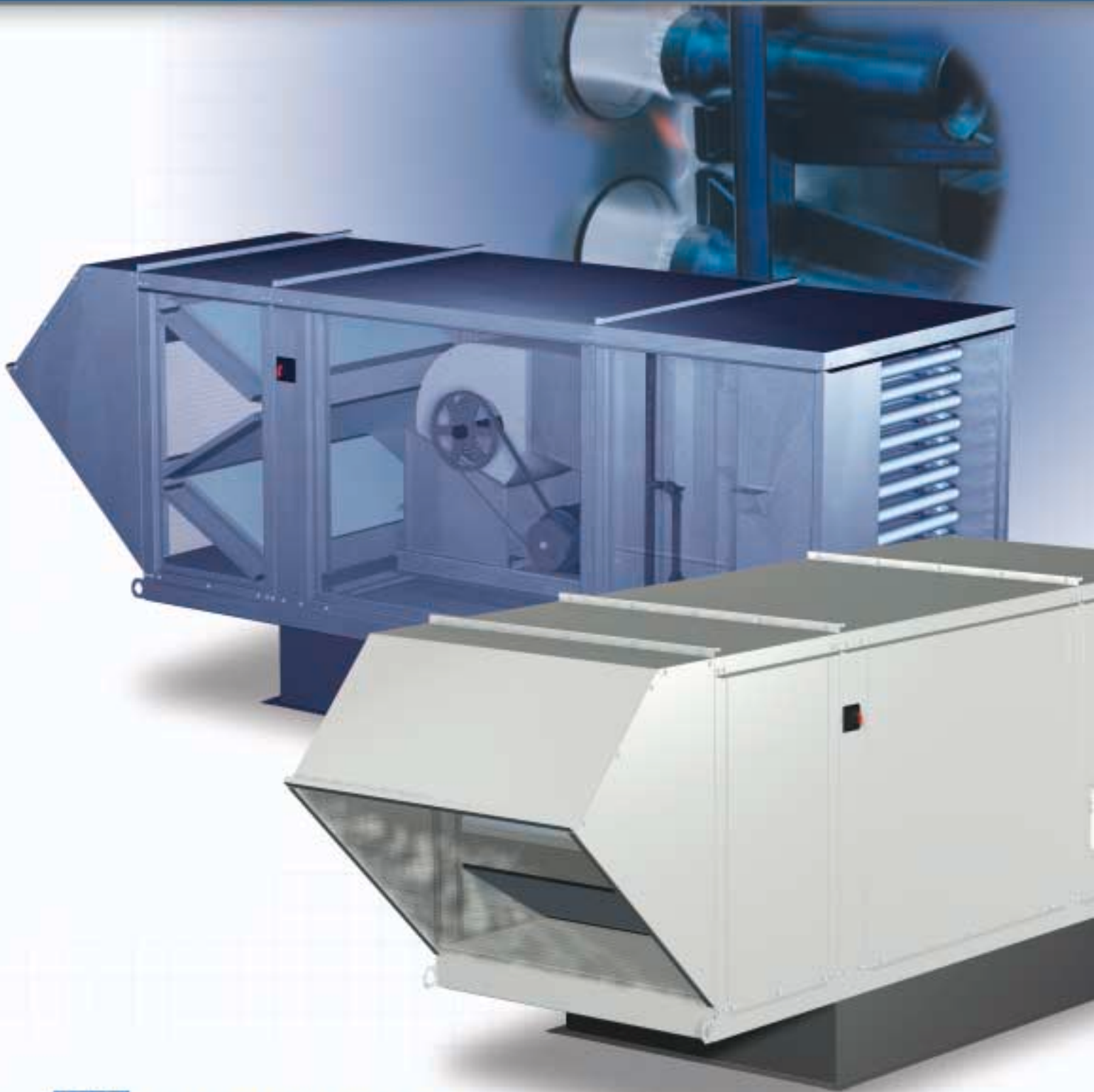


# Indirect Gas-Fired Make-Up Air Model IGX

Cooling Options • Evaporative • Direct Expansion • Chilled Water



## Model IGX

### Indirect Gas-Fired Make-Up Air Unit for Outdoor Installations

The Greenheck model IGX features 80% efficient indirect gas fired furnace(s) that are ETL listed. Heating capacities range from 100,000 to 1,200,000 BTU/Hr and air flow volumes are available up to 15,000 cfm.

A flexible design concept enables each product to be customized for its application. Units are factory assembled and wired to minimize field installation labor. The result is a semi-custom product at an attractive cost.

### Indirect Fired Gas Furnaces

- Power vented
- ETL listed to ANSI standard Z83.8 and CGA 2.6
- 80% thermal efficiency
- Up to 8-Stage or 4:1 modulating control per furnace
- Aluminized steel or stainless steel heat exchanger
- Direct spark ignition system
- Easy access burner controls
- Insulated double wall construction

### Durable Construction

Designed for maximum weather resistance, IGX housings are constructed of heavy gauge G90 galvanized steel. Lifting lugs are standard.

### Control Center

The control center includes the following standard components:

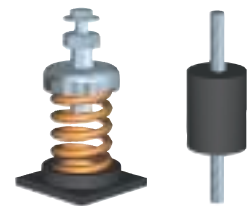
- Magnetic motor starter with solid state overload protection
- Control transformer with fusing
- Disconnect switch
- Separately fused motor
- Distribution terminal strip

Premium grade control components are selected for reliable operation. All electrical components are UL Listed, recognized or classified and factory prewired for single point power connection.



### Spring Vibration Isolation

The entire fan and motor assembly is mounted on vibration isolators to minimize noise transmission to the building. Spring vibration isolators are available in lieu of neoprene isolators for housing sizes H22 and H32 (fan sizes 112 and larger).



### Reliable Fan Performance

Air performance ratings from Greenheck's AMCA registered test chamber ensure accurate data.

Double width, double inlet forward curved wheels for high efficiency and low sound levels are constructed of heavy gauge steel. Wheels are statically and dynamically balanced to ensure vibration free operation.



### Access Panels

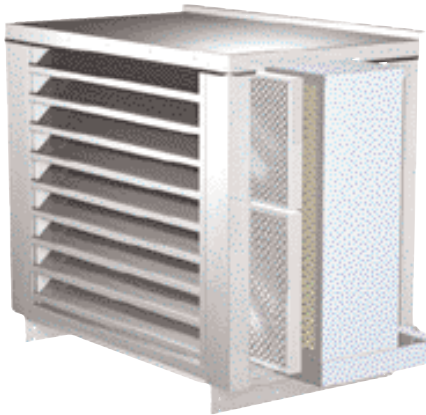
Large access panels are provided for easy inspection and maintenance of motors, drives, fan wheels, filters, and heater controls.

### Factory Wired and Tested

All units are tested prior to shipment. Units are checked for proper fan, furnace and controls operation.



## Evaporative Cooling

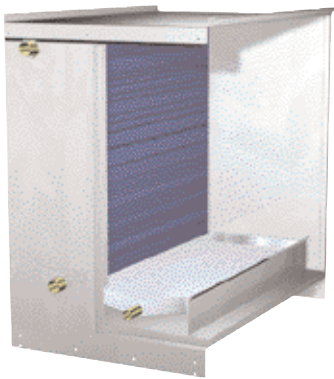


Adding evaporative cooling to the IGX may simply be done by adding an evaporative cooling section. The evaporative cooling section includes a galvanized steel housing with a louvered intake, 2 inch aluminum mesh filters and a stainless steel evaporative cooling module. The evaporative cooling media is Munters CELdek or GLASdek and has a depth of 12 inches for 90% cooling effectiveness.

The entire section mounts directly to the front of the IGX unit, eliminating transition or ductwork by others. Drain and overflow are conveniently tapped through the side of the cooling section. The supply line connection is field located where convenient. Freeze protection, automatic drain & fill and the Water Wizard™ are available.

Airflow capacity for evaporative cooling is up to 14,000 cfm. The evaporative cooling section for the housing size 32 ships separately.

## Cooling Coils



Chilled water or direct expansion (DX) cooling is available with the model IGX. The cooling section includes the cooling coil, sloped stainless steel drain pan and insulated double wall construction. Drain and coil connections are stubbed through the wall for convenience.

For proper coil sizing, use Greenheck CAPS selection software or contact your local representative. Four row and six row chilled water or DX coils are available with airflow capacity up to 11,000 cfm.

Cooling coil sections are installed upstream of the fan section for a draw through arrangement and provide a streamlined transition to adjacent IGX sections. DX coils require remote condensing units.

## Mixing Box

The mixing box option expands the make-up air application capabilities of the IGX. This section includes low leakage control dampers for outdoor and return air and an actuator in a face and bypass configuration. Either 2 inch pleated 30% efficient filters or 2 inch aluminum mesh filters available within the mixing box section. Double wall construction is available.

Greenheck offers three standard airflow control options with the IGX.

**Night Setback:** During daytime operation, the IGX operates as a 100% outdoor air unit with discharge temperature control. During night setback, the dampers shut off outdoor air and recirculate 100% return air to maintain the desired space temperature. A room thermostat is required with this option.

**Building Pressure Control:** Outdoor air and return air dampers modulate to maintain desired building pressure. Furnace control is based on discharge temperature. A remote control panel with photohelic gage is required with this option.

**Potentiometer Control:** Enables manual control of the outdoor air and return air damper positions. Furnace control is based on discharge temperature. A remote control panel is required with this option.

Weatherhoods for IGX units with a mixing box include a louvered intake with 2 inch aluminum mesh filters to prevent moisture from entering the mixing box section.



## Intake Options

### Birdscreen

The birdscreen weatherhood includes a large mesh screen that prevents large debris from entering the unit. An additional filter section for smaller debris is required.

### Filtered

The filter weatherhood includes aluminum mesh filters installed in the weatherhood, eliminating the need for a additional filter section. Redundant filtering is possible with the addition of a filter section to the filtered weatherhood. A filtered weatherhood should be your first choice when a cost competitive solution is needed for your make-up air application.

### Combo

The combo weatherhood is designed to keep debris and moisture out of the unit and your building in the most compact design possible. The combo weatherhood includes aluminum mesh filters and a moisture reducing louver to reduce water entering the unit.

## Furnace Control

Choose from staged or modulating furnace control.

### Staged Control

- 2, 8, 16 and 24-Stage Control

Control	Operation Points*
2-Stage	50, 100%
8-Stage	12½, 25, 37½, 50, 62½, 75, 87½, 100%
16-Stage*	6¼, 12½, 18¾, 25, ..., 81¼, 87½, 93¾, 100%
24-Stage*	4⅞, 8⅓, 12½, 16⅞, ..., 87½, 91⅞, 95⅞, 100%

### Modulating Control

- 2:1, 4:1, 8:1 and 12:1 Modulation Control

Control	Operation Points*
2:1 Mod.	Anywhere from 50 to 100%
4:1 Mod.	Anywhere from 25 to 100%
8:1 Mod.*	Anywhere from 12½ to 100%
12:1 Mod.*	Anywhere from 8⅞ to 100%

\* Percentage of maximum furnace output. † Multiple furnace units only.

## Temperature Control

### Discharge Temperature Control

As a make-up air unit, the IGX controls heat output based on discharge temperature. A factory mounted discharge temperature sensor feeds information back to the unit control center. The furnace(s) either stage or modulate the heat output to satisfy the discharge temperature set point. The set point is easily field adjustable with a dial located in the furnace control center.

For make-up air applications, single stage furnace control is not recommended.

### DDC Interface

The discharge temperature can be controlled by a DDC signal. The DDC options provides an factory installed interface, allowing easy integration into your building management system. The discharge temperature can be controlled using a 2-10 VDC or 4-20 mA signal.

### Discharge Temperature Control with Room Override

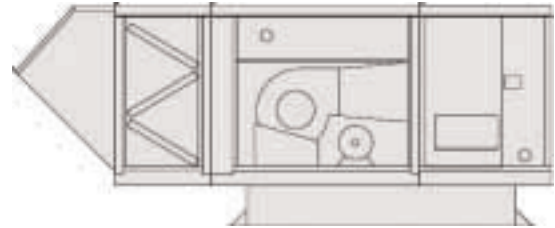
The room override option enables a make-up air unit to boost its heat output when the space temperature is cooler than desired. When the space temperature is satisfied, the IGX will control heat output based on the normal discharge temperature set point. When the space is too cool, the discharge temperature will be elevated (typically by 20° F) until the override thermostat is satisfied. Room sensor may be wall/beam mounted or included on a remote control panel.



**Arrangements**

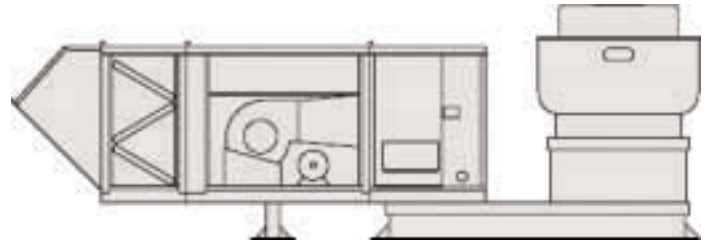
**Downblast or Horizontal Discharge**

Model IGX is available in either downblast (Arrangement DB) or horizontal (Arrangement HZ) discharge. Greenheck's furnace design features an integrated downturned plenum, eliminating the need for an additional section to achieve a downblast discharge.



**Kitchen Combination Package**

The Greenheck combination package simplifies installation and reduces field labor costs for kitchen ventilation systems. The pre-engineered design ensures that the supply fan, exhaust fan, curb and combination extension components interface properly.



Equally important, Greenheck combination packages are specifically designed to comply with NFPA 96.

NFPA 96 states:

- Exhaust duct must terminate at least 24 inches above the roof deck
- Fan discharge must be at least 40 inches above the roof deck
- Air intake shall have a horizontal separation of 10 feet from the exhaust discharge

See Greenheck's Model CUBE catalog for complete details on the exhaust fan.

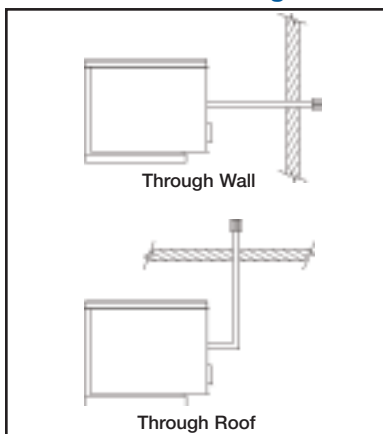
**Note:** Consult local codes and the authority having jurisdiction if there are questions concerning the use of this product.

**Indoor Venting**

**Venting Options**

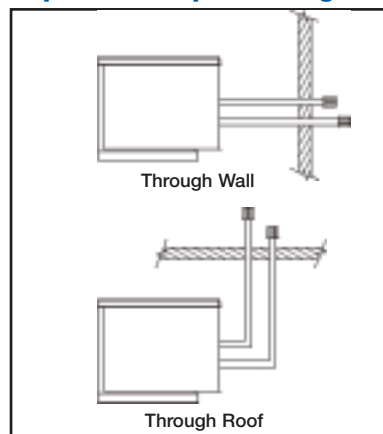
When your application calls for indoor installation, Greenheck offers multiple venting options:

**Basic Indoor Venting**



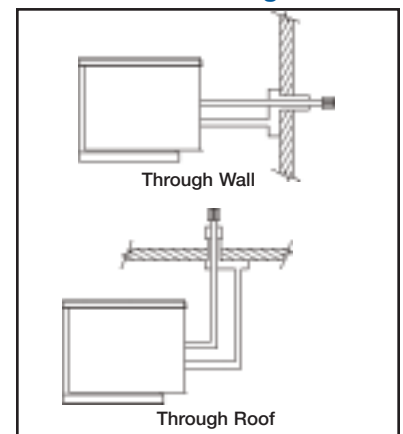
Indoor air is used for combustion, combustion byproducts vent outdoors through a vent line.

**Separate 2-Pipe Venting**



Outdoor air is used for combustion, combustion byproducts vent outdoors through a vent line. Requires one opening for each line.

**Concentric Venting**



Outdoor air is used for combustion, combustion byproducts vent outdoors through a vent line. Only one opening is needed.

## Remote Control Panels

Industrial type remote control panels feature a variety of switches and indicator lights mounted on a Perma-tector coated galvaneal steel box. If room override is specified, the override thermostat is factory mounted on the remote panel as shown at right.



Kitchen style remote panels feature lighted toggle switches and a stainless steel face plate for flush mounting to a wall. The junction box is also included.



## Additional Accessories

### Air Filter Gauge

Indicates when filters become dirty. An indicator light may be wall/beam mounted or provided with a remote control panel.

### Motorized Dampers

Intake or discharge dampers are available to prevent backdrafts when the fan is not in operation. Intake dampers are factory mounted and wired.

### Exhaust Fan Starter(s)

Up to 2 exhaust fan starters may be added to the control center.

### Inlet Air Sensor

An on/off type duct stat automatically de-energizes the gas system and interrupts the flow of gas to the burners when the inlet air temperature is above the desired setting.

### 115 Volt Service Receptacle

A 115 volt GFCI outlet is mounted externally in a NEMA 3R box for the convenience of field service personnel. A separate 115 volt power source is required.

### Roof Curbs

Factory provided roof curbs are available to ensure compatibility between make-up air unit and roof curb. Standard construction is G90 galvanized steel.

### Equipment Supports

Factory provided equipment supports may be required in addition to a roof curb, depending on the specified unit configuration. Standard construction is G90 galvanized steel.

### Freezestat

An on/off type discharge duct stat (with a timer) prevents the discharge of cold air into the building when the furnace(s) is not providing adequate tempering.

### Special Coatings

Greenheck's Perma-tector powder paint is available if a painted look is desired. Decorative baked enamel paints are also available in a variety of colors to match existing building fixtures. Consult your Greenheck representative for paint selections.

### Fiberglass Insulation

Fiberglass insulation is used to line the housing to prevent the formation of condensation and to form an acoustical barrier. Insulation is included for units specified with mixing box option.

### 2-Speed Motor

A 1/3 reduction 2-speed motor is available, provided that the temperature rise at maximum output is within acceptable limits for both speeds.

### Propane Gas

A propane heater may be provided in lieu of natural gas.

### Duct Adapter

Duct adapter is available with factory supplied curbs and allows an easy method for connecting ductwork to curb.

### Double Wall Construction

An interior metal liner is available to isolate insulation from the airstream. One inch thick insulation is included with this option.

### Gas Pressure Regulator

Required if building gas line pressure exceeds IGX maximum inlet gas pressure of 14 inches of WG.

### Smoke Detector

Photoelectric smoke detector is available for duct mounting.

### Discharge Diffuser

Available as either 3-way diffuser for horizontal discharge or 4-way diffuser for downblast discharge.

## Housing 12

Blower Size	CFM		TOTAL STATIC PRESSURE in inches of WG						Max MBH (Input)
			0.50	0.75	1.00	1.25	1.50	1.75	
108	800	RPM	993	1109	1216	1311	1399	-	100
		BHP	0.21	0.26	0.31	0.35	0.40	-	
	1,200	RPM	1238	1347	1445	1530	-	-	150
		BHP	0.51	0.59	0.68	0.75	-	-	
109	1,500	RPM	880	1014	1140	1255	1361	1460	200
		BHP	0.36	0.45	0.54	0.63	0.73	0.84	
	2,500	RPM	1154	1244	1329	1419	1503	1587	250
		BHP	1.1	1.2	1.4	1.6	1.7	1.9	
110	2,500	RPM	906	995	1082	1166	1247	1325	250
		BHP	0.79	0.93	1.1	1.2	1.4	1.5	
	3,500	RPM	1131	1202	1275	1340	1401	1464	250
		BHP	1.8	2.0	2.2	2.4	2.6	2.8	

## Housing 22

Blower Size	CFM		TOTAL STATIC PRESSURE in inches of WG						Max MBH (Input)
			0.50	0.75	1.00	1.25	1.50	1.75	
112	2,600	RPM	662	761	853	934	1009	-	350
		BHP	0.58	0.72	0.86	1.0	1.2	-	
	4,400	RPM	871	939	1006	1073	1137	1197	600
		BHP	1.8	2.1	2.4	2.6	2.9	3.1	
115	5,000	RPM	671	741	808	871	931	986	600
		BHP	1.7	2.0	2.3	2.6	2.9	3.2	
	7,000	RPM	833	889	943	994	1044	1093	600
		BHP	3.7	4.2	4.6	5.0	5.5	5.9	

## Housing 32

Blower Size	CFM		TOTAL STATIC PRESSURE in inches of WG						Max MBH (Input)
			0.50	0.75	1.00	1.25	1.50	1.75	
118	7,000	RPM	566	627	685	738	790	839	1,050
		BHP	2.1	2.5	2.8	3.2	3.6	4.0	
	10,000	RPM	712	759	805	849	891	933	1,200
		BHP	5.0	5.5	6.1	6.6	7.1	7.7	
120	10,000	RPM	542	590	634	678	723	765	1,200
		BHP	3.6	4.0	4.5	5.0	5.6	6.1	
	15,000	RPM	731	763	795	829	861	892	1,200
		BHP	10.2	10.9	11.6	12.3	13.1	13.8	

Note: The air performance data shown does not include internal static pressure losses due to items such as filters, dampers and furnaces. For exact air performance data based on specific unit configuration, use the Greenheck CAPS selection program.

# Typical Specifications

**General:** Make-up air unit shall be as manufactured by Greenheck or approved equal provided all specifications are met. Greenheck Model IGX is used as the basis of design. Performance shall be as scheduled on plans.

**Furnace:** Indirect fired gas furnace shall be 80% efficient, ETL Listed and have a blow through fan design. Furnace shall be capable of operation with natural or LP gas and have a power venting system. The heat exchanger shall be constructed of aluminized steel or stainless steel. Standard furnace features shall include main gas pressure regulator, main gas valve, electronic staged or electronic modulating controls, direct spark ignition system, high limit and a 24 volt control transformer. Furnace shall be insulated and have double wall construction.

**Temperature Control:** Furnace heat output shall be controlled based on a field adjustable discharge temperature set point. Discharge temperature sensor shall be factory mounted and wired to the unit control center. Furnace(s) shall have electronic modulation or at least 2 stages of control.

**Unit Casing and Frames:** Unit shall be of internal frame type construction of galvanized steel. All frames and panels shall be G90 galvanized steel. Where top panels are joined there shall be a standing seam to insure positive weather protection. All metal-to-metal surfaces exposed to the weather shall be sealed, requiring no caulking at job site. All components shall be easily accessible through removable doors.

**Insulation:** Models provided with a mixing box shall be insulated from the return section through to the supply discharge. Insulation shall be in accordance with NFPA 90A and tested to meet UL 181 erosion requirements. Double wall shall be provided if specified.

**Fan Section:** Centrifugal fans shall be double width, double inlet. Fan and motor shall be mounted on a common base and shall be internally isolated. All blower wheels shall be statically and dynamically balanced. Ground and polished steel fan shafts shall be mounted in permanently lubricated ball bearings (up to size 118) or ball bearing pillow blocks (size 120). Bearings shall be selected for a minimum (L10) life in excess of 100,000 hours at maximum cataloged speeds.

**Motors and Drives:** Motors shall be energy efficient, complying with EPACT standards, for single speed ODP and TE enclosures. Motors shall be permanently lubricated, heavy duty type, matched to the fan load and furnished at the specified voltage, phase and enclosure. Drives shall be sized for a minimum of 150% of driven horsepower. Pulleys shall be cast and have machined surfaces, 10 horse power and less shall be supplied with an adjustable drive pulley.

**Electrical:** All internal electrical components shall be prewired for single point power connection. All electrical components shall be UL listed, recognized or classified where applicable and wired in compliance with the National

Electrical Code. Control center shall include motor starter, control circuit fusing, control transformer for 24 VAC circuit, integral disconnect switch with separate motor fusing and terminal strip. Contactors, Class 20 adjustable overload protection and single phase protection shall be standard.

**Filter Section:** Filters shall be mounted in a V-bank arrangement such that velocities across the filters do not exceed 550 feet per minute. Filters shall be easily accessible through a removable access panel.

**Weatherhood:** Weatherhood shall be constructed of G90 galvanized steel with birdscreen mounted at the intake.

**Mixing Box (Night Setback):** Mixing box shall provide 100% make-up air during occupied hours and 100% recirculation air during unoccupied hours. Furnace(s) shall be multi-stage and operate based on discharge temperature control on occupied setting and space temperature control on unoccupied setting. The system shall allow for separate field adjustable temperature set points for occupied and unoccupied modes of operation.

**Mixing Box (Building Pressure):** Mixing box shall modulate outdoor and return air volumes to maintain desired building pressure. A remote control panel shall be provided by the make-up air unit manufacturer and include a photohelic gauge. Furnace(s) shall multi-stage and operate based on discharge temperature control.

**Mixing Box (Potentiometer):** Mixing box shall enable manual modulation of outdoor air and return air volumes from a remote potentiometer. The potentiometer shall be mounted on a control panel provided by the make-up air unit manufacturer. Furnace(s) shall multi-stage and operate based on discharge temperature control.

**Cooling Coil:** Direct expansion (DX) or chilled water coil shall be factory tested and rated in accordance with ARI 410. Coils shall have copper tubes with permanently expanded aluminum fins, 12 fpi or less. DX coils shall be equipped with distributors to receive expansion valves at the liquid connections. Drain pans shall extend at least 12 inches downstream of coil and be sloped to drain connection.

**Evaporative Cooling Section:** Evaporative cooling section shall include a galvanized steel housing with louvered intake, 2 inch aluminum mesh filters and a stainless steel evaporative cooling module all provided by the make-up air unit manufacturer. Evaporative cooling media shall be Munters CELdek with a depth of 12 inches for a cooling effectiveness of 90%. Drain and overflow connections shall be piped through the side of the evaporative cooling section.



## Our Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Motors are warranted by the motor manufacturer for a period of one year. Should motors furnished by Greenheck prove defective during this period, they should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any removal or installation costs. As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

**Greenheck P.O. Box 410 • Schofield, WI 54476-0410 • Phone (715) 359-6171 • [greenheck.com](http://greenheck.com)**