

NVx Suspended Gas Unit Heater

Industrial & Commercial Heating Systems



User, Installation & Servicing Manual



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powrmatic

Certificate of Guarantee

Dear Customer

This is to certify that this heater is guaranteed for two years parts and one year labour from the date of original commissioning. The heater must be commissioned within 4 weeks of installation.

To make a claim

In the first instance you must contact your appliance supplier, or installer and provide:-

1. The appliance type and serial number.
2. The original commissioning documentation. As much detail as possible on the fault.
3. Your supplier, or installer, will then contact Powrmatic to make a guarantee claim on your behalf.

Conditions of Guarantee

1. The heater must have been installed by a competent recognised installer, and in accordance with the manufacturer's instructions, building regulations and local regulations.
2. The heater has been professionally commissioned, within 4 weeks of installation, and a copy of the commissioning sheet returned to Powrmatic.
3. The heater has been maintained on a yearly basis by a competent servicing company.
4. The heater has been used in accordance with the manufacturer's instructions.
5. The correct specification fuel has been used.
6. No unauthorised repairs or modifications have been made. Powrmatic 'General Conditions of Sales' have been observed.
7. Except for the obligation of Powrmatic Ltd to perform warranty repairs during the guarantee period Powrmatic will not be liable in respect of any claim for direct or indirect consequential losses, including loss of profits or increased cost arising from loss of use of the heater, or any event arising there from.

Exclusions

Consumables such as gaskets, ignition electrodes, flame rectification electrodes, drive belts, fusible links, control batteries are all excluded from guarantee.

Powrmatic Ltd, Hort Bridge, Ilminster, Somerset, TA19 9PS
Tel: 01460 53535 Fax: 01460 52341
Web: www.powrmatic.co.uk e-mail: warranty@powrmatic.co.uk

Important: This certificate must be kept with the appliance

Failure to provide a copy of the commissioning sheet invalidates the heater warranty

Installer

Date: _____ Signed: _____ Installer

Commissioned

Date: _____ Signed: _____ Commissioning Engineer

Dear Customer - thank you for choosing Powrmatic.

We appreciate you buying one of our high quality products and know that you have made the best choice. By choosing Powrmatic, you are investing in UK manufacturing & its workforce. We pride ourselves by manufacturing products that provide clean, comfortable and safe working environments worldwide together with the personal & professional service and back-up you deserve. If you have any questions or concerns regarding this product, please contact our Technical Support Team by calling 01460 53535.

Users, Installation and Servicing Instructions

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User Instructions



If the heater has not been left operational proceed as follows.

A) Checks before lighting the Air Heater

The following preliminary checks should be made before lighting the heater(s)

- Ensure that the ELECTRICAL supply to the heater is switched OFF.
- Check that all warm air delivery outlets are open.
- Check that the thermostat is set at MAX.
- Check that the clock control is set to an ON period.
- Check that any other controls are calling for heat.

B) Lighting the Air Heater

- Switch on the electrical supply at the isolator
- If the Red Limit indicator lamp is illuminated, identify the limit stat, remove the black cap and press the reset button.
- The startup sequence will commence. After a short delay the burners will light and the green 'ON' indicator on the front of the heater will be illuminated.
- If the burners fail to light the control box will automatically restart the ignition sequence. If after 5 attempts at ignition the burners have still failed to light the control box will go to lockout and the Amber lockout lamp on the front of the heater (or on the low level remote reset, or MC200/MC300 if fitted) will be illuminated. To restart the ignition sequence depress the reset button on the low level reset for about 1-2 seconds.



WARNING: If it is not possible to light the heater after several attempts, contact the installer or local service company.

C) To Shut Down the Air Heater

1) For Short Periods:

Turn the room thermostat to the OFF, or set to it's lowest setting.

2) For Long Periods:

Complete step 1 above. Wait for 5 minutes and then turn OFF the electrical supply at the isolator.

D) Description of Operation



Important: The heater must NOT be controlled by switching ON and OFF the main electrical supply to it.

1) Standard Units

The ignition sequence commences each time the external controls e.g. Time clock, room thermostat etc. call for heat. The internal exhaust fan will run and, when sufficient combustion airflow is proved by the air pressure switch, the ignition spark will be generated, the main gas valve opens and the burners light. The green 'ON' indicator will be illuminated. The heater fan will automatically start approximately 2 minutes after the burners light. When the external controls are satisfied the burners will be turned off and approximately 2 - 3 minutes later the heater fan will be automatically stopped. If the burners fail to light the control box will make another four attempts at ignition.

2) High/Low & Modulating Units

When the burners are alight, the heat output will be controlled either to high fire or low fire or, in the case of modulating units, to any point between high and low fire; depending on the requirements of the space being heated and the external controls fitted.

3) Summer / Winter Modes

Certain types of external controls will provide for two modes of operation i.e:

Summer: The heater fan alone will run at the dictate of the external controls to provide air movement.

Winter: The heater will operate normally.

4) Overheat Thermostat

This operates if high temperatures within the heater are detected, the burners are turned off and a Red indicator lamp on the front panel is illuminated. NVx15 - 75 units have a single thermostat located inside the heater. NVx90 - 140 units have an additional thermostat on the side of the unit at the opposite end to the controls (either thermostat can go to limit and shut off the burners). The fault condition must be identified and rectified and the thermostat manually reset via the red high limit reset switch. When the unit has cooled, identify the limit stat, remove the black cap and press the reset button. The red indicator lamp will go out and the unit is operational again.



Note: The limit thermostat(s) can only be reset once the unit has cooled down. Unless the cause of the fault condition is readily obvious, for example a power cut whilst the heater was operating, a service engineer should be contacted.

E) Maintenance

To maintain efficient, reliable and safe operation of the heater it must be serviced by a qualified person at least annually and preferably at the end of the heating season.

F) IMPORTANT

Free access must be maintained to and around the heater for servicing purposes and the air supply to the heater must not be restricted in any way. Combustible materials must not be stored adjacent to the heater.

If at any time a gas leak is suspected, turn OFF the gas supply at the meter and contact the local gas undertaking immediately.

All Powrmatic heaters use gas and electricity to power them, they may also contain moving parts such as pulleys and belts. It would be hazardous to tamper with or attempt

1.1 Introduction

The NVx range are highly efficient, gas fired, fanned circulation air heaters that cover heat outputs of 15kW to 140kW, have a closed combustion circuit and are supplied complete with a flue system.

NVx heaters are certified for use on Natural Gas, Group H - G20, and Propane - G31 only. Appliance Categories are Cat II2H3P (GB, IE). All NVx heaters are CE certified and conform to all the European directives stated in section 1.3.1

NVx heaters are designed to be suspended from suitable roof points or alternatively to be mounted on purpose designed brackets and are intended primarily for heating commercial or industrial premises. All variants are for internal use only.

NVx heaters feature a closed combustion circuit and have an internal exhaust fan, mounted downstream of the heat exchanger, to evacuate the products of combustion and draw in air for combustion. The air heater must be connected to a flue system that is approved by Powrmatic Ltd.

They may be used where the atmosphere inside the premises could be contaminated e.g. Dust, oil mist etc. but the heaters are not airtight and therefore may not be used in areas classified as hazardous as defined in BS 5345: Part 2 or areas subjected to significant negative pressures due to extract systems.

NVx F, NVx Duo and NVx V heaters have an axial fan assembly fitted to circulate the air being heated through the formed tube heat exchanger. NVx CCF units are supplied with a centrifugal fan and NVx D units for use with

to service unless you are a competent person in the field of Gas and Electrical work.

If you have any safety questions reference the servicing and installation of any of our heaters please do not hesitate to contact our head office for expert advice. Your safety is paramount to us.

Gas Safety (Installation & Use) (Amendment) Regulations



It is law that all gas appliances are installed, adjusted and, if necessary, converted by qualified persons* in accordance with the current issue of the above regulations. Failure to install appliances correctly can lead to prosecution. It is in your own interests and that of safety to ensure that the law is complied with.

* An approved class of person listed on the gas safe register.

ducted systems where the air moving fan is by others or a centrifugal fan section is used adjacent to or remote from the heater. NVx DH units are for use in air handling units.

Heaters are fitted as standard with inshot burners, a fully automatic control for ignition, flame sensing, gas supply control and safety functions, an internal exhaust fan, main air fan (F and CCF models), and fan/limit thermostat.

Options include High/Low or Modulating burner controls, inlet duct connection, outlet duct connection, 30°, 45° head, 90° outlet bend, vertical/horizontal outlet louvre assembly and a full range of modular duct components.



IMPORTANT
Service and Maintenance Engineers shall ensure that replacement items are fitted, adjusted and set in accordance with the data and detail set out in these instructions. If in doubt consult Powrmatic Technical Department.

Gas Safety (Installation & Use) Regulations 1998



It is law that all gas appliances are installed, adjusted and, if necessary, converted by qualified persons* in accordance with the current issue of the above regulations. Failure to install appliances correctly can lead to prosecution. It is in your own interests and that of safety to ensure that the law is complied with.

* An approved class of person listed on the gas safe register.

Model			15	20	25	30	40	50	60	75	90	120	140	
Output (nominal)	High Fire (max)	kW	15	20	25	30	40	50	60	75	90	120	140	
	Low Fire (min)	kW	7.3	10.6	14.6	16.4	23.9	26.0	27.7	44.6	54.4	81.0	89.5	
Input (nett CV)	High Fire (max)	kW	16.4	21.9	27.3	32.9	43.5	54.2	65.5	80.6	97.4	128.5	149.0	
	Low Fire (min)	kW	8.22	11.96	16.5	18.34	26.85	29.6	31.68	50.68	60.18	87.83	97.3	
Airflow Volume	NVx F/CCF/V	m³/s	0.42	0.56	0.78	1.06	1.18	1.51	1.86	2.56	2.81	3.56	3.75	
	Duo	m³/s	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.34	3.12	3.64	
	NVx D	Min	m³/s	0.42	0.56	0.78	1.06	1.18	1.51	1.83	2.56	2.81	3.56	3.75
		Max	m³/s	0.46	0.62	0.86	1.16	1.30	1.67	2.02	2.81	3.09	3.91	4.13
Airflow	Throw	NVx F	m	10.0	14.0	20.0	24.0	28.0	30.0	30.0	32.0	34.0	38.0	
		NVx Duo	m	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	60.0	60.0	64.0
	Fan Static	NVx CCF	Pa	220	320	220	220	150	250	250	250	180	290	250
Electrics	Supply	Standard	V/ph/Hz	230/1/50										
		Optional*	V/ph/Hz	400/3/50 *on Centrifugal Unit Only. 3ph units shown in brackets ()										
	NVx F	Motor	kW	0.12	0.13	0.18	0.18	0.27	0.39	0.66	0.66	2 x 0.39	2 x 0.66	2 x 0.66
		Run	amp	0.50	0.53	0.56	1.0	1.0	1.7	2.6	2.6	3.4	5.2	5.2
	NVx CCF	Motor	kW	0.25	0.42	0.42	0.55	0.55	1.10	1.40	1.40	2 x 1.10	2 x 1.40	2 x 1.40
		Start	amp	5.0	8.5	13.3	13.3	18.0	26.3	29(16.5)	N/A(18)	31(N/A)	40(14.9)	44(16.8)
Run		amp	2.0	3.1	4.2	4.3	5.8	7.6	10(4.8)	N/A(5.3)	13(N/A)	17(4.6)	20(4.9)	
Fuel	Connection		BSP/Rc	¾"										
	Nominal Inlet Pressure	Nat Gas	mbar	20.0										
		LPG	mbar	37.0										
	Consumption	Nat Gas	m³/h	1.69	2.31	2.89	3.45	4.60	5.73	6.93	8.59	10.29	13.73	15.74
LPG		m³/h	0.65	0.90	1.13	1.33	1.78	2.21	2.68	3.33	4.01	5.44	6.20	
Mounting Height	NVx F/Duo Crossflow	Min	m	2.5				3.00						
		Max	m	3.0				5.00						
	NVx V Downflow	Min	m	3.00	4.00			4.00	5.00			6.00	6.00	
		Max	m	5.00	6.00			7.00	8.00			10.00	12.00	
Overall Dims	NVx F	Height	mm	540	540	540	760	760	912	760	912	831	975	1140
		Width	mm	1000	1000	1000	1000	1000	1000	1325	1325	1950	1950	1950
		Depth	mm	892	925	925	925	905	925	941	941	925	941	941
Install Clearance	NVx F	Top	mm	200										
		LH Side	mm	200										
		RH Side	mm	1000										
		Rear	mm	400										
Flue	Diameter		mm Ø	80	80	80	100	100	100	130	130	130	130	130
	Max Length	Flue Only	m	12										
		Room Sealed	m	6										
Combustion Air Spigot			mm Ø	80	80	80	100	100	100	130	130	130	130	130
Noise Levels	NVx F	dB(A)	54	52	53	54	58	61	62	62	66	67	67	
	NVx V	dB(A)	64	62	63	64	68	71	72	72	76	77	77	
Nett Weight	NVx F	kg	71.5	71.5	72.5	75.5	115	133.5	135.5	157	202	238	286	
	NVx CCF	kg	106.5	120.5	126.5	166.5	168.5	183	213	234	329	363.5	430	

- Notes:
- Fuel Consumption and input figures based upon nett calorific values as follows: - Natural Gas (G20) nett CV 34.02 MJ/m³ - Propane (G31) nett CV 88.00 MJ/m³
 - Heaters have efficiency levels which meet with the minimum heater efficiency requirements of UK Part L Building Regulations.
 - NVx heaters comply with the seasonal efficiency requirements of the Ecodesign regulation (EU) 2015/1188, Directive 2009/125/EC – Lot 21 Tier 1 (Known as ErP and mandatory as from 1st January 2018)
 - Standard heaters configured as High/Low. Optional Modulation available.
 - Air handling data is assessed at room ambient conditions
 - Throw figures provide the distance to the point where the terminal velocity degrades to 0.25m/s
 - Dimensions, weights and clearance data in the table above refer to NVx F and NVx V units only - for NVx CCF and NVx D data refer to the dimensions page and/or the installation instructions
 - Noise levels are applicable to standard NVx F and NVx V models and are measured 5m from appliance in a free field.
 - Motor kW, run and start amps apply to standard electrical supply as stated. For optional data contact sales office
 - Optional 3 phase direct drive centrifugal blowers shown in italics within brackets()
 - Connection of combustion air duct is not required for 'flue only' applications
 - The NVx Duo throw dimension is the effective combined throw measurement
 - It is the responsibility of the installing contractor to ensure that ductwork is correctly sized and balanced when installing NVx Centrifugal units

Dimensions

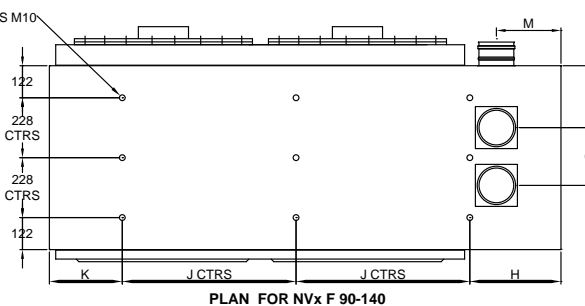
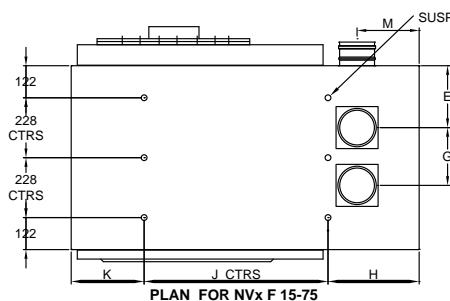
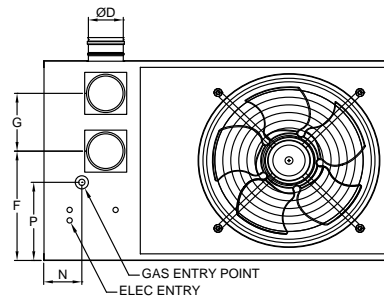
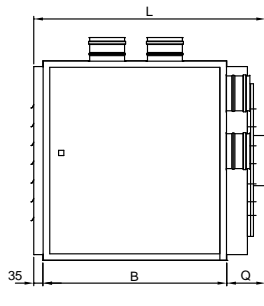
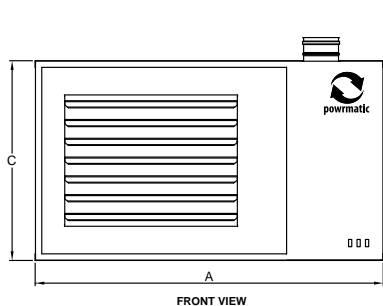
NVx F - Axial Fan Crossflow Units



NVx 40 F



NVx 90

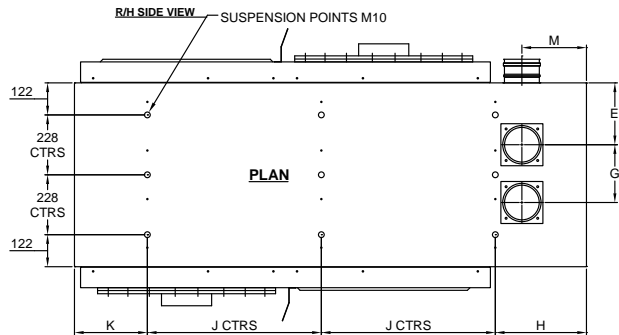
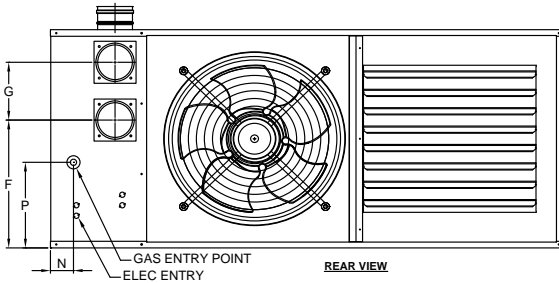
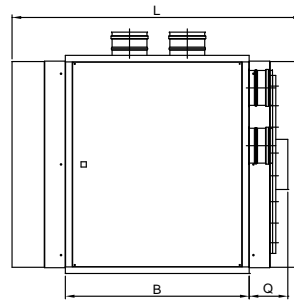
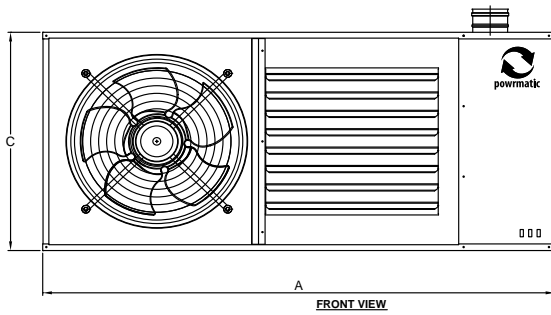


Model		15	20	25	30	40	50	60	75	90	120	140
A	mm	1000	1000	1000	1000	1000	1000	1325	1325	1950	1950	1950
B	mm	700	700	700	700	700	700	700	700	700	700	700
C	mm	540	540	540	760	760	912	760	912	831	975	1140
DØ	mm	80	80	80	100	100	100	130	130	130	130	130
E	mm	248	248	248	233.5	233.5	233.5	235.5	235.5	235.5	235.5	235.5
F	mm	308	308	308	492	492	644	416	568	487	631	796
G	mm	120	120	120	142	142	142	220	220	220	220	220
H	mm	317	317	317	317	317	317	347	347	347	347	347
J	mm	450	450	450	450	450	450	700	700	2 x 662.5	2 x 662.5	2 x 662.5
K	mm	218	232.5	232.5	232.5	232.5	232.5	278	278	278	278	278
L	mm	892	925	925	925	925	922	939	985	922	941	941
M	mm	216	216	216	206	206	206	236	236	246	246	246
N	mm	114	114	114	114	114	114	145	145	88	88	88
P	mm	194	194	225.5	297	297	374	297	374	326	398	481
Q	mm	157	190	190	190	170	190	204	250	188	207	207

NVx Duo - Axial Fan Bi-Directional Units



NVx 90 Duo



Model		90	120	140
A	mm	1950	1950	1950
B	mm	700	700	700
C	mm	831	975	1140
DØ	mm	130	130	130
E	mm	235.5	235.5	235.5
F	mm	487	631	798
G	mm	220	220	220
H	mm	347	347	347
J	mm	2 x 662.5	2 x 662.5	2 x 662.5
K	mm	278	278	278
L	mm	1287	1350	1350
M	mm	246	246	246
N	mm	88	88	88
P	mm	326	398	481
Q	mm	188	207	207

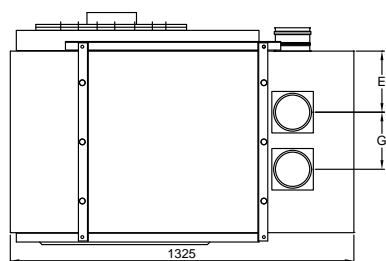
NVx V - Axial Fan Downflow Units



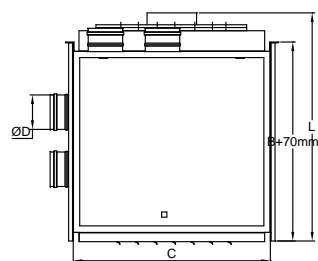
NVx 60 V



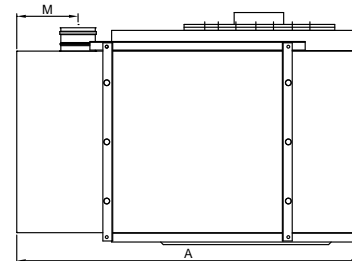
NVx 60 V



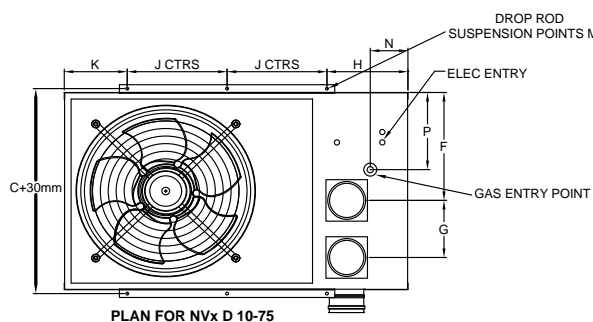
FRONT



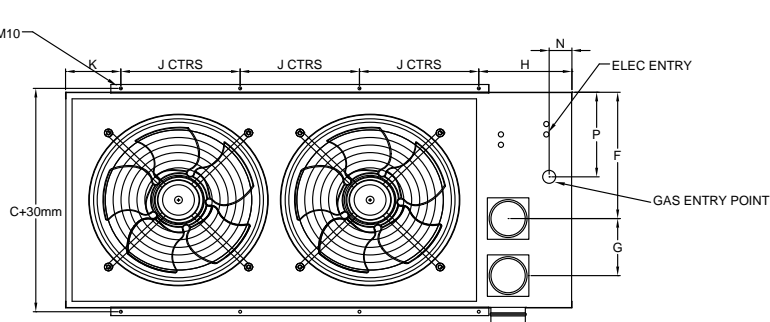
R/H SIDE VIEW



REAR



PLAN FOR NVx D 10-75



PLAN FOR NVx D 90-140

Model		15	20	25	30	40	50	60	75	90	120	140
A	mm	1000	1000	1000	1000	1000	1000	1325	1325	1950	1950	1950
B	mm	700	700	700	700	700	700	700	700	700	700	700
C	mm	540	540	540	760	760	912	760	912	831	975	1140
DØ	mm	80	80	80	100	100	100	130	130	130	130	130
E	mm	248	248	248	233.5	233.5	233.5	235.5	235.5	235.5	235.5	235.5
F	mm	308	308	308	492	492	644	416	568	487	631	796
G	mm	120	120	120	142	142	142	220	220	220	220	220
H	mm	283	283	304	283	283	283	312	312	319	319	319
J	mm	260	260	260	260	260	260	385	385	460	460	460
K	mm	197	197	197	197	197	197	243	243	251	251	251
L	mm	892	925	925	925	925	925	939	985	986	986	986
M	mm	216	216	216	206	206	206	236	236	246	246	246
N	mm	114	114	114	114	114	114	145	145	88	88	88
P	mm	194	194	225.5	297	297	374	297	374	326	398	481

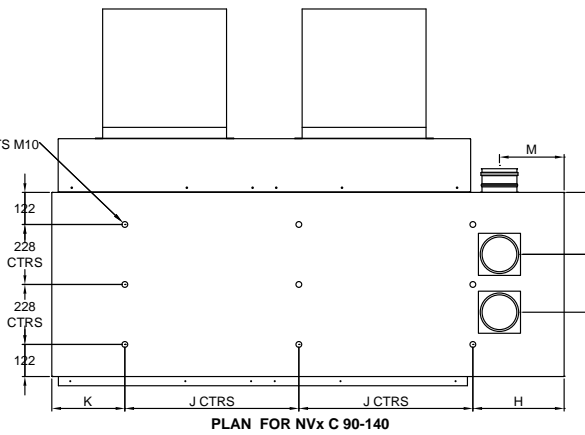
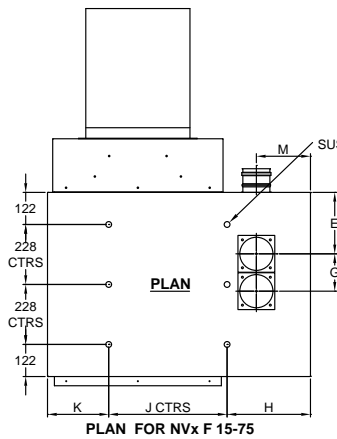
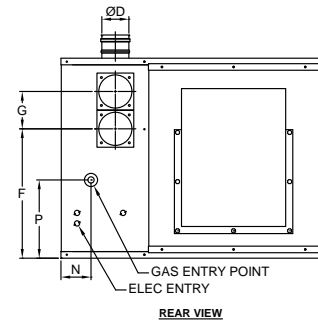
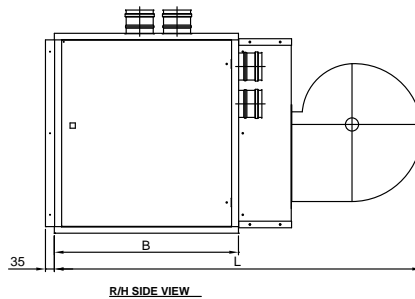
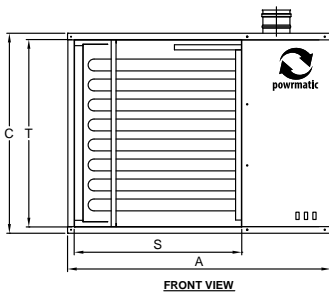
NVx CCF - Centrifugal Close Coupled Fan Units



NVx 50 CCF (Front)



NVx 50 CCF (Rear)



Model		15	20	25	30	40	50	60	75	90	120	140
A	mm	1000	1000	1000	1000	1000	1000	1325	1325	1950	1950	1950
B	mm	700	700	700	700	700	700	700	700	700	700	700
C	mm	540	540	540	760	760	912	760	912	831	975	1140
DØ	mm	80	80	80	100	100	100	130	130	130	130	130
E	mm	248	248	248	233.5	233.5	233.5	235.5	235.5	235.5	235.5	235.5
F	mm	308	308	308	492	492	644	416	568	487	631	796
G	mm	120	120	120	142	142	142	220	220	220	220	220
H	mm	317	317	317	317	317	317	347	347	347	347	347
J	mm	450	450	450	450	450	450	700	700	2x662.5	2x662.5	2x662.5
K	mm	218	232.5	232.5	232.5	232.5	232.5	278	278	278	278	278
L	mm	1317	1356	1356	1430	1430	1430	1505	1505	1430	1505	1505
M	mm	216	216	216	206	206	206	236	236	246	246	246
N	mm	114	114	114	114	114	114	145	145	88	88	88
P	mm	194	194	225.5	297	297	374	297	374	326	398	481
S	mm	637	637	637	637	637	637	932	932	1557	1557	1557
T	mm	492	492	492	712	712	864	712	864	783	927	1092

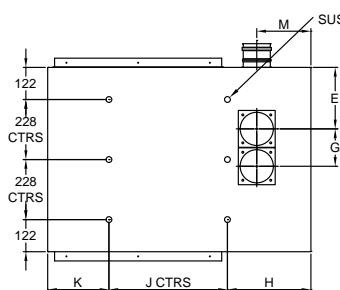
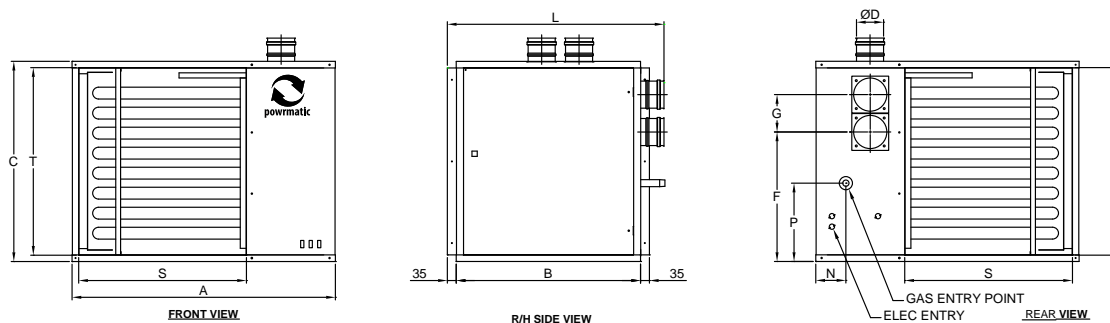
NVx D - Ducted Heat Module (No Fan)



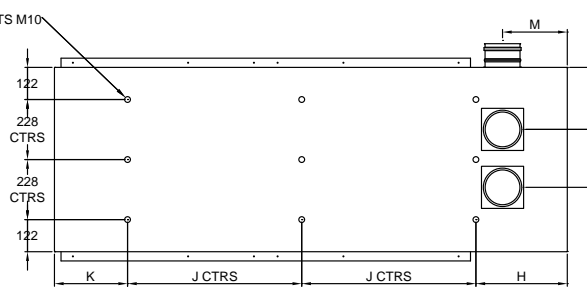
NVx 50 D (Front)



NVx 50 D (Rear)



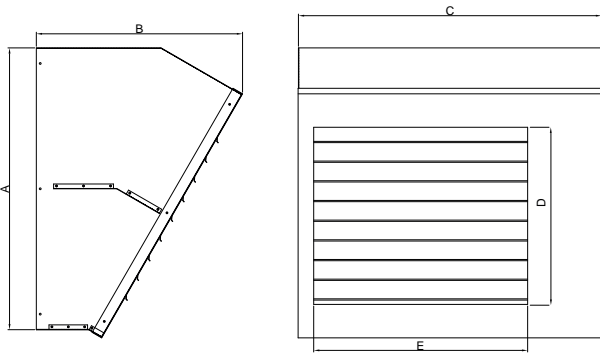
PLAN FOR NVx D 15-75



PLAN FOR NVx D 90-140

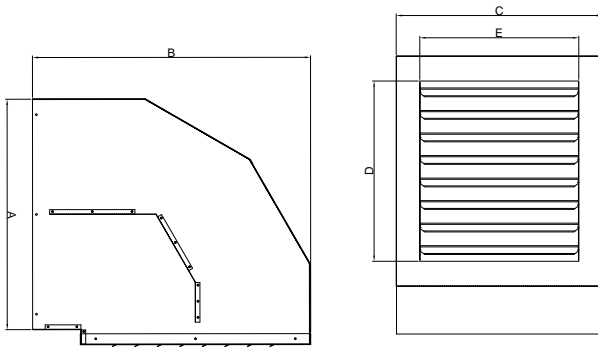
Model		15	20	25	30	40	50	60	75	90	120	140
A	mm	1000	1000	1000	1000	1000	1000	1325	1325	1950	1950	1950
B	mm	700	700	700	700	700	700	700	700	700	700	700
C	mm	540	540	540	760	760	912	760	912	831	975	1140
DØ	mm	80	80	80	100	100	100	130	130	130	130	130
E	mm	248	248	248	233.5	233.5	233.5	235.5	235.5	235.5	235.5	235.5
F	mm	308	308	308	492	492	644	416	568	487	631	796
G	mm	120	120	120	142	142	142	220	220	220	220	220
H	mm	317	317	317	317	317	317	347	347	347	347	347
J	mm	450	450	450	450	450	450	700	700	2 x 662.5	2 x 662.5	2 x 662.5
K	mm	218	232.5	232.5	232.5	232.5	232.5	278	278	278	278	278
L	mm	835	835	835	835	835	835	835	835	835	835	835
M	mm	216	216	216	206	206	206	236	236	246	246	246
N	mm	114	114	114	114	114	114	145	145	88	88	88
P	mm	194	194	225.5	297	297	374	297	374	326	398	481
S	mm	637	637	637	637	637	637	932	932	1557	1557	1557
T	mm	492	492	492	712	712	864	712	864	783	927	1092

30° Downflow Head (NVx F Models Only)



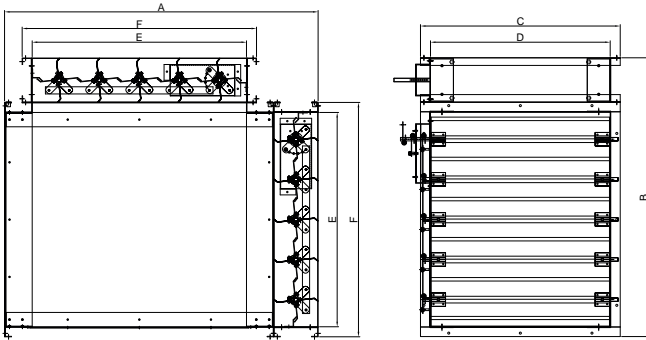
Model	Part Number	Dimensions (mm)				
		A	B	C	D	E
NVx 15-20-25	NVX01530DH	496	449	639	350	494
NVx 30-40	NVX03030DH	716	559	639	560	494
NVx 50	NVX05030DH	868	635	639	630	494
NVx 60	NVX06030DH	716	559	934	500	659
NVx 75	NVX07530DH	868	635	934	630	659
NVx 90	NVXSF09030DH	787	595	1566	560	659
NVx 120	NVXSF12030DH	931	667	1566	700	659
NVx 140	NVXSF14030DH	1096	746	1566	840	659

90° Downflow Head - (NVx F Models Only)



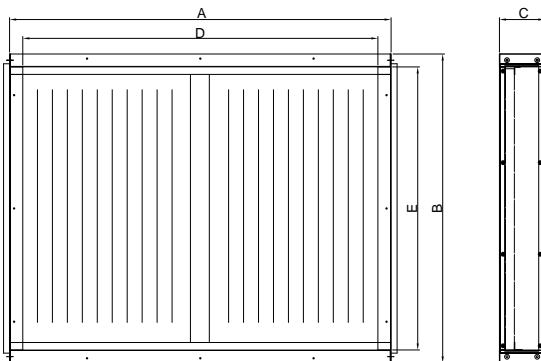
Model	Part Number	Dimensions (mm)				
		A	B	C	D	E
NVx 15-20-25	NVX01590DH	496	601	639	350	494
NVx 30-40	NVX03090DH	716	862	639	560	494
NVx 50	NVX05090DH	868	1015	639	630	494
NVx 60	NVX05090DH	716	862	934	500	659
NVx 75	NVX06090DH	868	1015	934	630	659
NVx 90	NVX07590DH	787	595	1566	560	659
NVx 120	NVXSF12090DH	931	667	1566	700	659
NVx 140	NVXSF14090DH	1096	746	1566	840	659

Mixing Box - (NVx CCF Models Only)



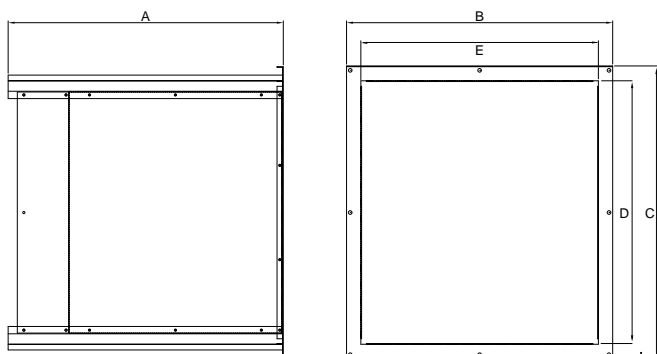
Model	Part Number	Dimensions (mm)					
		A	B	C	D	E	F
NVx 15-20-25	NVx015MB	865	745	698	628	520	590
NVx 30-40	NVx030MB	1093	973	698	628	748	818
NVx 50	NVx050MB	1247	1125	698	628	900	970
NVx 60	NVx060MB	1093	973	1011	941	748	818
NVx 75	NVx075MB	1247	1125	1011	941	900	970
NVx 90	NVxSF090MB	1111	991	1639	1569	766	836
NVx 120	NVxSF120MB	1289	1169	1639	1569	944	1014
NVx 140	NVxSF140MB	1475	1355	1639	1569	1130	1200

Filter Box - (NVx CCF Models Only)



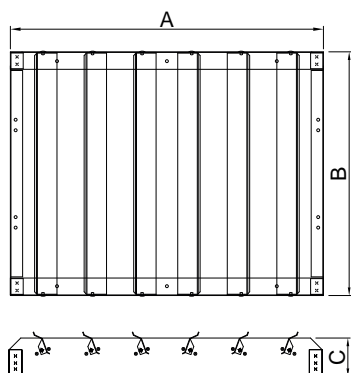
Model	Part Number	Dimensions (mm)				
		A	B	C	D	E
NVx 15-20-25	NVx015FB	698	590	120	628	522
NVx 30-40	NVx030FB	698	818	120	628	750
NVx 50	NVx050FB	698	970	120	628	902
NVx 60	NVx060FB	1010	818	120	940	750
NVx 75	NVx075FB	1010	970	120	940	902
NVx 90	NVxSF090FB	836	1639	120	766	1569
NVx 120	NVxSF120FB	1014	1639	120	944	1569
NVx 140	NVxSF140FB	1200	1639	120	1130	1569

Fan Plenum Box - (NVx CCF Models Only)



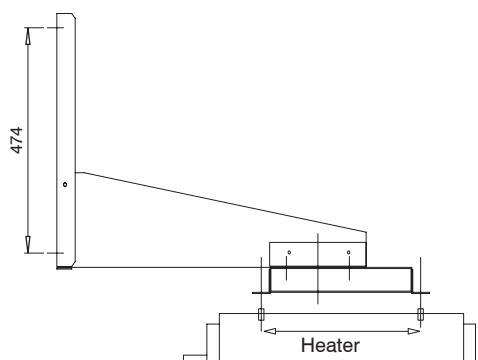
Model	Part Number	Dimensions (mm)				
		A	B	C	D	E
NVx 15-20-25	NVx015/PLENUM	750	725	575	494	644
NVx 30-40	NVx030/PLENUM	750	725	795	714	644
NVx 50	NVx050/PLENUM	750	725	947	866	644
NVx 60	NVx060/PLENUM	750	1020	795	714	939
NVx 75	NVx075/PLENUM	825	1020	947	866	939
NVx 90	NVxSF090/PLENUM	900	1639	836	755	1558
NVx 120	NVxSF120/PLENUM	900	1639	1014	935	1588
NVx 140	NVxSF140/PLENUM	900	1639	1200	1119	1558

Vertical Louvres (For Use On All Models)



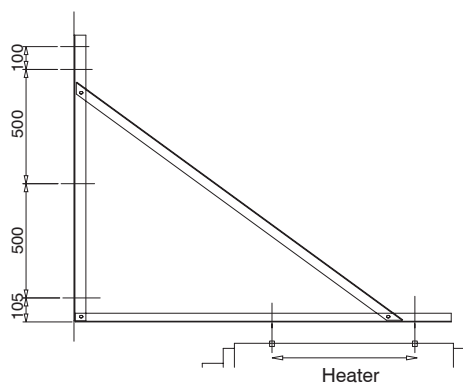
Model	Part Number	Dimensions (mm)		
		A	B	C
NVx 15-20-25	NVX015VL	537	418	66
NVx 30-40	NVX030VL	537	628	66
NVx 50	NVX050VL	537	698	66
NVx 60	NVX060VL	702	568	66
NVx 75	NVX075VL	702	698	66
NVx 90	NVX90SFVL	702	628	66
NVx 120	NVX120SFVL	702	758	66
NVx 140	NVX140SFVL	702	899	66

Swivel Wall Bracket - (NVx F Models Only)



Model	Part Number
NVx15 - 50	NVX15-50SWB
NVx60 - 75	NVX60-75SWB

Cantilever Wall Bracket - (NVx F Models Only)



Model	Part Number
NVx10 - 75	NVX10/75WB
NVx90 - 140	NVX90/140WB

Notes: - Dimensions for the swivel and cantilever brackets remain the same for all NVx models
 - Swivel Brackets can not be used with double units

1.2 Technical Data

Injector Sizes & Burner Pressures - Natural Gas - Group H - G20 Net CV (Hi = 34.02MJ/m³)

(All variants)

				High Fire		Low Fire	
				Burner Pressure	Gas Rate	Burner Pressure	Gas Rate
				mbar	m ³ /h	mbar	m ³ /h
MODEL	No.	Size (mm)	Marked				
NVx15	4	1.67	380	12.7	1.75	3.9	0.87
NVx20	4	1.94	500	12.7	2.33	3.4	1.27
NVx25	5	1.94	500	12.5	2.91	4.7	1.75
NVx30	6	1.94	500	13.9	3.49	4.0	1.94
NVx40	8	1.94	500	13.5	4.66	5.2	2.84
NVx50	10	1.94	500	13.2	5.71	4.0	3.13
NVx60	8	2.54	750	9.5	6.93	2.5	3.35
NVx75	10	2.54	750	10.0	8.52	4.0	5.36
NVx90	8	3.5	1500	5.9	10.52	2.5	6.37
NVx120	10	3.5	1500	7.2	13.60	3.1	9.76
NVx140	12	3.5	1500	6.9	15.77	3.2	10.81

Nominal Inlet Pressure = 20mbar

Minimum Inlet Pressure = 17.5mbar

Injector Sizes & Burner Pressures - Propane G31 Net CV (Hi = 88.00MJ/m³)

(All variants)

				High Fire		Low Fire	
				Burner Pressure	Gas Rate	Burner Pressure	Gas Rate
				mbar	m ³ /h	mbar	m ³ /h
MODEL	No.	Size (mm)	Marked				
NVx15	4	1.2	120	21.6	0.65	5.8	0.34
NVx20	4	1.36	240	21.2	0.90	6.1	0.47
NVx25	5	1.36	240	21.4	1.13	7.9	0.68
NVx30	6	1.36	240	20.6	1.33	6.0	0.75
NVx40	8	1.36	240	19.8	1.78	6.2	0.99
NVx50	10	1.36	240	21.2	2.21	5.7	1.16
NVx60	8	1.6	160	25.4	2.68	6.4	1.34
NVx75	10	1.6	160	25.1	3.33	7.2	1.74
NVx90	8	2.26	580	14.4	4.01	5.2	2.39
NVx120	10	2.26	580	15.9	5.44	7.4	3.60
NVx140	12	2.26	580	16.0	6.20	6.3	3.97

Nominal Inlet Pressure = 37mbar

Minimum Inlet Pressure = 37mbar

Electrical Loadings - 1Pha

MODEL	F / Duo ¹ / V Models			CCF Models		
	Start Amps (A)	Run Amps (A)	Fuse/MCB Rating (A)	Start Amps (A)	Run Amps (A)	Fuse/MCB Rating (A) ³
NVx15	0.8	0.50	3	5.0	2.0	6
NVx20	1.05	0.53	3	8.5	3.1	6
NVx25	1.05	0.56	3	13.3	4.2	6
NVx30	1.54	1.0	3	13.3	4.3	6
NVx40	2.4	1.0	3	18.0	5.8	10
NVx50	3.76	1.7	3	26.3	7.6	10
NVx60	5.5	2.6	5	29.0	10.0	13
NVx75	5.5	2.6	5	18/pha (3ph)	5.3/pha (3ph)	10/pha (3ph)
NVx90 ¹	5.0	3.4	5	31.0	12.8	16
NVx120 ¹	10.6	5.2	13	40.0	17.0	20
NVx140 ¹	10.6	5.2	13	44.0	20.0	32

Notes: ¹ 3 sizes only for Duo models; ² 3ph data is supplied separately with units ordered to this specification; ³ motor rated Protection Device

Heater Specifications

MODEL		High Fire		Low Fire		Air Volume		Maximum Duct Resistance	Noise Level	Weight
		Input (Nett)	Output	Input (Nett)	Output	m ³ /s	m ³ /h			
		kW		kW				Pa	dB(A)	kg
NVx15	F/Duo/V	16.4	15.0	8.22	7.3	0.42	1500	n/a	54	71.5
	CCF							145	n/a	106.5
NVx20	F/Duo/V	21.9	20.0	11.96	10.6	0.56	2020	n/a	52	71.5
	CCF							177	n/a	120.5
NVx25	F/Duo/V	27.3	25.0	16.50	14.6	0.78	2808	n/a	53	72.5
	CCF							143	n/a	126.5
NVx30	F/Duo/V	32.9	30.0	18.34	16.4	1.06	3800	n/a	54	75.5
	CCF							250	n/a	166.5
NVx40	F/Duo/V	43.8	40.0	26.85	23.9	1.18	4250	n/a	58	115
	CCF							236	n/a	168.5
NVx50	F/Duo/V	54.2	50.0	29.60	26.0	1.51	5450	n/a	61	133.5
	CCF							205	n/a	183
NVx60	F/Duo/V	65.5	60.0	31.68	27.7	1.83	6600	n/a	62	135.5
	CCF							250	n/a	213
NVx75	F/Duo/V	80.6	75.0	50.58	44.6	2.56	9200	n/a	62	157
	CCF							260	n/a	234
NVx90	F/Duo/V	97.4	90.0	60.18	54.4	2.81	10100	n/a	66	202
	CCF							200	n/a	329
NVx120	F/Duo/V	128.5	120.0	87.83	81.0	3.56	12800	n/a	67	238
	CCF							284	n/a	353.5
NVx140	F/Duo/V	148.9	140.0	97.30	89.5	3.75	13500	n/a	67	286
	CCF							285	n/a	430

1.3 General Requirements

1.3.1. Related Documents

All NVx heaters comply with the following European Directives:

Energy Related Product Directive:	2009/125/EC*
Gas Appliance Directive:	2009/142/EC
Electromagnetic Compatibility Directive:	2004/108/EC
Low Voltage Directive:	2006/95/EC
Machinery Directive:	2006/42/EC

Air heater(s) must be installed in accordance with **BS6230** and **BS5440** plus any relevant requirements of local and national building codes. * *where appropriate*

1.3.2 Location

Powrmatic NVx units are designed to operate within an ambient temperature range of -10 to 25°C.

NVx heaters can be installed in several ways: i) suspended from 'drop rods' via purpose designed M10 suspension fixing points on the heater, ii) attached to our optional wall support brackets or iii) positioned on a level, non-combustible base. In all cases, it is important that all supporting structures have been assessed with regard to the relevant weight loadings.

Consideration should be given to flue routes and points of exit, gas, electrical and control connections. Consideration should also be given to the throw characteristics of the heater, issues of public access and siting of environmental control stations and/or remote temperature sensors where the position needs to be representative of the zone temperature to which they refer.

Where the location of the air heater is such that it might suffer external mechanical damage e.g. from overhead cranes, fork lift trucks, it must be suitably protected.

Heaters should not be installed in hazardous areas or areas where there is a foreseeable risk of flammable or corrosion inducing particles, gases or vapours being drawn into the combustion air or main fan circuits.

Areas where special consideration or advice may be required could include but is not limited to –

- Where de-greasing solvents are present, even in minute concentrations
- Where paint spraying is carried out
- Where styrenes or other laminating products are used
- Where airborne silicone is present
- Where petrol engine vehicles are stored or

- maintained
 - Where dust is present (i.e. wood working or joinery shops)
 - Where high levels of extract persist
- Installation in such areas may be possible under specific conditions. Please consult our Technical Department for further information.

1.3.2.1 Sizing of the heater

The heater should be correctly sized for the area that it is heating, Full calculations need to be performed to ensure the correct KW output heater is fitted (CIBSE elemental methodology can be used, or the Powrmatic Technical Department can provide guidelines).

1.3.3 Electrical Supply

Wiring external to the air heater must be installed in accordance with the I.E.E. Regulations for Electrical Installations and any local regulations which apply. All standard heaters are supplied by 230V - 1ph, 50Hz. The method of connection to the main electricity supply must:-

- facilitate the complete electrical isolation of the unit(s)
 - be in a readily accessible position adjacent to the unit(s)
 - serve only the unit(s)
 - have a contact separation of at least 3mm in all poles. See the accompanying wiring diagram for the heater electrical connections
- NVx CCF and fan/silencer units can also be supplied for 400V 3N, 50Hz.

1.3.4 Gas Supply

A servicing valve and union to facilitate servicing must be fitted to the gas inlet pipe work of the heater. The gas supply must be completed in solid pipe work and be adequately supported. Heaters suspended by drop rods, straps or chains must have a flexible connection as the final link between the gas supply pipe work and the heater. Sufficient slack must be left in the connection to take account of normal movement of the heater.



Warning

When completing the final gas connection to the heater do not place undue strain on the gas pipe work of the heater.

1.3.4.1 Service Pipes

The local gas undertaking should be consulted at the installation planning stage in order to establish the

availability of an adequate supply of gas to suit the building requirements. An existing service pipe must not be used without prior consultation with the local gas undertaking.

1.3.4.2 Meters

An existing meter should be checked, preferably by the gas undertaking, to ensure that the meter is adequate to deal with the total rate of gas supply required by all connected equipment.

1.3.4.3. Installation Pipes

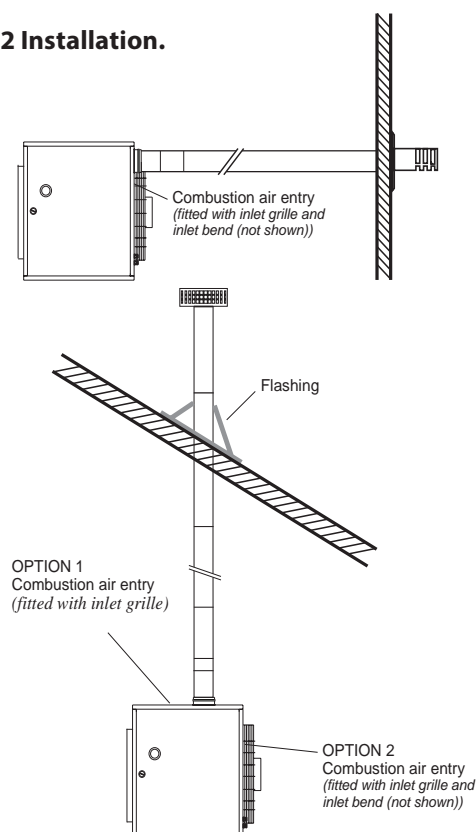
Installation pipes should be fitted in accordance with IGE/UP/2. Pipe work from the meter to the air heater must be of adequate size. Do not use pipes of a smaller size than the inlet gas connection of the heater. The complete installation must be tested for soundness as described in the above Code.

1.3.5 Flue System

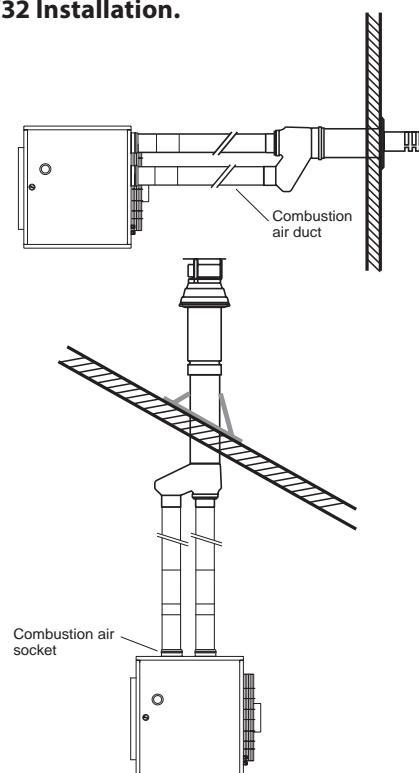
Only flue systems supplied through Powrmatic Ltd may be used with NVx units. Several configurations of flue and combustion air ducts are available.

The flue must terminate in a freely exposed position and be sited to prevent the products of combustion entering any opening in a building in such concentration as to be prejudicial to health or a nuisance.

Type B22 Installation.



Type C12 or C32 Installation.



1.3.6 Ventilation Requirements

Type B flued installations.

Where NVx heaters are **installed within the heated space (ie not in a plant room or an enclosure)** and having a building design air change rate of greater than 0.5/h, additional provision for ventilation is **not required**.

If the building design air change rate is **less than 0.5/h**, additional provision for natural or mechanical ventilation **is required**. These being:

- **Natural Ventilation:**

Grilles having a free area of at least 2cm² per kW of rated heat input shall be provided at low level i.e. below the level of the heater flue connection.

- **Mechanical Ventilation:**

Must ensure that the space air change rate is at least 0.5/h, must be of the 'input' type and interlocked to ensure the heaters cannot work if the input system is not working.

Type B flued installations.

Where NVx heaters are **installed in a plant room or an enclosure (ie not within the heated space)** having combustion air drawn directly from the room and connected to a flue that evacuates the products of combustion directly from the room additional provision for natural or mechanical ventilation **is required**.



These being:

• Natural Ventilation:

There must be permanent air vents communicating directly with the outside air, at high level and at low level.

Plant Rooms

Low level (inlet) 4cm²/kw of total rated net heat input

High level (outlet) 2cm²/kw of total rated net heat input

Enclosures

Low level (inlet) 10cm²/kw of total rated net heat input

High level (outlet) 5cm²/kw of total rated net heat input

• Mechanical Ventilation:

The minimum flow rate of ventilation shall be 4.14m³/h per kilowatt of total rated heat input.

Type C flued installations.

Where NVx heaters are **Installed within the heated space (ie not in a plant room or an enclosure)** having combustion air ducted to the appliance and combustion

products ducted to the outside air, **NO additional provision for the supply of either combustion air or for combustion products dilution or additional provision for the supply of air is necessary.**

Type C flued installations.

Where NVx heaters are **Installed in a plant room or an enclosure (ie not within the heated space)** having combustion air ducted to the appliance and combustion products ducted to the outside, air vents **shall be** provided and be permanently **open**.

To room or internal space

Low level (inlet) 10cm²/kw of total rated net heat input

High level (outlet) 10cm²/kw of total rated net heat input

Direct to outside air

Low level (inlet) 5cm²/kw of total rated net heat input

High level (outlet) 5cm²/kw of total rated net heat input.

<p>Type B₂₂ Installation (these refer to section 2.2 of these instructions) Air vents shall be permanently open. In all cases figures are per heater installed. For multi heater installations the appropriate values for each heater must be added together</p>							<p>Type C₁₂ or C₃₂ Installation (these refer to section 2.2 of these instructions) Air vents shall be permanently open. Figures are for heaters in plant rooms or enclosures ONLY In all cases figures are per heater installed. For multi heater installations the appropriate values for each heater must be added together.</p>				
--	--	--	--	--	--	--	---	--	--	--	--

NVx	Input kW	In the heated space			In a plant room, ventilation to outside		In an enclosure, ventilation to outside		Ventilation is to a room or internal space			Ventilation is to a outside air	
		Low level grille. Free area cm ²	Low level grille. Free area cm ²	High level grille. Free area cm ²	Low level grille. Free area cm ²	High level grille. Free area cm ²	Free area grille cm ²	Low level grille. Free area cm ²	High level grille. Free area cm ²	Low level grille. Free area cm ²	High level grille. Free area cm ²		
15	16.0	32.0	64.0	32.0	160.0	80.0	n/a	160.0	160.0	80.0	80.0		
20	21.9	43.8	87.6	43.8	219.0	109.5	n/a	219.0	219.0	109.5	109.5		
25	27.3	54.6	109.2	54.6	273.0	136.5	n/a	273.0	273.0	136.5	136.5		
30	32.6	65.2	130.4	65.2	326.0	163.0	n/a	326.0	326.0	163.0	163.0		
40	43.5	87.0	174.0	87.0	435.0	217.5	n/a	435.0	435.0	217.5	217.5		
50	54.2	108.4	216.8	108.4	542.0	271.0	n/a	542.0	542.0	271.0	271.0		
60	65.6	131.2	262.4	131.2	656.0	328.0	n/a	656.0	656.0	328.0	328.0		
75	81.3	162.6	325.2	162.6	813.0	406.5	n/a	813.0	813.0	406.5	406.5		
90	95.3	190.6	381.2	190.6	953.0	476.5	n/a	953.0	953.0	476.5	476.5		
120	130.1	260.2	520.4	260.2	1301.0	650.5	n/a	1301.0	1301.0	650.5	650.5		
140	148.9	297.8	595.6	297.8	1489.0	744.5	n/a	1489.0	1489.0	744.5	744.5		

1.3.7 Air Distribution System

Where NVx F units are required to cover a large floor area, and in buildings with high roof or ceiling heights Calecon thermal economiser units may be considered to ensure even heat distribution and minimise stratification. Care should be taken to avoid impeding the air throw with racking, partitions, plant or machinery etc. Various outlet configurations are available as optional extras to modify the air throw pattern to suit particular site conditions.

For NVx CCF units, the duct work must comply to current regulations and be correctly calculated to match the particular heaters resistance and air flow.

A full and unobstructed return air path to the air heater(s) must be provided.

If the air heater(s) is installed in a plant room, the return air intake(s) and the warm air outlet(s) from the heater(s) must be fully ducted, into and out of the plant room to avoid interference with the operation of the heater.

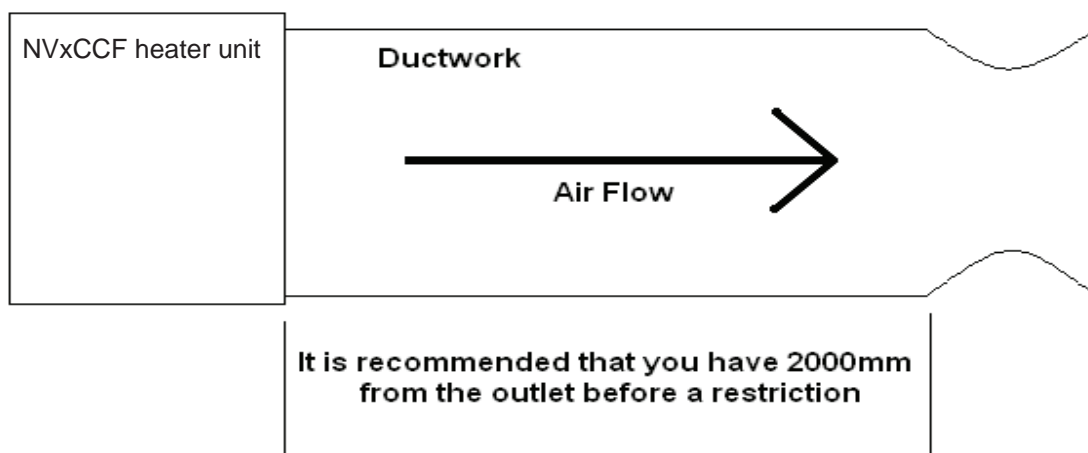
The openings in the structure of the plant room/enclosure through which the ducting passes must be fire stopped.

Care must be taken to ensure that return-air intakes are kept clear of sources of smells and fumes, and where there is any possibility of pollution of the air by dust, shavings etc., precautions must be taken to prevent contamination.

If necessary, suitable barrier rails should be provided to prevent any combustible material being placed within 900mm of the outlets.

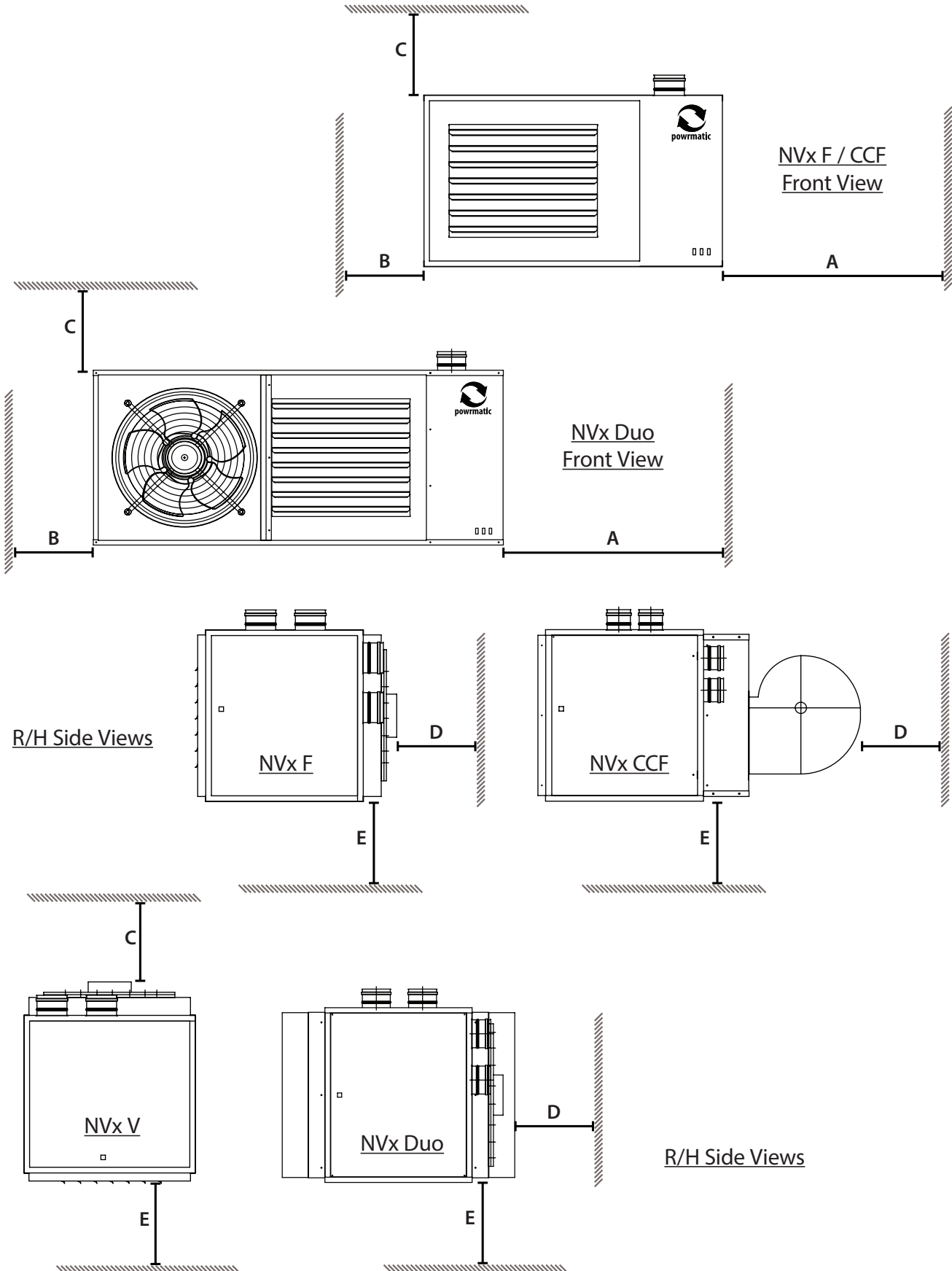
1.3.7.1 Ducting Requirements

Model	Air Volume m ³ /h	Maximum Duct Resistance (Pa)
NVx15CCF	1512	220
NVx20CCF	2016	320
NVx25CCF	2808	220
NVx30CCF	3816	220
NVx40CCF	4248	150
NVx50CCF	5436	250
NVx60CCF	3588	250
NVx75CCF	9216	250
NVx90CCF	10116	180
NVx120CCF	12816	290
NVx140CCF	13500	250



2.1 Fitting the Unit

2.1.1 Fitting space requirement



Distance from outside of heater to closest obstacle				Distance
A	RHS Clearance (when viewed at front of heater)		mm	1000
B	LHS Clearance (when viewed at front of heater)		mm	200
C	Top of heater		mm	200
D	Rear of heater (dependent on flue system)		mm	400
E	Recommended mounting heights (floor level to underside of unit)	NVx15F-30F / Duo	M	2.5-3.0
		NVx40F-140F / Duo	M	3.0-5.0
		NVx D	M	N/A
		NVx15V	M	3.0
		NVx20-30V	M	4.0-6.0
		NVx40V	M	4.0-7.0
		NVx50-75V	M	5.0-8.0
		NVx90V	M	6.0-10.0
		NVx120/140V	M	6.0-12.0
For multi air heater installations the following minimum distances between units must be observed				
	Between units, side to side/back to back		M	3.0



Note: All models must not be installed at a height of less than 2.5m to the base of the unit.



Note: For NVx D units the normal air flow direction is from right to left when viewing the heater from the burner/controls end with the fan unit upstream.



Note: The minimum clearances must be observed for installation and servicing.



Warning: Any combustible material adjacent to the air heater and the flue system must be so placed or shielded as to ensure that its temperature does not exceed 65 °C.



Warning: When NVx modular components are used in conjunction with the heater each component must be individually supported.



Note: The access door to the controls section may be removed to improve access. Open the door to 90°, remove the earth cable at the bottom, and then lift the door vertically upwards to disengage the hinge plates. Refit in reverse order. Ensure that the earth cable is refitted.

2.1.2 Suspending the heater

The air heater may be installed either:

- suspended from suitable vertical drop rods.
- on specifically designed cantilever brackets from a non combustible wall.
- on a level noncombustible surface. The surface must not extend past the front edge of NVx F heaters.

The method of installation must be capable of adequately supporting the weight of the unit (See section 1.2) and any ancillary equipment. Before installing the heater the existing structure must be inspected to ensure it is suitable. All supports should be protected against the effects of rust or corrosion.

Raise the heater up to the point of installation using suitable and safe means and connect to the means of suspension.



Note: Each heater is provided with additional central suspension points (suspension points running along the front and back are for permanent connection, suspension points running left to right in the centre are for temporary support) that can be used to provide temporary support, using suitable means, whilst the unit is being installed. Under no circumstances must these points be used as the final means of suspension.



Threaded drop rods must have lock nuts fitted that are tightened down onto the 10mm fixings in the heater. If reducing noise levels is important the heater should be insulated from the structure by installing it on suitable anti-vibration mountings. In all such cases and when the heater is suspended it is essential that all gas, duct, and electrical connections to the heater are made with flexible connections to maintain continuity of connection.

Any room thermostat, frost thermostat, time clock etc. must be suitable for switching 230V, 5A and must be of the 'snap action' type to minimise contact bounce.

For electrical connections of external controls see section 2.5 or the accompanying wiring diagram.

2.1.3 Air Distribution System

2.1.3.1 General

NVx Duo discharges air in two directions, significantly enhancing the effective coverage of the heater and leading to a more even warmth distribution especially within modern well insulated buildings. This in-turn offers a potential saving on both capital and installation costs.

NVx D and NVx CCF models are designed for use with duct work to more precisely define the point of air delivery, and /or provide ducted return air or ducted fresh air inlet. All ducting must be independently supported of the air heater. Joints and seams of supply ducts and joints between NVx ancillary components must be securely fastened and made airtight using appropriate sealants or sealing strips. If required the duct work should be insulated to reduce heat loss.

2.1.3.2 Noise Reduction

Ducting should be connected to the heater spigots via an airtight flexible coupling of noncombustible material.

Before fitting the coupling it must be ensured that a minimum clearance of approximately 15mm will be maintained between the ends of the ducting and the heater spigots.

Sound attenuators may be fitted in inlet and outlet ducts to reduce airborne fan noise. If sound attenuators are used then these must be factored into the total static resistance of the ductwork. Materials used in outlet sound attenuators must be capable of withstanding 100°C air temperature without any deterioration.

2.1.4 Room Thermostat Siting

The room thermostat should be fitted at a point which will be generally representative of the heated area as far as temperature is concerned. Draughty areas, areas subjected to direct heat e.g. from the sun, and areas where the air movement is relatively stagnant e.g. in recesses, should be avoided. The thermostat should be mounted approximately 1.5m from the floor.

2.2 Flue/Combustion Air Duct System

The minimum distance between surfaces of the flue pipe and any surfaces made from combustible materials is 300mm. If it is necessary for the flue pipe to pass through a structure made from combustible materials a metal sleeve must be used so that the minimum clearance of 300mm is maintained.

The flue and combustion air ducts supplied with the heater are capable of withstanding their own weight over the allowable flue lengths. Wall bands and bracing brackets, or equivalent, must be used to provide lateral stability and should be used at centres not exceeding 2.5 metres.

All models are supplied as standard with a rear flue outlet and the flue outlet and combustion air sockets temporarily fitted.

2.2.1 Conversion to Top Flue Outlet

1. Remove the two blanking plates from the flue / combustion air openings at the top of the unit.
2. Remove the four screws from the exhaust fan outlet flange.
3. Remove the screws securing the fan mounting box to the exhaust header plate.
4. Remove fan assembly and rotate the assembly 90° anticlockwise.
- 5 Refit the fan assembly to the exhaust header plate ensuring that the gasket is not damaged, if necessary replace or make good with silicon sealant.
6. Secure the exhaust fan outlet flange to the underside of the top panel and fit the blanking plates to the rear panel.

2.2.2. Fitting Flue/Combustion Air Sockets

1. Apply a bead of silicon sealant around the face of the flange on the exhaust fan outlet tube that can be seen from the outside of the heater. Place the flue socket on the outside of the heater to mate with this flange and clamp the two flanges together, on either side of the heater panel using the screws provided. Ensure that the silicon sealant has sealed between the two flanges.
2. If ducted combustion air is not required (see Section 1.2.5. Page 7) fit the mesh inlet plate behind the unused combustion air inlet hole.
3. Apply silicon sealant and refit blanking plates as required to seal unused panel holes.

2.2.3. General Requirements

See Figures 1a to 2b for the different types of flue installation. In all cases the flue outlet socket must be connected via the provided flue system to outside air.

The maximum permitted length of flue system is 6m, or 12m if the flue outlet only is used. If an offset is required two sets of 45° bends should be used each set being equivalent to 0.5m of flue length. 90° bends may be used but each set will be equivalent to 1.0m of flue length.

All outer joints must be finished with the provided locking bands. A smear of silicon grease to the inside of sockets will assist in fitting components together. All flue and combustion air ducts must be supported independently of the air heater. The flue or flue/combustion air terminal must not be installed so as to be less than:

- 300mm below an opening e.g. window, air brick etc.
- 200mm below eaves or gutter.
- 300mm from an internal or external corner.
- 1200mm from a surface facing the terminal.
- 1500mm vertically from another terminal on the same wall.
- 300mm horizontally from another terminal on the same wall.
- 2000mm from ground level.

2.2.4. Installation of Flue System



Note: A terminal guard, as supplied by Powrmatic Ltd, must be fitted to horizontal flue terminals.



Notes for all systems.

- i) Final overall length of adjustable disconnection piece must be between 360 - 415mm.
- ii) 45° offsets may be used if required. Each set is equivalent to 0.5m of flue length.
- iii) Where NVx heaters are used in clean environments it is permissible to take the combustion air directly from the heated space. The supplied mesh intake plate, must be fitted to the combustion air inlet on the rear of the heater.

2.2.4.1. Horizontal System - Rear Outlet



Note: If the outlet is required to the side of the unit 90° bends may be fitted directly onto the inlet/outlet spigots on the heater.

1. Locate the position of the flue terminal, allowing for a slight gradient running down from the heater to the terminal of 2° - 3° and cut a hole to suit.

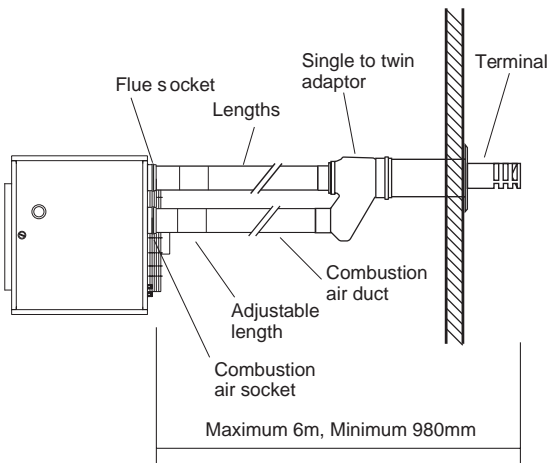
2. Fit the flue terminal, securing via the wall plate and weather with silicon sealant or similar.

3. Fit the twin to concentric adaptor to the terminal section and extend the flue and combustion air ducts to the heater using straight lengths.

Fit an adjustable length prior to the unit, to facilitate flue disconnection for servicing. Extend the adjustable lengths to make the final connection to the appropriate heater inlet/outlet spigots.

4. Ensure that internal silicon sealing rings are in place and that all tubes are pushed fully home. Secure concentric lengths with the locking bands provided.

Fig 1a Individual system - horizontal
Type C12 installation



Note: A terminal guard may be required.

2.2.4.2. Vertical System - Top Outlet

1. Locate the position of the flue terminal cut a hole in the roof to suit.

2. Fit the flashing and the flue terminal so that the lower edge of the outer case is over the top of the flashing. Weather with silicon sealant or similar.

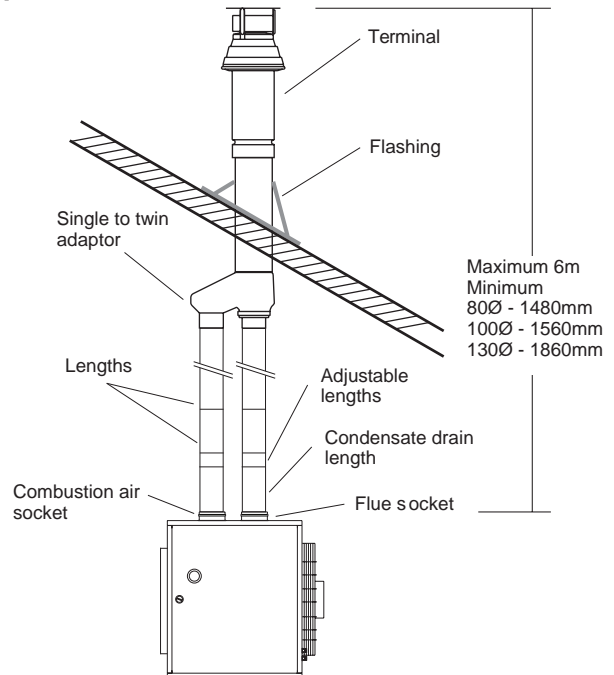
Fit a condensate drain length into the flue socket on the heater and an equivalent straight length onto the combustion air socket.

3. Fit the twin to concentric adaptor to the terminal section and then extend down to the heater using straight lengths. Fit adjustable lengths as the final connection pieces, to facilitate flue disconnection for servicing. Extend the adjustable lengths to make the final connection but do not exceed the maximum extended length so as to maintain joint integrity.

Extend the drainage off take of the condensate drainage length to a suitable gully or drain.

4. Ensure that internal silicon sealing rings are in place and that all tubes are pushed fully home. Secure concentric lengths with the locking bands provided.

Fig 1b Individual system - vertical
Type C32 installation

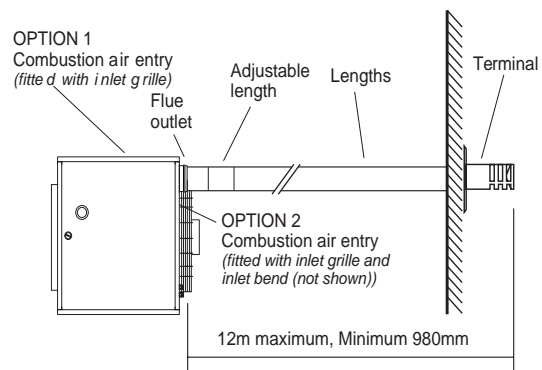


2.2.4.3. Internal Combustion Air System

1. Complete the run of flue sections from the terminal spigot to the flue outlet socket of the heater generally as described in 2.2.4.1. and 2.2.4.2., ensuring that the internal silicon sealing rings are in place.

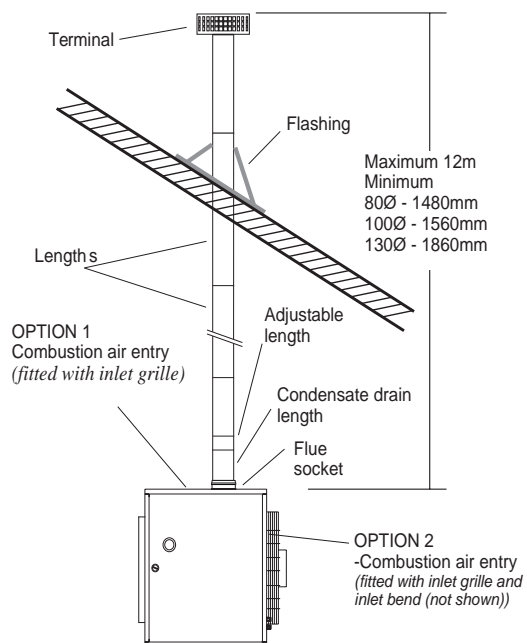
2. It is recommended that both air inlets are utilized and that both are fitted with the mesh inlet plates supplied. In addition a 90° bend should be fitted to the rear inlet, the inlet opening of the bend facing to the side of the heater i.e. away from the main air fan.

Fig 2a Exhaust only system - horizontal
Type B22 installation



Note: A terminal guard may be required.

**Fig 2b Individual system - vertical
Type B22 installation**



2.2.5. Condense Length

NVx gas fired heaters (with on/off burner)

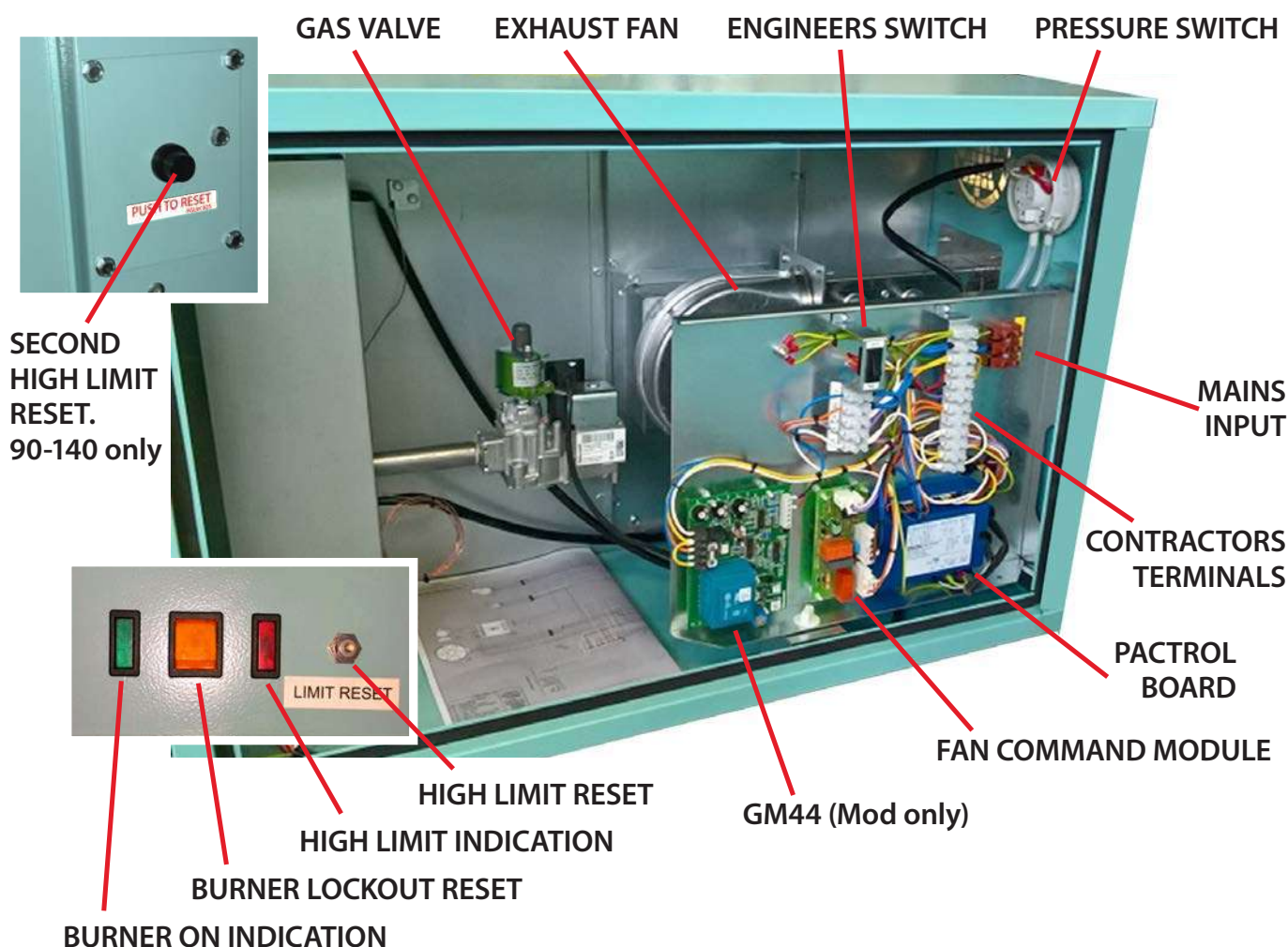
An NVx heater fitted with an on/off burner, an approved flue terminal & vertical flue run that's predominantly internal, will typically not require an inline condensate drain as flue gas temperatures are higher than the dew point, which is approximately 60°C.

NVx gas fired heaters (with High/Low & Modulating burners)

An NVx heater fitted with High/Low or Modulating burner may require an inline condensate flue drain if vertically flued, due to the lower flue gas temperatures experienced when the heater is operating at low firing rates.

Exceptions may occur if the installation requires significant length of the flue which may cause chilling, or if heater may be exposed to high winds and heavy rain, which may ingress the flue. We would always recommend fitting the inline condensate drain even if the drain point is capped, should the drain be required in the future. Any clarification can be achieved by consulting with Powrmatic.

2.3 General Identification of Electrical Items



2.4 Electrical Cable Installation

Electrical Connections



Warning: THIS APPLIANCE MUST BE EARTHED.



Warning: Wiring external to the unit must be carried out by an appropriately qualified person to current IEE regulations for Electrical Installations and any local regulations which apply.

Wiring should be completed in flexible conduit.

Heaters are for use with 230V, 1N, 50Hz supplies.

The method of connection to the main electricity supply must:-

- facilitate the complete electrical isolation of the heater(s) that will prevent remote activation of the heater during servicing.
- be in a readily accessible position adjacent to the heater(s).
- serve only the heater(s).
- have a contact separation of at least 3mm in all poles.

See section 2.5 or the accompanying wiring diagram for the heater electrical connections.

All units, (with the exception of units supplied with a centrifugal fan/silencer duct section) are fully prewired and only require final connections for the incoming mains supply and completion of the control circuit (230V).

Initial Wiring Installation

Key

- A = 2 core and earth
- B = MC200 High/Low = 7 core and earth
- MC200 Mod = 7 core and earth
- MC300 High/Low = 6 core screened + LNE
- MC300 Mod = 7 core screened + LNE
- C = 4 core and earth
- D = Screened 2 core (MC200 models only)*

* (screen must be grounded only at the MC200, See instructions supplied with controller for wiring sizing, Max. 100m)



Warning: Lockout reset is by a switched Neutral to the controls in the heater.

Reference must be made to Section 1.2 to ascertain the electrical loading of the unit(s) being installed so that cables of adequate cross-sectional area are used for the electrical installation. The length of the conductors between the cord anchorage and the terminals must be such that the current carrying conductors become taut before the earth conductor if the cable or cord slips out of the cord anchorage. All external controls must be of an approved type.

Models supplied with a centrifugal fan/silencer duct section require wiring to be completed between the heater and fan. Refer to supplied wiring diagram.

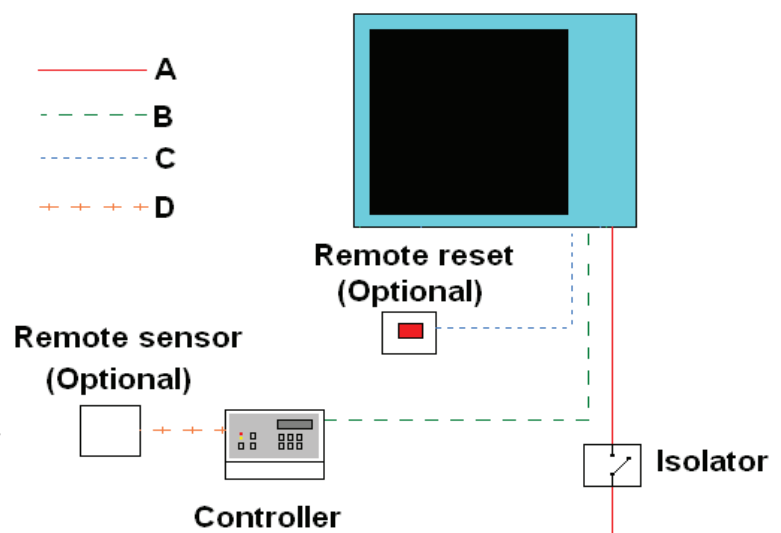


Warning: NVx D models supplied less fan must be electrically interlocked to the air movement system so that this is started in the same manner as the air heater fan would be. Refer to supplied wiring diagram.



Note: To achieve maximum system efficiency it is recommended that NVx units are controlled by an MC200 or MC300 unit. Simple room thermostat and thermostat/time clock control systems will not provide optimum system efficiency and fuel savings.

Wiring drawings and instructions are supplied with the respective controller.

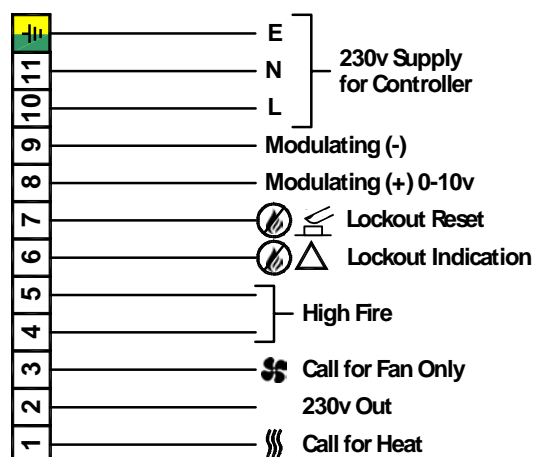


External Wiring

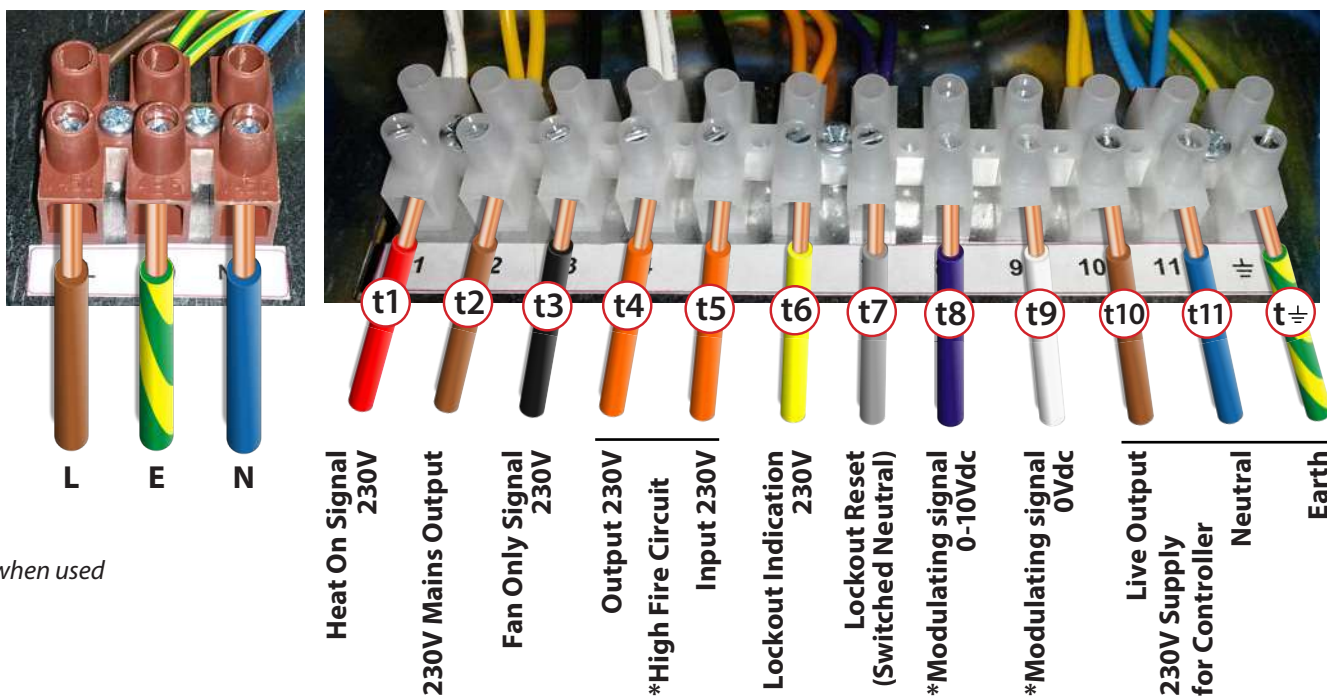
The wiring terminals are located on the electrical panel behind the side door of the heater which firstly has to be opened.

Mains input 230V 50Hz 1Ph supply connections are via a separate LNE terminal block. For input power refer to table below.

Control circuitry / external control mains connections are via a numbered terminal strip. These being:



Wiring Connections

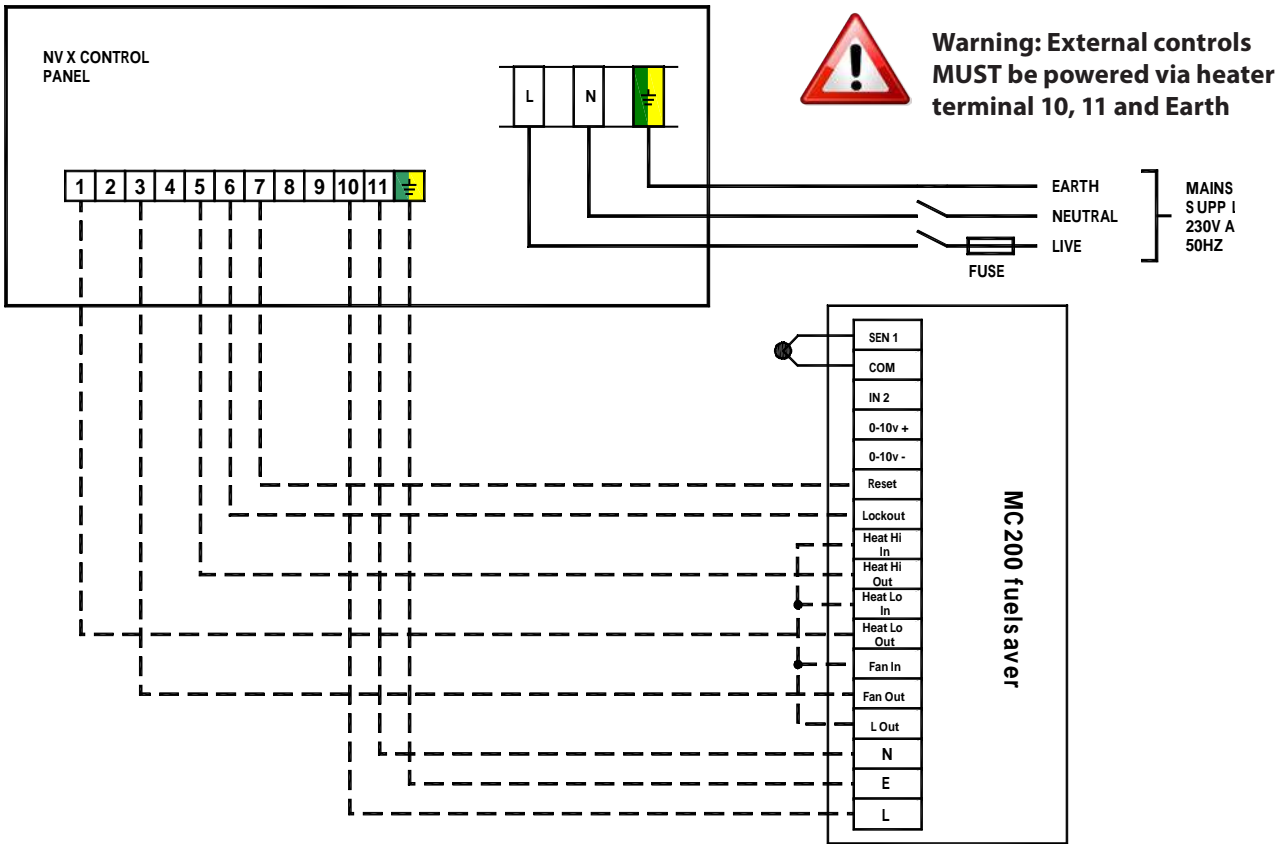


* when used

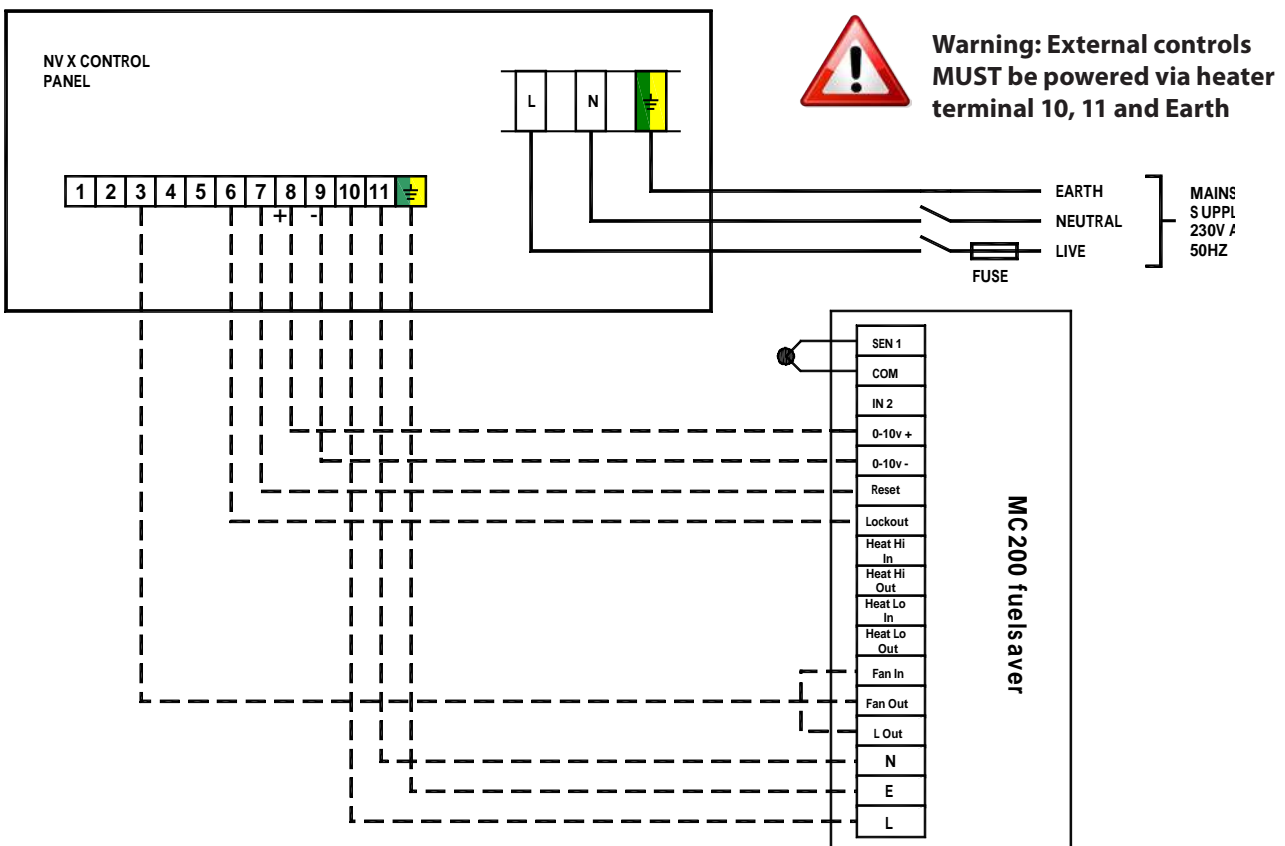
External Fuses

Model	F - Free Blowing Unit		CCF - Centrifugal Unit	
	Running Current (A)	Fuse/MCB Rating (A)	Running Current (A)	Fuse/MCB Rating (A) <i>(motor rated Protection Device)</i>
NVx15	0.50	3	2.0	6
NVx20	0.53	3	3.1	6
NVx25	0.56	3	4.2	6
NVx30	1.0	3	4.3	6
NVx40	1.0	3	5.8	10
NVx50	1.7	3	7.6	10
NVx60	2.6	5	10.0	13
NVx75	2.6	5	5.3/pha (3ph)	18/pha (3ph)
NVx90	3.4	5	12.8	16
NVx120	5.2	13	17.0	20
NVx140	5.2	13	20.0	32

**Interconnecting Wiring:
NVx High / Low to Powrmatic MC200**

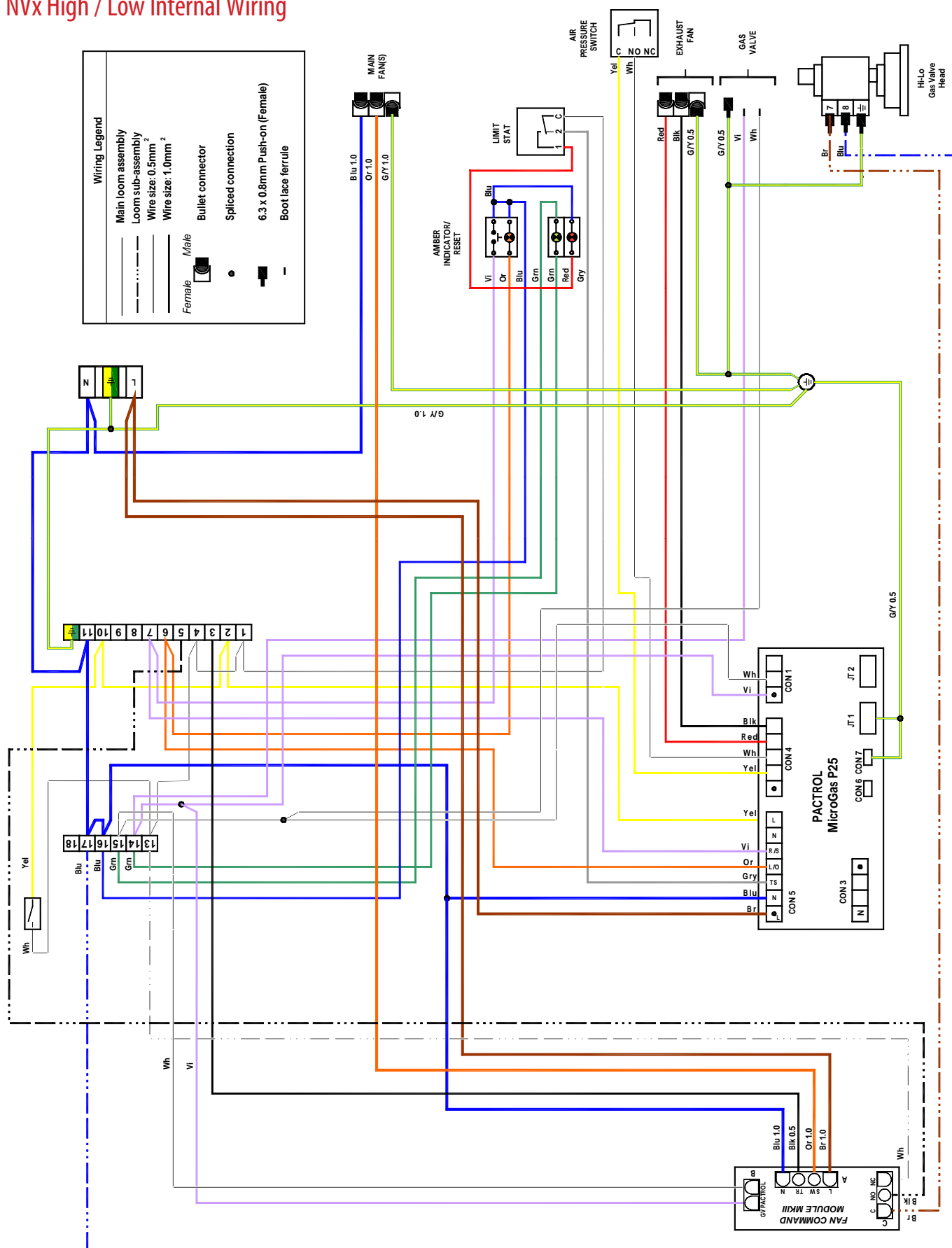


NVx Modulation to Powrmatic MC200

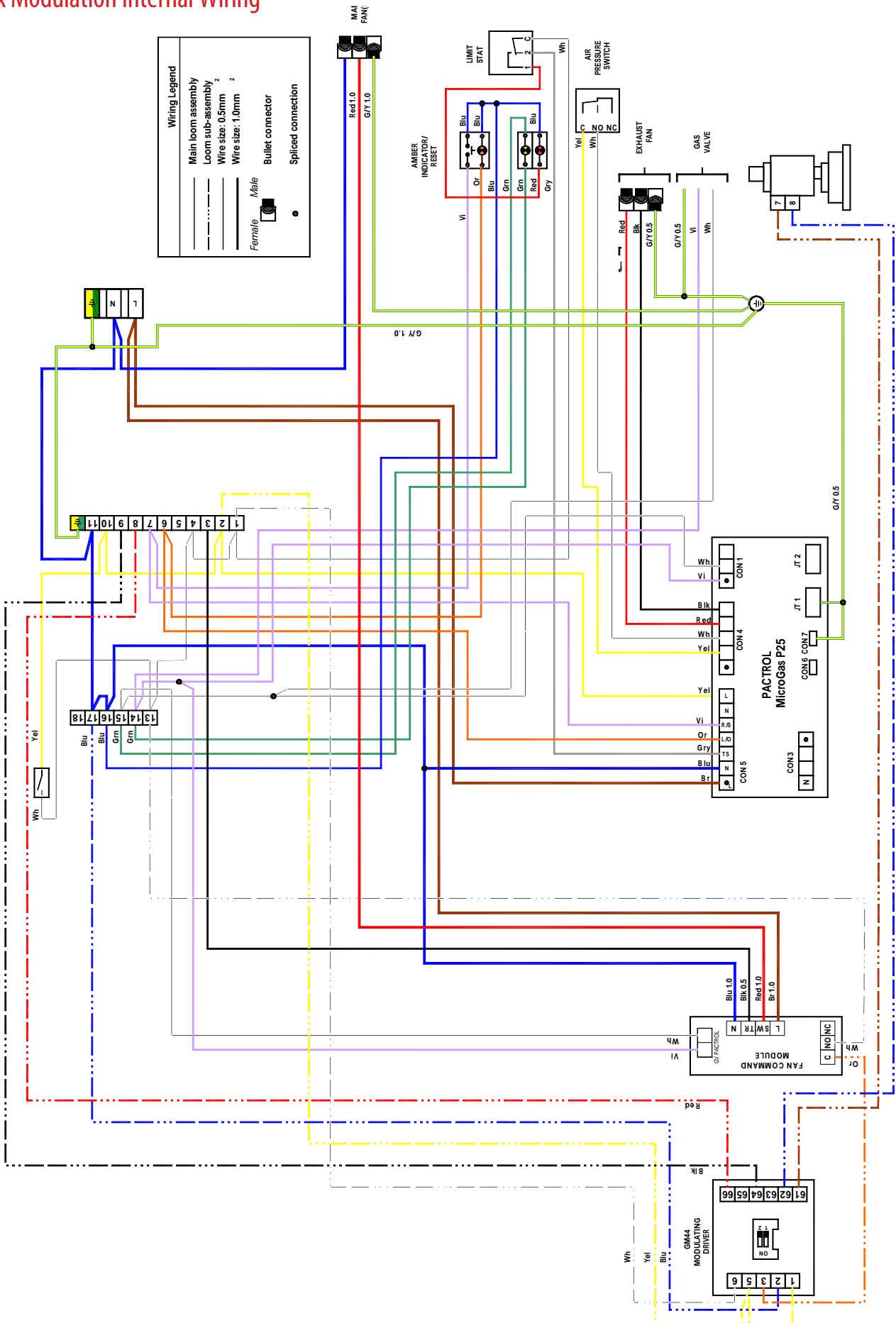


2.5 Wiring Diagrams

NVx High / Low Internal Wiring



NVx Modulation Internal Wiring



2.6 Commissioning and Testing

Gas Safety (Installation & Use) (Amendment) Regulations



It is law that all gas appliances are installed, adjusted and, if necessary, converted by qualified persons* in accordance with the current issue of the above regulations. Failure to install appliances correctly can lead to prosecution. It is in your own interests and that of safety to ensure that the law is complied with.

* An approved class of person listed on the gas safe register.

2.6.1. Electrical Installation

Checks to ensure electrical safety must be carried out by a qualified person.

2.6.2. Gas Installation

For new installations, the whole of the gas installation, including the meter, should be inspected and tested for soundness and purged in accordance with the recommendations of IGE/UP/1 (Edition 2) or IGE/UP/2A as appropriate.

2.6.3. Air Distribution System

The system should be checked to ensure that the installation work has been carried out in accordance with the design requirements.

Particular attention should be given to the correct arrangement of delivery ducts and registers, return air ducts and grills and general adequacy of return air paths.

For NVx D and NVx CCF units ensure that the duct work is balanced so that the specified motor running currents are achieved See section 1.2

2.6.4. Checks before lighting the Air Heater

The following preliminary checks should be made before lighting the heater(s)

- Ensure that the ELECTRICAL supply to the heater is switched OFF.
- Check that all warm air delivery outlets are open.
- Check that all external controls are calling for heat.
- If an MC200 or MC300 is being used ensure that the control is set to winter operation.

2.6.5. Lighting the Air Heater



NOTE: On initial lighting of the heater(s), it may take some time to purge the internal pipe work of air.

Model		15	20	25	30	40	50	60	75	90	120	140
Natural Gas G20												
High Fire CO ₂	%	6.7	8.1	8.8	9.0	8.9	8.1	7.8	8.7	7.5	8.2	8.0
FGT (nominal)	°C	146	187	191	177	188	194	199	202	151	158	157
Low Fire CO ₂	%	2.8	3.9	4.7	3.5	4.8	3.8	3.4	4.4	3.9	4.8	4.9
FGT (nominal)	°C	80.0	79.7	80.0	80.3	80.3	79.0	78.8	79.2	81.4	83.0	82.8
Propane G31												
High Fire CO ₂	%	6.6	9.71	10.0	9.3	9.6	9.6	9.95	10.4	8.5	10.1	8.0
FGT (nominal)	°C	137	172	171	179	183	178	168	185	156	160	159
Low Fire CO ₂	%	2.78	3.97	4.82	3.6	4.2	3.9	3.66	4.4	4.4	5.82	5.2
FGT (nominal)	°C	83.0	120.0	122.0	117.0	130.0	117.0	113.0	116.0	94.0	103.0	95.0



IMPORTANT: The internal pipe work of the appliance has been tested for soundness before leaving the factory. After establishing the main burners test round the gas inlet connection using a leak detection fluid.

1. Switch on the electrical supply at the isolator.



NOTES: If the red indicator illuminates, remove the adjacent black cap and press the High Limit Reset button. If the amber rocker switch illuminates, depress the switch for 2 seconds to reset the burner lockout.

2. The ignition sequence should now commence. After a delay of approximately 45 seconds the ignition spark will be generated and the main gas valves energized. The burners will then light.
3. If the burners fail to light the control box will complete a further four ignition attempts. If at the end of five attempts the burners have still not lit the control box will go to lockout and the amber rocker switch will be illuminated. To restart the ignition sequence depress the illuminated reset button for about 1-2 seconds.

4. SHUT OFF Set the external controls to OFF or MIN.

2.6.6 Adjustments

2.6.6.1. Burner Gas Pressures

This is set for the required heat input before despatch. High and low pressures should be checked in the following manner:

2.6.6.1.1. High/Low Regulation

1. Set external controls to ensure the main burner is off. Open the side access panel. Connect a pressure gauge to the burner pressure test point on the multifunctional control.
2. Set external controls to turn on the main burner and maintain high fire. Compare the measured burner gas pressure to that stated on the data plate. In addition it is advisable to check the gas rate using the gas meter dial pointer ensuring that no other appliances supplied through the meter are in operation.
3. Repeat 2 above with external controls set to maintain low fire.
4. If it is necessary to adjust either the high fire or low fire pressures proceed as follows after levering off the plastic cover from the High/Low regulator.



Note: High fire setting must be adjusted first after which the low fire setting can be set. Any adjustment of the high fire setting alters the minimum setting.

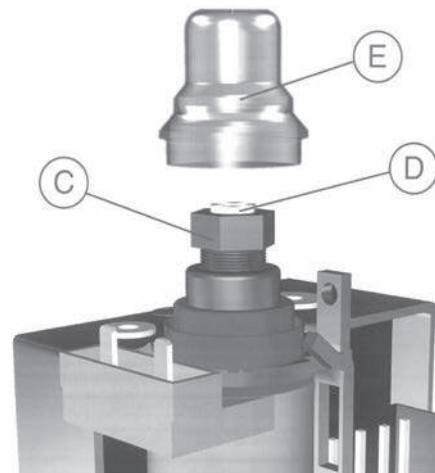
2.6.6.1.1.1. Sigma 843 Adjustment

Maximum Setting.

With the controls set to high fire, use an adjustable or 10mm spanner to screw the adjustment nut (C) in to increase and out to decrease, until the required pressure is obtained. Turn the burner On and OFF several times to check the pressure setting and then turn off.

Minimum Setting.

Disconnect electrical connection to the regulator and turn the burner back on and wait until the burner pressure has stabilised. Keeping the nut (C) stationary, use a 6 x 1 screwdriver to turn the slotted adjustment screw (D) clockwise to increase and counter-clockwise to decrease, until the required pressure is obtained. Reconnect high/low regulator and check high fire pressure. Repeat both steps if necessary and then replace cover cap



2.6.6.1.1.2. Honeywell 4336 Adjustment

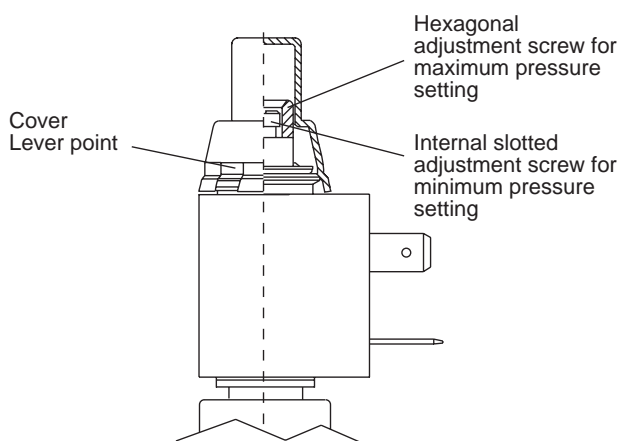
Maximum Setting

With the controls set to high fire, use an adjustable or 8mm spanner to turn the adjustment screw, clockwise to increase and counter-clockwise to decrease, until the reqd pressure is obtained. Turn the burner On and OFF several times to check the pressure setting and then turn off.

Minimum Setting

Disconnect electrical connection to the regulator and turn the burner back on and wait until the burner pressure has stabilised. Use a screwdriver to turn the slotted adjustment screw clockwise to increase and counter-clockwise to decrease, until the required pressure is obtained. Reconnect high/low regulator and check high fire pressure. Repeat both steps if necessary and then replace cover cap.

5. Turn off the main burner, disconnect the pressure gauge and replace the sealing screw. Turn on the main burner and test for gas soundness around pressure test joint using a leak detection fluid. Replace access panel.

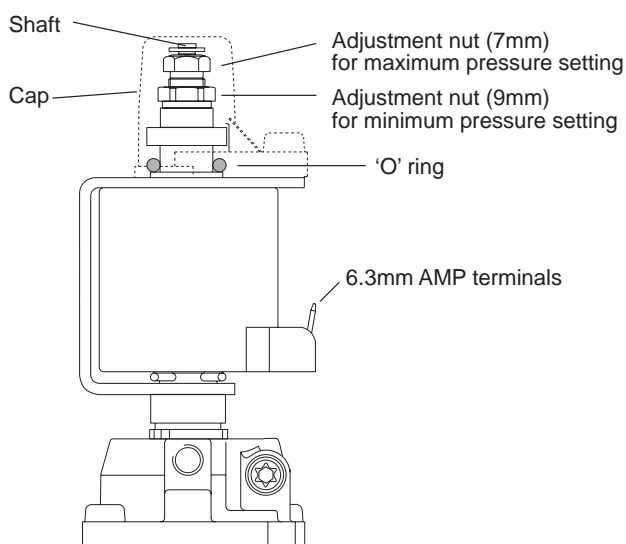


2.6.6.1.2. Modulating Regulation

1. Set external controls to ensure that the main burner is off. Open the side access panel. Connect a pressure gauge to the burner pressure test point on the multifunctional control.
2. Set external controls so as to turn on the main burner and maintain high fire. Compare the measured burner gas pressure to that stated on the data plate. In addition it is advisable to check the gas rate using the gas meter dial pointer ensuring that no other appliances supplied through the meter are in operation.
3. Repeat 2 above with external controls set to maintain low fire.
4. If it is necessary to adjust either the high fire or low fire pressures proceed as follows after removing the plastic cover from the Modulating regulator.



Note: Minimum fire setting must be adjusted first after which the high fire setting can be set. Any adjustment of the minimum fire setting alters the maximum setting.



Minimum Setting.

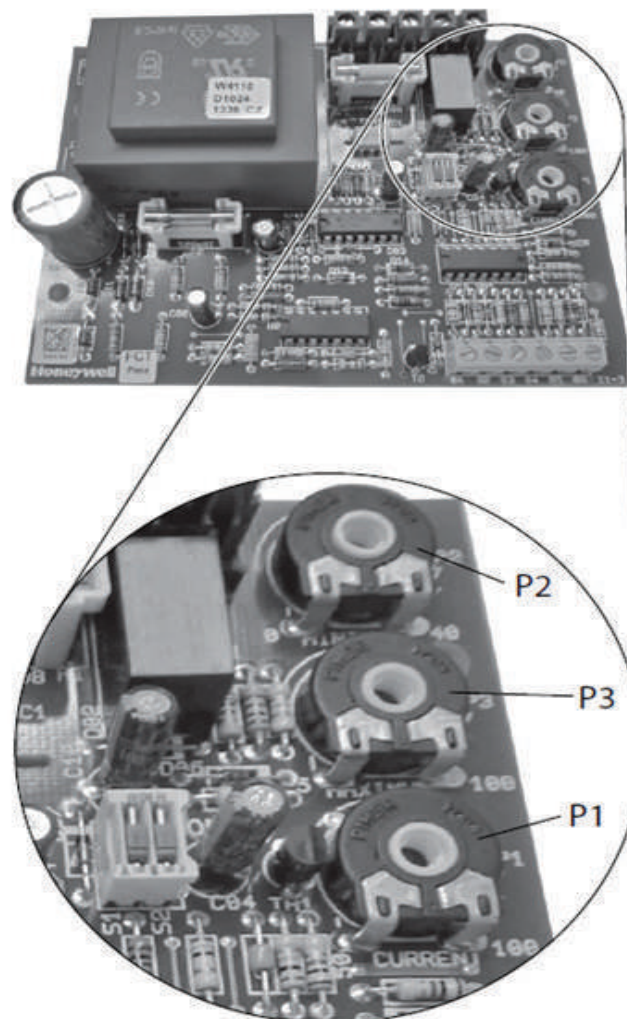
Disconnect electrical connection of modulating regulator and turn burners back on and wait until the burner pressure has stabilized. Turn 9mm adjustment nut for low fire pressure clockwise to increase and counter-clockwise to decrease until the required pressure is obtained. Reconnect modulating regulator and check high fire pressure, readjust if necessary.

Maximum Setting.

Disconnect electrical connection of modulating regulator and turn burners back on and wait until the burner pressure has stabilised. Push shaft gently downwards to the maximum adjustment screw and hold there. Turn 7mm adjustment nut for high fire pressure, clockwise to increase and counter-clockwise to decrease, until the required pressure is obtained. Release shaft. Repeat both settings if necessary and then replace cover cap.

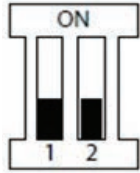
5. Turn off the main burner, disconnect the pressure gauge and replace the sealing screw. Turn on the main burner and test for gas soundness around pressure test joint using a leak detection fluid. Replace access panel.

2.6.6.1.3. Modulating Interface Board



The MIB interfaces between a 0-10VDC control signal and the modulating regulator. The following are applicable to this application.

1. The setting of the slide switches 1 & 2 should both be to OFF.



2. Potentiometer P1 (Default setting 100%)

The control current of the V7335A is controlled by P1, varying between 50% and 100% of the input signal.

E.g. -When P1 is set at 100% (fully clockwise) maximum power (165mA @ 22VDC) is provided to the modulation coil with a 10VDC input control signal.

-When P1 is set at 50% (fully anticlockwise) maximum power (165mA @ 22VDC) is provided to the modulation coil with a 5VDC input control signal.

3. Potentiometer P2

Controls the minimum drop-out voltage between 0% and 40% E.g.

- When P2 is set at 0% the drop-out voltage with an input control signal of 0-10V-DC is 0.3V-DC.

- When P2 is set at 40% the drop-out voltage with an input control signal of 0-10V-DC is 4.0V-DC.

4. Potentiometer P3 (Default setting 100%)

Controls the maximum hold-in voltage. Its proportional value is added to the P2 setting E.g.

- When P2 is set at 0% and P3 is set at 5%, the hold-in voltage of the burner relay is adjustable between 5% and 100% of the input control signal. If the input control signal is set at 0-10V-DC the hold-in voltage of the relay is 0.5V-DC.

- When P2 is set at 40% and P3 is set at 5%, the hold-in voltage of the burner relay is adjustable between 45% and 100% of the input control signal. If the input control signal is set at 0-10V-DC the hold-in voltage of the relay is 4.5V-DC.

The following table shows the relationship between P2 and P3 settings.

P2%	0	10	20	30	40	
Drop Out Volts	0.3	1.0	2.0	3.0	4.0	
Hold-in Voltage						
P3%	5	0.5	1.5	2.5	3.5	4.5
	10	1.0	2.0	3.0	4.0	5.0
	20	2.0	3.0	4.0	5.0	6.0
	30	3.0	4.0	5.0	6.0	7.0
	40	4.0	5.0	6.0	7.0	8.01
	50	5.0	6.0	7.0	8.01	9.0
	60	6.0	7.0	8.01	9.0	10.0
	70	7.0	8.01	9.0	10.0	
	80	8.01	9.0	10.0		
	90	9.0	10.0			
100	10.0					

3. In addition it is advisable to check the gas rate using the gas meter dial pointer. Ensure that no other appliances supplied through the meter are in operation.

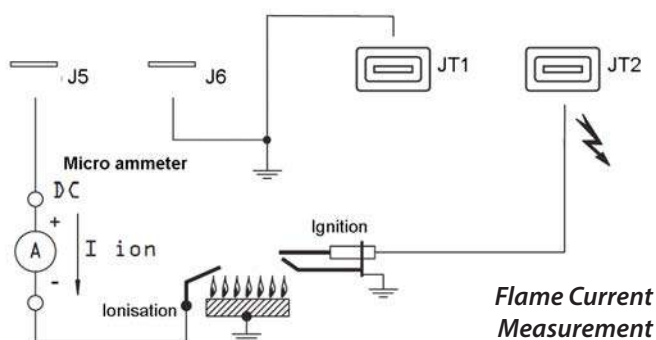
4. If required, after checking or setting the burner pressures, the CO₂ content in the flue gases can be checked by sampling in the first section of flue fitted to the flue outlet of the unit. Nominal CO₂ values are given for guidance in the table at the bottom of the previous page.

5. Turn off the main burner and disconnect the pressure gauge and replace the sealing screw. Turn on the main burner as above and test for gas soundness around pressure test joint using a leak detection fluid e.g. soap solution.

2.6.6.2. Flame Current

1. To measure the flame current connect a multimeter capable of measuring micro amps as shown in the following diagram.

2. Minimum current reading is $0.5\mu\text{A}$ and normal value should be $1.5\mu\text{A}$ or higher.



2.6.6.4. CCF Adjustments

The running current of the centrifugal fan must be checked once the heater is running and compared with the following table.



WARNING: Exceeding the MAX running current will cause the fan's thermal overload to trip!

Model	Pha	Motor kW	Typical Running Current	Max Running Current
NVx15	1	0.25	2.0A	5.0A
NVx20	1	0.42	3.1A	4.2A
NVx25	1	0.42	4.2A	4.2A
NVx30	1	0.55	4.3A	8.0A
NVx40	1	0.55	5.8A	8.0A
NVx50	1	1.1	7.6A	9.8A
NVx60	1	1.4	10.0A	10.0A
NVx75	3	1.5	5.3A	10.0A
NVx90	1	2 x 1.1	12.8A	8.0A*
NVx120	1	2 x 1.4	8.0A	10.0A*
NVx140	1	2 x 1.4	10.0A	10.0A*

* current shown for each fan

Adjust the balancing dampers within the airflow ductwork system to achieve a current suitable for the model in question.

2.6.6.3. Limit Thermostat

Limit Thermostat settings:-

NVx 10, 25 - 140 = 90°C

NVx 15 and 20 = 100°C

NVx 35 = 110°C



Note: NVx 15 to NVx 75 units have a single limit thermostat whereas NVx 90 to NVx 140 units have two. The second stat is at the opposing side of the heater to the burner/controls end.

The limit thermostats are wired in series (either thermostat will shut down the burner).

2.6.7. Air Heater Controls

1. Close the gas service tap and ensure that the gas valve is heard to close within 1 second and that the lockout light is illuminated. Note that the heater may attempt five re-ignitions before going to lockout. Open the gas service tap and reset the unit from lockout.

2. Check that the room thermostat and all automatic controls are operating satisfactorily.

2.6.8. Handing over the Air Heater

Hand these instructions to the user or purchaser for retention and instruct in the efficient and safe operation of the air heater and associated controls. Adjust the automatic controls to those values required by the User.

Finally, advise the user or purchaser that, for continued efficient and safe operation of the air heater, it is important that servicing is carried out annually.

In the event that the premises are not yet occupied turn off the gas and electricity supplies and leave instructional literature adjacent to gas meter.

2.7 Servicing

Gas Safety (Installation & Use) (Amendment) Regulations



It is law that all gas appliances are installed, adjusted and, if necessary, converted by qualified persons* in accordance with the current issue of the above regulations. Failure to install appliances correctly can lead to prosecution. It is in your own interests and that of safety to ensure that the law is complied with.

* An approved class of person listed on the gas safe register.



WARNING: Always switch off and disconnect electricity supply and close the gas service valve before carrying out any servicing work or replacement of failed components.



NOTE: If a suspended air heater is to be serviced do not lean ladders against the heater. Ensure that an access tower or equivalent is used.



NOTE: The access door to the controls section may be removed to improve access. Open the door to 90°, remove the earth cable at the bottom, and then lift the door vertically upwards to disengage the hinge plates.

Refit in reverse order. Ensure that the earth cable is refitted.

2.7.1. General

Full maintenance should be undertaken not less than once per year by a qualified person. After any servicing work has been complete, or any component replaced, the air heater(s) must be fully commissioned and tested for soundness as described in Section 2.6.

2.7.2. Main Burner Assembly Removal

1. Ensure that the gas service valve is turned OFF and then unscrew the union nut situated immediately downstream of it.

2. Disconnect the spark and rectification leads from the control box and remove the electrical plug connections from the top of the gas control valve assembly.

3. Remove the burner heat shield, 3 screws.

4. Release the inlet connection flange from the gas valve by removing the four screws.

5. If required remove the manifold by removing the four screws securing it to the burner assembly.

6. Remove the two screws that secure the top of the burner assembly to the bulkhead and lift out burner assembly.

7. Using a stiff brush, not a wire brush, brush the burners to dislodge accumulated deposits. Inspect the burners both internally and externally to ensure that they are clean. Examine the injectors and if damaged or deteriorated, replace with new ones of the correct size and marking. If deemed necessary, clean the injectors. Do not broach out with wire.

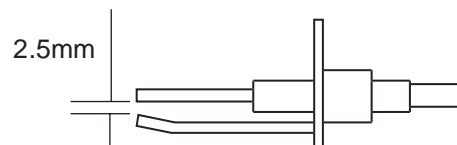
8. Reassemble the injectors, manifold and burners in reverse order to that above.

2.7.3. Ignition and Rectification Electrodes



Note: The ignition electrode is located at the bottom of the burner assembly, the rectification electrode is located at the top of the burner assembly.

Inspect the electrodes, making sure that they are in a sound and clean condition. In particular check that the ignition electrode is clean and undamaged. Check that the spark gap is 2.5mm and that the rectification probe is 10 - 12mm forward of the burner.



Ignition Electrode Spark Gap

2.7.4. Heat Exchanger

Whilst the main burner assembly is removed from the unit, check that the primary sections that the burners fire into are clean.

2.7.5 Main Fan Assembly

2.7.5.1. NVx F & CCF Models

1. Inspect the fan blades for any damage or excessive buildup of deposits that could give rise to an imbalance. Remove the assembly for cleaning as follows.
2. Slacken the cable gland on the heater casing through which the fan electrical cable passes.
3. Disconnect the fan leads from the electrical terminals.
4. Withdraw cable through entry grommet.
5. Remove the fan and motor assembly complete by removing the hexagon headed screws that secure the fan to the rear panel.
6. Reassemble in reverse order.

2.7.5.2. Centrifugal Fan/Silencer Section

1. Remove section side panel(s) and inspect the fan blades for any damage or excessive buildup of deposits that could give rise to an imbalance. Remove the assembly for cleaning as follows.
2. Slacken the cable gland on the casing through which the fan electrical cable passes.
3. Disconnect the fan leads from the electrical terminals in the contactor enclosure.
4. Withdraw cable through entry grommet.
5. Remove the complete fan assembly by removing the fixings securing the fan to the base rails.
6. Reassemble in reverse order.

2.7.6. Replacement of Faulty Components

2.7.6.1 Multifunctional Control

1. Ensure that the gas service valve is turned OFF. If a flexible gas connection has been used go to step 2 otherwise unscrew the union nut situated immediately downstream of the gas service valve.
2. Remove the electrical plug connections from the top of the multifunctional control.
3. Release the flanged connections at the inlet and outlet of the multifunctional control and remove the multifunctional control.
4. Reconnect the new valve in the reverse order to that above ensuring that the valve is correctly orientated. Renew the sealing 'O' rings if necessary.

2.7.6.2. Burners

1. Remove the burner assembly as described in Section 2.7.2.
2. Remove the end plates of the burner assembly and the central burner support plate.
3. Exchange burners as required and reassemble components in reverse order.
4. Re-commission the appliance as described in Section 2.6.

2.7.6.3. Electrode Assemblies

1. Disconnect the electrode leads from the control box as appropriate.
2. Remove the screw securing the electrode assembly to the burner assembly side plate and withdraw the assembly.
3. Fit replacement and reassemble in reverse order. Check that the spark gap is 2.5mm (See section 2.7.3) and the rectification electrode is 10 - 12mm forward of the burner.

2.7.6.4. Limit Thermostat

NB. Ensure that the thermostats are set correctly before fitment

Limit Thermostat settings:-

NVx 10, 25 - 140 = 90°C

NVx 15 and 20 = 100°C

NVx 35 = 110°C

1. Remove the screws securing the thermostat phial mounting plate to the inner bulkhead*, withdraw assembly and unclip the phial.

2. Remove the electrical connections from the limit thermostat.

Remove the securing nut and remove thermostat from the front panel.

3. Fit replacement thermostat in reverse order.



Note*: NVx 90 to NVx 140 units have a second limit stat at the opposing end of the heater to the burner/controls. Remove the two small cover plates and replace as above.

2.7.6.5. Exhaust Fan

1. Remove the four screws securing the flue outlet socket.

2. Disconnect the fan electrical connections from the main terminal strip

3. Remove the screws securing the fan mounting box to the exhaust header plate.

4. Remove fan assembly.

5. If needed, transfer the fan mounting box to the replacement fan.

6. Fit replacement exhaust fan, using new gaskets and silicon sealant as necessary, and reassemble in reverse order.

2.7.6.6. Air Pressure Switch

1. Remove the two screws securing the cover and remove cover.

2. Disconnect electrical connections.

3. Pull off the sensing tube from the air pressure switch.

4. Note the setting of the old pressure switch.

5. Remove the screws fixing the air pressure switch and remove switch.

6. Fit replacement in reverse order refitting the sensing tube to the negative (- or L) tapping on the pressure switch. Adjust setting to that of the old pressure switch.

2.7.6.7. Control Box

1. Unplug all the electrical connections.

2. Remove the two screws that secure the control box in place.

3. Fit replacement in reverse order.

2.7.6.8. Fan Command Module

1. Unplug all the electrical connections by squeezing each side to release.

2. Using a small flat screwdriver push on the locking tab of each PCB mount and gently ease the board upwards to release.

3. Fit replacement in reverse order.

2.7.6.9. Centrifugal Fan/Motor

1. Disconnect the electrical connections to the centrifugal fan section.

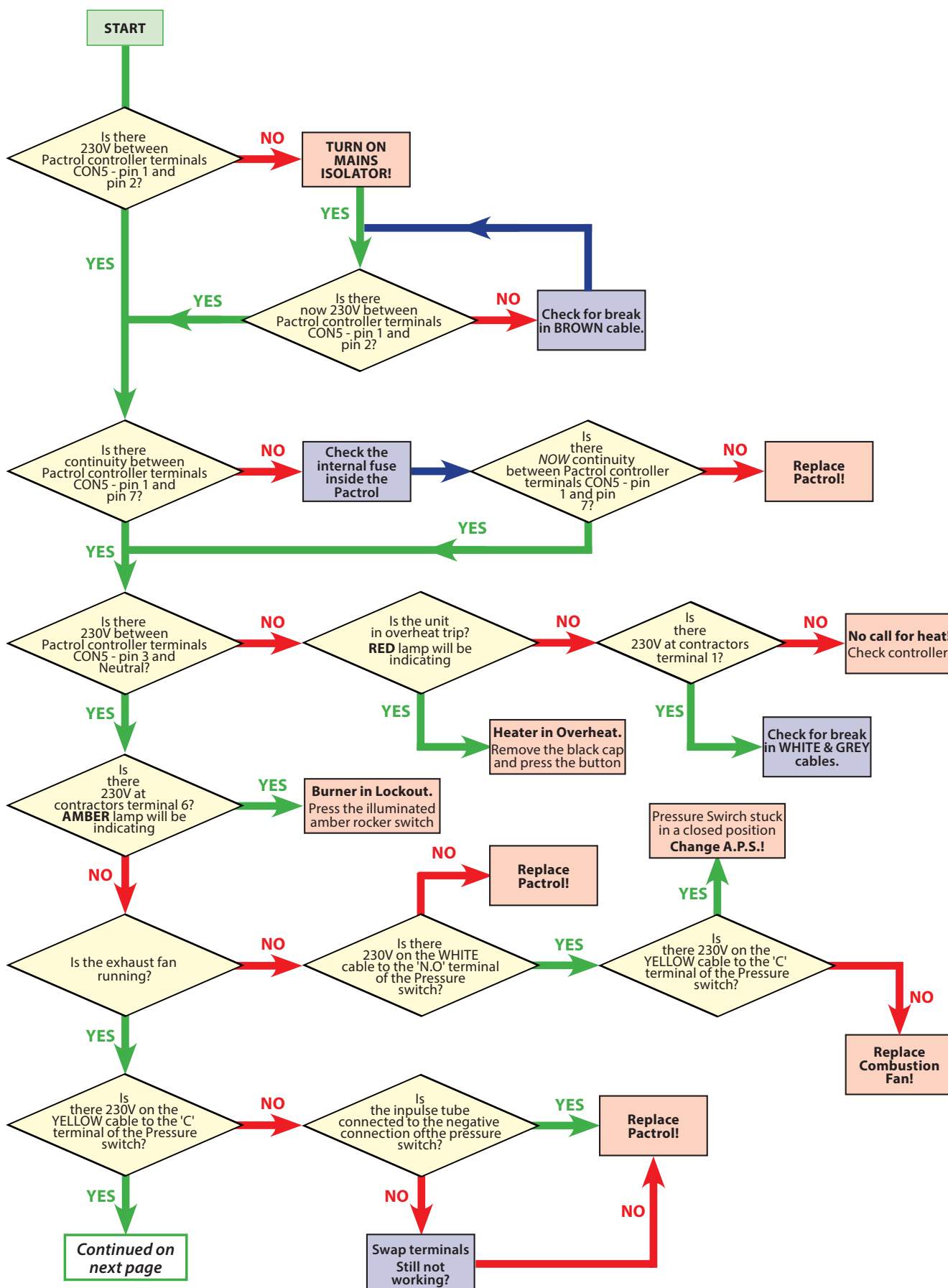
2. Remove the side panels of the section for access to the fan and motor.

3. Fit replacements as appropriate and reassemble in reverse order.

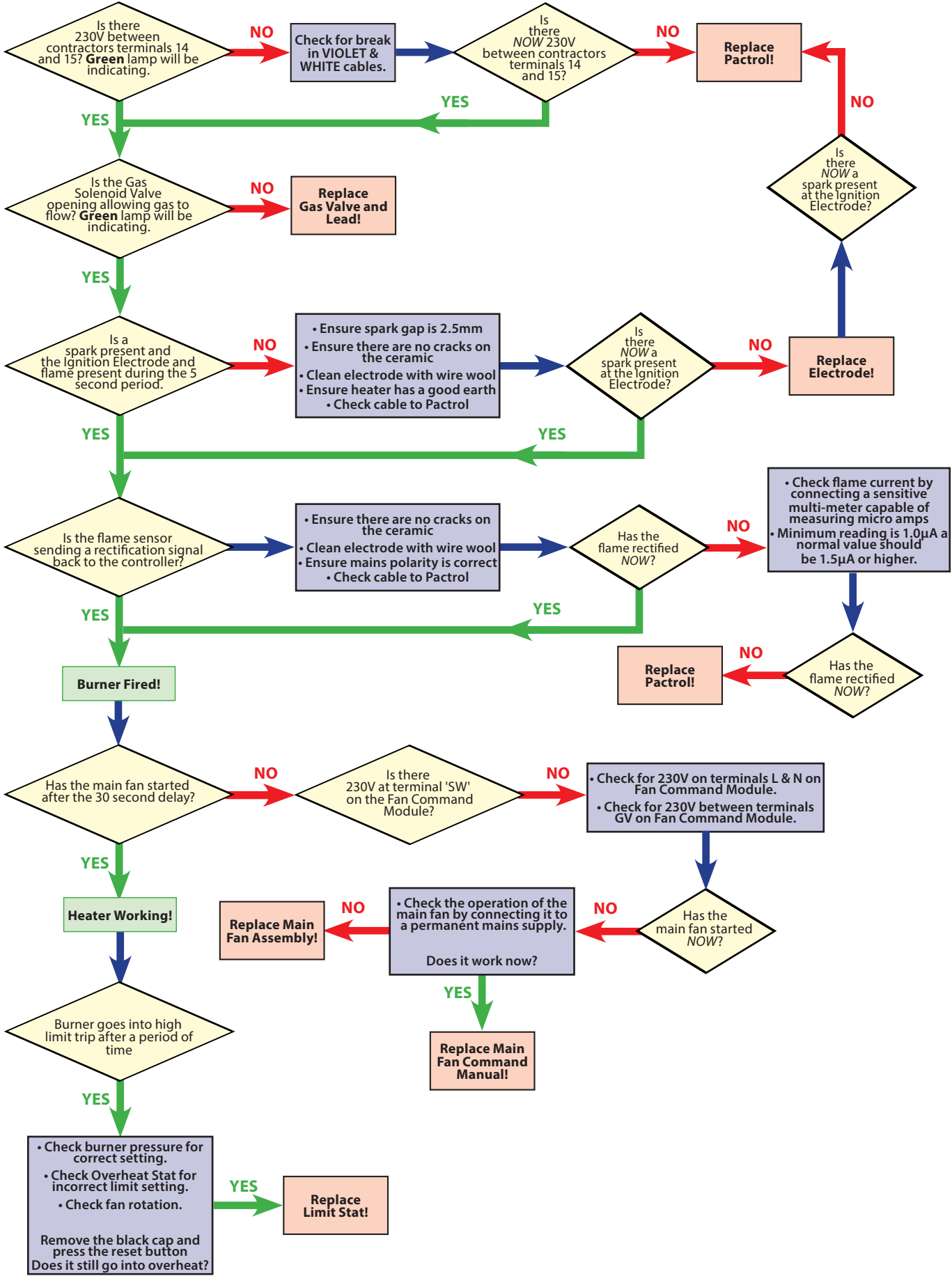


Note: If a 3ph motor is being replaced ensure that the direction of rotation is correct. If it is not interchange any two of the three phases connected to the motor.


3.1 Fault Finding



Continued from previous page



3.2 List of Parts

Item	Description	Usage	Part No.
	Gas Valve SIGMA 843	15-50	145035208HL-SIT/KIT
	Gas Valve VK4105A	15-50	145035208/KIT
	Gas Valve VR4605AB	60-90	145035204/KIT
	Gas Valve V425AB	120/140	141378715/KIT
	Ignition Electrode	15-75 90-140	142423010 142423004
	Rectification (Flame Sensor) Probe	All	142423003
	Burner	15-75 90-140	142400240 142400241
	Limit Stat	All	142403609
	Control Box (Sequence Controller)	All	145030846
	High/Low Governor Head	15-140 -/HL	142466402



Modulation Governor Head	15-140 -/MOD	142466403
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Modulation Driver (GM44)	15-140 -/MOD	142400303
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Lockout Reset Switch	All	143070276
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Fan Command Module MkIII	All	142403603
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Pressure Switch HUBA 604	All	146522176
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Exhaust Fan	15-50	140210496
Exhaust Fan c/w Mounting Brackets	15-50	NVX1050EXH/SP



Exhaust Fan	60 & 75	140201505
Exhaust Fan c/w Mounting Brackets	60 & 75	NVX6075EXH/SP



Exhaust Fan	90-140	140201506
Exhaust Fan c/w Mounting Brackets	90-140	NVX90140EXH/SP



Main Air Fan - NVx F	15	140232002/E/15
	20	140232003/E/15
	25	140232004/E/15
	30/40	140232005/E/15
	50/90	140232006/E/15
	60/75/120/140	140232007/E/15



Contactor	120-140, All -/CCF	143000600
	60-90, All -/CCF	143000601



Main Centrifugal Blower - NVx CCF

15	1402CFAN009
20/25	1402CFAN150/T/15
30	1402CFAN280/T/15
40/50/90	1402CFAN210/T/15
60	1402CFAN580/T/15
75	1402CFAN550/T/15
120/140	1402CFAN580/T/15

3.3 Gas Conversion

Gas Safety (Installation & Use) (Amendment) Regulations



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* An approved class of person listed on the gas safe register.

3.3.1. General

Heater conversion between gases will require a change of burner injectors, alteration of burner pressure and re-commissioning of the heater. (Refer to section 2.6 for commissioning details.)



Ensure that the gas inlet pressure to the heater is correct for the new gas, and that the gas supply has been purged of the old gas. (Refer to tables opposite for new gas inlet pressures.)

3.3.2. Burner Conversion

1. Ensure that the gas service valve is turned OFF.
2. Remove the burner heat shield, 3 screws.
3. Release the outlet connection flange from the gas valve by removing the four screws.
4. Remove the manifold by removing the four screws securing it to the burner assembly.
5. Remove the main burner injectors and washers.
6. Replace with the new injectors/washers for the new gas ensuring a gas tight seal.
7. Refit all other components in reverse order.

3.3.3. Gas Valves

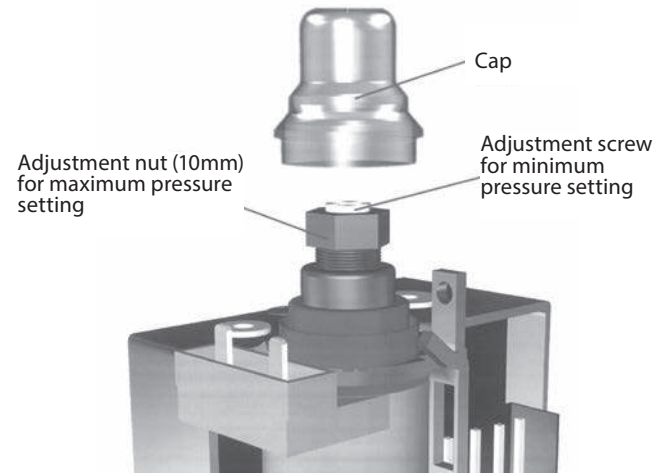
All gas valves used on the NVx range have pressure regulators that may be set to operate on natural gas or propane (LPG).

Conversion is carried out by adjusting the high and low burner pressures to the value in the tables opposite. (Refer to full regulator adjustment in section 2.6.6.1)

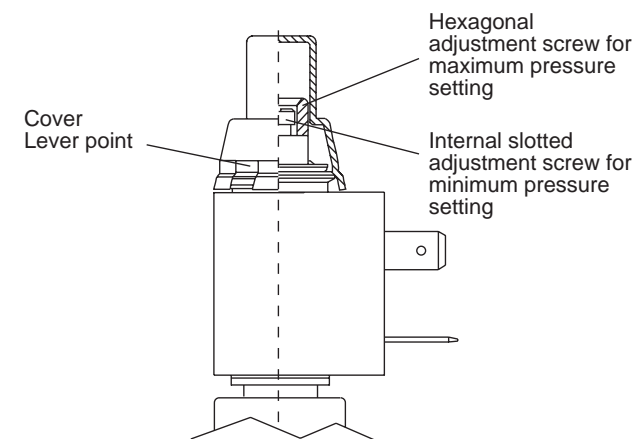


Note*: Ensure the original data badge is removed and replaced with new data badge and "change of gas" stickers.

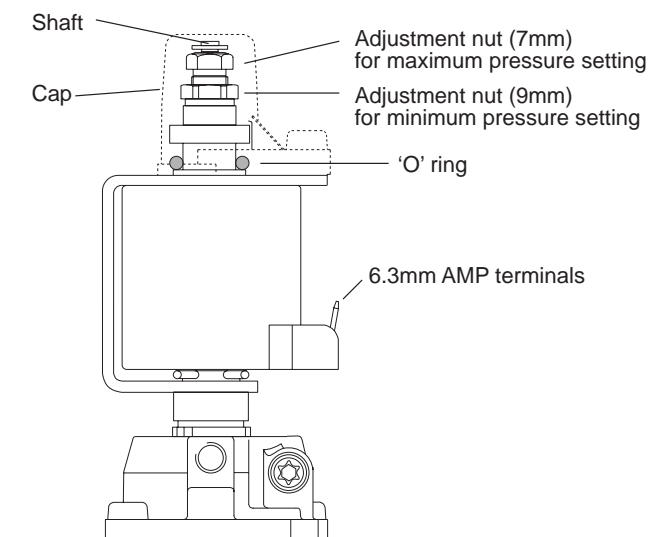
3.3.3.1. Sigma 843 Adjustment



3.3.3.2. Honeywell High/Low Adjustment



3.3.3.3. Honeywell Modulating Adjustment



Natural Gas to Propane (LPG) Conversion Data

Nominal Inlet Pressure = 37mbar, Minimum Inlet Pressure = 37mbar						High Fire	Low Fire
MODEL	Conversion Kit part number	Injectors			Injector part number	Burner Pressure	Burner Pressure
		No.	Size (mm)	Marked		mbar	mbar
NVx15	NVx15LPG	4	1.2	120	142401679	21.6	5.8
NVx20	NVx20LPG	4	1.36	240	142401661	21.2	6.1
NVx25	NVx25LPG	5	1.36	240	142401661	21.4	7.9
NVx30	NVx30LPG	6	1.36	240	142401661	20.6	6.0
NVx40	NVx40LPG	8	1.36	240	142401661	19.8	6.2
NVx50	NVx50LPG	10	1.36	240	142401661	21.2	5.7
NVx60	NVx60LPG	8	1.6	160	142401678	25.4	6.4
NVx75	NVx75LPG	10	1.6	160	142401678	25.1	7.2
NVx90	NVx90SFLPG	8	2.26	580	142401667	14.4	5.2
NVx120	NVx120SFLPG	10	2.26	580	142401667	15.9	7.4
NVx140	NVx140SFLPG	12	2.26	580	142401667	16.0	6.3

Propane (LPG) to Natural Gas Conversion Data

Nominal Inlet Pressure = 20mbar, Minimum Inlet Pressure = 17.5mbar						High Fire	Low Fire
MODEL	Conversion Kit part number	Injectors			Injector part number	Burner Pressure	Burner Pressure
		No.	Size (mm)	Marked		mbar	mbar
NVx15	NVx15NG	4	1.67	380	142401662	12.7	3.9
NVx20	NVx20NG	4	1.94	500	142401664	12.7	3.4
NVx25	NVx25NG	5	1.94	500	142401664	12.5	4.7
NVx30	NVx30NG	6	1.94	500	142401664	13.9	4.0
NVx40	NVx40NG	8	1.94	500	142401664	13.5	5.2
NVx50	NVx50NG	10	1.94	500	142401664	13.2	4.0
NVx60	NVx60NG	8	2.54	750	142401665	9.5	2.5
NVx75	NVx75NG	10	2.54	750	142401665	10.0	4.0
NVx90	NVx90NG	8	3.5	1500	142401666	5.9	2.5
NVx120	NVx120NG	10	3.5	1500	142401666	7.2	3.1
NVx140	NVx140NG	12	3.5	1500	142401666	6.9	3.2

Appendices

Information required for ecodesign (ErP) Directive 2009/125

Model			15	20	25	30	40	50
Rated Heat Capacity		kW	15.0	20.0	25.0	30.0	40.0	50.0
Low Heat Input	Nett CV	kW	8.2	12.0	16.5	18.3	26.9	29.6
Minimum Heat Capacity		kW	7.3	10.6	14.6	16.4	23.9	26.0
Useful Efficiency	High Fire	%	91%	91%	91%	91%	91%	93%
	Low Fire	%	89%	88%	89%	89%	89%	88%
Electrical Power Consumption*	High Fire	kW	0.07	0.07	0.07	0.07	0.07	0.06
	Low Fire	kW	0.07	0.07	0.07	0.07	0.07	0.06
	Standby	kW	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Ignition	kW	0.00	0.00	0.00	0.00	0.00	0.00
NOx Seasonal (Gross)		mg/kWh	146.2	142.6	147.2	126.4	155.6	138.8
Envelope Loss Factor		%	n/a	n/a	n/a	n/a	n/a	n/a
Emission Efficiency		% $\eta_{s, flow}$	95%	95%	94.4%	92%	94%	95%
Seasonal Space Heating Energy Efficiency		% $\eta_{s,h}$	72.3%	72.3%	72.9%	72.8%	72.3%	72.4%

Model cont.			60	75	90	120	140
Rated Heat Capacity		kW	60.0	75.0	90.0	120.0	140.0
Low Heat Input	Nett CV	kW	31.7	50.7	60.2	87.8	97.3
Minimum Heat Capacity		kW	27.7	44.6	54.4	81.0	89.5
Useful Efficiency	High Fire	%	92%	93%	92%	93%	94%
	Low Fire	%	87%	88%	90%	92%	92%
Electrical Power Consumption*	High Fire	kW	0.06	0.06	0.06	0.06	0.06
	Low Fire	kW	0.06	0.06	0.06	0.06	0.06
	Standby	kW	<0.01	<0.01	<0.01	<0.01	<0.01
	Ignition	kW	0.00	0.00	0.00	0.00	0.00
NOx Seasonal (Gross)		mg/kWh	143.6	167.9	165.7	161.2	135.6
Envelope Loss Factor		%	n/a	n/a	n/a	n/a	n/a
Emission Efficiency		% $\eta_{s, flow}$	95%	94.8%	94.6%	94.4%	94.1%
Seasonal Space Heating Energy Efficiency		% $\eta_{s,h}$	72.7%	72.1%	76.0%	74.1%	74.1%
* Excluding Distribution Fan							

<h1>TESTED</h1>	
STAGE 1	Full mechanical, construction, assembly and electrical sequence check <input type="checkbox"/>
STAGE 2	Full functional test in accordance with Quality System Procedures <input type="checkbox"/>
Heater Model _____	Final <input type="checkbox"/>
Heater Serial No. _____	
Type of Gas _____	

More information is available from our web site on:-

<http://www.powrmatic.co.uk/products/heating/browse/view/product/nvx-gas-unit-heaters/>



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Every effort is made to ensure accuracy at time of going to press. However as part of continued product improvement, we reserve the right to alter specification without prior notice.