Honeywell
ECLIPSE

Ultra low NO_X burners Furnnox FN

TECHNICAL INFORMATION

- NO_X emissions less than 30 ppm at 3% O_2 in most high temperature furnace applications
- Five sizes with capacity range: 0.25–2 MBtu/h (66–530 kW)
- Turndown: 10:1
- Max. process temperature: 2800°F (1540°C)
- Max combustion air temperature with standard design: 300°F (150°C) Max combustion air temperature with insulated body design: 1100°F (600°C)
- Air and gas inlets are independently adjustable in 90° increments to suit a variety of piping alternatives

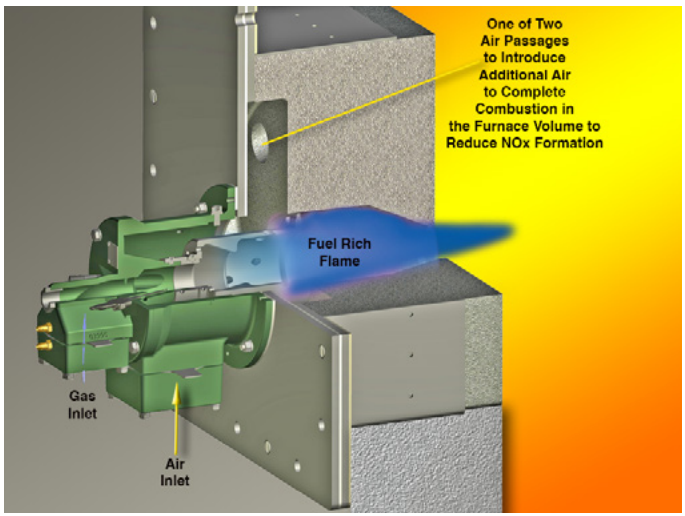
EAC

Version 1
EN
Edition 03.25
32-00291

Contents

Contents 2
1 Application 3
2 Certification 4
2.1 Eurasian Customs Union 4
3 Selection table 5
4 Technical data. 8
4.1 Input. 8
4.2 Inlet pressure. 9
4.3 Max. high fire visible flame length 9
4.4 Performance graphs 10
4.4.1 FN0025. 10
4.4.2 FN0050 11
4.4.3 FN0100. 12
4.4.4 FN0150. 13
4.4.5 FN0200 14
4.5 Dimensions 15
4.5.1 Block and holder. 16
5 Converting units. 17
For more information 18

1 Application



For continuous high temperature applications (e.g. annealing/pickling lines) as well as noncontinuous applications such as forge and heat treatment furnaces. Furnnox is a direct fired furnace burner with exceptionally low emissions for continuous high-temperature processes, e. g. in steel industry. Furnnox is capable of producing NO_X emissions of less than 30 ppm at 3% O_2 in most high-temperature applications. To achieve high efficiency, the burner is controlled on-ratio throughout the operating range. Available in standard configuration up to 300°F preheated combustion air, or a special, insulated body version for higher temperature preheated combustion air. The Furnnox offers the convenience of multi-fuel capability with no nozzle change. It can be fired on natural gas, propane and butane. With the Furnnox, you can light anywhere in the ignition range with no pilot required. Typical applications are galvanizing furnaces, slot type forge furnaces and heat treatment furnaces. The Furnnox will only achieve low NO_X in chambers operating below 5% O_2. NO_X performance is improved by reducing excess air through the burner and O_2 in the chamber. The burner should not be used in applications that require high excess air or process air.

2 Certification

2.1 Eurasian Customs Union

The products Furnnox meet the technical specifications of the Eurasian Customs Union.

3 Selection table

Description	Code	Availability					Remark
		0025	0050	0100	0150	0200	
Furnnox ultra low NO_X burner	**FN**	•	•	•	•	•	
Rated capacity							
250 kBtu/h (70 kW)	**0025**	•					
500 kBtu/h (150 kW)	**0050**		•				
1 MMBtu/h (290 kW)	**0100**			•			
1.5 MMBtu/h (440 kW)	**0150**				•		
2 MMBtu/h (590 kW)	**0200**					•	
Housing material							
Non-insulated cast body	**C**	•	•	•	•	•	
Preheat temperature							
No preheat ambient to 300°F (150°C)	**A**	•	•	•	•	•	
Furnace temperature							
1600–2800°F (870–1540°C)	**1**	•	•	•	•	•	
Nozzle material							
Stainless steel	**A**	•	•	•	•	•	
Combustor type							
Block and holder	**B**	•	•	•	•	•	
Gas type							
Butane	**B**	•	•	•	•	•	
Natural gas	**N**	•	•	•	•	•	
Propane	**P**	•	•	•	•	•	

3 Selection table

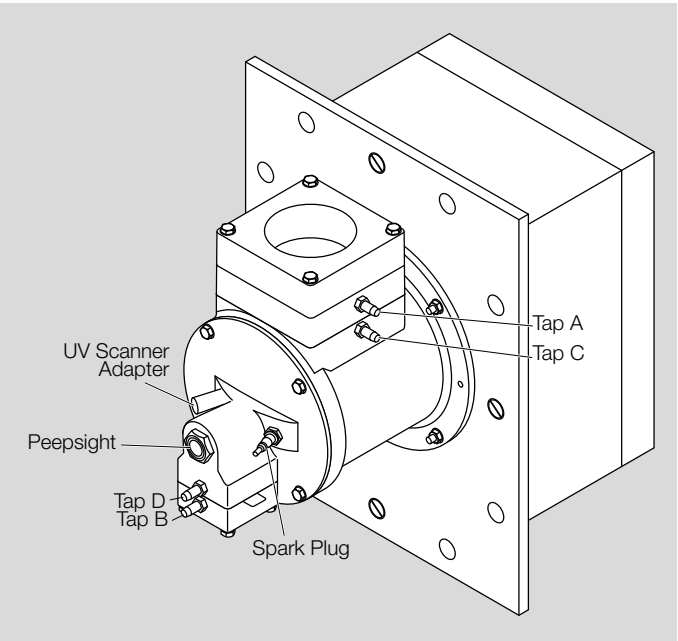
Description	Code	Availability					Remark
		0025	0050	0100	0150	0200	
Gas orifice							
7.0 mm	**A6**	•					Butane or propane only
9.1 mm	**A9**	•					Natural gas only
13.0 mm	**B7**			•			Butane or propane only
16.0 mm	**C2**				•		Butane only
18.0 mm	**C4**			•	•	•	FN0100: Natural gas only FN0150: Propane only FN0200: Propane or butane only
20.0 mm	**C6**				•		Natural gas only
24.0 mm	**D1**					•	Natural gas only
11.5 mm	**F2**		•				Natural gas only
8.5 mm	**F3**		•				Propane only
8.0 mm	**F4**		•				Butane only
Pipe connection							
Air/gas: BSP (Rc)	**B**	•	•	•	•	•	
Air/gas: NPT	**N**	•	•	•	•	•	
Air orifice							
29.0 mm	**D2**	•					
42.0 mm	**D6**		•				
57.0 mm	**E2**			•			
66.0 mm	**E6**				•		
70.0 mm	**E7**					•	
Flame control							
UV scanner adapter only	**A**	•	•	•	•	•	
UV scanner heat block seal	**H**	•	•	•	•	•	
Less scanner adapter	**X**	•	•	•	•	•	
Air orientation							
Combustion air inlet at 0° with block at 0°	**0**	•	•	•	•	•	
Combustion air inlet at 90° (CW) from block at 0°	**1**	•	•	•	•	•	
Combustion air inlet at 180° (CW) from block at 0°	**2**	•	•	•	•	•	
Combustion air inlet at 270° (CW) from block at 0°	**3**	•	•	•	•	•	

Description	Code	Availability					Remark
		0025	0050	0100	0150	0200	
Gas orientation							
Gas inlet at 0° with block at 0°	**0**	•	•	•	•	•	
Gas inlet at 90° (CW) from block at 0°	**1**	•	•	•	•	•	
Gas inlet at 180° (CW) from block at 0°	**2**	•	•	•	•	•	
Gas inlet at 270° (CW) from block at 0°	**3**	•	•	•	•	•	

Example

FN0025CA1ABNA9ND202

4 Technical data



FN0025–0200

Type of gas: natural gas, propane or butane; for any other mixed gas, contact Honeywell Eclipse.

Max. combustion air temperature with standard design: 300°F (150°C).

A special, insulated body design is available for combustion air temperatures up to 1100°F (600°C). Contact Honeywell Eclipse for more information.

Minimum operating furnace temperature: 1400°F (760°C). For operation with low NO_X and lowest CO emissions.

Maximum chamber temperature: 2400°F (1315°C).

Flame detection: UV scanner.

All information based on laboratory testing in neutral (0.0 "w.c.) pressure chamber. Different chamber sizes and conditions may affect the data.

Plumbing of air and gas will affect accuracy of orifice readings. All information is based on generally acceptable air and gas piping practices.

4.1 Input

Type	Maximum, Btu/h (kW)[1)]	Minimum, Btu/h (kW)[1)]
FN0025	250,000 (66)	25,000 (7)
FN0050	500,000 (132)	50,000 (13)
FN0100	1,000,000 (263)	100,000 (26)
FN0150	1,500,000 (396)	150,000 (40)
FN0200	2,000,000 (527)	200,000 (53)

1) All imperial inputs based upon gross calorific values (HHV). All metric inputs based upon net calorific values (LHV). For lower inputs, contact Honeywell Eclipse.

4.2 Inlet pressure

Type	Main gas, "w.c. (mbar), measured at Tap B						Air, "w.c. (mbar), measured at Tap A[1)2)]		
	Combustion air temp.: ambient			Combustion air temp.: 300°F (150°C)			ambient	300°F (150°C)	
	Natural gas	Propane	Butane	Natural gas	Propane	Butane			Air orifice
FN0025	3.8 (9.5)	7.0 (17.4)	6.2 (15.4)	5.8 (14.4)	7.4 (18.4)	6.5 (16.2)	10.2 (25.4)	14.6 (36.4)	29 mm
FN0050	5.0 (12.5)	7.5 (18.7)	5.9 (14.7)	6.0 (14.9)	8.8 (21.9)	6.7 (16.7)	13.2 (32.8)	18.8 (46.8)	42 mm
FN0100	4.7 (11.7)	6.3 (15.7)	6.0 (14.9)	5.1 (12.7)	6.7 (16.7)	6.3 (15.7)	11 (27.4)	15.7 (39.0)	57 mm
FN0150	7.1 (17.7)	9.2 (22.9)	8.4 (20.9)	6.4 (15.9)	8.0 (19.9)	7.3 (18.2)	22.9 (57)	33.5 (83.3)	66 mm
FN0200	3.8 (9.4)	6.4 (15.9)	5.9 (14.6)	5.8 (14.4)	6.6 (16.4)	6.2 (15.4)	13.7 (34.1)	19.6 (48.8)	70 mm

1) 15% excess air at maximum input

2) Includes pressure drop across listed air orifice.

4.3 Max. high fire visible flame length

Measured from the outlet end of the combustor

Type	Natural gas	Propane	Butane
	inch (mm)		
FN0025	22 (559)	14 (355)	14 (355)
FN0050	28 (711)	36 (914)	39 (991)
FN0100	38 (965)	37 (940)	42 (1065)
FN0150	38 (965)	42 (1065)	43 (1092)
FN0200	36 (914)	32 (813)	32 (813)

4.4 Performance graphs

Emissions from the burner are influenced by:

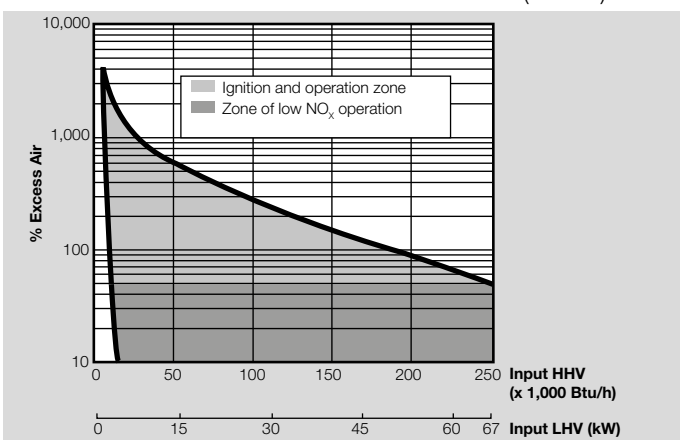
- Fuel type
- Combustion air temperature
- Firing rate
- Chamber conditions
- Percent of excess air

High fire NO_X emissions with natural gas are typically below 30 ppm at 3% O_2 in furnace applications below 2000°F (1093°C). Contact Honeywell Eclipse for an estimate of emissions for specific conditions.

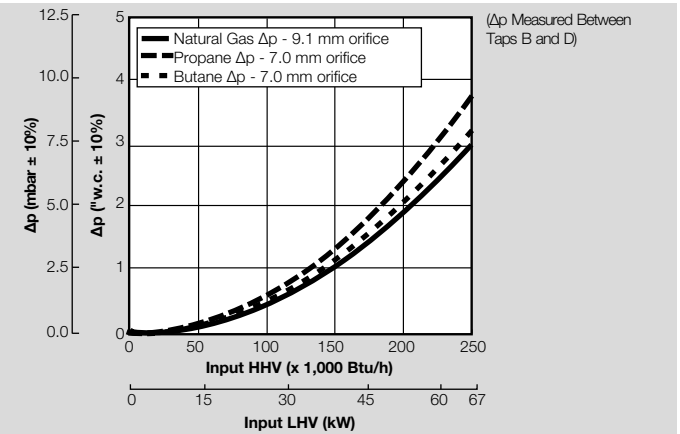
4.4.1 FN0025

Ignition and operation zone for ambient temperature

Input to be limited to 185 kBtu/h (49 kW) with a minimum of 30% EXA while the chamber is below 1400°F (760°C).

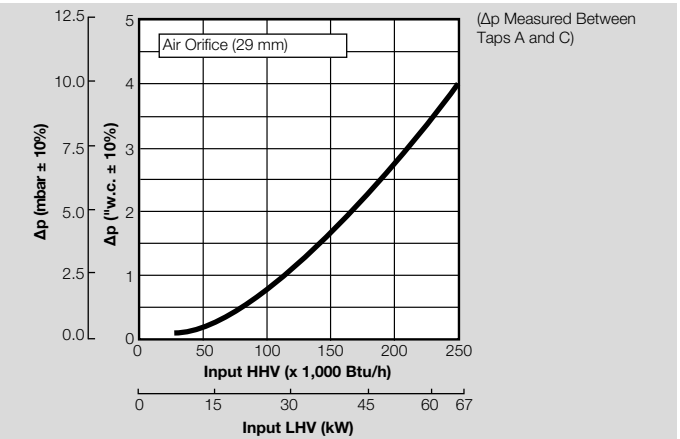


Fuel orifice Δp vs. Input



Air orifice Δp vs. Input

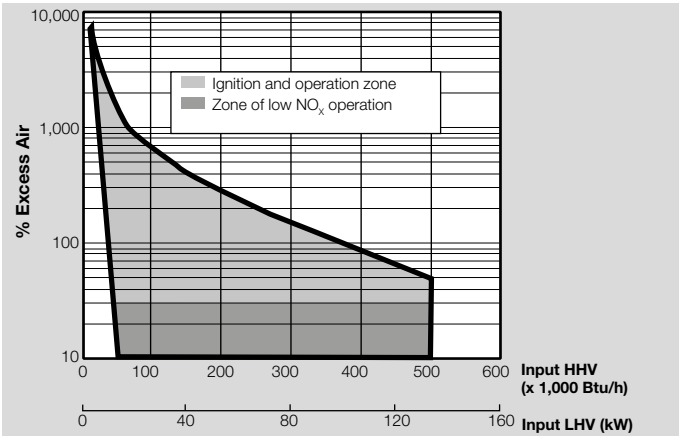
Ambient Combustion Air Temperature



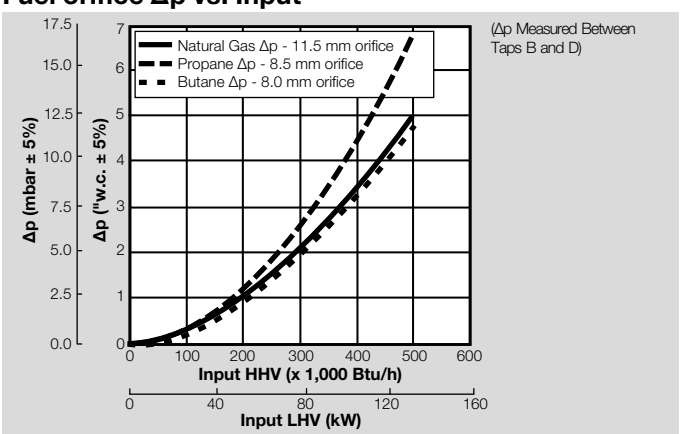
4.4.2 FN0050

Ignition and operation zone for ambient temperature

Input to be limited to 375 kBtu/h (99 kW) with a minimum of 30% EXA while the chamber is below 1400°F (760°C).

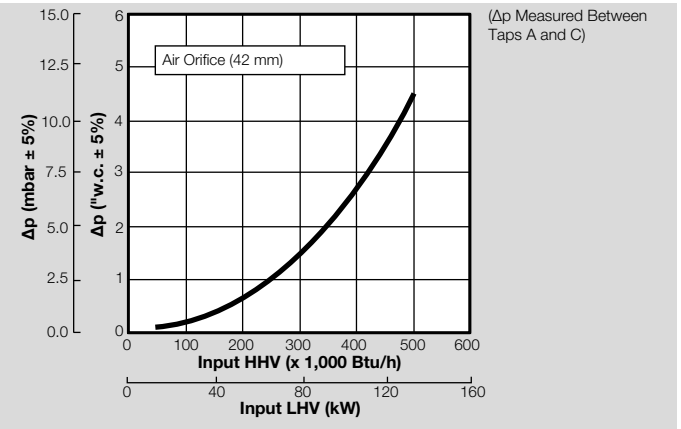


Fuel orifice Δp vs. Input



Air orifice Δp vs. Input

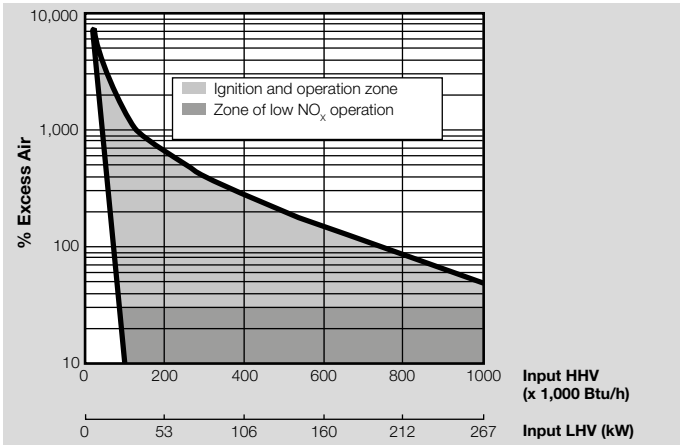
Ambient Combustion Air Temperature



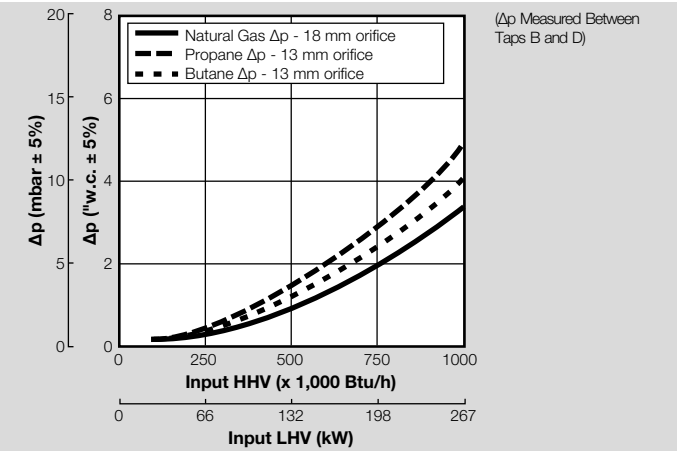
4.4.3 FN0100

Ignition and operation zone for ambient temperature

Input to be limited to 750 kBtu/h (198 kW) with a minimum of 30% EXA while the chamber is below 1400°F (760°C).

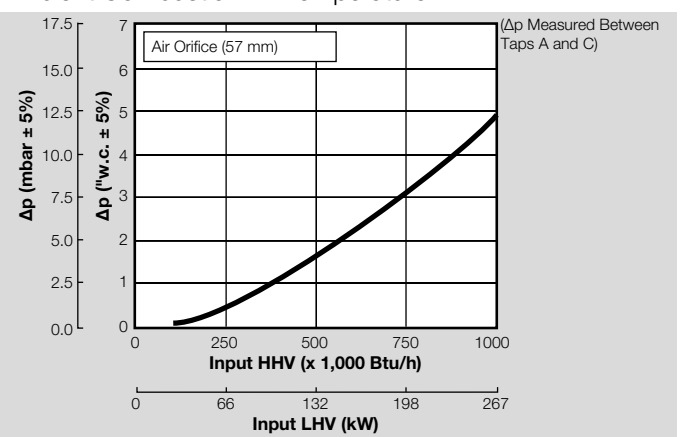


Fuel orifice Δp vs. Input



Air orifice Δp vs. Input

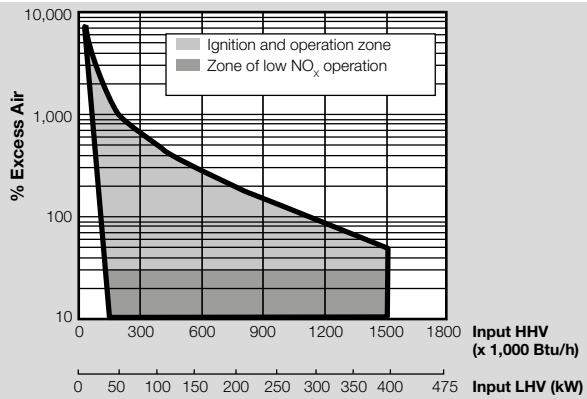
Ambient Combustion Air Temperature



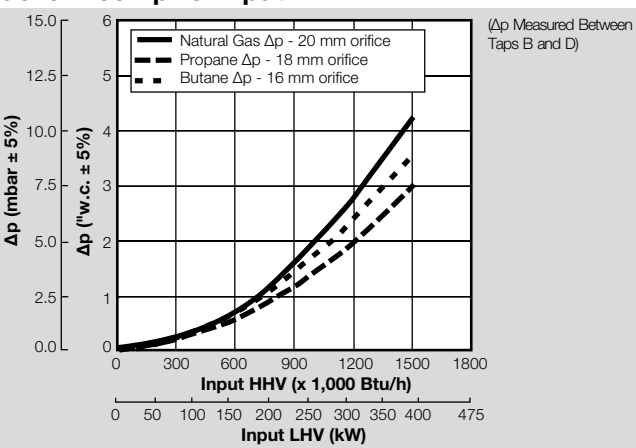
4.4.4 FN0150

Ignition and operation zone for ambient temperature

Input to be limited to 1.13 MMBtu/h (298 kW) with a minimum of 30% EXA while the chamber is below 1400°F (760°C).

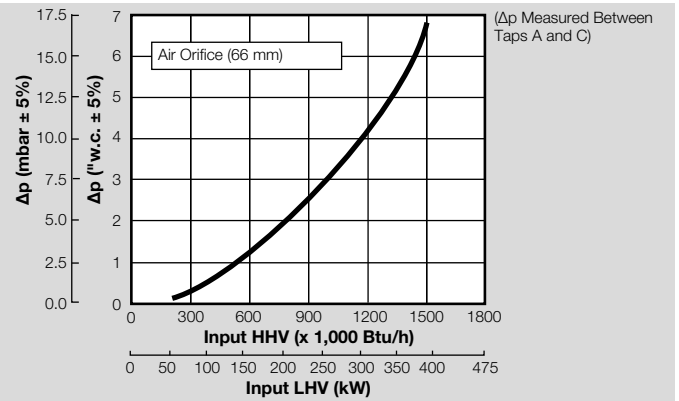


Fuel orifice Δp vs. Input



Air orifice Δp vs. Input

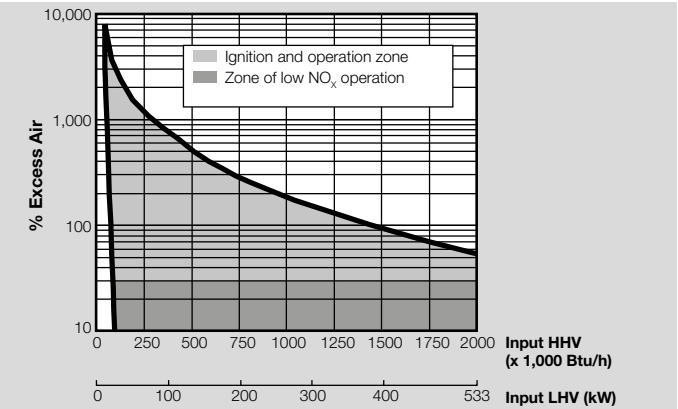
Ambient Combustion Air Temperature



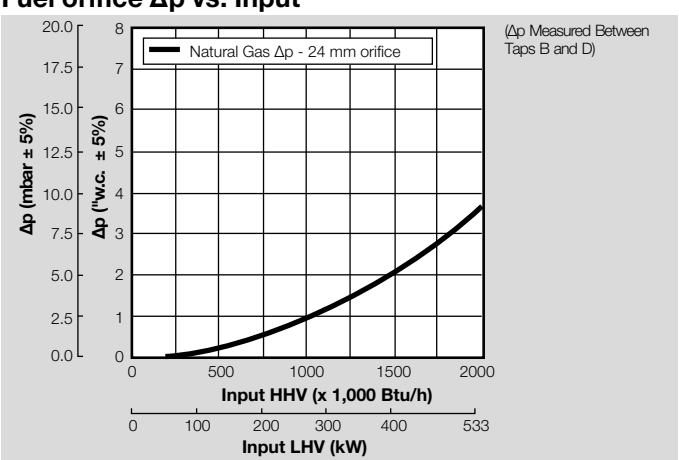
4.4.5 FN0200

Ignition and operation zone for ambient temperature

Input to be limited to 750 kBtu/h (198 kW) with a minimum of 30% EXA while the chamber is below 1400°F (760°C).

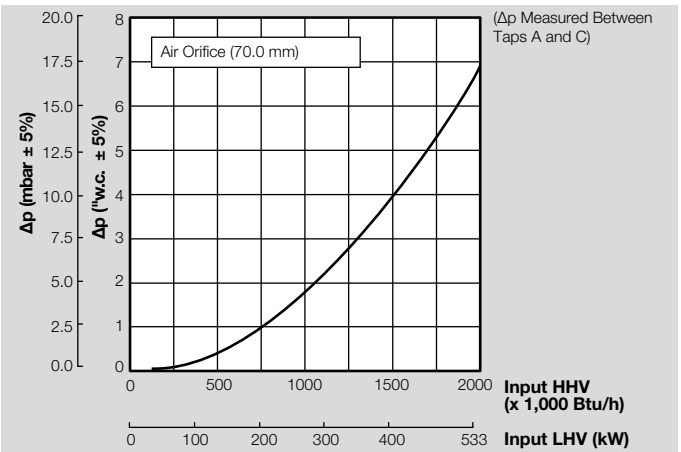


Fuel orifice Δp vs. Input

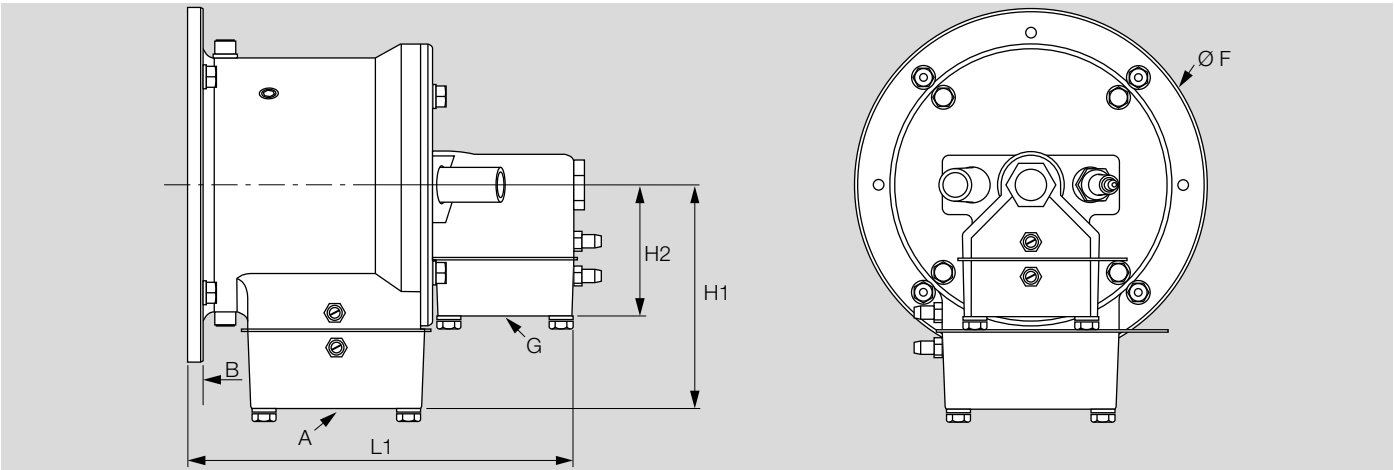


Air orifice Δp vs. Input

Ambient Combustion Air Temperature



4.5 Dimensions



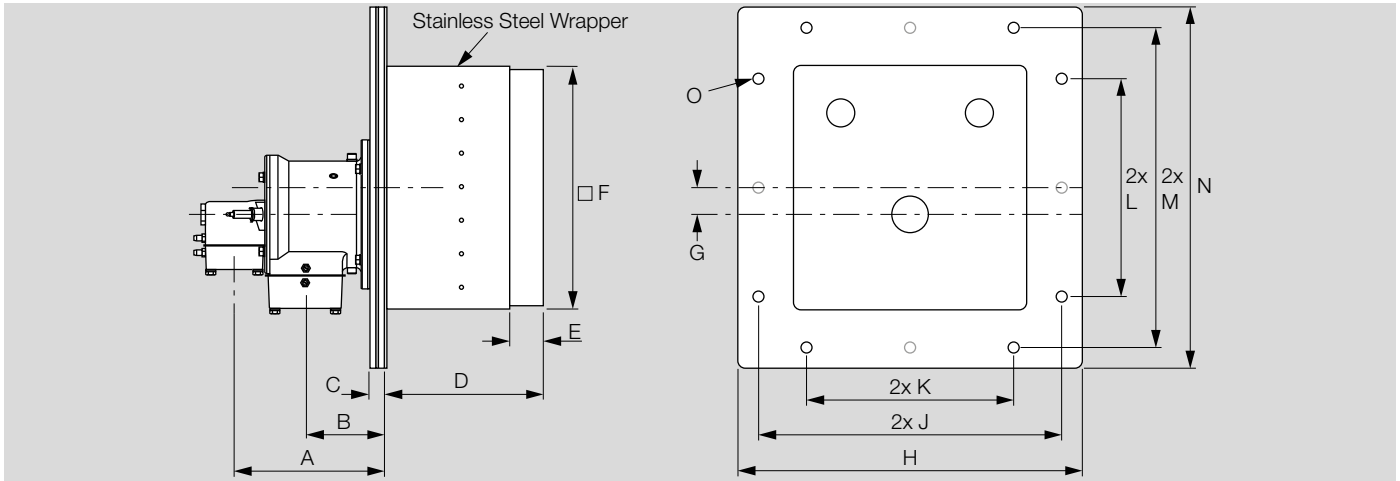
inch

Type	Gas inlet G	Air inlet A	L1	H1	H2	F	Weight
	NPT or BSP	NPT or BSP	inch				lbs
FN0025	1"	2.5"	8.5	5.0	3.1	7.5	37
FN0050	1"	2.5"	8.5	5.0	3.1	7.5	37
FN0100	1 1/2"	3"	9.4	5.5	3.2	8.7	42
FN0150	1 1/2"	3"	9.4	5.5	3.2	8.7	42
FN0200	1 1/2"	3"	9.4	5.5	3.2	8.7	42

mm

Type	Gas inlet G	Air inlet A	L1	H1	H2	F	Weight
	NPT or BSP	NPT or BSP	mm				kg
FN0025	1"	2.5"	215	127.5	78.5	190	16.7
FN0050	1"	2.5"	215	127.5	78.5	190	16.7
FN0100	1 1/2"	3"	240.5	139	81.5	220	19
FN0150	1 1/2"	3"	240.5	139	81.5	220	19
FN0200	1 1/2"	3"	240.5	139	81.5	220	19

4.5.1 Block and holder



inch

Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	Weight
	inch														lbs
FN0025	5.9	3.09	0.9	8.1	2.0	10.5	0.7	16.4	14.1	8.5	8.5	14.1	16.4	8x Ø0.63	135
FN0050	8.2	4.5	1.0	9.7	2.0	12.2	1.0	18.1	15.8	10.3	10.3	15.8	18.1	8x Ø0.63	188
FN0100	8.7	4.6	0.8	9.3	2.0	14.2	1.6	20.1	17.7	12.2	12.2	17.7	20.1	8x Ø0.63	230
FN0150	8.7	4.6	0.8	9.3	2.0	16.3	2.5	21.6	19.3	13.7	14.4	19.9	22.2	12x Ø0.63	290
FN0200	8.7	4.6	0.8	11	2.0	19.3	4.1	26.2	23.8	18.3	17.3	22.8	25.2	12x Ø0.63	565

mm

Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	Weight
	mm														kg
FN0025	151	78.5	22	205	50	267	19	417	357	217	217	357	417	8x Ø16	61.2
FN0050	209	114	25	247	50	311	25	461	401	261	261	401	461	8x Ø16	85.2
FN0100	221	116	20.5	265	50	360	40	510	450	310	310	450	510	8x Ø16	104
FN0150	221	116	20.5	235	50	415	64	550	490	350	365	505	565	12x Ø16	131
FN0200	221	116	20.5	280	50	490	105	665	605	465	440	580	650	12x Ø16	256

5 Converting units

See www.adlatus.org

For more information

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschröder and Maxon. To learn more about our products, visit ThermalSolutions.honeywell.com or contact your Honeywell Sales Engineer.

Honeywell Eclipse branded products
201 E 18th Street
Muncie, IN 47302
USA
ThermalSolutions.honeywell.com

Honeywell
ECLIPSE

Furnnox · Edition 03.25 · EN