

A-IBT WITH MPU SPECIFICATION

WRITTEN SPECIFICATION

Description

An Indirect-fired gas heating and ventilating unit(s), as indicated on the drawings shall be furnished. Orientation shall be Horizontal (Down) (Side) (Up) discharge. Unit(s) shall be factory assembled, tested and shipped as a complete packaged assembly, for indoor or outdoor mounting, consisting of the following:

- Gas furnace
- Centrifugal blower (forward-curved double width/double inlet)
- Motor starter with thermal overload protection
- Motor and drive assembly
- Fuel burning and safety equipment
- Temperature control system
- Gas piping
- Pre-piped and charged condenser(s)

Approvals

Unit(s) assembly shall be tested in accordance with Standard, ANSI Z83.8-2006 and CSA 2.6-2006 and shall bear the ETL label. The duct furnace shall be certified by the American Gas Association and approved by the Canadian Gas Association

Construction

Housing Standard: Unit housing shall be constructed of 20 Gauge G-90 galvanized steel. The wall panels and roof panels shall be fabricated by forming double-standing, self-locking seams that require no additional support. The floor and wall panels shall be caulked air tight with a silicone caulk. All casing panels shall be attached with sheet-metal screws or rivets, which can be removed to field service large components. The unit base shall be suitable for curb or flat mount. The base shall be constructed of galvanized steel for improved rigidity. Base shall be structurally reinforced to accommodate the blower assembly and burner. Housing construction should be suitable for outdoor or indoor installation.

All doors and at least one side of every sheet metal surface of the unit separating two air-masses of different air temperatures shall be faced with properly secured 1" aluminum-faced insulation for condensation prevention. The discharge of the unit (Down/Side/Up) shall be internal to the heating module containing the furnaces.

All electrical controls on the control board shall be mounted in an isolated, fully enclosed and insulated vestibule, completely separated from any combustion air, but accessible for servicing needs.

All furnace exhaust flues shall be of double-wall construction. All furnace exhaust flue connections and roof-penetration seams shall be sealed with High-Temp Fire-Barrier 2000+ type silicone caulking.

All unit housings, sizes 1-3, shall be equipped with Internal Air Distribution Screens on the upstream side of each furnace heat-exchanger.

All gas valves and electrical safety-limits shall be mounted within the burner vestibule; wiring to these components shall be properly secured and away from all high temperature metal surfaces. The burner vestibule shall be an integral part of the unit and not extend outside the exterior casing of the unit and not exposed to the main air

stream.

If an outdoor unit, high wind rain caps shall be installed at the termination of the furnace discharge flues.

The vestibule full-size door shall provide easy access to controls and gas-train components. Blower door shall provide easy access to blower, motor and drives. Access doors shall be provided on both front and back side of unit providing full access to every part of the unit.

Housing Optional:

- The unit shall have double-wall construction consisting of at least two layers of 20 gauge G-90 galvanized steel.
- The unit shall have a duct connection(s) with an area equal to or greater than that of the total area of all exhaust flues for the introduction of dedicated combustion air to the burner vestibule.

Blower: Blower(s) shall be forward-curved, centrifugal, Class I or II (depending on requirements of the application), double width, double inlet, constructed G-90 galvanized steel. Unit shall have a heavy-duty, solid-steel shaft. Wheels shall be balanced in two planes and done in accordance with AMCA standard 204-96, Balance Quality and Vibration Levels for Fans. The wheel blades shall be aerodynamically designed to minimize turbulence, increase efficiency and reduce noise. The wheel blades shall be securely attached to the wheel inlet ring. The wheel shall be firmly attached to the fan shaft with set screws and keys. The blower assembly shall be isolated from the fan structure with vibration isolators.

Blower capacity shall be _____ CFM at 70 degrees F standard air, _____ external static press.

External Static: The sum of duct loss plus duct component static- Example: louvers, diffusers. All blowers shall be tested and set at rated speed after being installed in the factory-assembled unit.

Motor & Motor Compartment: Motors shall be heavy duty ball bearing type and furnished at the specified voltage, phase and enclosure. Motor mounting plate shall be constructed of heavy gauge galvanized steel and shall be designed to provide easy adjustment of belt tension. Blower motor shall be suitable for operation on _____ volts, _____ cycle, _____ phase power. Blower motor shall be a _____ HP motor, Open Drip Proof.

Shaft & Bearings: Shafts shall be precision ground and polished. Heavy duty, pre-lubricated bearings shall be selected for a minimum (L50) life in excess of 200,000 hours of operation at maximum cataloged operating speed. They shall be designed for, and individually tested specifically for use in air handling applications.

Belts & Drives: Shafts shall be precision ground and polished. Heavy duty, pre-lubricated bearings shall be selected for a minimum (L50) life in excess of 200,000 hours of operation at maximum cataloged operating speed. They shall be designed for, and individually tested specifically for use in air handling applications.

Cooling Equipment

Standard: All cooling equipment should conform to local code requirements. All gas manifold components shall be piped and wired at the factory.

Components Include:

- 14 SEER minimum condenser
- Thermal Expansion Valve
- Filter/Dryer
- Hard Start Kit for Condenser
- Insulated Suction Lines
- Multiple Stages where required

- Pre Charged System
- R-410A Refrigerant

Gas Equipment

All gas equipment shall conform to local-Code requirements. All gas manifold components shall be piped and wired at the factory.

Components:

- Modulating-gas valve
- On/off redundant gas valve
- Burner
- Main-gas shut-off valve
- Main-gas regulator
- Two solenoid valves

Optional: High Gas Pressure Regulator

Safety Controls

Standard:

- Motor starter with adjustable overloads
- Main Air-flow safety switch
- Electronic flame-safety relay
- High-temperature limit switch
- Non-Fused Disconnect
- Flame roll-out switch
- Main-gas regulator
- Two solenoid valves
- Modulating-gas valve
- Burner
- Combustion air-proving switch

Optional:

- High gas-pressure switches to open circuit to electronic flame-safety relay, if gas pressure is too high.
- Low gas-pressure switch to open circuit to electronic flame safety relay, if gas pressure is too low.
- Adjustable low temperature blower-safety control with bypass timer to shut down unit, if discharge temperature drops below setting.

Accessories

Inlet Dampers: Manufacturer shall provide and install on unit, when possible, a two-position, motor-operated damper with internal end switch to energize the blower-starter circuit, when damper is 80% open. Blades shall be a maximum of 6" wide 16 Gauge G-90 galvanized steel shall be made to guarantee the absence of noticeable vibration at design air velocities. Damper blades to be mounted on friction-free synthetic bearings. Damper edges shall have PVC coated polyester fabric mechanically locked into blade edge. Jamb seals to be flexible metal, compression type.

Filters: The filters shall be (2") thick, aluminum mesh, coated with super-filter adhesive. Aluminum-mesh filters shall have aluminum frames with media to be layers of slit and expanded aluminum, varying in pattern to obtain maximum depth loading. Washable 2" filters shall be enclosed in two-piece, die-cut frame with diagonal supports. Frame shall be constructed of heavy-duty beverage board. Filter media is supported on the air leaving side by a metal grid.

Filter Section: Shall be (insulated) (uninsulated) constructed of G-90 galvanized steel with filters supported by internal slides and with removable access panels. Filters shall be provided in a v-bank arrangement.

Fresh-Air Inlet Hood: Shall be constructed of G-90 galvanized steel with birdscreen.

Fresh-Air Inlet Hood/Filter Combination: Shall be constructed of G-90 galvanized steel with birdscreen and (2") cleanable filters supported by internal slides mounted in the inlet face of the hood.

Discharge Diffusers: Shall be constructed of G-90 galvanized steel with horizontal and vertical blades capable of four-way diffusion.

Curb: 20" curb shall be constructed of 18 ga G-90 galvanized steel as a completed welded assembly.

Cooling Coil Section: Cooling coil section shall be bolted directly to discharge of blower section. Coil section to be designed to fit onto common curb with main unit. Base of coil section to be constructed same as main unit with double pitch stainless steel drain pan for coil. Casing and roof to be 20 ga. G-90 galvanized construction. Inside of section to be fully insulated with foil back insulation. DX or chilled water coil to meet scheduled requirements.

Temperature Control Systems

Discharge Air temperature controls shall be shipped as a standard feature on all electric heaters. Optional room controls shall be available.

Discharge Temp Control: For building exhaust-air replacement to maintain a constant discharge temperature of supply air. The burner flame modulates to compensate for outdoor temperatures. The adjustable dial controller serves is used for set-point adjustment. Supplied with optional remote-control panel with temperature selector dial and SUMMER/OFF/WINTER selector.

Space Temp Control: For building-exhaust air replacement and auxiliary-space heating to maintain a constant space temperature. An adjustable dial controller with an internal thermostat is used for set-point adjustment to maintain room temperature. Optional SUMMER/OFF/WINTER selector switch and exhaust-system interlock to control heater-blower operation. Supplied with optional remote-control panel with temperature-selection dial and SUMMER/OFF/WINTER selector switch.

BAS (Building Automation System) Control: For building exhaust-air replacement with modulated temperature control based off of BAS supplied 0-10 Vdc or 4-20mA input signal. Auxiliary contacts and relays provided for contractor in the field.

365 Day Programmable Thermostat: Thermostat contains both a modulating heat signal and up to 3 stages of cooling. Thermostat contains 4 programmable occupied times and set-points per day and up to 24 holiday schedules. Time of day auxiliary output can be used to drive external equipment based on occupied status.

VAV Options

VAV (Static Pressure Control): A factory-supplied field wired VFD is provided which varies the speed of the blower wheel. The VFD is controlled by a field wired Static Pressure Controller which measures building pressure and closes and opens contacts on the VFD to accelerate or decelerate the blower speed to maintain the building pressure set on the Static Pressure Controller. Factory supplied automatic dampers maintain the burner profile pressure drop as the blower speed is varied.

VAV (Manual Speed Control): A factory-supplied field wired VFD is provided which varies the speed of the blower wheel. The VFD is controlled by a field wired Manual Potentiometer which is manual adjusted to set the speed of the blower. Factory supplied automatic dampers maintain the burner profile pressure drop as the blower speed is varied.

VAV (Speed Switch): A factory-supplied field wired VFD is provided which varies the speed of the blower wheel. The VFD is controlled by a field wired speed switch, which manually switches the VFD between pre-set blower speeds. Factory supplied automatic dampers maintain the burner profile pressure drop as the blower speed is varied.

Other Options: Operating lights mounted in a remote-control panel to indicate: power, burner ON and blower ON.

Wiring and Electrical

Standard:

- The control circuit voltage shall be 24 volts.
- A control transformer shall be provided.
- Unit shall have standing 120 Vac power.
- The control wiring shall be carried in wire channel or conduit.
- Wiring in control enclosures shall be in accordance with the National Electrical Code and the local code, as it may affect the installation.
- Motor starter shall be provided.
- Starter shall be line voltage, definite purpose type.
- Unit(s) shall be complete with all items such as relays, starters, switches, safety controls, conduit and wire as previously mentioned, and as required for proper operation.
- All factory-mounted controls shall be factory prewired to the unit control panel.
- Each condenser shall have a separate circuit enabling the supply fan motor to accept signals from a VFD without interfering with condenser operation.

Optional:

- Single point electrical connection shall be supplied.
- Blower-on delay timer to pre-heat the heat-exchanger prior to energizing the main blower.
- Convenience outlet shall be provided on the control board with 120 Vac service.
- Freeze-stat shall be provided with adjustable dials for time and temperature settings to shut down the main blower in case of burner failure.
- Fire stat with adjustable set-point temperature.
- Dirty filter airflow switch with LED indicator light on remote panel.
- Cabinet heater strip with thermostat.
- Variable Frequency Drive for main blower motor.

Factory Tested

Unit(s) shall be operated, tested and set at the factory using job-site conditions for electrical and gas input. All operating and safety controls shall be tested and set at the factory. Adjustable, or fixed sheaves shall be set for proper RPM at specified conditions. Gas-pressure regulator shall be set for specified burning rate at specified inlet pressure.

Service and Parts



COMMERCIAL KITCHEN VENTILATION

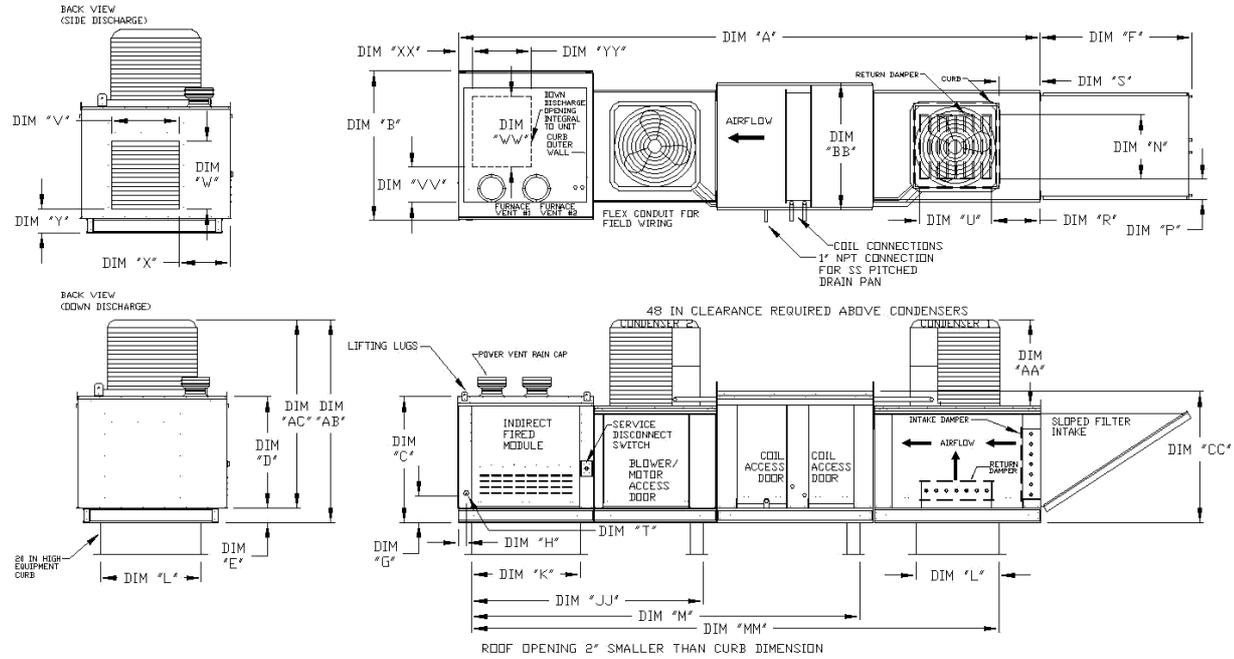
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The supplier shall furnish gas piping schematics, as built wiring connection and control-circuit diagrams, dimension sheets and a full description of the unit(s). Service manuals, showing service and maintenance requirements, shall be provided with each unit.

TYPICAL INSTALLATION

MODULAR OUTDOOR IBT HEATER WITH MIXING BOX, COOLING COIL AND INTAKE HOOD

3400CSAIBT-MPU
REV. 03/25/2011



ALL DIMENSIONS ARE NOMINAL AND GIVEN IN INCHES.

MODEL	WEIGHT (LBS)	UNIT DIMENSIONS																		MIXING BOX OPENING						SIDE DISCHARGE OPENING						DOWN DISCHARGE OPENING						GAS CONNECTION		# OF PURCHASERS
		A	B	BB	C	CC	D	E	F	G	H	JJ	K	L	M	MM	N	P	Q	R	S	U	V	W	X	Y	VV	WW	XX	YY	ZZ	AAA	BBB	CCC	DDD	EE	FF			
1-IBT150-G10	1327	176-3/4	49-1/2	39-3/8	39-9/16	42-3/4	35-13/16	3-3/4	44-3/8	8-3/4	2-11/16	89-3/16	71	21	131-7/16	162-3/4	14	8	14	12-1/2	18	17-3/4	17-3/4	18-1/2	7-1/4	3	17-3/4	3-1/8	21	3/4	1	3/4	1							
1-IBT200-G10	1357	176-3/4	49-1/2	39-3/8	39-9/16	42-3/4	35-13/16	3-3/4	44-3/8	8-3/4	2-11/16	89-3/16	71	21	131-7/16	162-3/4	14	8	14	12-1/2	18	17-3/4	17-3/4	18-1/2	7-1/4	3	17-3/4	3-1/8	21	3/4	1	3/4	1							
1-IBT300-150-150-G10	1412	176-3/4	49-1/2	39-3/8	39-9/16	42-3/4	35-13/16	3-3/4	44-3/8	8-3/4	2-11/16	89-3/16	71	21	131-7/16	162-3/4	14	8	14	12-1/2	18	17-3/4	17-3/4	18-1/2	7-1/4	3	17-3/4	3-1/8	21	3/4	1	3/4	1							
1-IBT400-200-200-G10	1466	176-3/4	49-1/2	39-3/8	39-9/16	42-3/4	35-13/16	3-3/4	44-3/8	8-3/4	2-11/16	89-3/16	71	21	131-7/16	162-3/4	14	8	14	12-1/2	18	17-3/4	17-3/4	18-1/2	7-1/4	3	17-3/4	3-1/8	21	3/4	1	3/4	1							
2-IBT200-G15	1670	184-3/4	49-1/2	49-3/8	39-9/16	47-3/4	35-13/16	3-3/4	50-5/8	8-3/4	2-11/16	97-3/16	79	31	139-7/16	175-3/4	22-3/4	8	11	7-1/2	24	24-1/2	17-3/4	18-1/2	7-1/4	5	24	3-1/8	21	1	1	1	1	1						
2-IBT300-G15	1762	184-3/4	49-1/2	49-3/8	39-9/16	47-3/4	35-13/16	3-3/4	50-5/8	8-3/4	2-11/16	97-3/16	79	31	139-7/16	175-3/4	22-3/4	8	11	7-1/2	24	24-1/2	17-3/4	18-1/2	7-1/4	5	24	3-1/8	21	1	1	1	1	1						
2-IBT400-G15	1841	184-3/4	49-1/2	49-3/8	39-9/16	47-3/4	35-13/16	3-3/4	50-5/8	8-3/4	2-11/16	97-3/16	79	31	139-7/16	175-3/4	22-3/4	8	11	7-1/2	24	24-1/2	17-3/4	18-1/2	7-1/4	5	24	3-1/8	21	1	1	1	1	1						
2-IBT400-200-200-G15	1729	184-3/4	49-1/2	49-3/8	39-9/16	47-3/4	35-13/16	3-3/4	50-5/8	8-3/4	2-11/16	97-3/16	79	31	139-7/16	175-3/4	22-3/4	8	11	7-1/2	24	24-1/2	17-3/4	18-1/2	7-1/4	5	24	3-1/8	21	1	1	1	1	1						
2-IBT600-300-300-G15	1883	184-3/4	49-1/2	49-3/8	39-9/16	47-3/4	35-13/16	3-3/4	50-5/8	8-3/4	2-11/16	97-3/16	79	31	139-7/16	175-3/4	22-3/4	8	11	7-1/2	24	24-1/2	17-3/4	18-1/2	7-1/4	5	24	3-1/8	21	1	1	1	1	1						
2-IBT800-400-400-G15	1996	184-3/4	49-1/2	49-3/8	39-9/16	47-3/4	35-13/16	3-3/4	50-5/8	8-3/4	2-11/16	97-3/16	79	31	139-7/16	175-3/4	22-3/4	8	11	7-1/2	24	24-1/2	17-3/4	18-1/2	7-1/4	5	24	3-1/8	21	1	1	1	1	1						
3-IBT400-G18	2327	189-3/4	57-3/4	54-3/8	57-1/16	56-3/8	51-13/16	5-1/4	58-5/8	10-3/4	2-11/16	102-3/16	84	35	144-7/16	183-3/4	28	8	7	4-1/2	30	27-1/2	31	18-1/2	8-3/4	6-3/4	26-1/2	4-1/8	26-1/2	1	1	1	1	1						
3-IBT600-300-300-G18	2445	189-3/4	57-3/4	54-3/8	57-1/16	56-3/8	51-13/16	5-1/4	58-5/8	10-3/4	2-11/16	102-3/16	84	35	144-7/16	183-3/4	28	8	7	4-1/2	30	27-1/2	31	18-1/2	8-3/4	6-3/4	26-1/2	4-1/8	26-1/2	1	1	1	1	1						
3-IBT800-400-400-G18	2593	189-3/4	57-3/4	54-3/8	57-1/16	56-3/8	51-13/16	5-1/4	58-5/8	10-3/4	2-11/16	102-3/16	84	35	144-7/16	183-3/4	28	8	7	4-1/2	30	27-1/2	31	18-1/2	8-3/4	6-3/4	26-1/2	4-1/8	26-1/2	1	1	1	1	1						

UNIT INFORMATION

MODEL	WEIGHT (LBS)	BTU RANGE (MBH)**		TURNDOWN RATIO	COMBUSTION EFFICIENCY***	GAS PRESSURE****	
		BTU LOW	BTU HIGH			IN	INCH
A1-IBT150-G10	200	208	1245	6	83.0%	7" WC	14" WC
A1-IBT200-G10	200	277	166	6	83.0%	7" WC	14" WC
A1-IBT300-150-150-G10	300	208	249	12	83.0%	7" WC	14" WC
A1-IBT400-200-200-G10	400	277	332	12	83.0%	7" WC	14" WC
A2-IBT200-G15	200	277	166	6	83.0%	7" WC	14" WC
A2-IBT300-G15	300	415	249	6	83.0%	7" WC	14" WC
A2-IBT400-G15	400	553	332	6	83.0%	7" WC	14" WC
A2-IBT400-200-200-G15	400	277	332	12	83.0%	7" WC	14" WC
A2-IBT600-300-300-G15	600	415	498	12	83.0%	7" WC	14" WC
A2-IBT800-400-400-G15	800	553	664	12	83.0%	7" WC	14" WC
A3-IBT400-G18	400	553	232	6	83.0%	7" WC	14" WC
A3-IBT600-300-300-G18	600	415	498	12	83.0%	7" WC	14" WC
A3-IBT800-400-400-G18	800	553	664	12	83.0%	7" WC	14" WC

* ADD CONDENSING UNIT WEIGHT TO WEIGHT IN TABLE ABOVE

** ALL MODELS ARE FULLY ELECTRONICALLY MODULATING

*** COMBUSTION EFFICIENCY OF EVERY UNIT IS 83.0% OVER THE ENTIRE GAS FIRING RANGE.

**** GAS PRESSURES IN TABLE ARE FOR NATURAL GAS, LP MINIMUM GAS INLET PRESSURE = 11" W.C.

CONDENSER INFORMATION

MODEL	WEIGHT (LBS)	TONNAGE			AA	AB	AC
		#1	#2	#3			
2 TON-G10	110 LBS	2 TON	N/A	25-5/16	55-1/16	51-3/8	
3 TON-G10	141 LBS	3 TON	N/A	32-5/16	62-1/16	58-3/8	
5 TON-G10	251 LBS	2 TON	3 TON	32-5/16	62-1/16	58-3/8	
5 TON-G10	222 LBS	2.5 TON	2.5 TON	28-11/16	58-7/16	54-3/4	
5 TON-G15	190 LBS	5 TON	N/A	25-1/2	62-1/4	58-9/16	
7.5 TON-G12	300 LBS	2.5 TON	5 TON	28-11/16	62-7/16	61-3/4	
10 TON-G12	380 LBS	5 TON	5 TON	25-1/2	62-1/4	58-9/16	
5 TON-G15	190 LBS	5 TON	N/A	25-1/2	62-1/4	58-9/16	
7.5 TON-G15	300 LBS	2.5 TON	5 TON	28-11/16	62-7/16	61-3/4	
10 TON-G15	380 LBS	5 TON	5 TON	25-1/2	62-1/4	58-9/16	
10 TON-G18	380 LBS	5 TON	5 TON	25-1/2	68-7/8	63-9/16	

R410A REFRIGERANT

SUGGESTED SPECIFICATION