Grant

HVO conversion of Grant Vortex boilers

UK | DOC 0201 | Rev 1.1 | December 2024

IMPORTANT NOTE FOR INSTALLERS

These instructions are intended to give an overview of the HVO burner settings for Grant Vortex oil boilers.

FUEL TYPE

The settings provided in this guide are suitable for Grant Vortex boilers operating on HVO Biofuel used for domestic heating purposes and should comply with BS EN 15940.

SPECIAL TEXT FORMATS

The following special text formats are used in these instructions for the purposes listed below:

! WARNING !

Warning of possible human injury as a consequence of not following the instructions in the warning.

! CAUTION !

Caution concerning likely damage to equipment or tools as a consequence of not following the instructions.

! NOTE !

Used for emphasis or information not directly concerned with the surrounding text but of importance to the reader.

SERVICING

The boiler should be serviced at least every twelve months and the details entered in the Service Log in the user handbook.

FUEL TYPE

The use of Class D Gas Oil on all Grant Vortex Low NOx and Blue Flame boilers DOES NOT comply with ErP requirements or EU regulations, and as a result Grant UK does not condone its use.

CUSTOMER SUPPORT CENTRE

Grant UK provides an online support centre for Heating Professionals and Homeowners to access post-installation care, advice and maintenance support for Grant products. Follow the QR codes below to access your relevant Customer Support Centre.

SUPPORT HUB

Homeowner

SUPPORT HUB

Professional

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1 STEP BY STEP HVO CONVERSION OF GRANT VORTEX OIL BOILERS

1.1 GENERAL

In 2019, the UK government amended the Climate Change Act 2008 to create a legally binding target of achieving net zero emissions by 2050.

To achieve the de-carbonisation of heat, we must end the use of fossil fuels such as oil, coal and gas.

OFTEC and other industry partners believe that in order to achieve this goal, many households will prefer to replace their existing oil with a low carbon alternative.

Following extensive tests, OFTEC stated that BS EN 15940 Hydrotreated Vegetable Oil (HVO) offers the best current solution reducing the heating system's emission by around 88%.

Hydrotreated Vegetable Oil or HVO is a bio-liquid fuel that is made by waste sources such as used cooking oils.

Boilers running on a mix of kerosene and up to 30% HVO do not need to be converted as showing in this information. Boilers operating on this mixture should be left set to the setting given in the installation instructions supplied with the boiler when it was installed.

All of Grant's current range of Vortex oil boilers (**Except Blue Flame boilers**) can be operated on 100% Hydrotreated Vegetable Oil (HVO) biofuel provided the burners are converted to do so.

Details of the conversion process are given below in section 1.2.

1.2 STEP BY STEP CONVERSION

The process of converting a Grant Vortex current range of boiler to HVO operation is straightforward and can be carried out as part of the boiler's annual service. This step-by-step takes a closer look at the HVO conversion process.

! CAUTION !

Older materials such as natural rubber should be replaced like flexible fuel lines, filter, fire valves, de-aerators, valves, control valves, lifters, etc. as they can deteriorate rapidly when used with HVO (dry out), crack and leak.

! CAUTION !

Attention should be paid to pipe sizing such as suction pipework as existing pipework sized for Kerosene may be undersized for HVO.

Step 1: Turn off the boiler, isolate the electrical supply and shut off the oil supply. Refer to Figure 1-1.

Figure 1-1: Step 1

Step 2: The existing oil tank will need to be drained of kerosene and any water/sludge removed before being replenished with HVO biofuel. Refer to Figure 1-2.

Figure 1-2: Step 2

Step 3: Drain down the pipework and carefully extract any remaining fuel residues (via a suction pump, for example).

Step 4: Remove the existing oil filter from the tank and replace it with a biofuel compatible oil filter. Refer to Figure 1-3.

Figure 1-3: Step 4

Step 5: Remove the burner from the boiler. If the burner was manufactured after 2013, it should already be fitted with a biofuel compatible pump (mark BI0). If not, it should be replaced with a biofuel compatible pump. Clean and remove any debris or water contamination from an existing pump before using it on HVO. Refer to Figure 1-4.

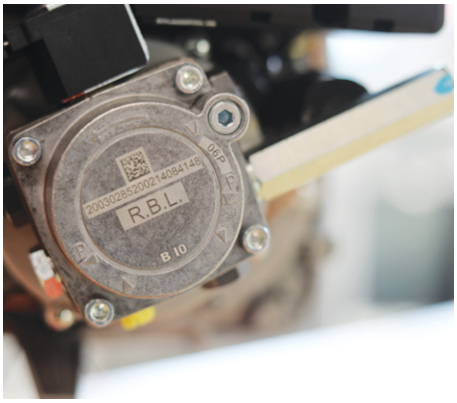

Figure 1-4: Step 5

Step 6: Remove the burner head and diffuser. Replace the existing oil nozzle with the correct specification of nozzle for HVO for the required boiler output, referring to www.grantuk.com/support/biofuelheating for details. Refit the diffuser, check electrode setting and refit burner head. Refer to Figure 1-5.

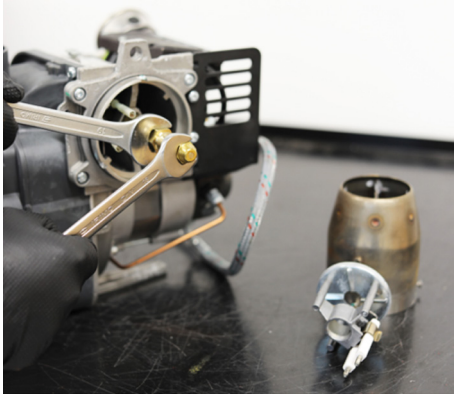

Figure 1-5: Step 6

Step 7: Replace the flexible oil line with a one that is HVO compatible. Note that **only** the long-life flexible oil lines (Part code RS86) currently supplied by Grant UK are HVO compatible. Refer to Figure 1-6.

Figure 1-6: Step 7

Step 8: Pressure test the pipework if required.

Step 9: Flush the pipework through with HVO until you are confident there are no traces of the previous fuel.

Step 10: Purge the fuel supply pipework of air up to the appliance burner.

Step 11: Check for leaks.

Step 12: Refit the burner to the boiler. Switch on the oil and electrical supply to the boiler. Switch the boiler on. Check and adjust the oil pressure to the correct value for the required boiler output referring to www.grantuk.com/support/biofuelheating for details. Refer to Figure 1-7.

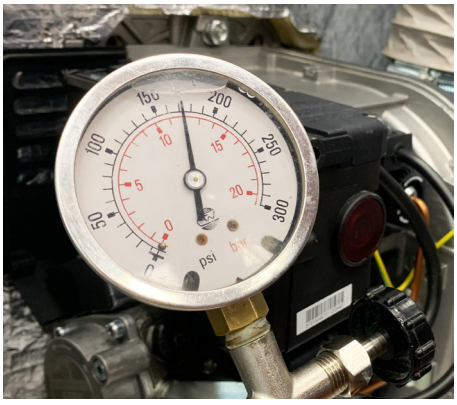

Figure 1-7: Step 12

Step 13: Check the smoke number is 0-1 and run the boiler for at least 20 minutes. Using a digital combustion gas analyser (set to light oil), check and adjust the air setting to get the required percentage of CO_2 in the flue gases. Refer to Figure 1-8.

Figure 1-8: Step 13

Please refer to section 5.15 - Conversion to HVO of the OFTEC HVO handbook

The HVO conversion process is then complete.

For further information, please visit www.grantuk.com/support/biofuelheating.

! CAUTION !

Please check that all the items installed on oil supply lines are compatible with HVO.

REPLACE ANY NON-COMPATIBLE EQUIPMENT

1.3 GUIDANCE - BURNER SETTINGS CLASSIFIED BY BOILER'S DATE OF MANUFACTURE

In order to find the burner settings for you boiler, please follow this guidance:

- Boilers manufactured before September 2018 - Refer to subsection 2.1.
- Boilers manufactured between September 2018 and 1st July 2022 - Refer to subsection 2.2.
- Boilers manufactured from 1st July 2022 - Refer to subsection 2.3.

2 GRANT VORTEX OIL BOILER HVO BURNER SETTINGS

2.1 PRE-LOW NOX YELLOW FLAME HVO BURNER SETTINGS FOR GRANT OIL BOILERS BEFORE SEPTEMBER 2018

2.1.1 VORTEX PRO (INTERNAL & EXTERNAL), VORTEX PRO SYSTEMS AND BOILER HOUSE HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-1: Vortex Pro (Internal & External), Vortex Pro Systems and Boilerhouse burner settings (HVO Biofuel). Refer to Figure 2-1.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)										
Vortex Pro & Vortex Pro external 15-21 **Riello RDB2.2**	15	51,200	0.40/60°ES	10.0	0 - 1	T1	Disc: B	N/A	1.32	65 - 70	12.0	16.0
	18	61,400	0.40/60°ES	12.5	0 - 1	T1	Disc: B	N/A	1.57	70 - 75	12.5	20.0
	21	71,600*	0.45/60°ES	12.5	0 - 1	T2	Disc: C	N/A	1.81	75 - 80	12.5	23.0
Vortex Pro, Vortex Pro external, Boilerhouse and System 15-26 **Riello RDB 1**	15	51,200	0.40/60°ES	10.0	0 - 1	T1	Disc: B	N/A	1.32	60 - 65	12.5	16.0
	21	71,600	0.40/60°ES	12.5	0 - 1	T1	Disc: C	N/A	1.81	65 - 70	12.5	22.0
	23	78,500*	0.65/60°ES	9.5	0 - 1	T2	N/A	N/A	1.97	65 - 70	12.5	25.0
	26	88,700	0.65/60°ES	11.5	0 - 1	T2	N/A	N/A	2.21	75 - 80	12.5	28.5
Vortex Pro, Vortex Pro external, Boilerhouse and System 26-36 **Riello RDB2**	26	88,700	0.65/60°ES	11.5	0 - 1	T3	N/A	N/A	2.21	65 - 70	12.5	28.5
	31	105,700*	0.75/60°ES	12.0	0 - 1	T3	N/A	N/A	2.66	70 - 75	12.5	34.5
	36	122,800	0.85/60°ES	12.0	0 - 1	T5	N/A	N/A	3.07	75 - 80	12.5	39.5
Vortex Pro, Vortex Pro external, Boilerhouse and System 36-46 **Riello RDB 2.2**	36	122,800	0.85/60°ES	12.0	0 - 1	T5	N/A	N/A	3.07	75 - 80	12.5	39.5
	41	140,000*	0.85/60°ES	14.5	0 - 1	T5	N/A	N/A	3.50	80 - 85	12.5	45.5
	46	157,000	1.00/60°ES	14.5	0 - 1	T5	N/A	N/A	3.88	85 - 90	12.5	51.0
Vortex Pro, Vortex Pro external, Boilerhouse 46-58 **Riello RDB 3.2**	46	157,000	1.25/80°S	8.0	0 - 1	GIB	N/A	N/A	3.92	75 - 80	12.0	51.0
	52	177,500*	1.35/80°S	9.5	0 - 1	GIB	N/A	N/A	4.43	75 - 80	12.0	58.5
	58	197,900	1.65/80°S	8.0	0 - 1	GIB	N/A	N/A	4.94	75 - 80	12.0	66.0
Vortex Pro, Vortex Pro external, Boilerhouse 58-70 **Riello RDB 3.2**	58	197,900	1.35/45°H	10.0	0 - 1	GIB	N/A	N/A	4.97	75 - 80	12.0	66.0
	64	218,300*	1.50/45°H	10.5	0 - 1	GIB	N/A	N/A	5.49	75 - 80	12.0	72.5
	70	238,800	2.00 /45°S	7.0	0 - 1	GIB	N/A	N/A	6.00	75 - 80	12.0	78.5

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 15-26 to 15kW, the air adjuster disc requires repositioning. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0120.
   When setting the 15-26 to 26kW, the air adjuster disc is not required. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0120.
9. When setting the 26-46 to either 26kW or 31kW, the burner air adjuster disc (Grant UK product code: Z20094349) must be fitted and positioned to the correct disc setting, as shown in Table 1-1 above. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0120. This disc is supplied with the boiler.
10. The installer must amend the boiler data label if the output is changed.
11. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC0120.

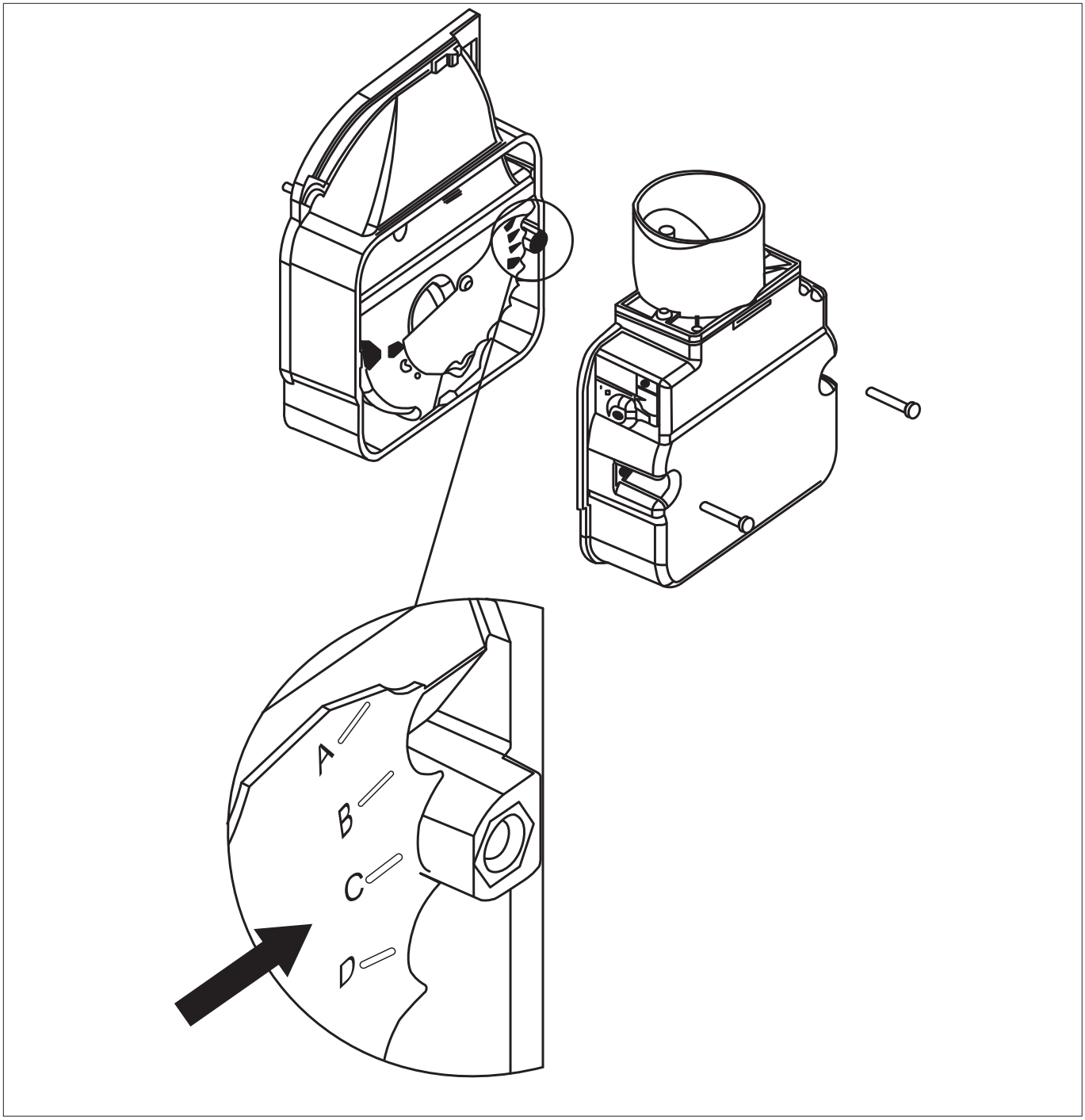

Figure 2-1: Air disc setting

2.1.2 VORTEX PRO COMBI (INTERNAL & EXTERNAL) AND PRO COMBI XS HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-2: Vortex Pro Combi (Internal & External) & Pro Combi XS settings (HVO Biofuel). Refer to Figure 2-1.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)										
Vortex Combi 21 (internal & external) **Riello RDB 2.2 BX E15/21**	21	71,600*	0.45/60°ES	12.5	0 - 1	T2	Disc: C	N/A	1.81	75 - 80	12.5	23.0
Vortex Combi 26 (Internal & External) **Riello RDB 2.2 BX VC26**	26	88,700*	0.65/60°ES	11.5	0 - 1	T2	N/A	N/A	2.21	75 - 80	12.5	28.5
Vortex Combi 36 Internal & External) **Riello RDB 2.2 BX VC36**	36	122,800*	0.85/60°ES	12.0	0 - 1	T5	N/A	N/A	3.07	75 - 80	12.5	39.5
Vortex Combi XS **Riello RDB 2.2 BX VC26**	26	88,700*	0.65/60°ES	11.5	0 - 1	T2	N/A	N/A	2.21	75 - 80	12.5	28.5

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate

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. * Outgoing factory setting.
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 15-26 to 15kW, the air adjuster disc requires repositioning. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0121.
   When setting the 15-26 to 26kW, the air adjuster disc is not required. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0121.
9. When setting the 26-46 to either 26kW or 31kW, the burner air adjuster disc (Grant UK product code: Z20094349) must be fitted and positioned to the correct disc setting, as shown in Table 1-2 above. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0121. This disc is NOT supplied with the boiler but can be obtained free-of-charge by contacting Grant UK.
10. The installer must amend the boiler data label if the output is changed.
11. Refer to Section 10.2 for information on how to set Distance D (Figure 10-4) in Grant UK DOC0121.

2.1.3 VORTEX ECO UTILITY, UTILITY SYSTEMS, EXTERNAL AND EXTERNAL SYSTEMS HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-3: Vortex Eco Utility, Utility Systems, External & External systems burner settings (HVO Biofuel). Refer to Figure 2-1.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)										
15/21 Riello RDB2.2	15.0	51,200	0.40/60°ES	10.0	0 - 1	T1	Disc: B	N/A	1.30	70 - 75	12.0	16.0
	18.0	61,400	0.40/60°ES	12.5	0 - 1	T1	Disc: B	N/A	1.55	75 - 80	12.5	20.0
	21.0	71,600*	0.45/60°ES	12.5	0 - 1	T1	Disc: C	N/A	1.80	80 - 85	12.5	23.0
21/26 Riello RDB2.2	21.0	71,600	0.45/60°ES	12.5	0 - 1	T1	Disc: C	N/A	1.80	80 - 85	12.5	23.0
	23.0	78,400	0.65/60°ES	9.5	0 - 1	T2	N/A	N/A	1.97	85 - 90	12.5	26.0
	26.0	88,700	0.65/60°ES	11.5	0 - 1	T2	N/A	N/A	2.24	90 - 95	12.5	28.5
26/35 Riello RDB2.2	26.0	88,700	0.65/60°ES	11.5	0 - 1	T3	N/A	N/A	2.24	75 - 80	12.5	28.5
	31.0	105,700*	0.75/60°ES	12.0	0 - 1	T5	N/A	N/A	2.64	85 - 90	12.5	34.5
	35.0	119,400	0.75/60°ES	14.0	0 - 1	T5	N/A	N/A	2.97	90 - 95	12.5	39.0

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate

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. * Outgoing factory setting.
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 to 15.0kW the air adjuster disc requires repositioning. Refer to Section 10.3 (air adjuster disc) in Grant UK DOC 0124.
   When setting the 21-26 to 26.0kW, the air adjuster disc is not required. Refer to Section 10.3 (air adjuster disc) in Grant UK DOC 0124.
9. The installer must amend the boiler data label if the output is changed.
10. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC 0124.

2.1.4 VORTEX WALL HUNG , INTERNAL, EXTERNAL, INTERNAL AND EXTERNAL SYSTEMS HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-4: Vortex Wall Hung, Internal, External, Internal and External Systems burner settings (HVO Biofuel). Refer to Figure 2-1.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Distance between nozzle and blast tube	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)									
Vortex Wall hung 12-16 **MAX 1 LN VORTEX WM 12-16 ERP**	12.7	43,300	0.30/80°S	11.0	0 - 1	EK12-16	N/A	1.09	60 - 65	12.5	13.0
	14.0	47,800*	0.30/80°S	12.5	0 - 1	EK12-16	N/A	1.20	65 - 69	12.5	15.0
	16.5	56,300	0.40/80°ES	11.0	0 - 1	EK12-16	N/A	1.41	65 - 69	12.5	17.0
Vortex Wall hung 16-21 **MAX 1 LN VORTEX WM 16-21 ERP**	16.5	56,300	0.40/80°ES	11.0	0 - 1	EK16-21	N/A	1.41	65 - 69	12.5	17.0
	18.7	63,100*	0.40/80°ES	14.0	0 - 1	EK16-21	N/A	1.59	70 - 75	12.5	20.0
	21	71,600	0.50/80°ES	12.0	0 - 1	EK16-21	N/A	1.79	75 - 79	12.0	23.0

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 15-26 to 15kW, the air adjuster disc requires repositioning. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0128.
   When setting the 15-26 to 26kW, the air adjuster disc is not required. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0128.
9. When setting the 26-46 to either 26kW or 31kW, the burner air adjuster disc (Grant UK product code: Z20094349) must be fitted and positioned to the correct disc setting, as shown in Table 1-9 above. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0128. This disc is NOT supplied with the boiler but can be obtained free-of-charge by contacting Grant UK.
10. When setting the 46-70 to 46, 52 or 58kW the burner head requires repositioning. Refer to Section 10 (Commissioning) in Grant UK DOC0128.
11. The installer must amend the boiler data label if the output is changed.
12. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC0128.
13. 21kW CO^2 = 12.00%

2.2 LOW NOX YELLOW FLAME HVO BURNER SETTINGS FOR GRANT OIL BOILERS BETWEEN SEPTEMBER 2018 AND JULY 2022

2.2.1 VORTEX PRO (INTERNAL & EXTERNAL), VORTEX PRO SYSTEMS AND BOILER HOUSE HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-5: Vortex Pro (Internal & External), Vortex Pro Systems and Boilerhouse burner settings (HVO Biofuel). Refer to Figures 2-2, 2-3 & 2-4.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)										
Vortex Pro & Vortex Pro external **Riello RDB2.2 BX E15/21**	15	51,200	0.40/60°ES	9.0	0 - 1	BX 500	Disc: B	13	1.34	65 - 70	12.5	16.0
	18	61,400	0.40/60°ES	12.0	0 - 1	BX 500	Disc: B	13	1.55	70 - 75	12.5	20.0
	21	71,600*	0.50/60°ES	12.0	0 - 1	BX 500	Disc: C	14	1.81	75 - 80	12.5	23.0
Vortex Pro, Vortex Pro external, Boilerhouse and System **Riello RDB2.2 BX V15/26**	15	51,200	0.40/60°ES	9.0	0 - 1	BX 500	Disc: B	13	1.34	60 - 65	12.5	16.0
	21	71,600*	0.50/60°ES	12.0	0 - 1	BX 500	Disc: C	13	1.81	65 - 70	12.5	23.0
	26	88,700	0.60/60°ES	12.5	0 - 1	BX 500	N/A	15	2.21	75- 80	12.5	28.5
Vortex Pro, Vortex Pro external, Boilerhouse and System **Riello RDB2.2 BX V26/36**	26	88,700	0.60/60°ES	12.5	0 - 1	BX 700	N/A	15	2.21	65 - 70	12.5	28.5
	31	105,700*	0.75/60°ES	12.0	0 - 1	BX 700	N/A	16	2.69	70 - 75	12.5	34.5
	36	122,800	085/60°ES	12.0	0 - 1	BX 700	N/A	17.5	2.99	75 - 80	12.5	39.5
Vortex Pro, Vortex Pro external, Boilerhouse and System **Riello RDB2.2 BX V36/46**	36	122,800	085/60°ES	12.5	0 - 1	BX 700	N/A	17.5	2.99	75 - 80	12.5	39.5
	41	140,000*	0.85/60°ES	14.5	0 - 1	BX 700	N/A	17.5	3.50	80 - 85	12.5	45.5
	46	NO HVO setting at this output			-	-	-	-	-	-	-	-
Vortex Pro, Vortex Pro external & Boilerhouse **Riello RDB 3.2 VORT 58**	46	157,000	1.25/80°S	8.0	0 - 1	GIB	N/A	N/A	3.91	75 - 80	12.5	51.0
	52	177,500*	1.35/80°S	9.5	0 - 1	GIB	N/A	N/A	4.43	75 - 80	12.5	58.5
	58	197,900	1.65/80°S	8.0	0 - 1	GIB	N/A	N/A	4.96	75 - 80	12.5	66.0
Vortex Pro, Vortex Pro external & Boilerhous **Riello RDB 3.2 VORT 70**	58	197,900	1.35/45°H	10.0	0 - 1	GIB	N/A	N/A	4.97	75 - 80	12.5	66.0
	64	218,300*	1.50/45°H	10.5	0 - 1	GIB	N/A	N/A	5.45	75 - 80	12.5	72.5
	70	238,800	2.00/45°S	7.0	0 - 1	GIB	N/A	N/A	5.97	75 - 80	12.5	78.5

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 15-26 to 15kW, the air adjuster disc requires repositioning. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0120.
   When setting the 15-26 to 26kW, the air adjuster disc is not required. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0120.
9. When setting the 26-46 to either 26kW or 31kW, the burner air adjuster disc (Grant UK product code: Z20094349) must be fitted and positioned to the correct disc setting, as shown in Table 1-1 above. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0120. This disc is supplied with the boiler.
10. The installer must amend the boiler data label if the output is changed.
11. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC0120.

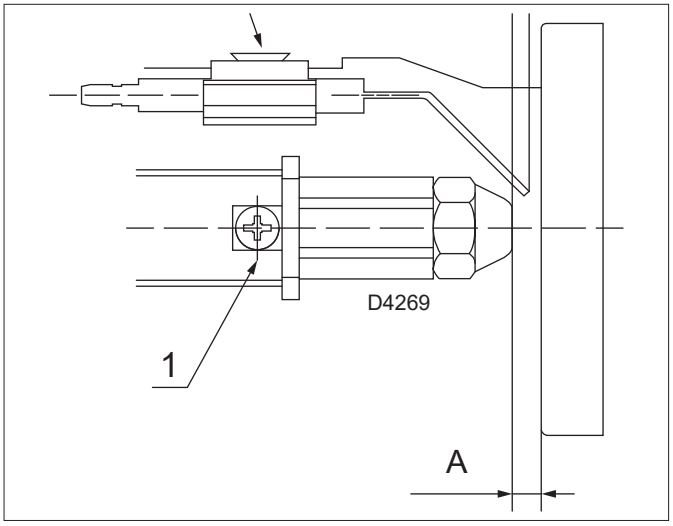

Figure 2-2: Diffuser setting distance A mm

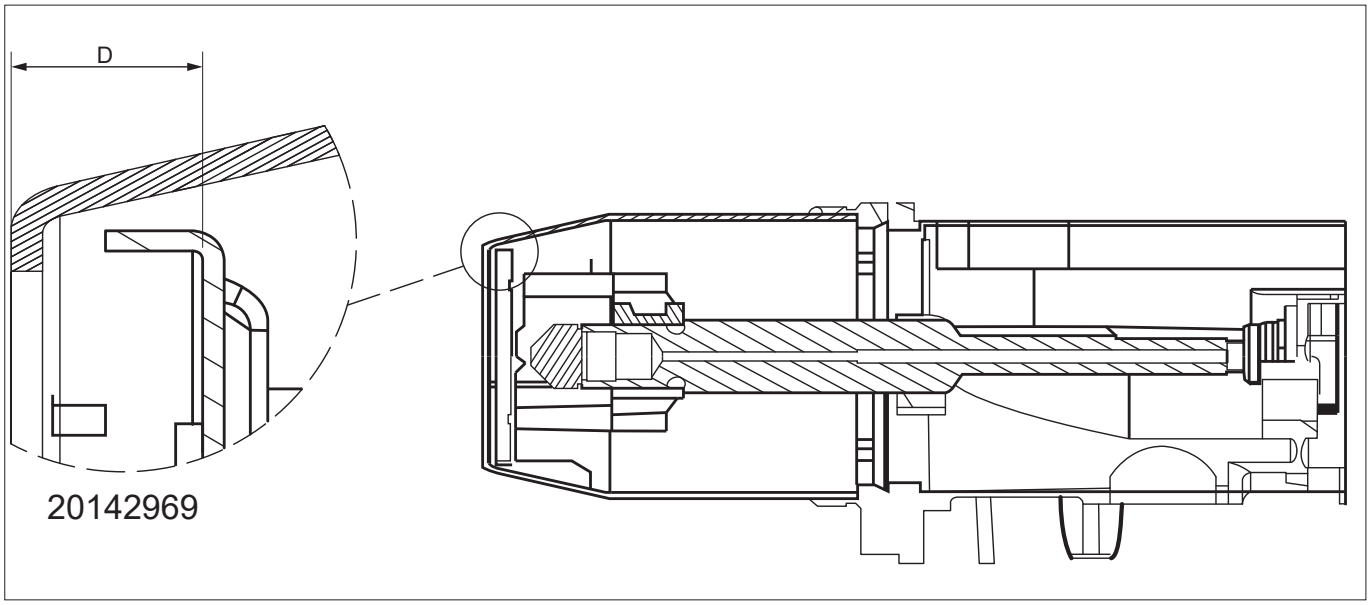

Figure 2-3: Diffuser setting distance D mm

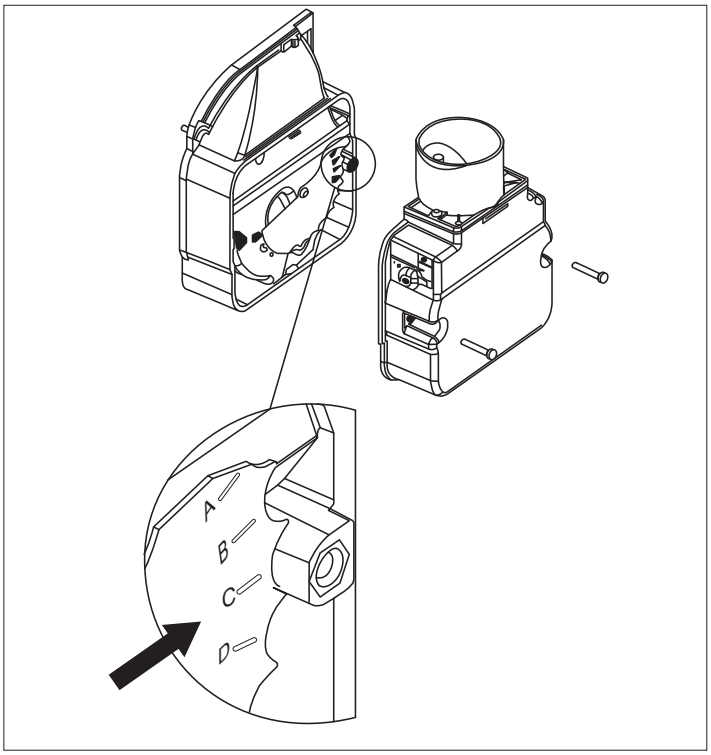

Figure 2-4: Air disc setting

2.2.2 VORTEX PRO COMBI (INTERNAL & EXTERNAL) AND PRO COMBI XS HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-6: Vortex Pro Combi (Internal & External) & Pro Combi XS settings (HVO Biofuel). Refer to Figures 2-2, 2-3 & 2-4.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)										
Combi 21 **Riello RDB2.2 BX E15/21**	21	71,600*	0.50/60°ES	12	0 - 1	BX 500	Disc: C	14	1.84	75 - 80	12.5	23.0
Combi 26 **Riello RDB2.2 BX VC26**	26	88,700*	0.60/60°ES	12.5	0 - 1	BX 500	N/A	15	2.21	75 - 80	12.5	28.5
Combi 36 **Riello RDB2.2 BX VC36**	36	122,800*	0.85 60°ES	12.0	0 - 1	BX 700	N/A	17.5	2.99	75 - 80	12.5	39.5
Combi XS 26 **Riello RDB2.2 BX VC26**	26	88,700*	0.60/60°ES	12.5	0 - 1	BX 500	N/A	15	2.21	75 - 80	12.5	28.5

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 15-26 to 15kW, the air adjuster disc requires repositioning. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0121.
   When setting the 15-26 to 26kW, the air adjuster disc is not required. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0121.
9. When setting the 26-46 to either 26kW or 31kW, the burner air adjuster disc (Grant UK product code: Z20094349) must be fitted and positioned to the correct disc setting, as shown in Table 1-2 above. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0121. This disc is NOT supplied with the boiler but can be obtained free-of-charge by contacting Grant UK.
10. The installer must amend the boiler data label if the output is changed.
11. Refer to Section 10.2 for information on how to set Distance D (Figure 10-4) in Grant UK DOC0121.

2.2.3 VORTEX ECO UTILITY, UTILITY SYSTEMS, EXTERNAL AND EXTERNAL SYSTEMS HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-7: Vortex Eco Utility, Utility System, External & External systems burner settings (HVO Biofuel). Refer to Figures 2-2, 2-3 & 2-4.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)										
Riello RDB2.2 BX E15/21	15.0	51,180	0.40/60°ES	9.0	0 - 1	BX 500	Disc: B	13	1.34	70 - 75	12.5	16.0
	18.0	61,400	0.40/60°ES	12.0	0 - 1	BX 500	Disc: B	13	1.55	75 - 80	12.5	20.0
	21.0	71,600*	0.50/60°ES	12.0	0 - 1	BX 500	Disc: C	13	1.81	80 - 85	12.5	23.0
Riello RDB2.2 BX E21/26	21.0	71,600	0.50/60°ES	12.0	0 - 1	BX 500	Disc: C	13	1.81	80 - 85	12.5	23.0
	23.5	80,200*	0.50/60°ES	15.0	0 - 1	BX 500	Disc: C	14	2.01	85 - 90	12.5	26.0
	26.0	88,700	0.60/60°ES	12.5	0 - 1	BX 500	N/A	15	2.21	90 - 95	12.5	28.5
Riello RDB2.2 BX V26/36	26.0	88,700	0.60/60°ES	12.5	0 - 1	BX 700	N/A	15	2.24	75 - 80	12.5	28.5
	31.0	105,700*	0.75/60°ES	12.0	0 - 1	BX 700	N/A	16	2.64	85 - 90	12.5	34.5
	35.0	119,400	0.75/60°ES	14.0	0 - 1	BX 700	N/A	17.5	2.96	90 - 95	12.5	39.0

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 to 15.0kW the air adjuster disc requires repositioning. Refer to Section 10.3 (air adjuster disc) in Grant UK DOC 0124.
   When setting the 21-26 to 26.0kW, the air adjuster disc is not required. Refer to Section 10.3 (air adjuster disc) in Grant UK DOC 0124.
9. The installer must amend the boiler data label if the output is changed.
10. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC 0124.

2.2.4 VORTEX WALL HUNG , INTERNAL, EXTERNAL, INTERNAL AND EXTERNAL SYSTEMS HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

Table 2-8: Vortex Wall Hung, Internal, External, Internal External Systems burner settings (HVO Biofuel). Refer to Figure 2-5.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Distance between nozzle and blast tube (E)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)									
Ecoflam Max 1 LN Vortex WM 12-16 ERP	12.7	43,300	0.30/80°S	11.0	0 - 1	EK12-16	30.5	1.09	60 - 65	12.5	13.0
	14.0	47,800*	0.30/80°S	12.5	0 - 1	EK12-16	31.5	1.20	65 - 69	12.5	15.0
	16.5	56,300	0.40/80°ES	11.0	0 - 1	EK12-16	32.5	1.41	65 - 69	12.5	17.0
Ecoflam Max 1 LN Vortex WM 16-21 ERP	16.5	53,300	0.40/80°ES	11.0	0 - 1	EK16-21	29.5	1.41	65 - 69	12.5	17.0
	18.7	63,800*	0.40/80°ES	14.0	0 - 1	EK16-21	31.0	1.59	70 - 75	12.5	20.0
	21	71,600	0.50/80°ES	12.0	0 - 1	EK16-21	31.0	1.79	75 - 79	12.5	23.0

Notes:
‡ Flue gas VFR: Flue gas volumetric flow rate.
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. * Outgoing factory setting.
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 46-70 to 46, 52 or 58kW the burner head requires repositioning. Refer to Section 10 (Commissioning) in Grant UK DOC0128.
9. The installer must amend the boiler data label if the output is changed.
10. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC0128.

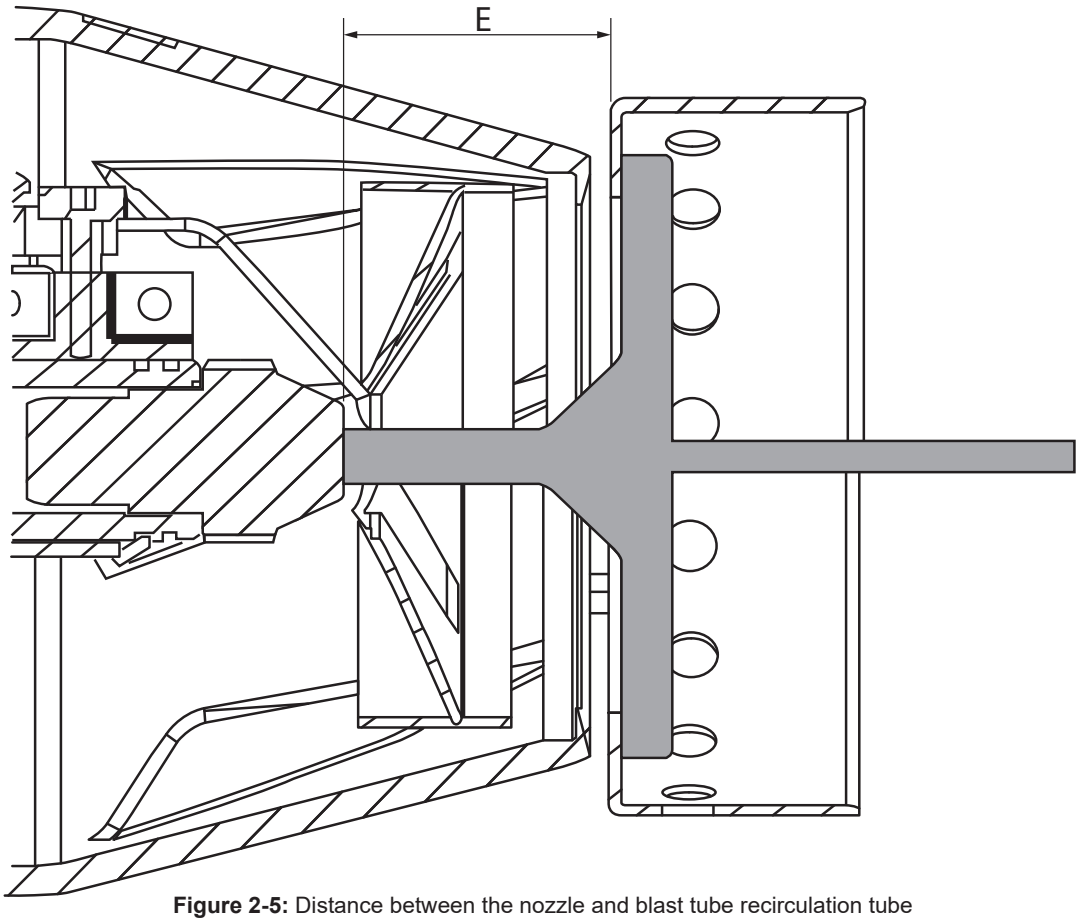

Figure 2-5: Distance between the nozzle and blast tube recirculation tube

2.3 LOW NOX YELLOW FLAME HVO BURNER SETTINGS FOR GRANT OIL BOILERS AFTER 1ST JULY 2022)

2.3.1 VORTEX PRO (INTERNAL & EXTERNAL), VORTEX PRO SYSTEMS AND BOILER HOUSE HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-10: Vortex Pro (Internal & External), Vortex Pro Systems and Boilerhouse burner settings (HVO Biofuel). Refer to Figures 2-6, 2-7 & 2-8.

Boiler models (burner type)	Heat output (kW)	Heat output (Btu/h)	Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
(Riello RDB2.2 BX V15/26)	15	51,200	0.40/60°ES	9.0	0 - 1	BX 500	Disc: B	13	1.34	60 - 65	12.5	16.0
	21	71,600*	0.50/60 ES	12.0	0 - 1	BX 500	Disc: C	13	1.81	65 -70	12.5	23.0
	26	88,700	0.60/60°ES	12.5	0 - 1	BX 500	N/A	15	2.21	75 - 80	12.5	28.5
(Riello RDB2.2 BX V26/46)	26	88,700	0.60/60°ES	12.5	0 - 1	BX 700	N/A	15	2.21	65 - 70	12.5	28.5
	31	105,700*	0.75/60 ES	12.0	0 - 1	BX 700	N/A	16	2.69	70 - 75	12.5	34.5
	36	122,800	0.85/60°ES	12.0	0 - 1	BX 700	N/A	17.5	2.99	75 - 80	12.5	39.5
	41	140,000*	0.85/60°ES	14.5	0 - 1	BX 700	N/A	17.5	3.50	80 - 85	12.5	45.5
	NO HVO setting at this output			-	-	-	-	-	-	-	-	-
(Riello RDB3.2 VORT V70)	46	157,000	1.25/80°S	8.0	0 - 1	GIB	N/A	N/A	3.91	75 - 80	12.5	51.0
	52	177,500*	1.35/80°S	9.5	0 - 1	GIB	N/A	N/A	4.43	75 - 80	12.5	58.5
	58	197,900	1.35/45°H	10.0	0 - 1	GIB	N/A	N/A	4.97	75 - 80	12.5	66.0
	64	218,00*	1.50 45°H	10.5	0 - 1	GIB	N/A	N/A	5.45	75 - 80	12.5	72.5
	70	238,800	2.00 45°S	7.0	0 - 1	GIB	N/A	N/A	5.97	75 - 80	12.5	78.5

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 15-26 to 15kW, the air adjuster disc requires repositioning. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0120. When setting the 15-26 to 26kW, the air adjuster disc is not required. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0120.
9. When setting the 26-46 to either 26kW or 31kW, the burner air adjuster disc (Grant UK product code: Z20094349) must be fitted and positioned to the correct disc setting, as shown in Table 1-1 above. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0120. This disc is supplied with the boiler.
10. The installer must amend the boiler data label if the output is changed.
11. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC0120.

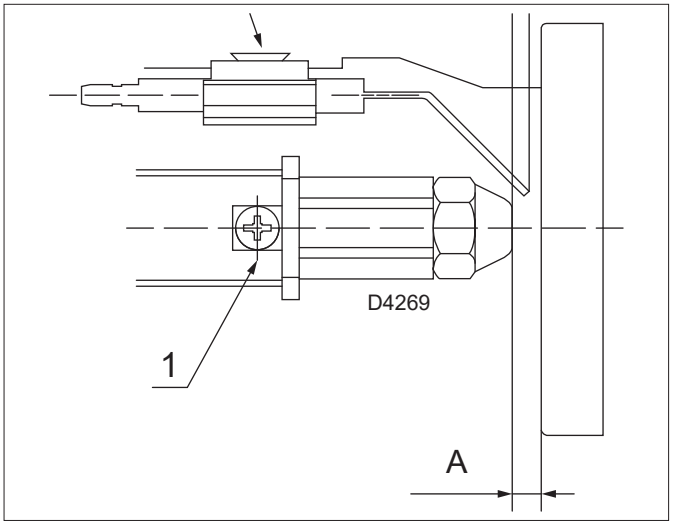

Figure 2-6: Diffuser setting distance A mm

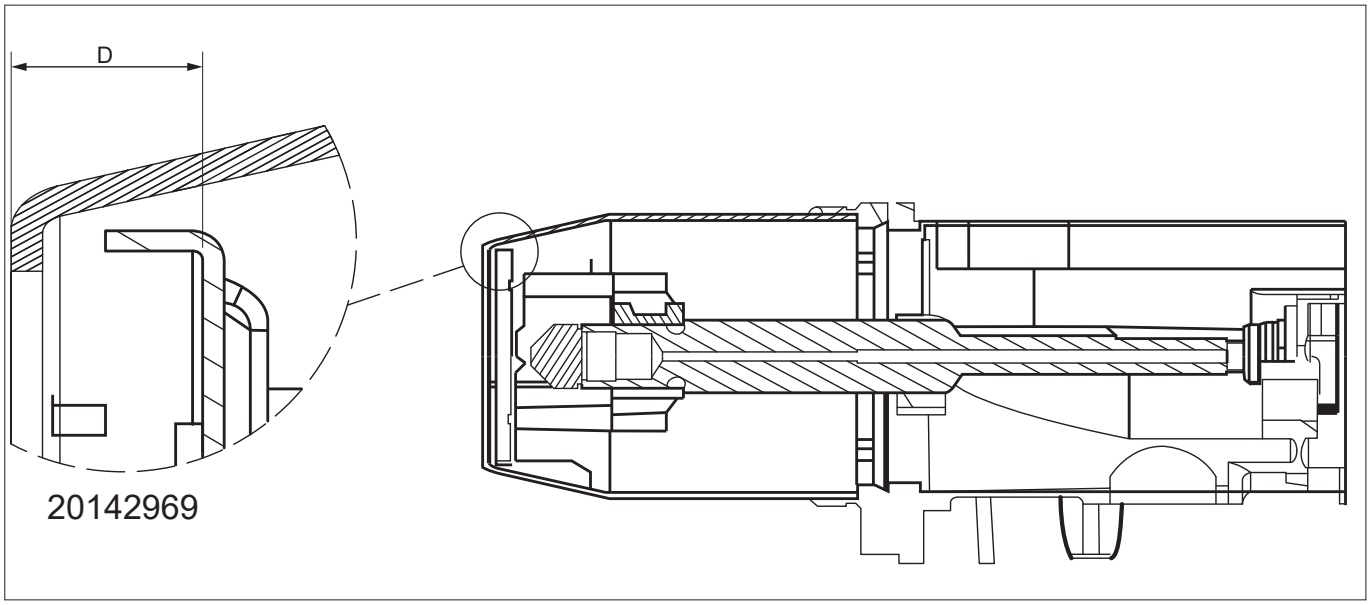

Figure 2-7: Diffuser setting distance D mm

2.3.2 VORTEX PRO COMBI (INTERNAL & EXTERNAL) AND COMBI XS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-11: Vortex Pro combi (Internal & External) and combi XS settings (HVO Biofuel). Refer to Figures 2-6, 2-7 & 2-8.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)										
Pro combi 21 (Riello RDB2.2 BX E15/21)	21	71,600*	0.50/60°ES	12.0	0 - 1	BX 500	Disc: C	14	1.84	75 - 80	12.5	23.0
Pro combi 26 (Riello RDB2.2 BX VC26)	26	88,700*	0.60/60°ES	12.5	0 - 1	BX 500	N/A	15	2.21	75 - 80	12.5	28.5
Pro combi 36(Riello RDB2.2 BX VC36)	36	122,800*	0.85 60°ES	12.0	0 - 1	BX 700	N/A	17.5	2.99	75 - 80	12.5	39.5
Pro combi XS 26 (Riello RDB2.2 BX VC26)	26	88,700*	0.60/60°ES	12.5	0 - 1	BX 500	N/A	15	2.21	75 - 80	12.5	28.5

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 15-26 to 15kW, the air adjuster disc requires repositioning. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0121.
   When setting the 15-26 to 26kW, the air adjuster disc is not required. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0121.
9. When setting the 26-46 to either 26kW or 31kW, the burner air adjuster disc (Grant UK product code: Z20094349) must be fitted and positioned to the correct disc setting, as shown in Table 1-2 above. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0121. This disc is NOT supplied with the boiler but can be obtained free-of-charge by contacting Grant UK.
10. The installer must amend the boiler data label if the output is changed.
11. Refer to Section 10.2 for information on how to set Distance D (Figure 10-4) in Grant UK DOC0121.

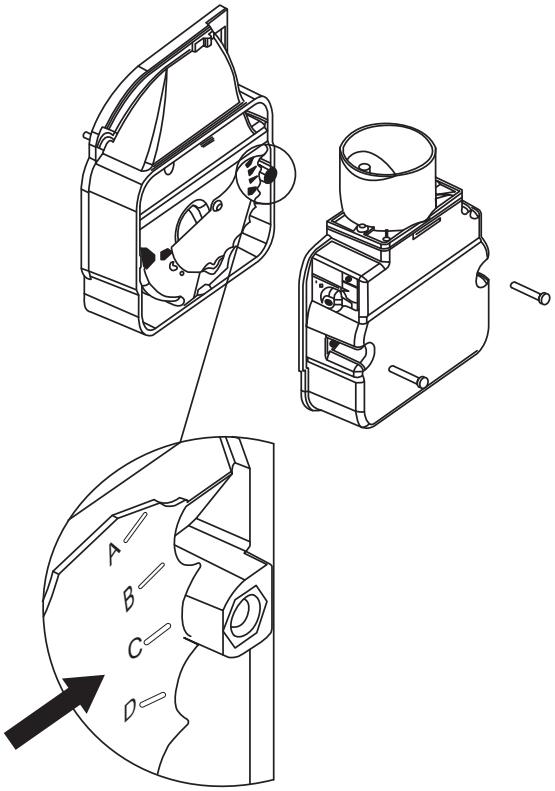

Figure 2-8: Air disc setting

2.3.3 VORTEX ECO UTILITY, UTILITY SYSTEM, EXTERNAL AND EXTERNAL SYSTEMS HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-12: Vortex Eco Utility, Utility System, External & External systems burner settings (HVO Biofuel). Refer to Figures 2-6, 2-7 & 2-8.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)										
(Riello RDB2.2 BX E15/21)	15.0	51,180	0.40/60°ES	9.0	0 - 1	BX 500	Disc: B	13	1.34	70 - 75	12.5	16.0
	18.0	61,400	0.40/60°ES	12.0	0 - 1	BX 500	Disc: B	13	1.55	75 - 80	12.5	20.0
	21.0	71,600*	0.50/60°ES	12.0	0 - 1	BX 500	Disc: C	13	1.81	80 - 85	12.5	23.0
(Riello RDB2.2 BX E21/26)	21.0	71,600	0.50/60°ES	12.0	0 - 1	BX 500	Disc: C	13	1.81	80 - 85	12.5	23.0
	23.5	80,200*	0.50/60°ES	15.0	0 - 1	BX 500	Disc: C	14	2.01	85 - 90	12.5	26.0
	26.0	88,700	0.60/60°ES	12.5	0 - 1	BX 500	N/A	15	2.21	90 - 95	12.5	28.5
(Riello RDB2.2 BX V26/36)	26.0	88,700	0.60/60°ES	12.5	0 - 1	BX 700	N/A	15	2.24	75 - 80	12.5	28.5
	31.0	105,700*	0.75/60°ES	12.0	0 - 1	BX 700	N/A	16	2.64	85 - 90	12.5	34.5
	35.0	119,400	0.75/60°ES	14.0	0 - 1	BX 700	N/A	17.5	2.96	90 - 95	12.5	39.0

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 to 15.0kW the air adjuster disc requires repositioning. Refer to Section 10.3 (air adjuster disc) in Grant UK DOC 0124.
   When setting the 21-26 to 26.0kW, the air adjuster disc is not required. Refer to Section 10.3 (air adjuster disc) in Grant UK DOC 0124.
9. The installer must amend the boiler data label if the output is changed.
10. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC 0124.

2.3.4 VORTEX WALL HUNG HVO BURNER SETTINGS (INTERNAL, EXTERNAL & SYSTEMS)

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-13: Vortex Wall Hung burner settings (HVO Biofuel). Refer to Figures 2-9.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Distance between nozzle and blast tube	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)									
Internal & Internal System 12-16 (Ecoflam Max 1 LN Vortex WM 12-16 ERP)	12.7	43,300	0.30/80°S	11.0	0 - 1	EK12-16	30.5	1.09	60 - 65	12.5	13.0
	14.0	**47,800***	0.30/80°S	**12.5**	**0 - 1**	**EK12-16**	**31.5**	**1.20**	**65 - 69**	**12.5**	**15.0**
	16.5	56,300	0.40/80°ES	11.0	0 - 1	EK12-16	32.5	1.41	65 - 69	12.5	17.0
Internal & Internal System, External & External System 16-21 (Ecoflam Max 1 LN Vortex WM 16-21 ERP)	16.5	53,300	0.40/80°ES	11.0	0 - 1	EK16-21	29.5	1.41	65 - 69	12.5	17.0
	18.7	**63,800***	0.40/80°ES	**14.0**	**0 - 1**	**EK16-21**	**31.0**	**1.59**	**70 - 75**	**12.5**	**20.0**
	21	71,600	0.50/80°ES	12.0	0 - 1	EK16-21	31.0	1.79	75 - 79	12.5	23.0

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 46-70 to 46, 52 or 58kW the burner head requires repositioning. Refer to Section 10 (Commissioning) in Grant UK DOC0128.
9. The installer must amend the boiler data label if the output is changed.
10. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC0128.

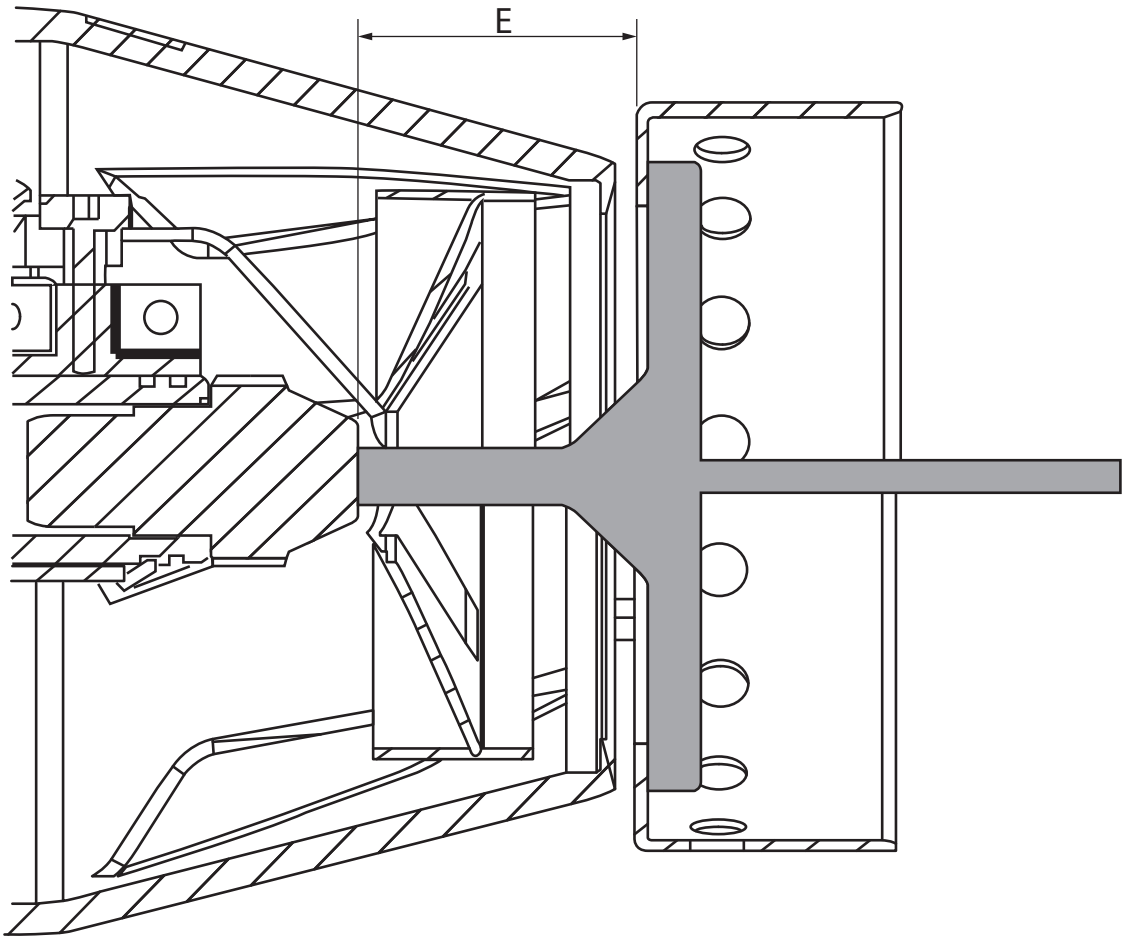

Figure 2-9: Distance between the nozzle and blast tube recirculation tube

2.3.5 VORTEXAIR HVO BURNER SETTINGS

! NOTE !

When commissioning, the air damper must be adjusted to obtain the correct CO_2 level and the installer must amend the data label.

! CAUTION !

These conversion settings are required to operate the boiler on 100% HVO only.

Boilers running on a mix of kerosene and up to 30% HVO do NOT need to be converted as below.

Table 2-9: VortexAir burner settings (HVO Biofuel). Refer to Figure 2-5.

Boiler models (burner type)	Heat output		Nozzle	Oil pressure (bar)	Smoke No.	Burner head type	Burner head/ air disc setting	Distance D [10] (mm)	Fuel flow rate (kg/h)	Flue gas temp. (°C)	CO_2 (%)	Flue gas VFR ‡ (m^3/hr)
	(kW)	(Btu/h)										
HPIDAIRR32 15/26kW **(Riello RDB2.2 BX V15/26)**	15.0	51,200	0.40/60°ES	9.0	0 - 1	BX500	Disc: B	13.0	1.34	65 - 70	12.5	16.0
	21.0	71,600*	0.50/60°ES	12.0	0 - 1	BX500	Disc: C	14.0	1.81	75 - 80	12.5	23.0
	26.0	88,700	0.60/60°ES	12.5	0 - 1	BX500	N/A	2.21	2.21	75 - 80	12.5	28.5

Notes:

‡ Flue gas VFR: Flue gas volumetric flow rate.

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. * Outgoing factory setting.
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 15-26 to 15kW, the air adjuster disc requires repositioning. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0128.
   When setting the 15-26 to 26kW, the air adjuster disc is not required. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0128.
9. When setting the 26-46 to either 26kW or 31kW, the burner air adjuster disc (Grant UK product code: Z20094349) must be fitted and positioned to the correct disc setting, as shown in Table 1-9 above. Refer to Section 10.4 (air adjuster disc) in Grant UK DOC0128. This disc is NOT supplied with the boiler but can be obtained free-of-charge by contacting Grant UK.
10. When setting the 46-70 to 46, 52 or 58kW the burner head requires repositioning. Refer to Section 10 (Commissioning) in Grant UK DOC0128.
11. The installer must amend the boiler data label if the output is changed.
12. Refer to Section 10.2 for information on how to set Distance D (Figure 10-5) in Grant UK DOC0128.

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