

Hoval Cosmo heating boilers,  
outputs from 100 to 4000kW.  
Working pressures to 8 bar.

Heatpack boilers  
to 2900kW.



**Hoval**

Whether your application is for single, multiple or space saving  
heatpack boilers, Hoval always have the solution.  
If only everything could be as versatile as the high efficiency Hoval  
Cosmo.





## General

The Hoval Cosmo has been developed from our well proven steel boiler design to give greater specifier options in meeting the latest efficiency and emissions legislation. The Cosmo boiler is designed and manufactured under EN ISO 9001 and is fully CE-marked.

## Key Benefits

- No minimum water flow rate is required due to the generous boiler water content.
- Unique third pass tube design for improved heat transfer rate.
- Boiler quality steel chamber and shell construction with heavy grade tubes.
- Standing losses typically 0.3%.
- Hinged boiler door and bolt-on smoke box provides easy access for cleaning and maintenance.
- Suitable for firing with a range of matched burners for use with gas (including bio-gas), oil (including bio-diesel) or dual fuel.
- Rear connections allow a second boiler to be stacked on top to form a Cosmo-Heatpack.

## Cosmo

- Extremely reliable offering both high efficiency performance together with low NOx emissions.
- Operating temperatures up to 100°C. (Higher temperature version with PED certification available on request)
- Working pressure 6 bar as standard.
- 8 bar model available on request.
- Efficiency to 92% net.

## Cosmo-plus

- Matched to a wide range of burners including fully modulating and Ultra-low NOx.
- Burner selections have additional fan power to overcome the resistance of the ThermoCondensor unit when the Cosmo-Condens package is specified.
- Special retarders fitted for improved efficiency to 94% net.

## Cosmo-Condens

- Combined with a Hoval TC-AF thermocondensor unit (left), the Cosmo-Condens can achieve efficiencies of up to 107% net on gas. (See separate page for details).

## Cosmo-Heatpack

- Where there are space limitations in the plantroom the Cosmo and the Cosmo-plus boilers can be stacked to form the Cosmo-Heatpack or the Cosmo-plus Heatpack. The Heatpack solution gives double the output capability within the same footprint area as a standard boiler.

## Controls

All Cosmo boilers are supplied with an integral control panel, which is top-mounted on boilers up to the Cosmo 2500 model and side-mounted on larger sizes together with the Cosmo Heatpack models.

The standard control panel incorporates the following:

- Flow thermometer.
- Temperature control thermostat(s).
- High temperature limit thermostat with manual reset.
- On/off switch.
- Excess temperature, burner run, burner lockout and high fire indicators.

Optional items include:

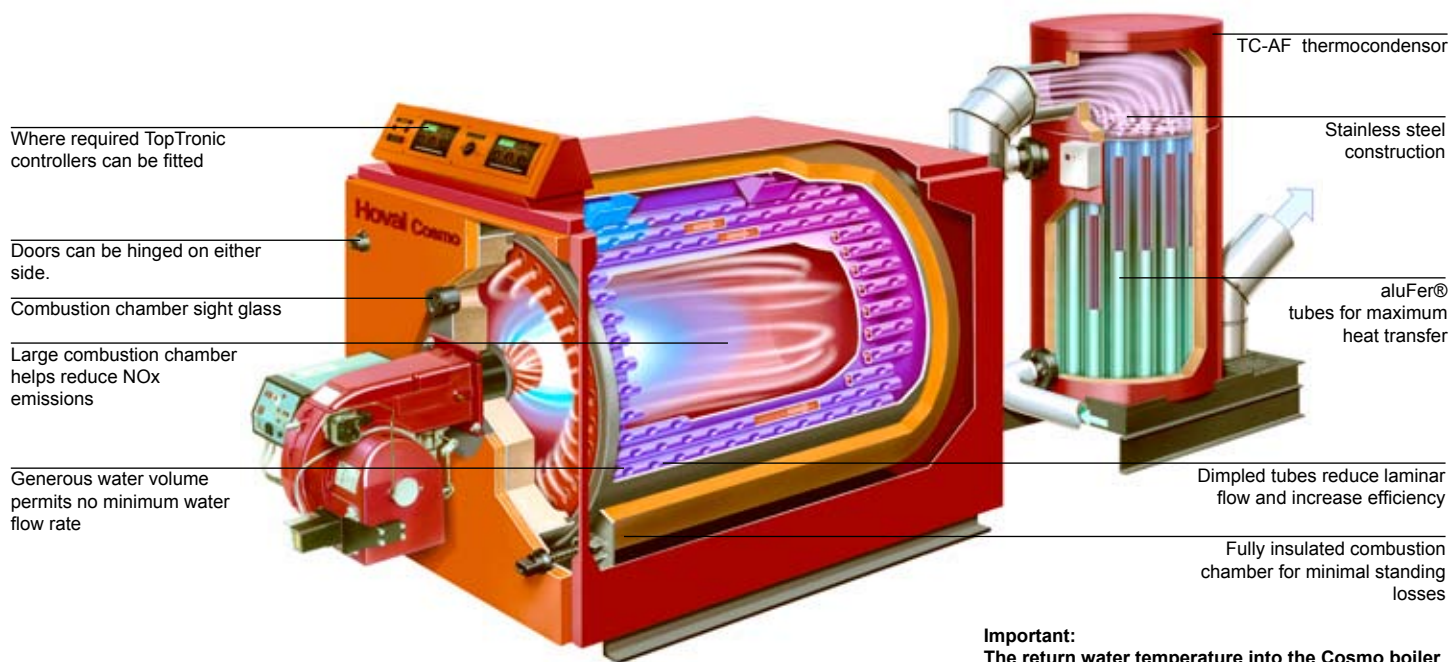
- Volt free contacts (for BMS interface)
- Hours run meter
- Burner modulating controller
- Flue gas thermometer and altitude gauge.

## TopTronic control

Alternatively Hoval TopTronic controller(s) can be specified, providing a simple user friendly operating platform that controls individual heating and hot water systems and optimises energy consumption.



Cosmo and Cosmo-plus boilers can be fired using gas, oil, or dual fuel pressure jet burners. The gas fired Cosmo-Condens combines the well proven Cosmo boiler and the TC-AF ThermoCondensor to form a fully engineered and highly efficient condensing solution.



**Important:**  
The return water temperature into the Cosmo boiler must (if required) be raised to at least 55°C to prevent condensation of the flue gas in the boiler.

### Cosmo-Condens

Combined with a TC-AF thermocondensor to form a fully engineered and matched package, the highly efficient Cosmo is even better, achieving up to 107% net efficiency on gas.

The ThermoCondensor aluFer® TC-AF is an independent exhaust gas condensation heat recovery unit. It is available in five sizes and matched to Hoval gas fired pressure jet boilers.

The TC-AF can be matched as a single unit with the Cosmo boiler up to 2000kW to achieve significant energy savings (see graph).

### Cosmo-Condens key benefits

- Significant energy savings achieved at low return water temperature due to higher efficiency
- The heat exchanger utilises a bank of single pass patented aluFer® tubes constructed of an inner aluminium finned surface within an outer stainless steel tube. This provides maximum heat transfer and water-side corrosion resistance.
- Greatest efficiency gains occur with return temperature of 40°C or lower.
- Lower hydraulic resistance allows full system water flow through the unit.

- Multi-position flue gas inlet connection aids site installation.
- Compact design – minimum plant room requirements.
- An optional condensate neutralisation reservoir can be supplied (if required by local by-laws), complete with a condensate discharge pump.
- Burner matched to overcome boiler and ThermoCondensor flue gas combined resistance.

Please refer to our separate TC-AF leaflet for further information.

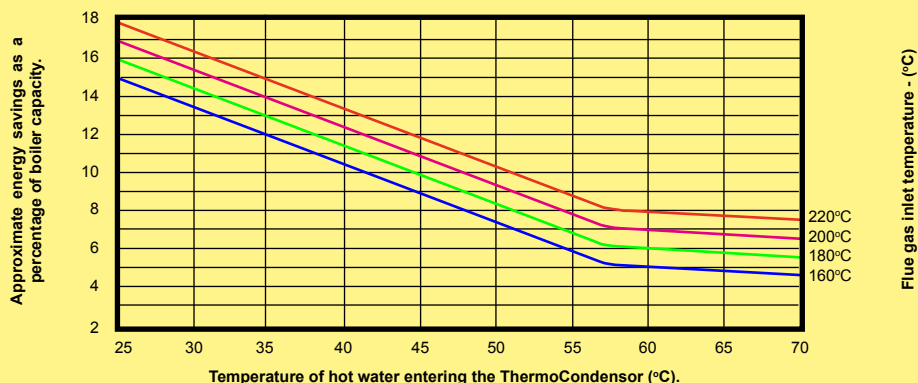
**Chloride** - Max chloride content of heating system water serving the ThermoCondensor is 50mg/litre.

### aluFer® tubes

At the heart of the Hoval's condensing technology, the revolutionary aluFer® tube maximizes heat transfer and efficiency.



**Cosmo-Condens Energy Gains.**



## Technical Data

### Cosmo

Type		175	240	290	350	410	465	585	700	850	950
• Nominal output	kW	174	241	291	350	410	465	584	701	850	950
• Minimum output	kW	100.00	145.00	155.00	165.00	190.00	205.00	220.00	260.00	350.00	460.00
• Boiler input at nominal output	kW	191.25	262.51	317.75	382.51	448.09	508.42	639.35	765.24	929.96	1038.53
• Boiler input at minimum output	kW	109.65	158.12	169.58	180.33	207.42	224.04	236.56	278.07	375.94	491.45
• Maximum boiler operating temperature <sup>(1)</sup>	°C	100	100	100	100	100	100	100	100	100	100
• Minimum return temperature (oil/gas)	°C	60/55	60/55	60/55	60/55	60/55	60/55	60/55	60/55	60/55	60/55
• Minimum flue gas temperature	°C	140	140	140	140	140	140	140	140	140	140
• Maximum working pressure / test pressure <sup>(2)</sup>	bar	6/9	6/9	6/9	6/9	6/9	6/9	6/9	6/9	6/9	6/9
• Boiler efficiency net <sup>(3)</sup>	at 100%PN at 30%PN	% %	91.2 93.9	91.7 93.5	91.4 93.6	91.5 93.8	91.6 93.9	91.5 93.0	91.7 93.5	91.4 93.1	91.5 93.6
• Standing losses qB at 70°C	Watt	600	800	800	900	1200	1200	1500	1600	1800	2000
• Insulation thickness	mm	70	70	70	70	70	70	70	70	70	70
• Fuel Consumption at nominal output											
Nat Gas <sup>(4)</sup>	m³/hr	19.83	27.22	32.99	39.67	46.47	52.72	66.19	79.27	96.44	107.67
35 seconds oil <sup>(5)</sup>	litres/hr	19.30	26.49	32.10	38.60	45.22	51.31	64.41	77.14	93.85	104.77
• Hydraulic resistance through the boiler <sup>(6)</sup>	z-factor	0.102	0.106	0.106	0.051	0.051	0.051	0.033	0.009	0.008	0.005
• Hydraulic resistance with 11 K ΔT	m bar	18.95	37.50	54.77	38.18	52.49	67.42	68.76	27.02	35.31	27.57
• Hydraulic resistance with 20 K ΔT	m bar	5.75	11.35	16.56	11.55	15.89	20.40	20.80	8.17	10.68	8.34
• Water Flow rate with 11 K ΔT	m³ / h	13.63	18.81	22.73	27.36	32.08	36.36	45.65	54.79	66.44	74.26
• Water Flow rate with 20 K ΔT	m³ / h	7.50	10.35	12.50	15.05	17.65	20.00	25.11	30.14	36.54	40.84
• Boiler water content	litres	270	333	385	396	455	574	617	697	837	1134
• Dry Weight (without burner) <sup>(7)</sup>	kg	577	640	695	801	862	932	1184	1273	1433	1792

### Cosmo

Type		1050	1200	1450	1800	2000	2500	3000	3500	4000
• Nominal output	kW	1051	1200	1450	1800	2000	2500	3000	3500	4000
• Minimum output	kW	480	570	650	882	1020	1225	1530	1715	1920
• Boiler input at nominal output	kW	1148.63	1311.49	1611.11	1975.8	2185.8	2741.2	3281.5	3833.5	4376.4
• Boiler input at minimum output	kW	511.72	608.32	695.93	947.4	1094.4	1310.1	1632.9	1834.2	2057.9
• Maximum boiler operating temperature <sup>(1)</sup>	°C	100	100	100	100	100	100	100	100	100
• Minimum return temperature (oil/gas)	°C	60/55	60/55	60/55	60/55	60/55	60/55	60/55	60/55	60/55
• Minimum flue gas temperature	°C	140	140	140	140	140	140	140	140	140
• Maximum working pressure / test pressure <sup>(2)</sup>	bar	6/9	6/9	6/9	6/9	6/9	6/9	6/9	6/9	6/9
• Boiler efficiency net <sup>(3)</sup>	at 100%PN at 30%PN	% %	91.6 93.8	91.5 93.7	91.1 93.4	91.5 93.2	91.2 93.5	91.4 93.7	91.3 93.6	91.2 93.3
• Standing losses qB at 70°C	Watt	2000	2100	2300	2290	2370	2560	2950	3050	3150
• Insulation thickness	mm	70	70	70	70	70	70	70	70	70
• Fuel Consumption at nominal output										
Nat Gas <sup>(4)</sup>	m³/hr	118.87	136.00	165.05	204.89	226.66	284.26	340.37	397.53	454.82
35 seconds oil <sup>(5)</sup>	litres/hr	115.68	132.35	160.62	199.39	220.58	276.63	331.23	386.86	442.61
• Hydraulic resistance through the boiler <sup>(6)</sup>	z-factor	0.005	0.005	0.005	0.0034	0.0029	0.0012	0.0012	0.0011	0.0010
• Hydraulic resistance with 11 K ΔT	m bar	33.68	43.99	56.52	67.30	70.87	45.82	65.98	82.33	97.75
• Hydraulic resistance with 20 K ΔT	m bar	10.19	13.31	17.10	20.36	21.44	13.86	19.96	24.91	29.57
• Water Flow rate with 11 K ΔT	m³ / h	82.07	93.80	113.34	140.70	156.33	195.41	234.49	273.57	312.66
• Water Flow rate with 20 K ΔT	m³ / h	45.14	51.59	62.34	77.38	85.98	107.48	128.97	150.47	171.96
• Boiler water content	litres	1134	1138	1520	2710	2927	3417	4810	5515	5930
• Dry Weight (without burner) <sup>(7)</sup>	kg	1792	2004	2380	4800	5300	5900	6850	7200	7700

<sup>(1)</sup> Based on a maximum limit thermostat setting of 110°C. Cosmo boilers suitable for higher operating temperatures conforming to the PED are available on request (to model 1450 only).  
Alternatively refer to the THW-I HTE boiler leaflet for other high temperature boiler options.

<sup>(2)</sup> Refers to all standard Cosmo boilers, a higher pressure version is available on request, (8 bar maximum operating pressure / 12 bar test).

<sup>(3)</sup> Boiler efficiencies at 100% load are based on a mean operating temperature of 70°C, at 30% efficiencies are based on a mean temperature of 50°C.

<sup>(4)</sup> Based on gross CV 38.5 MJ/m³.

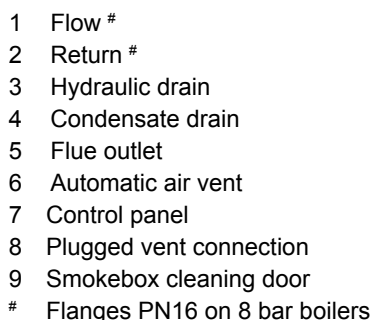
<sup>(5)</sup> Based on gross CV 45.5 MJ/kg and specific gravity 0.835.


<sup>(6)</sup> Hydraulic resistance (mbar) = (Flow rate (m³/h))² x z

<sup>(7)</sup> Dry weights based on the 6 bar boiler, to calculate the weight of an 8 bar version add 30%.

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### Cosmo heating boiler (models 175 to 1450)



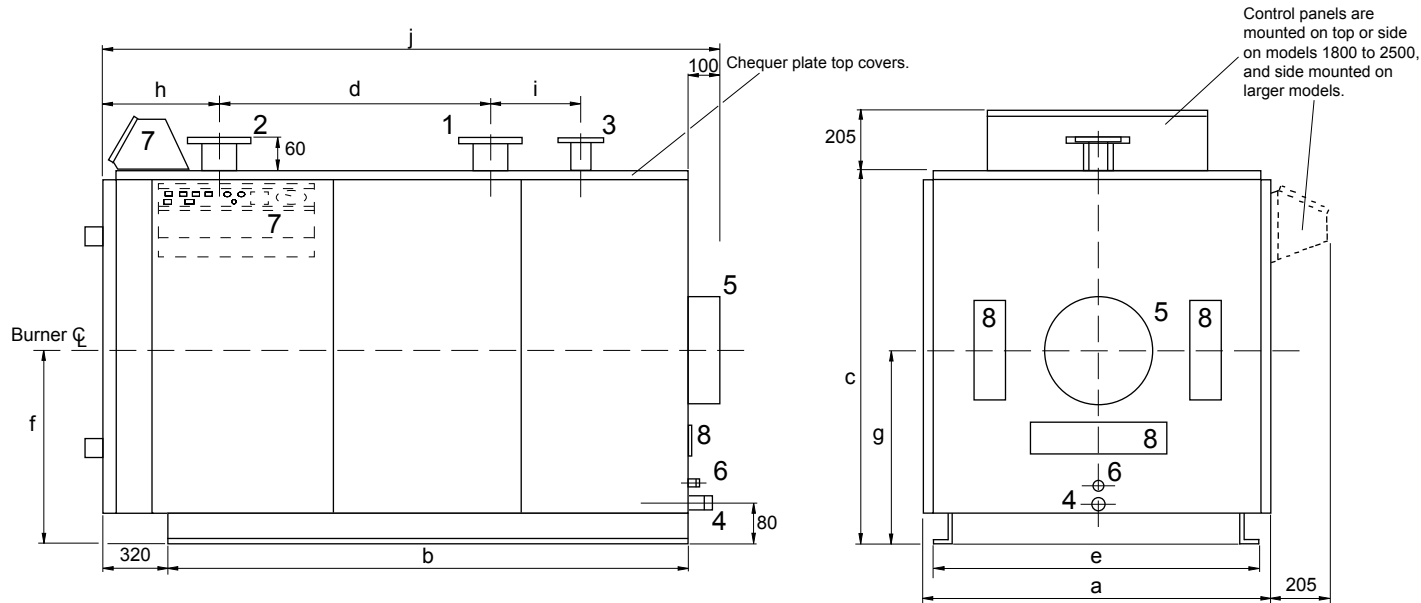
 A single phase 230V supply is required for the control panel operation. Single phase burners are electrically supplied via the control panel. Three phase burners require a separate three phase isolated supply (by the installer) direct to the burner, incorporating a flexible connection to allow for boiler/burner door opening. In this case control cables fitted with wieland plug/sockets will still run between the control panel and the burner.

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Dimensions and Technical Information

Cosmo heating boiler (models 1800 to 4000)



- 1 Flow
- 2 Return
- 3 Safety valve connection
- 4 Hydraulic drain
- 5 Flue outlet
- 6 Condensate drain
- 7 Control panel
- 8 Smokebox cleaning door

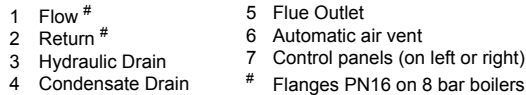
Note: The installer must ensure the condensate drain connection (6) is piped to drain via a drain trap to prevent flue gases escaping. Do not fit an isolation valve in this pipework.

A single phase 230V supply is required for the control panel operation. Three phase burners require a separate three phase isolated supply (by the installer) direct to the burner, incorporating a flexible connection to allow for boiler/burner door opening. A separate control cable is fitted with wieland plug/sockets to run between the control panel and the burner.

Cosmo Boiler		1800	2000	2500	3000	3500	4000
Dimensions:							
a	(mm)	1800	1800	1800	2200	2200	2200
b	(mm)	2534	2664	3234	3000	3200	3450
c	(mm)	1950	1950	1950	2350	2350	2350
d	(mm)	1100	1200	1300	1300	1500	1750
e	(mm)	1750	1750	1750	2150	2150	2150
f	(mm)	1025	1025	1025	1225	1225	1225
g	(mm)	1025	1025	1025	1225	1225	1225
h	(mm)	800	800	800	900	900	900
i	(mm)	750	750	750	800	800	800
j	(mm)	3270	3400	4000	3750	3050	4200
Connections:							
1 Flow	(PN16)	DN150	DN200	DN200	DN200	DN200	DN200
2 Return	(PN16)	DN150	DN200	DN200	DN200	DN200	DN200
3 Safety valve	(PN16)	DN100	DN100	DN100	DN100	DN100	DN100
4 Drain	(BSP)	G2"	G2"	G2"	G2"	G2"	G2"
5 Flue O/Dia	(mm)	450	450	450	650	650	650
6 Condensate drain	(BSP)	R1"	R1"	R1"	R1"	R1"	R1"

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### Cosmo Heatpack (models 2x175 to 2x1450)



**Note:** The installer must fit a safety valve in the flow pipework before any isolation valve.  
The installer must ensure the automatic air vents (6) are fitted.  
The installer must ensure the condensate drain connection (4) is piped to drain via a drain trap to prevent flue gases escaping. Do not fit an isolation valve in this pipework.

Cosmo Boiler	2x175	2x240	2x290	2x350	2x410	2x465	2x585	2x700	2x850	2x950	2x1050	2x1200	2x1450
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Dimensions:

a	(mm)	1610	1860	2060	1860	2060	2260	2070	2270	2620	2470	2470	2820	3120
b	(mm)	2087	2087	2087	2303	2303	2303	2690	2690	2690	3000	3000	3000	3000
c	(mm)	1606	1606	1606	1768	1768	1768	2080	2080	2080	2303	2303	2303	2303
d	(mm)	552	552	552	606	606	606	725	725	725	795	795	795	795
e	(mm)	210	210	210	210	210	210	210	210	210	210	210	210	210
f	(mm)	1014	1264	1464	1264	1464	1664	1464	1664	2014	1864	1864	2214	2514
g	(mm)	1610	1860	2060	1860	2060	2260	2070	2270	2620	2470	2470	2820	3120
h	(mm)	386	386	386	386	386	386	396	396	396	391	391	391	391
i	(mm)	73	73	73	73	73	73	80	80	80	80	80	80	80
j	(mm)	1054	1054	1054	1162	1162	1162	1355	1355	1355	1508	1508	1508	1508
k	(mm)	379	379	379	424	424	424	499	499	499	556	556	556	556
l	(mm)	970	970	970	1078	1078	1078	1226	1226	1226	1400	1400	1400	1400
m	(mm)	1985	1985	1985	2192	2192	2192	2579	2579	2579	2859	2859	2859	2859
n	(mm)	1606	1606	1606	1768	1768	1768	2080	2080	2080	2303	2303	2303	2303
o	(mm)	931	931	931	1030	1030	1030	1224	1224	1224	1351	1351	1351	1351
p	(mm)	552	552	552	606	606	606	725	725	725	795	795	795	795
q	(mm)	920	920	920	1028	1028	1028	1176	1176	1176	1350	1350	1350	1350

Connections:

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Installation Information

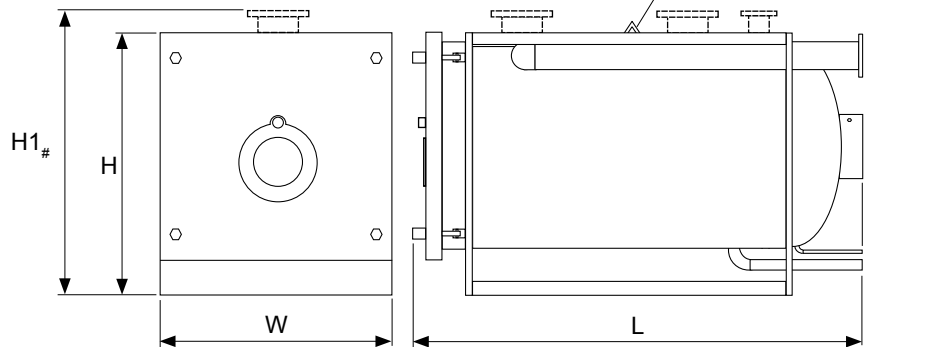
Delivery and assembly

All Cosmo boilers are delivered with burner, insulation, casings and control panel packed separately for fitting by the installer. Any ancilliary items such as safety valves, altitude gauges, drain valves, gas boosters etc, will also be supplied separately for fitting by the installer.

**Heatpack boilers will be supplied as two separate boilers for the installer the mount on site.**

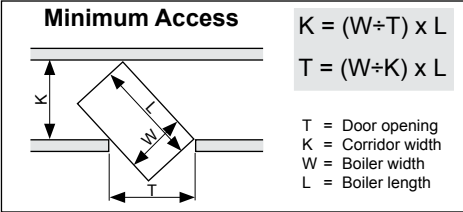
**Before mounting the burner, the front casing must be fitted. Likewise before connecting the flue, the rear casing must be fitted.**

Shipment dimensions and weights



Cosmo Boiler Model		175	240	290	350	410	465	585	700	850	950	1050	1200	1450	1800	2000	2500	3000	3500	4000
Boiler																				
Dimensions:																				
L	(mm)	1643	1893	2093	1893	2093	2293	2103	2303	2653	2501	2501	2851	3151	3240	3370	3970	3720	3920	4170
W	(mm)	920	920	920	1028	1028	1028	1176	1176	1176	1350	1350	1350	1350	1750	1750	1750	2150	2150	2150
H or H1 <sub>#</sub>	(mm)	1012	1012	1012	1120	1120	1120	1313	1313	1313	1470	1470	1470	1470	2010	2010	2010	2410	2410	2410
Weight:	(kg)	512	565	615	711	762	827	1078	1152	1302	1635	1635	1837	2218	4610	5090	5670	6400	6950	7390
Casings Box Dimensions:																				
Number of Boxes:		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
L	(mm)	2120	1880	1880	2120	2120	2120	2120	2110	2120	1920	1920	1920	1920	2120	2120	2120	2120	2120	2120
W	(mm)	330	230	270	300	300	300	300	300	350	350	350	330	330	350	350	350	350	350	350
H	(mm)	1330	1005	1005	1330	1330	1330	1330	1330	1330	1520	1520	1520	1520	1330	1330	1330	1330	1330	1330
Weight per box:	(kg)	145	90	90	100	110	115	120	135	145	175	175	175	200	240	260	140	150	150	180

# Top connections as standard on Cosmo 1800-4000 boilers

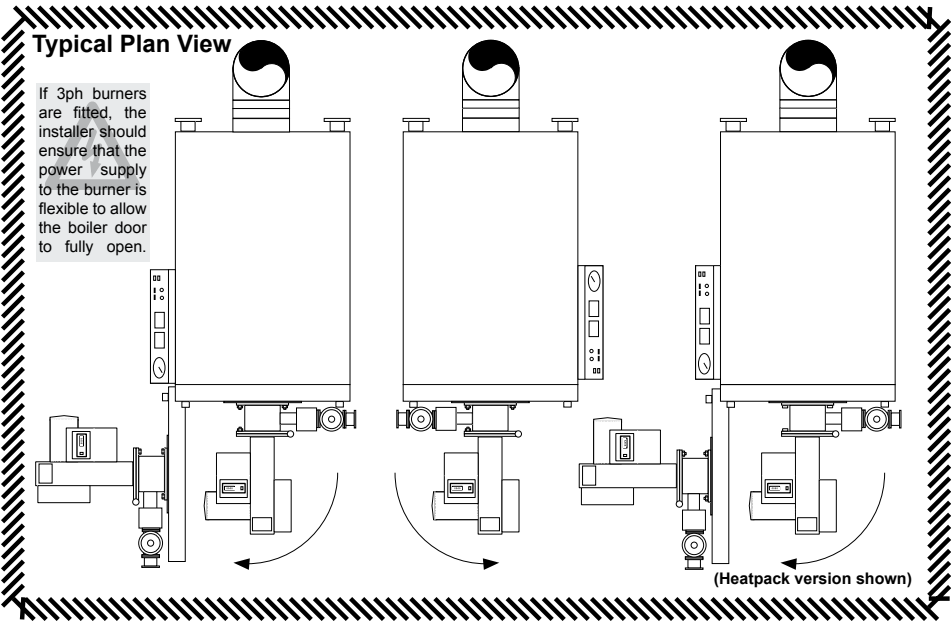


Plantroom Layout.

Wherever possible, space should be left around the boiler to enable all parts to be examined and the cubicle casings to be fitted or removed easily.

**Front clearance:** Space for the burner and the servicing of the equipment, must be accommodated. Ideally, front clearance should equate to the length of the boiler. This will permit the cleaning and removal of boiler tubes. The installer is advised to avoid creating obstructions which may hinder opening the boiler door, or the fitting of an acoustic shroud. These obstructions include; other plant, extended boiler plinths, extensive gas pipework, and rigid oil lines / burner power supplies.

Hoval recommend the boiler plinth does not project beyond the front of the boiler as this will prevent a wheel over type shroud from encapsulating the burner. Also, in some circumstances a plinth may be necessary to increase the firing height of the boiler to accomodate a particular burner. The installer must avoid, wherever practicable, the fitting of pipework within the swing of the boiler door. If this is not possible, a removeable stool piece with a shut off valve upstream must be fitted.



**Side Clearance:** Generally a minimum clearance of 100mm is required at the side of the boiler to fit and remove the side casings. Space to one side of the boiler is required to swing the boiler door with the burner fitted, (standard to the right, optional to left), whereby when the door is open 90°, the length of the burner+80mm will be at the side of the boiler. Normally the same access for the burner swing can also be used for getting to the back of the boiler. Where gas burners are fitted consideration should be given to the gas train (and booster if specified). Normally the gas mains are run either from high or low level.

In both cases an elbow has to be fitted off the gas train to connect back to the header. Where gas trains fall within the width of the boiler this elbow has to be taken into account.

**Back clearance:** is required for the flue and system connections and access to the cleaning door.

**Top clearance:** is required above the boiler to fit safety valves, automatic air vents and to access the top boiler on Heatpack units.

Shorter clearances are possible subject to cleaning methods and plantroom layout. Please consult Hoval technical.

## Other associated products



### **Cosmo-Combination**

The Cosmo-combination boiler couples the tried and tested technology of the Cosmo boiler with that of the Hoval CT-plus and Modul-plus calorifier range. Mounted on top, the calorifier combines with the boiler to provide a fully integrated package, including the primary circulating pump and DHW temperature control. 'Mix & Match' your DHW and heating requirements with a tailored combination package.

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### **Uno-3**

The Uno-3 boiler couples high efficiency with low NOx emissions. These dual goals are achieved with the special 3-pass design which incorporates the unique Hoval thermolytic heat exchanger. Available as heating only units or with a calorifier as a combination unit, with ratings between 50 -280 kW and DHW up to 1110 litres per hour. A modular heatpack version is also available up to 180 kW output.



### **THW-I NTE and HTE**

The Hoval THW-I boilers are steel fabricated boilers based on the proven 3 pass wet back type construction with unique water cooled finned tube wall gas reversal chamber generating high efficiency. Design options allow for low, medium and high temperature / pressure applications from 1.5MW to 28MW boiler output. All boiler models are complete with Pressure Equipment Directive (PED) / CE certification.



### **PressVal Micron**

The PressVal Micron range of pressurisation units are compact microprocessor controlled units. Covering all system outputs from small commercial heating and chilled water systems, through to the very largest district heating schemes. Both single and twin pump units are available in wall hung, free standing, skid mounted, or cabinet housed configurations. Volt free contacts provide a multitude of fault signals for BMS interface.



Conservation of energy - protection of the environment