3 Technical specifications

3.1 Homologations

3.1.1 Safety, Performance & Quality

This boiler has been assessed by an appropriate Notified Body and shown to meet the requirements of all Directives and Regulations as applicable. These Directives and Regulations lay down requirements for the safety and efficiency of the appliance, together with its design, construction and use of materials. They also require the production process to be covered by an approved and monitored system of quality assurance.

3.1.2 Certifications

Tab.1 Certifications

CE certificate number	0085CU0338	UKCE certificate number	748353
NOx class	6		
Boiler type	C_{13}, C_{33}	G.C. nos. 824-2: 47-077-63 830-2: 47-077-64 836-2: 47-077-65	

3.1.3 Gas category

Tab.2 Gas category, type and supply pressure

Gas category	Gas type	Supply pressure (mbar)
I_{2H}	G20 (H natural gas)	20
I_{3P}	G31 (P LPG)	37

Important
This appliance is suitable for G20 gas containing up to 20% hydrogen (H_2). Due to variations in the percentage of H_2, the percentage of O_2 may vary over time. (For example: 20% of H_2 in the gas may lead to a 1.5% increase of O_2 in the flue gases) The gas valve may need to be adjusted more accurately. This must be adjusted using standard O_2 values for the gas used.

3.1.4 Standards

Codes of Practice — refer to the most recent version

Tab.3 In GB the following Codes of Practice apply:

Standard	Scope
BS 6891	Gas Installation.
BS 5546	Installation of hot water supplies for domestic purposes.
BS EN 12828	Heating systems in buildings.
BS EN 12831	Heating systems in buildings — Calculation of load.
BS EN 14336	Installation & commissioning of water based heating sys tems.
BS 6798	Installation of gas fired hot water boilers.
BS 5440 Part 1	Flues.
BS 5440 Part 2	Ventilation.

Standard	Scope
BS 7074	Expansion vessels and ancillary equipment for sealed wa ter systems.
BS 7593	Treatment of water in domestic hot water central heating systems.
BS 4814	Specification for Expansion Vessels using an internal dia phragm, for sealed hot water systems.
IGE/UP/ 7/1998	Guide for gas installations in timber framed housing.

Tab.4 In IE the following Code of Practice apply:

Standard	Scope
IS 813	Domestic Gas Installations.
The following standards give valuable additional information:	
BS 5546	Installation of hot water supplies for domestic purposes.
BS EN 12828	Heating systems in buildings.
BS EN 12831	Heating systems in buildings — Calculation of load.
BS EN 14336	Installation & commissioning of water based heating sys tems.
BS 7074	Expansion vessels and ancillary equipment for sealed wa ter systems.
BS 7593	Treatment of water in domestic hot water central heating systems.

3.2 Technical data

3.2.1 Technical information

Important
All data in these sections are nominal and subject to normal pro duction tolerances.

Tab.5 Technical settings for combination heaters with boilers

			24 Combi	30 Combi	36 Combi
Condensing boiler			Yes	Yes	Yes
Low-temperature boiler(1)			No	No	No
B1 boiler			No	No	No

			24 Combi	30 Combi	36 Combi
Cogeneration space heater			No	No	No
Combination heater			Yes	Yes	Yes
Rated heat output	*Prated*	kW	20	25	25
Useful heat output at rated heat output and high temperature setting (2)	*P4*	kW	20.0	25.0	25.0
Useful heat output at 30% of rated heat output and low temperature setting(1)	*P1*	kW	6.7	8.4	8.4
Seasonal space heating energy efficiency	*ηs*	%	94	94	94
Useful efficiency at rated heat output and high temperature setting(2)	*η4*	%	88.2	88.1	88.1
Useful efficiency at 30% of rated heat output and low temperature setting(1)	*η1*	%	99.0	98.8	98.8
Auxiliary electricity consumption					
Full load	*elmax*	kW	0.046	0.061	0.071
Partial load	*elmin*	kW	0.008	0.009	0.009
Standby mode	*PSB*	kW	0.004	0.004	0.004
Other items					
Heat loss on standby	*Pstby*	kW	0.04	0.04	0.04
Ignition burner power consumption	*Pign*	kW	0	0	0
Annual energy consumption	*QHE*	GJ	62	77	77
Sound power level, indoors	*LWA*	dB	50	51	51
Nitrogen oxide emissions	NOx	mg/kWh	32	31	31
Domestic hot water parameters					
Declared load profile			XL	XL	XL
Daily electricity consumption	*Qelec*	kWh	0.146	0.140	0.138
Annual electricity consumption	*AEC*	kWh	32	31	30
Water heating energy efficiency					
Daily fuel consumption	*Qfuel*	kWh	20.547	20.438	20.473
Annual fuel consumption	*AFC*	GJ	16	16	16

(1) Low temperature means for condensing boilers 30 °C, for low temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet).
(2) High temperature setting means 60 °C return temperature at boiler inlet and 80 °C flow temperature at boiler outlet.

Tab.6 General

		24 Combi	30 Combi	36 Combi
Rated heat input (Qn) for domestic hot water	kW	24.7	30.9	36.9
Rated heat input (Qn) for heating	kW	20.6	25.7	25.7
Reduced heat input (Qn) 80/60 °C	kW	4.9	6.0	7.4
Rated heat output (Pn) for domestic hot water	kW	24.0	30.0	36.0
Rated heat output (Pn) 80/60 °C for heating	kW	20	25	25
Rated heat output (Pn) 50/30 °C for heating	kW	21.8	27.1	27.1
Reduced heat output (Pn) 80/60 °C	kW	4.8	5.8	7.2
Reduced heat output (Pn) 50/30 °C	kW	5.2	6.3	7.6
Rated efficiency 50/30 °C (Hi)	%	105.8	105.8	105.8

		24 Combi	30 Combi	36 Combi
Rated heat input (Qn) for domestic hot water (G20+20%H2)	kW	23.6	29.5	35.1
Rated heat input (Qn) for heating (G20+20%H2)	kW	19.7	24.5	24.5

Tab.7 Characteristics of the heating circuit

		24 Combi	30 Combi	36 Combi
Maximum pressure	bar	2.5	2.5	2.5
Minimum pressure	bar	0.5	0.5	0.5
Temperature range for heating circuit	°C	25−80	25−80	25−80
Water capacity of expansion vessel	l	7	7	7

Tab.8 Characteristics of the domestic water circuit

		24 Combi	30 Combi	36 Combi
Minimum pressure	bar	0.8	0.8	0.8
Maximum pressure	bar	8.0	8.0	8.0
Minimum dynamic pressure	bar	0.15	0.15	0.15
Minimum water flow	l/min	2.0	2.0	2.0
Specific flow (D)	l/min	11.5	14.3	17.2
Temperature range for domestic water circuit	°C	35-60	35-60	35-60
Domestic water production with ΔT = 25 °C	l/min	14.1	17.6	21.0
Domestic water production with ΔT = 35 °C	l/min	10.2	12.2	15.0

Tab.9 Combustion characteristics

		24 Combi	30 Combi	36 Combi
G20 gas consumption (Qmax)	m^3/h	2.61	3.26	3.9
G20 gas consumption (Qmin)	m^3/h	0.52	0.63	0.78
Diameter of coaxial discharge pipes	mm	60/100	60/100	60/100
Flue gas mass flow rate (max)	kg/sec	0.011	0.014	0.017
Flue gas mass flow rate (min)	kg/sec	0.002	0.003	0.004

		24 Combi	30 Combi	36 Combi
G31 (LPG) gas consumption (Qmax)	kg/h	1.92	2.4	2.86
G31 (LPG) gas consumption (Qmin)	kg/h	0.38	0.47	0.58

Tab.10 Electrical characteristics

		24 Combi	30 Combi	36 Combi
Power supply voltage	V	230	230	230
Power supply frequency	Hz	50	50	50
Rated electric power	W	85	88	91

Tab.11 Other characteristics

		24 Combi	30 Combi	36 Combi
Humidity protection rating (EN 60529)	IP	X5D	X5D	X5D
Net weight when empty/filled with water	kg	28/30	29/31	30/31
Dimensions (height/width/depth)	mm	700/395/285	700/395/285	700/395/285

3.2.1 Features of the temperature sensors

Tab.12 Temperature sensor outdoor sensor (NTC1000 Beta 3688 1 kOhm@25 °C)

Temperature [°C]	-20	-16	-12	-8	-4	0	4	8	12	16	20	24
Resistance [Ω]	7578	6166	5046	4152	3435	2857	2387	2004	1690	1433	1217	1040

Tab.13 Temperature flow/heating circuit return sensor (NTC10K Beta 3977 10 kOhm@25 °C)

Temperature [°C]	0	10	20	25	30	40	50	60	70	80	90
Resistance [Ω]	32505	19854	12483	9999	8060	5332	3608	2492	1754	1257	915

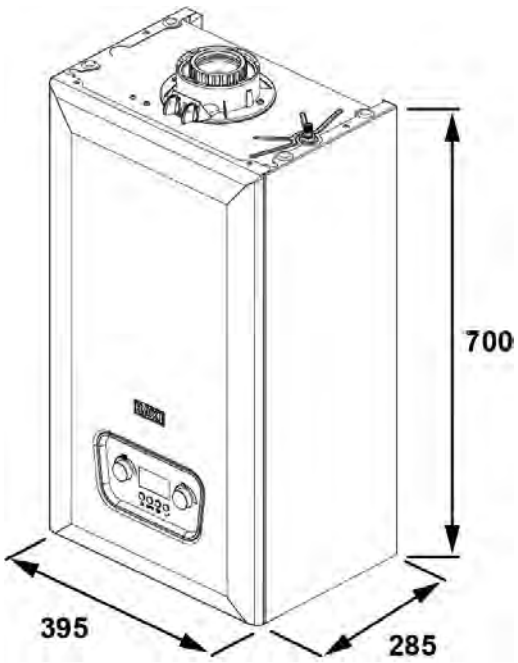
Tab.14 Flue gas temperature sensor (NTC20K Beta 3970 20 kOhm@25 °C)

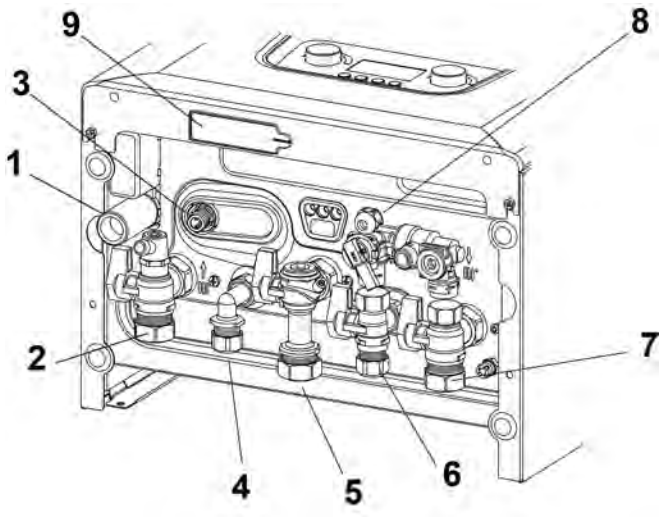
Temperature [°C]	0	10	20	25	30	40	50	60	70	80	90	100
Resistance [Ω]	66050	40030	25030	20000	16090	10610	7166	4943	3478	2492	1816	1344

— — — — —>	110	120	130	140	150	160	170	180	190	-	-	-
— — — — —>	1009	768	592	461	364	290	233	189	155	-	-	-

3.3 Dimensions and connections

Fig.3 Dimensions and connections





1 Condensate outlet
2 Heating circuit flow fitting (G3/4”)
3 Pressure relief & drain
4 DHW (Domestic Hot Water) outlet fitting (G1/2”)
5 Gas inlet fitting (G3/4”)
6 Domestic cold water inlet fitting (G1/2”)
7 Heating circuit return fitting (G34")
8 Cable gland
9 Boiler ID inc. serial number