



TECHNICAL MANUAL

GB

MONOLITE GT

CONDENSING BOILER WITH PREMIX BURNER

MONOLITE JB

CONDENSING BOILER (WITHOUT BURNER)

**LOW NO_x STEEL CONDENSING
BOILERS**

CE

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1 GENERAL

The boilers of the MONOLITE series have a horizontal through-flame combustion chamber and a vertical condensing section of a special design, in stainless steel type AISI 316 Ti. These elements are immersed in water contained in a horizontal boiler drum with a vertical column to which the system inlet and outlet connections are fitted.

These boilers reach very high efficiency levels (nearly 108% referred to the Lower Calorific Value LCV) as the flue gases not only are released at a temperature little higher than that of the system return water, but also a large part of the water vapour contained in the flue gases is condensed, recovering the latent heat of condensation.

The particular flame path (through the combustion chamber without inversion) limits as much as possible the formation of Nitrogen Oxides (NOx) that form when the flame remains at high temperature in the combustion chamber for long periods.

The MONOLITE series boilers place no limit on the return water temperature, and reach the highest performance when used with floor panel heating systems in which the return temperature is lower than 58C. At higher temperatures, condensation does not occur and so the recovery of the latent heat contained in the water vapour, present in the flue gas, is impossible. The efficiency of the boiler remains in any case high (97%) even with traditional high-temperature heating systems (Δt 80/65° C).

The very high efficiency due to the complete recovery of the heat content of the fuel and to heavy thermal insulation of the boiler, using high density glass wool, allow classification of the MONOLITE series boilers as “4-Star - very high efficiency” as to the Efficiency Directive 92/42/CEE..



2 GENERAL WARNINGS

Each generator is provided with a data plate that can be found in the envelope with the boiler documents. The plate lists:

- Serial number or identification code;
- Rated thermal output in kcal/h and in kW;
- Furnace thermal output in kcal/h and in kW;
- Types of fuels that can be used;
- Max operating pressure.

A manufacturer's certificate is also provided which certifies the hydraulic test pressure.

The installation must be performed in compliance with the regulations in force by professionally qualified personnel. The term "professionally qualified personnel" means persons with specific technical skills in the sector of heating system components.

Incorrect installation may cause damage to persons, animals or objects for which the manufacturer cannot be held responsible.

At the first start up, all regulation and control devices positioned on the control panel should be checked for efficiency. The guarantee shall be valid only upon compliance with the instruction given in this manual.

Our boilers have been built and tested in observance of EEC requirements and, consequently, CE-marked. EEC directives are as follows:

- Directive on Gas 90/396/EEC
- Directive on Output 92/42/EEC
- Directive on Electromagnetic Compatibility 89/336/EEC
- Directive on Low Voltage 73/23/EEC

IMPORTANT: This boiler has been designed to heat hot water to a temperature lower than the boiling point of water at atmospheric pressure and must be connected to a heating plant and/or a domestic hot water plant within the limits of the boiler performance and output.

WARNING!

THE BOILER MAY ONLY BE INSTALLED IN A ROOM WHICH COMPLIES WITH THE APPROPRIATE VENTILATION REQUIREMENTS. READ THE INSTALLATION AND USER INSTRUCTION BEFORE INSTALLING AND LIGHTING THE BOILER.



Systems must be cleaned in accordance with British Standard Code of Practice BS 7593:1992, Code of practice for treatment of water in central heating systems.

3 TECHNICAL SPECIFICATIONS

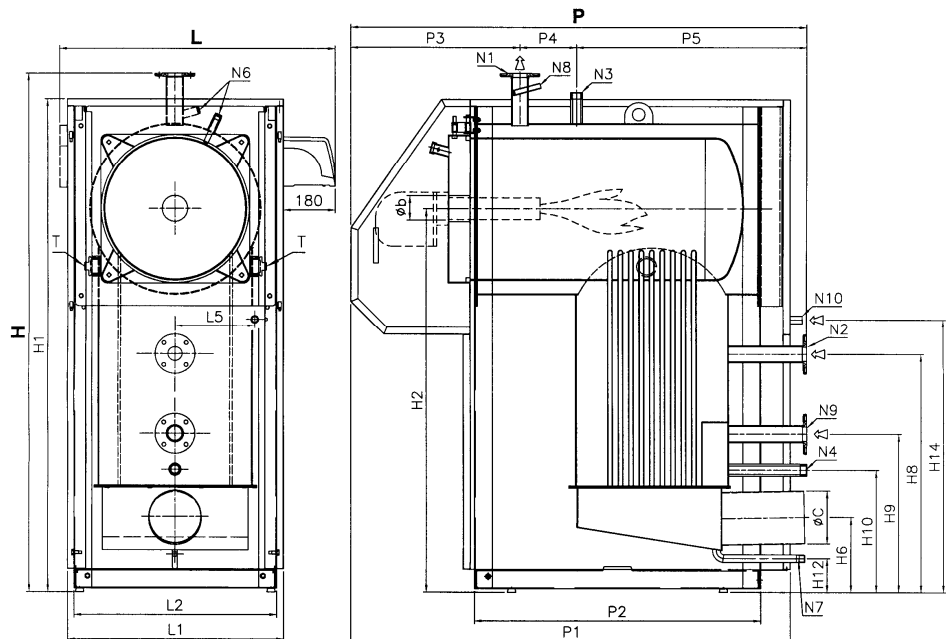
3.1 MONOLITE 45 GT – 350 GT

Characteristics	Heat output				Heat input		Efficiency 100% (N.C.V.)		Effic. 100% (stars)	NG max flow rate G20	NG max flow rate G30	NG max flow rate G31	Max flow rate of flues
	kW		kcal/h		kW		kcal/h						
	Medium Temp. 70°C	Temp. flow/return 50/30°C					Medium Temp. 70°C	Temp. flow/return 50/30°C	%	%	m³/h	kg/h	kg/h
MONOLITE 45 GT	52,0	45.000	57,0	49.200	53,0	45.800	98,3	107,5	****	5,64	4,18	4,14	84,04
MONOLITE 70 GT	81,0	70.000	88	76.500	82,0	71.200	98,3	107,5	****	8,76	6,50	6,43	130,52
MONOLITE 95 GT	110,0	95.000	120	103.800	112,0	96.600	98,3	107,5	****	11,89	8,82	8,73	177,16
MONOLITE 125 GT	145,0	125.000	158	136.700	147,0	127.200	98,3	107,5	****	15,65	11,62	11,49	233,19
MONOLITE 160 GT	186,0	160.000	203	175.000	189,0	162.800	98,3	107,5	****	20,03	14,87	14,71	298,45
MONOLITE 210 GT	244,0	210.000	266	229.600	248,0	213.600	98,3	107,5	****	26,28	19,51	19,30	391,57
MONOLITE 270 GT	313,0	270.000	343	295.300	319,0	274.700	98,3	107,5	****	33,80	25,09	24,81	503,62
MONOLITE 350 GT	406,0	350.000	445	382.800	414,0	356.100	98,3	107,5	-	43,82	32,52	32,17	652,92

Characteristics	Minimum output				Minimum input		Efficiency at 30% (N.C.V.)		Effic. 30% (stars)	NG min flow rate G20	NG min flow rate G30	NG min flow rate G31	Min flow rate of flues
	kW		kcal/h		kW		kcal/h						
	Medium Temp. 70°C	Temp. flow/return 50/30°C					Medium Temp. 70°C	Temp. flow/return 50/30°C	%	%	m³/h	kg/h	kg/h
MONOLITE 45 GT	17	15.000	19	16.599	17	15.228	98,5	109	****	1,87	1,39	1,38	27,92
MONOLITE 70 GT	26	23.000	30	25.452	27	23.350	98,5	109	****	2,87	2,13	2,11	42,81
MONOLITE 95 GT	37	32.000	41	35.411	37	32.487	98,5	109	****	4,00	2,97	2,93	59,56
MONOLITE 125 GT	48	42.000	54	46.477	49	42.640	98,5	109	****	5,25	3,89	3,85	78,18
MONOLITE 160 GT	61	53.000	68	58.650	62	53.807	98,5	109	****	6,62	4,91	4,86	98,65
MONOLITE 210 GT	81	70.000	90	77.462	82	71.066	98,5	109	****	8,74	6,49	6,42	130,29
MONOLITE 270 GT	104	90.000	116	99.594	106	91.371	98,5	109	****	11,24	8,34	8,25	167,52
MONOLITE 350 GT	136	117.000	151	129.472	138	118.782	98,5	109	-	14,62	10,85	10,73	217,77

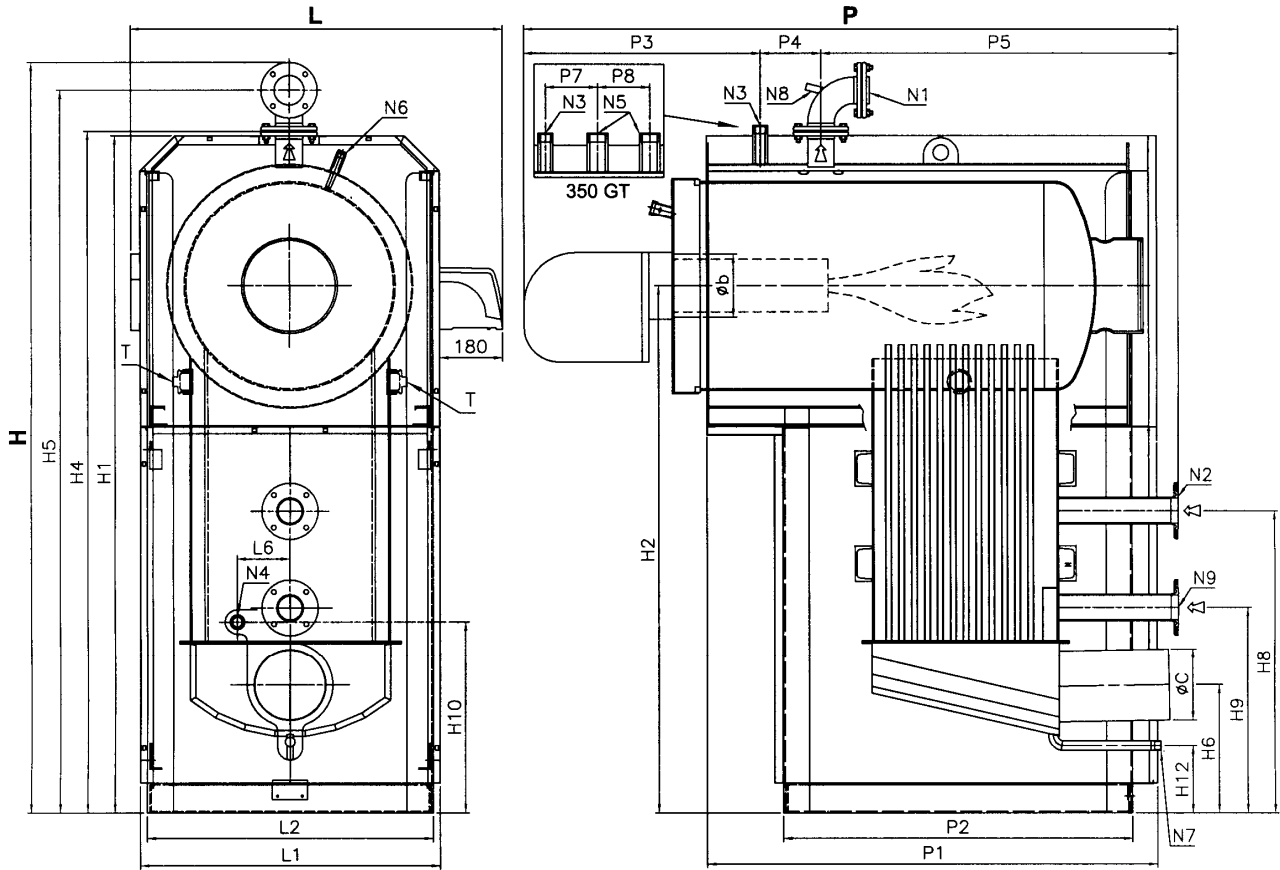
Characteristics	Pressure losses flue gas side	Chimney available head	Noise level	CO emissions	Nox emissions	Heat losses through the chimney	Heat losses through the casing	Heat losses with burner off	Flue gas temp. at boiler output and air at 20 deg. C	Condense production	Press. losses water side	Design Pressure	Total capacity	Boiler weight	Electric supply	Frequency	Insulation class	Electric power
	mbar	mbar	dB(A)	mg/kWh	mg/kWh	%	%	%	°C	kg/h	mbar	bar	l	kg	Volt ~	Hz	IP	W
						For condensing Temp. flow/return 50/30°C	For condensing Temp. flow/return 50/30°C	For condensing Temp. flow/return 50/30°C	GAS For condensing Temp. flow/return 50/30°C	Temp. flow/return 50/30°C	(ΔT=12K)							
MONOLITE 45 GT	0,6	0,5	62,0	0	45	1,50	0,30	0,10	50	6,68	3,0	5	160	200	230	50	IP X0D	150
MONOLITE 70 GT	0,8	0,2	62,5	0	58	1,50	0,30	0,10	50	10,38	8	5	150	220	230	50	IP X0D	150
MONOLITE 95 GT	1,0	0,5	62,5	0	55	1,50	0,30	0,10	50	14,09	12	5	210	280	230	50	IP X0D	150
MONOLITE 125 GT	1,1	0,5	63,0	0	65	1,50	0,30	0,10	50	18,55	22	5	200	320	230	50	IP X0D	150
MONOLITE 160 GT	1,5	0,5	65,0	0	52	1,50	0,30	0,10	50	23,74	12	5	308	520	230	50	IP X0D	300
MONOLITE 210 GT	2,0	0,5	66,0	0	58	1,50	0,30	0,10	50	31,14	22	5	285	590	230	50	IP X0D	300
MONOLITE 270 GT	2,1	0,5	68,0	0	60	1,50	0,30	0,10	50	40,05	16	5	340	680	230	50	IP X0D	300
MONOLITE 350 GT	2,3	0,5	68,0	0	65	1,50	0,30	0,10	50	51,93	11	5	392	1030	230	50	IP X0D	300

Mod. 45 GT – 125 GT



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Mod. 160 GT – 350 GT



Dimensions	H	H1	H2	H4	H5	H6	H8	H9	H10	H12	H14	L	L1	L2	L5	L6
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
MONOLITE 45 GT	1825	1734	1348	-	-	264	837	557	432	125	987	939	756	710	272	-
MONOLITE 70 GT	1825	1734	1348	-	-	264	837	557	432	125	987	939	756	710	272	-
MONOLITE 95 GT	1825	1734	1348	-	-	264	837	557	432	120	991	966	756	710	279	-
MONOLITE 125 GT	1825	1734	1348	-	-	264	837	557	432	120	991	966	756	710	279	-
MONOLITE 160 GT	2151	1941	1510	1952	2071	367	864	589	562	192	-	1063	853	814	-	150
MONOLITE 210 GT	2151	1941	1510	1952	2071	367	864	589	562	192	-	1063	853	814	-	150
MONOLITE 270 GT	2200	1941	1510	1955	2105	367	864	589	562	192	-	1063	853	814	-	150
MONOLITE 350 GT	2310	2008	1532	2025	2205	315	854	569	524	121	-	1201	991	932	-	200

Dimensions	P	P1	P2	P3	P4	P5	P6	P7	P8	Øb	Øc	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in
MONOLITE 45 GT	1267	1210	670	595	350	322	715	-	-	150	150	50	50	1"	1"	-	1/2"	3/4"	1/2"	50	3/4"	
MONOLITE 70 GT	1267	1210	670	595	350	322	715	-	-	150	150	50	50	1"	1"	-	1/2"	3/4"	1/2"	50	3/4"	
MONOLITE 95 GT	1607	1550	1010	595	200	812	715	-	-	150	180	50	50	1"	1"	-	1/2"	3/4"	1/2"	50	3/4"	
MONOLITE 125 GT	1607	1550	1010	595	200	812	715	-	-	150	180	50	50	1"	1"	-	1/2"	3/4"	1/2"	50	3/4"	
MONOLITE 160 GT	2012	1296	1004	785	175	1052	450	-	-	205	200	65	65	1"	1"	-	1/2"	3/4"	1/2"	65	-	
MONOLITE 210 GT	2087	1296	1004	860	175	1052	450	-	-	205	200	65	65	1"	1"	-	1/2"	3/4"	1/2"	65	-	
MONOLITE 270 GT	2338	1546	1254	860	195	1283	580	-	-	205	200	80	80	1"1/4	1"	-	1/2"	3/4"	1/2"	80	-	
MONOLITE 350 GT	2354	1577	1205	861	220	973	580	150	150	225	250	100	100	1"	1"	1"1/2	1/2"	3/4"	1/2"	100	-	

KEY

- | | |
|------------------------------|---------------------------|
| N1 Boiler flow | N8 Inspection well |
| N2 Medium temperature return | N9 Low temperature return |
| N3 Fitting for Instruments | N10 Gas fitting |
| N4 System filling/drainage | |
| N6 Bulbs wells | T Inspection plugs |
| N7 Boiler condensation drain | |

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3.2 MONOLITE 30 JB - 670 JB

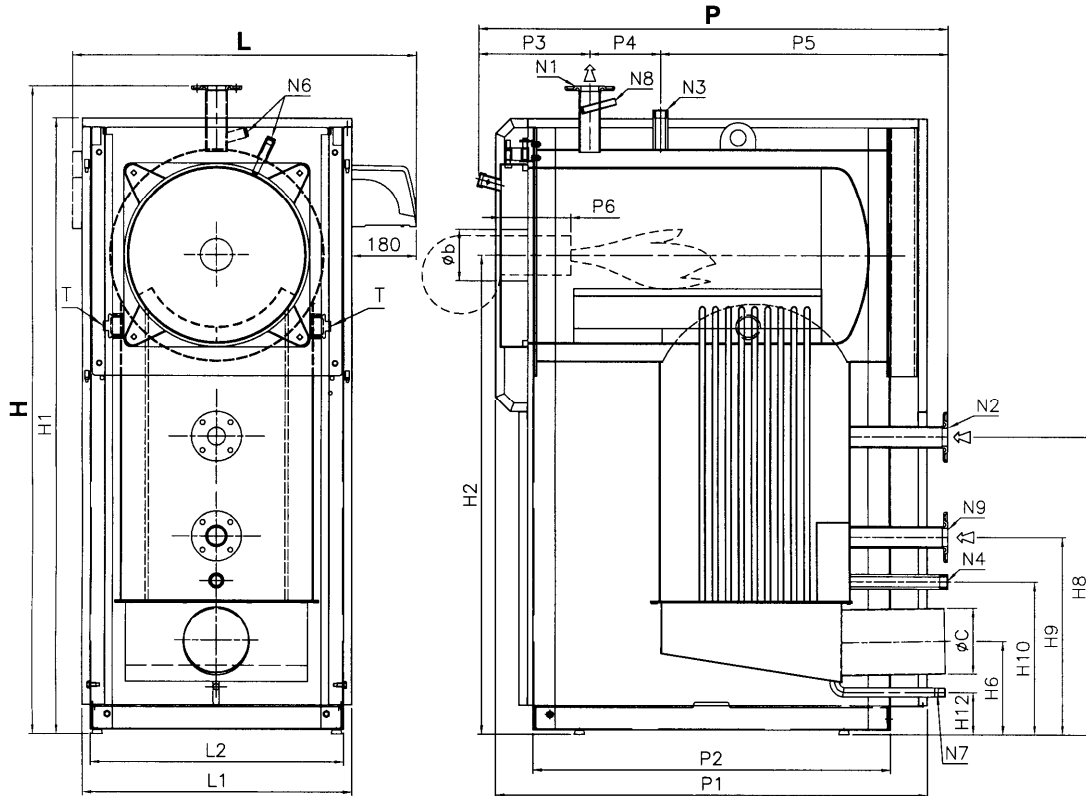
Characteristics	Heat output				Heat input		Efficiency 100% (N.C.V.)		Effic. 100% (stars)	NG max flow rate G20	NG max flow rate G30	NG max flow rate G31	Max flow rate of flues
	kW	kcal/h	kW	kcal/h	kW	kcal/h	%	%	%	m³/h	kg/h	kg/h	kg/h
	Medium Temp. 70°C		Temp. flow/return 50/30°C				Medium Temp. 70°C	Temp. flow/return 50/30°C	(Efficiency Dir. 92/42/CEE)				
MONOLITE 30 JB	31	27.200	34,6	29.722	32	27.700	98,3	107,3	****	3,41	2,53	2,50	50,81
MONOLITE 45 JB	52	45.000	57	49.200	53	45.800	98,3	107,5	****	5,64	4,18	4,14	84,04
MONOLITE 75 JB	87	75.000	95	82.000	88	76.300	98,3	107,5	****	9,39	6,97	6,89	139,91
MONOLITE 95 JB	110	95.000	120	103.800	112	96.600	98,3	107,5	****	11,89	8,82	8,73	177,16
MONOLITE 125 JB	145	125.000	158	136.700	147	127.200	98,3	107,5	****	15,65	11,62	11,49	233,19
MONOLITE 160 JB	186	160.000	203	175.000	189	162.800	98,3	107,5	****	20,03	14,87	14,71	298,45
MONOLITE 210 JB	244	210.000	266	229.600	248	213.600	98,3	107,5	****	26,28	19,51	19,30	391,57
MONOLITE 270 JB	313	270.000	343	295.300	319	274.700	98,3	107,5	****	33,80	25,09	24,81	503,62
MONOLITE 350 JB	406	350.000	445	382.800	414	356.100	98,3	107,5	-	43,82	32,52	32,17	652,92
MONOLITE 440 JB	511	440.000	559	481.200	520	447.600	98,3	107,5	-	55,08	40,88	40,43	820,69
MONOLITE 550 JB	639	550.000	699	601.500	650	559.500	98,3	107,5	-	68,84	51,10	50,54	1025,72
MONOLITE 610 JB	709	610.000	775	667.000	721	620.500	98,3	107,5	-	76,35	56,67	56,05	1137,62
MONOLITE 670 JB	779	670.000	851	732.700	792	681.600	98,3	107,5	-	83,87	62,25	61,57	1249,66

Characteristics	Minimum output				Minimum input		Efficiency at 30% (N.C.V.)		Effic. 30% (stars)	NG min flow rate G20	NG min flow rate G30	NG min flow rate G31	Min flow rate of flues
	kW	kcal/h	kW	kcal/h	kW	kcal/h	%	%	%	m³/h	kg/h	kg/h	kg/h
	Medium Temp. 70°C		Temp. flow/return 50/30°C				Medium Temp. 70°C	Temp. flow/return 50/30°C	(Efficiency Dir. 92/42/CEE)				
MONOLITE 30 JB	11	10.000	13	11.066	11	10.152	98,5	109,0	****	1,25	0,93	0,92	18,61
MONOLITE 45 JB	17	15.000	19	16.599	17	15.228	98,5	109,0	****	1,87	1,39	1,38	27,92
MONOLITE 75 JB	29	25.000	32	27.665	29	25.381	98,5	109,0	****	3,12	2,32	2,29	46,53
MONOLITE 95 JB	37	32.000	41	35.411	37	32.487	98,5	109,0	****	4,00	2,97	2,93	59,56
MONOLITE 125 JB	48	42.000	54	46.477	49	42.640	98,5	109,0	****	5,25	3,89	3,85	78,18
MONOLITE 160 JB	61	53.000	68	58.650	62	53.807	98,5	109,0	****	6,62	4,91	4,86	98,65
MONOLITE 210 JB	81	70.000	90	77.462	82	71.066	98,5	109,0	****	8,74	6,49	6,42	130,29
MONOLITE 270 JB	104	90.000	116	99.594	106	91.371	98,5	109,0	****	11,24	8,34	8,25	167,52
MONOLITE 350 JB	136	117.000	151	129.472	138	118.782	98,5	109,0	-	14,62	10,85	10,73	217,77
MONOLITE 440 JB	170	147.000	189	162.670	173	149.239	98,5	109,0	-	18,36	13,63	13,48	273,61
MONOLITE 550 JB	212	183.000	235	202.508	216	185.787	98,5	109,0	-	22,86	16,97	16,78	340,62
MONOLITE 610 JB	236	203.000	261	224.640	239	206.091	98,5	109,0	-	25,36	18,82	18,62	377,85
MONOLITE 670 JB	259	223.000	287	246.772	263	226.396	98,5	109,0	-	27,86	20,68	20,45	415,07

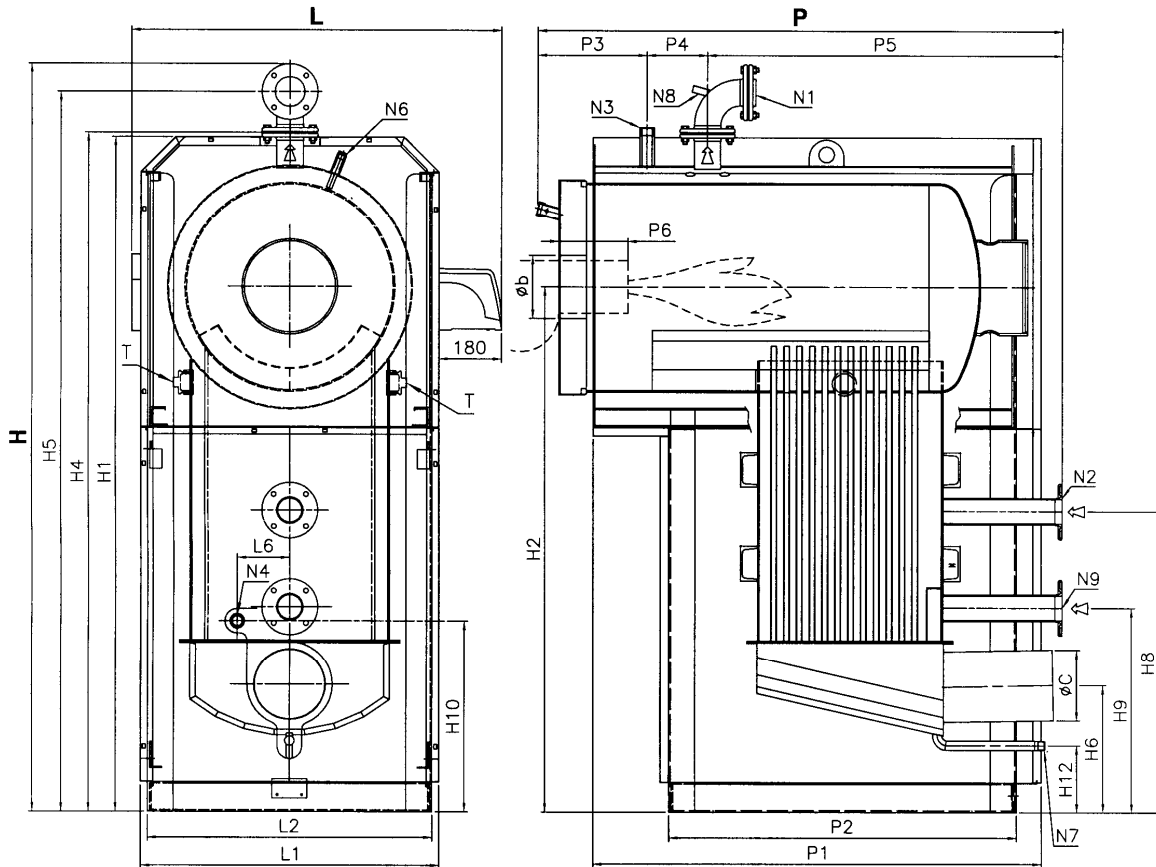
Characteristics	Pressure losses flue gas side	Heat losses through the chimney	Heat losses through the casing	Heat losses with burner off	Flue gas temp. at boiler output and air at 20 deg. C	Condense production	Press. losses water side	Design Pressure	Capacity	Boiler weight	Electric supply	Frequency	Insulation class	Electric power	Fuel	
	mbar	%	%	%	°C	kg/h	mbar	bar	l	kg	Volt ~	Hz	IP	W	Nat. gas	Lpg
		For condensing Temp. flow/return 50/30°C	For condensing Temp. flow/return 50/30°C	For condensing Temp. flow/return 50/30°C	GAS For condensing Temp. flow/return 50/30°C	Temp. flow/return 50/30°C	(ΔT=12K)							With electr. contr. (excluded pump and burner)		
MONOLITE 30 JB	0,4	1,50	0,30	0,10	50	4,04	1,4	5	160	200	230	50	IP X0D	20	X	X
MONOLITE 45 JB	0,6	1,50	0,30	0,10	50	6,68	3	5	160	200	230	50	IP X0D	20	X	X
MONOLITE 75 JB	0,8	1,50	0,30	0,10	50	11,13	8	5	150	220	230	50	IP X0D	20	X	X
MONOLITE 95 JB	1,0	1,50	0,30	0,10	50	14,09	12	5	210	280	230	50	IP X0D	20	X	X
MONOLITE 125 JB	1,1	1,50	0,30	0,10	50	18,55	22	5	200	320	230	50	IP X0D	20	X	X
MONOLITE 160 JB	1,5	1,50	0,30	0,10	50	23,74	12	5	308	520	230	50	IP X0D	20	X	X
MONOLITE 210 JB	2,0	1,50	0,30	0,10	50	31,14	22	5	285	590	230	50	IP X0D	20	X	X
MONOLITE 270 JB	2,1	1,50	0,30	0,10	50	40,05	16	5	340	680	230	50	IP X0D	20	X	X
MONOLITE 350 JB	2,3	1,50	0,30	0,10	50	51,93	11	5	392	1030	230	50	IP X0D	20	X	X
MONOLITE 440 JB	2,5	1,50	0,30	0,10	50	65,27	17	5	560	1230	230	50	IP X0D	20	X	X
MONOLITE 550 JB	2,7	1,50	0,30	0,10	50	81,58	27	5	523	1270	230	50	IP X0D	20	X	X
MONOLITE 610 JB	3,4	1,50	0,30	0,10	50	90,47	34	5	523	1270	230	50	IP X0D	20	X	X
MONOLITE 670 JB	4,1	1,50	0,30	0,10	50	99,39	41	5	523	1270	230	50	IP X0D	20	X	X

MONOLITE

Mod. 30 JB - 125 JB



Mod. 160 JB - 270 JB

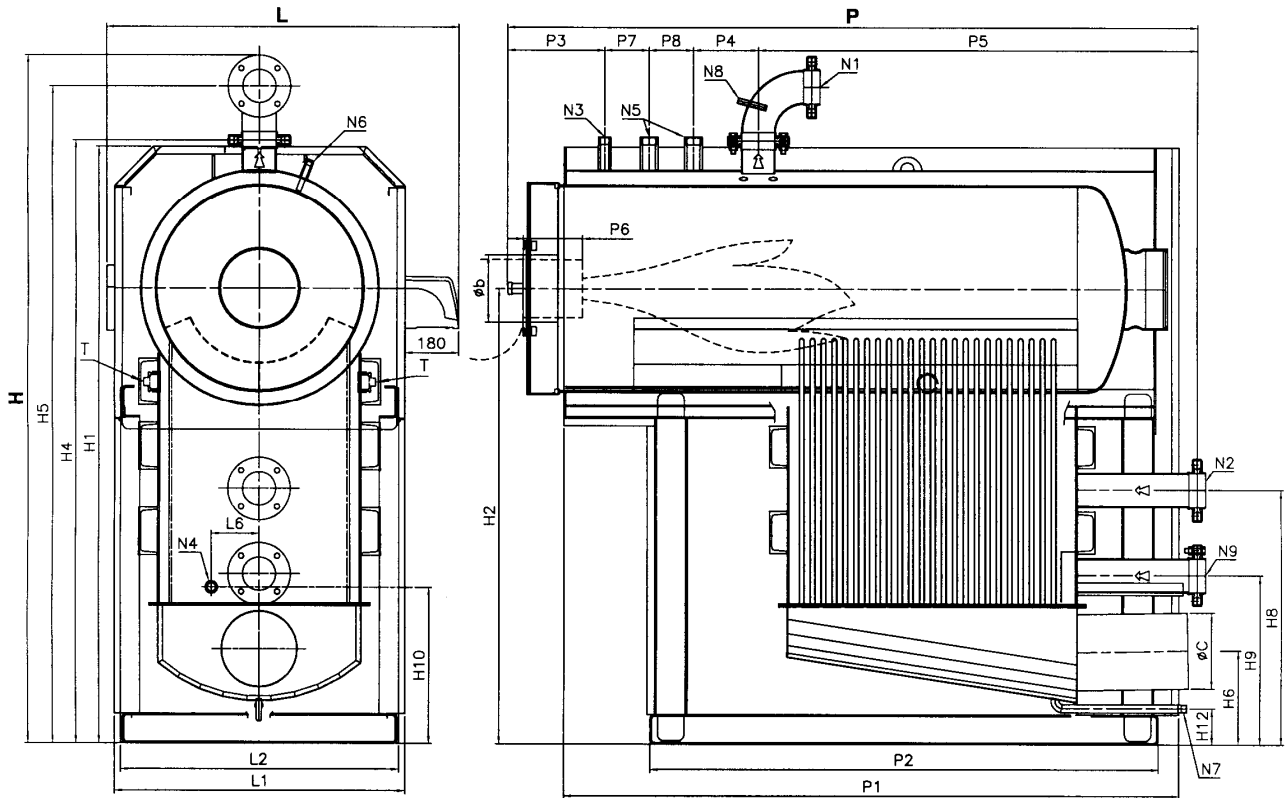


KEY

N1	Boiler flow	N7	Boiler condensation drain
N2	Medium temperature return	N8	Inspection well
N3	Fitting for Instruments	N9	Low temperature return
N4	System filling/drainage	T	Inspection plugs
N5	Safety valve(s) fitting		
N6	Bulbs wells		

MONOLITE

Mod. 350 JB - 670 JB



Dimensions	H	H1	H2	H4	H5	H6	H8	H9	H10	H12	L	L1	L2	L6
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
MONOLITE 30 JB	1825	1734	1348	-	-	264	837	557	432	125	939	756	710	-
MONOLITE 45 JB	1825	1734	1348	-	-	264	837	557	432	125	939	756	710	-
MONOLITE 75 JB	1825	1734	1348	-	-	264	837	557	432	125	939	756	710	-
MONOLITE 95 JB	1825	1734	1348	-	-	264	837	557	432	120	966	756	710	-
MONOLITE 125 JB	1825	1734	1348	-	-	264	837	557	432	120	966	756	710	-
MONOLITE 160 JB	2151	1941	1510	1952	2071	367	864	589	562	192	1063	853	814	150
MONOLITE 210 JB	2151	1941	1510	1952	2071	367	864	589	562	192	1063	853	814	150
MONOLITE 270 JB	2200	1941	1510	1955	2105	367	864	589	562	192	1063	853	814	150
MONOLITE 350 JB	2310	2008	1532	2025	2205	315	854	569	524	121	1201	991	932	200
MONOLITE 440 JB	2310	2008	1532	2025	2205	315	854	569	524	121	1201	991	932	200
MONOLITE 550 JB	2310	2008	1532	2025	2205	315	854	569	524	121	1201	991	932	200
MONOLITE 610 JB	2310	2008	1532	2025	2205	315	854	569	524	121	1201	991	932	200
MONOLITE 670 JB	2310	2008	1532	2025	2205	315	854	569	524	121	1201	991	932	200

Dimensions	P	P1	P2	P3	P4	P5	P6	P7	P8	Øb	Øc	N1	N2	N3	N4	N5	N6	N7	N8	N9
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in	DN/in
MONOLITE 30 JB	990	881	670	318	350	322	200-250	-	-	150	150	50	50	1"	1"	-	1/2"	3/4"	1/2"	50
MONOLITE 45 JB	990	881	670	318	350	322	200-250	-	-	150	150	50	50	1"	1"	-	1/2"	3/4"	1/2"	50
MONOLITE 75 JB	990	881	670	318	350	322	200-250	-	-	150	150	50	50	1"	1"	-	1/2"	3/4"	1/2"	50
MONOLITE 95 JB	1330	1221	1010	318	200	812	200-250	-	-	150	180	50	50	1"	1"	-	1/2"	3/4"	1/2"	50
MONOLITE 125 JB	1330	1221	1010	318	200	812	200-250	-	-	150	180	50	50	1"	1"	-	1/2"	3/4"	1/2"	50
MONOLITE 160 JB	1550	1296	1004	323	175	1052	250-300	-	-	205	200	65	65	1"	1"	-	1/2"	3/4"	1/2"	65
MONOLITE 210 JB	1550	1296	1004	323	175	1052	250-300	-	-	205	200	65	65	1"	1"	-	1/2"	3/4"	1/2"	65
MONOLITE 270 JB	1801	1546	1254	323	195	1283	250-300	-	-	205	200	80	80	1 1/4"	1"	-	1/2"	3/4"	1/2"	80
MONOLITE 350 JB	1817	1577	1205	324	220	973	250-300	150	150	225	250	100	100	1"	1"	1 1/2"	1/2"	3/4"	1/2"	100
MONOLITE 440 JB	2331	2092	1720	324	220	1487	250-300	150	150	225	250	100	100	1"	1"	1 1/2"	1/2"	3/4"	1/2"	100
MONOLITE 550 JB	2331	2092	1720	324	220	1487	250-300	150	150	225	250	100	100	1"	1"	1 1/2"	1/2"	3/4"	1/2"	100
MONOLITE 610 JB	2331	2092	1720	324	220	1487	250-300	150	150	225	250	100	100	1"	1"	1 1/2"	1/2"	3/4"	1/2"	100
MONOLITE 670 JB	2331	2092	1720	324	220	1487	250-300	150	150	225	250	100	100	1"	1"	1 1/2"	1/2"	3/4"	1/2"	100

4 INSTALLATION

Before connecting the boiler, carry out the following operations:

- Clean carefully all the system pipework to remove any residues that could damage impede correct boiler operation;
- Check that the flue has sufficient draught, has no restrictions, is free of all soot and residues, and is perfectly gas tight in particular to the water vapour contained in the flue gas. Check further that no other devices are connected to the flue. Take account of applicable regulations in this regard.

4.1 HEATING SYSTEM

4.1.1 Boiler room

The system must correspond to current applicable regulations. In all cases, the boiler must be installed in adequately ventilated rooms that also allow routine maintenance and repairwork.

4.2 FLUE

The pressurised boiler that is now a part of your heating system uses this denomination as the boiler includes a burner with a blower that supplies, to the combustion chamber, the quantity of air needed for the fuel, at a pressure equivalent to the sum of the air-flow pressure drops caused by the flue gas path.

The boiler flue gas connection to the chimney base must be inclined, rising in the direction of flow, with a suggested slope not less than 10%. The path of this connection shall be as short and straight as possible, any bends being designed taking account of the rules used in designing air ducts.

Chimneys must in any case be dimensioned according to Standard **UNI 13384-1**.

WARNING

The flue gas temperatures produced by MONOLITE boilers are considerably lower than in the case of non-condensing boilers, and have therefore very high relative humidity. For these reasons the chimney must be completely watertight, must withstand corrosion attack by acid condensate and must be adequately heat-insulated to guarantee sufficient draught.

4.2.1 Condensate drain

Connect condensate drain:



If the boiler is not supplied with acid condense neutralizer, a siphon must be fitted on the condensate drain in order to avoid flue gas leakage.

4.3 WATER CONNECTIONS

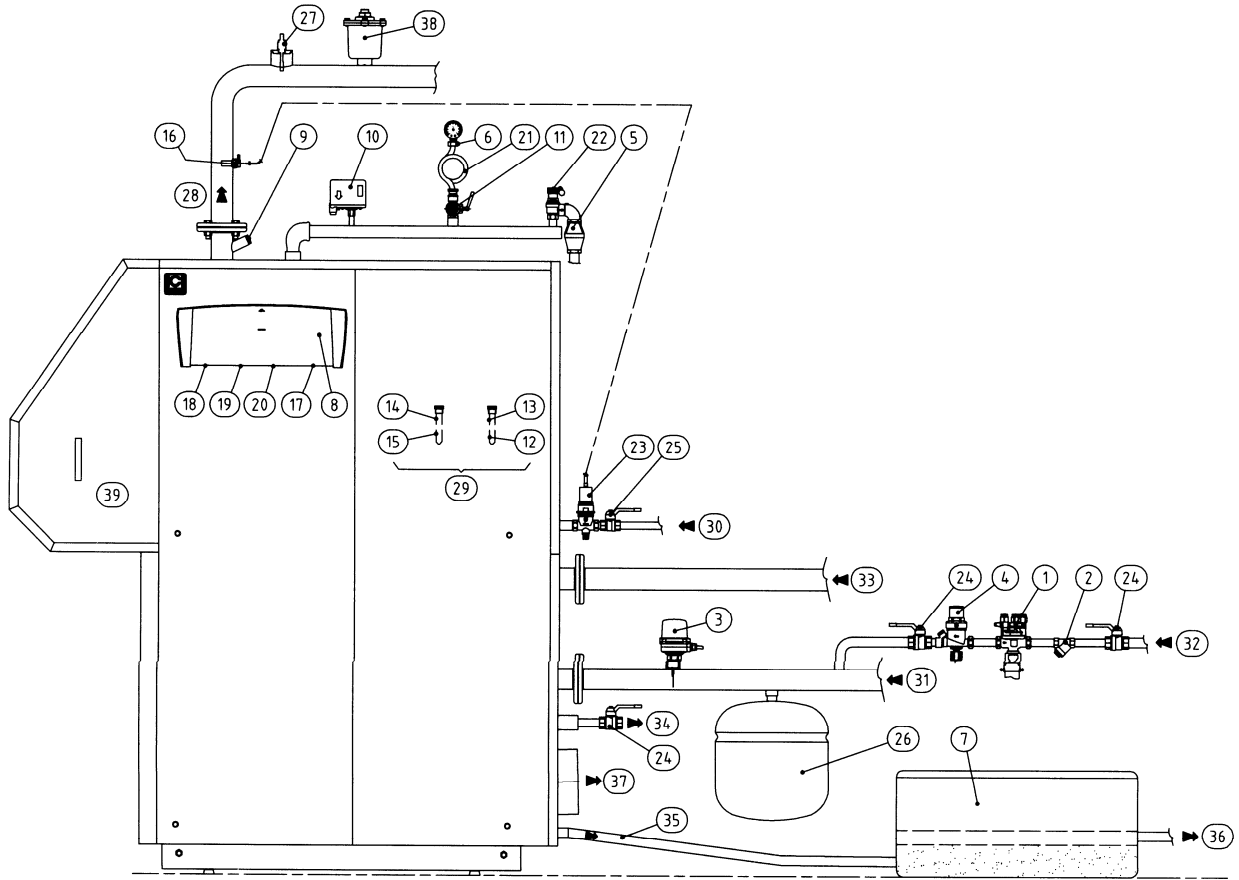
Make sure that the water pressure downstream of the water supply pressure reducer is lower than the **working pressure shown on the boiler data plate**.

- During operation, the water in the heating system increases in pressure; make sure therefore, that the maximum pressure reached does not exceed the maximum admissible pressure for the component as shown on the component number plate.
- Make sure that the safety valve discharge fittings of the boiler and of any sanitary water heater are connected to the drains via an open funnel, so that if the safety valves open, the boiler room will not be flooded.
- Make sure that the water and heating system pipework **are not used as a ground for the electrical system**: if so, serious damage can be caused in a short time to the boiler, pipework, water heater and radiators.
- Once the heating system has been filled with water, close the water supply valve, and keep it closed. Any water leaks from the system will then appear as pressure drops, as shown by the system pressure gauge.

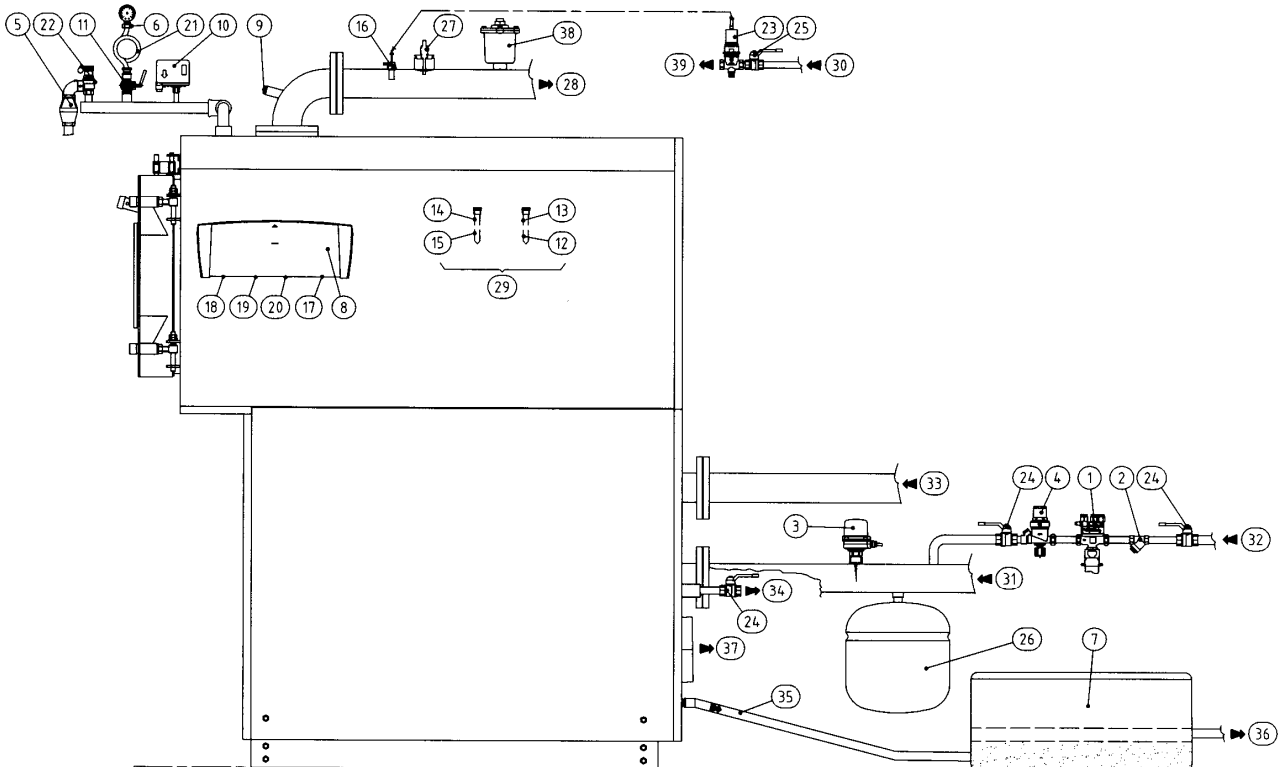
NOTE: IF ONLY ONE RETURN IS REQUIRED, ALWAYS USE THE LOW TEMPERATURE ONE

4.3.1 SEALED HOT WATER HEATING SYSTEM WITH EXPANSION VESSEL

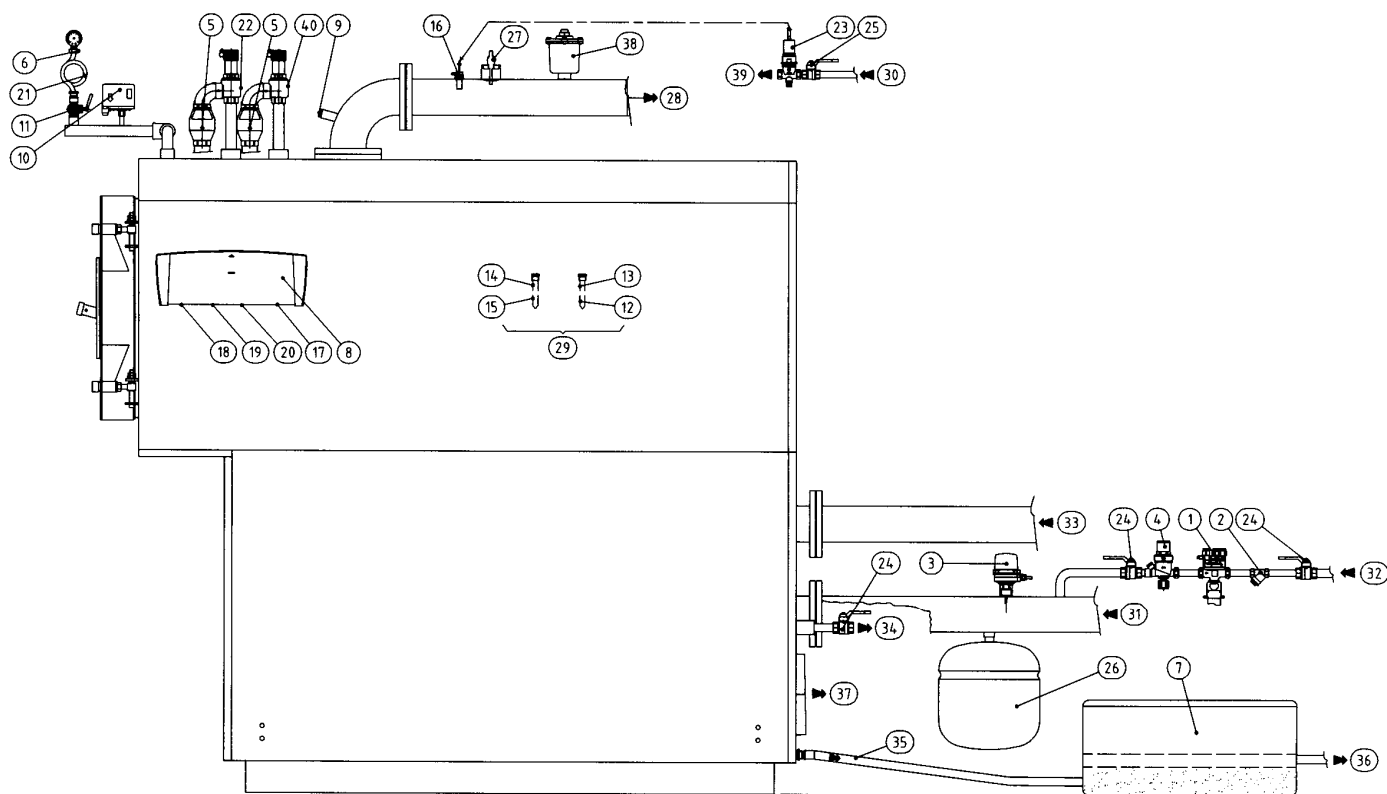
Mod. 45 - 125



Mod. 160 - 270



Mod. 350 - 670



KEY

- | | |
|------------------------------------|--|
| 1 Hydraulic disconnect switch | 22 Safety valve n° 1 (the 2 nd has a heating capacity above 580 kW) |
| 2 Filter a y | 23 Fuel shut-off valve |
| 3 Water flow switch | 24 Manual shut-off valve |
| 4 Filling unit | 25 Manual shut-off valve for gas |
| 5 Tundish with articulated joint | 26 Expansion vessel |
| 6 Pressure gauge | 27 Level probe glow plug (optional) |
| 7 Acid condense neutralizer | 28 System flow |
| 8 Boiler switchboard | 29 Probe sleeves inside the boiler |
| 9 Inspection well | 30 Gas inlet |
| 10 Safety pressure switch | 31 Low temperature return |
| 11 Pressure gauge cock | 32 Return water inlet from the plant |
| 12 Termometer probe | 33 Medium temperature return |
| 13 Safety thermostat probe | 34 Boiler exhaust |
| 14 Regulation thermostat probe n°1 | 35 Acid condense outlet |
| 15 Regulation thermostat probe n°2 | 36 Neutralized condense outlet |
| 16 Fuel shut-off valve probe | 37 Outlet flue gas |
| 17 Termometer | 38 Air vent valve |
| 18 Regulation thermostat n°1 | 39 Burner |
| 19 Regulation thermostat n°2 | 40 Safety valve n° 2 (heating capacity above 580 kW) |
| 20 Manual reset safety thermostat | |
| 21 Shock absorbing pipe | |

4.4 ELECTRICAL CONNECTION

The electrical system in a heating plant that is for building heating only, **is the object of numerous regulations, some of which are general in character, others being specific to the type of application or type of fuel.**

4.5 OPTIONAL CONTROL PANEL

The control panel (optional) with the boilers is made of self-extinguishing plastic and houses the regulation and safety instruments:

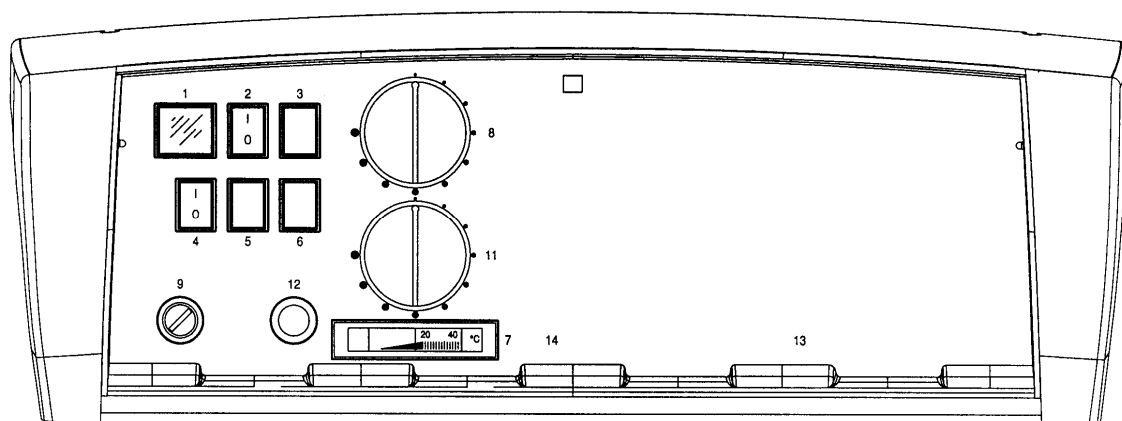


Fig. 1

LEGEND

- 1 PANEL LIVE
- 2 BURNER SWITCH N. 1
- 4 HEATIN PUM SWICTH
- 7 BOILER THERMOMETER
- 8 BOILER LIMIT THERMOSTAT
- 9 SAFETY LIMIT THERMOSTAT
- 11 2nd FLAME THERMOSTAT

The upper part of the control panel can be rotated to gain access to the terminal board and uncoil the thermostat and thermometer capillaries. A copy of the wiring diagram is contained inside the control panel cover. The **control thermostats (TR1-TR2)** have an operating range from 0° to 90° and can be set by the user by means of the front dial.

Safety limit thermostats (TS) has a fixed setting of 100 (+0/-6)°C and can be manually reset.

For correct installation, refer to the boiler casing assembly instructions.

4.6 STARTING

Open the gas tap (check if there is any gas leakage).

Switch on the burner and heating pump on the control panel.

At this point if the water temperature inside the boiler is less that the value set up on the control thermostat and the room thermostat/timer (if present) is closed, the burner and the pump will run.

NB.

It is common to find air inside the gas pipe-work, especially during the initial start up or after a long period of without use. So if the flame failure occurs, repeat the same operation as previously explained.

NOTE: control pumps are running.

CONNECTION LIVE/NEUTRAL

If the connections of the live and the neutral are not correct, the burner will stop at the end of the safety time (even if the burner is running).

4.7 INVERTING THE DOOR APERTURE (MOD. 45 GT/125 GT)

The door can be opened in either direction (RH or LH). For the door height adjustment see Fig. 2.

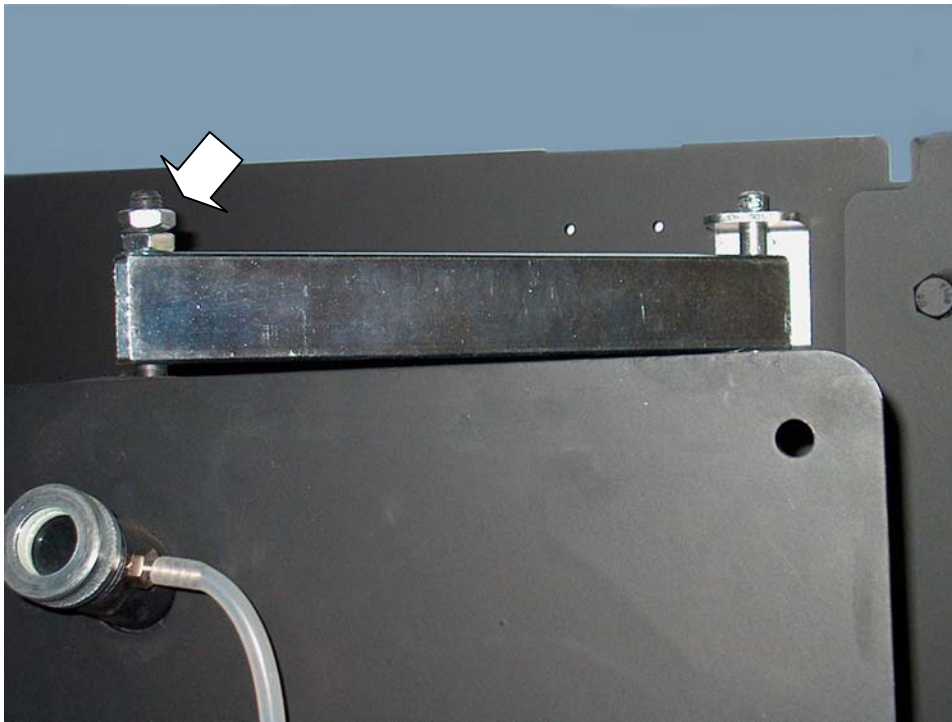


Fig. 2 – Door clamping arm

4.8 INVERTING THE DOOR APERTURE (mod. 160 GT/JB - 350 GT/670 JB)

If the door is to be opened to the opposite side, act as follows:

1. Switch the outside nut (or bush) of one hinge with the diametrically opposite closure bush; then at the hinge side, fasten the cone to the door with the inside nut.
2. Repeat the operation for the other hinge.
3. For any adjustment needed, act on the specific hinge nuts.

4.9 PRESSURISED BOILER CONNECTION

Before installation, clean the inside of all the fuel supply pipes, to remove any residues that might compromise correct boiler operation. Check the maximum combustion chamber pressure, as shown in the technical characteristics table. The observed value can increase by 20 % if the fuel used is not gas or light fuel oil, but heavy oil; further, make the following checks:

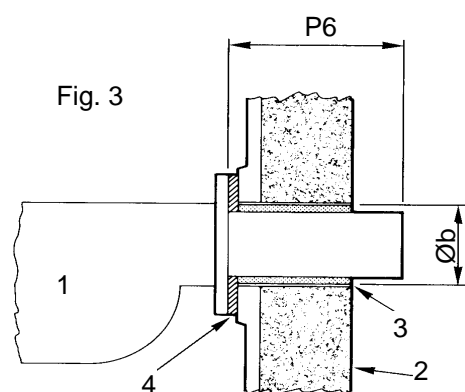
- a) check the internal and external fuel supply system for any leaks;
- b) adjust the fuel supply rate as to the required boiler heat rating;
- c) check that the boiler is supplied with the type of fuel for which it has been arranged;
- d) check that the fuel supply pressure is within the values shown on the burner data plate;
- e) check that the fuel supply system is dimensioned adequately for the fuel supply rate that the boiler requires, and that the fuel supply system is complete with all the safety and control devices foreseen by current applicable regulations.

In particular for the use of gas:

- f) check that the gas line and collector pipes conform to current applicable standards and regulations;
- g) check that all gas connections are perfectly gas-tight;
- h) check that the boiler room ventilation openings are dimensioned to guarantee an air flow as foreseen by applicable regulations, and in any case sufficient for perfect combustion;
- i) check that the gas pipes are not used as a ground (earth) for electrical devices.

If the boiler will not be used for some time, close the fuel supply.

IMPORTANT: check that the spaces between the burner sleeve and the boiler door are filled with thermal insulation (Fig. 3). A piece of ceramic fibre insulation rope is provided with the boiler. If this is not suited to the specific burner fitted, use a rope of another diameter, of the same type of material.



KEY:

1. Burner
2. Manhole
3. Thermoinsulating material
4. Flange

All details on the draught tube length (**P6**), the diameter of the burner hole (**Øb**) and the pressurization are included in the par. Technical Specifications.

4.10 WIRING DIAGRAM

See wiring diagram inside the boiler control panel supplied:

- Control panel with thermostats (standard)
- Control panel with RVA 43 digital controller for high/low burners (optional)
- Control panel with RVA 63 digital controller for modulating burners (optional)

REMARK: specific instruction are provided along the digital controllers control panels.

5 FITTING THE BOILER CASING

5.1 BOILER BODY INSULATION (Fig. 4-5-6)

- Wrap glass wool (A) around the column and attach with the clips.
- Wrap glass wool (B) around the upper cylindrical boiler body without covering the shaft/bulb holder located near the flanged outlet pipe and fix in position with the clips supplied.
- Then insulate the rear boiler plate, attaching the wool (C) to the springs on the edge of the plate (see figure).

5.2 BOILER CASING MOD. 45 GT/125 GT – 30 JB/125 JB (Fig. 4)

- Fit the panel (1D) by hooking the upper profile to the square tube and the lower to the boiler longheron. Repeat the same procedure for panel (1S).
- Fit the panel (2D) by hooking the upper profile to the square section tube and the lower to the boiler longheron, making sure that the side panels are joined by the specific coupling pins. Repeat the procedure for panel (2S) with the burner-control panel connection cables passing through the aperture (for the wiring harness please refer to the control panel diagram and to the standard plugs connection kit).
- Unwind the thermostat capillaries, fit the control panel (3) to the side (RH or LH), fastening with the screw, then insert the bulbs in the pocket. Hook the upper rear panel (4) to the sides.
- Fasten the support bracket (5) to the frame base L profile; insert the cable grommets in the panel holes (6S), hook the panel to the side panel and feed through the supply cable, then connecting the cable to the junction box. Hook on the panel (6D) and then fasten both using the screws at the top, and close the holes with the specific plugs provided (see figure).
- Fix the front/upper panel supports (7) to the boiler plate (excluded JB) and put on the upper panels (8S) and (8D). Hook on the front/lower panel (9) and the front/upper panel (10). For JB models, hook the front/central panel (10a) and the front/upper panel (10b). Finally, screw the document holder (11) on to the opposite side of the control panel (excluded mod. 30/45/75).

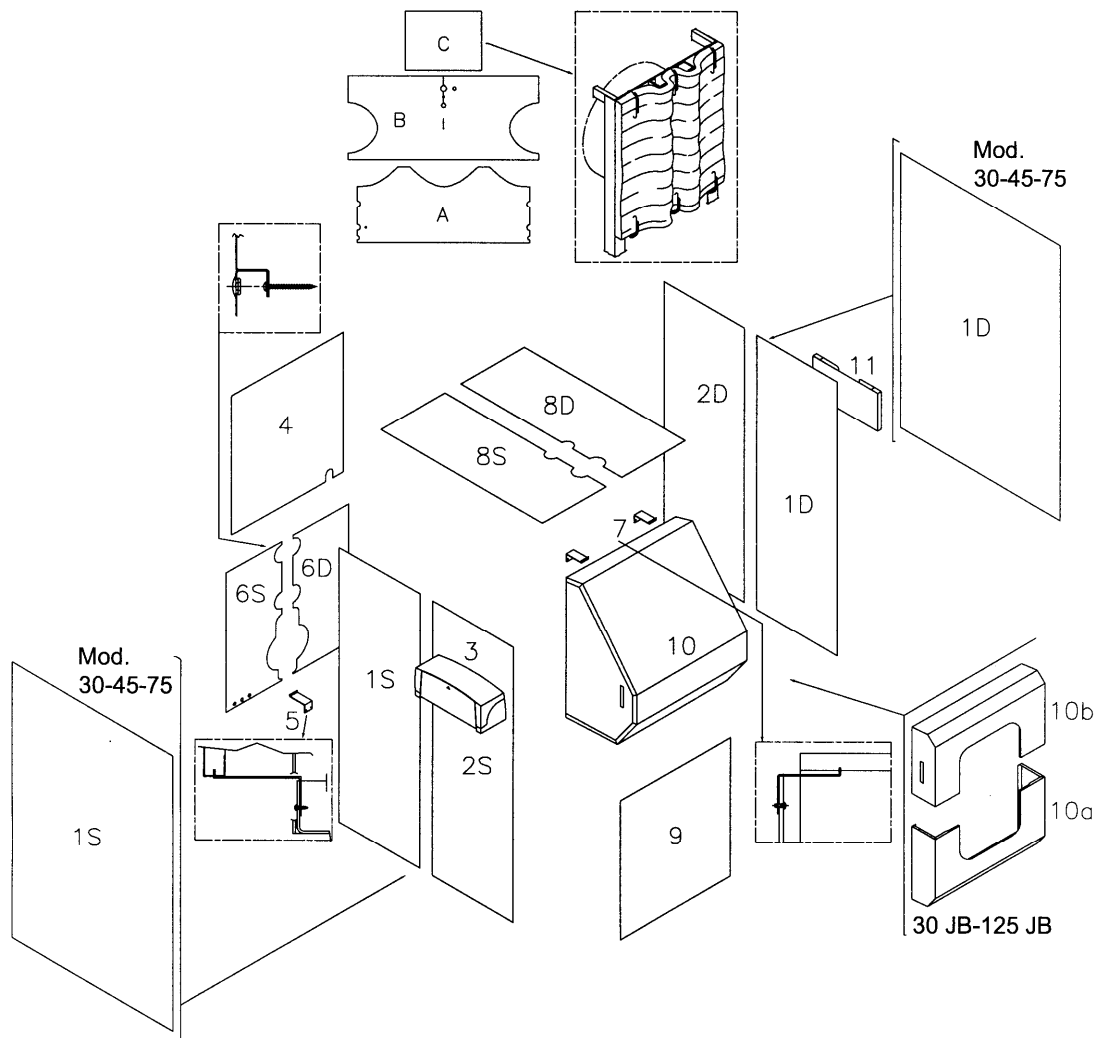


Fig. 4

5.3 BOILER CASING mod. 160 GT/ JB-270 GT/ JB (Fig. 5)

- Fit the panel (1D) by hooking the upper profile to the square tube and the lower to the boiler longheron. Repeat the same procedure for panel (1S).
- Fit the panel (2D) by hooking the upper profile to the square section tube and inserting it in the slots in the lower panel. Repeat the procedure for panel (2S) with the burner-control panel connection cables passing through the aperture (for the wiring harness please refer to the control panel diagram and to the standard plugs connection kit).
- Unwind the thermostat capillaries, fit the control panel to the side, fastening with the screw, then insert the bulbs in the pocket. Fit the upper panels (4S and 4D).
- Mount the panel (5); attach the support bracket (6) to the corner of the frame base, position the panel (7D) and then the panel (7S) with fairlead attached to its side panels. Screw on tightly and plug the passage holes with the appropriate caps. Attach the front/central panel with fairlead (8) and the front/lower panel (9). Finally, screw the document holder (10) on to the opposite side of the control panel.

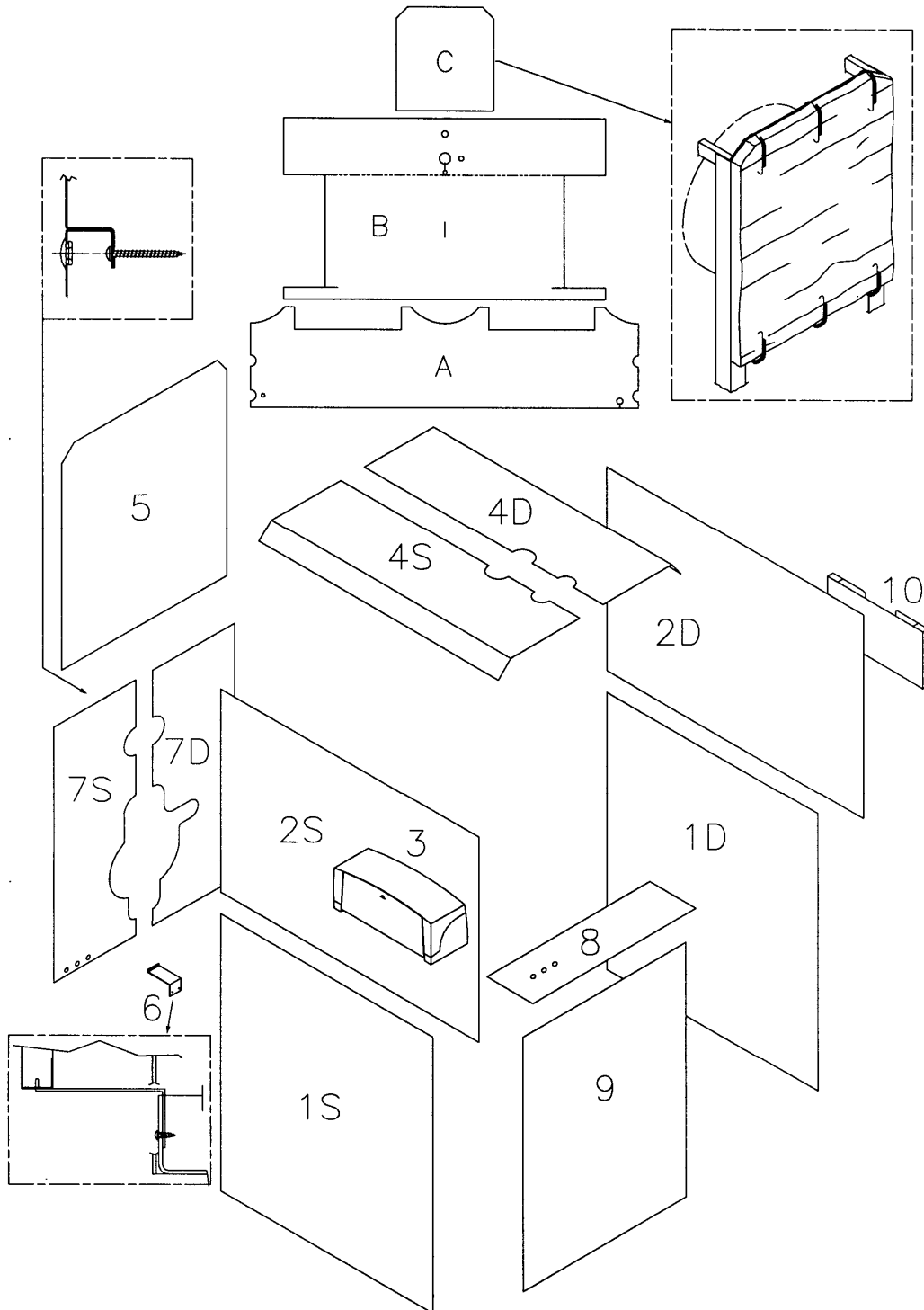


Fig. 5

5.4 BOILER COVERING mod. 350 GT/JB-670 JB (Fig. 6)

- Mount the panels (1D) fixing the lower folds on to the metal strut on the boiler and attaching the upper ones to the centre with the appropriate screws. Repeat the same procedure for the panels (1S).
- Mount the panels (2D) fixing the upper folds to the rectangular tube and inserting them into the appropriate slits in the lower panels. Repeat the same procedure for the panels (2S) leaving the burner-control panel connection cables sticking out from the existing opening (for the wiring harness please refer to the control panel diagram and to the standard plugs connection kit).
- Unwind the thermostat capillaries, attach the control panel (3) to the side with a screw, then insert the bulbs into the shaft.
- Mount the upper panels (4P), (4D) and (4S) with screws and plug the holes with the caps.
- Mount the panel (5); attach the support bracket (6) to the frame base, position the panel (7D) and then the panel (7S) with fairlead attached to its side panels. Screw on tightly and plug the passage holes with the appropriate caps.
- Attach and screw on the front/central (8) and front/lower (9) panels.
- Finally, screw the document holder (10) on to the opposite side of the control panel.

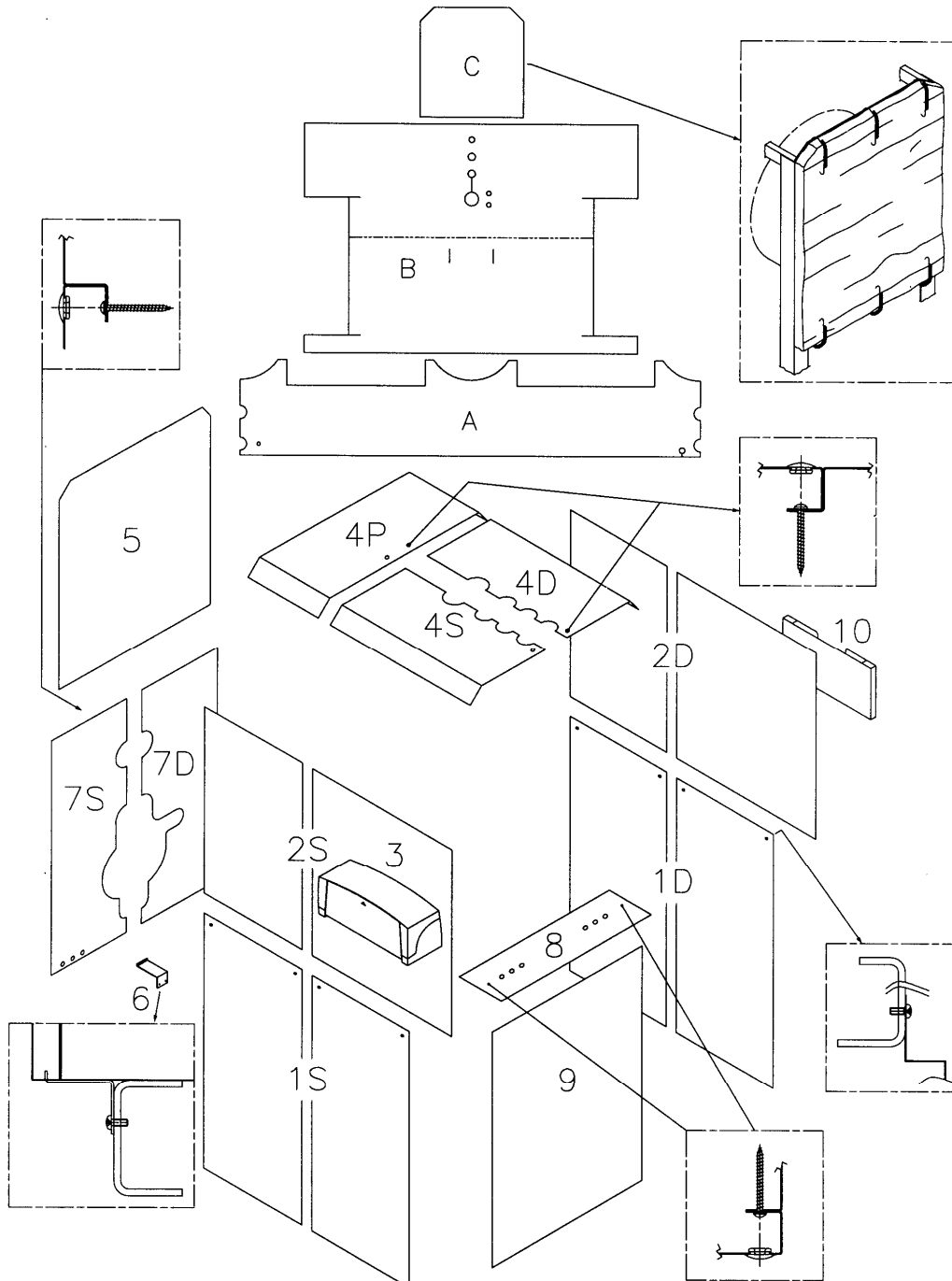


Fig. 6

6 STARTING

IMPORTANT: before starting insert the flue gas baffles completely in the flue gas pipes, pushing them in by at least 100 mm.

6.1 PRELIMINARY CHECKS

Before starting the boiler, make sure that:

- The number plate data corresponds to the electrical, water and liquid or gas fuel supply data;
 - The burner rating is compatible with that of the boiler;
 - The burner and boiler instructions are available in the boiler room;
 - The chimney operates correctly;
 - The ventilation openings are adequately dimensioned and free of all obstacles;
 - The door, the combustion chamber and the burner plate are closed so that the boiler is gas tight at all positions;
 - The system has been filled with water and that any air locks have been eliminated;
 - There is frost protection;
 - The water circulation pumps operate correctly;
 - The expansion tank and the safety valve(s) are correctly connected (with no valves) and operative.
- Check the electrical system and that the thermostats are operative.

6.2 WATER TREATMENT

If the boiler is to be installed in an existing system where there could be frequent losses from the system or if the hardness of the water is greater than 10 F, it will be necessary to use a filter and a softener for system water and control the pH above 8-9.

The most common phenomena in heating systems are:

- Furring (calcareous deposits of Calcium Carbonate)

Furring impedes heat exchange between the flue gases and the water, thereby increasing the temperature of parts exposed to the flame and reducing considerably the boiler life. Furring concentrates where the boiler wall temperature is higher, and the best defence against this phenomenon is a boiler design that eliminates high temperature spots.

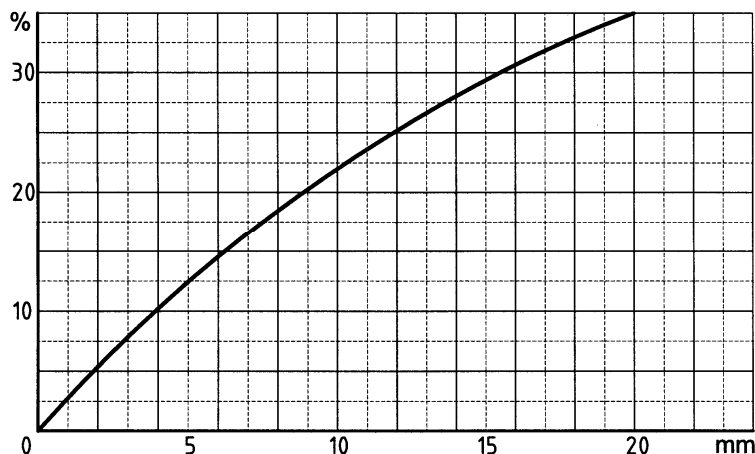
Furring represents an insulation layer that decreases heat exchange, penalising boiler efficiency. This means that a large part of the combustion heat is not transferred to the water, but leaves the system via the chimney.

Calcium Carbonate Diagram

Legend

% % unused fuel

mm mm furring



- Water-side corrosion

Corrosion of metallic boiler surfaces, waterside, is due to Iron dissolving to form ions (Fe⁺). In this process, the presence of any dissolved gas plays a major role, in particular oxygen and carbon dioxide. Often there are corrosion phenomena with softened and demineralised water, which are by their nature aggressive to iron (acid water, that is with pH < 7): in these cases though clearly there will be no furring, corrosion remains a risk and it will be necessary to condition the feedwater with corrosion inhibitors.

6.3 FILLING THE SYSTEM

The water must enter the system as slowly as possible, and in proportion to the rate of air purge from the components involved. In the case of a system with a closed expansion tank, water is injected until the pressure gauge reaches the static pressure for the tank. Then proceed to heat the water to the maximum allowed plant temperature, but not higher than 90°C. During this operation, the air in the system purges from the automatic or manual air separators fitted to the system. On completion of the air purge, bring the pressure to the set value and close the manual and/or automatic water supply valve.

7 OPERATION

7.1 OPERATION CHECKS

The heating system must be used suitably, ensuring on the one hand, optimum combustion with reduced emission to the atmosphere of carbon monoxide, hydrocarbons and soot, and on the other avoiding all damage to persons and property.

The pressurisation must remain within the limit values shown in the technical data table.

The burner switch should always remain on; this ensures that the boiler water temperature remains near the value set by the thermostat.

In the case of flue gas leaks from the front of the boiler (door and burner plate), the closure tie rods of the single parts must be adjusted; if this is not sufficient, replace the gaskets.

WARNING

Do not open the door and do not remove the fume chamber while the burner is in operation. In all cases wait a few minutes after stopping the burner for the insulation to cool.

7.2 TEMPORARY BOILER STOP

To stop the boiler temporarily, set the main switch on the control panel to "OFF". The electrical parts will now be free of tension.

7.3 PROLONGED BOILER STOP

Close the gas valve that is fitted upstream of the boiler.

WARNING: during long stoppages in winter, and in order to avoid frost damage, drain both the sanitary water* and the heating system water; drainage of the latter can be avoided by adding antifreeze.

- **Boiler with water heater**

7.4 PERIODICAL USER CHECKS

- Check periodically that there is no air in the heating system, and if necessary open the blow-off valve at the top of the boiler.
- Periodically check the boiler pressure.

7.5 MAINTENANCE AND CLEANING

All maintenance and cleaning can only be carried out only after closing the fuel supply and switching off the electrical supply.

As economic operation depends on the cleanliness of the heat exchanger surfaces and on burner adjustment, it is well to:

- Have the burner settings checked by professionally qualified personnel;
- **Analyse the system water and allow for adequate water treatment to avoid the formation of calcareous incrustations that initially reduce boiler efficiency, and then lead to damage;**

IMPORTANT

It is recommended to check periodically possible scale deposits through the side inspection plugs (see par. Technical Data): if necessary, carry out chemical washing.

- Check that the cladding and the flue gas sealing gaskets are in good order and if not, replace;
- Periodically check the efficiency of the regulation and safety instruments on the system.



alta tecnologia del calore

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C.C.I.A.A. VR n. 69600

Appartenente al Gruppo Finluc
Iscritto R.I. VR 02245640236

DECLARATION OF CONFORMITY WITH THE EUROPEAN COMMUNITY REGULATIONS

I undersigned Emanuela Lucchini, Managing Director of ICI CALDAIE S.p.A. headquartered in via G. Pascoli 38 – 37059 Campagnola di Zevio (VR) Italia.

DECLARE THAT BOILERS MONOLITE 45 GT, 70 GT, 95 GT, 125 GT with burner MONOLITE 160 GT, 210 GT, 270 GT, 350 GT body only* MONOLITE JB

comply with the CE certificate and with the following regulations (or harmonised regulations):

EN 60335-1, EN 303-1, pr EN 303-3

In accordance with the boards regulations:

- Gas Directive 90/396/CEE
- Low Voltage Directive 73/23/CEE (modified by 93/68)
- Efficiency Directive 92/42/CEE
- EMC Directive 89/336/CEE

S. Maria di Zevio, 14/03/2007

ICI CALDAIE S.p.A.
Direttore Generale
Emanuela Lucchini

*The declarations of conformity of the burner are attached to the boiler documentation.



Appartenente al Gruppo Finluc, iscritto R.I. VR n. 02245640236

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