

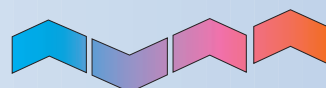
Vapac[®]



*Delivering Humidification
Advantage*

GF RANGE

Gas Fired Humidifier



GF RANGE – GAS FIRED HUMIDIFIERS

Vapac sets the standard with a new generation of atmospheric steam boilers developed for humidification applications. The GF is the only UK designed and manufactured humidifier of its type available in Europe and offers exclusive features that benefit both installers and operators.

Gas is far more cost effective than electricity. The benefits of a high efficiency burner and heat exchanger, combined with low flue temperatures obtained with the new system, are highly attractive. It will give confidence to the specifier and building owner / operator to address environmental issues without sacrificing technological benefits, performance and reliability.

The Gas Fired Humidifier incorporates the new VapaNet control system, based on the open architecture LON Works software and hardware, making it a LON Mark device compatible with all open architecture Building Management Systems. Each unit is factory set for UK and European Gas prior to despatch. This open approach to control allows all units to be configured to accept any of nine different external input signals. It also allows for up to 10 units to be connected as master/slave to give a potential 850kg/hr. The master would be proportional and all slaves would operate as On/Off devices connected together by a pair of wires.

An optional Alpha-Numeric Display can be added as a permanent feature, or positioned remote from the Humidifier, or temporarily plugged in for the service engineer to interrogate the units to fault find and / or change internal configurations. The standard display informs the maintenance technician of the system operation without the need for the Alpha-Numeric Display.

The nine capacity steps, from 6kg/hr to 85kg/hr in 10kg increments, make Vapac's offering the largest range of gas fired humidifiers available in Europe. Each capacity is available in On/Off and Proportional control. The Humidifier can be driven from external proportional signals or connected to a Vapac room or duct mounted sensor.

The whole range has been independently certified by GASTEC in Holland to conform to all European gas regulations. Each humidifier is supplied pre-set for two bands of European gases (E and LL). The Calorific Values for these gases range from 30.98 to 45.28 Gross (Hs). The design delivers the low NOx levels of 36ppm at maximum output. An efficiency level of 95.6% NET at maximum capacity has been achieved with the burner and heat exchanger design.

The Humidifier has an IP 20 rating and is designed for plant room location. All sizes are available as 'Type B' Open Flue or 'Type C' Balanced Flue with twin or concentric flue. Competitive ranges of standard flues are offered as optional accessories to enable the contractor to source all requirements from one supplier. A full range of steam accessories is also available from Vapac covering single Steam Pipes to the exclusive MultiPipe Short Absorption System.

Vapac's Gas Fired Humidifier is capable of operating with a range of water qualities from raw mains to de-mineralised or de-ionised. To reduce maintenance periods we recommend a Base Exchange softened water be used to feed the Humidifier as the minimum water quality level. A full range of water treatment solutions are available to suit the prevailing site conditions, typically, water softeners and de-mineralisation plants.

The Gas Fired Humidifier is a cost effective way for building owners and occupiers to upgrade existing and new electricity based systems for a more energy efficient alternative.



- **Compact size**

85Kg of steam producing power, packed into less than 0.6m³ of plant room space. With a footprint of less than 0.5m².

- **Nine duties**

The largest range of Gas Fired Humidifiers available as true proportional control following a linear capacity ramp.

- **6-85Kg/Hr**

No more than 10kg increments between sizes allows you to select the duty that best matches the humidification load.

- **Modulating/On-off control available**

The same device can be configured for On/Off operation or Fully Proportional at no extra cost.

- **Master/Slave facility**

A single proportional Master can control up to nine On/Off slave humidifiers, having a potential steam duty of 850Kg/Hr.

- **LON Works compatible**

Every GF Humidifier is a LON Mark Device and can be introduced into any compatible open architecture building control system.

- **High efficiency gas burner**

Operating at maximum output the GF will deliver NET measured efficiency in the range 93.9% to 95.6%.

- **Type 'B' or 'C' Flue compatible**

The same unit can be configured for 'Type B' or 'Type C' arrangements with twin or concentric flues.

- **Laminar Matt Burner**

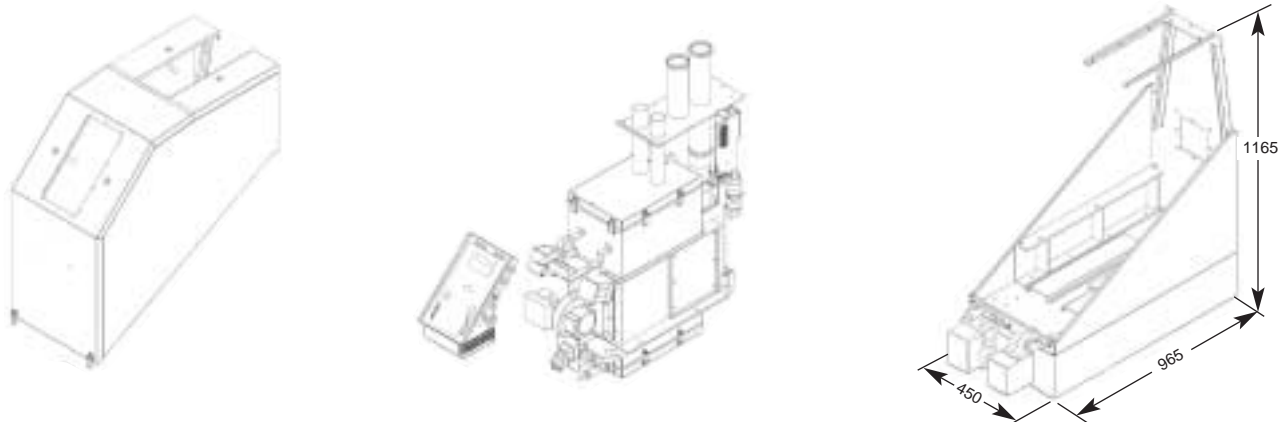
Patented burner and Heat Exchanger arrangement ensures the applied heat maintains a uniform pattern across the finned tubes delivering the best performance available today.

- **VapaNet Control System**

The exclusive VapaNet software control system, developed from the highly successful VOS6 operating system, ensures a simple and easily understood operator-to-humidifier interface.

- **Balanced Flue**

The balanced flue means the GF Humidifier can be located conveniently against an outside wall to deliver steam wherever and whenever you want it.



PERFORMANCE DATA & EFFICIENCY

Model	Steam Output Kg/Hr		Steam Connection		Max Gas Rate m3/hr			Efficiency at Max Output		Average water consumption
	Min	Max	No	Dia/mm	E on G20	LL on G25	Net Burner Power Hs Kw	Gross %	Nett %	l/min
GF6	6		1	54	0.48	0.55	4.51	86.7	95.6	0.11
GF10	6	10	1	54	0.78	0.89	7.33	86.5	95.4	0.18
GF10 P										
GF20	6	20	1	54	1.52	1.74	14.37	86.5	95.4	0.37
GF20 P										
GF30	6	30	1	54	2.27	2.6	21.42	86.3	95.1	0.55
GF30 P										
GF40	17	40	2	54	3.05	3.5	28.86	86	94.8	0.73
GF40 P										
GF50	17	50	2	54	3.81	4.37	35.98	85.6	94.4	0.92
GF50 P										
GF60	17	60	2	54	4.56	5.23	43.1	85.4	94.2	1.1
GF60 P										
GF70	17	70	2	54	5.31	6.1	50.22	85.3	94	1.28
GF70 P										
GF85	17	85	2	54	6.44	7.39	60.89	85.2	93.9	1.56
GF85P										

GENERAL PERFORMANCE DATA

		GF(6-30) GF(6-30)P	GF(40-85) GF(40-85)P
Gas Operating Pressure	Max	27mbar	
	Min	15mbar	
Gas Supply Connection		1/2 BSP female into valve	3/4 BSP female into valve
NOx at Maximum Output		36 ppm	
NOx at Minimum Output		15 ppm	
Flue Inlet & Outlet Connection		80 mm	
Coaxial Flue Connection		80 / 125 mm	
Water Flow Rate		5 l/min	
Mains Water Pressure	Max	8 bar	
	Min	1-5 bar	
Mains Water Connection		1/2 BSP female into isolating valve	
Maximum Drain Discharge Rate		16.8 l/min @ 50Hz. 17.2 l/min @ 60Hz	
Drain Connection		1 inch BSP for 35 mm pipe from tundish to waste gully	
Electrical Power Consumption		70 watts	90 watts
Maximum Fuse Rating		3.15 Amps	
Electrical Connection		2.5mm ² screw clamp terminals for L N & E	
Dry Weight		125kg	142.5kg
Dimensions		450mm Wide x 965mm Deep x 1165mm High	

GF RANGE – GAS FIRED HUMIDIFIER GUIDE SPECIFICATION

1. The Vapac self-contained gas fired self-generating atmospheric steam Humidifier, is electronically controlled by the VapacNet open architecture controls system and is designated a LON Mark Device.

Nominate A) Vapac Gas Fired Humidifier Model GF() (On/Off)
B) Vapac Gas Fired Humidifier Model GF()P (Proportional)

Each Humidifier shall generate () kg/hr of steam at atmospheric pressure.

All capacities given will be at sea level barometric pressure of 1013.25 mbar.

2. The VapacNet internal control system shall operate at 24VAC. The electrical power shall be 220/240 volt single phase and neutral plus earth, or 220/240 volt 2 phase plus earth, 50/60 Hz. When connected to suitable Gas, Water and Electrical services the humidifier will respond to an external control signal to give a fully automatic –

- A) On/Off operation
- B) Proportional operation.

The VapacNet control system will allow up to 10 dissimilar size Humidifiers to be connected in a master/slave configuration for a modular approach to large load applications.

The VapacNet control system shall be capable of accepting any one of nine commonly used external control signals (Potentiometric, 0-5v, 0-10v, 0-20v, 2-20v, 2-10v, 1-18v, 4-20mA, LON Network).

3. The steam shall be generated in a patented stainless steel gas to water heat exchanger that will incorporate the exclusive Laminar Matt Burner. The patent shall be registered in Great Britain, Europe, USA and Canada. The Humidifier will comply with all European Low Voltage Directive, Electro Magnetic Compatibility, Gas and Water Appliance Regulations as certified by GASTEC of Holland (Test House Number 0063) as an independent test laboratory. The Product Test Pin Number is BM3169.

Each Humidifier, defined as a single burner and heat exchanger, shall not exceed a maximum input power rating of 70kW.

- (i) The Humidifier will be factory set to operate with two bands of European Gases designated E and LL, with net calorific values of 34.02MJ/Kg for gas type G20 and 29.25MJ/Kg for gas type G25.
- (ii) Each Humidifier will be factory set to run at 8.7 CO₂ for G20 or 9.0 CO₂ for G25 on minimum fan speed and at 9.3 CO₂ for G20 or 9.7 CO₂ for G25 at maximum fan speed. This must be checked on site when commissioning to take flue design into account. The net efficiency level for each humidifier shall be between 93.9% and 95.6% at full capacity.
- (iii) Alternative flue and air inlet connections shall be available as top vertical or back horizontal connection. The maximum flue temperature, assuming air temperature at inlet to be 20°C, shall not exceed 106°C.

4. The cabinet base shall be constructed of 2mm thick Nirosta 4003 steel and the top shall be constructed of 2mm thick Aluminium 5251. The assembled cabinet shall be sealed and rated at IP 20 to allow the humidifier to be classified as a balanced flue appliance.

- 5.1 The Humidifier shall have an open flue system, 'Type B', which takes air from the plant room for combustion and discharges the fumes of combustion via an appropriate flue to the outside. Ventilation to the plant room will be in accordance with the **Vapac Installation & Design Performance Manual**.

The flue terminal positions shall be in accordance with BS5440-1 for appliances with maximum heat output of 60kW. OR

- 5.2 The Humidifier shall have a balanced sealed air inlet, 'Type C', with air flue discharge to outside via a concentric or twin pipe flue arrangement. Ventilation to the plant room will be in accordance with the **Vapac Installation & Design Performance Manual**.

The flue terminal positions shall be in accordance with BS5440-1 for appliances with maximum heat output of 60kW.

6. An indicator panel shall be built into the front of the cabinet to indicate Alarm and Normal Run operation.

The Humidifier will be automatically shut down in the event of the following alarms:

- 6.1 Heat exchanger high temperature trip
- 6.2 Burner lockout
- 6.3 Heat exchanger empty (No water)
- 6.4 Safety relay interlock fault

Normal run indicators shall be:

- 6.5 Humidifier shut down
- 6.6 Humidifier online demand present heat exchanger operational
- 6.7 Standby - No demand signal
- 6.8 Drain fault
- 6.9 Feed fault
- 6.10 Service interval expired OR Conductivity sensor fault
- 6.11 Service routine / Periodic / Manual / Auto flush / Drain in progress
- 6.12 Service routine / Periodic / Manual / Auto flush / Drain complete

- 6.13 Constant output active / Full output via UCP3 (Master only)

7. GF()P Models

The Humidifier shall include a VapacNet control facility to achieve an output response to a modulating control signal by switching and controlling the speed of the burner fan. The minimum load to achieve start up will be:

6kg/hr for the GF10P, GF20P, GF30P
17kg/hr for the GF40P, GF50P, GF60P, GF70P, GF85P

8. Each Gas to Steam heat exchanger shall have a water level switch to trigger closure of the feed valve and prevent over filling and / or lock out if water level drops below minimum limit for safe operation of the burner.
9. The Humidifier shall include a drain pump to minimise the risk of blockage by sediment.
10. The Humidifier shall include a fill-cup with safety overflow circuit to drain from water feed line and pump circuit.
11. The Humidifier shall include a fill-cup providing 25mm air gap on the water feed line to prevent back feeding or contamination of feed water. The drain circuit shall discharge through a drain trap vented into the steam cylinder compartment.
12. The water feed to the unit shall incorporate a strainer and flow control restrictor to suit connection of water supplies with pressures in the range 1-5 to 8 bar. The humidifier shall be capable of operating with a range of water qualities from raw mains to de-mineralised or de-ionised. The water supply should be within the following limits:

Conductivity	0-1000mS
PH	7.3 – 8.0
Silica	0
Pressure	1.5 – 8 bar
Chlorine maximum	170ppm

It is recommended that, in hard water areas, water treatment be undertaken to extend the time interval between cleaning the water chamber and tubes. The minimum water treatment should be a softener. If, after testing the water supply, the mineral / chemical content falls outside the limits above, guidance from Vapac or a water treatment specialist should be sought.

ACCESSORIES

13. The steam shall be introduced into the air stream using 54mm diameter stainless steel steam pipes positioned in accordance with the manufacturer's recommendations in the **Vapac Installation & Design Performance Manual**.
- 13.1 Each steam pipe shall be manufactured from 316 stainless steel and have a built in negative 8% inclination for continuous condensate drainage to outside the air path to avoid the need for a separate condensate return line. OR
- 13.2 Each steam pipe shall be manufactured from 316 stainless steel and built in positive 8% inclination for continuous condensate drainage from the 15mm straight connector welded to the end. This will allow the connection of a condensate line run to the internal drain pan or to outside the air stream.
- 14.1 Interconnecting pipe work between the Humidifier and the steam pipe shall be run in 54mm ID flexible steam hose supplied by Vapac which conforms to the connection dimensions given in the detailed technical specification. If there are excessive run lengths the hose should be supported with brackets at regular intervals or on cable tray to prevent sagging, thereby causing traps. (**Please see Vapac Installation & Design & Performance Manual for guidance.**) OR
- 14.2 Interconnecting pipe work between the Humidifier and steam pipe shall be run in 316 grade 54mm stainless steel pipe utilising long and short radius bends in the same material. Connection of straight and bent pipes will utilise the Vapac Mechanical Connection Kit. The diameter will match the steam outlet size of the Humidifier. (**Please see Vapac Accessory List for guidance.**)

OPTIONS

15. The VapacNet Master/Slave control system shall be interconnected to operate from one proportional signal entering the designated Master humidifier. Up to nine further Humidifiers can be connected using twisted pair wiring in series. The slave units shall be On/Off devices and the Master shall be a Proportional unit. To obtain the required load there will be 1 x Master (Model GF()P and (1-9) x Slave units (Model GF()).
- 16.1 Each Humidifier can incorporate an Alpha-Numeric display with touch sensitive keypad for access to operational information, service and adjustment procedures. The display will be permanently positioned within the controller, accessible from the front without opening the cabinet. OR
- 16.2 Each Humidifier can incorporate an Alpha-Numeric display with touch sensitive keypad for access to operational information, service and adjustment procedures. The display will be permanently positioned remote from the humidifier, connected by screened twisted pair communications cable.
17. A standard set of Single and Coaxial Flues shall be offered as part of the matched system supplied by Vapac Humidity Control. The exact layout and option numbers will be in accordance with the site details and as recommended in BS 5440-1. (**Please see Vapac Accessory List for guidance.**)

Vapac® is an internationally registered trademark
Vapac equipment is covered by international patents

The manufacturers reserve the right to change the design or specification of the equipment described in this brochure without prior notice.

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