Unical

ELLPREX.

ELLPREX: tradition and innovation

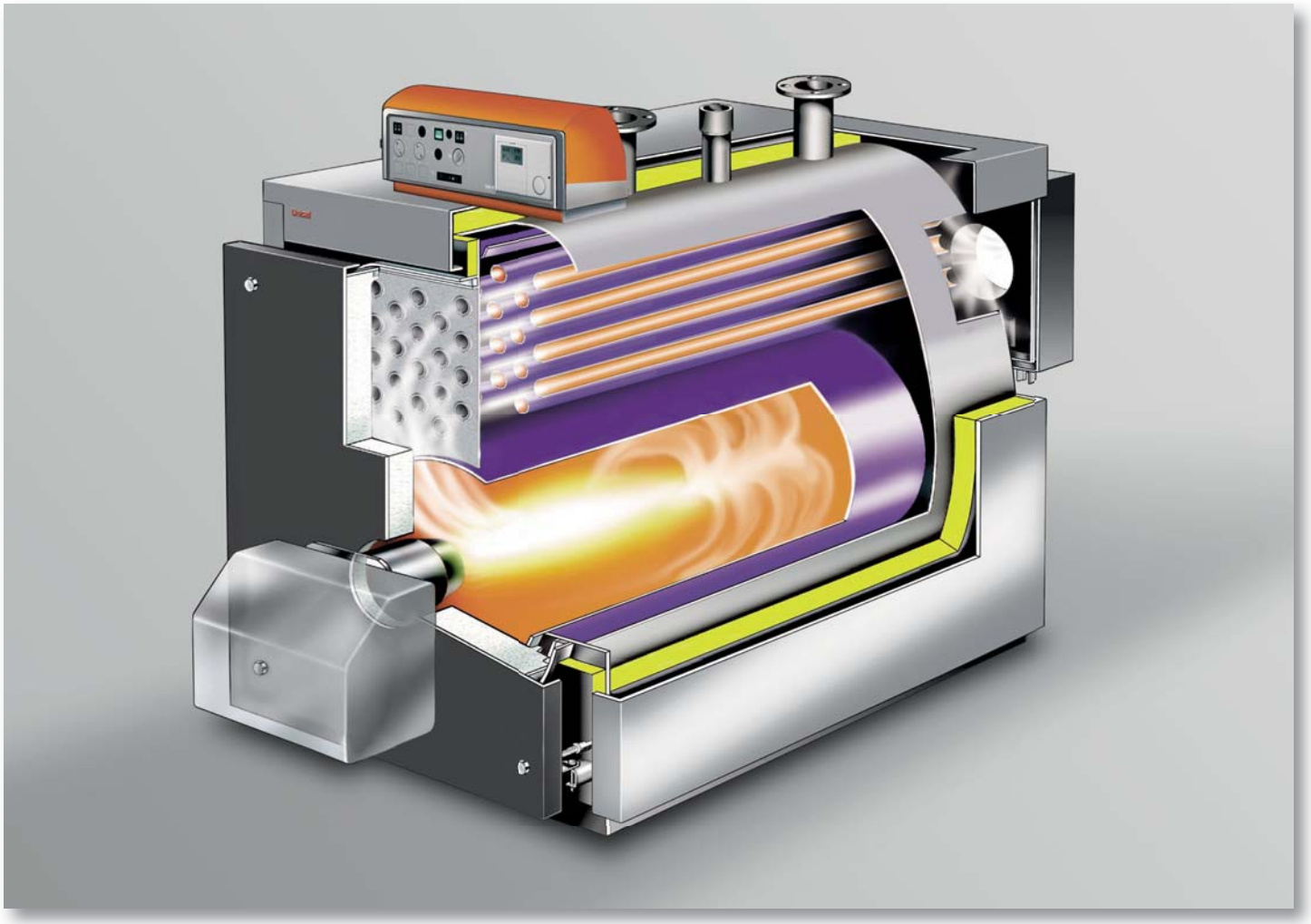
The steel pressurised ELLPREX boilers cover a large power range which satisfies any system's need.

In this boilers series the technicians will find:

- Large power extension: 22 models from 340 to 7000 kW.
- Flexibility in the choice and use thanks to the power range approval.
- Easy installation, thanks to the compact dimensions.
- Maximum working pressure of 6 bar (on request up to 10 bar for models 1100 to 7000 kW).

The elliptic shape great advantages

- **FLEXIBILITY OF USE**
- **THERMAL EXCHANGE OPTIMISATION**
  by driven water passage into the boiler
- **THE ELLIPTIC SHELL SHAPE (UP TO 970 kW) has interesting advantages:**
  - smaller dimensions (for easier transport and positioning).
  - smoke pipes positioning above the furnace with drastic reduction of the possible condensation.
- **SMOKE PIPES OF HIGH THICKNESS**
  with anti-condensing effect
- **TURBOLATORS FOR THE THERMAL EXCHANGE**
  optimisation into the smoke pipes
- **CYLINDRICAL FLOATING FURNACE**
  anti thermo-mechanic stress from 760 kW
- **BOTTOM OF THE FURNACE WITH DISSIPATION PLATES**
  for greater performance and greater mechanical resistance
- **FRONT DOOR**
  with self centering locking
- **INTERNAL DOOR INSULATION**
  in light refractory concrete
- **EXTERNAL CASING**
  inclusive of 80 mm rock wool insulation
- **THERMOSTATIC OR ELECTRONIC CONTROL PANELS.**
- **FACILITATED TRANSPORT**
  thanks to the upper hooks and strong base plates



The technique...

The door

The experience of Unical technicians in the development of this boilers range has greatly improved the characteristics of front door insulation, responsible for 30% of the boilers heat losses for irradiation.
Up to the capacity of 970 kW a light refractory concrete is used, lighter and 50% more resistant compared to traditional materials.
Over 970 kW, instead, a special double refractory cement is used.

The perfect gas soundness, not only important for heat losses, but also for the door life, is guaranteed by the self centering and reversible closing (right or left) with fine registration:

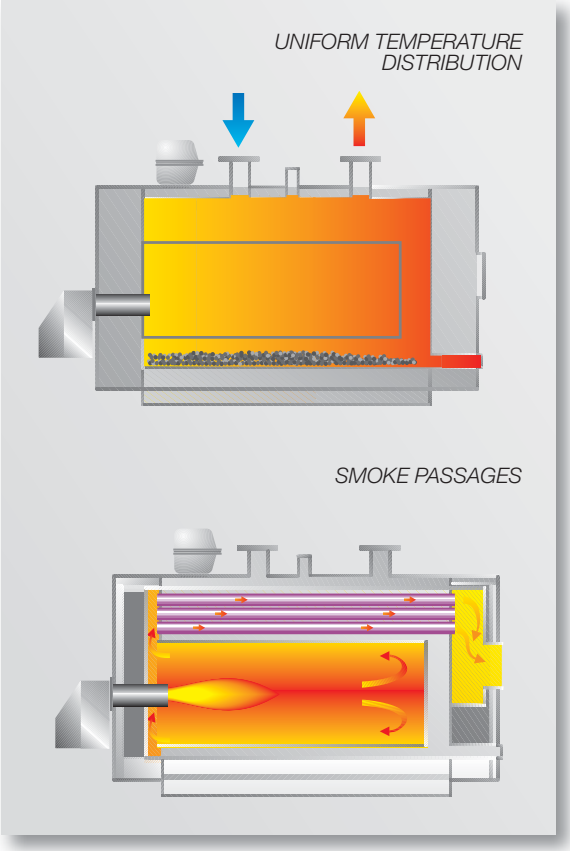
- *vertical*, via the insertion of spacers (up to Ellprex 630) or acting on regulating nuts (from 760 onwards)
- *transversal*; slackening and moving the hinges
- *axial*: screwing more or less the locking nuts

...and the boiler art

Thermal balancing

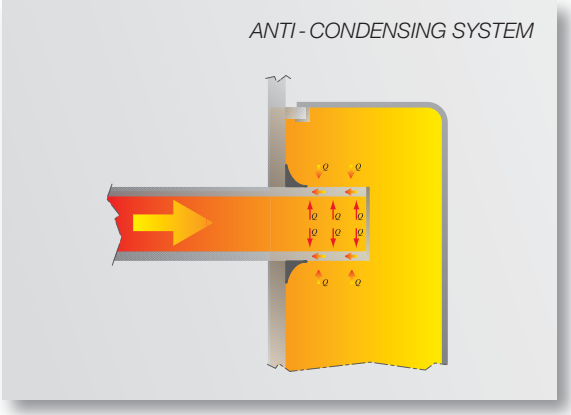
Great thermal stability thanks to homogenous temperature distribution on the shell: the internal hydraulic circuit of ELLPREX has been studied to take full advantage of thermal exchange and at the same time to cool off the more stressed parts, thus reducing the calcium deposits formation.
As shown in the figure of page 3, the return of cold water is driven to a specific eave in order to cover the more thermally stressed parts (front plate, front part of smoke pipes and furnace).

This system causes the structure cooling down and the calcifying phenomena reduction.
The boiler body oval shape preserves the boiler "vital parts" from the accumulation of possible mud present into the system guaranteeing a high distance between the furnace and the shell itself.



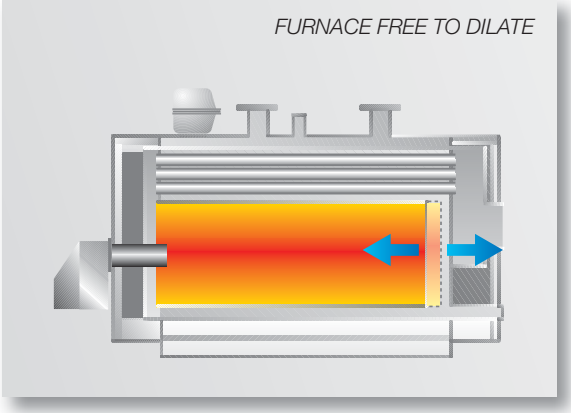
"Tab effect"

A further system for acid condensation reduction and therefore for the extension of the boiler life, in particular into the smoke pipes and in their welding to the rear plate, is to raise the pipe length over the plate itself. This system causes a tab effect which directs the accumulated heat towards the welding seam, drying the condensation around it and avoiding its formation.



Floating Cylindrical Furnace

On particularly big boilers the longitudinal expansion of the furnace becomes consistent. It is for this reason that, from ELLPREX 760 onwards, with an extremely fine technology, already experimented for long periods, Unical welds the furnace only on the front plate. It remains free to dilate, guaranteeing a long duration and operation elasticity.



The panel board

The panel board is manufactured in conformity to the LVD Directive 73/23/EC, now 2006/95/EC.
On request it can be adapted to any type of installation.

ELLPREX is supplied with the standard panel board, controlling, via ***thermostats***:

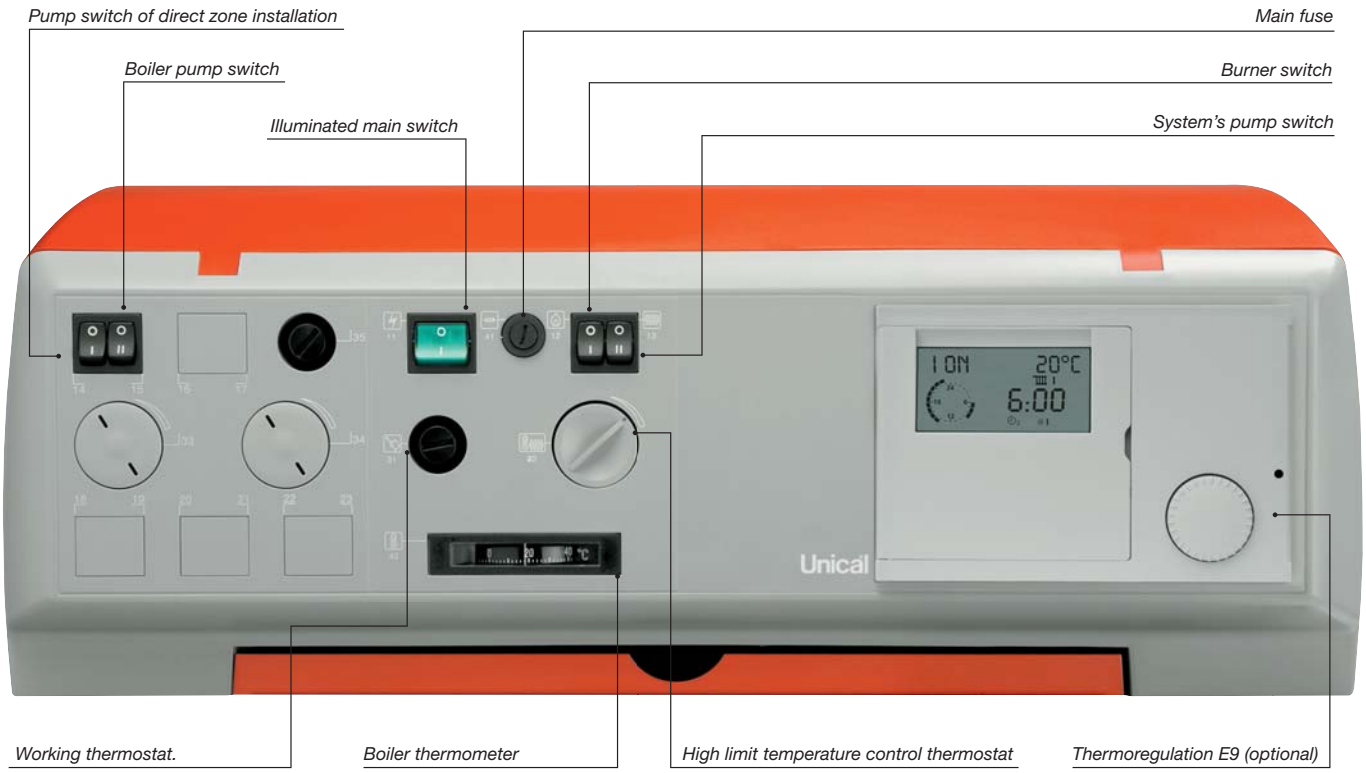
- *the burner operation*
- *the pump operation*
- *the water temperature.*

The panel board is complete with main switch, CH pump switch, burner switch, boiler thermometer, two stage working thermostat, safety thermostat and minimum temperature thermostat (internal to the panel board).

For complex installations, on request, an ***electronic panel board*** is available, complete with ***thermoregulation E9*** and relevant temperature sensors, such as: boiler sensor, flow sensor, outer sensor, D.H.W. storage tank sensor and room sensor (optional this last one), in order to control:

- *an one-zone direct installation, without mixing valve*
- *an one-zone installation with motorized mixing valve*
- *a two zones installation, of which one direct and one with mixing valve*

For the control of two boilers in cascade contact our technical office.



The thermoregulation E9

E9, the clever thermoregulation

The installation and the connection of the dedicated thermoregulation E9 (optional), allows an important qualitative jump in the managing of the boiler according to the applied loads.

E9, besides becoming the dialogue window, thanks to its prerogatives, allows the complete management of the thermal installation.

System optimization

Boiler heating Optimization
The heating controller, on the basis of the timer/heating programme set by the user, once the system's characteristics have been evaluated, will activate the function for automatically bringing forward the heating ignition time so as to ensure that the set temperature is reached at the time requested by the user.

Fast set temperature
This is obtained by calculating the optimum ignition start-up time. This calculation can be carried out taking into consideration the outdoor temperature or the room temperature.

Overheating protection
The boiler's safety temperature is controlled via the pump's overrun time in order to get rid of any thermal inertia.

Self-adaption
Through the elaboration of data transmitted by the room sensor, this function adjusts the boiler's ouput to the building's characteristics, ensuring a constant monitoring of the indoor temperature on the basis of the variation of the outdoor temperature, keeping in consideration the building's thermal inertia and the contribution of "free" heat (solar radiation, internal heat sources etc).

Slope offset (heating slope distance)
The boiler temperature that is required for a mixed circuit is calculated by adding to the calculated temperature setting for the heating circuit temperature the heating slope distance. The heating slope distance compensates for sensor tolerances and heat loss up to the mixer.

Valve opening time
Based on the characteristics of the servomotor.

Frost protection mode
The frost protection operation mode prevents the CH system from freezing by automatically switching heating operation on. In the frost protection mode, the room temperature for all the heating circuits is set to 5°C and the storage tank sensor frost protection is activated when the temperature drops below 10°C.

DHW control

Domestic hot water production
There are many programmes which control the domestic hot water production. You can choose from the maximum of comfort to the maximum fuel saving. In order to permit the storage cylinder to supply hot water rapidly, the heating controller brings the boiler's temperature to the maximum set value.

Antilegion
Every 20th heating start-up or once a week on Saturday at 01:00 hrs, the storage tank is heated up to 60°C. This function will eliminate any eventual pathogens which have formed in the DHW.

DHW optimization (loading pump)
The DHW loading pump is switched on only if the boiler temperature exceeds by 5°C the storage tank temperature. It is deactivated when the boiler temperature drops below the storage tank temperature or if the storage tank temperature is higher than the nominal temperature.

Setting

Programme setting
The heating programmes can be set daily or weekly, with more than one On-Off firing times or temperature reductions during the arch of the day.

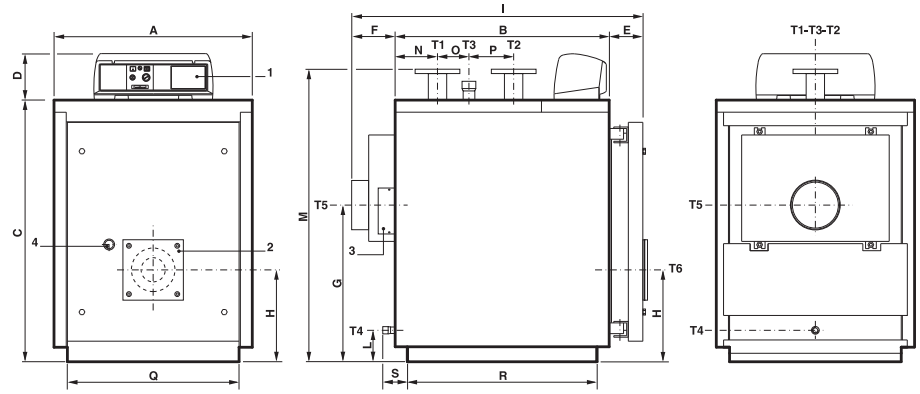
Multiple zone control
With the same heating control device you can control 2 independent circuits with different characteristics, though having ensured all the described functions, including the deep sliding temperature function.

Energy sources control

Integration with renewable energy sources
As for example: solar systems and/or solid fuel fired boilers.

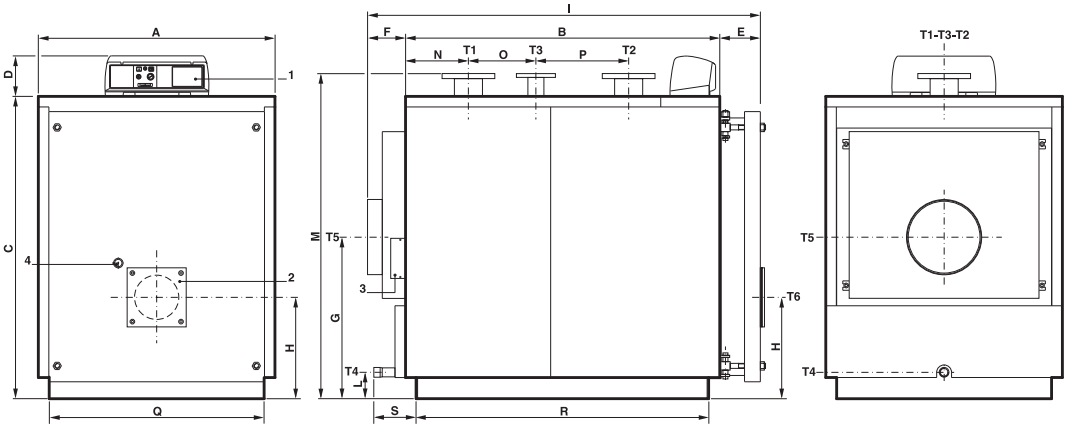
Dimensions

ELLPREX 340 ÷ 970



Legend:

1 - *Panel board*
2 - *Burner fixing plate*
3 - *Smoke chamber cleaning door*
4 - *Sight glass*
T1 - *C.H. flow*
T2 - *C.H. return*
T3 - *Expansion vessel connection*
T4 - *Boiler drain*
T5 - *Flue socket*
T6 - *Max. burner blast tube dia.*

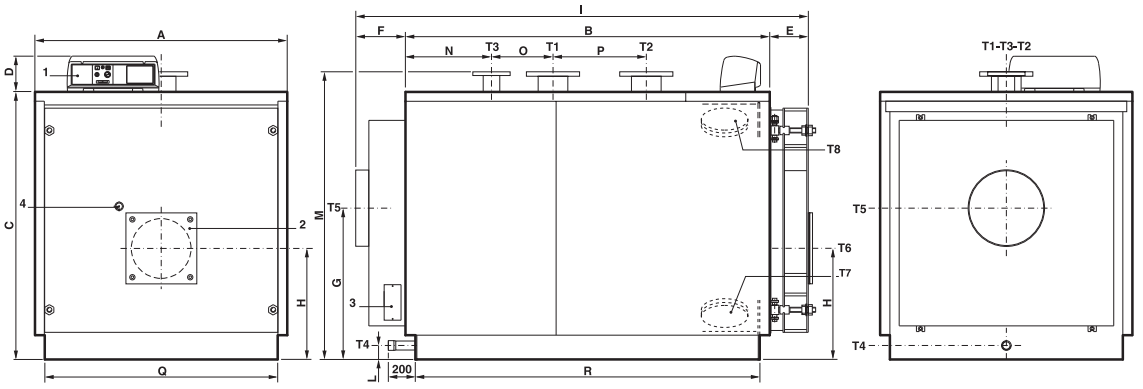


MODEL	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	L mm	M* mm	N mm	O mm	P mm	Q* mm	R* mm	S mm	T1-T2 UNI 2278 PN16	T3 ISO 7/1 - UNI 2278 PN16	T4 ISO 7/1	T5 Øi mm	T6 Ø mm
ELL 340	860	1210	1182	190	139	190	708	400	1541	130	1310	215	340	250	750	1112	100	DN 80	Rp 2	Rp ¾	250	220
ELL 420	890	1275	1352	190	139	190	748	440	1606	125	1485	255	285	315	780	1177	100	DN 100	Rp 2	Rp ¾	250	220
ELL 510	890	1470	1352	190	139	190	748	440	1801	125	1485	255	480	315	780	1372	100	DN 100	Rp 2	Rp ¾	250	220
ELL 630	890	1780	1352	190	139	190	748	440	2113	125	1485	255	790	315	780	1682	100	DN 100	Rp 2	Rp ¾	300	220
ELL 760	1122	1605	1432	190	195	190	765	480	1989	125	1540	298	435	440	1020	1504	200	DN 125	DN 65	Rp 1¼	350	270
ELL 870	1122	1800	1432	190	195	190	765	480	2184	125	1540	298	630	440	1020	1699	200	DN 125	DN 65	Rp 1¼	350	270
ELL 970	1122	1995	1432	190	195	190	765	480	2379	125	1540	298	825	440	1020	1894	200	DN 125	DN 65	Rp 1¼	350	270

(*) Minimum dimensions for boiler room access requirements.

Dimensions

ELLPREX 1100 ÷ 2650



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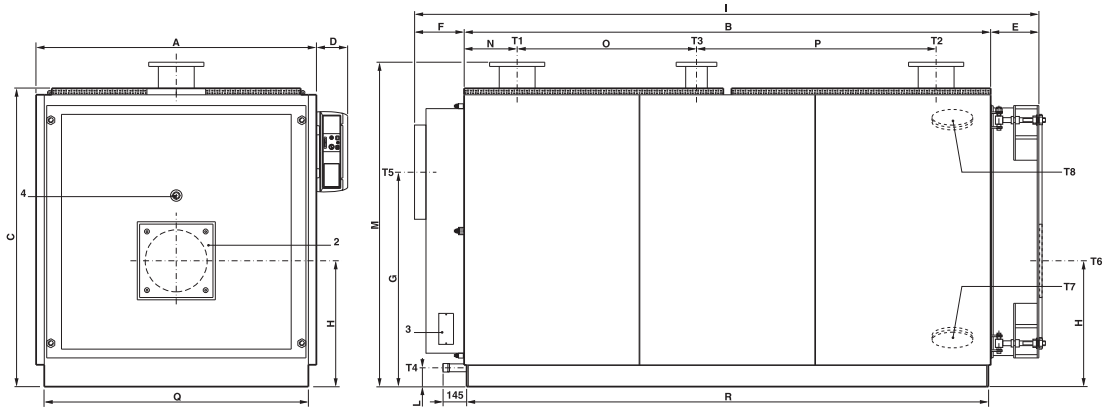
T3 - *Expansion vessel connection*
T4 - *Boiler drain*
T5 - *Flue socket*
T6 - *Max. burner blast tube dia.*
T7 - *Sludge drain*
T8 - *Inspection door*

MODELL	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	L mm	M* mm	N mm	O mm	P mm	Q* mm	R* mm	T1-T2 UNI 2278 PN16	T3 UNI 2278 PN16	T4 ISO 7/1	T5 Øi mm	T6 Ø mm
ELL 1100	1352	1952	1432	190	207	187	810	595	2346	180	1540	461	330	500	1250	1846	DN 150	DN 80	Rp 1½	400	320
ELL 1320	1352	2292	1432	190	207	187	810	595	2686	180	1540	461	670	500	1250	2186	DN 150	DN 80	Rp 1½	400	320
ELL 1570	1462	2282	1542	190	227	272	880	640	2781	75	1650	561	510	550	1360	2176	DN 175	DN 100	Rp 1½	450	320
ELL 1850	1462	2652	1542	190	227	272	880	640	3151	75	1650	561	880	550	1360	2546	DN 175	DN 100	Rp 1½	450	320
ELL 2200	1622	2692	1702	190	259	274	950	690	3225	75	1810	661	670	700	1520	2590	DN 200	DN 125	Rp 1½	520	380
ELL 2650	1622	3014	1702	190	258	273	950	690	3545	75	1810	662	990	700	1520	2910	DN 200	DN 125	Rp 1½	520	380

(*) Minimum dimensions for boiler room access requirements.

ELLPREX 3000 ÷ 4000



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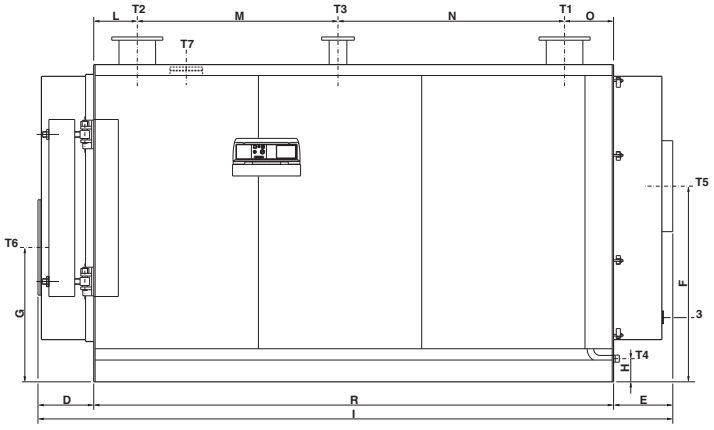
T6 - *Max. burner blast tube dia.*
T7 - *Sludge drain*
T8 - *Inspection door*

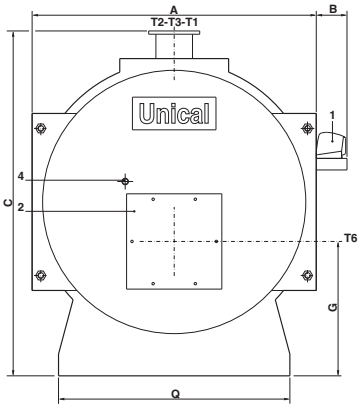
MODELL	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	L mm	M* mm	N mm	O mm	P mm	Q* mm	R* mm	T1-T2 UNI 2278 PN16	T3 UNI 2278 PN16	T4 ISO 7/1	T5 Øi mm	T6 Ø mm
ELL 3000	1720	3230	1830	190	295	310	1315	772	3835	115	1990	325	1100	1470	1620	3200	DN 200	DN 125	Rp 1½	570	380
ELL 3500	1970	3194	2090	190	325	360	1535	915	3879	144	2271	377	1060	1420	1870	3164	DN 200	DN 125	Rp 1½	620	400
ELL 4000	1970	3594	2090	190	325	360	1535	915	4279	144	2271	777	1060	1420	1870	3564	DN 250	DN 125	Rp 1½	620	400

(*) Minimum dimensions for boiler room access requirements.

Dimensions

ELLPREX 4500 ÷ 7000





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T5 - *Flue socket*
T6 - *Max. burner blast tube dia.*
T7 - *Inspection door*

MODELLO	A mm	B mm	C* mm	D mm	E mm	F mm	G mm	H mm	I mm	L mm	M mm	N mm	O mm	Q* mm	R* mm	T1-T2 UNI 2278 PN16	T3 UNI 2278 PN16	T4 ISO 7/1	T5 Øi mm	T6 Øi mm	T7 Ø mm
ELL 4500	2088	226	2533	417	445	1437	987	170	4682	320	1475	1665	360	1700	3820	DN 250	DN 125	Rp 1½	660	500	133
ELL 5000	2088	226	2533	417	445	1437	987	170	4682	320	1475	1665	360	1700	3820	DN 250	DN 125	Rp 1½	660	500	133
ELL 5500	2214	240	2653	437	465	1550	1007	167	4872	320	1475	1815	360	1700	3970	DN 250	DN 125	Rp 1½	660	500	133
ELL 6000	2214	240	2653	437	465	1550	1007	167	4872	320	1475	1815	360	1700	3970	DN 250	DN 125	Rp 1½	660	500	133
ELL 6500	2380	240	2860	509	595	1650	1100	224	5484	325	2920	670	465	1850	4380	DN 250	DN 125	Rp 1½	720	500	133
ELL 7000	2380	240	2860	509	595	1650	1100	224	5484	325	2920	670	465	1850	4380	DN 250	DN 125	Rp 1½	720	500	133

(*) Minimum dimensions for boiler room access requirements.

Technical data

MODEL	Water content l	Water side pressure loss* m w.c.	Smoke side pressure loss mm w.c.	Maximum working pressure bar	Weight kg
ELL 340	298	0,16÷0,28	17÷34	6	629
ELL 420	398	0,09÷0,17	16÷29	6	796
ELL 510	462	0,14÷0,25	24÷43	6	919
ELL 630	565	0,21÷0,38	32÷55	6	1049
ELL 760	671	0,15÷0,26	29÷51	6	1341
ELL 870	753	0,19÷0,33	33÷57	6	1447
ELL 970	836	0,24÷0,41	29÷49	6	1553
ELL 1100	1040	0,18÷0,30	32÷52	6	1821
ELL 1320	1242	0,20÷0,35	38÷67	6	2030
ELL 1570	1418	0,19÷0,33	35÷60	6	2780
ELL 1850	1617	0,26÷0,45	42÷73	6	3280

MODEL	Water content l	Water side pressure loss* m w.c.	Smoke side pressure loss mm w.c.	Maximum working pressure bar	Weight kg
ELL 2200	2086	0,21÷0,34	39÷65	6	4145
ELL 2650	2324	0,28÷0,48	43÷76	6	4465
ELL 3000	2667	0,36÷0,62	35÷60	6	5110
ELL 3500	4142	0,54÷0,84	47÷74	6	6700
ELL 4000	4455	0,54÷0,85	60÷80	6	7500
ELL 4500	6012	0,70÷0,85	51÷88	6	7750
ELL 5000	6012	0,80÷1,05	65÷110	6	7750
ELL 5500	7058	0,95÷1,15	60÷100	6	9300
ELL 6000	7058	1,00÷1,35	68÷120	6	9300
ELL 6500	7909	1,05÷1,50	61÷105	6	12450
ELL 7000	7909	1,10÷1,75	69÷120	6	12450

(*) Hydraulic resistance for Δt 15K

Technical data

ELLPREX (oil fired)		**340**	**420**	**510**	**630**	**760**	**870**	**970**	**1100**	**1320**	**1570**	**1850**	**2200**	**2650**	**3000**	**3500**	**4000**	**4500**	**5000**	**5500**	**6000**	**6500**	**7000**
Nominal heat output min/max	*kW*	255 340	315 420	385 510	480 630	580 760	660 870	750 970	860 1100	1000 1320	1200 1570	1400 1850	1700 2200	2000 2650	2300 3000	2700 3500	3040 4000	3420 4500	3800 5000	4180 5500	4560 6000	4940 6500	5320 7000
Nominal heat input min/max	*kW*	277 371	342 459	418 557	520 688	630 830	715 950	815 1060	935 1200	1087 1442	1304 1715	1520 2020	1845 2400	2170 2890	2492 3280	2930 3825	3297 4371	3638,3 4838,7	4064,2 5421,8	4446,8 5914	4877 6506,2	5255,3 6989,2	5689,8 7590,5
Water efficiency at nominal load (100%)	*%*	92 91,6	92,1 91,5	92,1 91,5	92,3 91,5	92 91,5	91,5 91,5	92 91,5	91,9 91,6	92 91,5	92 91,5	92,1 91,5	92,1 91,6	92,1 91,7	92,3 91,4	92,1 91,4	92,2 91,5	94,0 93,0	93,5 92,22	94,0 93,0	93,5 92,22	94,0 93,0	93,5 92,22
Water efficiency at 30% load	*%*	93,6 93,6	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	94,66 93,65	94,15 92,87	94,66 93,65	94,15 92,87	94,66 93,65	94,15 92,87
Combustion efficiency at nominal load (100%)	*%*	92,8 92,5	92,7 92,4	92,7 92,4	92,6 92	92,3 92,1	92,1 92,1	92,5 91,9	92,3 92	92,2 91,8	92,2 91,9	92,4 91,8	92,4 91,9	92,4 92	92,4 91,7	92,4 91,7	92,4 91,8	94,53 93,48	94,07 92,84	94,53 93,48	94,07 92,84	94,53 93,48	94,07 92,84
Casing heat losses (min/max)	*%*	0,8 0,8	0,6 0,9	0,6 0,9	0,3 0,4	0,2 0,5	0,5 0,5	0,4 0,4	0,4 0,3	0,2 0,2	0,2 0,3	0,3 0,3	0,3 0,3	0,3 0,3	0,1 0,3	0,3 0,3	0,2 0,3	0,53 0,48	0,57 0,62	0,53 0,48	0,57 0,62	0,53 0,48	0,57 0,62
Heat loss at chimney with burner on (min/max)	*%*	7,1 7,4	7,2 7,5	7,3 7,5	7,3 7,9	7,6 7,8	7,8 7,8	7,4 8	7,6 7,9	7,7 8,1	7,7 8	7,5 8,1	7,5 8	7,5 7,9	7,5 8,2	7,5 8,2	7,5 8,1	5,47 6,52	5,93 7,16	5,47 6,52	5,93 7,16	5,47 6,52	5,93 7,16
Heat loss at chimney with burner off (min/max)	*%*	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Net flue gas temperature tf-ta (min/max)	*°C*	156 164	158 166	160 165	162 175	168 173	158 172	164 177	167 175	170 179	170 177	165 178	165 176	165 175	165 180	165 180	165 179	120 143	130 157	120 143	130 157	120 143	130 157
CO_2 content	*%*	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8	12,8
Flue gas mass flow rate (min/max)	*kg/h*	424 568	523 702	640 852	796 1053	964 1271	1094 1454	1248 1632	1431 1837	1664 2208	1996 2626	2327 3093	2825 3675	3322 4425	3816 5022	4486 5861	5048 6693	5571,4 7409,6	6223,5 8302,5	6809,4 9056,1	7468,2 9963,0	8047,5 10702,7	8712,9 11623,5

ELLPREX (gas fired)		**340**	**420**	**510**	**630**	**760**	**870**	**970**	**1100**	**1320**	**1570**	**1850**	**2200**	**2650**	**3000**	**3500**	**4000**	**4500**	**5000**	**5500**	**6000**	**6500**	**7000**
Nominal heat output min/max	*kW*	255 340	315 420	385 510	480 630	580 760	660 870	750 970	860 1100	1000 1320	1200 1570	1400 1850	1700 2200	2000 2650	2300 3000	2700 3500	3040 4000	3420 4500	3800 5000	4180 5500	4560 6000	4940 6500	5320 7000
Nominal heat input min/max	*kW*	277 371	342 459	418 557	520 688	630 830	715 950	815 1060	935 1200	1087 1442	1304 1715	1520 2020	1845 2400	2170 2890	2492 3280	2930 3825	3297 4371	3638,3 4838,7	4064,2 5421,8	4446,8 5914	4877 6506,2	5255,3 6989,2	5689,8 7590,5
Water efficiency at nominal load (100%)	*%*	92 91,6	92,1 91,5	92,1 91,5	92,3 91,5	92 91,5	92,3 91,5	92 91,5	91,9 91,6	92 91,5	92 91,5	92,1 91,5	92,1 91,6	92,1 91,7	92,3 91,4	92,1 91,4	92,2 91,5	94,0 93,0	93,5 92,22	94,0 93,0	93,5 92,22	94 93	93,5 92,22
Water efficiency at 30% load	*%*	93,6 93,6	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	93,9 93,9	94,66 93,65	94,15 92,87	94,66 93,65	94,15 92,87	94,66 93,65	94,15 92,87
Combustion efficiency at nominal load (100%)	*%*	92,9 92,5	92,8 92,4	92,7 92,4	92,6 92	92,3 92,1	92,8 92,1	92,5 91,9	91,4 92	92,2 91,8	92,2 91,9	92,4 91,9	92,4 91,9	92,4 92	92,4 91,8	92,4 91,8	92,4 91,8	94,54 93,51	94,05 92,83	94,54 93,46	94,05 92,83	94,54 93,46	94,05 92,83
Casing heat losses (min/max)	*%*	0,8 0,8	0,7 0,9	0,6 0,9	0,3 0,4	0,2 0,5	0,5 0,6	0,5 0,4	0,4 0,3	0,2 0,3	0,2 0,4	0,3 0,3	0,3 0,3	0,3 0,3	0,2 0,3	0,3 0,3	0,2 0,3	0,54 0,51	0,55 0,61	0,54 0,46	0,55 0,61	0,54 0,46	0,55 0,61
Heat loss at chimney with burner on (min/max)	*%*	7,1 7,4	7,1 7,5	7,2 7,5	7,3 7,9	7,6 7,8	7,1 7,8	7,4 8	7,6 7,9	7,7 8,1	7,7 8	7,5 8,1	7,5 8	7,5 7,9	7,5 8,1	7,5 8,1	7,5 8,1	5,46 6,49	5,95 7,17	5,46 6,54	5,95 7,17	5,46 6,54	5,95 7,17
Heat loss at chimney with burner off (min/max)	*%*	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Net flue gas temperature tf-ta (min/max)	*°C*	145 152	147 154	149 153	151 163	156 161	147 160	152 165	155 163	158 166	158 165	153 166	153 164	153 163	153 167	153 167	153 166	112 133	122 147	112 134	122 147	112 134	122 147
CO_2 content	*%*	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8	9,8
Flue gas mass flow rate (min/max)	*kg/h*	416 557	514 689	628 837	781 1034	947 1247	1074 1428	1225 1593	1405 1803	1633 2167	1960 2577	2284 3036	2773 3607	3261 4344	3745 4930	4404 5754	4955 6570	5468,9 7273,3	6109,0 8149,8	6684,2 8889,5	7330,8 9779,7	7899,5 10505,8	8552,6 11409,7

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