Grant Vortex Pro

External Module
Condensing Oil Boiler Range
ADDENDUM

ATTENTION INSTALLERS - UPDATED INFORMATION!

LOW NOX YELLOW FLAME (RIELLO RDB 2.2 BX) BURNER FITTED

THE GRANT VORTEX PRO EXTERNAL MODULE RANGE HAS SEVERAL RECENT CHANGES THAT DIFFER FROM THE INSTALLATION & SERVICING INSTRUCTIONS SUPPLIED WITH THE UNIT.
THESE CHANGES ARE DUE TO OUR CONTINUED PRODUCT IMPROVEMENT PROCESS AND ARE DETAILED ON THE FOLLOWING PAGES.
IMPORTANT – PLEASE READ THIS ADDENDUM AND USE THE INFORMATION IN CONJUNCTION WITH THE CORRESPONDING SECTIONS OF THE INSTALLATION AND SERVICING INSTRUCTIONS (AS INDICATED BELOW).

After installation and commissioning the boiler(s), please ensure that both the Installation and Servicing Instructions and this addendum are left with the user for future reference.

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2 TECHNICAL DATA

2.1 BOILER TECHNICAL DATA

Table 2-1: Boiler technical data

	Units	External					
		15/21	15/26	26/36	36/46	46/58	58/70
Water content	litre	16.5	19	21	21	50	50
	gal	3.6	4.2	4.7	4.7	11	11
Weight (dry)	kg	99	157	174	174	335	339
	lb	218	345	383	383	738	747
Maximum heat output (Kerosene)	kW	21	26	36	46	58	70
	Btu/h	71,700	88,700	122,800	157,000	197,900	238,800
Minimum flow rate (ΔT=10°C)	l/h	1,800	2,200	3,000	4,000	5,200	6.000
Minimum flow rate (ΔT=20°C)	l/h	900	1,100	1,500	2,000	2,600	3,000
Condensate connection		22 mm (only connect plastic pipe)					
Flue diameter (conventional)		100 mm				125 mm*	
Waterside resistance ΔT=10°C	mbar	28.5		26.0			
Waterside resistance ΔT=20°C	mbar	10.0		9.5			
Maximum static head	m	28					
Minimum circulating head	m	1					
Boiler thermostat range	°C	65 to 78					
Limit (safety) thermostat shut off temperature	°C	110 ± 3					
Maximum hearth temperature	°C	Less than 50					
Electricity supply		~230 1ph 50Hz 5A fused					
Burner motor power	Watts	90				150	
Absorbed motor power	kW					6.4	
Starting current	Amps					6.4	
Running current	Amps					1.2	
Oil connection		¼" BSP male (on end of flexible fuel hose)					
Conventional flue draught	mbar	Minimum: 0.087 - Maximum: 0.37					
	in wg	Minimum: 0.035 - Maximum: 0.15					
Maximum operating pressure - sealed/open system	bar	2.0					
Maximum operating pressure - pressure relief valve	bar	2.0					
Boiler type		ON/OFF					

* 125 mm diameter required for flexible flue liner (Orange system). For rigid flue system, e.g. Green system, 100 mm diameter flue required. Refer to Section 9 (Flue System and Air Supply) for further details.

2.2 BURNER SETTINGS

Table 2-2: Burner settings

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance †		Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)						A	D				
External 15/21 **(Riello RDB2.2 BX E15/21)**	15.0	51,200	0.45/80°EH	7.5	0 - 1	BX 500	Disc: B	-	11	1.31	65 - 70	12.5	16.0
	18.0	61,400	0.55/60°ES	7.0	0 - 1	BX 500	Disc: C	-	11.5	1.58	70 - 75	12.5	20.0
	21.0 *	71,700	0.60/60°ES	8.0	0 - 1	BX 500	Disc: C	-	13	1.84	75 - 80	12.5	23.0
External 15/26 § External System 15/26 § **(Riello RDB2.2 BX V15/26)**	15.0	15,200	0.45/80°EH	8.0	0 - 1	BX 500	Disc: B	-	11.5	1.25	60 - 65	12.5	16.0
	21.0 *	71,700	0.60/60°ES	10.0	0 - 1	BX 500	Disc: C	-	13	1.75	65 - 70	12.5	23.0
	26.0	88,700	0.75/60°ES	8.5	0 - 1	BX 500	N/A	-	15	2.16	75 - 80	12.5	28.5
External 26/36 External System 26/36 **(Riello RDB2.2 BX V26/36)**	26.0	88,700	0.75/60°ES	8.0	0 - 1	BX 700	N/A	-	15	2.16	65 - 70	12.5	28.5
	31.0 *	105,800	0.85/60°ES	9.0	0 - 1	BX 700	N/A	-	16	2.58	70 - 75	12.5	34.5
	36.0	122,800	1.00/60°ES	9.0	0 - 1	BX 700	N/A	-	17.5	2.99	75 - 80	12.5	39.5
External 36/46 External System 36/46 **(Riello RDB2.2 BX V36/46)**	36.0	122,800	1.00/60°ES	9.0	0 - 1	BX 700	N/A	-	17.5	3.09	75 - 80	12.5	39.5
	41.0 *	139,900	1.10/60°ES	10.0	0 - 1	BX 700	N/A	-	17.5	3.52	80 - 85	12.5	45.5
	46.0	157,000	1.25/60°S	8.0	0 - 1	BX 700	N/A	-	20	3.95	85 - 90	12.5	51.0
External 46/58 **(Riello RDB3.2 VORT 58)**	46.0	157,000	1.25/80°S	8.0	0 - 1	GIB	Head: 0	-	-	3.92	75 - 80	12.5	51.0
	52.0 *	177,400	1.35/80°S	9.5	0 - 1	GIB	Head: 0	-	-	4.43	75 - 80	12.5	58.5
	58.0	197,900	1.65/80°S	8.0	0 - 1	GIB	Head: 0	-	-	4.94	75 - 80	12.5	66.0
External 58/70 **(Riello RDB3.2 VORT 70)**	58.0	197,900	1.65/80°S	8.0	0 - 1	GIB	Head: 0	-	-	4.97	75 - 80	12.5	66.0
	64.0 *	218,400	1.65/80°S	9.5	0 - 1	GIB	Head: 0	-	-	5.49	75 - 80	12.5	72.5
	70.0	238,800	1.75/80°S	9.5	0 - 1	GIB	Head: 4	7-8	-	6.00	75 - 80	12.5	78.5

Notes:

† Refer to Section 10.2 (Burner Settings: RDB2.2 BX burners)

‡ Flue gas VFR: Flue gas volumetric flow rate

§ Recirculation tube fitted to Utility 15/26 and Utility System 15/26. Refer to Figure 10-3 (item 2).

1. The data given above is approximate only and is based on the boiler being used with a low level balanced flue.
2. The above settings may have to be adjusted on site for the correct operation of the burner.
3. Gas Oil is NOT suitable for use with Grant Vortex boiler range
4. The flue gas temperatures given above are ± 10%.
5. When commissioning, the air damper **must be** adjusted to obtain the correct CO_2 level.
6. * Factory settings: 15/21 - 21kW, 15/26 - 21kW, 26/36 - 31kW, 36/46 - 41kW, 46/58 - 52kW, 58/70 - 64kW.
7. The combustion door test point may be used for CO_2 and smoke readings only. Do not use this test point for temperature or efficiency readings.
8. When setting the 15/21 and 15/26 to 15kW, the air adjuster disc requires repositioning. Refer to Section 10.4 (air adjuster disc).
   When setting the 15/26 to 26kW, the air adjuster disc is not required. Refer to Section 10.4 (air adjuster disc).
   When setting the 58/70 to 70kW, the combustion head must be changed. Refer to Section 11.4 (Cleaning the burner)
9. The installer must amend the boiler data label if the output is changed.

2.3 FLUE GAS ANALYSIS

To allow the boiler to be commissioned and serviced, the boiler is supplied with a combustion test point on the front cleaning door.

When this test point is used please note the following:

- The test point is for CO_2 and smoke readings only.
- The boiler efficiency and temperature must be taken from the flue test point on high level, vertical and conventional flue adaptors.
- Concentric low level flues do not contain a test point. The temperature and efficiency readings must be taken from the flue terminal.

2.4 WATER CONNECTIONS

Table 2-3: Water connections

Boiler model	Flow connection			Return connection		
	Size	Fitting	Supplied	Size	Fitting	Supplied
External 15/21	22 mm pipe	Compression straight	In fittings kit	22 mm pipe	Compression	Fitted
External 15/26	22 mm pipe	Compression elbow	In fittings kit	22 mm pipe	Compression	Fitted
External 26/36	28 mm pipe	Compression straight	In fittings kit	28 mm pipe	Compression	Fitted
External 36/46	28 mm pipe	Tectite straight	In fittings kit	28 mm pipe	Compression	Fitted
External 46/58	1¼" BSP	Female socket	Fitted	1¼" BSP	Female socket	Fitted
External 58/70	1¼" BSP	Female socket	Fitted	1¼" BSP	Female socket	Fitted

10 COMMISSIONING

To ensure safe and efficient operation, it is essential that a Grant Vortex Pro boiler is commissioned as detailed in the following procedure.

To access the controls, remove the front panel from the boiler (pull forward at the top and then lift off).

The controls are shown in Figure 10-1.

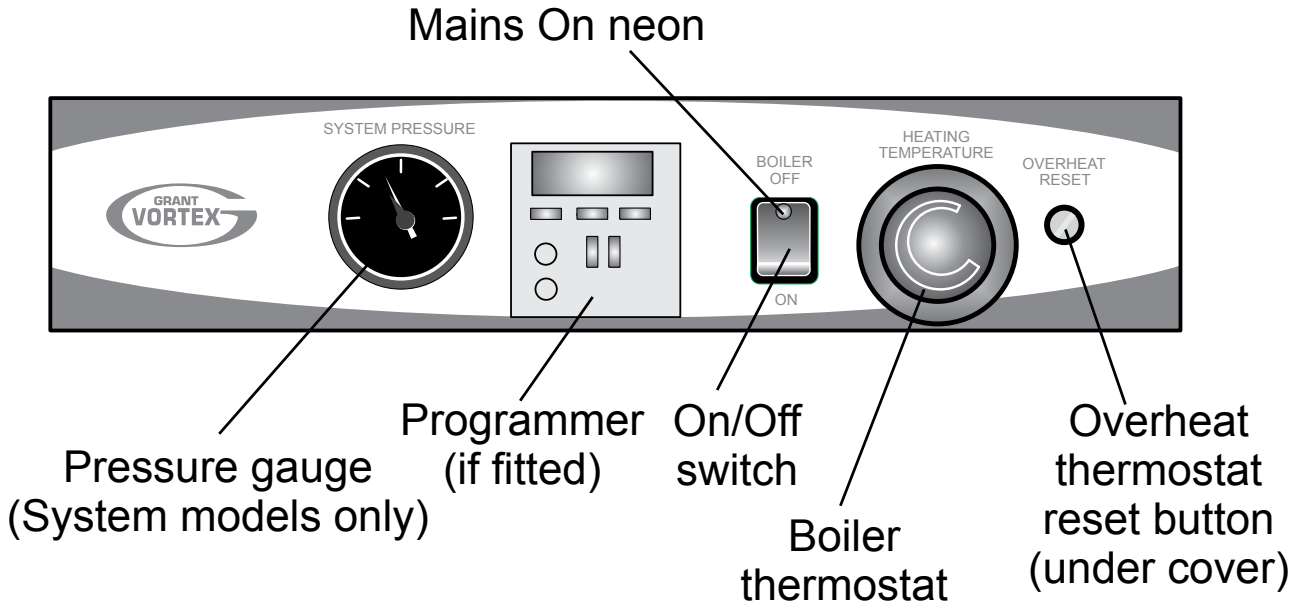


Figure 10-1: Vortex Pro boiler control panel

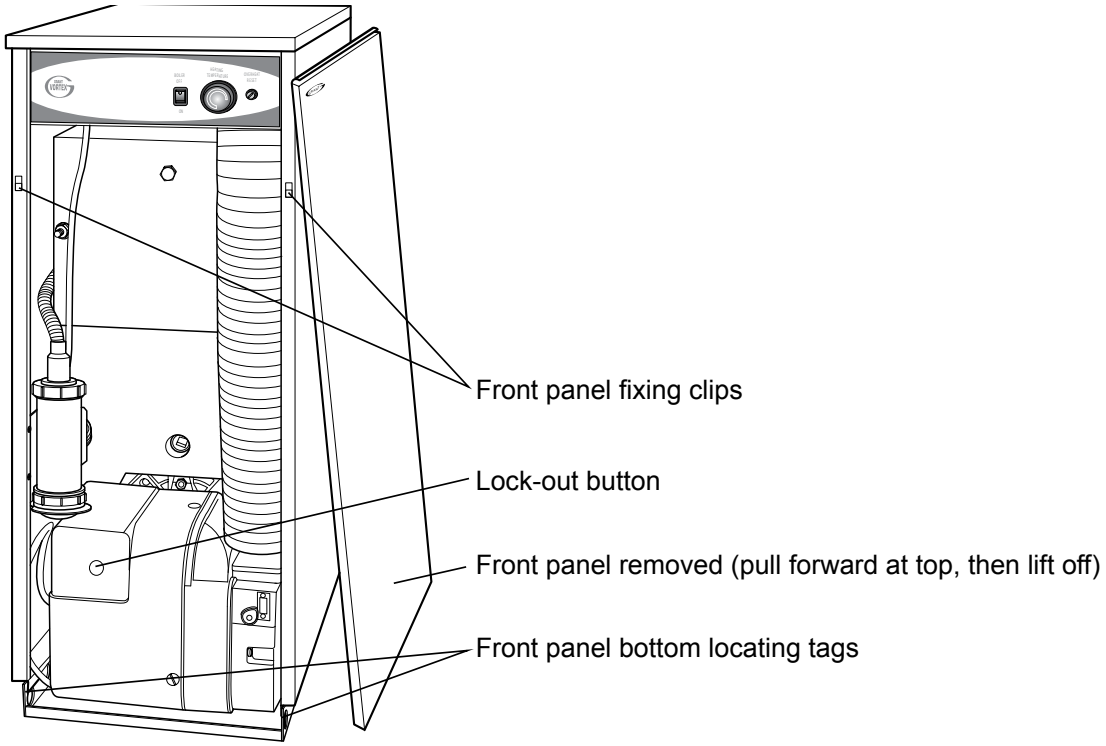


Figure 10-2: Position of boiler components - Vortex Pro boiler

10.1 BEFORE SWITCHING ON

1. Ensure the boiler is isolated from the electrical supply and the boiler On/Off switch is set to OFF.
2. Check that the high limit thermostat bulb and boiler thermostat bulb are correctly located in their respective pockets. Refer to Figures 5-1 to 5-4. Check condition of both thermostat capillaries. Ensure they are not damaged, broken, kinked or crushed.
3. Remove the nuts and washers securing the front cleaning door. Withdraw the door – take care as it is heavy!
4. Check that the turbulators are in position and that the ends are vertical. Refer to Figure 11-6.
5. Check that the baffles are in position. Refer to Figures 11-1, 11-2, 11-3, 11-4 or 11-5 as required.
6. Re-fit cleaning door and check it is fitted correctly and that a good seal is made.
7. Unscrew the burner fixing nut (located at the top of the mounting flange) and remove the burner from the boiler.
8. Check/adjust the burner settings as described in Section 10.2 or 10.3.
9. Re-fit the burner to the boiler and tighten the fixing nut. DO NOT OVERTIGHTEN!
10. Check that the sealed system has been vented and pressurised and there are no leaks.
11. Ensure that the condensing heat exchanger has been vented via the manual air vent (on heating return connection). Refer to Section 5.3
12. Ensure that the air vent on the heating flow pipe (system version only) is open. Refer to Section 5.3.
13. Check that all fuel line valves are open.
14. Remove the plastic burner cover if it was not previously removed.
15. Connect a combined vent manifold and pressure gauge to the pressure gauge connection port on the oil pump. See Figure 3-5. Open the vent screw on the vent manifold to vent the oil supply whilst the pump is running.
16. Check that all system controls are calling for heat and turn the boiler thermostat to maximum.

10.2 BURNER SETTINGS: RDB2.2 BX BURNERS

FOR 15/21, 15/26, 26/36 AND 36/46 MODELS

With the burner removed from the boiler:

1. On the 15/26 models - first remove the recirculation tube from the burner head. Unscrew and remove the single fixing screw and slide the recirculation tube off the head.
2. Remove the burner head. Refer to Figure 10-3. Loosen the three fixing screws (1) and remove head (2) from burner.

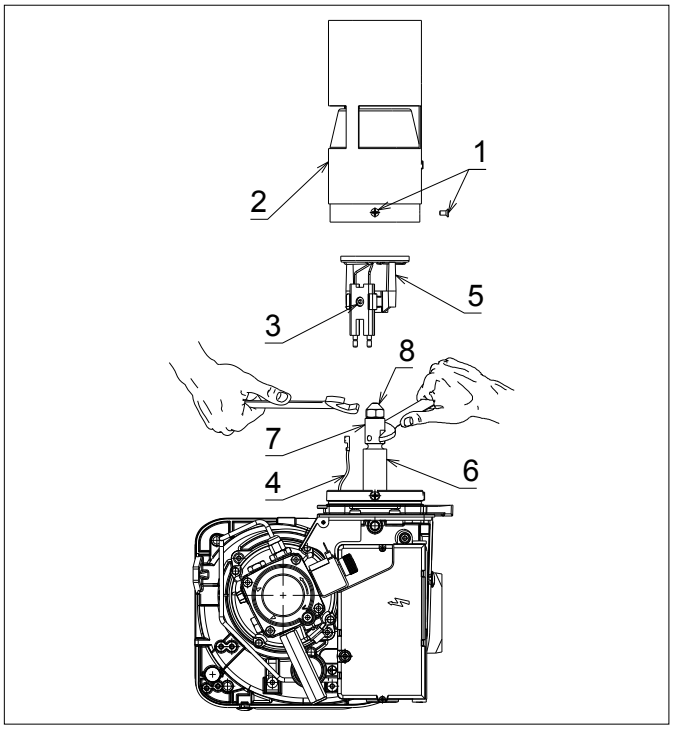


Figure 10-3: Burner head, recirculation tube (if fitted) diffuser and nozzle holder

3. Check the nozzle is correct for the required boiler output. Refer to Table 2-2 for the correct nozzle size and type for the required boiler output.
4. If the nozzle needs to be replaced - remove the diffuser/ electrode assembly. Refer to Figure 10-4.
   - Using a 4 mm Allen key, loosen the diffuser fixing screw (3) on the electrode assembly.
   - Lift diffuser/electrode assembly (5) up and off the nozzle holder.
   - Disconnect both ignition leads (4) from the electrodes.
5. Use a 16 mm spanner to remove/re-fit the nozzle, whilst holding the nozzle holder using a 19 mm spanner.

! CAUTION !

The use of an ill-fitting spanner will damage the nozzle and could lead to an incorrect flame pattern and poor combustion.

! NOTE !

Ensure that the nozzle is securely tightened so that it does not leak but DO NOT OVER TIGHTEN!

6. Re-fit the diffuser/electrode assembly. Refer to Figure 10-3.
   - Reconnect ignition leads (4) to electrodes.
   - Re-fit the diffuser/electrode assembly (5) onto the nozzle holder lining up the fixing screw with the recess in the nozzle holder.
   - Ensure diffuser assembly is fitted down hard onto the shoulder on the nozzle holder.
   - Tighten the fixing screw (3) to secure the diffuser/ electrode assembly in place on the nozzle holder.

! NOTE !

Do not overtighten the fixing screw as this may damage the electrode insulator.

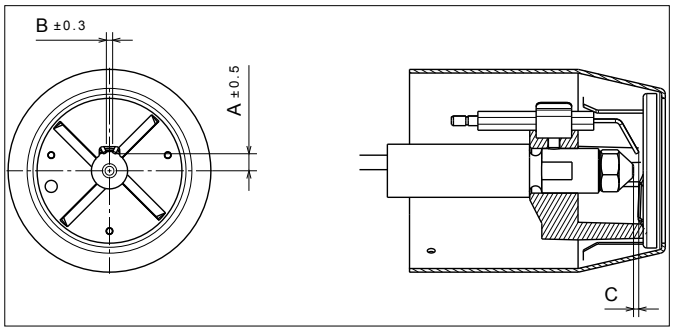


Figure 10-4: Ignition electrode settings

Model	A	B	C
External 15/21, 15/26 External System 15/26	7	2.5	2.5 - 3
Uility 26/36, 36/46 External System 26/36 and 36/46	4.5	3	2 - 2.5

7. Check/adjust electrode setting. Refer to Figure 10-4.
8. Re-fit the burner head. Refer to Figure 10-3.
   - Locate the head fixing screws (5) in the countersunk slots in the burner collar.
   - Check that the small oil drip hole (on the head) is pointing downwards.
   - Tighten the two screws (1) to secure the head (2) in position on the burner.
9. Adjust the diffuser position. Refer to Figure 10-5.

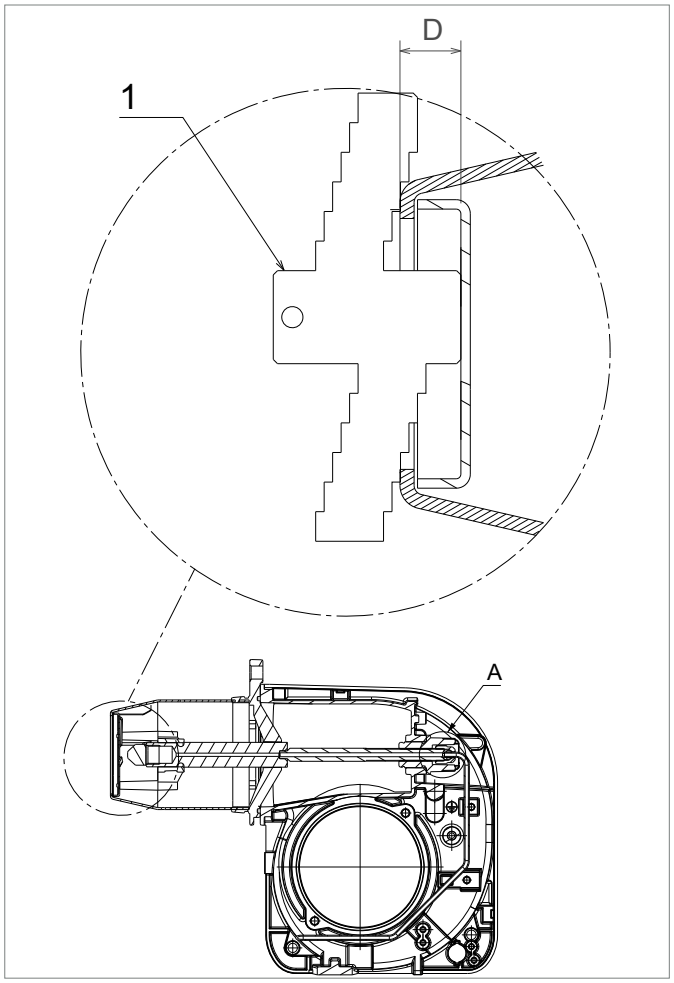


Figure 10-5: Riello RDB 2.2 BX diffuser position and gauge plate

! NOTE !

The distance between the end of the burner head and the front face of the diffuser (D) MUST be correctly set for the burner to operate correctly.

- Refer to Table 2-2 for the required distance (head setting) for the boiler output required.
- Check the distance D using the gauge plate supplied with the boiler.
- To use the gauge plate: Position the gauge on the burner head as shown in Figure 10-5.
- Locate the gauge with the correct steps (i.e. the two marked with the required distance D) resting on the edge of the burner head.
- Check the gauge plate is at 90° to the end of the burner head and is positioned at the full diameter of the head.
- If the distance D is correct, the tongue of the gauge should just make contact with the diffuser, with BOTH steps still in contact with the edge of the burner head.
- If the steps are not in contact with the edge of the burner head, when the tongue of the gauge is touching the diffuser, the diffuser must be 'opened' (see below).
- If the tongue does not reach the diffuser, when the steps are in contact with the edge of the burner head, the diffuser must be 'closed' (see below).

To adjust the diffuser position:

- If necessary, adjust distance D using the black adjustment knob located around the oil supply pipe on the front of the burner. Refer to Figure 10-5. Re-check distance D using the gauge plate, as described above.
- For easier access to the adjustment knob, pull the photocell out from the burner housing.
- To increase distance D (to open the diffuser): rotate the knob clockwise - indicated as '+' on the knob.
- To decrease distance D (to close the diffuser): rotate the knob anti-clockwise - indicated as '-' on the knob.

! NOTE !

One full rotation of the adjustment knob is approximately 1mm of diffuser movement.

! NOTE !

It is essential that the final position of the diffuser is checked, using the gauge plate provided with the boiler and the diffuser adjusted as necessary to achieve the required distance D.

10. For Vortex Pro 15/21 and 15/26 models only:
    Check the burner air adjuster disc is correctly set. Refer to Section 10.4.
11. On the 15/26 models - refit the recirculation tube to the burner head and secure using the single fixing screw.

10.3 BURNER SETTINGS: RDB3.2 BURNERS

FOR 46/58 AND 58/70 MODELS

With the burner removed from the boiler:

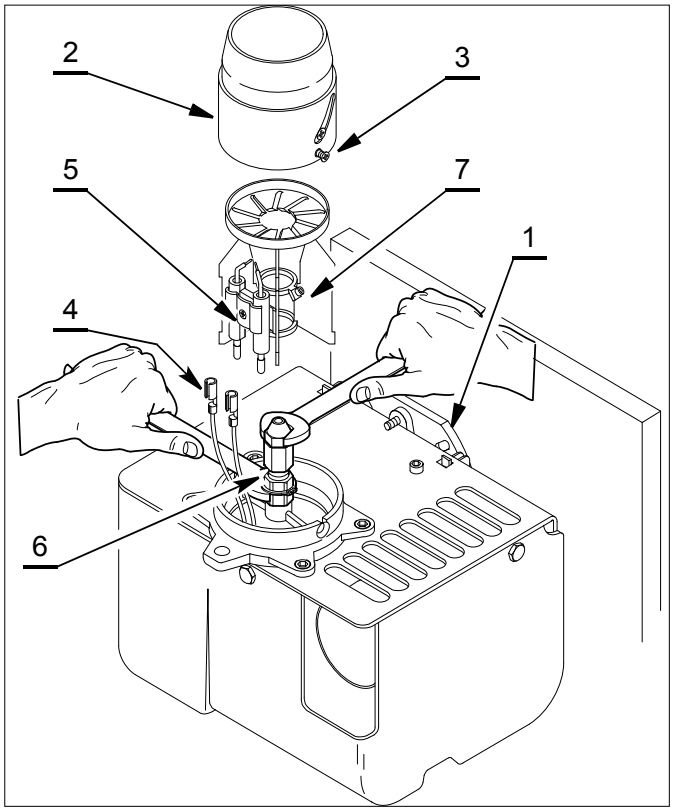


Figure 10-6: Riello RDB 3.2 burner head, diffuser and nozzle holder

1. Remove the burner head. Refer to Figure 10-6. Loosen both fixing screws (3) and remove head from burner (2).
2. Check the nozzle is correct for the required boiler output. Refer to Table 2-2 for the correct nozzle size and type for the required boiler output.
3. If the nozzle needs to be replaced - Remove the diffuser/ electrode assembly. Refer to Figure 10-6.
   - Loosen the diffuser clamp screw (7) and remove the diffuser/electrode assembly from the nozzle holder (6). Refer to Figure 10-6
   - Disconnect both ignition leads (4) from the electrodes.
4. Use a 16mm spanner to remove/re-fit the nozzle, whilst holding the nozzle holder using a 17mm spanner.

! CAUTION !

The use of an ill-fitting spanner will damage the nozzle and could lead to an incorrect flame pattern and poor combustion.

! NOTE !

Ensure that the nozzle is securely tightened so that it does not leak but DO NOT OVER TIGHTEN!

5. Reconnect ignition leads to electrodes.
6. Re-fit the diffuser/electrode assembly to the nozzle holder.
7. Check/adjust the diffuser position to give the correct gap (A) between the nozzle and diffuser. Refer to Figure 10-7.

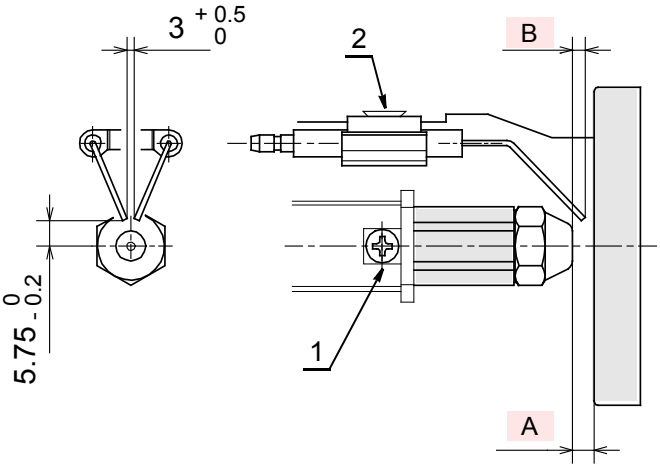


Figure 10-7: Ignition electrode settings

Model	A	B
Uility 46/58 and 58/70	7.5	4

   - To adjust the diffuser position:
     - Loosen the diffuser clamp screw.
     - Slide diffuser along the nozzle holder to give the correct gap (A).
     - Tighten the diffuser clamp screw.
8. Check/adjust the electrode assembly to give the correct gap (B) between the nozzle and electrodes. Refer to Figure 10-7.
   - To adjust the electrode position:
     - Loosen the electrode clamp screw.
     - Slide the electrode assembly to give the correct gap (B).
     - Tighten the electrode clamp screw.
9. Re-fit the burner head. Refer to Figure 10-6.
   - Locate the head fixing screws in the countersunk slots in the burner collar.
   - Tighten the two screws (3) to secure the head (2) in position on the burner.
10. Check the combustion head setting.
    - The correct head setting depends on the required output of the boiler. Refer to Table 2-2
    - This should be set to '0' in all cases except when the 58/70 is set to maximum (70kw) output.
    - In this case the head is set to '4' (i.e. on the 4th line). Refer to Figure 10-8.
11. To adjust the head setting (if required):
    - Loosen the two screws in the curved slots in outer ring of the head (NOT the two head fixing screws). Refer to Figure 10-8.
    - Rotate the end of the burner head until either '0' or the 4th line, as required.
    - Tighten the two screws to fix the head in the required position.

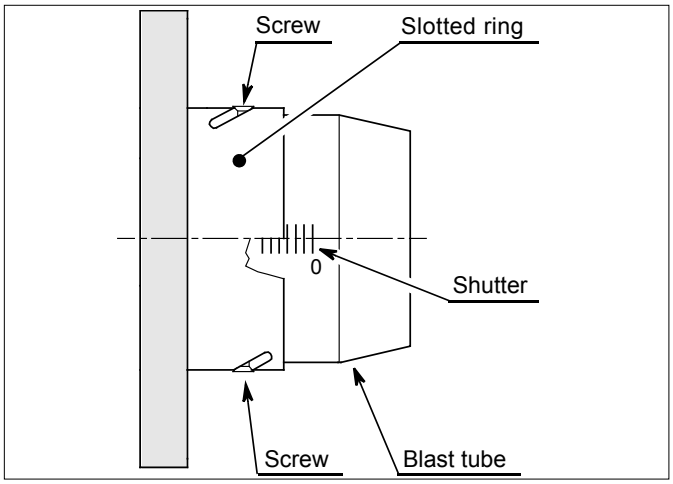


Figure 10-8: Riello RDB 3.2 combustion head adjustment

10.4 AIR ADJUSTER DISC: 15/21 AND 15/26 MODELS ONLY

! NOTE !

If the 15/26 model is to be set to 26kW, the air adjuster disc is not required. It should be removed from the burner and discarded.

The Riello RDB 2.2 BX burner fitted to these boilers incorporates a secondary air adjustment.

This is an air adjuster disc located on the fan housing (inside the air inlet housing).

It is essential, for correct operation of the burner, that this internal air adjuster disc is correctly set. Refer to Figure 10-9.

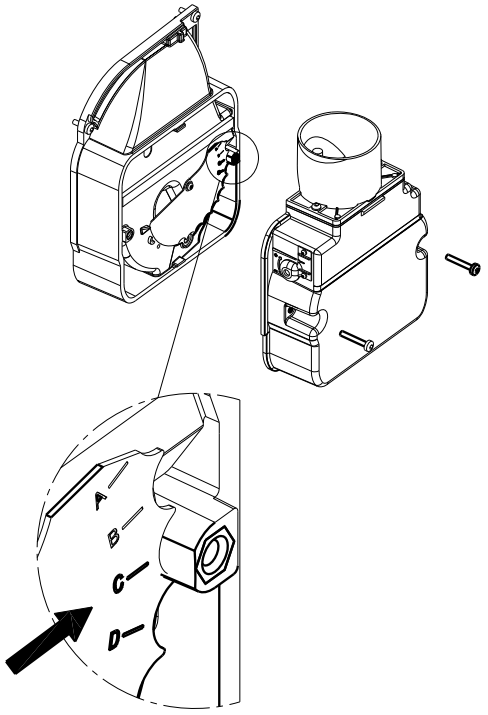


Figure 10-9: Air adjuster disc

To access the air adjuster disc:

1. Ensure the boiler is isolated from the electrical supply.
2. Remove the burner fixing nut (located at the top of the mounting flange) and withdraw the burner from the boiler.
3. Undo the two screws and remove the air inlet cover from the side of the burner.
4. The air adjuster disc is mounted on the fan housing. Refer to Figure 10-9.
5. Check that this disc is correctly set for the factory set output of the boiler, i.e. with the correct cut-out marked located against the moulded boss on the fan housing. Refer to Table 2-2 for correct disc settings. If the disc is not correctly set it MUST be re-positioned. Refer to step 7 below.
6. If the burner is to be set to a different output than the factory setting, the air adjuster disc MUST be set to the required setting for that output. Refer to Table 2-2 for correct disc settings.
7. The air adjuster disc is re-positioned as follows:
   - Remove the screw from the centre of the air adjuster disc.
   - Re-position the disc so that the correct cut-out is located against the moulded boss on the fan housing.
   - Replace the screw in the centre of the air shutter disc and tighten.
8. If the 15/26 model is to be set to 26kW, the air adjuster disc is not required. It should be removed from the burner and discarded.
9. Re-fit the air inlet cover to the side of the burner and secure in place using the two screws.

10.5 SWITCHING ON

1. Switch on the electricity supply to the boiler.
2. Set the boiler On/Off switch to ON. A neon on the switch lights when it is in the ON position. The boiler will now light automatically.

   Note that the neon lights when the boiler is switched on, but does not necessarily indicate the burner is firing.

   The burner should then fire. Open the vent screw on the vent manifold to vent the supply while the oil pump is running
3. The burner fan should start and the burner should light within about 12 seconds. If the burner does not light and the 'Lock-out' reset button on the burner lights, wait about 45 seconds and press the reset button to restart the ignition process.

   This procedure may have to be repeated several times during first lighting.
4. With the burner alight, check the fuel pressure. Refer to Section 2.3 (burner settings).
5. Adjust the pressure if necessary - refer to Section 11.9 (burner components).

! NOTE !

It is important that the oil pressure is correctly set.

6. Operate the boiler until it reaches normal operating temperature. Check oil supply/return pipe for leaks, rectifying where necessary.
7. Check the operation of the boiler thermostat. Ensure that by turning it anticlockwise it switches the burner off.
8. With the burner alight, re-check the fuel pressure and re-adjust if necessary. Turn the boiler off, remove the pressure gauge and replace the plug in the pump.
9. Ensure that there are no oil leaks, replace the burner cover.
10. On balanced flue installations - Ensure the flexible air inlet tube is correctly connected to both the burner air inlet and the flue system.

10.6 RUNNING THE BOILER

1. Relight the boiler and allow it to run for at least 20 minutes.
2. Check the smoke number, if it is 0-1 then it is satisfactory.
3. Using a calibrated electronic flue gas analyser, set to the correct fuel, check the %CO2 in the flue gases.
4. Set the $\%CO_2$, as indicated on the flue gas analyser, to the required value as given in Section 2.3 for the boiler concerned.
5. Adjust the burner air damper, using the hexagonal key supplied, to achieve the required %CO2. Refer to Section 11-9.
6. To increase the $\%CO_2$:
   - Turn the screw anti-clockwise. This will close down the burner air damper and decrease the combustion air entering the burner.

   To decrease the $\%CO_2$:
   - Turn the screw clockwise. This will open up the burner air damper and increase the combustion air entering the burner.
7. When the $\%CO_2$ is set to the correct level, re-check the smoke number if the burner air damper has been moved. Under no circumstances must the smoke number be above 1.

! NOTE !

For safe and efficient operation of the boiler it is essential that the air damper is correctly set to give the required %CO2 in the flue gases.

10.7 BALANCING THE SYSTEM

1. When the boiler has been adjusted and is running satisfactorily, balance the central heating system by adjusting the radiator lock shield valves. Start with the radiator nearest the boiler and adjust the valves to achieve the required temperature drop across each radiator. If thermostatic radiator valves have been installed, check the system bypass.
2. Switch off the boiler.

10.8 COMPLETION

1. With the system hot, check again for leaks, rectifying where necessary. Drain the system while it is hot to complete the flushing process. Refill and vent the sealed system.
2. A suitable central heating system inhibitor must be added to protect the system against the effect of corrosion.
3. A suitable antifreeze should be used to prevent damage to the boiler in areas where electrical power failure can occur in winter months.
4. Replace the top, front and rear panels as necessary.

! NOTE !

After commissioning the boiler complete the OFTEC CD/11 commissioning report. Leave the top copy with the user and retain the carbon copy.

If the boiler is to be left in service with the User, set the controls and room thermostat (if fitted) to the User's requirements.

If the boiler is not to be handed over immediately, close the boiler fuel supply valve and switch off the electricity supply.

! CAUTION !

If there is any possibility of the boiler being left during freezing conditions, then the boiler and system should be drained. Alternatively, a suitable heating system antifreeze should be used.

! NOTE !

To allow the boiler to be commissioned and serviced correctly a combustion test point is provided on the front cleaning door. Both the $\%CO_2$ and smoke test may all be carried out using this test point.

This test point is NOT suitable for measuring boiler efficiency or conventional flue draught.

When using the test point on the cleaning cover note that the flue gas temperature reading will be higher than that measured in the flue thus resulting in an inaccurate efficiency reading. To obtain an accurate flue gas temperature and efficiency, the reading can only be measured outside through the low level flue terminal (or the test point on the conventional flue starter section when used).

10.9 INFORMATION FOR THE USER

The User must be advised (and demonstrated if necessary) of the following important points:-

- How to start and switch off the boiler and how to operate the system controls.
- The precautions necessary to prevent damage to the central heating system and to the building, in the event of the boiler not being in operation during frost conditions.
- The importance of servicing the boiler to ensure safe and efficient operation. This should normally be required only once a year.
- The type of fuel used.
- That any servicing or replacement of parts must only be carried out by a suitably qualified engineer.
- Ensure that the boiler controls and room thermostat (if fitted) are set to the User's requirements.
- Tell the User the system pressure and show them the position of the safety valve discharge pipe.
- Show the User how to reset the overheat thermostat and how to restart the boiler if it goes to 'Lockout'.

11 BOILER SERVICING

To ensure safe and efficient operation it is essential that a Grant Vortex Pro boiler is serviced at regular intervals of no longer than 12 months.

Servicing and replacement of parts must only be carried out by a suitably qualified engineer.

! CAUTION !

Details of every service should be entered in the Service Log, in the Boiler Handbook.

This information may be required to validate the Grant extended guarantee.

! WARNING !

Before starting any work on the boiler or fuel supply, please read the Health and Safety information given in Section 14 of these Instructions.

11.1 CHECKS BEFORE SERVICING

The following sequence of checks should be made before starting any servicing work:

1. Check the flue terminal and ensure it is not blocked or damaged.
2. Run the boiler and check the operation of its controls.
3. Ensure that all water system connections and fittings are sound. Remake any joints and check the tightness of any fittings that may be leaking.
4. Allow the boiler and system to cool down.
5. If the boiler is part of a sealed central heating system, check the system pressure, check the operation of the pressure relief valve and check the expansion vessel air charge. Refer to Section 7.
6. Refill, vent and re-pressurise the system as necessary. Refer to Section 7.
7. Check that any ventilation openings are adequate of adequate free area and are clear of obstructions. See Section 9.
8. Remove any sludge/water from the fuel tank by opening the sludge valve at the lower end of the tank (if fitted).
9. Ensure that all fuel system connections and fittings are sound. Remake any joints and check the tightness of any fittings that may be leaking.
10. With the fuel supply valve (at the oil tank) closed, clean/ replace the filter element and clean the filter bowl.

! WARNING !

Before servicing, set the boiler ON/OFF switch to OFF, isolate the electricity supply and close the fuel supply valve.

The data label on the inside of the case side panel will indicate the fuel used and the nozzle fitted.

11.2 DISMANTLING PRIOR TO SERVICING

The procedure for dismantling the boiler is as follows:

1. Remove the front panel from the boiler (pull forward at the top and then lift off).
2. On system models, carefully lift up the expansion vessel and remove it from the boiler. Place it on the floor, taking care not to strain the flexible pipe.
3. Disconnect the flexible air tube from the burner.
4. Unscrew and remove the two fixing screws and remove the red cover from the burner.
5. Remove the burner fixing nut (located at the top of the mounting flange) and withdraw the burner from the boiler. If required, disconnect the flexible oil line(s), using a suitable container to prevent any oil spillage.
6. Check or replace the flexible fuel supply hose, as follows:
   - Braided flexible fuel supply hoses (as supplied with the boiler) should be replaced annually, i.e. when the boiler is serviced.
   - Long-life hoses should be inspected annually. If in doubt replace the hose(s). In any event, these hoses must be replaced every five years.

! NOTE !

With a two-pipe oil supply there will be two flexible hoses connected to the burner. Identify (mark if necessary) which is the inlet and return if they are to be disconnected.

11.3 CLEANING THE BOILER

The procedure for cleaning the boiler is as follows:

1. Remove the nuts and washers securing the front cleaning door and withdraw the door. Take care - it is heavy.
2. Remove the baffles as shown in Figure 11-1, Figure 11-2 and Figure 11-3.
3. Remove all deposits from the baffle plates and all the boiler internal surfaces using a stiff brush and scraper if necessary.
4. Check the condition of the flue, clean as necessary.
5. Check the condition of the front cleaning door seal and replace if necessary.
6. Replace the baffles, ensuring they are correctly fitted. Refer to Figures 11-1 to 11-5, as appropriate. Pull out the spiral turbulators from the heat exchanger tubes. See Figure 11-6.
7. Clean the turbulators using a stiff brush.
8. Test the heat exchanger condensate drain by pouring water into one of the lower tubes and observe whether the water discharges from the 22 mm condensate outlet. Replace the turbulators.
9. Replace the front cleaning door, ensuring the seal is in good condition and secure it in position with the nuts and washers previously removed. Tighten to form a seal.
10. Remove the condensate trap and check that it is not blocked and is operating correctly, i.e. the float is free to move. Clean the trap and float as required.
11. Check the condition of the flexible condensate hose between the trap and the boiler.
12. Check that the boiler condensate outlet is unobstructed. Clean if necessary.

! NOTE !

The condensate trap and condensate outlet must be checked on every service and cleaned as necessary.

The end cap is not sealed to the trap body and can be removed for cleaning. Ensure that this cap is correctly re-fitted before re-starting the boiler.

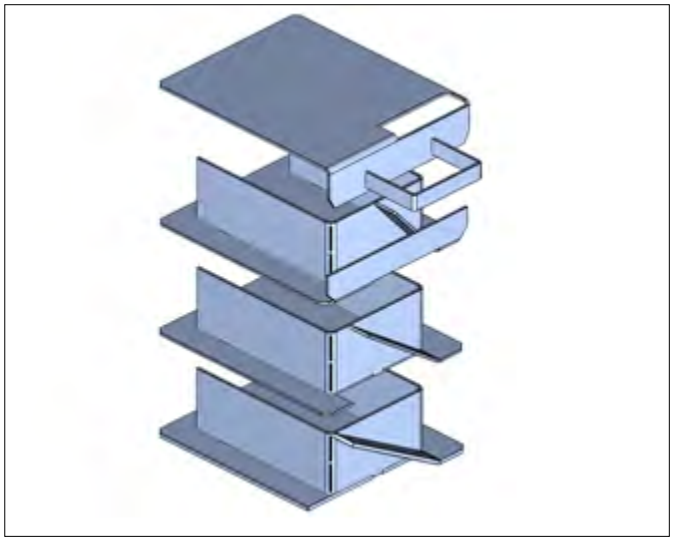


Figure 11-1: Baffles (15/21 models)

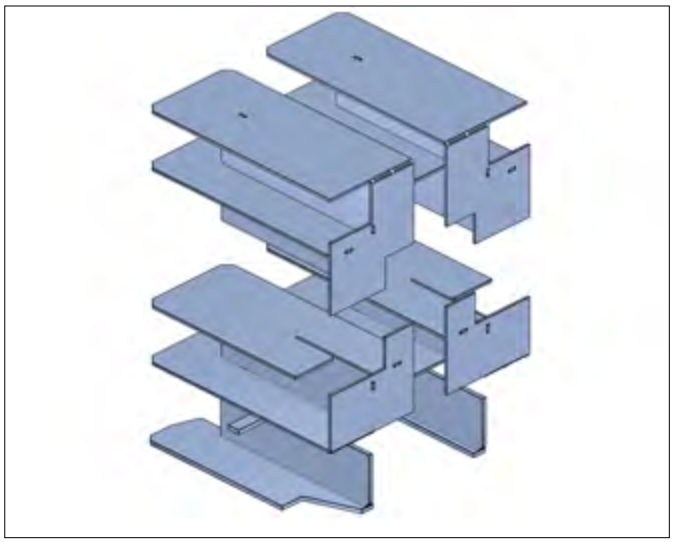


Figure 11-2: Baffles (15/26 models)

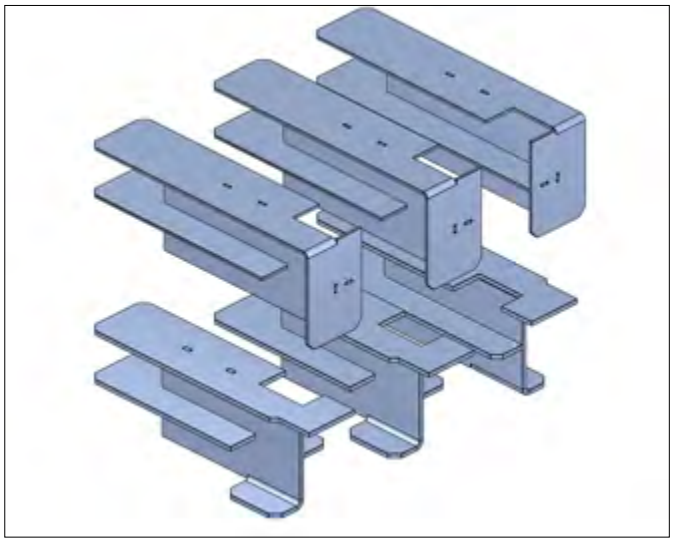


Figure 11-3: Baffles (26/36 and 36/46 models)

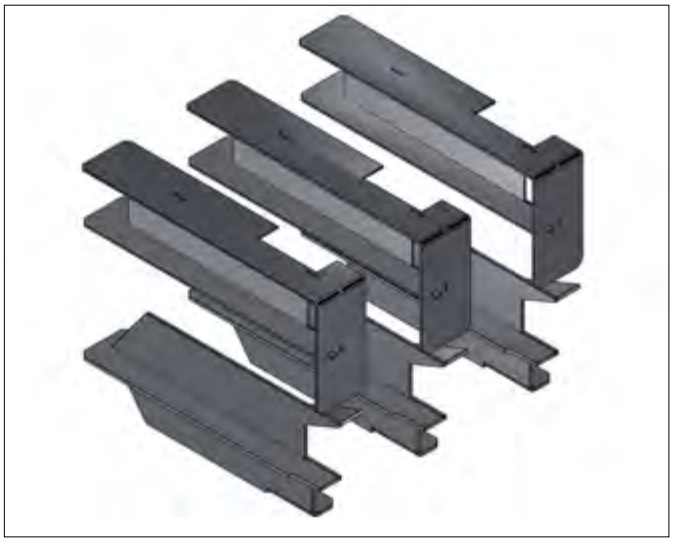


Figure 11-4: Baffles (46/58 models)

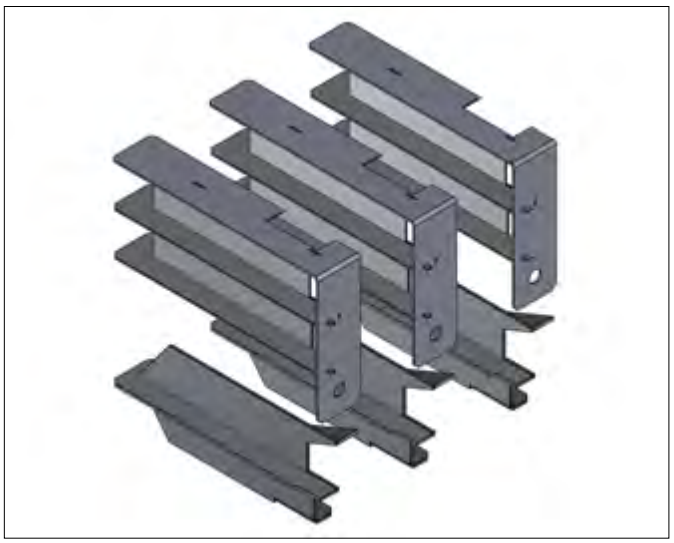


Figure 11-5: Baffles (58/70 models)

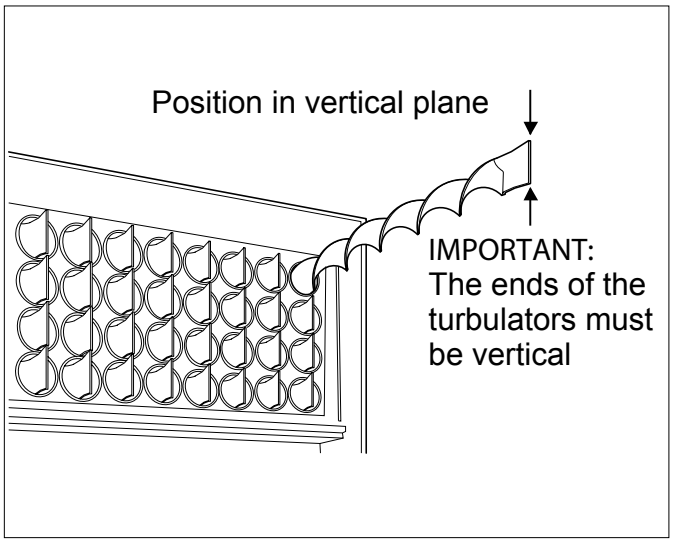


Figure 11-6: Turbulators

11.4 CLEANING THE BURNER: RDB2.2 BX BURNERS ONLY

FOR 15/21, 15/26, 26/36 AND 36/46 MODELS

With the burner removed from the boiler:

Burner head, nozzle and diffuser/electrode assembly:

1. On the 15/26 models - first remove the recirculation tube from the burner head. Unscrew and remove the single fixing screw and slide the recirculation tube off the head.
2. Remove the burner head. Refer to Figure 10-3. Loosen the three fixing screws (1) and remove head (2) from burner.
3. Clean the burner head and recirculation tube (if fitted).
4. Remove diffuser/electrode assembly. Refer to Figure 10-3.
   - Using a 4 mm Allen key, loosen the diffuser fixing screw (3) from electrode assembly.
   - Lift diffuser/electrode assembly (5) up and off the nozzle holder.
   - Disconnect both ignition leads (4) from the electrodes.
5. Replace the nozzle (8). The nozzle should always be replaced on an annual service. Refer to Table 2-2 for the correct nozzle size and type for the required boiler output. Do NOT attempt to clean the nozzle.

   Use a 16 mm spanner to remove/re-fit the nozzle, whilst holding the nozzle holder using a 19 mm spanner.

! CAUTION !

The use of an ill-fitting spanner will damage the nozzle and could lead to an incorrect flame pattern and poor combustion.

! NOTE !

Ensure that the nozzle is securely tightened so that it does not leak but do not overtighten.

6. Inspect the ignition electrodes - remove the diffuser fixing screw and withdraw the electrode assembly. Wipe clean and check for any cracks in the ceramic insulation. Replace if necessary.
7. Re-fit the diffuser/electrode assembly. Refer to Figure 10-3.
   - Reconnect ignition leads (4) to electrodes.
   - Re-fit the diffuser/electrode assembly (5) onto the nozzle holder lining up the fixing screw with the recess in the nozzle holder.
   - Ensure diffuser assembly is fitted down hard onto the shoulder on the nozzle holder.
   - Tighten the fixing screw (3) to secure the diffuser/electrode assembly in place on the nozzle holder.

! NOTE !

Do not overtighten the fixing screw as this may damage the electrode insulator.

8. Check/adjust the electrode settings. Refer to Figure 10-4. Always check the electrode settings after replacing the nozzle.
9. Re-fit the burner head. Refer to Figure 10-3.
   - Locate the head fixing screws (5) in the countersunk slots in the burner collar.
   - Check that the small oil drip hole (on the head) is pointing downwards.
   - Tighten the two screws (1) to secure the head (2) in position on the burner.
10. Adjust the diffuser position. Refer to Figure 10-5.

! NOTE !

The distance between the end of the burner head and the front face of the diffuser (D) MUST be correctly set for the burner to operate correctly.

- Refer to Table 2-2 for the required distance (head setting) for the boiler output required.
- Check the distance D using the gauge plate supplied with the boiler.
- To use the gauge plate: Position the gauge on the burner head as shown in Figure 10-5.
- Locate the gauge with the correct steps (i.e. the two marked with the required distance D) resting on the edge of the burner head.
- Check the gauge plate is at 90° to the end of the burner head and is positioned at the full diameter of the head.
- If the distance D is correct, the tongue of the gauge should just make contact with the diffuser, with BOTH steps still in contact with the edge of the burner head.
- If the steps are not in contact with the edge of the burner head, when the tongue of the gauge is touching the diffuser, the diffuser must be 'opened' (see below).
- If the tongue does not reach the diffuser, when the steps are in contact with the edge of the burner head, the diffuser must be 'closed' (see below).

To adjust the diffuser position:

- If necessary, adjust distance D using the black adjustment knob located around the oil supply pipe on the front of the burner. Refer to Figure 10-5. Re-check distance D using the gauge plate, as described above.
- For easier access to the adjustment knob, pull the photocell out from the burner housing.
- To increase distance D (to open the diffuser): rotate the knob clockwise - indicated as '+' on the knob.
- To decrease distance D (to close the diffuser): rotate the knob anti-clockwise - indicated as '-' on the knob.

! NOTE !

One full rotation of the adjustment knob is approximately 1 mm of diffuser movement.

! NOTE !

It is essential that the final position of the diffuser is checked, using the gauge plate provided with the boiler and the diffuser adjusted as necessary to achieve the required distance D.

11. On the 15/26 models - refit the recirculation tube to the burner head and secure using the single fixing screw.
12. Continue cleaning the other burner components as detailed in Section 11.6

11.5 CLEANING THE BURNER: RDB3.2 BURNERS ONLY

FOR 46/58 AND 58/70 MODELS

With the burner removed from the boiler:

1. Remove the burner head. Refer to Figure 10-6. Loosen both fixing screws and remove head from burner.
2. Clean the burner head.
3. Remove diffuser/electrode assembly. Refer to Figure 10-6.
   - Loosen the diffuser clamp screw.
   - Remove the diffuser/electrode assembly from the nozzle holder. Refer to Figure 10-6.
   - Disconnect both ignition leads from the electrodes.
4. Replace the nozzle (6). The nozzle should always be replaced on an annual service. Refer to Table 2-2 for the correct nozzle size and type for the required boiler output. Do NOT attempt to clean the nozzle.

   Use a 16 mm spanner to remove/re-fit the nozzle, whilst holding the nozzle holder using a 19 mm spanner.

! CAUTION !

The use of an ill-fitting spanner will damage the nozzle and could lead to an incorrect flame pattern and poor combustion.

! NOTE !

Ensure that the nozzle is securely tightened so that it does not leak but DO NOT OVER TIGHTEN!

5. Inspect the ignition electrodes - loosen the electrode clamp screw and withdraw the electrode assembly. Wipe clean and check for any cracks in the ceramic insulation. Replace if necessary.
6. Reconnect ignition leads to electrodes.
7. Re-fit the diffuser/electrode assembly to the nozzle holder.
8. Check/adjust the diffuser position to give the correct gap (A) between the nozzle and diffuser. Refer to Figure 10-7.

   To adjust the diffuser position:
   - Loosen the diffuser clamp screw.
   - Slide diffuser along the nozzle holder to give the correct gap (A).
   - Tighten the diffuser clamp screw.
9. Check/adjust the electrode assembly to give the correct gap (B) between the nozzle and electrodes. Refer to Figure ??

   To adjust the electrode position:
   - Loosen the electrode clamp screw.
   - Slide the electrode assembly to give the correct gap (B).
   - Tighten the electrode clamp screw.
10. Re-fit the burner head. Refer to Figure 10-6.
    - Locate the head fixing screws in the countersunk slots in the burner collar.
    - Tighten the two screws (3) to secure the head (2) in position on the burner.
11. Check the combustion head setting.
    - The correct head setting depends on the required output of the boiler. Refer to Table 2-2.
    - This should be set to '0' in all cases except when the 58/70 is set to maximum (70kw) output.
    - In this case the head is set to '4' (i.e. on the 4th line). Refer to Figure 10-9.
12. To adjust the head setting:
    - Loosen the two screws in the curved slots in outer ring of the head (NOT the two head fixing screws). Refer to Figure 10-9.
    - Rotate the end of the burner head until either '0' or the 4th line, as required.
    - Tighten the two screws to fix the head in the required position.
13. Continue cleaning the other burner components as detailed in Section 11.6.

11.6 CLEANING THE BURNER: ALL MODELS

Photocell

The photocell is a push-fit in the front of burner body. Refer to Sections 11.9.1 and 11.9.2.

1. Holding the body of the photocell and NOT the cable, carefully pull the photocell out of the burner.
2. Clean the sensor end of the photocell.
3. Replace photocell back in the burner and check that it is fully pushed in.

Burner air inlet cover

This is located on the right hand side of the burner. Refer to Figure 11-5.

1. Unscrew and remove the two screws and remove the air inlet cover from the burner.
2. Check inside and remove any debris, leaves, hair, fluff, etc. from the air inlet cover and air damper..
3. Check the condition of the rubber seal around the air inlet cover. Replace if damaged or missing.

Burner fan housing

This is located over the fan impeller. Refer to Figure 11-5.

With the burner air inlet cover already removed:

1. Unscrew and remove the four screws and remove the fan housing from the burner.
2. Check and clean the fan impeller and remove any debris, leaves, hair, fluff etc.
3. Check/clean the fan housing is clean.
4. Check the rubber seal around the fan housing. Replace if damaged or missing.
5. Re-fit the fan housing to the burner and secure with the four screws.
6. Check the air adjuster disc (15/21 and 15/26 models only). Refer to Section 11.7 for details.
7. Re-fit the air inlet cover to the burner and secure with the two screws.

Oil pump filter

This is located under the end cover on the oil pump. Refer to Figure 11-5.

1. Unscrew and remove the four cap screws securing the pump end cover.
2. Remove the filter and wash in kerosene.
3. Check the O-ring seal around the end cover. Replace if damaged.
4. Replace the filter and end cover.
5. Re-fit the four cap screws, tightening evenly, to secure the end cap.

11.7 AIR ADJUSTER DISC: 15/21 AND 15/26 MODELS ONLY

Refer to Section 10.4.

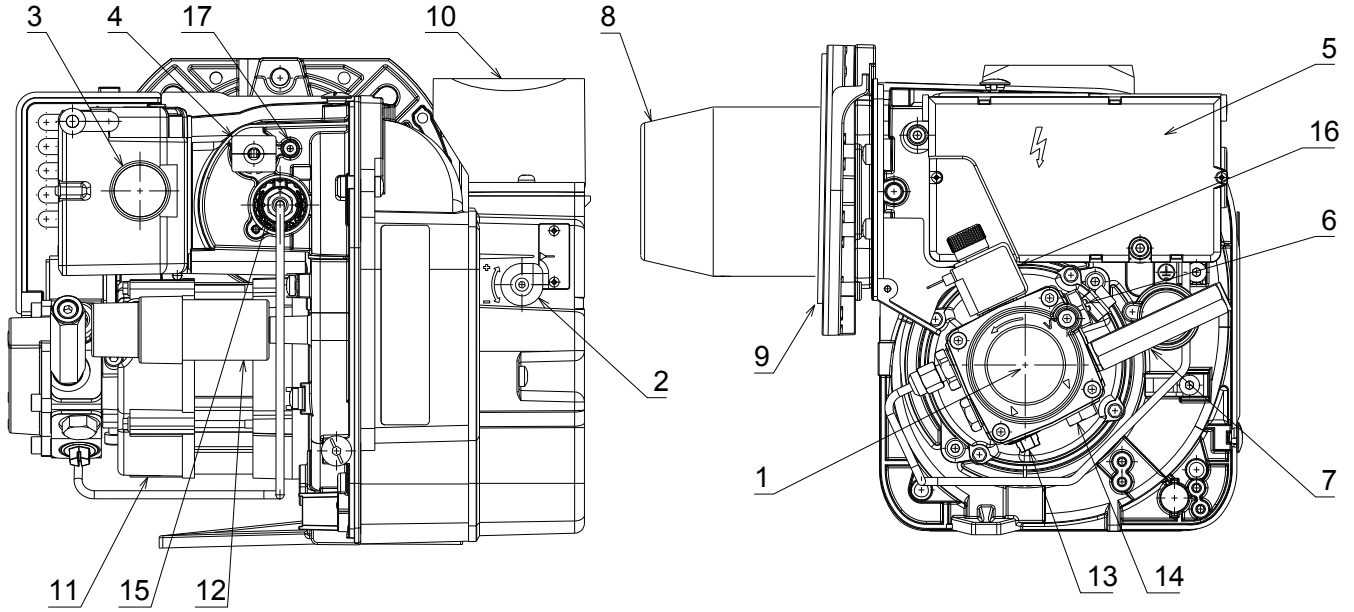
11.8 RECOMMISSIONING

! WARNING !

To ensure safe and efficient operation of the boiler it is important that re-commissioning is carried out, especially combustion checks (%CO_2 level, flue gas temperature and smoke number) after the boiler has been serviced. Refer to the Commissioning instructions in Section 10.

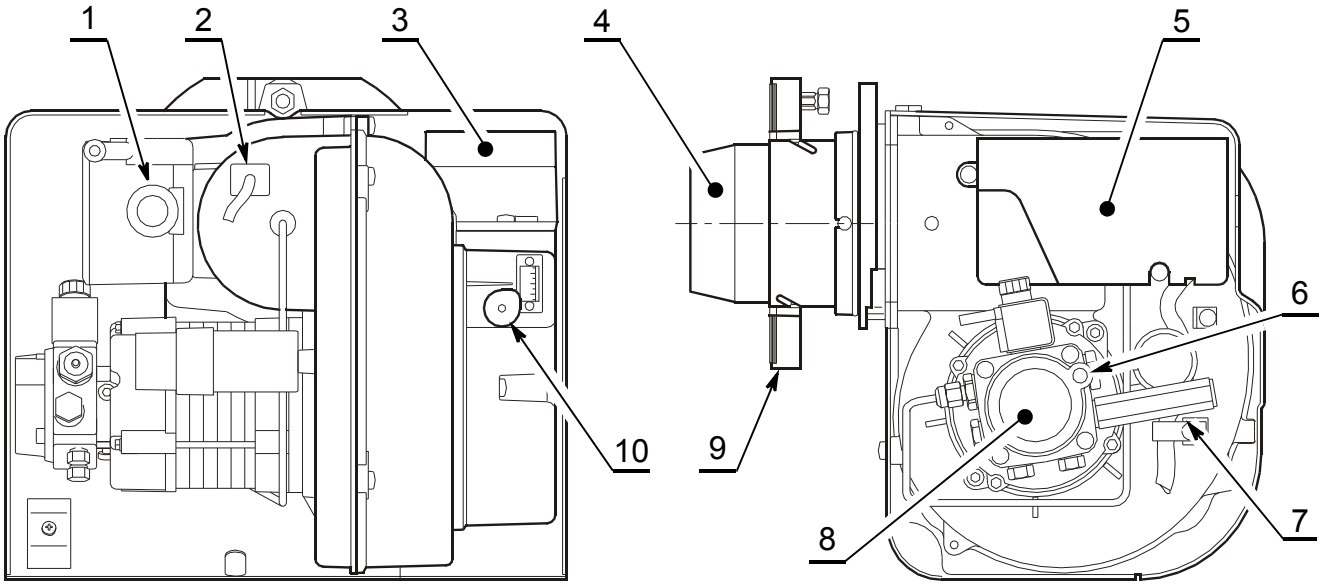
11.9 BURNER COMPONENTS

11.9.1 EXTERNAL 15/21, 15/26, 26/36, 36/46 AND EXTERNAL SYSTEM 15/26, 26/36 AND 36/46 (RIELLO RDB 2.2 BX)



Item	Description	Item	Description
1	Oil pump	10	Air inlet
2	Air damper adjustment screw	11	Motor
3	Reset button with lockout lamp	12	Motor ignition capacitor
4	Photocell	13	Fuel suction line
5	Control box	14	Return line
6	Pump pressure adjustment screw	15	Combustion head adjustment handle
7	Extension for gauge connection	16	Coil
8	Combustion head	17	Air pressure test point
9	Flange with insulating gasket	18	Recirculation tube (fitted to 15/26 models only)

11.9.2 EXTERNAL 46/58 AND 58/70 (RIELLO RDB 3.2)



Item	Description	Item	Description
1	Reset button with lockout lamp	6	Pump pressure adjustment screw
2	Photocell	7	Extension for gauge connection
3	Air inlet	8	Oil pump
4	Combustion head	9	Flange with insulating gasket
5	Control box	10	Air damper adjustment screw

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