

Indirect Gas-Fired Make-Up Air Model IGX

Commercial, Industrial, and Kitchen Applications



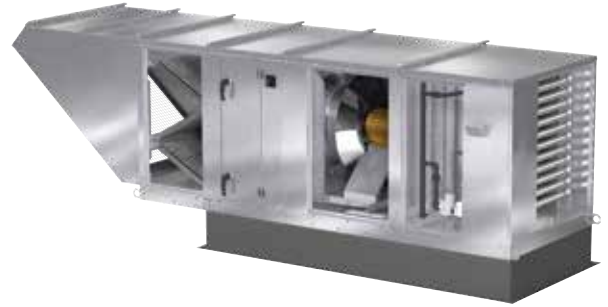
BUILDING VALUE IN AIR.



May
2024

Greenheck's indirect gas-fired make-up air units provide tempered outdoor air to a wide range of applications from kitchens to commercial warehouses and industrial facilities. Greenheck offers various levels of construction and control accessories for maximum flexibility to meet the performance needs of countless applications.

Multiple supply fans and cabinet sizes provide airflow capacities up to 15,000 cfm and external static pressure capabilities up to 2.5 in. wg. All supply fans are tested to ensure accurate fan performance. All units are factory-wired and tested prior to shipment. Each unit is checked for proper operation of the gas train, electrical components and airflow.



Indirect Gas Technology

Greenheck's indirect gas technology uses power vented 81% efficient 4-pass tubular-style heat exchangers with capacities up to 1,200,000 BTU/hr to provide efficient heating for any climate. Single, double and triple furnace options are available with up to 8:1 staged turndown or 16:1 modulating turndown per furnace. Greenheck's furnace design ensures a long furnace life in the most compact and flexible unit configuration available.

With indirect gas-fired units, the flame is never introduced into the supply airstream, making these units ideal for applications where combustion byproducts are a concern, such as sleeping quarters.



Features	Benefits
Power venting with post purge cycle	Prevents corrosive combustion gases from condensing within the heat exchanger
Horizontally firing burners and four-pass heat exchanger tubes	Makes stainless steel burners unnecessary and drip pans obsolete
Built-in commissioning menu	Assists in start-up, reducing labor costs

Heat Exchanger Material Selection

Selecting the proper heat exchanger material can greatly increase the life of the furnace. Heat stress cracking can reduce furnace life if the wrong heat exchanger material is selected. To select the best heat exchanger material, the application and climate should be considered.

- **Aluminized steel** is recommended for mild climates, where the temperature rise is less than 60°F.
- **Stainless steel** is recommended for colder climates, where the temperature rise equals or exceeds 60°F.

Winter Design Temp.	Required Temp. Rise	Recommended Heat Exchanger Material
-10°F	80°F	Stainless
0°F	70°F	Stainless
10°F	60°F	Stainless
20°F	50°F	Aluminized
20°F	40°F	Aluminized

*Assumes a discharge temperature of 70°F.

Product Certifications

Greenheck takes pride in offering a high quality, reliable product. We invest our resources into designing, testing and manufacturing products to ensure customer satisfaction.



IGX models shall be ETL and cETL Listed to ANSI Z83.8 and CSA 2.6. Indirect gas-fired units are Listed to UL 1995. Both are harmonized standard between USA and Canada.

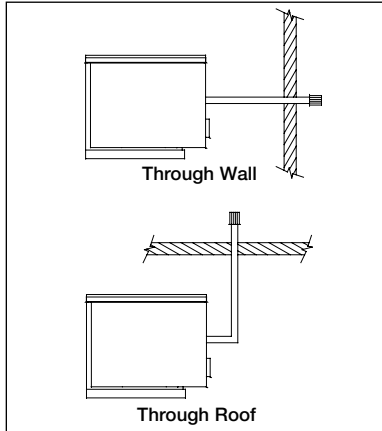


AHRI Certified coils. To guarantee your coil is going to perform as required, check for AHRI Certification.

Venting Options

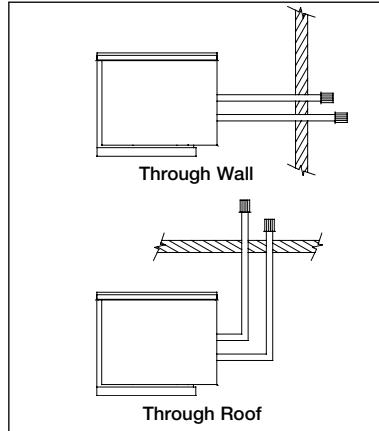
When your application calls for indoor installation, Greenheck offers multiple venting options to accommodate numerous applications.

Basic Indoor Venting



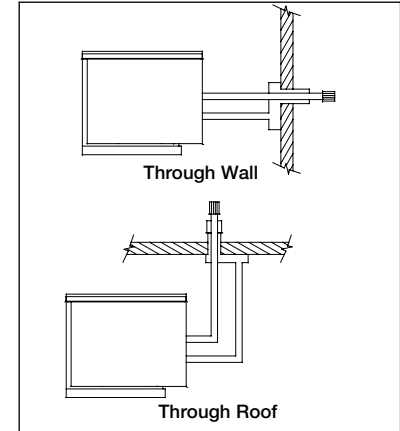
Indoor air is used for combustion. Combustion byproducts vent outdoors through a vent line.
* Not typical

Separate 2-Pipe Venting



Outdoor air is used for combustion. Combustion byproducts vent outdoors through a vent line. This requires two wall or roof penetrations.

Concentric Venting



Outdoor air is used for combustion. Combustion byproducts vent outdoors through a vent line. Only one wall or roof penetration is needed.

Furnace Controls

Electronic Modulation - The benefit of electronic modulation is that it enables precise Leaving Air Temperature (LAT) control. As outdoor air temperatures vary, the furnace can modulate the gas flow and deliver a constant LAT.

Multistaged - When maximum turndown ratio is desired, multistage control is the answer. A single furnace unit (<400 mbh) can have an 8:1 turndown ratio.

Control	Operation Points*	Control	Operation Points*
4:1 Modulating	Anywhere from 25 to 100%	24:1 Modulating	Anywhere from 4.17 to 100%
8:1 Modulating ⁺	Anywhere from 12.5 to 100%	32:1 Modulating [^]	Anywhere from 3.13 to 100%
12:1 Modulating ⁺	Anywhere from 8.33 to 100%	48:1 Modulating ^{+^}	Anywhere from 2.01 to 100%
16:1 Modulating [^]	Anywhere from 6.25 to 100%	8-Stage	12½, 25, 37½, 50, 62½, 75, 87½, 100%

*Percentage of maximum furnace output.

+Multiple furnace units only.

[^]Patent pending option.

Commercial and Industrial Applications



Greenheck's Solution: Greenheck's line of commercial and industrial make-up air units are designed to provide supply air for general, process and combustion exhaust.

Flexible Designs: Units are available with an optional mixing box designed to combine outdoor air and return air to commercial and industrial spaces. This provides heating in the winter months with the benefits of economizer operation in mild conditions. Variable frequency drives are also available for building pressure control, direct control, or CO₂ control from a building management system (BMS).

Unit Controls

Microprocessor

The optional microprocessor controller controls all aspects of unit operation and is factory-programmed, wired and tested to match the configuration for each job. The controller is the ideal option for integrating into a building management system and offers the ability to control as many or as few communication points as needed. Network communication is available over the following protocols: BACnet® or Modbus®.



Room Thermostat

The room thermostat gives users the ability to view the room temperature and control the active room set point from the adjustable display. The room thermostat also has the ability to send the unit into temporary occupied mode. The room thermostat is shipped loose for field installation and is connected to the microprocessor with Modbus® wiring. Optional averaging sensors are available for up to four temperature readings.



Remote Panel

The optional remote panel is designed for surface mounting to control and monitor basic unit operation through switches and indicating lights. Switches control fan, heating, and cooling enable. Indicating lights provide status of the fan, heating and cooling. The panel is available in a Permatector™ coated NEMA-1 enclosure or stainless steel NEMA 4X enclosure.



Temperature Controls

Discharge Temperature Control

A factory-installed control allows the unit to discharge at a field-adjustable temperature by staging and/or modulating the heat output of the furnace(s). A room override thermostat is also available.



Room Override Thermostat

Works with the discharge temperature control option to temporarily increase the discharge temperature if the room drops below space set point. The room sensor may be wall/beam mounted or included on a remote control panel.



Room Temperature Control

Allows the user to select a space temperature set point. The unit will then adjust the discharge temperature to achieve the desired space temperature set point.

External Control

A field supplied 2-10 VDC or 4-20 mA signal can be used to remotely adjust the discharge temperature set point. The Greenheck furnace controller will stage and/or modulate the heat output of the furnace(s) to satisfy the discharge temperature set point.

Cooling Coils

Both chilled water and direct expansion coils for split systems are available. The cooling section includes the cooling coil, drain pan, and insulated double-wall construction. Chilled water and direct expansion cooling coils are available with the following features:

- Airflow capacity up to 11,700 cfm
- Various coil depths and circuiting options to meet a wide variety of cooling applications
- Insulated double-sloped stainless steel drain pan for positive draining
- Coils constructed with copper tubes mechanically bonded to aluminum fins
- Coil performance is rated in accordance with AHRI 410
- Condensate drain, overflow, and coil connections are stubbed through the wall of the unit
- Optional ElectroFin® coil coating



Evaporative Cooling

The evaporative cooling section mounts directly to the front of the unit eliminating transition or ductwork. The evaporative cooling section includes the following features:

- Airflow capacity up to 14,100 cfm
- 12-inch media depth producing a 90% cooling effectiveness
- CELdek® or GLASdek® evaporative cooling media options
- Stainless steel sump and cooling frame around the media
- Painted or galvanized steel housing construction
- Integral louvered intake and 2-inch aluminum mesh filters
- Drain and overflow connections stubbed through the wall of the unit for convenience



The following control options are available:

- **Recirculating Pump:** Includes a pump that recirculates water over the evaporative media and is activated by a call for cooling. A field-adjustable bleed-off valve keeps mineral concentrations low.
- **Auto Drain and Flush:** Includes a recirculating pump and a field-adjustable timer that will periodically flush the sump to minimize mineral build-up.

S Standard Feature **O** Optional Feature

1 Construction

- Constructed of heavy-gauge G90 galvanized steel
- Double-wall construction with 1-inch fiberglass insulation
- Removable access panels with optional hinged doors
- Available finishes include:
 - Permator™ (2,500 hr/salt spray rating under ASTM B117 testing conditions)
 - Hi-Pro Polyester (5,000 hr/salt spray rating under ASTM B117 testing conditions) available in various standard colors or custom color match

2 Weatherhood

- Weatherhood with birdscreen features a wire mesh intake, preventing large debris from damaging the filters. An additional filter section is required
- Aluminum mesh filtered weatherhood eliminates the need for an additional filter section
- Louvered weatherhood includes a drainable blade louver at intake with 2-inch aluminum mesh filters

3 Dampers

- Low-leakage, factory-mounted and wired, inlet damper
- Low-leakage non-insulated factory mounted and wired outlet damper

4 Filters

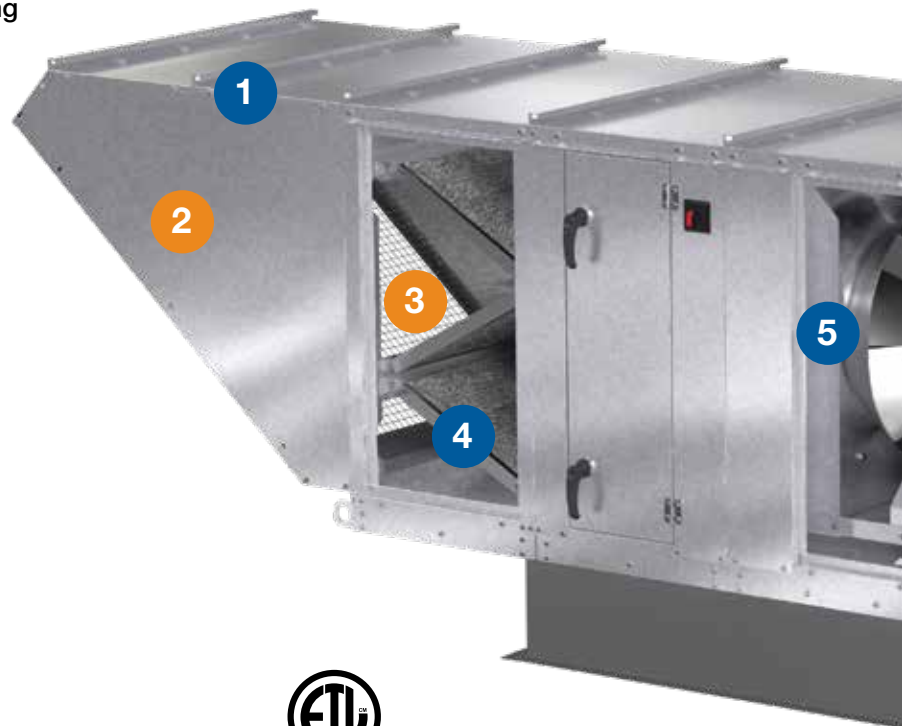
- V-bank filter section or mixing box
- 2-inch washable aluminum mesh
- 2-inch MERV 8 pleated disposable
- 2-inch MERV 13 pleated disposable
- 4-inch MERV 14 pleated disposable
- 2-inch MERV 8 and 2-inch MERV 13 pleated disposable
- 2-inch MERV 8 and 4-inch MERV 14 pleated disposable

5 Supply Fan Options

- Direct drive, mixed flow plenum fan with factory-provided VFD

6 Control Center

- 24 volt control voltage
- Control transformer
- Disconnect switch
- Distribution terminal strip
- Factory prewired for single point power connection



7 Cooling Options (not shown)

All cooling options include a stainless steel drain pan

- Evaporative cooler
- Chilled water coils
- Split DX coil (coils only)
- Packaged direct expansion (PDX)
Includes low sound condenser fans.
- Optional ElectroFin® coil coating
- Coils tested in accordance with AHRI 410

8 Indirect Gas-Fired System

- Power vented with integral pre-purge and post-purge control
- ETL Listed to ANSI standard Z83.8 and CSA 2.6
- 81% thermal efficiency
- Up to 8-stage or 16:1 modulating control per furnace - patent pending
- Direct spark ignition system
- Easy access burner controls
- Insulated double-wall construction



9 Vibration Isolators

- The entire fan and motor assembly is mounted on vibration isolators to minimize noise transmission into the building. Neoprene or spring isolators are available on forward-curved supply fan models. Mixed flow supply fan models only offer neoprene isolators.

Optional Electrical Controls

Airflow Proving Contact – Provides a factory mounted airflow proving switch with a dry contact that can be monitored to verify airflow through the unit.

Auxiliary Contacts – Normally open and normally closed contacts are available for supply fan status and supply fan interlocks.

Coil Freeze Protection – Adjustable temperature sensing capillary tube which will disable the fan motor at 35°F. This freeze protection is NOT a substitute for draining of water-filled coils.

Cooling Relay – When interlocked with a rooftop unit (RTU), this relay can be used to lockout a call for heat from the make-up air unit when there is a simultaneous call for cooling from the RTU.

CO₂ Sensor – Shipped loose for field-mounting and wiring in the supply or return air duct to measure CO₂ concentration in the ventilated space or return air duct.

Dirty Filter Sensor – Monitors the pressure drop across the filter section. If the pressure drop is higher than the field-adjustable setting, the switch will trip and indicate that the filters need to be cleaned or replaced. An indicator light may be wall/beam mounted or provided with a remote panel.

Exhaust Fan Starter(s) – Factory-mounted and wired for an electrical interlock between the supply and exhaust fan(s).

Factory-Provided Variable Frequency Drive (VFD) – A factory-mounted, wired and programmed variable frequency drive can be used for soft start and final balancing, or for varying fan speed on units configured for variable volume operation.

Freeze Protection – Automatically shuts down the supply fan when the discharge temperature is below the set point for an extended amount of time. This prevents the unit from discharging non-tempered air into the building and freezing pipes and other temperature sensitive items.

Heating Inlet Air Sensor – Automatically turns the heat on and off based on a field-adjustable set point.

Inlet Damper End Switch – Will not allow starter to engage until end switch is proved, ensuring that the inlet damper is fully open before unit operation.

Service Receptacle – A 115 volt GFCI outlet can be shipped loose or mounted externally in a NEMA-3R box for the convenience of service personnel. A separate 115 volt power source is required.

Smoke Detector – Shipped loose for field mounting and wiring in the supply or return air duct. Contains two normally open and two normally closed contacts for alarm notification.

Packaged Direct Expansion (DX) Cooling

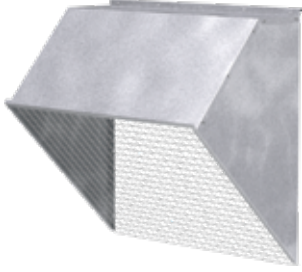
Cooling 100% outside air can be challenging and expensive due to varying outside air conditions. Greenheck make-up air approaches this challenge sensibly with a cost-effective packaged DX system designed to cool outside air to 65-75°F. By only cooling to these temperatures, cooling capacity can be reduced by 50-65% in comparison to fully dehumidifying dedicated outdoor air equipment significantly. This not only reduces first cost, but also operation costs and therefore providing improved occupant comfort in an application such as kitchens, auto shops, and small manufacturing areas at an affordable price.

- 800 – 7500 cfm
- 2.5 – 16 tons
- Optional standard scroll or digital scroll compressor
- Lead EC condenser fan with digital scroll compressor



Features	Benefits
Side mounted condensing section	Minimizes equipment height to avoid site line to equipment on the roof
Draw through coil design	Maximizes utilization of the coil for improved efficiency, and a wider operating temperature range
Low sound condensing fans	Significantly reduces sound levels by up to 8 decibels
Isolated service access	Easy access to all refrigeration components that can be accessed without affecting airflow
Engineered cooling system	Designed and tested by Greenheck engineers specifically for make-up air applications, ensuring optimal performance and a wider operating temperature range

Weatherhoods



Birdscreen



Aluminum Mesh Filtered



Louvered

Filter Section



V-Bank



Mixing Box

Supply Fans



Hybrid Centrifugal

Discharge Options



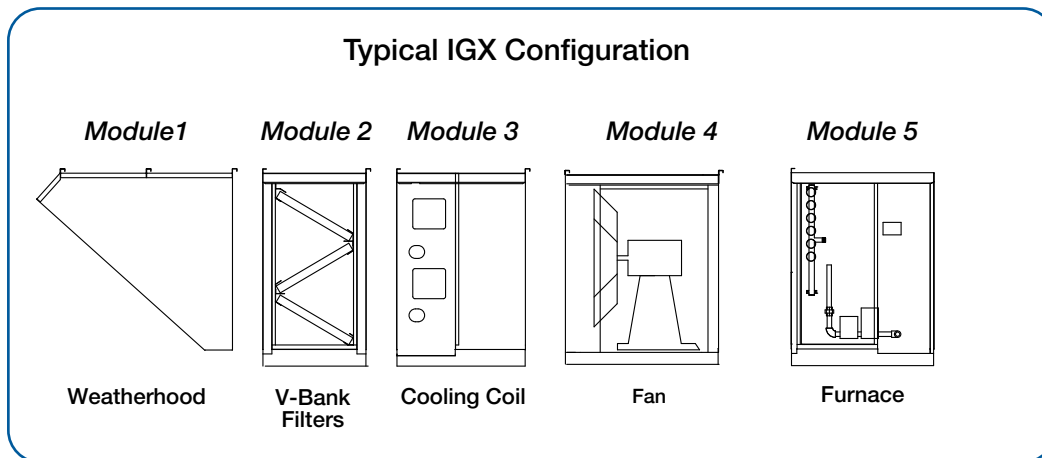
Downblast Discharge



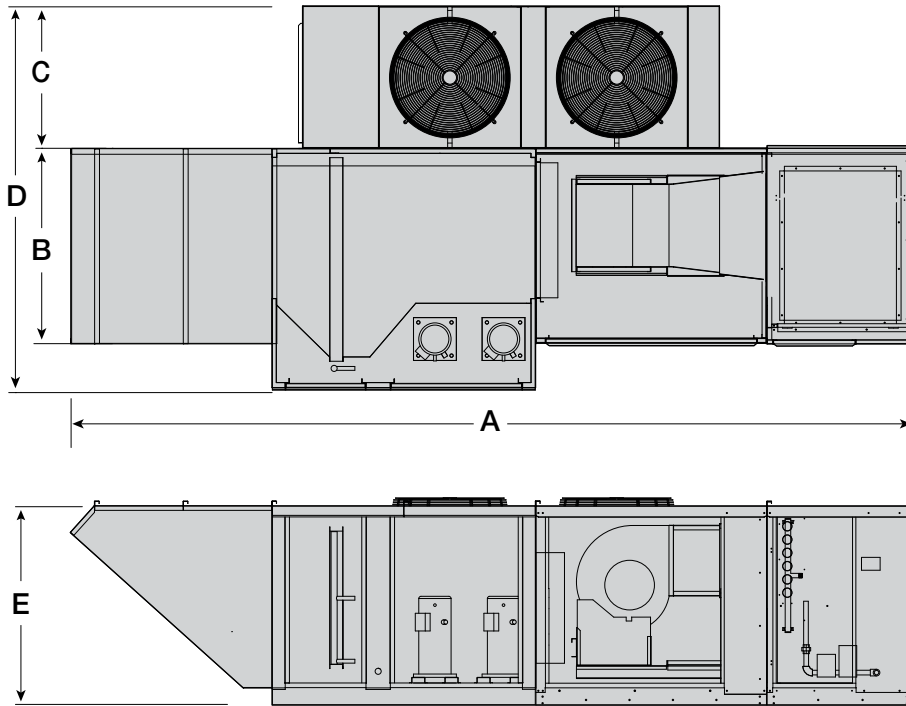
Horizontal Discharge

Model		IGX-H12	IGX-H22	IGX-H32
	Approximate Weight* (lbs.)	900	1,300	2,300
	Height (in.)	39	45	48.7
	Width (in.)	44.6	<350 mbh = 44.6 ≥350 mbh = 53.9	52.2
	Overall Width with Evaporative Cooling (in.)	44.6	≤4,800 cfm = 44.6 >4,800 cfm = 60.6	≤9,000 cfm = 66.5 >9,000 cfm = 96.5
Lengths (in.)				
Module 1	Birdscreen Weatherhood	30	45.6	47.3
	Aluminum Mesh Filtered Weatherhood	31.4	47.1	48.7
	Louvered Weatherhood	13.8	16.9	16.9
	Evaporative Cooling	40.2	≤4,800 cfm = 40.2 >4,800 cfm = 44.7	≤9,000 cfm = 44.7 >9,000 cfm = 48.1
Module 2	V-Bank Filter Section	21.5	24.1	25.8
	Mixing Box Filter Section	30.7	34	40.7
Module 3	Cooling Coil (standard)	30	30	-
	Cooling Coil (high capacity)	50.4	69.4	98.1
Module 4	Blower	27	36	44
Module 5	Furnace(s) (quantity of 1/2/3)	33.2	33.2/66.4	33.2/66.4/99.6

*Weight based on IGX with optional birdscreen weatherhood, V-bank filter section and downblast fan discharge.



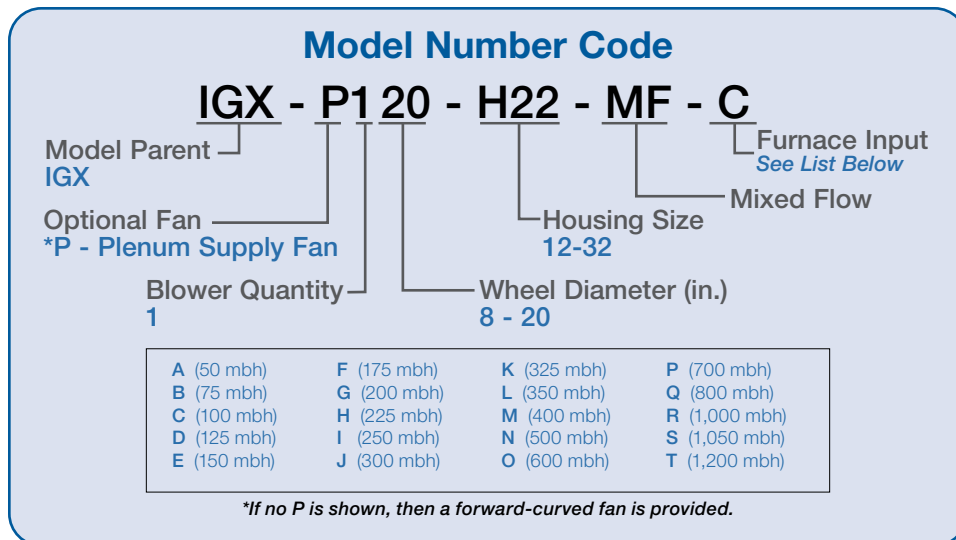
IGX with Packaged DX Cooling



Model	Nominal Tons	A	B	C	D	E	Approx. Weight (lbs.)
		(inches)					
IGX-H12	2.5, 4, 5, 8	151.8	33.2	30	73.7	39.0	1,700
IGX-H22 [^]	7, 10	192.2	44.1	32.1	86.3	45.0	2,300
IGX-H32 [^]	10, 12, 16	217.9	52.2	35.5	100.1	48.7	3,200

All weights include weatherhood and packaged DX cooling.

[^] Dimension is for one furnace only. Add 33.2 inches for each additional furnace.





**Direct Gas - Configurable
Model DGX**



**Direct Gas - Industrial
Model TSU**



**Direct Gas - Vertical
Model VSU**



**Modular Supply
Model MSX**



**Non-tempered
Model TSF**



Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.

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