

Bosch Uni 3000F Steel Hot Water Boiler



BOSCH

Hot Water & Heating



Standard Engineering Specifications

The boiler(s) shall be high-efficiency steel boiler utilising reverse flame technology to deliver hot water to heating systems with standard seasonal efficiency [to DIN] up to 93%. The boiler(s) shall be suitable for forced draft firing with (select as appropriate - gas, oil, LPG, and dual fuel burner options).

The boiler(s) shall be factory installed with all-round thermal insulation and aluminium sheet casing, other visible steel parts shall be painted. The combustion chamber and the gas to water heat exchangers shall have easy access through large front door that can be pivoted to the left or right.

The boiler(s) shall have a large heating surface in the second pass to provide excellent heat transfer as well as low flue gas and standby losses.

The boiler(s) shall be high efficiency and floor standing, designed for hot water heating systems. The boilers shall have no minimum circulation requirements.

The boiler(s) shall have a modular control technology and provide the option of 0-10 V interface with the BMS.

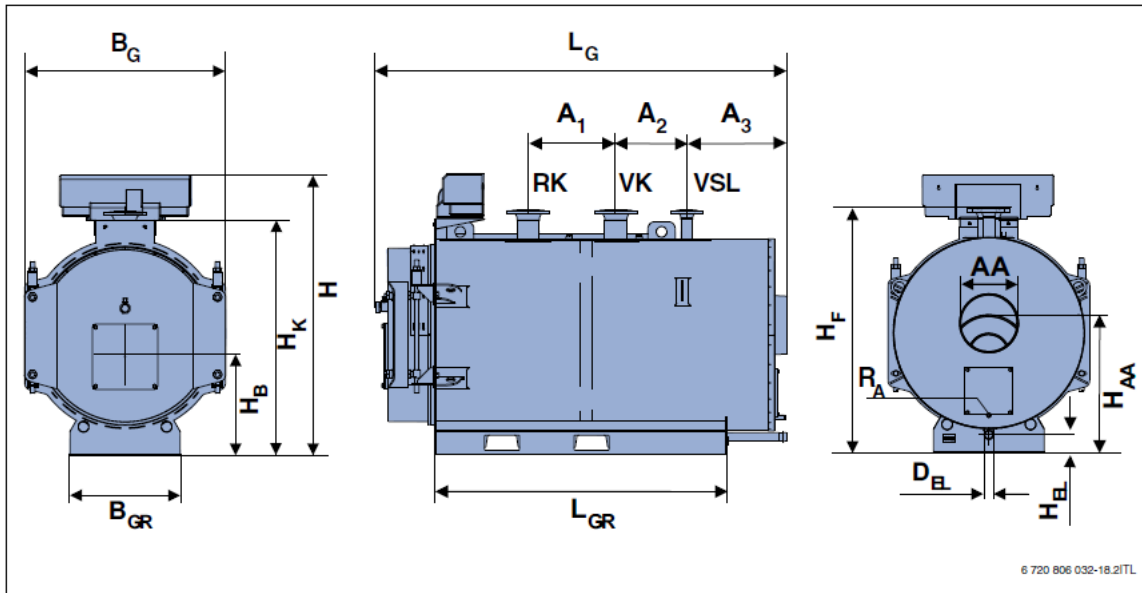


Fig.1 Dimensions Uni 3000F 120kW – 820 kW

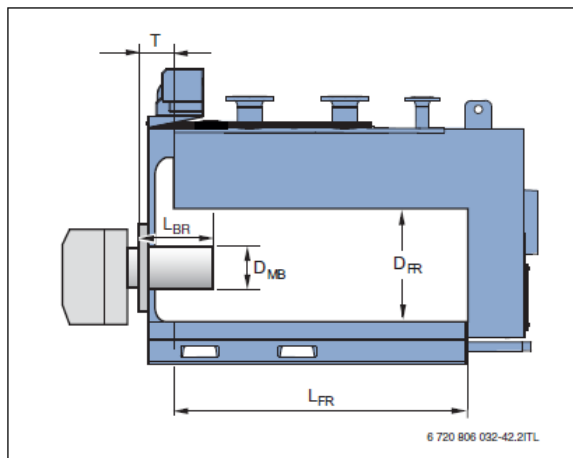


Fig.2 Dimensions, burner door and burner, Uni 3000F¹⁾

Boiler size			120	190	250	300	360	420	500	600	730	820
Boiler length	L _G	mm	1515	1720	1850	2010	1972	2172	2114	2364	2310	2510
Boiler width (overall)	B _G	mm	800	850	890	890	955	955	1040	1040	1150	1150
Base frame length	L _{GR}	mm	915	1110	1240	1400	1373	1573	1503	1753	1700	1900
Swivelling range of the burner door ²⁾	B _T	mm	700	760	790	790	860	860	950	950	1060	1060
Base frame width	B _{GR}	mm	420	430	450	450	480	480	570	570	650	650
Overall height (with control unit)	H	mm	1157	1220	1255	1255	1320	1320	1430	1430	1430	1430
Boiler height	H _K	mm	937	1000	1035	1035	1100	1100	1210	1210	1320	1320
Flue outlet diameter	D _{AA}	mm	200	200	250	250	250	250	300	300	350	350
Flue outlet height	H _{AA}	mm	542	582	597	597	632	632	664	670	727	727
Combustion chamber length	L _{FR}	mm	865	1060	1190	1350	1260	1460	1390	1640	1585	1785
Combustion chamber diameter	D _{FR}	mm	390	420	450	450	488	488	548	548	624	624
Minimum blast tube diameter	D _{MB}	mm	130	240	240	240	290	290	290	290	350	350

Table 1. Dimensions for Uni 3000F (Fig 1)

¹⁾ The blast tube must protrude beyond the lining in the burner door

²⁾ → Fig. 1

2 | Dimensions and Specifications

Boiler size			120	190	250	300	360	420	500	600	730	820
Minimum blast tube length	L _{BR}	mm	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
Burner door depth	T	mm	260	260	260	260	260	260	260	260	260	260
Installed burner height	H _B	mm	427	442	457	457	477	477	507	507	547	547
Boiler flow connection ³⁾	VK	DN (mm)	65	65	65	65	80	80	100	100	125	125
Boiler return connection ³⁾	RK	DN (mm)	65	65	65	65	80	80	100	100	125	125
Flow safety line connection ³⁾	VSL	DN (mm)	40	40	40	50	50	50	50	50	65	65
Boiler safety assembly connection	SG	Inches	1	1	1	1	1	1	1	1	1	1
Flange height VK/VSL/RK	H _F	mm	1005	1065	1095	1095	1165	1165	1255	1255	1255	1365
Clearance	A ₁	mm	240	345	495	470	540	540	450	450	620	620
Clearance	A ₂	mm	170	205	185	200	225	225	365	365	350	350
Clearance	A ₃	mm	400	400	413	573	437	637	516	766	541	541
Drain (DFV) connection	DEL	Inches	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Drain (DFV) height	HEL	mm	100	100	100	100	100	100	100	100	100	100
Cleaning seq	R _A	Inches	G 3/8	G 3/8	G 3/8	G 3/8	G 3/8	G 3/8	G 3/8	G 3/8	G 3/8	G 3/8

Table 2. Dimensions for Uni 3000F (→ Fig. 1)

Boiler size		120	190	250	300	360	420	500	600	730	820
Rated output	kW	120	190	250	300	360	420	500	600	730	820
Rated heat input	kW	132	209	274	329	393	459	546	655	795	893
Transport weight	kg	385	475	575	610	730	835	955	1055	1250	1385
Boiler water content	l	136	203	233	262	323	367	434	502	607	675
Gas content	l	129	183	238	268	304	350	420	495	618	693
Pressure loss on the hot gas side	mbar	0.8	1.6	1.54	2.7	3.3	3.9	4.7	5.59	6.1	6.47
Draught required	Pa	0	0	0	0	0	0	0	0	0	0
Maximum temperature of high limit safety cut-out	°C	99	99	99	99	99	99	99	99	99	99
Maximum permissible operating pressure (boiler)	bar	6	6	6	6	6	6	6	6	6	6

Table 3. Specifications for Uni 3000F (certified with modulating burner output)

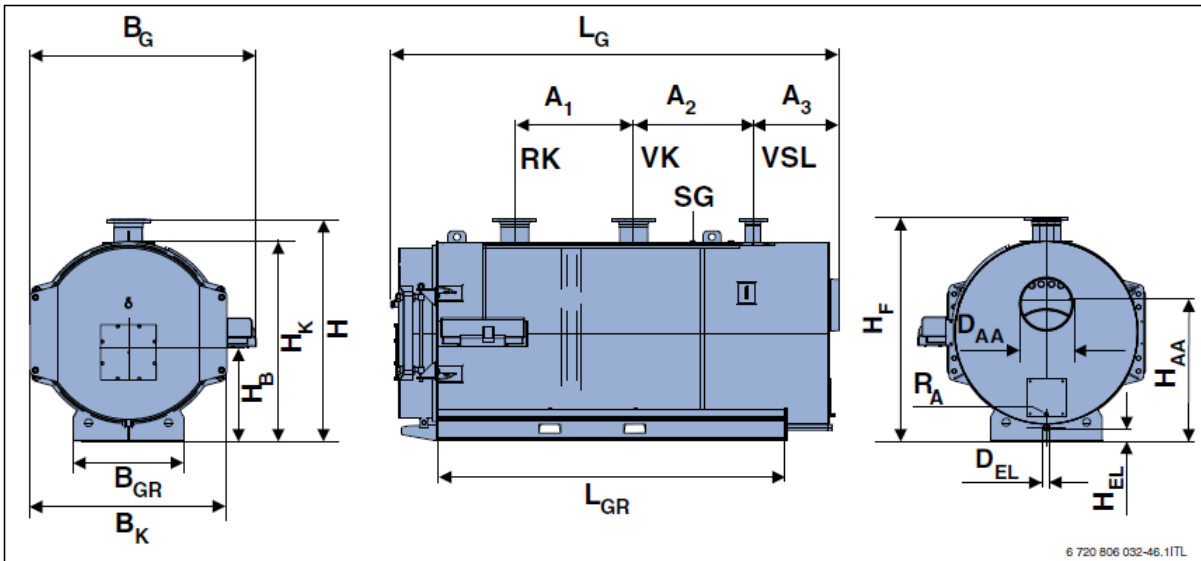


Fig. 3 Dimensions, Uni 3000F 1040 kW and 1200 kW

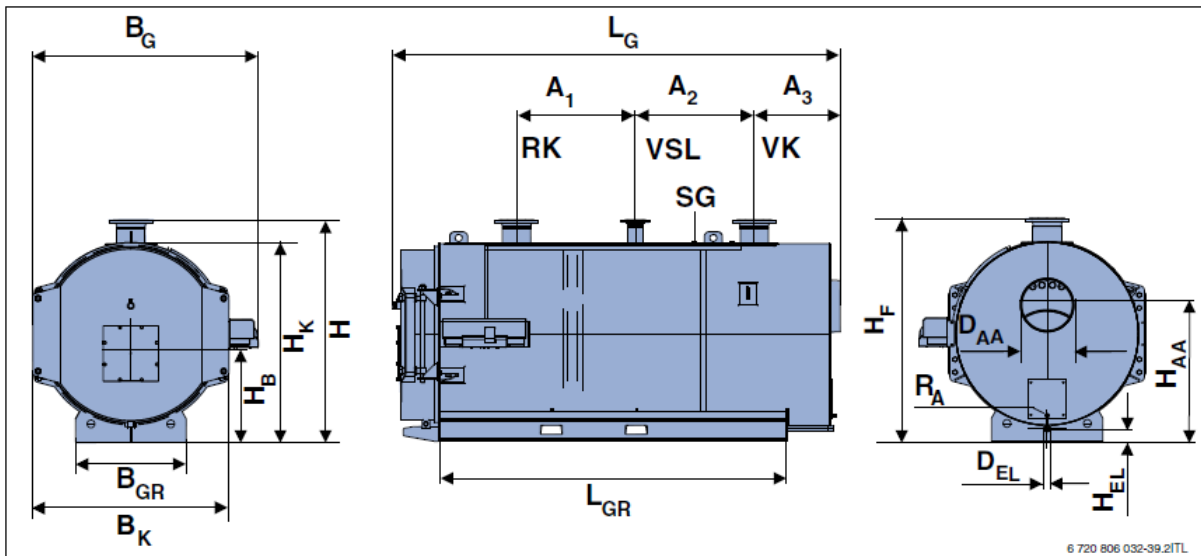


Fig. 4 Dimensions, Uni 3000F 1400 kW and 1850 kW

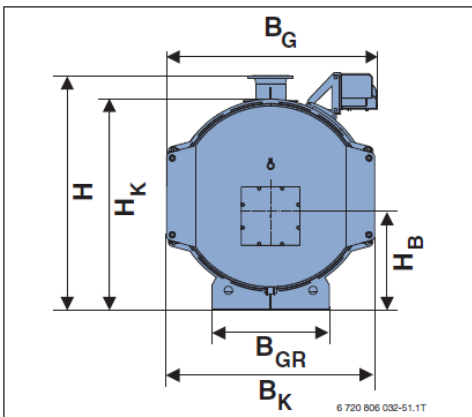


Fig. 5 Dimensions, Uni 3000F 1850kW

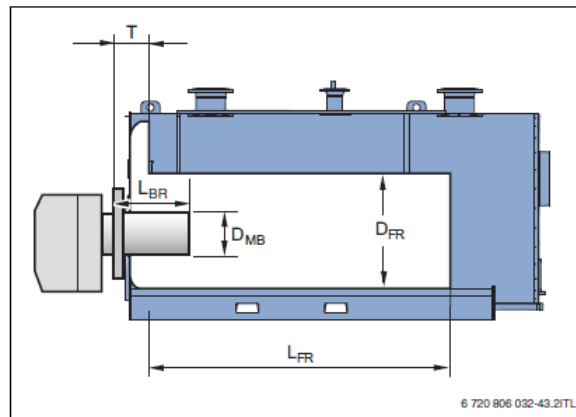


Fig. 6 Dimensions, burner door and burner, Uni 3000F¹⁾

¹⁾ The blast tube must protrude beyond the lining in the burner door

2 | Dimensions and Specifications

Boiler size			1040	1200	1400	1850
boiler length	LG	mm	2635	2935	3080	3480
Boiler width (overall)	B _G	mm	1470	1470	1610	1352
Boiler width	B _K	mm	1250	1250	1390	1510
Swivelling range of the burner door	B _T	mm	1170	1170	1280	1385
Base frame length	LGR	mm	1960	2260	2316	2720
Base frame width	BGR	mm	820	820	880	860
Overall height	H	mm	1475	1475	1612	1730
Boiler height	HK	mm	1340	1340	1460	1545
Flue outlet diameter	DAA	mm	350	350	400	400
Flue outlet height	HAA	mm	800	800	1070	1050
Combustion chamber length	LFR	mm	1845	2145	2120	2520
Combustion chamber diameter	DFR	mm	710	710	780	860
Maximum blast tube diameter	DMB	mm	350	350	350	350
Minimum blast tube length	LBR	mm	1)	1)	1)	1)
Burner door depth	T	mm	310	310	310	310
Burner height	H _B	mm	592	592	635	685
Boiler flow connection ²⁾	VK	DN (mm)	125	125	150	200
Boiler return connection ²⁾	RK	DN (mm)	125	125	150	200
Flow safety line connection ²⁾	VSL	DN (mm)	80	80	80	100
Boiler safety assembly connection	SG	Inches	1	1	1	1
Flange height VK/VSL/RK	H _F	mm	1475	1475	1612	1732
Clearance	A ₁	mm	620	620	725	925
Clearance	A ₂	mm	595	595	725	925
Clearance	A ₃	mm	569	870	673	670
Drain & fill valve (DFV) connection	DEL	Inches	1¼	1¼	1½	1½
Drain & fill valve (DFV) height	HEL	mm	100	100	100	100
Cleaning seq	R _A	Inches	G ½	G ½	G ½	G ½

Table 4. Dimensions for Uni 3000F (→ Fig.4)

¹⁾ The blast tube must protrude beyond the lining in the burner door

³⁾ Flange to DIN 2633 (PN16)

Boiler size		1040	1200	1400	1850
Rated output	kW	1040	1200	1400	1850
Rated heat input	kW	1138	1313	1532	2024
Transport weight	kg	1795	1990	2115	3140
Boiler water content	l	822	942	1339	1655
Gas content	l	934	1071	1275	1710
Pressure loss on the hot gas side	mbar	7.25	7.74	7.13	9.17
Draught required	Pa	0	0	0	0
Maximum temperature of high limit safety cut-out	°C	99	99	99	99
Maximum permissible operating pressure (boiler)	bar	6	6	6	6

Table 5. Specifications for Uni 3000F (certified with modulating burner output)

Pressure loss on the water side

The pressure loss on the water side is the pressure differential between the boiler flow and return connections. The pressure loss on the water side depends on the VK/RK connector size and the heating water flow rate.

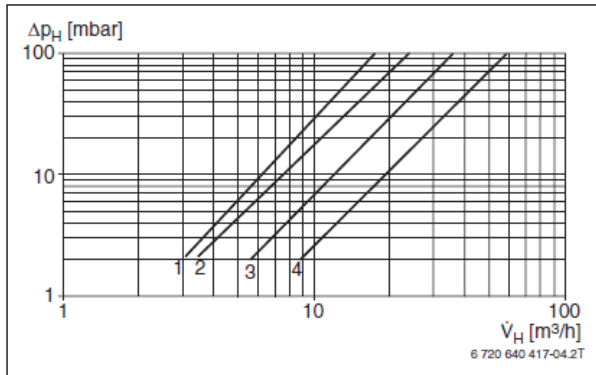


Fig. 7 Pressure loss on the water side Uni 3000F 120kW – 600kW

Δp_H Pressure Loss

\dot{V}_H Heating water flow rate

- 1 Uni 3000F 120kW
- 2 Uni 3000F 190kW, 250kW, 300kW
- 3 Uni 3000F 360kW, 420kW
- 4 Uni 3000F 500kW, 600kW

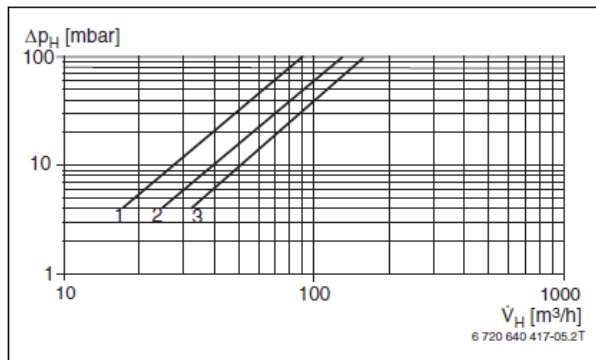


Fig. 8 Pressure drop on the water side Uni 3000F 730kW – 1850kW

Δp_H Pressure Loss

\dot{V}_H Heating water flow rate

- 1 Uni 3000F 730kW, 820kW, 1040kW, 1200kW
- 2 Uni 3000F 1400kW
- 3 Uni 3000F 1850kW

Boiler Efficiency

The boiler efficiency η_K is the ratio between the rated output and the rated heat input. It shows boiler efficiency in relation to average boiler water temperature and boiler output.

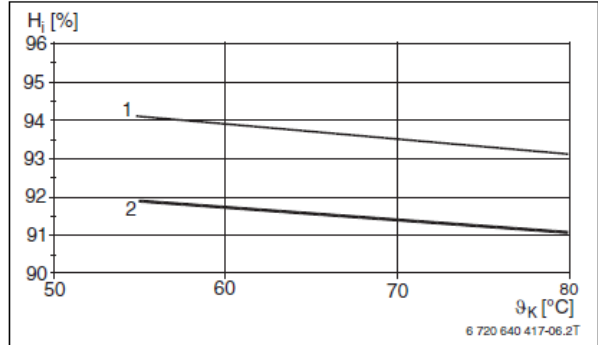


Fig. 9 Boiler efficiency subject to the average boiler water temperature (average value for the complete model range) – Uni 3000F 120kW – 360kW

H_i Efficiency, net calorific value

θ_K Average boiler temperature

- 1 Boiler efficiency at stage 1 (partial load 60 %)
- 2 Boiler efficiency at stage 2 (full load 100 %)

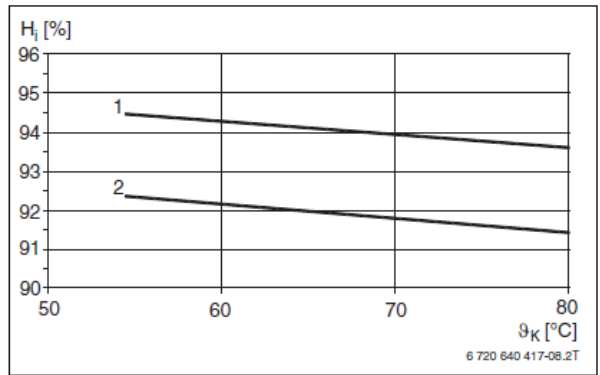


Fig. 10 Boiler efficiency subject to the average boiler water temperature (average value for the complete model range) – Uni 3000F 420kW – 1880kW

H_i Efficiency, net calorific value

θ_K Average boiler temperature

- 1 Boiler efficiency at stage 1 (partial load 60 %)
- 2 Boiler efficiency at stage 2 (full load 100 %)

Weishaupt Burners and Combustion Management

The boilers are offered with exceptional quality burners from Weishaupt Germany. These fully modulating burners offer the highest levels of performance and lowest emissions for standard packaged equipment. The burner has an integrated digital Burner Management System (BMS) that eliminates cams and linkages, even on milli-fuels. This W-FM digital combustion manager was co-developed with Siemens, with many advantages including fault self-diagnosis, elimination of mechanical linkages for air/fuel ration control and infra-re or UV self checking flame sensor.

The benefits include:

- Exceptional high quality for enhanced reliability
- High efficiency combined with the lowest emissions (CO and NO_x)
- High turndown capability
- Digital Burner Management System (BMS) with clear fault messaging
- Servo motors for air & fuel for precise repeatable combustion
- Low noise operate
- Optional Dual Fuel configuration (Diesel / Heavy Oils / Biogas)



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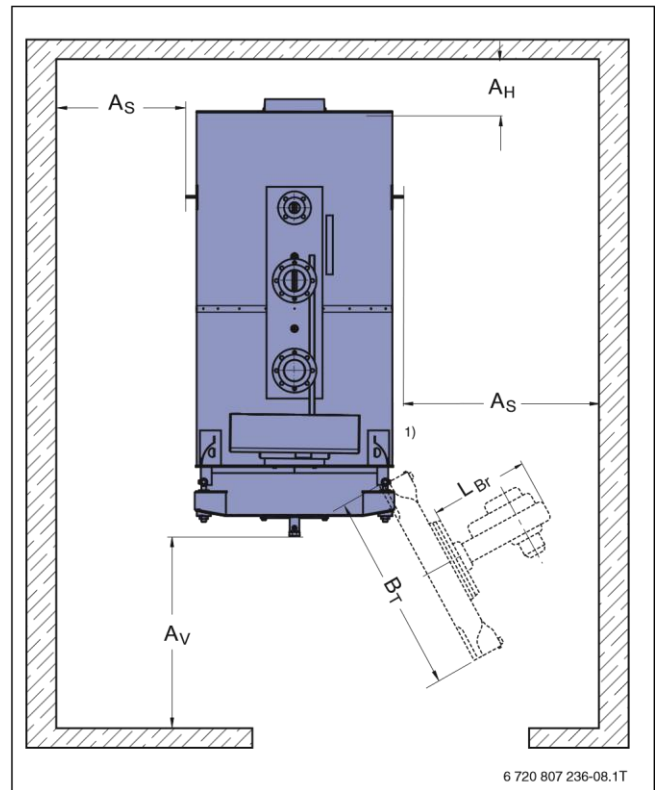


Fig. 11 Installation room for Uni 3000F boilers


Maintain the recommended minimum dimensions shown in table 6 below. Select the recommended wall clearances to enable easy access for installation, maintenance and service work.

Only install the boiler in rooms that comply with the local regulations appertaining to the siting of boilers. The room must be large enough to ensure access to the boiler in line with local regulations.

Boiler	Boiler size	Clearance A _H in mm	Clearance A _V in mm ¹⁾	Clearance A _S in mm ¹⁾
Uni 3000F	120 – 360	1000	2500	250+L _{BR} ²⁾
	420 -1850	1000	2500	

Table 6. Specified wall clearances

- 1) Observe dimension L_{BR} (burner length) and dimension B_T (swivelling range of the burner door, Tab. 7, page 8 and Tab. 10, page 11) in relation to clearances A_V and A_S (on the closure side of the burner door).
- 2) On the Uni 3000F, observe the dimension of the particular control unit with regard to the minimum clearance A_S (on the installation side of the control unit 250+L_{BR}). On the side where the burner door is not hinged, only observe 250mm clearance. If the hinge arrangement may change following installation please observe the LBR dimension.



Robert Bosch (Australia) Pty. Ltd.

1555 Centre Road

Clayton Victoria 3168

Phone: 1300 30 70 37

Fax: 1300 30 70 38

www.bosch-industrial.com.au