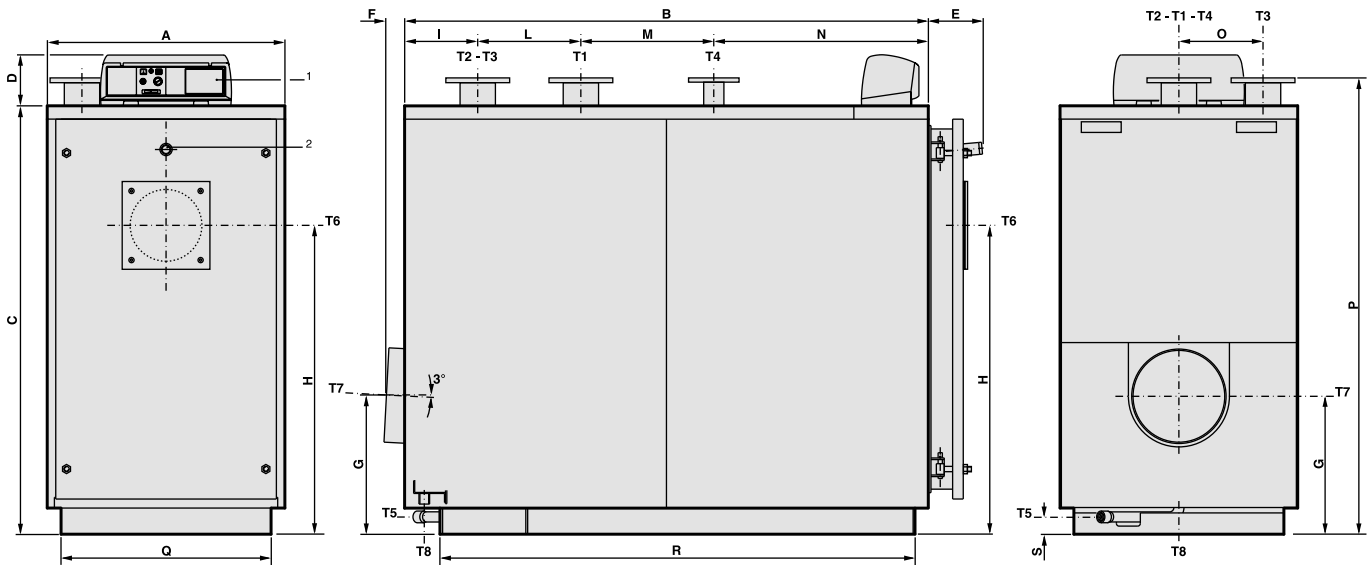
- 1 Panel board
- 2 Flame sight glass
- T1 C.H. flow
- T2 Low temperature C.H. return
- T3 High temperature C.H. return
- T4 Expansion vessel connection
- T5 Boiler drain
- T6 Burner connection
- T7 Chimney connection
- T8 Condensation drain

XC-K	Nominal output (80°-60°C)	Nominal output (50°-30°C)	Nominal input	Boiler capacity	Water pressure drops(**)	Flue gas pressure drop	Maximum boiler working pressure	Weight	CONNECTIONS						
									T1 T2	T3	T4	T5	T6 Ø	T7 Øi	T8 Øe
124	kW	kW	kW	l	kPa	daPa	bar	kg	UNI 2276 PN6	UNI 2276 PN6	UNI 2276 PN6	ISO 7/1	mm	mm	mm
124	112.8	124	115.9	140	1.5	9.8	6	365	Rp 2	Rp 2	Rp 1¼	Rp ¾	150	182	40
200	182.7	200	186.9	260	3.8	18.6	6	525	DN 65	DN 65	Rp 1½	Rp ¾	180	202	40
290	265.6	290	271	305	2.5	25.4	6	660	DN 80	DN 80	Rp 2	Rp 1	180	252	40
400	367.1	400	373.8	332	3.2	32.3	6	800	DN 80	DN 80	Rp 2	Rp 1	180	252	40
480	440.7	480	448.6	544	2	34.3	6	1007	DN 100	DN 100	Rp 2	Rp 1	220	302	40
570	523.3	570	532.7	515	2.9	39.2	6	1137	DN 100	DN 100	Rp 2	Rp 1	220	302	40

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

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	Nominal output (80°-60°C)	Nominal output (50°-30°C)	Nominal input	Boiler capacity	Water pressure drops(**)	Flue gas pressure drop	Maximum boiler working pressure	Weight	CONNECTIONS						
									T1 T2	T3	T4	T5	T6 Ø	T7 Øi	T8 Øe
	kW	kW	kW	l	kPa	daPa	bar	kg	UNI 2276 PN6	UNI 2276 PN6	UNI 2276 PN6	ISO 7/1	mm	mm	mm
700	642.6	700	654.2	625	3	46	6	1376	DN 125	DN 125	DN 65	Rp 1	270	352	40
900	826.2	900	841.1	664	3.7	58.8	6	1613	DN 125	DN 125	DN 65	Rp 1	270	352	40
1140	1046.6	1140	1065.4	1107	3.5	73.5	6	2158	DN 150	DN 150	DN 80	Rp 1½	320	402	40
1420	1303.6	1420	1327.1	1157	4	88.2	6	2443	DN 150	DN 150	DN 80	Rp 1½	320	402	40
1820	1670.8	1820	1700.9	1936	3.9	90.2	6	3458	DN 200	DN 200	DN 100	Rp 1½	320	452	40
2160	1983	2160	2018.7	1904	5.5	98	6	3765	DN 200	DN 200	DN 100	Rp 1½	320	452	40

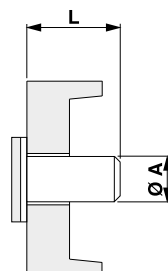
XC-K	A	B	C	D	E	F	G	H	I	L	M	N	O	P*	Q*	R*	S
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
700	894	1970	1612	190	292	65	523	1161	275	388	500	807	316	1715	790	1787	65
900	894	2340	1612	190	292	65	523	1161	405	388	500	1047	316	1715	790	2157	65
1140	1064	2360	1802	190	317	57	551	1287	289	624	900	547	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.

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

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

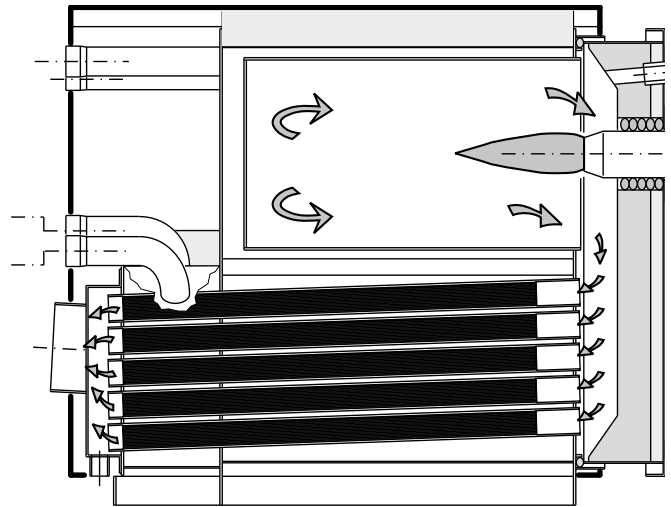
XC-K boilers are equipped with a blind cylindrical furnace, in which the central flame of the burner is reversed peripherally towards the front.

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.

For the value of this pressure, see the tables on page 297-298, in the column "Flue gas pressure drop".

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



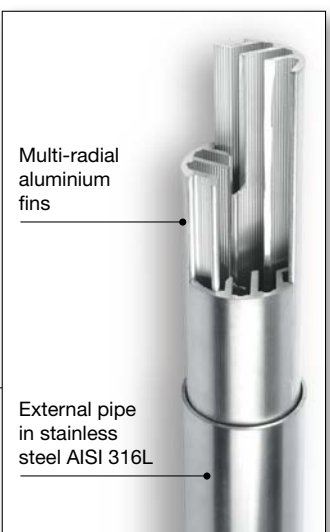
## SPECIAL SMOKE PIPES (patented)

### 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



BREVETTO  
**Unical**  
PATENT




## TECHNICAL DATA

**ELECTRICAL, HYDRAULIC, INSTALLATION DIAGRAMS AND CONTROLLERS can be unloaded from the web site [www.unical.eu](http://www.unical.eu) at the page of the product**

XC-K (Gas fired)		124	200	290	400	480	570	700	900	1140	1420	1820	2160
Nominal heat output (80°-60°C)	kW	112.8	182.7	265.6	367.1	440.7	523.3	642.6	826.2	1046.6	1303.6	1670.8	1983
Nominal heat output (50°-30°C)	kW	124	200	290	400	480	570	700	900	1140	1420	1820	2160
Nominal heat input	kW	115.9	186.9	271	373.8	448.6	532.7	654.2	841.1	1065.4	1327.1	1700.9	2018.7
Heat efficiency at nominal load (80°-60°C)	%	97.3	97.72	98.2	98.2	98.23	98.23	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	107	107	107	107	107	107
Heat efficiency at 30% load	%	109	109	109	109	109	109	109	109	109	109	109	109
Combustion efficiency (80°-60°C)	%	98.06	98.1	98.23	98.37	98.37	98.37	98.37	98.37	98.37	98.37	98.37	98.37
Combustion efficiency (50°-30°C)	%	99	99	99	99	99	99	99	99	99	99	99	99
Heat loss at shell (80°-60°C)	%	0.76	0.38	0.23	0.17	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Heat loss at shell (50°-30°C)	%	0.68	0.34	0.21	0.15	0.12	0.12	0.12	0.12	0.12	0.12	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	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	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	0.05	0.05	0.05	0.05	0.05	0.05
Flue gas temperature $t_f-t_a$ (80°-60°C)	°C	44	43	40	37	37	37	37	37	37	37	37	37
Flue gas temperature $t_f-t_a$ (50°-30°C)	°C	22	22	22	22	22	22	22	22	22	22	22	22
CO <sub>2</sub> 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
Flue gas mass flow rate (min.-max)	kg/h	166.9	269.1	390.2	538.3	645.9	767	941.9	1211.1	1534	1910.8	2449	2906.6
Maximum condensation production (natural gas)	l/h	19.61	31.62	45.85	63.24	75.89	90.12	110.68	142.3	180.24	224.52	287.76	341.52

## 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	189	266	367
SEASONAL ENERGY EFFICIENCY TO HEAT THE ROOM	$\eta_s$	%	94	94	94	94
<b>SEASON EFFICIENCY CLASS TO DISCHARGE</b>			<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>
<b>FOR BOILERS TO HEAT THE ROOM AND MIXED BOILERS: USEFUL HEAT OUTPUT</b>						
USEFUL HEAT OUTPUT with high temperature capacity ( $T_r$ 60 °C / $T_m$ 80 °C)	$P_4$	kW	112,8	182,6	265,6	367,1
RATED HEAT OUTPUT EFFICIENCY with high temperature capacity ( $T_r$ 60 °C / $T_m$ 80 °C)	$\eta_4$	%	87,7	88,04	88,3	88,5
USEFUL POWER AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity ( $T_r$ 30 °C)	$P_1$	kW	97,9	61,1	88,6	122,2
PERFORMANCE AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity ( $T_r$ 30 °C)	$\eta_1$	%	98,2	98,2	98,2	98,2
BOILER WITH OUTPUT RANGE ADJUSTMENT: YES / NO			NO	NO	NO	NO
<b>AUXILIARY ELECTRICITY CONSUMPTION</b>						
WITH A FULL LOAD	$e_{l_{max}}$	kW	0,35	0,53	0,7	0,6
WITH A PARTIAL LOAD	$e_{l_{min}}$	kW	57	55	55	55
STANDBY MODE	$P_{SB}$	kW	0,050	0,050	0,050	0,050
<b>OTHER ELEMENTS</b>						
HEAT DISPERSION ON STANDBY	$P_{stby}$	kW	0,058	0,093	0,136	0,187
NITROGEN OXIDES EMISSIONS	NO <sub>x</sub>	mg/kWh	51	51	51	51

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