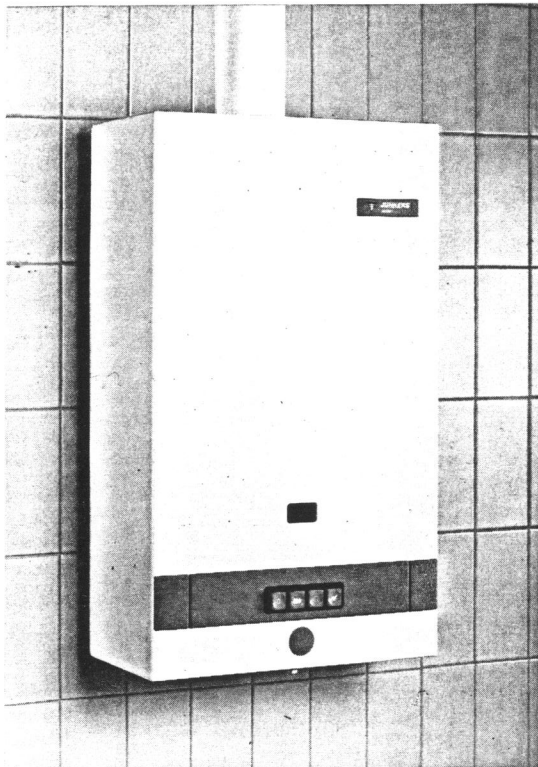


Gas Instantaneous Water Heaters

WR 250 K...T1
 WR 325 K...T1
 WR 400 K...T2



FOR YOUR SAFETY

If you smell gas:

1. Turn off gas cut-off tap
2. Open windows
3. Do not actuate any electrical switches
4. Extinguish naked flames
5. Immediately contact gasworks

Do not store or use flammable materials or liquids near the unit.

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- THE UNIT MAY BE INSTALLED ONLY BY AN AUTHORISED PERSON.
- Perfect functioning of the unit is guaranteed only by following this specification and the instruction manual.
- The customer shall be provided with these installation instructions.
- The fitter shall explain the function and operation of the unit to the customer.
- Regular maintenance is necessary for reliable and safe functioning of the unit. Maintenance may be carried out only by an authorised person.

Construction and Connecting Measurements

All dimensions in millimeters

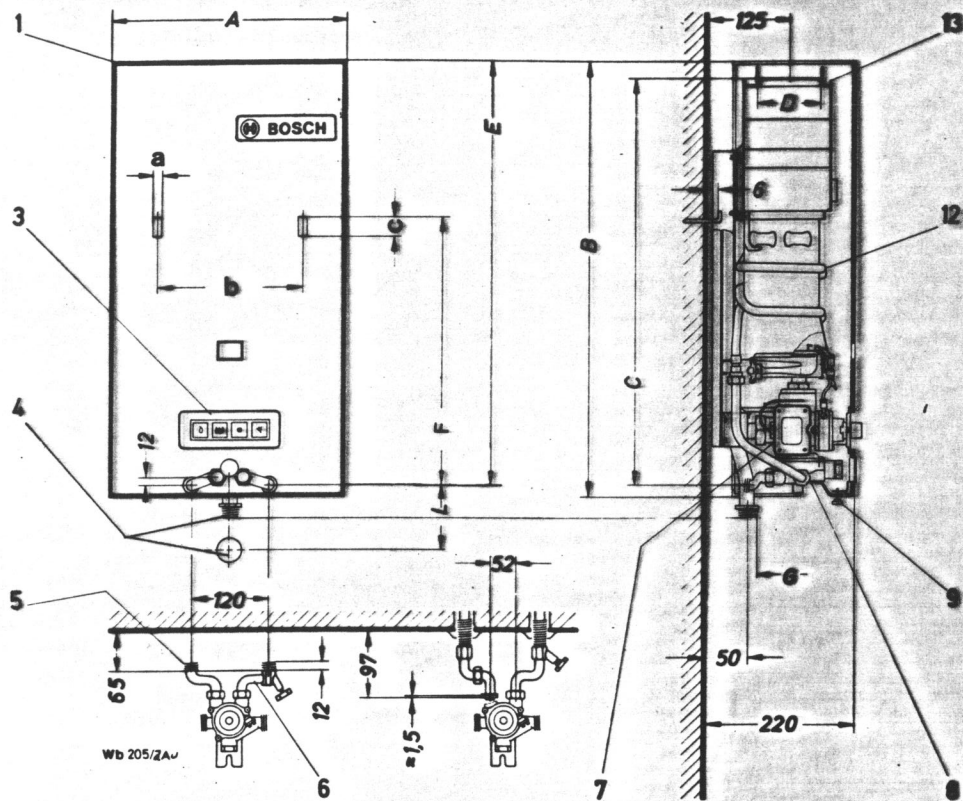


Fig. 1

- 1 Front shell
- 3 Pushbutton-controlled automatic valve
- 4 Gas connection: G for natural gas, R^{1/2}" (1/2" BSP) for LP-gases, 12 mm, Ermeto
- L: for natural gas = 92 mm
- 5 Hot water connection, R^{1/2}" (1/2" BSP)
- 6 Cold water connection, R^{1/2}" (1/2" BSP)
- 7 Gas valve assy.
- 8 Water valve assy.
- 9 Knurled screw
- 12 Heating body
- 13 Draught diverter

	WR250..T1	WR325..T1	WR400..T2
a	18	16	
b	228	334	
c	40	20	

Appliance measurements	A		B		C		D		E		F	
	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.
Model WR 250..T1	360	14 ³ / ₁₆	680	26 ³ / ₄	636	25 ¹ / ₁₆	110	4 ⁵ / ₁₆	665	26 ³ / ₁₆	474	18 ¹¹ / ₁₆
Model WR 325..T1	400	15 ³ / ₄	755	29 ³ / ₄	708	27 ⁷ / ₈	132	5 ¹ / ₈	740	29 ¹ / ₈	512	20 ⁵ / ₃₂
Model WR 400..T2	460	18 ¹ / ₈	755	29 ³ / ₄	708	27 ⁷ / ₈	132	5 ¹ / ₈	740	29 ¹ / ₈	542	21 ¹¹ / ₃₂

Performance Data

		WR 250 K..T1	WR 325 K..T1	WR 400 K..T2
Rated output	kW (MJ/h)	7-17.4 (63)	7-22.7 (82)	7.0-27.9 (100)
Rated input (based on gross c.v.)	kW (MJ/h)	22.0 (79)	29.0 (104)	35.3 (127)
Gas Inlet Pressure				
Town/grid gas	mbar (kPa)	7.5 (0.75)	7.5 (0.75)	7.5 (0.75)
Natural gas	mbar (kPa)	11.5 (1.13)	11.5 (1.13)	11.5 (1.13)
LP-gases	mbar (kPa)	28 (2.75)	28 (2.75)	28 (2.75)
Gas Consumption (based on gross c.v. at 15 °C/60 °F - 1013 mbar-dry)				
Town/grid gas (ref. page 7)				
- 15.0 MJ/m ³	m ³ /h	5.2	6.9	8.4
Natural gas				
- 38 MJ/m ³	m ³ /h	2.1	2.8	3.3
	ltr/min.	39	45	55
LP-gas				
- 51.7 MJ/kg	kg/h	1.6	2.1	2.5

Characteristic Data

Max. water flow	Ltrs./min.	10	13	16
Temperature rise	° C	25	25	25
Min. inlet water pres.	bar	0.7	1.0	1.5
	kPa	70	100	150
Water flow	ltrs./min.	2.0-5.0	2.0-7.0	2.0-8.5
Outlet temperatures	° C	60	60	60
Min. inlet water pres.	bar	0.3	0.4	0.5
	kPa	30	40	50
Max. inlet water pres. for mains pressure types	bar	12	12	12
	kPa	1200	1200	1200
for low pressure types	bar	6	6	6
	kPa	600	600	600
Main burner injectors	Diam.-mm			
	NG	1.25	1.30	1.30
	TLP	2.15	2.25	2.6
	TG 6	2.15	2.25	2.6
LP-gas	LP-gas	0.75	0.79	0.76
	kPa			
	NG	0.87	0.84	0.78
	TLP	0.40	0.35	0.27
TG 6	TG 6	0.40	0.38	0.27
	LP-gas	2.6	2.6	2.6
	mbar (Pa)	0.015 (1.5)	0.015 (1.5)	0.015 (1.5)
	kg/h	43.2	57.6	72
° C	160	170	180	

Fluegas Data

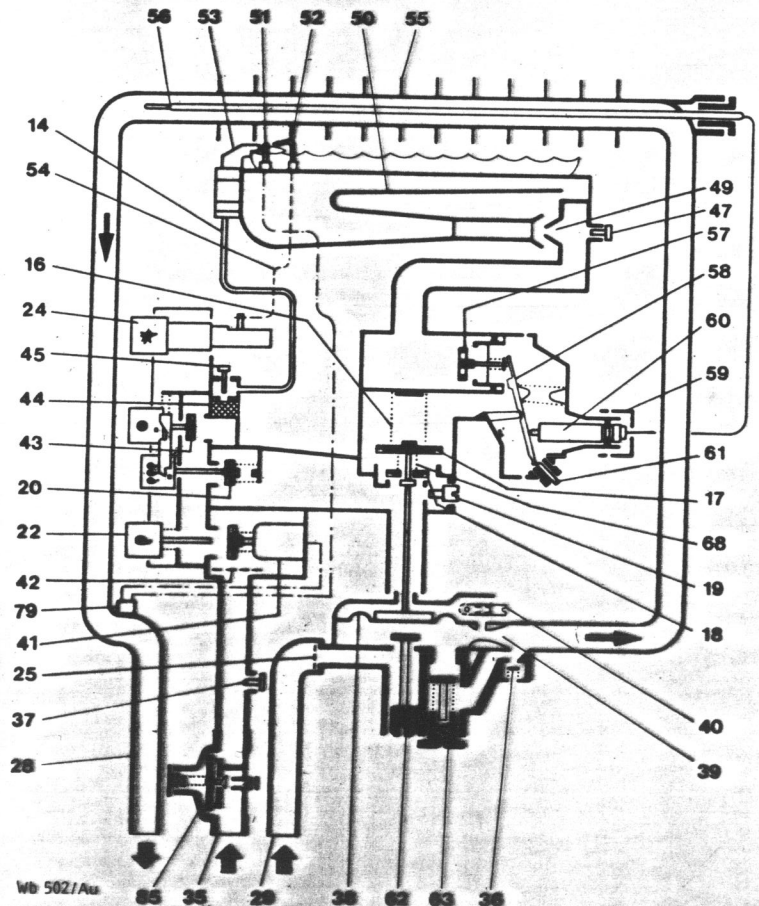
Draught required	mbar (Pa)	0.015 (1.5)	0.015 (1.5)	0.015 (1.5)
Fluegas load*	kg/h	43.2	57.6	72
Fluegas temperature*	° C	160	170	180

Constructional Details

Schematic representation of the appliances

Fig. 2

- | | |
|------------------------------------|--|
| 14 Pilot gas pipe | 47 Measuring point "A" for orifice pressure |
| 16 Gas valve spring | 49 Injector orifice |
| 17 Large poppet valve head | 50 Main burner |
| 18 Small poppet valve head | 51 Thermocouple |
| 19 Cross-ignition bolt | 52 Sparking plug |
| 20 Main gas valve | 53 Pilot burner |
| 22 Pilot gas button | 54 High-tension ignition lead |
| 24 Piezo igniter | 55 Finned heat exchanger |
| 25 Water strainer | 56 Sensing bulb |
| 28 Hot water connecting bend | 57 Governing insert |
| 29 Cold water connecting bend | 58 Lever |
| 35 Gas supply pipe | 59 Temperature adjusting screw "B" |
| 36 Blow-off valve | 60 Control bellows |
| 37 Measuring point | 61 Sealing screw |
| 38 Diaphragm | 62 Water throttle |
| 39 Venturi with O-ring | 63 Relief valve |
| 40 Slow-ignition valve with O-ring | 64 Gas inlet |
| 41 Magnetic valve unit | 68 Valve spring |
| 42 Gas filter | 79 Temperature limiter |
| 43 Pilot gas valve | 85 Gas pressure regulator (only natural gas or town gas) |
| 44 Pilot gas filter | |
| 45 Pilot adjustment | |



* Behind draught-diverter with draught requirer and with nominal heat load.

Installation

General remarks

Any local by-laws and regulations pertaining to installation and use of gas-heated appliances must be observed.

Location

The appliance should be installed in a frost-protected, well ventilated room, as near as possible to a chimney. In order to prevent corrosion, make sure that the combustion air is kept free of aggressive substances. Substances that especially contribute to corrosion are halogenated hydrocarbons (e.g. chlorine and fluorine), which are contained in solvents, paint, adhesives, propellant gases, various household cleaners, etc. Take precautionary measures as necessary.

A caulked window must be provided at installation to ensure sufficient ventilation.

Cupboard-like enclosures (Fig. 3)

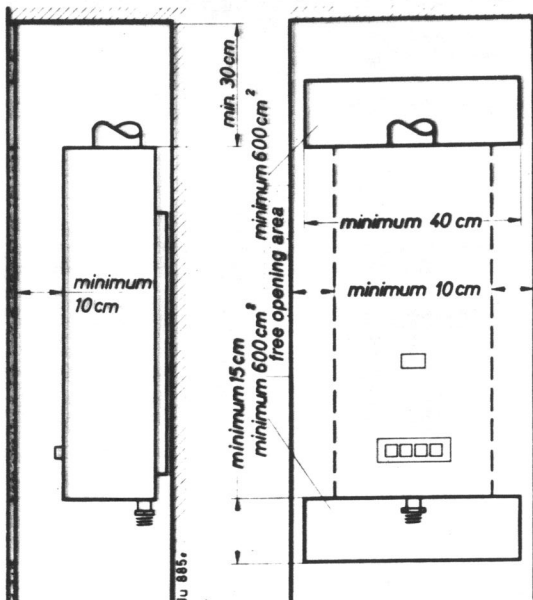


Fig. 3

Removal of front shell

After knurled screw 9 has been undone, the front shell swung to the front and pushed upwards.

Mounting gauge

Connections for gas and water supply to be fixed as per Fig. 1, or with the aid of mounting gauge EWZ 236/1 (8709918061).

Gas supply

Pipe bore to suit local conditions; gas shut-off cock to be provided. Gas pipe must be clean inside.

Water supply

Pipes of suitable bore according to local conditions and in compliance with pertinent regulations to be used.

Cold water inlet (right) and hot water outlet (left) are marked by arrows on the water valve housing. Look out for the installed water strainer (fig. 2, pos. 25). Re-

strictions in the water ways (angle valves, perlators, etc.) must be avoided.

If plastic pipes are used, a 1.5 mm metal connection must be provided on the cold and hot water sides.

Connecting

After the 2 wall hooks, which are supplied, have been applied (see fig. 1), the heater is connected to the service lines with the aid of the installation accessories as per Special List.

Flue installation

Flue pipe to be leakage-tight in accordance with pertinent requirements. Flue dampers, if used, must be of an approved type, and the maker's instructions for the installation must definitely be observed.

Leakage test

Appliance together with gas and water connections to be tested for leakages. Flue leakage test at draught diverter to be carried out with a dewplate.

Operation

Front shell to be replaced; gas and water shut-off means to be turned on; all pipes to be vented.

Commissioning

- 1 Depress button fully and keep depressed;
- 2 After a few seconds, depress igniter button
- 3 Release button after approx. 10 secs.

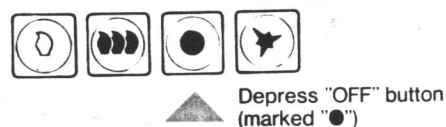
If pilot flame is not alight then, repeat ignition procedure.

Operation



Shutting-off

(if no hot water is to be drawn for a longer period of time)



Setting

Please note

Make sure that the type of gas stated on the nameplate is the same as the type of gas supplied by the gas works. If this is not identical, the unit must be adjusted accordingly.

1. Temperature adjustment

In the factory the units are set at a hot water draw-off temperature of 60 ° C and are lead-sealed. If other values are to be specified or if an adjustment has been wrongly carried out, then the following procedure should be adopted:

1. Unscrew the gas setting screw (C) to approx. 8 mm from the edge.

2. With the water throttle (62) on the water armature and with the hot water draw-off valve fully turned on, set a water flow of approx. 4 litres per min. for model WR 250 and 5 litres per min. for model WR 325/400.
3. With adjusting screw (B) set a draw-off temperature of 62 ° C.

Gas rate

Junkers Gas Water Heaters as supplied are fitted for use with fuel gas as stated on the performance badge. The use of a different fuel gas necessitates a conversion as described on page 6.

This setting of the gas rate should be carried out by the orifice pressure method, or by the volumetric method.

For both methods, a U-pipe manometer is required. The orifice pressure method is time-saving and therefore to be preferred.

On LP-gas types the gas rate need not be set.

I. Orifice pressure method

1. Sealing screw "A" (Fig. 4) to be removed and U-pipe manometer to be connected.
2. Gas shut-off cock to be turned on and appliance to be started in accordance with instructions under "Operation", p. 4.
3. Hot water draw-off valve to be turned on for a flow of 10 litres per min. or more.
Gas shut-off cock to be turned off, U-pipe manometer removed, and sealing screw "A" replaced.
5. Sealing screw "D" to be removed and U-pipe manometer connected.
7. Gas shut-off cock to be turned on and appliance to be started again.
8. Gas inlet flowing pressure required for natural gas to be 1.13 kPa.
9. With inlet pressures 1.13 kPa only 85 % of the rated output to be set.
10. If inlet pressure differs from the above values, causes therefore to be found out and shortcomings to be remedied. Should this not be possible, then gas works to be notified. With gas pressures below 9 mbar the heater must not be started and operated.

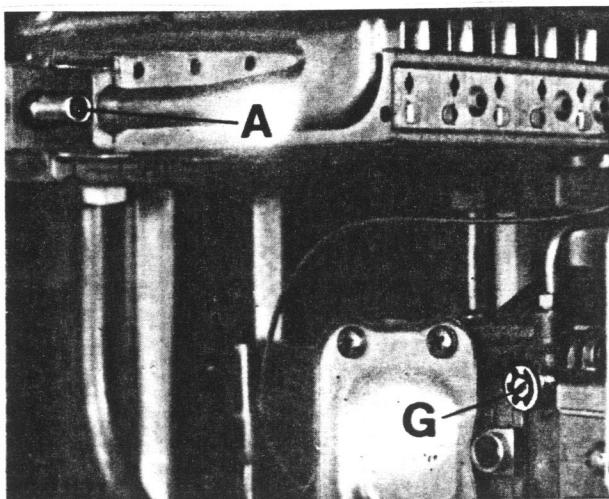


Fig. 4

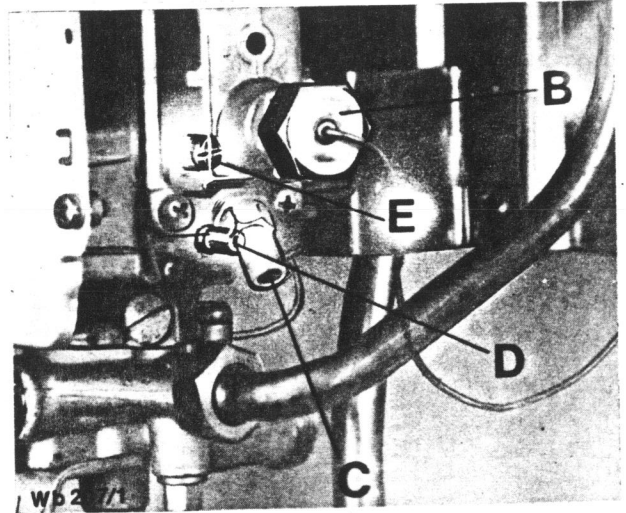


Fig. 5

11. Gas shut-off cock to be turned off, U-pipe manometer removed, and sealing screw "D" replaced.
12. Covering cap at "C" to be replaced and lead-sealed.
13. With extraordinary flame picture, orifice check to be carried out, see Table on page 7.

II. Volumetric method

This is applicable only if during peak hours no fuel gases of different characteristics are fed into the supply network.

Operational c.v. to be ascertained from gasworks.

1. Gas shut-off cock to be turned on and appliance to be started in accordance with instruction under "Operation", p. 4.
2. Hot water draw-off valve to be turned on for a flow of 10 litres per min. or more.
3. Gas shut-off cock to be turned off; sealing screw "D" to be removed and U-pipe manometer connected.
4. Gas shut-off cock to be turned on again and appliance to be started.
5. see I, para. 8 to 13 (above).

III. Setting of pilot flame

Pilot orifice suits the pertinent kind of fuel gas.

IV. Water setting

At a pressure of 2.5 bar the units are set for a water flow as follows:

- WR 250 = 5.5 litres per min.
- WR 325 = 7.5 litres per min.
- WR 400 = 8.5 litres per min.

If greater water flows and thereby lower draw-off temperatures are desired, the water throttle (Fig. 2, item 62) should be turned on the right.

C: with sealing screw

Conversion to other Fuel Gases

From city gas/natural gas to LP-gas and vice-versa

Conversion parts for new type of fuel gas to be ordered from manufacturer or agent.

Model designation and type of fuel gas must be stated with order.

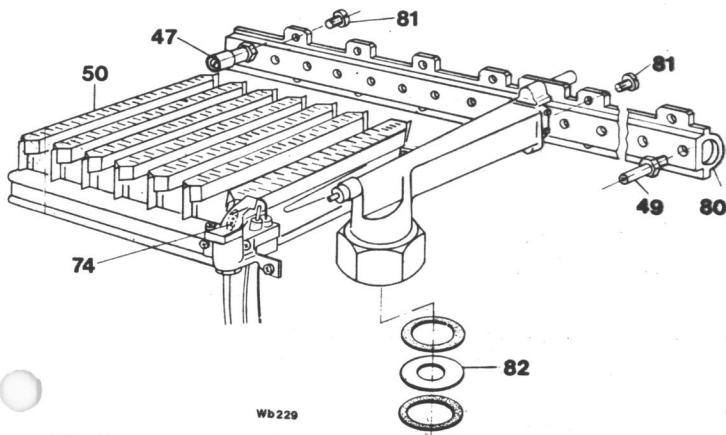


Fig. 6

- 47 Measuring point for nozzle pressure
- 49 Injector orifice
- 50 Burner assembly, left and right
- 74 Pilot orifice
- 80 Distributor pipe
- 81 Screw (short)
- 82 Throttle disc

Maintenance

After 12 to 24 months of service, the heater should be looked over, thoroughly cleaned and descaled, and repaired if necessary. The following operations will have to be carried out by the serviceman.

Pilot flame

With a properly burning pilot flame, the valve within magnetic unit 41 must remain open after 5 secs. following the start of the heater. If upon release of the button marked the pilot flame goes out, this may be due to insufficient contact at the thermocouple lead connections. Screwed sleeves at both magnetic valve unit 41 and main burner 50 should be tightened. If necessary, thermocouple 51 or magnetic valve unit 41 to be exchanged.

The pilot flame must fully surround the thermocouple approx. 5 mm ($\frac{1}{8}$ in.) below its tip. If the pilot flame burns too small, then the pilot burner will have to be cleaned or, if necessary, exchanged.

Main burner flames

These must fully develop within approx. 5 secs. after a hot water draw-off point has been turned on.

If such draw-off point is turned off, the main burner flames must extinguish within approx. 1 sec., otherwise water strainer 25 and slow-ignition valve 40 will have to be cleaned. After the pilot flame has gone out, the magnetic valve unit 41 must shut off the gas supply within 45 secs.

Proper working of the burner and of the flue gas installation to be checked.

Water-actuated gas valve

If the main burner flames do not go out completely after hot water has been drawn, then the gas valve 17 with stem has to be cleaned. The O-ring to be greased with compound Hf 1 v 5.

Valves of the pushbutton-controlled automatic valve assy.

For a leakage test, the heater has to be started and a hot water draw-off point to be turned on.

Upon pushing the button marked "●", main and pilot burner must go out, at the latest after the magnetic valve unit 41 has snapped shut. Leaky valves to be cleaned, washers to be exchanged, if necessary.

Insufficient rise in water temperature

Output to be checked according to information under "Gas Rate Setting" on page 5. With LPG appliances, gas inlet pressure to be checked at measuring point. Gas filter 42 and main burner 50 to be cleaned, and relief valve 63 to be checked.

Heating body

Finned heat exchanger 55 to be cleaned; if necessary, heating body to be descaled with conventional means (supplier's instructions for use to be observed!). Max. test pressure, 20 bar (285 lbs/sq.in.). Prior to removal of heating body from the appliance, the pilot burner 53 has to be taken off.

Greasing compounds

Only special Junkers Compounds must be used.
Water valve assy.: Unisilkon L 641
Gas valve assy. incl. burner: HFT 1 v 5.

Replacement and spare parts

These may be ordered by special lists, quoting description and part No.

Gas Rates Setting Table

Fuel Gas	Orifices					
	Main Burner			Pilot Burner		
	WR 250	WR 325	WR 400	WR 250	WR 325	WR 400
Natural Gas Group "H"	Ordering No. 8 708 202 124	Ordering No. 8 708 202 147	Ordering No. 8 708 202 147	Ordering No. 8 708 200 140 blue	Ordering No. 8 708 200 140 blue	Ordering No. 8 708 200 140 blue

Gas rates, litres (cu.ft.) per min.¹⁾

Fuel	Calorific values MJ/m ³	WR 250... Input rating				WR 325... Input rating				WR 400... Input rating			
		100%		85%		100%		85%		100%		85%	
		litres	cu.ft	litres	cu.ft	litres	cu.ft	litres	cu.ft	litres	cu.ft	litres	cu.ft
Town gas/ TLP	15.0	86	3.04	73	2.6	113	4.0	96	3.4	137	4.8	116	4.1
	16.5	80	2.8	68	2.4	105	3.7	89	3.15	128	4.5	109	3.85
	18.0	74	2.6	63	2.2	97	3.4	82	2.9	118	4.2	100	3.55
	19.0	68	2.4	58	2.05	90	3.2	76	2.7	110	3.9	93	3.4
	20.5	64	2.25	54	1.9	84	3.0	71	2.5	102	3.6	87	3.1
	22.0	60	2.1	51	1.8	79	2.8	67	2.35	97	3.4	82	2.9
	23.5	56	1.95	47	1.65	73	2.6	62	2.2	89	3.1	76	2.7
	25.0	52	1.85	44	1.55	69	2.45	58	2.05	84	3.0	71	2.5
	Natural gas	38.0	35	1.2	29	1.0	45	1.6	38	1.35	55	1.97	46

¹⁾ at 15 ° C, 1013 mbar, dry

Orifices for LP-gases	Models	Main Burner		Pilot Burner	
		Ordering No.	Marking	Ordering No.	Marking
28 mbar (2.75 kPa)	WR 250...	8 708 202 132	75	8 708 200 205	red
	WR 325...	8 708 202 149	79	8 708 200 205	red
	WR 400...	8 708 202 139	76	8 708 200 205	red

Manufacturer:

ROBERT BOSCH GMBH · Geschäftsbereich Junkers · D-7314 Wernau, Germany
Postfach 1309 – Telex 7 266 808 – Phone (0 71 53) 306-1

Represented by:

ROBERT BOSCH (Aust.) Pty. Ltd
Cnr Centre and Mc Naughton Roads Clayton/NC

Specifications WR 325/400... New Zealand for appliances installed in New Zealand only

Ganz Approval No. ...

Data Plate located inside front cover

		WR 325...			WR 400...	
		NG	LP	TLP	NG	LP
Wobbe Index		46-52	77-87	23	46-52	77-87
Inlet Pressure	kPa	1.15	2.8	0.75	1.15	2.8
Burner Pressure	kPa	0.78	2.6	0.35	0.78	2.6
N.H.G.C.	MJ/hour	103	95	106	130	110
Output	Kw	23	21	23	29	24
Pilot Orifice Diameter	mm	0.30	0.19	0.56	0.30	0.19
Burner Injector	mm	1.30	0.69	2.25	1.30	0.69
Quantity of Water Raise 30 ° C	l/sec	0.18	0.16	0.18	0.22	0.19
Maximum Water Flow at 25 ° C Rise	l/min	13	12	13	16	14
Quantity of Water at 60 ° C	l/min	2-7	2-7	2-7	2-8.5	2-8.5
Minimum Water Pressure for Minimum Flow	kPa	40	40	40	50	50
Minimum Water Pressure for Maximum Flow	kPa	100	100	100	150	150
Maximum Water Pressure	kPa	1200	1200	1200	1200	1200

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Pipe Sizing · Refer to Ganz Installation Code 1.11.16