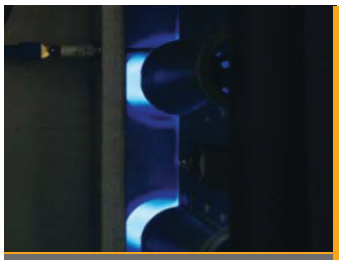


HTDM 82 INDIRECT-FIRED UNITS

EXCELLENCE THROUGH PROVEN PERFORMANCE

Ozone Friendly
R410A
R407C
R134A

INTERTEK ETL LISTED C US

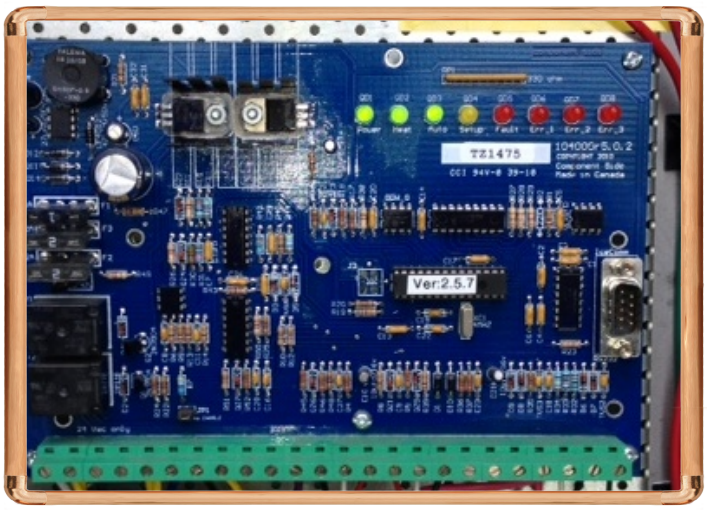
ICG WESTERN

THE REVOLUTIONARY ICECON III

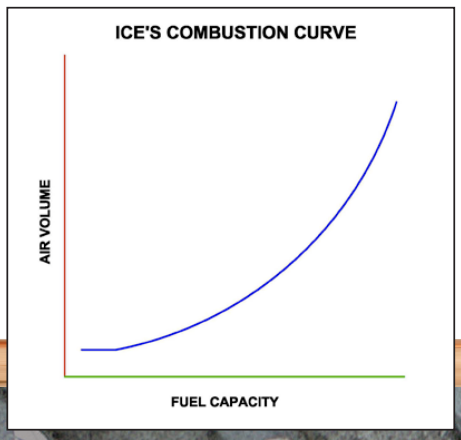
For the past 20 years the ICECON III board capability has allowed ICE to create near perfect combustion throughout the operating range of the heat exchanger. Because of this advanced technology ICE has become very successful in producing efficient and high quality heat exchangers and burners.

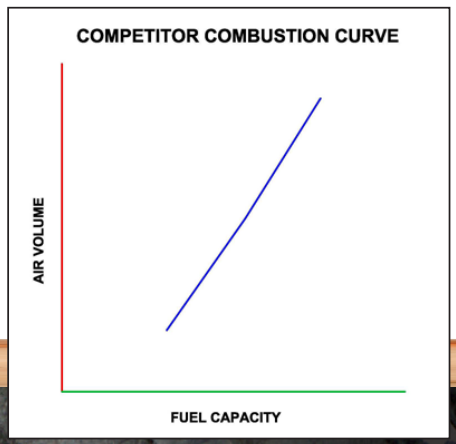
ICECON III

- **Heat Modes: Factory set discharge temperature**
- **Remote Temperature Selector (RTS)**
- **External modulation control**
- **Signal: 4-10mA, 0-10 VDC, compatible with Building Management Systems (BMS)**
- **Error signal indication:**
  - **High limit**
  - **Low limit**
  - **Air Proving**
  - **Flame Failure**
  - **Gas Valve**
- **Options:**
  - **Space Over-ride**
  - **Low Limit**
  - **System Pre-heat**
  - **Standby**
  - **Fan Standby**



The ICECON III board comes with 6 factory presets within the combustion curve. From these 6 presets a microprocessor produces an infinite number of points to precisely create the combustion curve. The ICECON III can be precisely programmed for different elevations to ensure the highest quality rate of combustion. To acquire this near perfect combustion, the ICECON board sends signals to a Triac solid state relay which controls the rpm of the combustion motor and optimizes the gas ball valve position to allow for combustion at any set point desired. The combustion fan information and gas valve position feedback is sent back to the ICECON III via a tac sensor for constant interlock of both variables. This technology produces quiet combustion and smooth modulation changes between low fire and high fire to ensure greater efficiency, greater control and impressive turndown ratios that cannot be matched by competitors.





COMPANY PROFILE

CREDIBILITY: ICE Western was founded in 1991 as a custom division of ICE MFG LTD in Winnipeg, Manitoba whose roots trace back to 1950.

Throughout the 1950's the Company established a reputation for designing, manufacturing, and installing natural gas conversion burners to replace oil and coal fired furnaces. In 1961, ICE designed and built the first direct fired make-up air unit for the Canadian natural gas heating market.

More innovative new designs followed and the manufacturing of indirect fired units has continued for over 40 years. Constant improvement provides ICE customers with the next generation of heaters and industrial heating/cooling equipment. Many new products and inovations are on the horizon to meet the ever-increasing concern over cost, consumption and environmental impact.

With decades of proven experience, ICE offers a comprehensive product line of direct & indirect fired equipment with or with out integral packaged DX cooling. However, one size does not fit all, which is why ICE Western offers in house, custom design for any configuration of air-handling, heat recovery or process unit. Don't hesitate to contact ICE Western to discuss a solution for your site-specific conditions.

CAPABILITY: Top management at ICE Western has over 25 years of HVAC and Refrigeration experience. With 300 employees, 3 production facilities and 50 + distributors, ICE units can be found on all types of buildings throughout Canada & the U.S.A. ICE Western has been servicing western Canada and the U.S.A. for over 25 years and now boasts a production facility on a 5 acre lot in Calgary with an extra 40,000 sqft. of brand new production space due online by Spring 2016.

With the addition of production at ICE Western, lead times for industrial cooling & heat recovery have dropped from 20 weeks to 12-14 weeks. A large, camera monitored and fence secured yard with ample storage, allows ICE Western to operate as a staging facility to hold units so that shipping can occur at the customer's convenience.

QUALITY: Employees at ICE take great pride as manufacturers of HVAC equipment. ICE is committed to providing quality through every step of the operation with a quality control program that is equivalent to I.S.O. 9001. Every product is fully tested and inspected before delivery to ensure a high quality product. All models are approved according to The Standard for Gas Unit Heaters, Gas Packaged Heaters, Gas Utility Heaters, and Gas Fired Duct Furnaces: ANSI Z83.8/CSA 2.6 Issued 2013/04/01 and The Standard for Gas-Fired Appliances for Use at High Altitudes: CGA 2.17 Issued 1991/01/01.

SERVICE: ICE provides qualified staff that can assist in on-site start-up and troubleshooting.

PRICE: ICE offers some of the best pricing in the HVAC industry, and can match or surpass any competitor's unit capabilities and quality commitments as well as meet or beat their delivery times.

CUSTOM UNITS: ICE provides custom built units to meet specifications and to exceed customer expectations. No job is too big or too difficult. Consult the in house design team for your custom needs.

For more information, please call 403-252-5577 ext. 222 or visit our website: www.icewestern.com

ICG WESTERN

CONTENTS

STANDARD FEATURES

ASSURANCE
- ETL listed
- Factory wired, piped, and test fired

CABINET
- Welded structural or formed channel base frame primed with rust inhibitor
- Heavy gauge colorbond steel casing with rust-resistant gray enamel paint finish
- One inch thick 1.5# density neoprene coated fiberglass. The insulation is glued and pinned, solid liner in the burner section Lifting lugs

VENTING
- Type 3/4 venting
- Condensate neutralizer tank (shipped loose

BLOWER/MOTOR
- AMCA rated forward curve DWDI centrifugal blower Polished steel shaft with rust inhibitor
- Maximum operating speed less than 75% of first critical speed Standard heavy-duty industrial bearings used on unit with blower sizes 20x20 and larger.
- Sealed cartridge bearings provided on units with blower sizes 18x18 and smaller.
- ODP motor, 1800 RPM, T frame, 1.15 service factor mounted on adjustable base
- Drives designed for 150% motor brake horsepower Adjustable V-belt drives used up to and including 5 HP; fixed drives on 7.5 HP and larger

HEAT EXCHANGER/MANIFOLD
- 82% efficiency
- Stainless steel heat exchanger and cast iron gas manifold
- Intermittent pilot assembly with spark igniter and ignition transformer Solid state flame monitoring system
- Burner observation port
- Choice of temperature control systems
- Manifold pressure for natural gas 7-14" W C. or 1-5 psig Manifold pressure for propane 11"W.C.
- Manifold includes: pilot regulator, gas valve and shutoff valve, safety shutoff valve, pressure regulator or combination modulating and pressure regulating valve, modulating gas valve, main test fire valve, manifold pressure taps

CONTROLS ENCLOSURE
- Electronic flame safeguard relay manual reset High and low airflow pressure switches Manual reset high limit
- Factory wired control panel with numbered terminal strip Motor starter with overloads
- Control circuit transformer, 120 volt Control panel service switch
- Circuit breaker
- Terminal connections for exhaust interlock
- Nationally recognized components, service parts.

OPTIONAL FEATURES

80/20 MIX BOX
Allows the recirculation of air to occur. This will provide a cost effective way of space heating
Includes V-bank filter rack

WEATHERHOUSING
Control and manifold enclosure

FILTER SECTION
V-bank filter section with side access suitable for 2" filters

WINTER FILTER SECTION
Located on the discharge side of burner

FILTERS
2" thick permanent, pleated and throwaway filters; high efficiency filters, various efficiency bag filters and HEPA filters complete with filter gauge and/or indicating light

MOTORIZED INLET & DISCHARGE DAMPER
Parallel blade damper with a two-position spring return actuator and end switch

ROOF CURB
Prefabricated galvanized roof curb 16" or 24" high; full perimeter available on most units

BLOWERS
Backward inclined, air foil, and plug fans For special fan performance, contact the factory

HEAT RECOVERY
Heat wheels or cutting edge fixed media options

DX PLENUM
Coil located in vertical or horizontal airflow complete with drain pan when applicable

COIL PLENUMS
Heating coils- steam, hot water, and glycol
Cooling coils- chilled water, DX coil

EVAPORATIVE COOLERS
Industrial and commercial

HINGED ACCESS DOORS
Optional on filter section, motor section and weatherhousing. Comes with #140 ventlock handles, #310 ventlock handles upgrade available

MUSHROOM HOOD
Complete with internal screen for debris

LOUVERED INLET
Standard on all units. Manufactured by ICE and sized for a maximum velocity of 500 FPM to ensure moisture does not enter the unit

4 WAY DISCHARGE HEAD
The adjust able 4 way discharge head provides 4 equal quantities of air in the conditioned space

HORIZONTAL DISCHARGE HEAD
180 deg. vertical and horizontal adjustment with 360 deg. of free rotation

INTERNAL VIBRATION ISOLATION
Blower and motor isolated on separate frame with R.I.S. or spring c/w canvas connector

EXTERNAL VIBRATION ISOLATION
Floor mounted or suspended isolation

SERVICE PLATFORM
Provides access to controls and gas train

MOTORS
TEFC and high-efficiency, meeting EEE and CSA standards and 2-speed

DISCONNECT SWITCH
Weatherproof enclosure; non-fused or fused

FM GAS TRAIN
Meets Factory Mutual (FM) requirements

IRI GAS TRAIN
Meets Industrial Risk Insurers requirements

HIGH GAS PRESSURE REGULATOR
Required on natural gas with pressure in excess of 14" W.C and LP applications in excess of 11 "W.C.

HIGH/LOW GAS PRESSURE SWITCHES
Manual reset. Gas pressure safety switches which lock out the burner in the event of gas pressure malfunction

CONTROL PANELS
NEMA 4 or 12 custom, unit mounted or remote enclosures

ADDITIONAL OPTIONS

- Auto low limit freeze protection control with bypass timer
- 1O point electronic circuit analyzer with signal lights
- Exhaust Interlock Relay
- Proof of Closure Valve
- Inlet Air Controller (burner economizer)
- Ultra violet flame supervision
- Audible alarm
- Null pressure switch
- Firestat
- Purge timer
- Delay exhaust start
- 115 volt GFI service receptacle
- Marine service light with 100 watt bulb, guard, and lighted switch
- High density insulation
- 2" thick and 4" thick insulation
- Motor and bearings out of airstream
- Internal liners- 22 gauge solid or perforated
- JIC wiring
- Extended grease lines
- Belt guards
- Checker plate floor
- Walk-in service corridors
- Corrosion resistant two-step acrylic finish Special coatings
- Special construction: aluminum, stainless steel, heavier gauge

PERFORMANCE SPECIFICATIONS

MODEL	INPUT/ OUTPUT MBH	AIR CAPACITY CFM	TEMPERATURE RISE (Deg-F)
HTDM 200 85% EFF	200/170	1,431	110
		1,574	100
		1,749	90
		1,968	80
		2,249	70
		2,623	60
		3,148	50

MODEL1	INPUT/ OUTPUT MBH	AIR CAPACITY CFM	TEMPERATURE RISE (Deg-F)
HTDM 1500 82% EFF	1500/1230	10,354	110
		11,389	100
		12,654	90
		14,236	80
		16,270	70
		18,981	60
		22,778	50

MODEL	INPUT/ OUTPUT MBH	AIR CAPACITY CFM	TEMPERATURE RISE (Deg-F)
HTDM 400 82% EFF	400/328	2,761	110
		3,037	100
		3,374	90
		3,796	80
		4,339	70
		5,062	60
		6,074	50

MODEL	INPUT/ OUTPUT MBH	AIR CAPACITY CFM	TEMPERATURE RISE (Deg-F)
HTDM 2000 82% EFF	2000/1640	13,805	110
		15,185	100
		16,872	90
		18,981	80
		21,693	70
		25,309	60
		30,370	50

MODEL	INPUT/ OUTPUT MBH	AIR CAPACITY CFM	TEMPERATURE RISE (Deg-F)
HTDM 600 82% EFF	600/492	4,141	110
		4,556	100
		5,062	90
		5,694	80
		6,508	70
		7,593	60
		9,111	50

MODEL	INPUT/ OUTPUT MBH	AIR CAPACITY CFM	TEMPERATURE RISE (Deg-F)
HTDM 2500 82% EFF	2500/2050	17,256	110
		18,981	100
		21,091	90
		23,727	80
		27,116	70
		31,636	60
		37,963	50

MODEL	INPUT/ OUTPUT MBH	AIR CAPACITY CFM	TEMPERATURE RISE (Deg-F)
HTDM 1000 82% EFF	1000/820	6,902	110
		7,593	100
		8,436	90
		9,491	80
		10,847	70
		12,654	60
		15,185	50

MODEL	INPUT/ OUTPUT MBH	AIR CAPACITY CFM	TEMPERATURE RISE (Deg-F)
HTDM 3000 82% EFF	3000/2460	20,707	110
		22,778	100
		25,309	90
		28,472	80
		32,540	70
		37,963	60
		45,556	50

AMPERAGE SPECIFICATIONS

Due to the many variables involved, please consult ICE Western for an MCA based on your specific requirements.

ICE WESTERN

WEIGHTS (IN POUNDS)

HORIZONTAL UNITS

	HTDM 85 200	HTDM 82+ 400	HTDM 82 600	HTDM 82 1000
Basic Unit: c/w Blower, Filter & Heat Exchanger	2,747	3,240	4,053	5,733
c/w Return Air and Mixbox	2,834	3,387	4,168	5,977
c/w Mixbox & Coil Section	3,454	3,798	4,594	6,583
c/w Mixbox & High Eff. Filter Plenum	3,173	3,609	4,464	6,360
C/W Mixbox With Relief	3,342	3,620	4,603	6,220
c/w Mixbox With Relief & Return Air Blower	3,699	4,120	4,952	7,221
C/W Coil Plenum	3,062	3,779	4,669	6,463
c/w Packaged DX Cooling & Mixbox	3,732	4,361	5,206	7,491

	HTDM 82 1500	HTDM 82 2000	HTDM 82 2500	HTDM 82 3000
Basic Unit: c/w Blower, Filter & Heat Exchanger	6,508	7,917	10,725	11,176
c/w Return Air and Mixbox	6,773	8,109	11,042	11,623
c/w Mixbox & DX Coil Section	7,455	8,758	11,841	12,814
c/w Mixbox & High Eff. Filter Section	7,190	8,411	11,526	12,140
C/W Mixbox With Relief	7,038	8,301	11,350	11,834
c/w Mixbox With Relief & Return Air Blower	8,116	9,222	12,654	13,195
c/w Coil Plenum	7,445	8,751	11,196	12,361
c/w Packaged DX Cooling & Mixbox	8,447	10,155	13,403	14,329

COMPONENTS

	HTDM 82 200	HTDM 82 400	HTDM 91+ 600	HTDM 82 1000
Coil Plenum; Horizontal Discharge	547	695	788	1,172
Coil Plenum; Down Discharge	622	789	935	1,338
High Eff. Filter Section; Horizontal Discharge	407	550	628	888
High Eff. Filter Section Down Discharge	507	636	851	1,114
Inlet Hood	46	60	114	151
Relief Fresh Air Section	647	811	902	1231
Relief Fresh Air Blower Section	1,472	1,578	1,727	2,650

	HTDM 82 1500	HTDM 82 2000	HTDM 82 2500	HTDM 82 3000
Coil Plenum; Horizontal Discharge	1,319	1,587	1,826	1,918
Coil Plenum; Down Discharge	1,718	1,962	2,232	2,362
High Eff. Filter Section; Horizontal Discharge	1,005	1,180	1,319	1,334
High Eff. Filter Section Down Discharge	1,289	1,486	1,781	1,856
Inlet Hood	192	293	316	320
Relief Fresh Air Section	1,408	1,607	1,771	1,800
Relief Fresh Air Blower Section	2,900	3,215	3,452	3,596

Note:

- For additional components, add the component weight to the basic unit weight
- Includes 10% safety factor
- For reference only, subject to change without notice

For more information, please call 403-252-5577 ext. 222 or visit our website: www.icewestern.com

EFFICIENCIES AND TURNDOWNS

MODEL HTDM 82	EFFICIENCY	TURNDOWNS
200	85%	23:1
400	82%	23:1
600	82%	29:1
1000	82%	50:1
1500	82%	60:1
2000	82%	60:1
2500	82%	60:1
3000	82%	60:1

STATIC PRESSURE DROP(S) DUE TO ACCESSORIES

ACCESSORIES	STATIC PRESSURE DROP (IN INCHES WATER)
Flat and v-Bank Filter Section	0.4
Louvered Inlet Hood	0.1
Evaporative Cooler (Commercial)	0.3
Evaporative Cooler (Industrial)	0.4
Inlet Damper	0.1
DX Plenum & Coil	0.6
80/20 Mixbox w/ Filters	0.7
Horizontal Discharge Head	0.5
High Eff. Filter Section	1.0
Heat Coil	0.2
Fixed Media Heat Recovery	1.0

Note:
Accessory static pressure drops are calculated at maximum CFM loads

STANDARD FILTER SECTION SUMMARY

MODEL HTDM 91+	QUANTITY – SIZE INCHES	TOTAL FILTER FREE AREA ft^2	MAXIMUM AIR FLOW CFM
200	2-16x25x2	5.26	2,780
400	4-16x25x2	11.1	5,550
600	3-16x20x2 3-20x20x2	15	7,500
1000	4-20x25x2 4-20x20x2	25	12,500
1500	12-16x25x2	33.3	16,500
2000	12-24x24x2	48	24,000
2500	16-25x20x2	55.6	27,500
3000	12-25x20x2 8-25x16x2	63.9	32,000

General Filter Performance Notes:

-The standard filter section may contain one of the following three types:

- Replaceable: 2 inch fiberglass media with an average efficiency of 20% at 500 fpm.
- Throwaway: 2 inch pleated media with an average efficiency of 30% at 500 fpm.
- Permanent: 2 inch media with layers of silt and expanded aluminum. The media efficiency averages 20% at 500 fpm. The media can be cleaned using a stream of water.

Note:

- The static pressure drop through the filters is approximately 0.4" W.C. (clean) and approximately 0.8" W.C. (dirty)
- The maximum airflow is calculated so that the velocity across the filters never exceeds 500 fpm
- A V-bank filter section is required on the HTDM 82 1000, 1500, 2000 and 3000 when the temperature rise is less than 70°F

HTDM 82 PERFORMANCE SPECIFICATIONS

MODELHTDM 91+	INPUT/ OUTPUT (MBH)	AIR CAPACITY CFM	TEMP. RISE deg F	0.25" W.C.		0.5" W.C.		0.75" W.C.		1.0" W.C.		1.5" W.C.		2.0" W.C.		GAS CONN. INCHES
				BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	
200	200/170	1,434	110	9x9	0.36	9x9	0.44	9x9	0.55	9x9	0.61	9x9	0.81	9X9	1.05	1
		1,574	100	9x9	0.42	9x9	0.51	9x9	0.60	9x9	0.69	9x9	0.89	9x9	1.12	
		1,749	90	10x10	0.52	9x9	0.61	9x9	0.71	9x9	0.81	9x9	1.01	9x9	1.24	
		1,968	80	10x10	0.70	9x9	0.80	9x9	0.90	9x9	1.02	9x9	1.24	10x10	1.46	
		2,249	70	10x10	0.79	9x9	1.09	9x9	1.20	9x9	1.32	9x9	1.63	9x9	1.89	
		2,623	60	10x10	1.17	10x10	1.31	10x10	1.45	10x10	1.60	10x10	1.91	12x9	2.21	
		3,148	50	12x12	1.29	12x12	1.47	12x9	1.71	12x9	1.86	12x12	2.33	12x12	2.84	

MODELHTDM 91+	INPUT/ OUTPUT (MBH)	AIR CAPACITY CFM	TEMP. RISE deg F	0.25" W.C.		0.5" W.C.		0.75" W.C.		1.0" W.C.		1.5" W.C.		2.0" W.C.		GAS CONN. INCHES
				BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	
400	400/328	2,761	110	10x10	1.11	10x10	1.23	10x10	1.37	10x10	1.51	10x10	1.82	10x10	2.13	1
		3,037	100	12x12	0.88	10x10	1.57	10x10	1.71	10x10	1.86	10x10	2.18	10x10	2.52	
		3,374	90	12x12	1.06	12x12	1.24	12x12	1.43	12x12	1.63	12x12	2.03	12x12	2.48	
		3,796	80	12x12	1.31	12x12	1.50	12x12	1.71	12x12	1.92	12x12	2.36	12x12	2.81	
		4,339	70	12z12	1.86	15z15	1.51	15z11	1.75	15z11	2.02	15z15	2.66	15x15	3.29	
		5,062	60	15z15	1.83	15x15	2.06	15x15	2.30	15x15	2.61	15x15	3.28	18x18	3.88	
		6,074	50	15x15	2.98	15x15	3.26	15x15	3.53	15x15	3.81	15x15	4.52	18x18	5.05	

MODELHTDM 91+	INPUT/ OUTPUT (MBH)	AIR CAPACITY CFM	TEMP. RISE deg F	0.25" W.C.		0.5" W.C.		0.75" W.C.		1.0" W.C.		1.5" W.C.		2.0" W.C.		GAS CONN. INCHES
				BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	
600	600/492	4,141	110	12x12	1.61	12x12	1.80	12x12	2.02	12x12	2.24	12x12	2.71	12x12	3.19	1
		4,556	100	15x15	1.34	15x15	1.54	15x15	1.78	15x11	2.03	15x15	2.68	15x15	3.30	
		5,062	90	15x15	1.68	15x15	1.92	15x15	2.15	15x15	2.42	18x18	2.92	15x15	3.75	
		5,694	80	15x15	2.18	15x15	2.47	15x15	2.74	15x15	2.98	15x15	3.59	15x15	4.36	
		6,508	70	18x18	2.25	18x18	2.56	18x18	2.86	18x18	3.20	18x18	4.01	18x18	4.87	
		7,593	60	18x18	3.14	18x18	3.53	18x18	3.89	18x18	4.24	18x18	5.01	20x20	6.28	
		9,111	50	20x20	3.97	20x20	4.54	20x20	5.09	20x20	5.61	20x20	6.49	20x20	7.76	

MODELHTDM 91+	INPUT/ OUTPUT (MBH)	AIR CAPACITY CFM	TEMP. RISE deg F	0.25" W.C.		0.5" W.C.		0.75" W.C.		1.0" W.C.		1.5" W.C.		2.0" W.C.		GAS CONN. INCHES
				BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	
1000	1000/820	6,902	110	2-12x12	2.15	2-12x12	2.53	2-12x12	2.93	2-12x12	3.36	2-12x12	4.68	2-12x12	5.65	1 1/4
		7,593	100	2-12x12	3.10	2-12x12	3.54	2-12x12	4.00	2-12x12	4.47	2-12x12	5.40	2-12x12	6.41	
		8,436	90	2-15x15	2.82	2-15x15	3.36	2-15x15	3.98	2-15x15	4.57	2-12x12	6.42	2-12x12	7.47	
		9,491	80	2-15x15	3.57	2-15x15	4.06	2-15x15	4.67	2-15x15	5.06	2-18x18	6.54	2-18x18	8.08	
		10,847	70	2-15x15	4.84	2-15x15	5.36	2-15x15	5.89	2-15x15	6.55	2-18x18	7.67	2-18x18	9.34	
		12,654	60	2-18x18	5.35	2-18x18	6.03	2-18x18	6.81	2-18x18	7.67	2-18x18	9.45	2-18x18	9.50	
		15,185	50	2-18x18	8.20	2-18x18	8.97	2-18x18	9.74	2-18x18	10.08	2-18x18	11.59	2-20x20	11.92	

Note:

- All static values include the blower, burner and casing
- Accessory static values must be added to obtain the total static (see page 8)
- Brake horsepower does NOT include drive losses
- A V-bank filter section is required on HTDM 1000, 1500, 2000 and 3000 with a temperature rise of less than 70°F

Consult ICE Western for:

- Higher air capacities or special applications
- Performance data on higher statics than listed
- Performance data at elevations other than sea level

For more information, please call 403-252-5577 ext. 222 or visit our website: www.icewestern.com

MODELHT DM 91+	INPUT/ OUTPUT (MBH)	AIR CAPACITY CFM	TEMP. RISE deg F	0.25" W.C.		0.5" W.C.		0.75" W.C.		1.0" W.C.		1.5" W.C.		2.0" W.C.		GAS CONN. INCHES
				BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	
1500	1500/1230	10,354	110	2-15x15	3.89	2-15x15	4.33	2-15x15	4.91	2-15x15	5.49	2-15x15	6.93	2-18x18	8.16	1 1/4
		11,389	100	2-15x15	4.69	2-15x15	5.30	2-15x15	5.88	2-15x15	6.43	2-18x18	7.20	2-18x18	8.87	
		12,654	90	2-18x18	4.59	2-15x15	5.21	2-18x18	5.89	2-18x18	6.98	2-18x18	8.74	2-18x18	9.45	
		14,236	80	2-18x18	5.88	2-18x18	6.26	2-18x18	6.94	2-18x18	7.63	2-18x18	9.22	2-20x20	11.62	
		16,270	70	2-18x18	7.52	2-18x18	8.34	2-18x18	9.12	2-18x18	9.8	2-18x18	11.43	2-20x20	13.76	
		18,981	60	2-20x20	8.88	2-20x20	10.09	2-20x20	11.25	2-20x20	12.38	2-20x20	14.16	2-20x20	16.58	
		22,778	50	2-20x20	13.76	2-20x20	14.91	2-20x20	16.26	2-20x20	17.72	2-20x20	20.50	2-20x20	22.93	

MODELHT DM 91+	INPUT/ OUTPUT (MBH)	AIR CAPACITY CFM	TEMP. RISE deg F	0.25" W.C.		0.5" W.C.		0.75" W.C.		1.0" W.C.		1.5" W.C.		2.0" W.C.		GAS CONN. INCHES
				BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	
2000	2000/1640	13,805	110	2-18x18	4.45	2-18x18	5.14	2-18x18	5.80	2-18x18	6.45	2-18x18	7.89	2-18x18	9.63	2
		15,185	100	2-20x20	4.30	2-20x20	5.19	2-18x18	6.80	2-18x18	7.65	2-18x18	9.05	2-18x18	10.72	
		16,872	90	2-20x20	5.57	2-20x20	6.44	2-20x20	7.53	2-20x20	8.53	2-18x18	11.18	2-18x18	12.78	
		18,981	80	2-22x22	5.81	2-20x20	8.30	2-20x20	9.31	2-20x20	10.54	2-20x20	12.77	2-18x18	15.96	
		21,693	70	2-22x22	7.77	2-22x22	8.78	2-22x22	9.84	2-20x20	13.30	2-20x20	16.04	2-20x20	18.60	
		25,309	60	2-22x22	11.30	2-22x22	12.48	2-22x22	13.64	2-22x22	14.88	2-20x20	21.21	2-20x20	24.38	
		30,370	50	2-25x25	14.55	2-25x25	16.11	2-22x22	20.68	2-22x22	22.08	2-22x22	25.03	2-20x20	28.03	

MODELHT DM 91+	INPUT/ OUTPUT (MBH)	AIR CAPACITY CFM	TEMP. RISE deg F	0.25" W.C.		0.5" W.C.		0.75" W.C.		1.0" W.C.		1.5" W.C.		2.0" W.C.		GAS CONN. INCHES
				BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	
2500	2500/2050	17,256	110	2-22x22	4.29	2-20x20	6.32	2-20x20	7.32	2-20x20	8.41	2-20x20	10.22	2-20x15	13.92	2
		18,981	100	2-22x22	5.07	2-22x22	5.98	2-20x20	8.50	2-20x20	9.57	2-20x20	11.95	2-20x20	13.74	
		21,091	90	2-22x22	6.58	2-22x22	7.55	2-22x22	8.60	2-20x20	11.78	2-20x20	14.37	2-20x20	16.88	
		23,727	80	2-22x22	8.67	2-22x22	9.79	2-22x22	10.92	2-22x22	12.52	2-20x20	18.08	2-20x20	21.14	
		27,116	70	2-25x25	9.54	2-25x25	10.85	2-22x22	14.43	2-22x22	15.68	2-22x22	18.26	2-22x22	25.60	
		31,636	60	2-25x25	13.77	2-25x25	15.32	2-25x25	16.88	2-22x22	22.04	2-22x22	24.92	2-22x22	28.01	
		37,963	50	2-28x28	17.42	2-25x25	22.73	2-25x25	24.62	2-25x25	26.48	2-25x25	30.10	2-25x25	33.92	

MODELHT DM 91+	INPUT/ OUTPUT (MBH)	AIR CAPACITY CFM	TEMP. RISE deg F	0.25" W.C.		0.5" W.C.		0.75" W.C.		1.0" W.C.		1.5" W.C.		2.0" W.C.		GAS CONN. INCHES
				BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	BLOWER	BHP	
3000	3000/2460	20,707	110	2-25x25	4.98	2-22x22	6.95	2-22x22	7.95	2-20x20	10.98	2-20x20	13.48	2-20x20		2 1/2
		22,778	100	2-25x25	5.82	2-22x22	8.28	2-22x22	9.34	2-22x22	10.38	2-20x20	15.42	2-22x22		
		25,309	90	2-25x25	7.45	2-25x25	8.73	2-22x22	11.75	2-22x22	12.96	2-22x22	15.41	2-20x20		
		28,472	80	2-25x25	9.77	2-25x25	11.16	2-22x22	15.23	2-22x22	16.57	2-22x22	19.25	2-22x22		
		32,540	70	2-28x28	11.08	2-25x25	14.81	2-25x25	16.36	2-25x25	17.93	2-25x25	21.19	2-28x28		
		37,963	60	2-28x28	15.24	2-28x28	17.05	2-25x25	22.39	2-25x25	24.22	2-25x25	27.90	2-25x25		
		45,556	50	2-30x30	19.58	2-30x30	21.46	2-28x28	27.73	2-28x28	29.85	2-28x28	34.40	2-28x28		

Note:

- All static values include the blower, burner and casing
- Accessory static values must be added to obtain the total static (see page 8)
- Brake horsepower does NOT include drive losses
- A V-bank filter section is required on HTDM 1000, 1500, 2000 and 3000 with a temperature rise of less than 70°F

Consult ICE Western for:

- Higher air capacities or special applications
- Performance data on higher statics than listed
- Performance data at elevations other than sea level

For more information, please call 403-252-5577 ext. 222 or visit our website: www.icewestern.com

COOLING PERFORMANCE DATA

DX5S		Available Stages of Cooling: 1				
SST (°F)		Air Temperature Entering Condenser (°F)				
		75	85	95	105	115
40	TC	57.8	55.1	52.2	49.2	46.1
	CDT	99.3	110.0	120.0	130.0	140.0
45	TC	63.0	60.0	57.0	53.8	50.5
	CDT	101.0	111.0	121.0	132.0	142.0
50	TC	68.5	65.3	62.1	58.7	55.2
	CDT	102.0	113.0	123.0	133.0	143.0

DX6S		Available Stages of Cooling: 1				
SST (°F)		Air Temperature Entering Condenser (°F)				
		80	95	100	105	115
40	TC	77.4	69.8	67.3	64.7	59.6
	CDT	111	124	128	132	141
45	TC	84.9	77.0	74.4	71.7	66.4
	CDT	114	126	131	135	143
50	TC	92.7	84.5	81.7	78.9	73.4
	CDT	116	129	133	138	146

DX7.5S		Available Stages of Cooling: 1				
SST (°F)		Air Temperature Entering Condenser (°F)				
		80	95	100	105	115
40	TC	97.5	88.0	84.8	81.7	75.3
	CDT	109	120	127	131	140
45	TC	107.0	97.0	93.6	90.2	83.4
	CDT	111	124	129	133	142
50	TC	117.0	106.0	103.0	99.2	92.0
	CDT	114	127	131	136	144

DX10S		Available Stages of Cooling: 1, 2				
SST (°F)		Air Temperature Entering Condenser (°F)				
		80	95	100	105	115
40	TC	119.0	107.0	102.0	98.4	90.3
	CDT	115	127	132	136	145
45	TC	130.0	117.0	113.0	109.0	100.0
	CDT	118	130	134	139	147
50	TC	142.0	128.0	124.0	119.0	110.0
	CDT	121	133	137	141	150

DX10.5S		Available Stages of Cooling: 1, 2, 3, 4				
SST (°F)		Air Temperature Entering Condenser (°F)				
		85	95	100	105	115
40	TC	117.0	109.0	105.0	101.0	93.0
	CDT	115	124	128	133	142
45	TC	129.0	120.0	116.0	111.0	103.0
	CDT	117	126	131	135	144
50	TC	141.0	132.0	127.0	122.0	113.0
	CDT	120	129	133	137	146

DX12.5S		Available Stages of Cooling: 1, 2, 3, 4				
SST (°F)		Air Temperature Entering Condenser (°F)				
		80	95	100	105	115
40	TC	145.0	135.0	131.0	126.0	117.0
	CDT	112	121	126	130	140
45	TC	159.0	149.0	144.0	139.0	130.0
	CDT	114	123	127	132	141
50	TC	174.0	164.0	159.0	153.0	143.0
	CDT	116	124	129	134	143

DX15S		Available Stages of Cooling: 1, 2, 3, 4				
SST (°F)		Air Temperature Entering Condenser (°F)				
		80	95	100	105	115
40	TC	187.0	176.0	170.0	165.0	154.0
	CDT	117	126	130	135	144
45	TC	204.0	192.0	186.0	180.0	168.0
	CDT	119	128	133	137	146
50	TC	222.0	209.0	203.0	197.0	184.0
	CDT	122	131	135	140	148

DX20S		Available Stages of Cooling: 2, 3				
SST (°F)		Air Temperature Entering Condenser (°F)				
		80	95	100	105	115
40	TC	251.0	255.0	217.0	208.0	191.0
	CDT	117	129	133	137	146
45	TC	275.0	248.0	239.0	230.0	212.0
	CDT	121	133	137	141	149
50	TC	299.0	271.0	262.0	252.0	232.0
	CDT	124	136	140	144	152

DX25S		Available Stages of Cooling: 2, 3, 4				
SST (°F)		Air Temperature Entering Condenser (°F)				
		80	95	100	105	115
40	TC	333.0	301.0	290.0	279.0	258.0
	CDT	115	128	133	137	145
45	TC	365.0	330.0	319.0	307.0	284.0
	CDT	118	131	135	140	148
50	TC	398.0	361.0	348.0	336.0	312.0
	CDT	121	134	138	142	151

DX30S		Available Stages of Cooling: 2, 3, 4				
SST (°F)		Air Temperature Entering Condenser				
		80	95	100	105	115
40	TC	371.0	337.0	326.0	314.0	292.0
	CDT	115	128	132	136	145
45	TC	405.0	369.0	357.0	345.0	321.0
	CDT	117	130	135	139	147
50	TC	440.0	402.0	390.0	377.0	351.0
	CDT	120	133	138	142	150

DX40S		Available Stages of Cooling: 2, 3, 4				
SST (°F)		Air Temperature Entering Condenser				
		80	95	100	105	115
40	TC	503.0	461.0	447.0	433.0	405.0
	CDT	111	124	129	133	142
45	TC	551.0	505.0	489.0	474.0	444.0
	CDT	114	127	131	136	145
50	TC	599.0	550.0	534.0	518.0	485.0
	CDT	116	129	134	138	147

DX50T		Available Stages of Cooling: 4, 6, 8				
SST (°F)		Air Temperature Entering Condenser				
		85	95	100	105	115
40	TC	568.0	527.0	506.0	486.0	44.0
	CDT	116	125	130	135	144
45	TC	627.0	583.0	561.0	540.0	496.0
	CDT	119	127	132	137	146
50	TC	688.0	642.0	619.0	595.0	-
	CDT	121	130	134	139	-

DX60T		Available Stages of Cooling: 4, 6, 8				
SST (°F)		Air Temperature Entering Condenser (°F)				
		85	95	100	105	115
40	TC	682.0	634.0	611.0	588.0	541.0
	CDT	116	125	130	135	144
45	TC	749.0	699.0	674.0	650.0	600.0
	CDT	118	127	132	136	146
50	TC	822.0	768.0	741.0	715.0	662.0
	CDT	120	130	134	139	148

DX70T		Available Stages of Cooling: 4, 6, 8				
SST (°F)		Air Temperature Entering Condenser (°F)				
		80	95	100	105	115
40	TC	829.0	778.0	753.0	727.0	677.0
	CDT	115	124	129	133	143
45	TC	910.0	854.0	827.0	800.0	745.0
	CDT	118	127	131	136	145
50	TC	994.0	935.0	905.0	876.0	817.0
	CDT	120	129	133	138	147

DX80T		Available Stages of Cooling: 4, 6, 8				
SST (°F)		Air Temperature Entering Condenser (°F)				
		85	95	100	105	115
40	TC	954.0	896.0	866.0	838.0	780.0
	CDT	117	126	131	136	145
45	TC	1047.0	984.0	953.0	922.0	860.0
	CDT	119	128	128	138	147
50	TC	1144.0	1077.0	1044.0	1011.0	944.0
	CDT	122	131	135	140	149

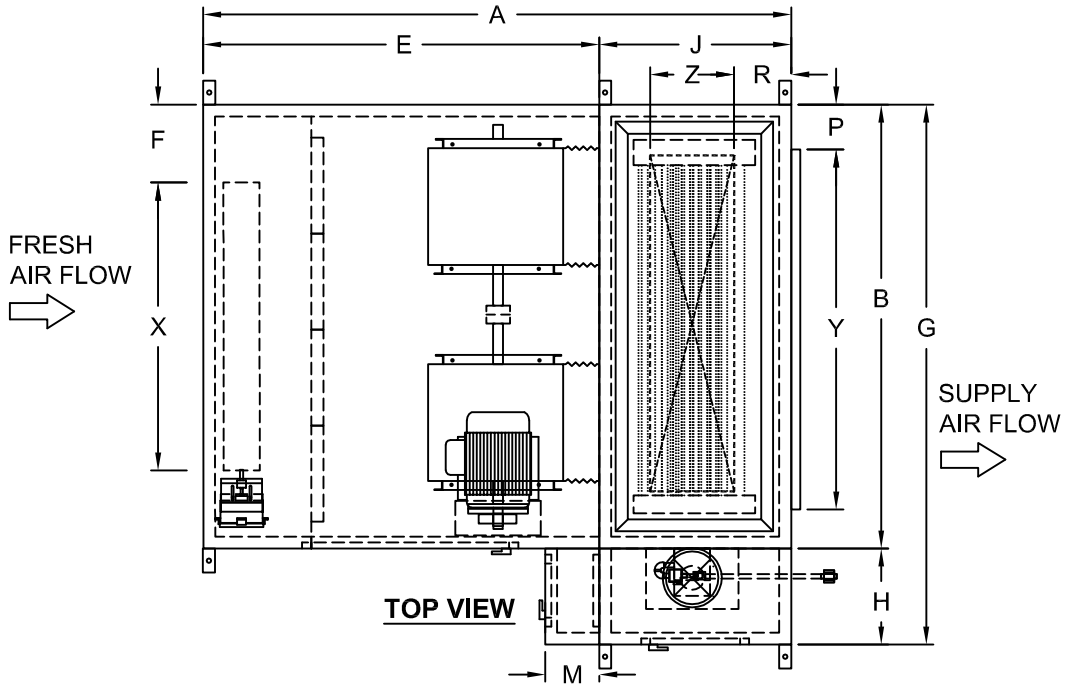
Nomenclature:

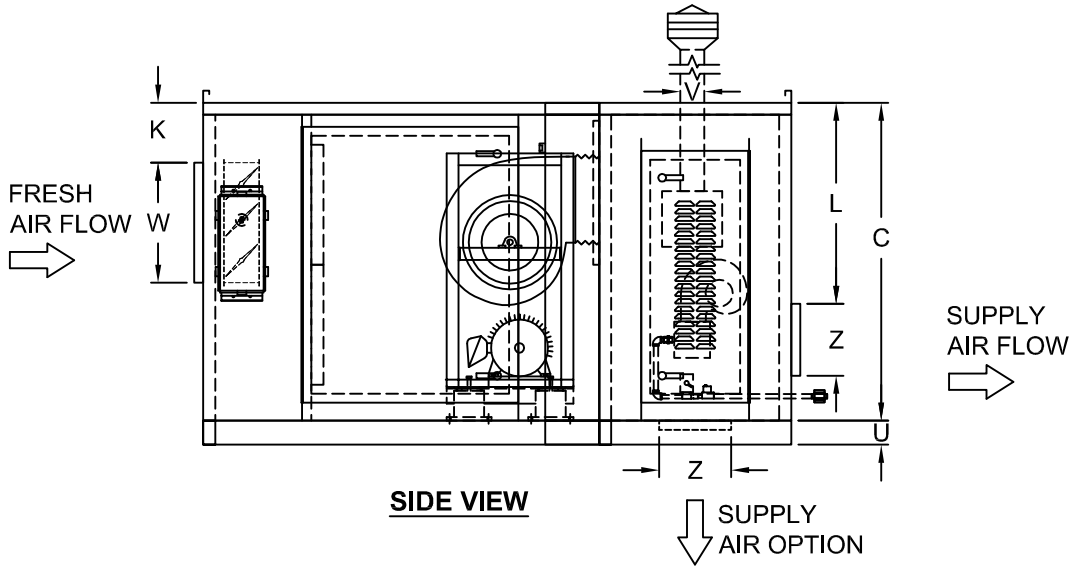
DX 20 S
↓ ↘
Nominal S – Single Compressor
Tonnage T – Twin Compressor

SST -Saturated Suction Temperature (°F)
TC - Gross Cooling Capacity (°F)
CDT - Saturated Discharge Temperature at Compressor (°F)

For capacities larger than or between those indicated or for capacities of twin compressor units less than 50 tons, consult ICE Western.
For reference only, subject to change without notice.

For more information, please call 403-252-5577 ext. 222 or visit our website: www.icewestern.com





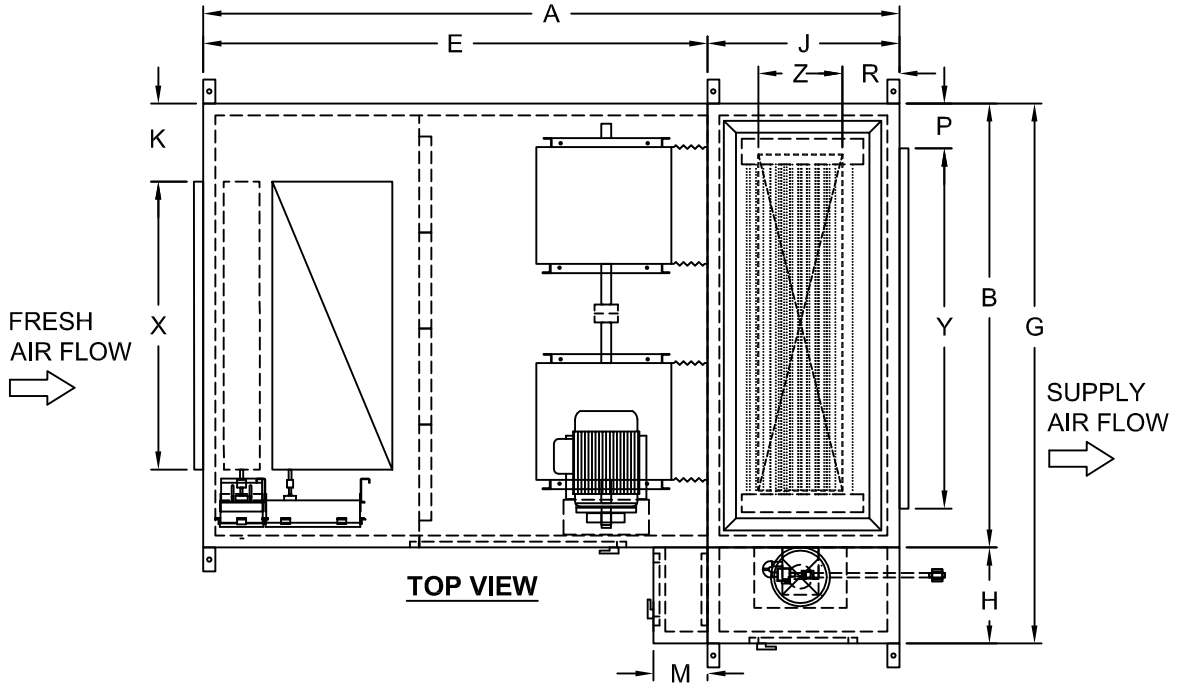
MODEL	A	B	C	E	F	G	H	J	K	L	M	P	R	U	V	W	X	Y	Z
200	88	36	45	56	6	52	16	32	12	33 ½	9	7	10 ½	4	6	18	18	20	12
400	98	60	45	67	6	76	16	32	15	33 ½	9	12	10 ½	4	8	14	42	36	12
600	98	74	45	66	13	90	16	32	10	33 ½	9	8	10 ½	4	8	20	48	58	12
1000	116	84	55	66	6	102	18	50	14	42 ¾	9	5	9 ¼	4	10	26	66	74	20
1500	121	89	78	70	6	107	18	51	12	42 ½	9	5	12 ½	4	12	30	70	78	24
2000	124	106	78	70	6	126	20	54	16	43 ½	9	6	17	6	14	30	92	100	20
2500	130	115	88	70	7	137	22	60	12	48 ½	9	5	18	6	16	36	96	104	24
3000	136	118	88	70	7	142	24	66	18	44 ½	9	6	20 ½	6	18	40	102	106	26

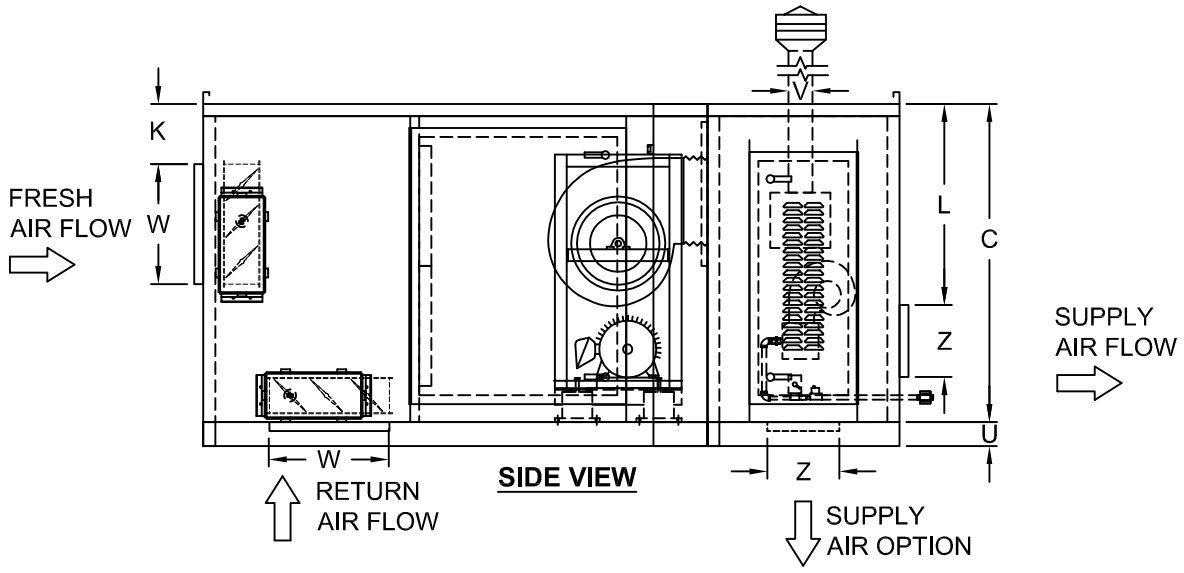
NOTE:
1. DIMENSIONS ARE GENERALIZED FOR ILLUSTRATIVE PURPOSES. CONTACT I.C.E. FOR A NO-OBLIGATION DESIGN CUSTOMIZED TO MEET YOUR SPECIFIC NEEDS
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED. RECOMMENDED CLEARANCES IS MINIMUM 24".
3. 1-1/2" DISCHARGE & INLET FLANGES AT OPENINGS.
4. RIGHT HAND UNIT SHOWN, LEFT HAND OPPOSITE SHOWN
5. LIFTING LUG 2"x4" (TYP.)
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED
c/w FLAT FILTER





MODEL	A	B	C	E	F	G	H	J	K	L	M	P	R	U	V	W	X	Y	Z
200	104	36	45	72	6	52	16	32	12	33 ½	9	7	10 ½	4	6	18	18	20	12
400	111	60	45	79	6	76	16	32	15	33 ½	9	12	10 ½	4	8	14	42	36	12
600	116	74	45	84	13	90	16	32	10	33 ½	9	8	10 ½	4	8	20	48	58	12
1000	144	84	55	94	6	102	18	50	14	42 ¾	9	5	9 ¼	4	10	26	66	74	20
1500	149	89	78	98	6	107	18	51	12	44 ½	9	5	12 ½	4	12	30	70	78	24
2000	152	106	78	98	6	126	20	54	16	43 ½	9	6	17	6	14	30	92	100	20
2500	158	115	88	98	7	139	22	60	12	48 ½	9	5	18	6	16	36	96	104	24
3000	174	118	88	108	7	142	24	66	18	44 ½	9	6	20 ½	6	18	40	102	106	26

NOTE:
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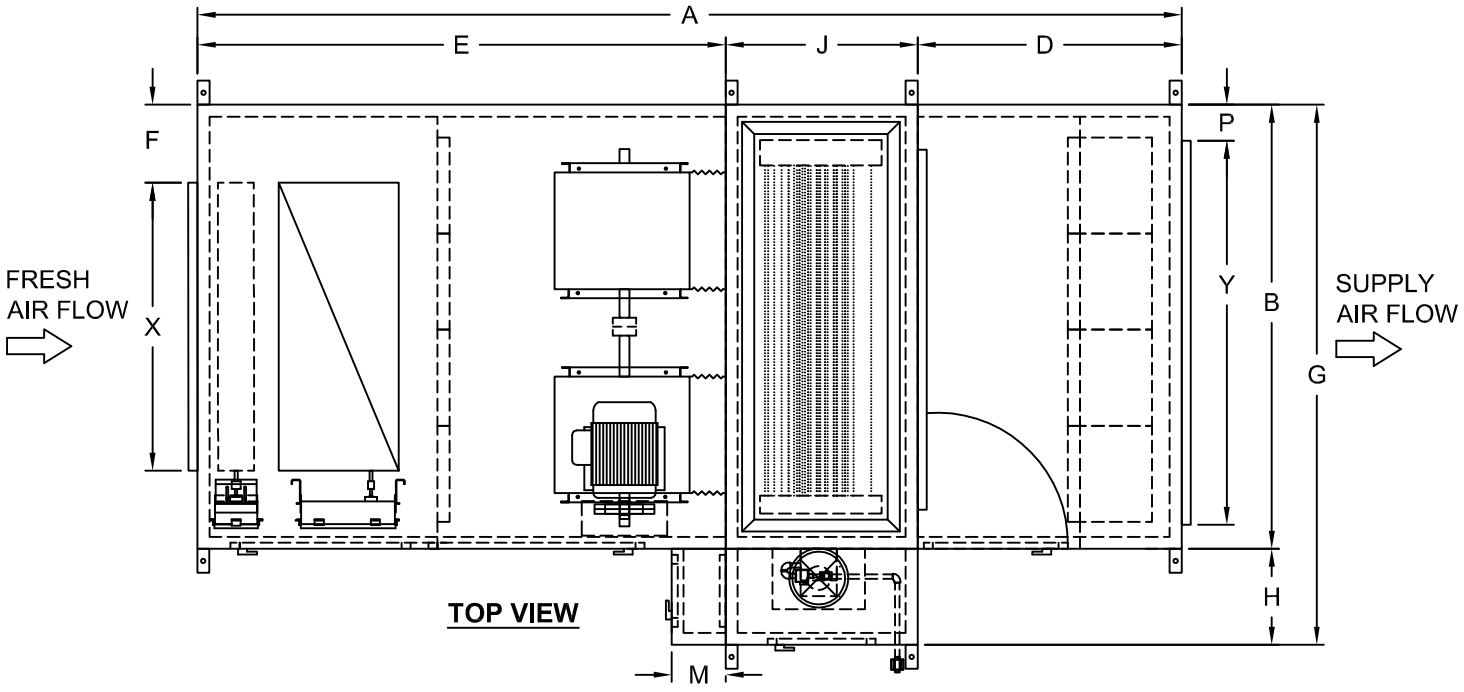
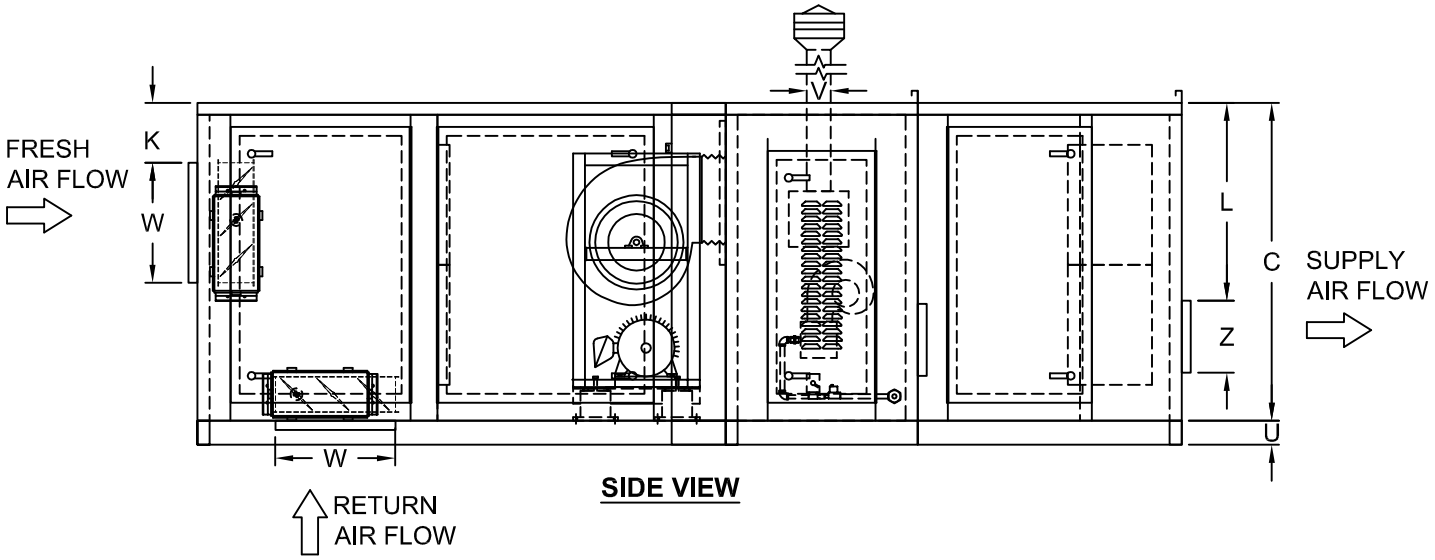
4. RIGHT HAND UNIT SHOWN, LEFT HAND OPPOSITE SHOWN
5. LIFTING LUG 2"x4" (TYP.)
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED
c/w FLAT FILTER & MIX BOX





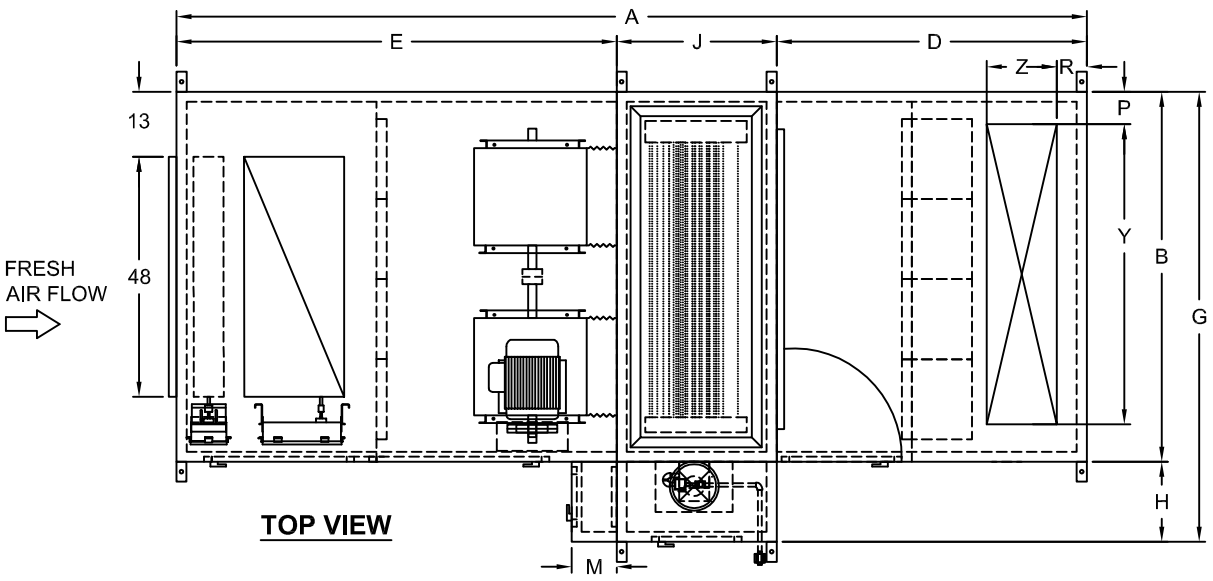
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	P	U	V	W	X	Y	Z
200	148	36	45	44	72	6	52	16	32	12	33 ½	9	7	4	6	18	18	20	12
400	155	60	45	44	79	6	76	16	32	15	33 ½	9	12	4	8	14	42	36	12
600	160	74	45	44	84	13	90	16	32	10	33 ½	9	8	4	8	20	48	58	12
1000	188	84	55	44	94	6	102	18	50	14	42 ¾	9	5	4	10	26	66	74	20
1500	193	89	78	44	98	6	107	18	51	12	44 ½	9	5	4	12	30	70	78	24
2000	196	106	78	44	98	6	126	20	54	16	43 ½	9	6	6	14	30	92	100	20
2500	202	115	88	44	98	7	139	22	60	12	48 ½	9	5	6	16	36	96	104	24
3000	218	118	88	44	98	7	142	24	66	18	44 ½	9	6	6	18	40	102	106	26

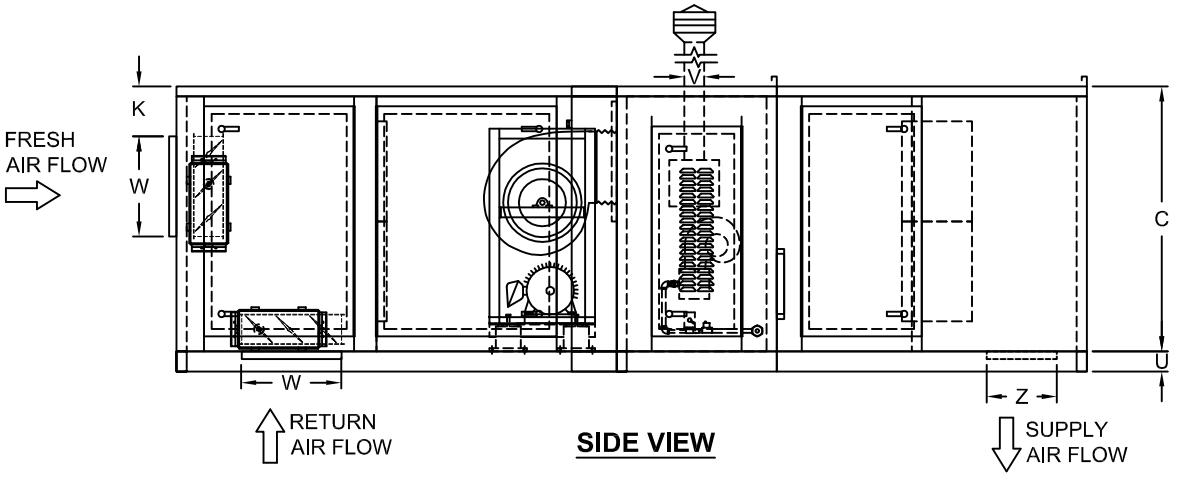
NOTE:
1. DIMENSIONS ARE GENERALIZED FOR ILLUSTRATIVE PURPOSES. CONTACT I.C.E. FOR A NO-OBLIGATION DESIGN CUSTOMIZED TO MEET YOUR SPECIFIC NEEDS
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED. RECOMMENDED CLEARANCES IS MINIMUM 24".
3. 1-1/2" DISCHARGE & INLET FLANGES AT OPENINGS.
4. RIGHT HAND UNIT SHOWN, LEFT HAND OPPOSITE SHOWN
5. LIFTING LUG 2"x4" (TYP.)
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, MIX BOX, HIGH E. FILTER PLENUM & HORIZONTAL DISCHARGE





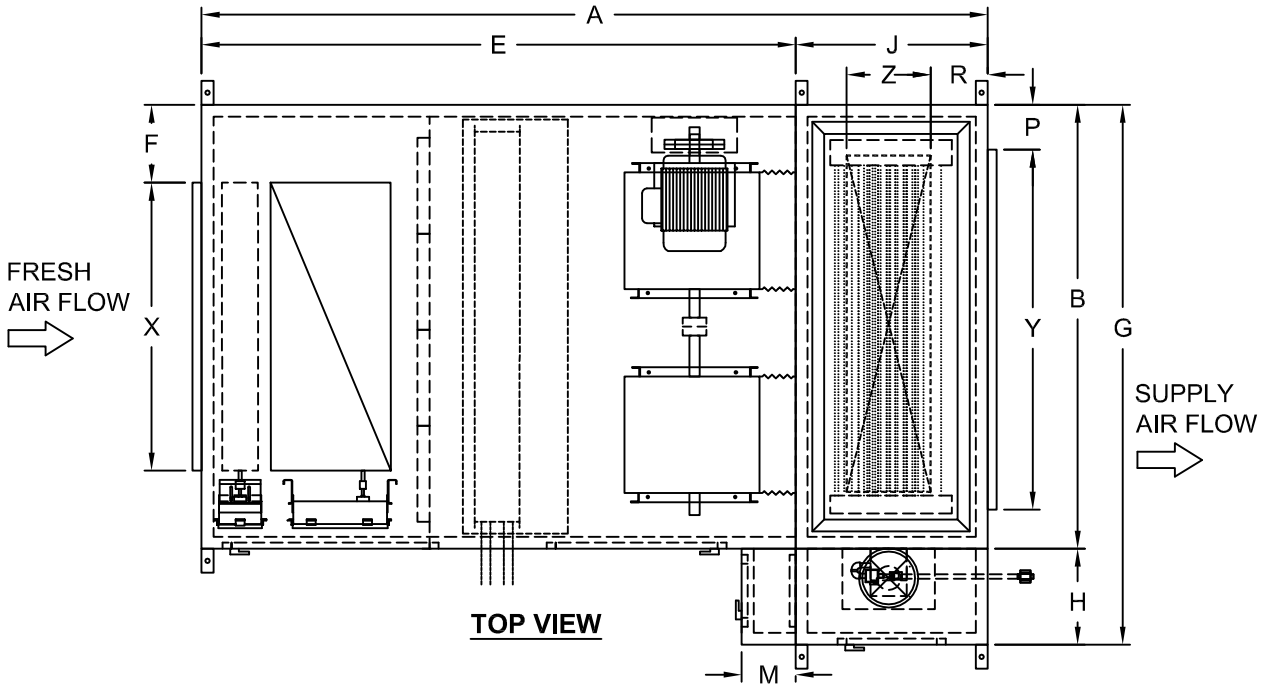
MODEL	A	B	C	D	E	F	G	H	J	K	M	P	R	U	V	W	X	Y	Z
200	164	36	45	60	72	6	52	16	32	12	9	7	6	4	6	18	18	20	12
400	171	60	45	60	79	6	76	16	32	15	9	12	6	4	8	14	42	36	12
600	176	74	45	60	84	13	90	16	32	10	9	8	6	4	8	20	48	58	12
1000	212	84	55	68	94	6	102	18	50	14	9	5	6	4	10	26	66	74	20
1500	221	89	78	72	98	6	107	18	51	12	9	5	6	4	12	30	70	78	24
2000	220	106	78	68	98	6	126	20	54	16	9	6	6	6	14	30	92	100	20
2500	230	115	88	72	98	7	139	22	60	12	9	5	6	6	16	36	96	104	24
3000	248	118	88	74	108	7	142	24	66	18	9	6	6	6	18	40	102	106	26

NOTE:
1. DIMENSIONS ARE GENERALIZED FOR ILLUSTRATIVE PURPOSES. CONTACT I.C.E. FOR A NO-OBLIGATION DESIGN CUSTOMIZED TO MEET YOUR SPECIFIC NEEDS
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED. RECOMMENDED CLEARANCES IS MINIMUM 24".
3. 1-1/2" DISCHARGE & INLET FLANGES AT OPENINGS.
4. RIGHT HAND UNIT SHOWN, LEFT HAND OPPOSITE SHOWN
5. LIFTING LUG 2"x4" (TYP.)
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

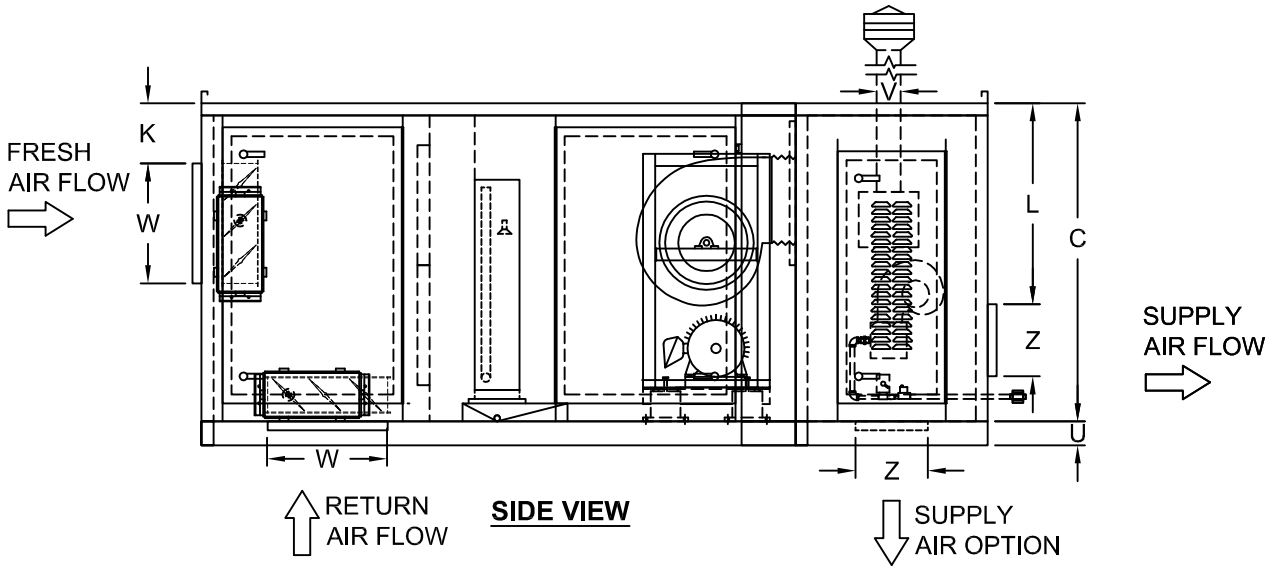
ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, MIX BOX, HIGH E. FILTER PLENUM & BOTTOM DISCHARGE



TOP VIEW



SIDE VIEW

MODEL	A	B	C	E	F	G	H	J	K	L	N	P	R	U	V	W	X	Y	Z
200	119	36	45	87	6	52	16	32	12	33 ½	9	7	10 ½	4	6	18	18	20	12
400	126	60	45	94	6	76	16	32	15	33 ½	9	12	10 ½	4	8	14	42	36	12
600	131	74	45	99	13	90	16	32	10	33 ½	9	8	10 ½	4	8	20	48	58	12
1000	159	84	55	109	6	102	18	50	14	42 ¾	9	5	9 ¼	4	10	26	66	74	20
1500	164	89	78	113	6	107	18	51	12	44 ½	9	5	12 ½	4	12	30	70	78	24
2000	167	106	78	113	6	126	20	54	16	43 ½	9	6	17	6	14	30	92	100	20
2500	173	115	88	113	7	139	22	60	12	48 ½	9	5	18	6	16	36	96	104	24
3000	189	118	88	123	7	142	24	66	18	44 ½	9	6	20 ½	6	18	40	102	106	26

NOTE:
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4. RIGHT HAND UNIT SHOWN, LEFT HAND OPPOSITE SHOWN
5. LIFTING LUG 2"x4" (TYP.)
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
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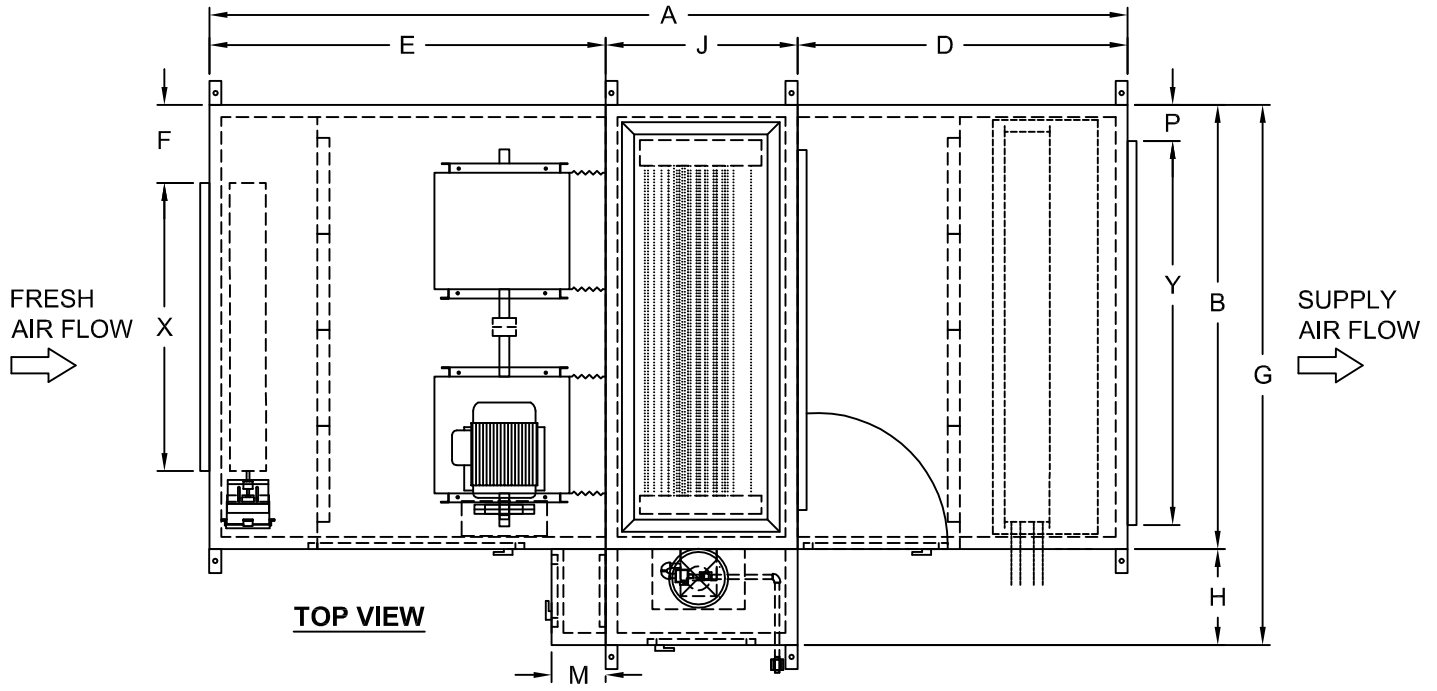
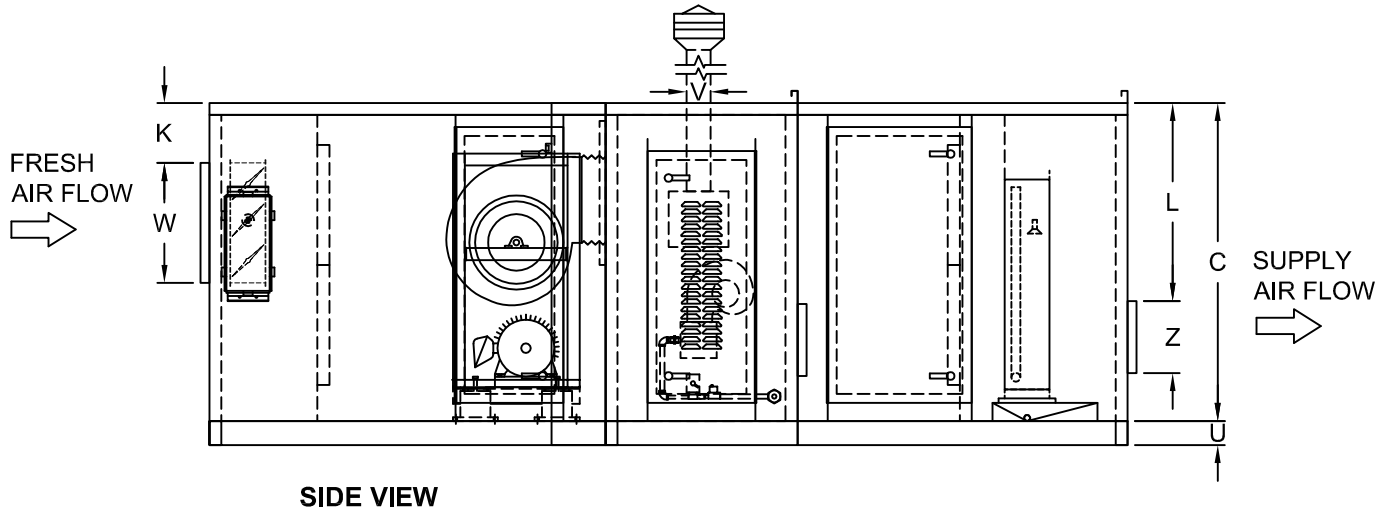
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED
c/w FLAT FILTER, COIL & MIX BOX





SIDE VIEW

MODEL	A	B	C	D	E	F	G	H	J	K	L	M	P	U	V	W	X	Y	Z
200	130	36	45	42	56	6	52	16	32	12	33 ½	9	7	4	6	18	18	20	12
400	140	60	45	42	67	6	76	16	32	15	33 ½	9	12	4	8	14	42	36	12
600	140	74	45	42	66	13	90	16	32	10	33 ½	9	8	4	8	20	48	58	12
1000	158	84	55	42	66	6	102	18	50	14	42 ¾	9	5	4	10	26	66	74	20
1500	163	89	78	42	70	6	107	18	51	12	44 ½	9	5	4	12	30	70	78	24
2000	166	106	78	42	70	6	126	20	54	16	43 ½	9	6	6	14	30	92	100	20
2500	172	115	88	42	70	7	139	22	60	12	48 ½	9	5	6	16	36	96	104	24
3000	178	118	88	42	70	7	142	24	66	18	44 ½	9	6	6	18	40	102	106	26

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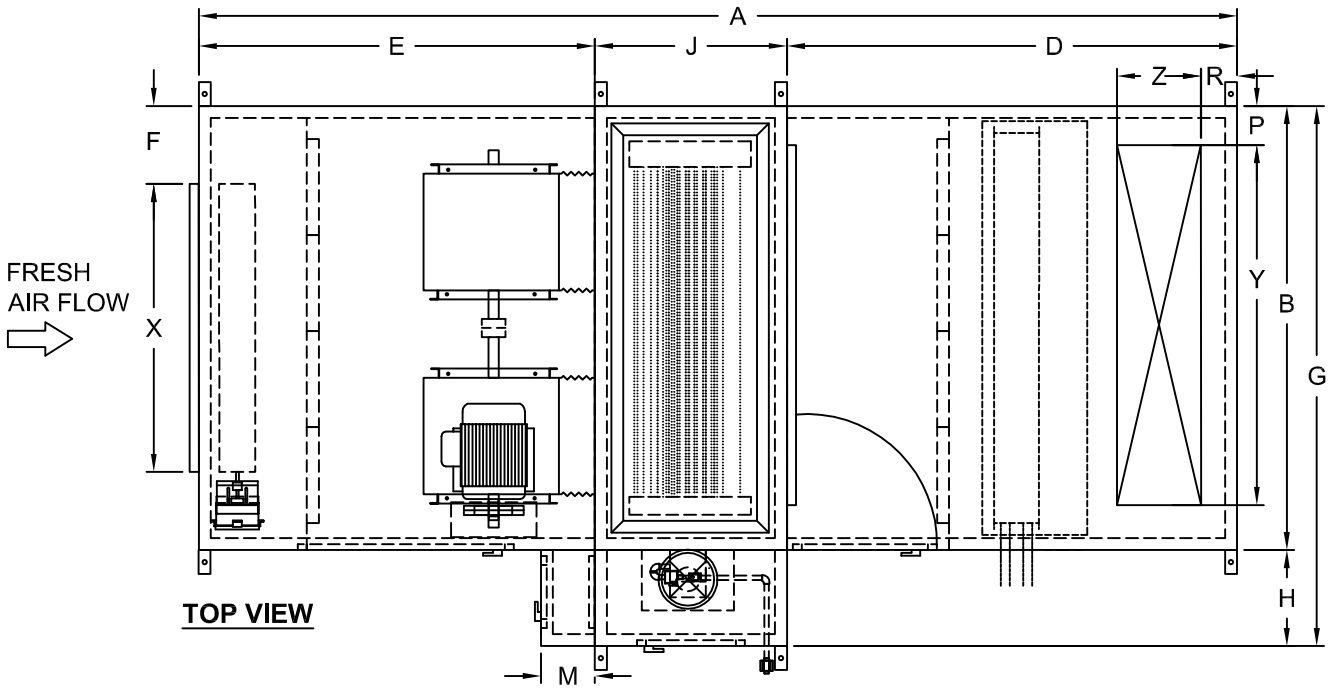
9. SEE PAGE 7 FOR UNIT WEIGHTS

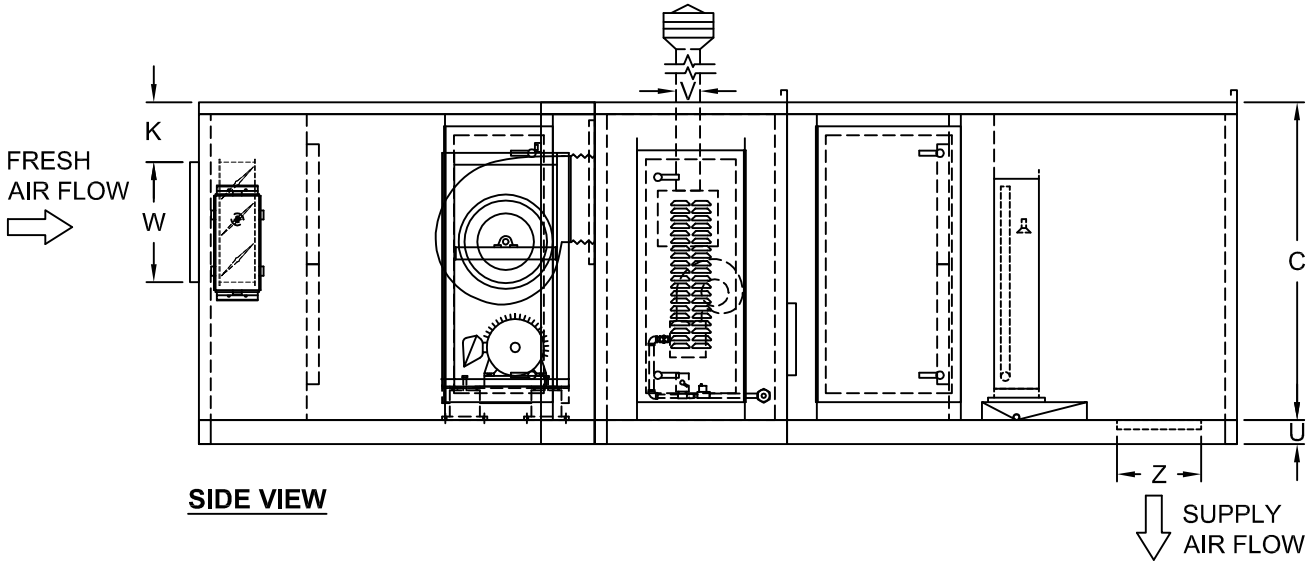
ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, COIL PLENUM AND HORIZONTAL DISCHARGE



TOP VIEW



SIDE VIEW

MODEL	A	B	C	D	E	F	G	H	J	K	M	P	R	U	V	W	X	Y	Z
200	164	36	45	76	56	6	52	16	32	12	9	7	6	4	6	18	18	20	12
400	180	60	45	82	67	6	76	16	32	15	9	12	6	4	8	14	42	36	12
600	174	74	45	76	66	13	90	16	32	10	9	8	6	4	8	20	48	58	12
1000	198	84	55	82	66	6	102	18	50	14	9	5	6	4	10	26	66	74	20
1500	207	89	78	86	70	6	107	18	51	12	9	5	6	4	12	30	70	78	24
2000	206	106	78	82	70	6	126	20	54	16	9	6	6	6	14	30	92	100	20
2500	216	115	88	86	70	7	139	22	60	12	9	5	6	6	16	36	96	104	24
3000	224	118	88	88	70	7	142	24	66	18	9	6	6	6	18	40	102	106	26

NOTE:
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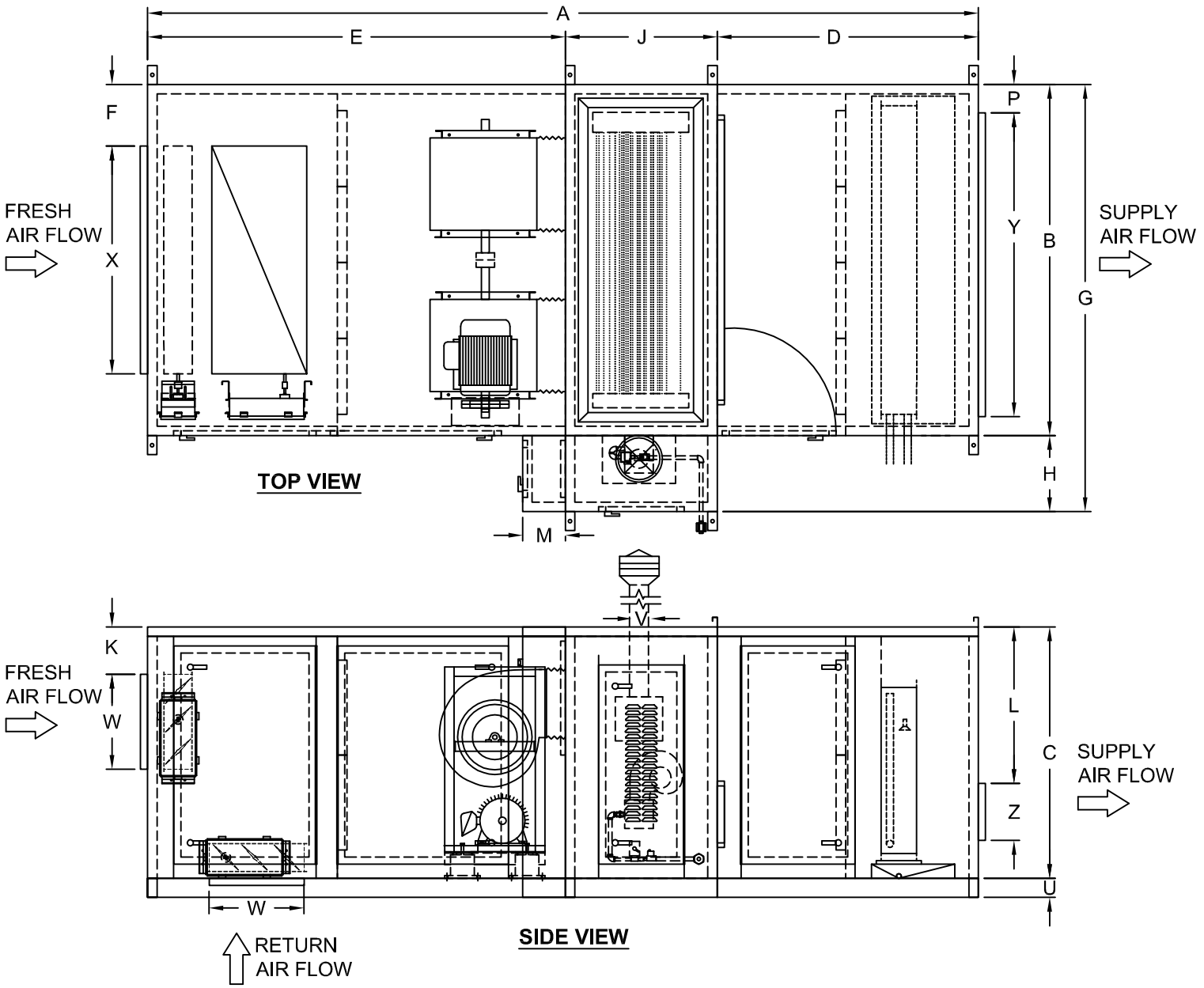
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, COIL PLENUM & BOTTOM DISCHARGE



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	P	U	V	W	X	Y	Z
200	146	36	45	42	72	6	52	16	32	12	33 ½	9	7	4	6	18	18	20	12
400	153	60	45	42	79	6	76	16	32	15	33 ½	9	12	4	8	14	42	36	12
600	158	74	45	42	84	13	90	16	32	10	33 ½	9	8	4	8	20	48	58	12
1000	186	84	55	42	94	6	102	18	50	14	42 ¾	9	5	4	10	26	66	74	20
1500	191	89	78	42	98	6	107	18	51	12	44 ½	9	5	4	12	30	70	78	24
2000	194	106	78	42	98	6	126	20	54	16	43 ½	9	6	6	14	30	92	100	20
2500	200	115	88	42	98	7	139	22	60	12	48 ½	9	5	6	16	36	96	104	24
3000	206	118	88	42	108	7	142	24	66	18	44 ½	9	6	6	18	40	102	106	26

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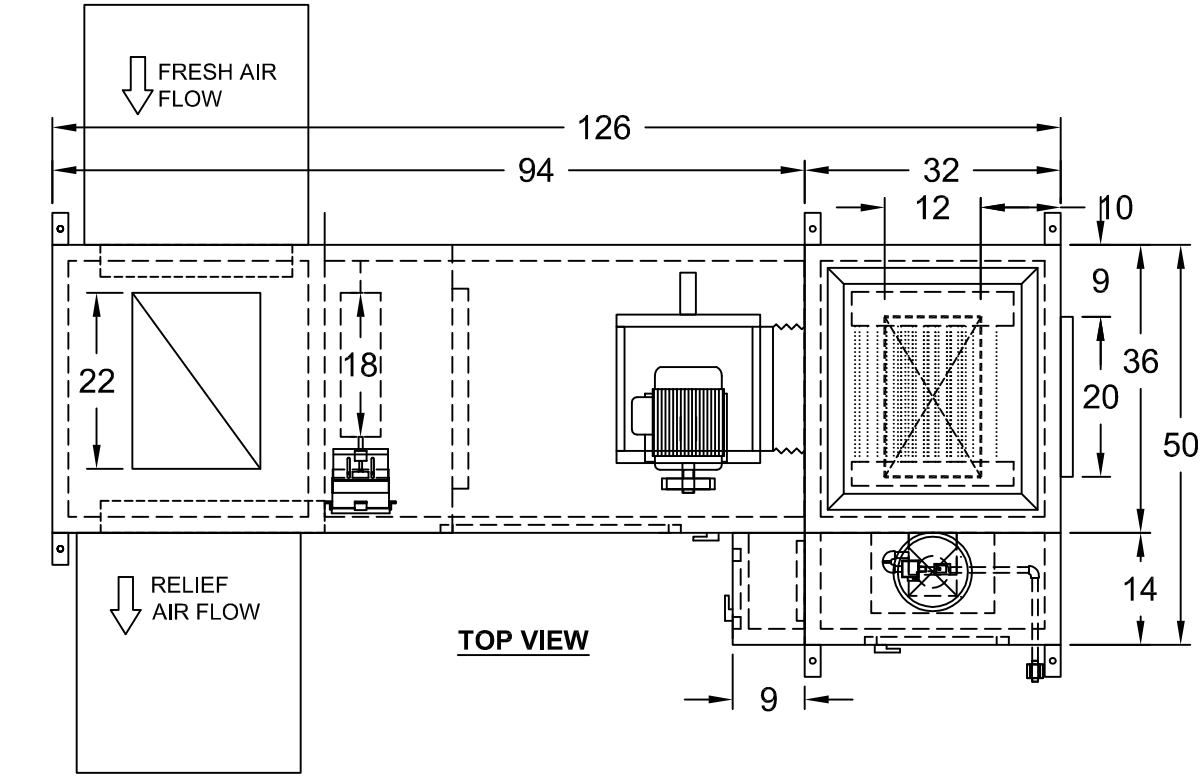
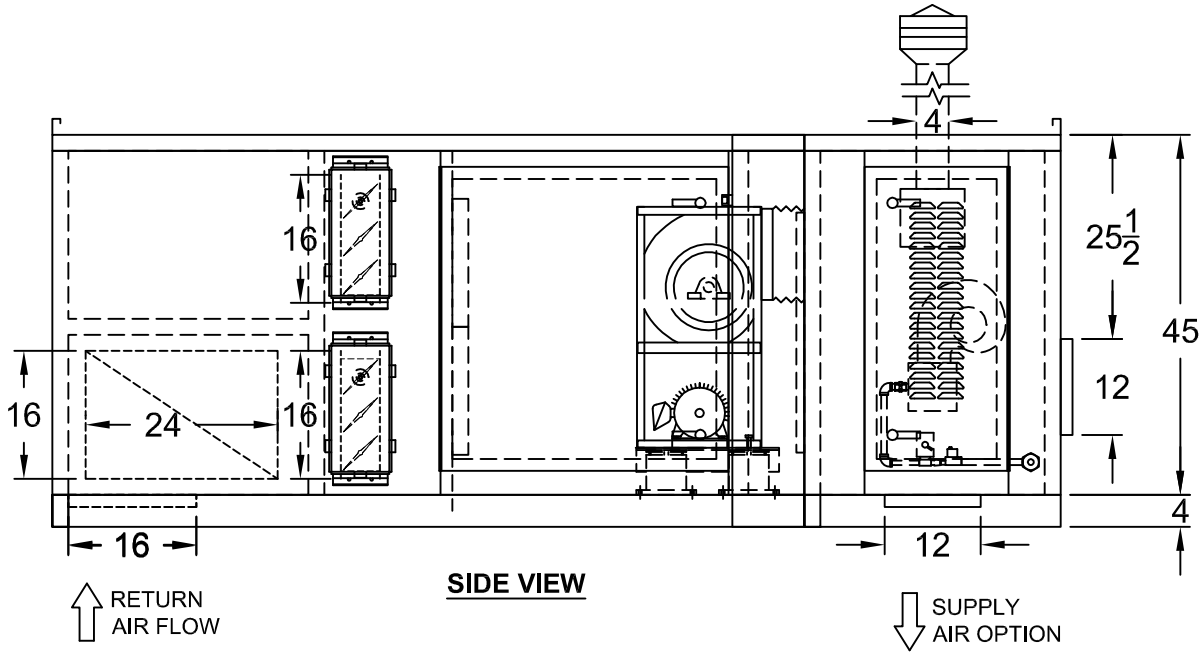
ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, MIX BOX, COIL PLENUM & HORIZONTAL DISCHARGE





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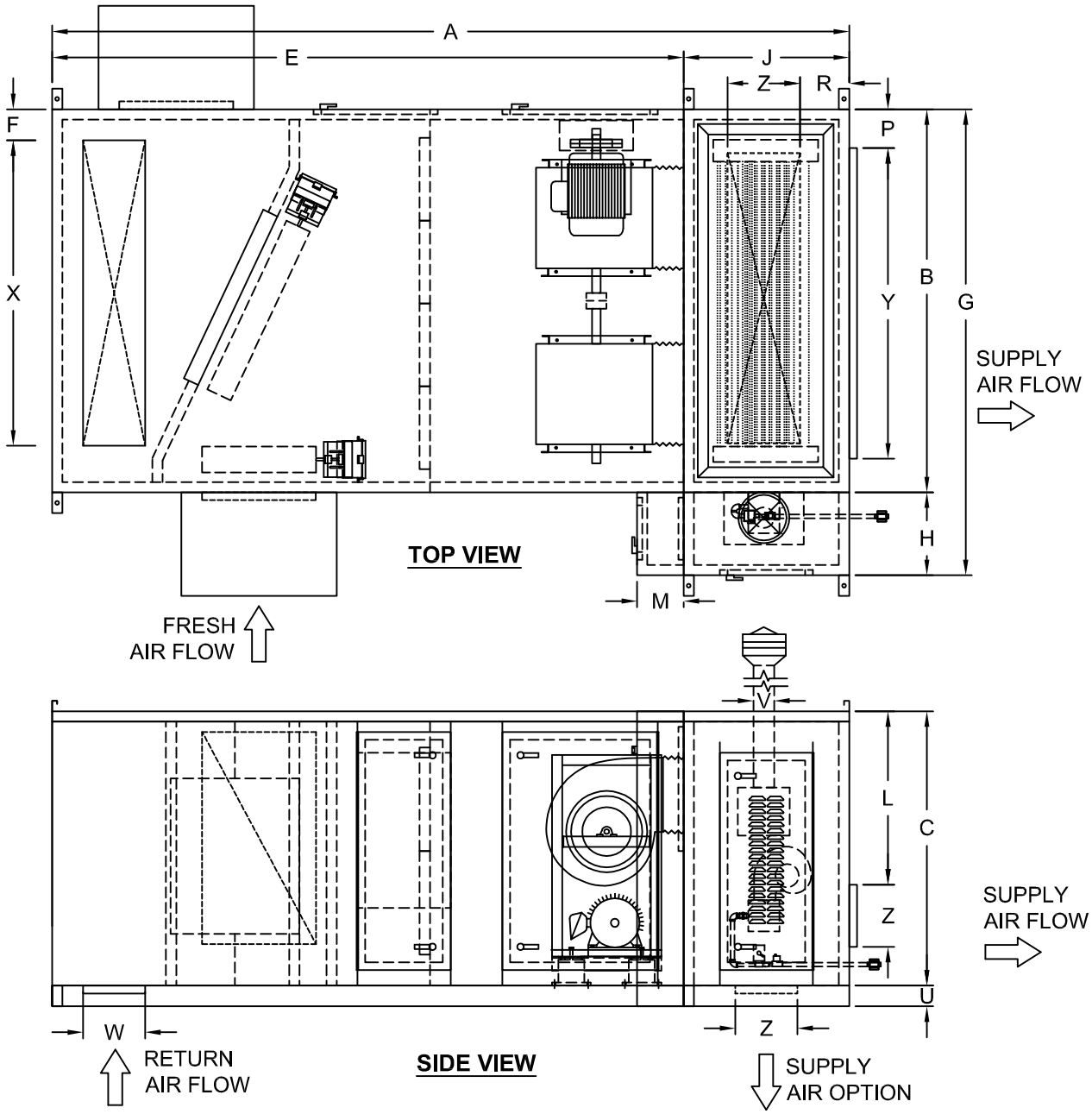
ICE WESTERN	HTDM 82 SERIES	TITLE: HTDM 200-HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER & MIX BOX WITH RELIEF FA



MODEL	A	B	C	E	F	G	H	J	K	L	M	N	P	R	U	V	W	X	Y	Z
400	180	60	45	122	6	76	16	32	15	33 ½	9	26x26	12	10 ½	4	8	14	42	36	12
600	180	74	45	122	13	90	16	32	10	33 ½	9	30x30	8	10 ½	4	8	20	48	58	12
1000	202	84	55	122	6	102	18	50	14	42 ¾	N/A	32x32	5	9 ¼	4	10	26	66	74	20
1500	211	89	78	126	6	107	18	51	12	44 ½	N/A	36x36	5	12 ½	4	12	30	70	78	24
2000	236	106	78	126	6	126	20	54	16	43 ½	N/A	36x36	6	17	6	14	30	92	100	20
2500	242	115	88	126	7	139	22	60	12	48 ½	N/A	42x42	5	18	6	16	36	96	104	24
3000	252	118	88	126	7	142	24	66	18	44 ½	N/A	46x46	6	20 ½	6	18	40	102	106	26

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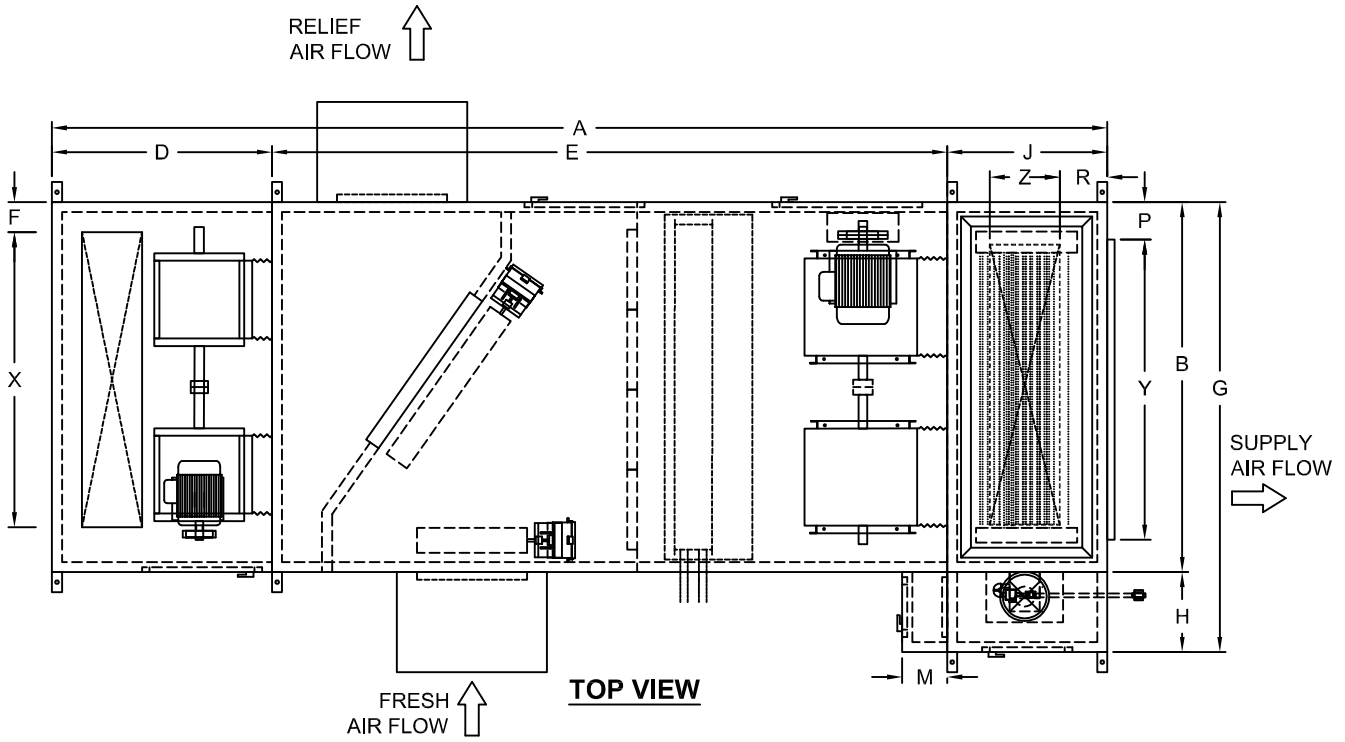
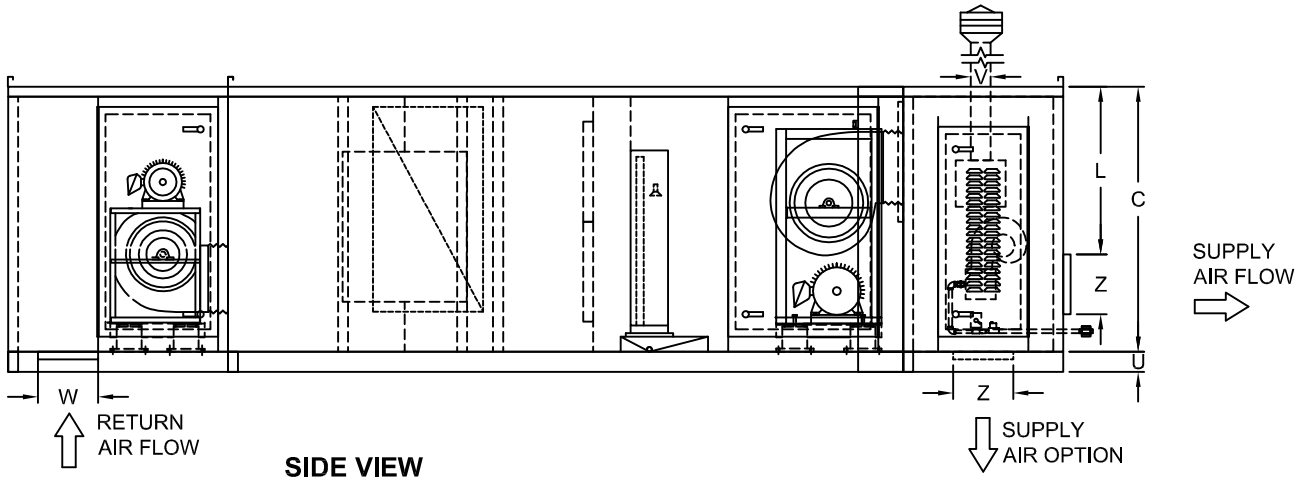
ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED
c/w FLAT FILTER & MIX BOX WITH RELIEF FA





MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	U	V	W	X	Y	Z
200	233	36	45	32	149	6	52	16	32	12	33 ½	9	24x24	7	10 ½	4	6	18	18	20	12
400	222	60	45	34	138	6	76	16	32	15	33 ½	9	26x26	12	10 ½	4	8	14	42	36	12
600	222	74	45	37	138	13	90	16	32	10	33 ½	9	30x30	8	10 ½	4	8	20	48	58	12
1000	245	84	55	42	143	6	102	18	50	14	42 ¾	N/A	32x32	5	9 ¼	4	10	26	66	74	20
1500	250	89	78	45	147	6	107	18	51	12	44 ½	N/A	36x36	5	12 ½	4	12	30	70	78	24
2000	253	106	78	48	147	6	126	20	54	16	43 ½	N/A	36x36	6	17	6	14	30	92	100	20
2500	259	115	88	52	147	7	139	22	60	12	48 ½	N/A	42x42	5	18	6	16	36	96	104	24
3000	265	118	88	57	147	7	142	24	66	18	44 ½	N/A	46x46	6	20 ½	6	18	40	102	106	26

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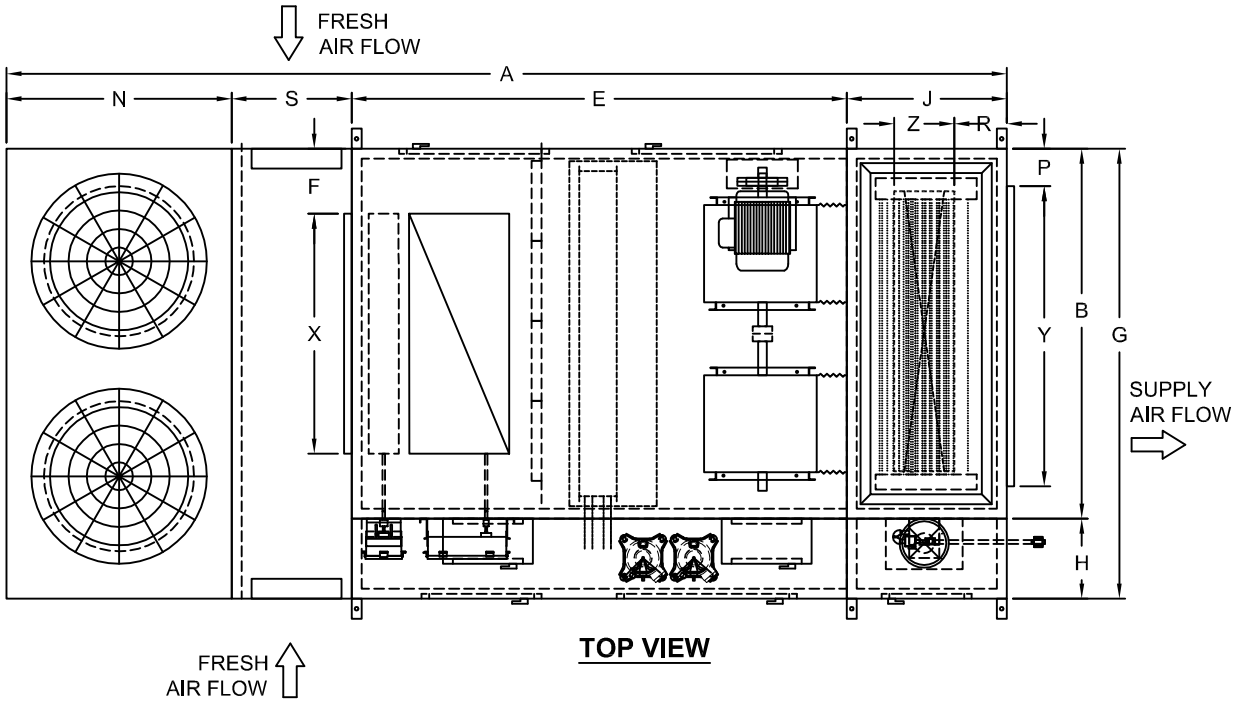
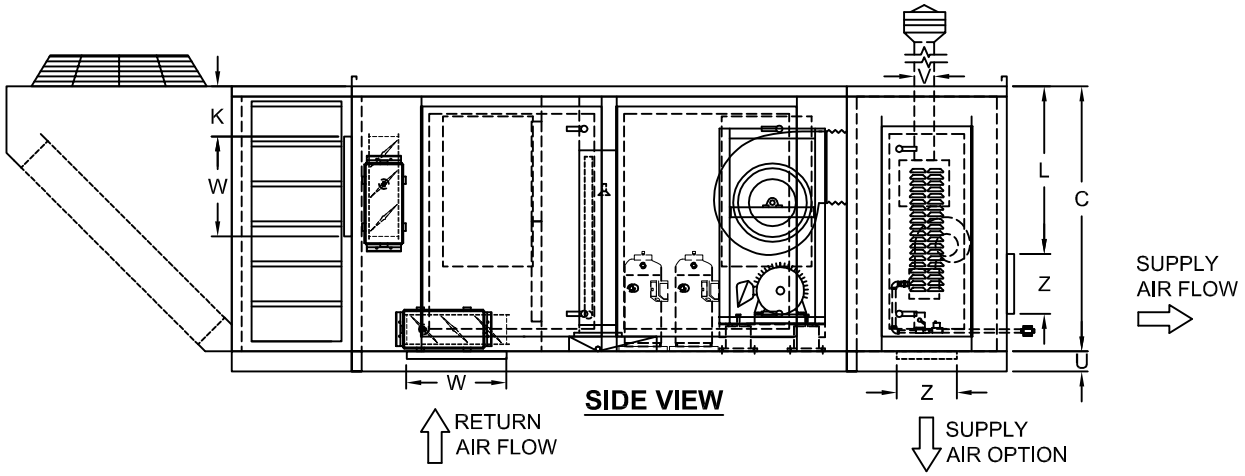
ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, RETURN BLOWER SECTION, COIL & MIX BOX WITH RELIEF FA



TOP VIEW



SIDE VIEW

A1/N1: UNIT WITH SINGLE CONDENSER (AS SHOWN)
A2/N2: UNIT WITH V-BANK CONDENSER
A3/N3: UNIT WITH TRIPLE CONDENSER

MODEL	A1	A2	A3	B	C	E	F	G	H	J	K	L	N1	N2	N3	P	S	U	V	W	X	Y	Z
200	171	205	-	36	45	83	6	52	16	32	12	33 ½	42	76	-	7	14	4	6	18	18	20	12
400	183	219	-	60	45	95	6	76	16	32	15	33 ½	42	78	-	12	14	4	8	14	42	36	12
600	200	235	268	74	45	99	13	90	16	32	10	42 ¾	45	80	113	8	24	4	8	20	48	58	12
1000	230	267	300	84	55	109	6	102	18	50	14	44 ½	45	82	115	5	26	4	10	26	66	74	20
1500	237	276	312	89	78	113	6	107	18	51	12	44 ½	45	84	120	5	28	4	12	30	70	78	24
2000	243	281	319	106	78	113	6	126	20	54	16	43 ½	48	86	124	6	28	6	14	30	92	100	20
2500	251	291	333	115	88	113	7	139	22	60	12	48 ½	48	88	130	5	30	6	16	36	96	104	24
3000	267	309	359	118	88	123	7	142	24	66	18	44 ½	48	90	140	6	30	6	18	40	102	106	26

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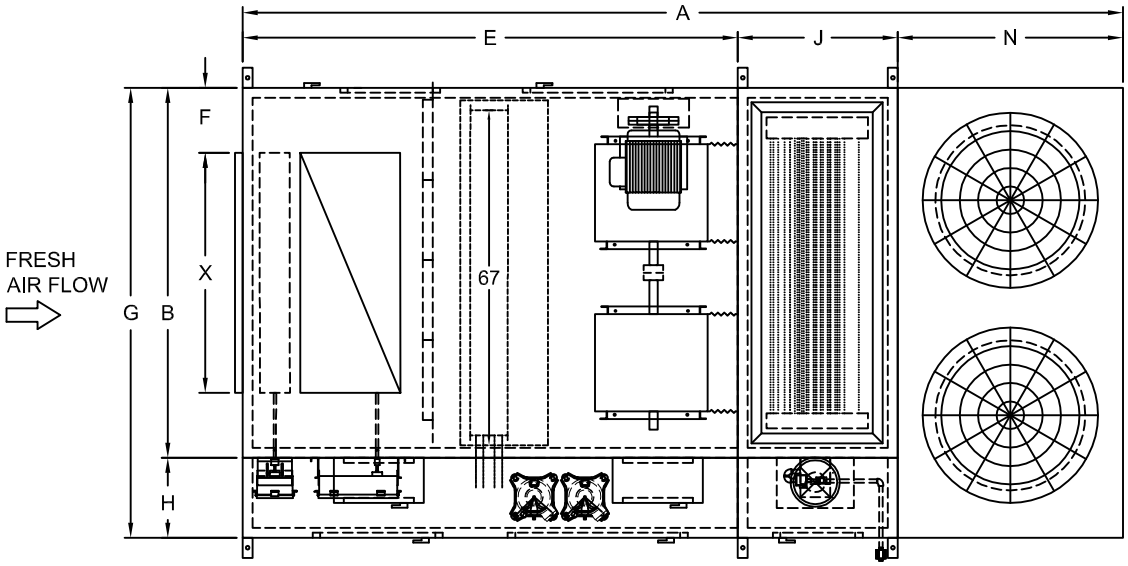
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

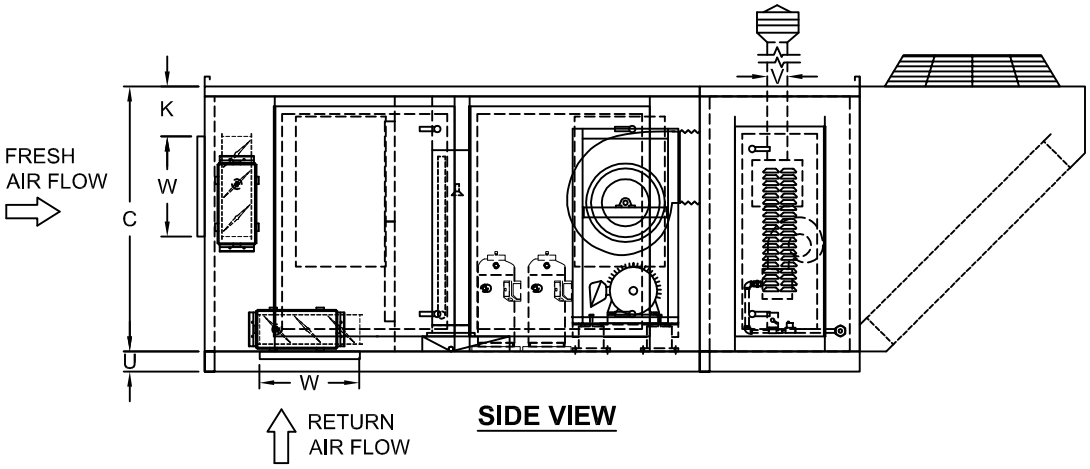
ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, DX COIL, MIX BOX, HORIZONTAL DISCHARGE AND CONDENSER



TOP VIEW

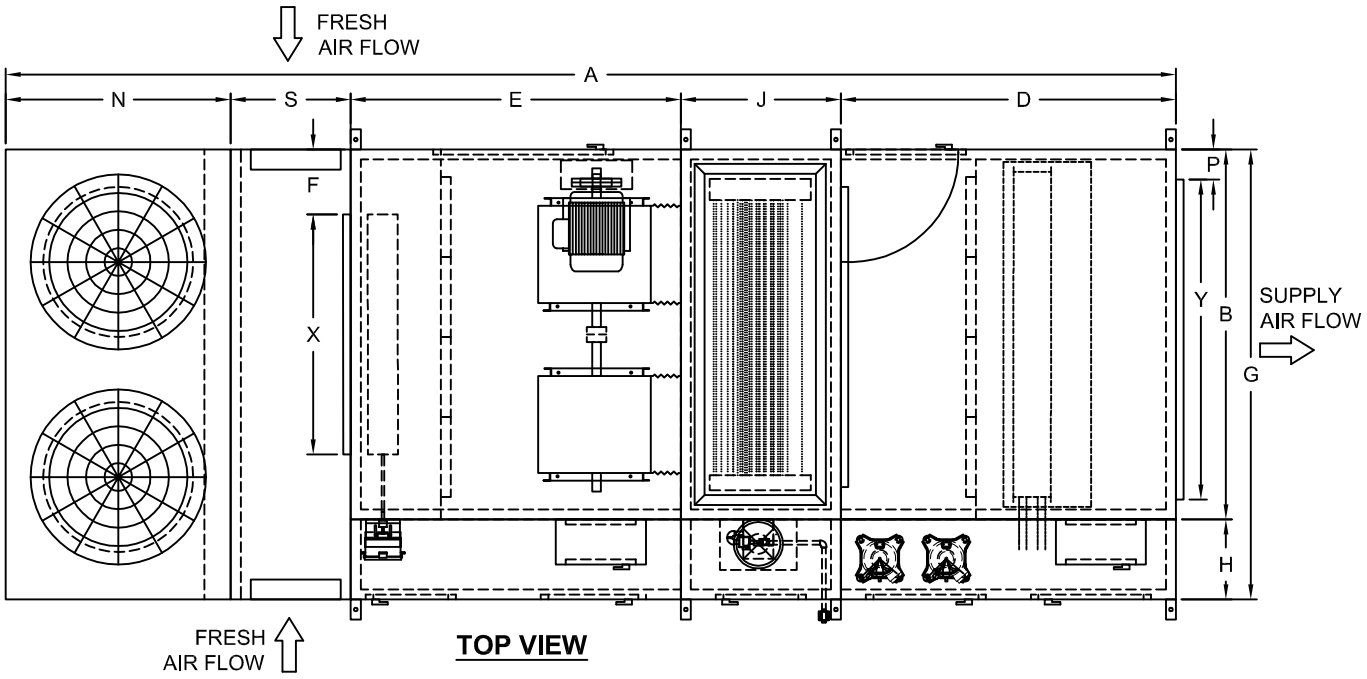


SIDE VIEW

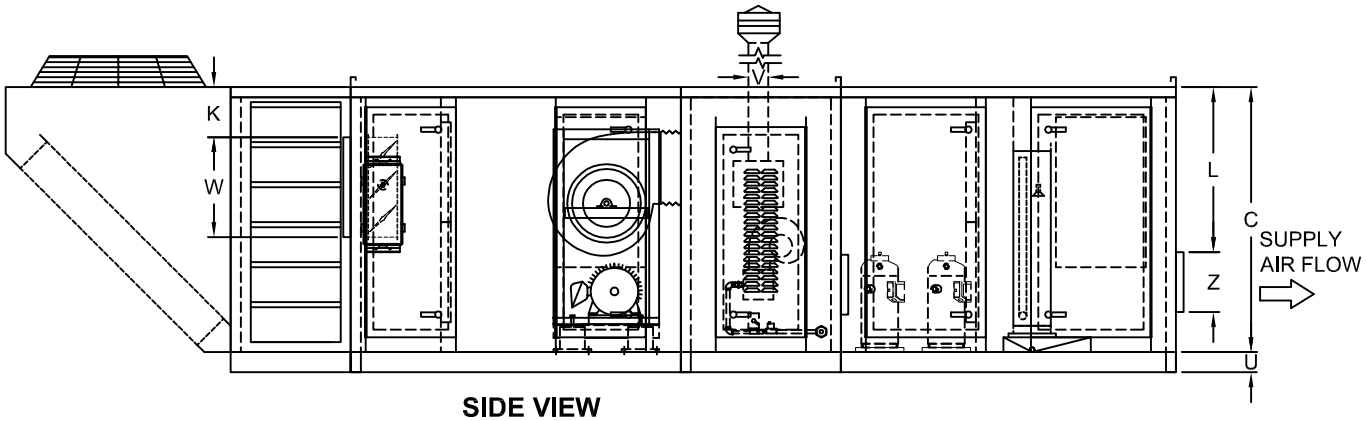
A1/N1: UNIT WITH SINGLE CONDENSER (AS SHOWN)
A2/N2: UNIT WITH V-BANK CONDENSER
A3/N3: UNIT WITH TRIPLE CONDENSER

MODEL	A1	A2	A3	B	C	E	F	G	H	J	K	N1	N2	N3	P	U	V	W	X	Y	Z
200	157	191	-	36	45	83	6	52	16	32	12	42	76	-	7	4	6	14	22	20	12
400	169	205	-	60	45	95	6	76	16	32	15	42	78	-	12	4	8	14	42	36	12
600	176	211	244	74	45	99	13	90	16	32	10	45	80	113	8	4	8	20	48	58	12
1000	204	241	274	84	55	109	6	102	18	50	14	45	82	115	5	4	10	26	66	74	20
1500	209	248	284	89	78	113	6	107	18	51	12	45	84	120	5	4	12	30	70	78	24
2000	215	253	291	106	78	113	6	126	20	54	16	48	86	124	6	6	14	30	92	100	20
2500	221	261	303	115	88	113	7	139	22	60	12	48	88	130	5	6	16	36	96	104	24
3000	237	279	329	118	88	123	7	142	24	66	18	48	90	140	6	6	18	40	102	106	26

NOTE:
1. DIMENSIONS ARE GENERALIZED FOR ILLUSTRATIVE PURPOSES. CONTACT I.C.E. FOR A NO-OBLIGATION DESIGN CUSTOMIZED TO MEET YOUR SPECIFIC NEEDS
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED. RECOMMENDED CLEARANCES IS MINIMUM 24".
3. 1-1/2" DISCHARGE & INLET FLANGES AT OPENINGS.
4. RIGHT HAND UNIT SHOWN, LEFT HAND OPPOSITE SHOWN
5. LIFTING LUG 2"x4" (TYP.)
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS



TOP VIEW



SIDE VIEW

A1/N1: UNIT WITH SINGLE CONDENSER (AS SHOWN)
A2/N2: UNIT WITH V-BANK CONDENSER
A3/N3: UNIT WITH TRIPLE CONDENSER

MODEL	A1	A2	A3	B	C	D	E	F	G	H	J	K	L	N1	N2	N3	P	S	U	V	W	X	Y	Z
200	198	232	-	36	45	54	56	6	52	16	32	12	33 ½	42	76	-	7	14	4	6	14	22	20	12
400	208	244	-	60	45	54	66	6	76	16	32	15	33 ½	42	78	-	12	14	4	8	14	42	36	12
600	211	246	279	74	45	54	66	13	90	16	32	10	33 ½	45	80	113	8	24	4	8	20	48	58	12
1000	241	278	311	84	55	54	66	6	102	18	50	14	42 ¾	45	82	115	5	26	4	10	26	66	74	20
1500	248	287	323	89	78	54	70	6	107	18	51	12	44 ½	45	84	120	5	28	4	12	30	70	78	24
2000	254	292	330	106	78	54	70	6	126	20	54	16	43 ½	48	86	124	6	28	6	14	30	92	100	20
2500	262	302	344	115	88	54	70	7	139	22	60	12	48 ½	48	88	130	5	30	6	16	36	96	104	24
3000	268	310	360	118	88	54	70	7	142	24	66	18	44 ½	48	90	140	6	30	6	18	40	102	106	26

NOTE:
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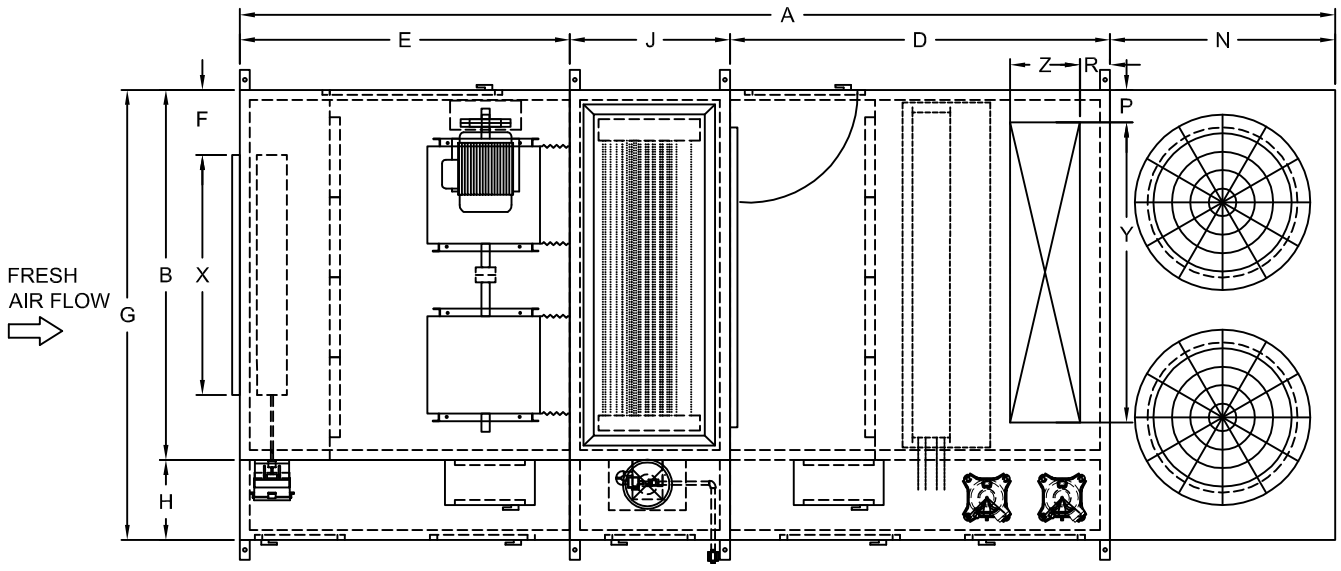
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED. RECOMMENDED CLEARANCES IS MINIMUM 24".
3. 1-1/2" DISCHARGE & INLET FLANGES AT OPENINGS.
4. RIGHT HAND UNIT SHOWN, LEFT HAND OPPOSITE SHOWN
5. LIFTING LUG 2"x4" (TYP.)
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

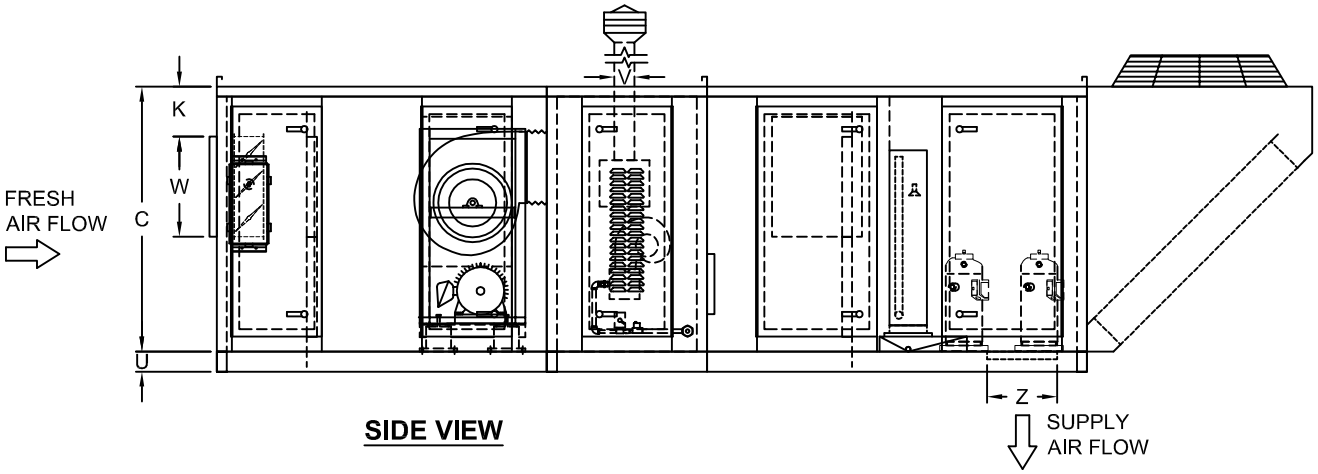
ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, DX COIL PLENUM, HORIZONTAL DISCHARGE & CONDENSER



TOP VIEW



SIDE VIEW

A1/N1: UNIT WITH SINGLE CONDENSER (AS SHOWN)
A2/N2: UNIT WITH V-BANK CONDENSER
A3/N3: UNIT WITH TRIPLE CONDENSER

MODEL	A1	A2	A3	B	C	D	E	F	G	H	J	K	N1	N2	N3	P	R	U	V	W	X	Y	Z
200	206	240	-	36	45	76	56	6	52	16	32	12	42	76	-	7	6	4	6	14	22	20	12
400	222	258	-	60	45	82	66	6	76	16	32	15	42	78	-	12	6	4	8	14	42	36	12
600	219	254	287	74	45	76	66	13	90	16	32	10	45	80	113	8	6	4	8	20	48	58	12
1000	243	280	313	84	55	82	66	6	102	18	50	14	45	82	115	5	6	4	10	26	66	74	20
1500	252	291	327	89	78	86	70	6	107	18	51	12	45	84	120	5	6	4	12	30	70	78	24
2000	254	292	330	106	78	82	70	6	126	20	54	16	48	86	124	6	6	6	14	30	92	100	20
2500	264	304	346	115	88	86	70	7	139	22	60	12	48	88	130	5	6	6	16	36	96	104	24
3000	272	314	364	118	88	88	70	7	142	24	66	18	48	90	140	6	6	6	18	40	102	106	26

NOTE:
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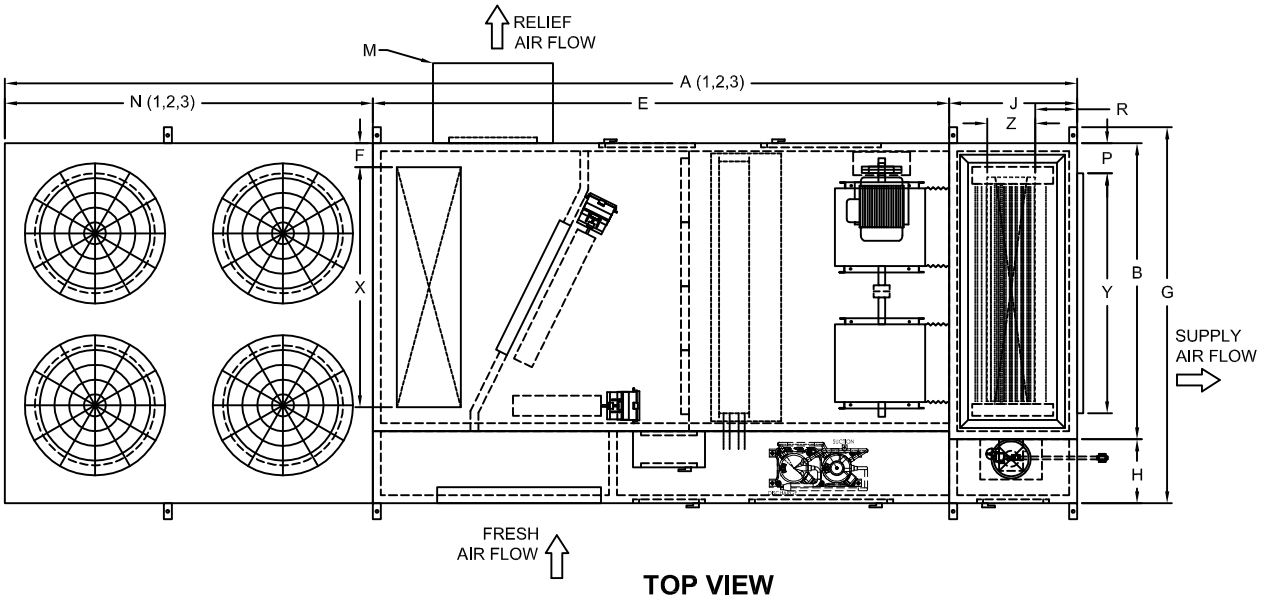
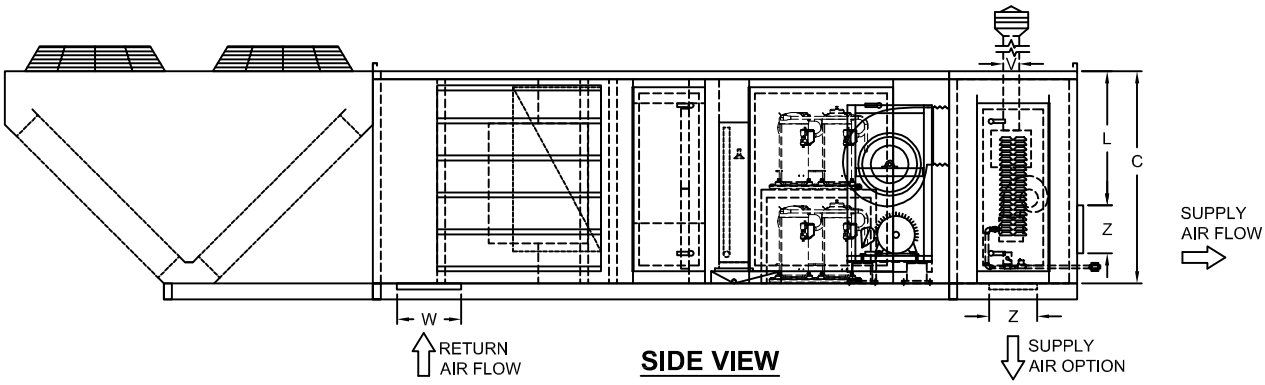
9. SEE PAGE 7 FOR UNIT WEIGHTS



TOP VIEW



SIDE VIEW

A1/N1: UNIT WITH SINGLE CONDENSER
A2/N2: UNIT WITH V-BANK CONDENSER (AS SHOWN)
A3/N3: UNIT WITH TRIPLE CONDENSER

MODEL	A1	A2	A3	B	C	E	F	G	H	J	K	L	M	N1	N2	N3	P	R	U	V	W	X	Y	Z
200	223	257	-	36	45	149	6	52	16	32	12	33 ½	24x24	42	76	-	7	10 ½	4	6	18	18	20	12
400	212	248	-	60	45	138	6	76	16	32	15	33 ½	26x26	42	78	-	12	10 ½	4	8	14	42	36	12
600	215	250	283	74	45	138	13	90	16	32	10	33 ½	30x30	45	80	113	8	10 ½	4	8	20	48	58	12
1000	238	275	308	84	55	143	6	102	18	50	14	42 ¾	32x32	45	82	115	5	9 ¼	4	10	26	66	74	20
1500	243	282	318	89	78	147	6	107	18	51	12	44 ½	36x36	45	84	120	5	12 ½	4	12	30	70	78	24
2000	249	287	325	106	78	147	6	126	20	54	16	43 ½	36x36	48	86	124	6	17	6	14	30	92	100	20
2500	255	295	337	115	88	147	7	139	22	60	12	48 ½	42x42	48	88	130	5	18	6	16	36	96	104	24
3000	261	303	353	118	88	147	7	142	24	66	18	44 ½	46x46	48	90	140	6	20 ½	6	18	40	102	106	26

NOTE:
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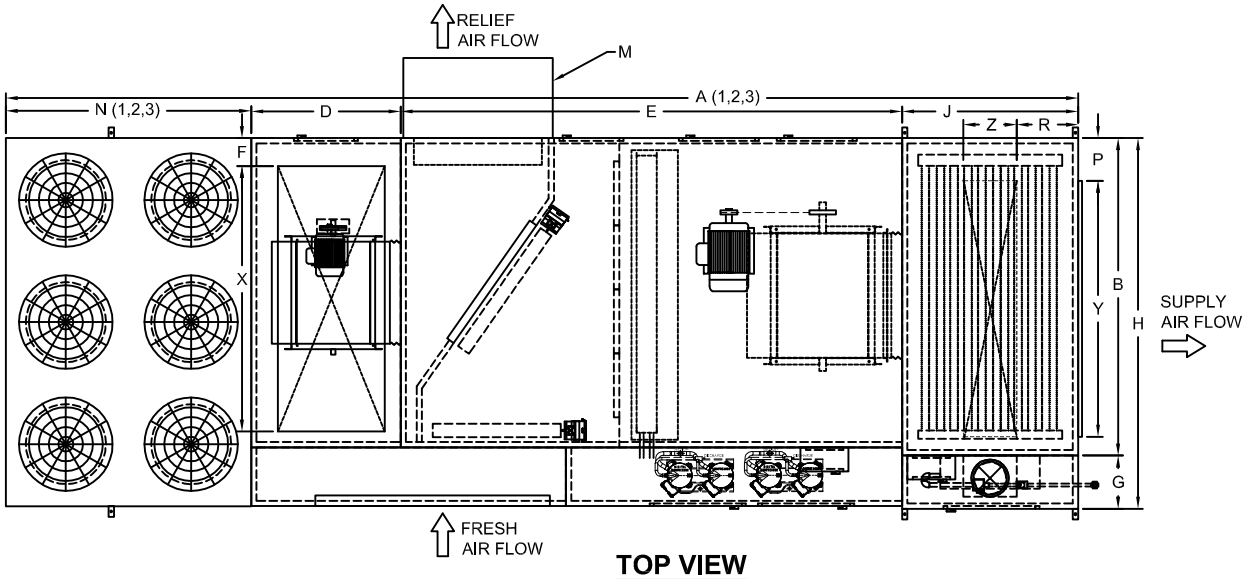
5. LIFTING LUG 2"x4" (TYP.)
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

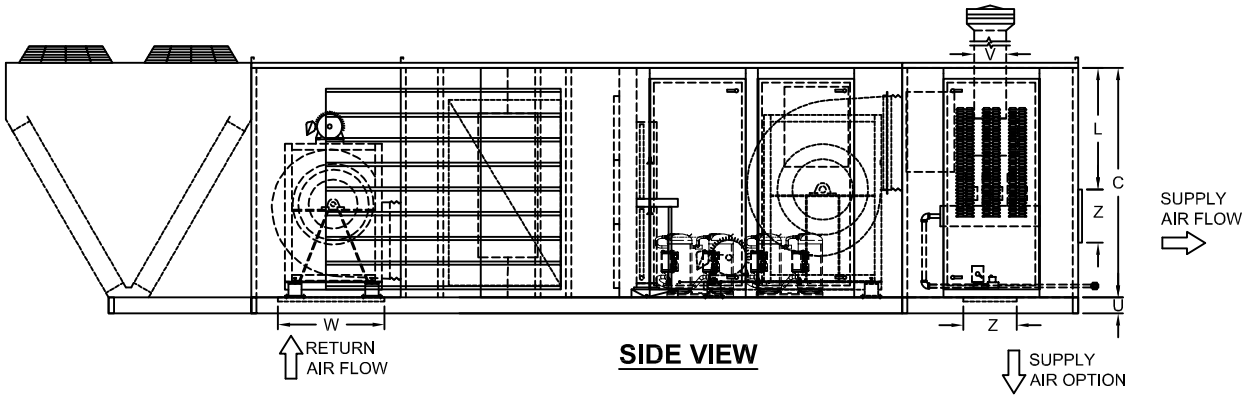
ICE WESTERN

HTDM
82 SERIES

TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, DX COIL & MIX BOX WITH RELIEF FA & CONDENSER



TOP VIEW



SIDE VIEW

A1/N1: UNIT WITH SINGLE CONDENSER
A2/N2: UNIT WITH V-BANK CONDENSER (AS SHOWN)
A3/N3: UNIT WITH TRIPLE CONDENSER

MODEL	A1	A2	A3	B	C	D	E	F	G	H	J	K	L	M	N1	N2	N3	P	R	U	V	W	X	Y	Z
200	255	289	-	36	45	32	149	6	52	16	32	12	33 ½	24x24	42	76	-	7	10 ½	4	6	18	18	20	12
400	246	282	-	60	45	34	138	6	76	16	32	15	33 ½	26x26	42	78	-	12	10 ½	4	8	14	42	36	12
600	252	287	320	74	45	37	138	13	90	16	32	10	33 ½	30x30	45	80	113	8	10 ½	4	8	20	48	58	12
1000	280	317	350	84	55	42	143	6	102	18	50	14	42 ¾	32x32	45	82	115	5	9 ¼	4	10	26	66	74	20
1500	288	327	363	89	78	45	147	6	107	18	51	12	44 ½	36x36	45	84	120	5	12 ½	4	12	30	70	78	24
2000	297	335	373	106	78	48	147	6	126	20	54	16	43 ½	36x36	48	86	124	6	17	6	14	30	92	100	20
2500	307	347	389	115	88	52	147	7	139	22	60	12	48 ½	42x42	48	88	130	5	18	6	16	36	96	104	24
3000	318	360	410	118	88	57	147	7	142	24	66	18	44 ½	46x46	48	90	140	6	20 ½	6	18	40	102	106	26

NOTE:
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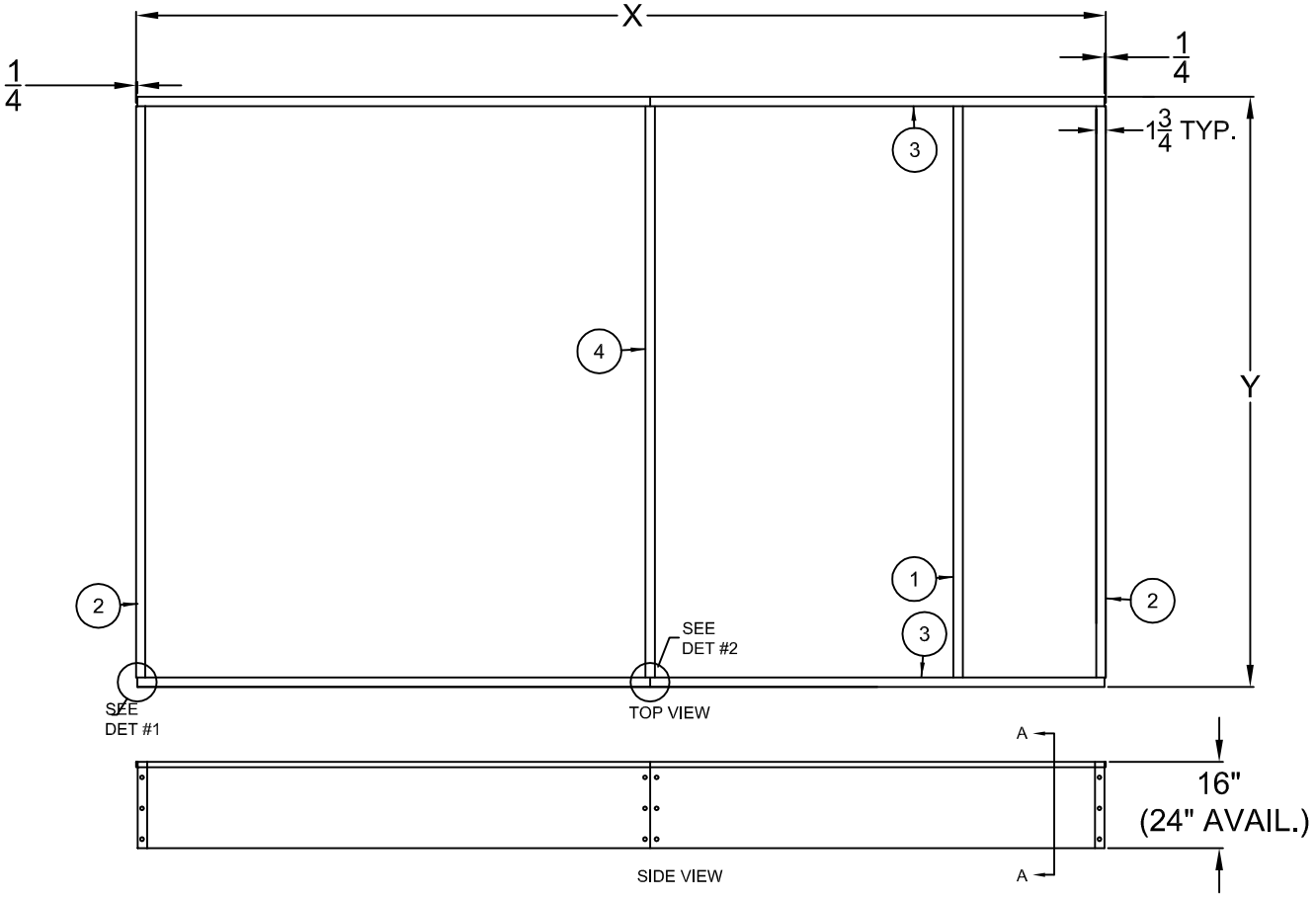
4. RIGHT HAND UNIT SHOWN, LEFT HAND OPPOSITE SHOWN
5. LIFTING LUG 2"x4" (TYP.)
6. SEE PAGE 30 FOR INTAKE AND EXHAUST HOOD DIMENSIONS
7. DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND TO MANUFACTURING TOLERANCES.
8. SEE PAGE 29 FOR ROOF CURB DIMENSIONS
9. SEE PAGE 7 FOR UNIT WEIGHTS

ICE WESTERN

HTDM
82 SERIES

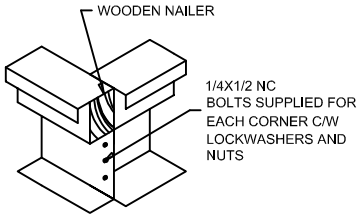
TITLE:
HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER, RETURN BLOWER SECTION, DX COIL, MIX BOX WITH RELIEF FA & CONDENSER



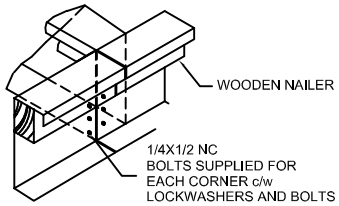
1. DUCT SUPPORT ANGLE (BTM. DISCH. ONLY)
2. CURB ENDS
3. CURB SIDES
4. CENTER CURB BRACING

UNITS WITH 4" BASE FRAME
X: SUBTRACT 4⅝" FROM THE CHOSEN UNIT'S "A" DIMENSION
Y: SUBTRACT 4⅝" FROM THE CHOSEN UNIT'S "B" DIMENSION

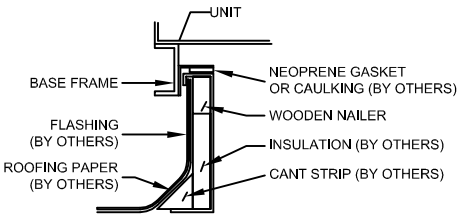
UNITS WITH 6" BASE FRAME
X: SUBTRACT 5¾" FROM THE CHOSEN UNIT'S "A" DIMENSION
Y: SUBTRACT 5¾" FROM THE CHOSEN UNIT'S "B" DIMENSION



CORNER BOLTING ASSEMBLY DETAIL #1



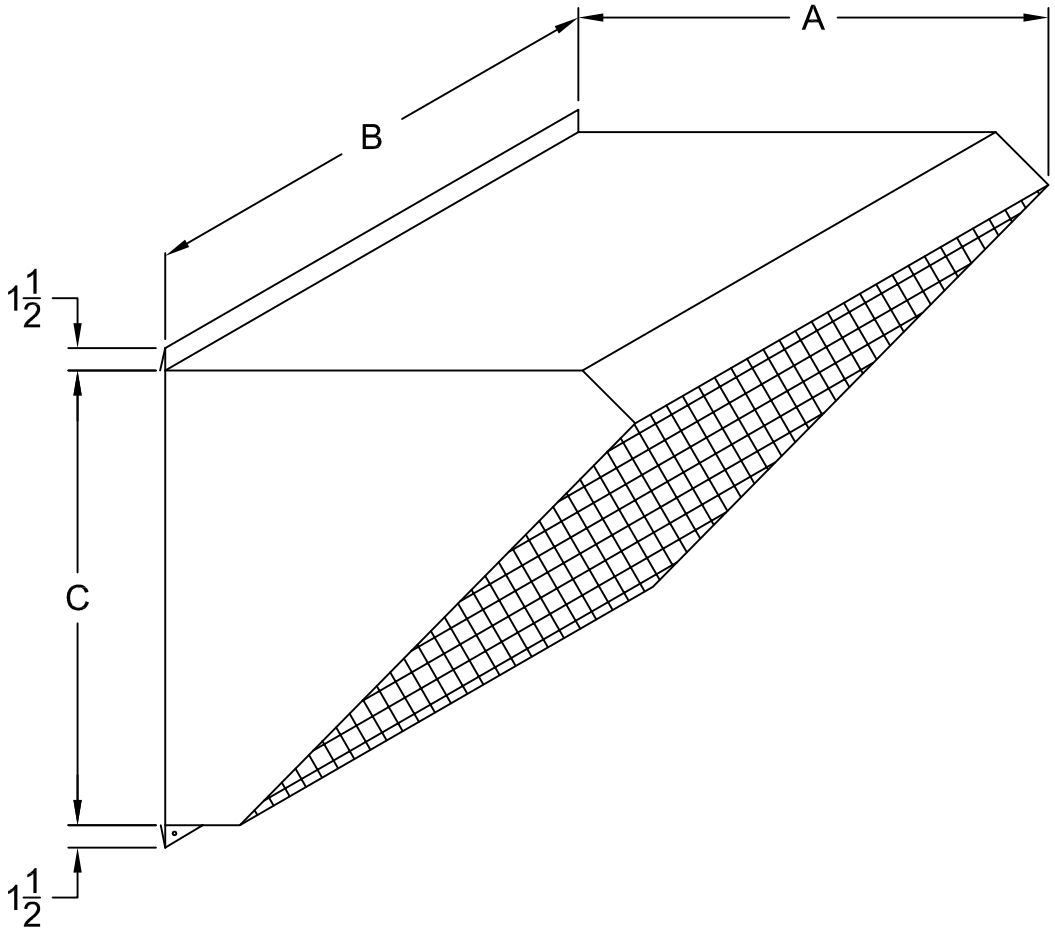
CENTER BRACING
BOLTING ASSEMBLY DETAIL #2



ROOF CURB CROSS SECTION DETAIL AA

NOTE:
1. FOR ILLUSTRATIVE PURPOSES ONLY. CONTACT ICE WESTERN FOR DIMENSIONS SPECIFIC TO YOUR PROJECT.
2. ASSEMBLY HARDWARE INCLUDED WITH CURB
3. CURBS ARE SHIPPED SEPARATELY AND FIELD INSTALLED BY OTHERS
4. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES
5. FOR REFERENCE ONLY, SUBJECT TO CHANGE WITHOUT NOTICE

ICE WESTERN	HTDM 82 SERIES	TITLE: HORIZONTAL CONFIGURATION GRAVITY VENTED c/w FLAT FILTER



HTDM 91 PLUS SERIES			
MODEL	A	B	C
200	19 3/4	36	51 1/2
400	19 3/4	60	51 1/2
600	39	74	51 1/2
1000	43 1/2	84	67 1/2
1500	52 3/4	89	76 1/2
2000	79	111	76 1/2
2500	79	115	86 1/2
3000	79	118	86 1/2

HTDM 82 TYPICAL SPECIFICATIONS

TYPE AND DESCRIPTION

Furnish an I.C.E HTDM DX Model indirect fired self-contained make-up air unit with packaged cooling in accordance with the following specifications. The unit shall be ETL and CETL certified.

The heater shall be designed to ensure a minimum efficiency of 80 - 85% at full firing rate and the power burner has a turndown capacity between 23:1 and 60:1 depending on the HTDM selection. The heat exchanger and blower shall be constructed so they can easily be disassembled and reassembled in the field if necessary. The unit shall be equipped to operate from a single point power connection. The heater shall be flame tested before shipment and the manufacturer shall keep a detailed flame test report on file. Factory testing shall be confirmed with a combustion analyzer and flow meter. The heater shall be shipped completely factory assembled and wired including all pre-piped manifold components and fuses, ready for immediate power and fuel connections.

CASING

The unit exterior casing shall be heavy gauge G90 rated bonderized steel. Unit roof shall feature standing seam construction. The entire unit casing shall be insulated with 1-in. thick 1.5-lb. (2-in. thick 1.5-lb.) fiberglass insulation with hard neoprene backing in a sandwich wall fashion (22-gauge solid liner). The unit exterior shall be finished with industrial enamel (catalyzed epoxy) paint. An integral welded iron channel frame shall support the unit casing. The structural iron frame shall be sandblasted, primed and finished with industrial enamel (catalyzed epoxy) paint.

BLOWER/MOTOR SECTION

The fan section and motor assembly shall be constructed in accordance with the requirements of the Air Moving and Conditioning Association (AMCA). The assembly shall be designed to house the fan(s), bearings, motor, and v-belts, which shall be selected for at least 50% above the rated motor capacity. The fan(s) and motor shall be mounted on a welded unitary base made of angle iron frame. The frame shall be sandblasted, primed and finished with industrial enamel (catalyzed epoxy) paint. The unitary base shall be provided with seismic spring vibration isolation. The blower section shall have a hinged access door with Austin Romtech handles to allow easy maintenance of filters and belts. The NEMA T-Frame motor shall be mounted on an adjustable base located within the fan section. The blower shall be a forward curve DWDI centrifugal blower. The blower wheel shall be statically and dynamically balanced, and mounted on a turned, ground and polished shaft with rigid bearing supports. The shaft shall be designed with a maximum operating speed not exceeding 75% of the first critical speed. The bearings shall be split taper lock ball bearing type L20 minimum life of 100,000 hours (L10 200 kHr).

Fan performance shall be based on tests conducted in accordance with AMCA Standard Test Code for Air moving Devices. (All fans shall have sharply rising pressure characteristic extending throughout the operating range and continuing to rise well beyond the efficiency peak to assure quiet and stable operation under all conditions. Horsepower characteristics shall be truly non-overloading and shall reach a peak in the normal selection area.) Fan manufacturer shall provide sound power ratings in the eight octave bands, which shall be based on AMCA Standard 300-67, test, setup number one. Sound power ratings shall be referenced 10-12 watts. A factory dynamic balance shall be made on all fans after their assembly. An IRD or PMC analyzer shall be used to measure velocity, and the final reading shall not exceed 0.1 inches per second. The exact level of vibration shall be recorded on the fan as proof of the final dynamic balance at the factory.

HEAT EXCHANGER

The heat exchanger shall be of two-pass design, made up of at least 16-gauge stainless steel drum and tubes. The primary and secondary heat transfer surfaces shall be constructed of Type 409 series stainless steel, with internal stainless steel high efficiency enhancing baffles. The stainless steel tubes shall be continuously welded into the secondary front and rear header tube sheets to ensure an airtight seal. After welding, the heat exchanger shall be pressure tested to 20 psi to ensure that there are no leaks. Manufacturer shall provide complete pressure testing report with Installation Manual. Failure to provide this report will result in a 10% holdback. Units shall be provided with multiple condensate drains. The heat exchanger section shall have an internal radiation shield to maintain a jacket loss of less than 2% of rated output. All heat transfer surfaces, including headers and the front collector box, shall be inside the casing and in the airstream. The construction of the heat exchanger shall permit free, unrestricted lateral, vertical, and peripheral expansion during the heating and cooling cycle without damage or strain to any parts. The burner shall be constructed with at least 14-gauge stainless steel and with the air baffles being made up of 430 stainless steel to ensure high durability and life of the burner. The burner assembly shall be a blow through positive pressure type with an intermittent pilot ignition system. Flame supervision shall be with a solid state programmed flame relay complete with flame rod. The unit's burner motor and modulating gas valve must be electronically controlled to guarantee, to the customer, a highly efficient unit at all times and applications. The unit efficiency shall be a minimum of 80 - 85% through the entire operating range depending on which HTDM selection is used and shall be independently tested and verified by ETL. The main and pilot manifolds shall be completely factory pre-piped to the burner. This assembly must be factory wired and include the following minimum components: main and pilot manual shut-off valves, main and pilot regulators, main and pilot automatic shut-off valves and adequate union and test ports for unconstrained service. HTDM 200, 400 and 600 indoor units can be vented using type B vent without a draft hood. HTDM 1000 and 1500 indoor units can be vented using type B vent with a diverter to assure safety and guarantee that all combustible gases leave the unit. There must also be a means of collecting and disposal of condensate formed in the flue gas by means of a 409 stainless steel flue box with drain and heat exchanger drain. Drains shall be made of stainless steel tubing.

HEATING CONTROLS

Units must be controlled electronically to achieve a turndown of at least 23:1 and to guarantee the heat exchanger efficiencies of at least 82%. Unit controller must be a true proportional integral decay (PID) controller to maintain the turndown and unit efficiencies. The controller must be able to electronically adjust the burner blower and modulating gas valve to maintain ideal combustion levels and shall monitor the amount of combustion air available to guarantee proper emission standards. Unit control will consist of a highly accurate feedback control system. Corrective action in this system is taken only when the balance has been upset due to a change in the disturbance variable. Any other control that does not behave in this manner is unacceptable. The ICECON III controller analyzes the process and calculates a control error from the measured values. Continuous cycling of the burner or blower is unacceptable. The proportional control in the ICECON III controller will provide an output signal in proportion to the size of the control error. If the control error persists, the output will continue to ramp in the correct direction, until the control error is eliminated.

The ICECON III modulation controller is compatible with the following external inputs:
1) Discharge air sensor.
2) Discharge air sensor with space override thermostat.
3) Discharge air sensor with remote temperature selector and space override thermostat.
4) Discharge air sensor with high and low temperature remote temperature selector and space reset thermostat.
5) 0-10 volt dc signal from building management system.
6) 4-20 mA signal from building management system.

COOLING CONTROLS
Cooling control shall be achieved via a multi-stage sequencer. The sequencer shall be controlled with an analog signal provided by the discharge air thermostat. As the discharge air thermostat requires cooling the signal shall increase, thereby turning on the stages at specific set points. The set points shall be set with appropriate offset and differential to ensure accurate discharge temperature is maintained. The stages are to be sequenced without turning on and off of compressors to minimize unnecessary wear on the compressors. Upon sensing a call for cooling from the space, the compressors shall provide full cooling until the space sensor is satisfied, upon which time the cooling shall revert to discharge air control. A low discharge temperature set point with a large differential shall be set to prevent the compressor from cycling on and off. The compressor will remain on low setting until cooling is disabled manually or the ambient temperature falls below the minimum set point.

ELECTRICAL CONTROL EQUIPMENT
Electrical assembly and components shall be in strict accordance with the latest provisions and requirements of the Nation Electric Code. Control cabinet shall be designed and constructed to ETL specifications. A safety disconnect switch shall be mounted on the unit. The controls shall be located in a weatherproof cabinet. Provisions for service padlocking shall be provided. The following items shall be located within the cabinet: fuses, starters, control relays, timing and holding relays, resistors and numbered terminal strips. All components shall be labeled and cross-referenced to control and field wiring diagrams. The control circuit shall be 24V, single phase. Wiring shall be neatly run in "PANDUIT" wiring duct. Low and/or line voltage thermostats shall be furnished shipped loose for installation by others. Unit shall be equipped with automatic low limit freeze protection with bypass timer.

DAMPERS & FILTER SECTION
The dampers are to be galvanized steel (aluminum airfoil low leak) type (with seals). The dampers shall be equipped with 2-position (modulating) actuators. The filters shall be 2" pleated throwaway type with minimum of 85% arrestance and 30% efficiency. Filter access shall be through a latched and gasketed access doors located on both sides of the unit. (Final filters shall be 4 or 12 inch high efficiency cartridge filters.)

REMOTE CONTROL PANELS
Remote NEMA 1(12) locking control panel shall be equipped with summer/off/winter switch and blower on, burner on, flame failure and loaded filter lights. (A remote adjustment potentiometer shall control damper positioning.) (An LCD display shall provide system temperature and set points.)

EVAPORATOR COILS
Evaporator coils are intended for use with a wide range of applications and refrigerant types. Coils are to be designed to maximize performance under specified conditions with minimal air-side pressure drop.

- Coils shall be UL recognized as Refrigerant Containing Component. Coils to be used with refrigerant R-410A shall have undergone cycle testing, and shall be safety listed with 750 psig rating.
- Tubes and return bends shall be constructed from seamless UNS C12200 copper conforming to ASTM B224 and ASTM E527. Properties shall be O50 light annealed with a maximum grain size of 0.040 mm.
- Tubes are to be mechanically expanded into fins (secondary surface) for maximum heat transfer. Materials are to be 3/8” diameter x (0.014, 0.022) wall thickness, 1/2” diameter x (0.016, 0.025) wall thickness, or 5/8” diameter x (0.020, 0.025, 0.035, 0.049) wall thickness.
- Secondary surface (fins) shall be of the plate-fin design using aluminum or copper, with die-formed collars. Fin design to be flat, waffle, or sine-wave in a staggered tube pattern to meet performance requirements.
- Collars will hold fin spacing at specified density, and cover the entire tube surface. Aluminum properties are to be Alloy 1100 per ASTM B209, with O (soft) temper; copper is to be Alloy 11000 per ASTM B152-06 with soft (anneal) temper. Fins are to be free of oils and oxidation.
- Headers are to be constructed of seamless UNS C12200, Type L (drawn) copper material sized to match specified connection size. Type K (drawn) copper headers shall be offered as optional material.
- Die-formed copper end caps are brazed on the inside of the headers, unless spun-closed (for sized up to 1-3/8”).
- Evaporator coils shall be designed with brass liquid distributors (as required), and copper sweat suction connections. Distributors shall be capped using soft-solder for ease of cap removal; suction connections shall be capped.
- Coil casing material shall be of G90 galvanized steel, 16 gauge minimum. Heavier material, stainless steel, copper, or aluminum casing are to be provided as required.
- Intermediate tube supports are to be provided on all coils 48” and longer fin length. Coil casing on top and bottom of coils are to have double-flange construction, allowing for vertical stacking of coils.
- All coils are to be brazed with minimum 5% silver content (BCup-3) filler material to insure joint integrity.
- Coils shall be tested at 550 psig using dry nitrogen, submerged under water. Dual-operator verification shall determine that all coils are leak-free.
- Coils shall be shipped with nitrogen charge to verify leak-free integrity, and to prevent moisture migration into coil.
- Coils shall be certified to withstand 750 psig working pressure.

CONDENSER COILS

Condenser coils are intended for use with a wide range of applications and refrigerant types. Coils are to be designed to maximize performance under specified conditions with minimal air-side pressure drop.

- Coils shall be UL recognized as Refrigerant Containing Component. Coils to be used with refrigerant R-410A shall have undergone cycle testing, and shall be safety listed with 750 psig rating.
- Tubes and return bends shall be constructed from seamless UNS C12200 copper conforming to ASTM B224 and ASTM E527. Properties shall be O50 light annealed with a maximum grain size of 0.040 mm.
- Tubes are to be mechanically expanded into fins (secondary surface) for maximum heat transfer. Materials are to be 3/8" diameter x (0.014, 0.022) wall thickness, 1/2" diameter x (0.016, 0.025) wall thickness, or 5/8" diameter x (0.020, 0.025, 0.035, 0.049) wall thickness.
- Internally enhanced rifled or cross-hatched tubes can be offered as an option.
- Secondary surface (fins) shall be of the plate-fin design using aluminum or copper, with die-formed collars. Fin design to be flat, waffle, or sine-wave in a staggered tube pattern to meet performance requirements.
- Collars will hold fin spacing at specified density, and cover the entire tube surface. Aluminum properties are to be Alloy 1100 per ASTM B209, with O (soft) temper; copper is to be Alloy 11000 per ASTM B152-06 with soft (anneal) temper. Fins are to be free of oils and oxidation.
- Headers are to be constructed of seamless UNS C12200, Type L (drawn) copper material sized to match specified connection size. Type K (drawn) copper headers shall be offered as optional material.
- Die-formed copper end caps are brazed on the inside of the headers, unless spun-closed (for sized up to 1-3/8").
- Condenser coils shall be designed with copper sweat connections, and shall be shipped with caps on connections.
- Coil casing material shall be of G90 galvanized steel, 16 gauge minimum. Heavier material, stainless steel, copper, or aluminum casing are to be provided as required.
- Coils designed for hot-gas applications shall have oversized tube sheet holes for hot gas feeds to allow for free expansion and contraction of tubes during operation.
- Intermediate tube supports are to be provided on all coils 48" and longer fin length. Coil casing on top and bottom of coils are to have double-flange construction, allowing for vertical stacking of coils.
- All coils are to be brazed with minimum 5% silver content (BCup-3) filler material to insure joint integrity.
- Coils shall be tested at 550 psig using dry nitrogen, submerged under water. Dual-operator verification shall determine that all coils are leak-free.
- Coils shall be shipped with nitrogen charge to verify leak-free integrity, and to prevent moisture migration into coil.
- Coils shall be certified to withstand 750 psig working pressure.

COMPRESSORS

Hermetic digital scroll compressors shall be set on resilient neoprene mounts and complete with line voltage break internal overload protection, internal pressure relief valve and crankcase heater. Each unit shall have a minimum of two compressors. Whereby a unit utilizing two compressors the first stage compressor must be a digital scroll operating with a Emerson EC3 series stand-alone superheat controller with a built in synchronization control for the digital scroll. Unit will provide turndown on cooling. Multiple refrigeration circuits shall be separate from each other. Refrigeration circuits shall be complete with liquid line filter driers and service ports fitted with Schraeder fittings. Units shall incorporate electronic expansion valves, an EC3 digital superheat controller and combination sight glass moisture indicators. System charge will be designed for 10 degrees Fahrenheit. Each system shall be factory run and adjusted prior to shipment. Controls shall include:

- Compressor motor contacts
- Overload protection control
- Cooling relays
- Ambient compressor lockout
- Dual pressure controls
- Anti-cycle timers

CONDENSER FANS

Condenser fans shall be aluminum blade, direct drive, complete with 3 1/4 inch high venturi and 1140 RPM condenser fan motor controlled by VFD taking a signal from a transducer located in the discharge line. This, along with an electronic expansion valve allows for Floating Head and condension down to 70 degrees Fahrenheit condensing.

Packaged units shall operate down to 50 degrees Fahrenheit as standard. Minus 50 refrigeration systems are available as an option. Compressors shall be located on the side of the unit in a service enclosure complete with hinged access doors.

Custom Wiring Options

-CONTROLS SELECTED TO MEET END USER PROTOCOL
-FACTORY INSTALLED
-FACTORY PROGRAMMED
-FACTORY TESTED
-FIELD COMMISIONING SERVICES AVAILABLE

SEIMENS PLC WITH HMI

ALLEN BRADLEY PLC

B.A.C. NET CONTROLS

LON WORKS CONTROLS

ICE Western's DX Cooling Modulation

AC-Tech VFD

Programmable digital and analog I/O allowing drive to be configured for tasks such as multiple preset speeds, electronic braking and motor jogging

- **Power range: 0.37 to 22 kW**
- **Wide speed range with up to 200% torque for highly dynamic motor response**
- **EPM plug-in memory chip & programmer to copy parameters**

Tandem Digital Scroll Compressors

- **Simple, variable modulation, for temperature control within 0.5 F**
- **Lower operating cost**
- **Reduced power consumption – up to 30% more efficient than using hot-gas bypass**
- **Longer cycle times to reduce wear and improve humidity control**
- **Available for commercial air-conditioning and refrigeration applications**
- **Available in configurations from 3-30HP**

Superheat Controller EC3-X33

- **Perform all control tasks and precisely regulates the superheat at the evaporator**
- **A complete system consisting of control valve, superheat controller, and temperature and pressure sensor, controls the superheat exactly to setpoint**
- **The MOP (Maximum Operating Pressure) function protects the compressor from dangerous overload conditions**
- **Positive shut-off function eliminates the use of an additional solenoid valve, and built in backup battery closes the valve after power loss.**

EX4 Electrical Control Valve

- **Optimized for control of liquid or gaseous mass flow in refrigeration systems**
- **Energized directly from the electrical power and therefore operates independent from differential pressure ensuring accurate temp/humidity control**

ICE WESTERN

Reliability at its finest

HTDM

High Turndown
Indirect-Fired Units

STANDARD FEATURES:

CABINET
- Welded Structure or formed channel base frame.
- Lifting Lugs.
- Heavy gauge colorbond steel casing w/ rust-resistant gray enamel paint finish.

HEAT EXCHANGER/MANIFOLD
- SS primary & secondary heat exchanger and cast iron gas manifold.
- Solid state flame monitoring system.

CONTROL ENCLOSURE
- Electronic flame safeguard relay manual reset.
- Factory wired control panel with numbered terminal strip.

ASSURANCE
- ETL & C-ETL listed, conforms to ANSI Z83.8/CSA 2.6 issued 2013/04/01 and CGA 2.17 issued 1991/01/01
- Factory wired, piped, and test fired.

BLOWER/MOTOR
- AMCA rated forward curve DWDI Centrifugal blower.
- ODP Motor, 1800 RPM.
- Drives designed for 150%

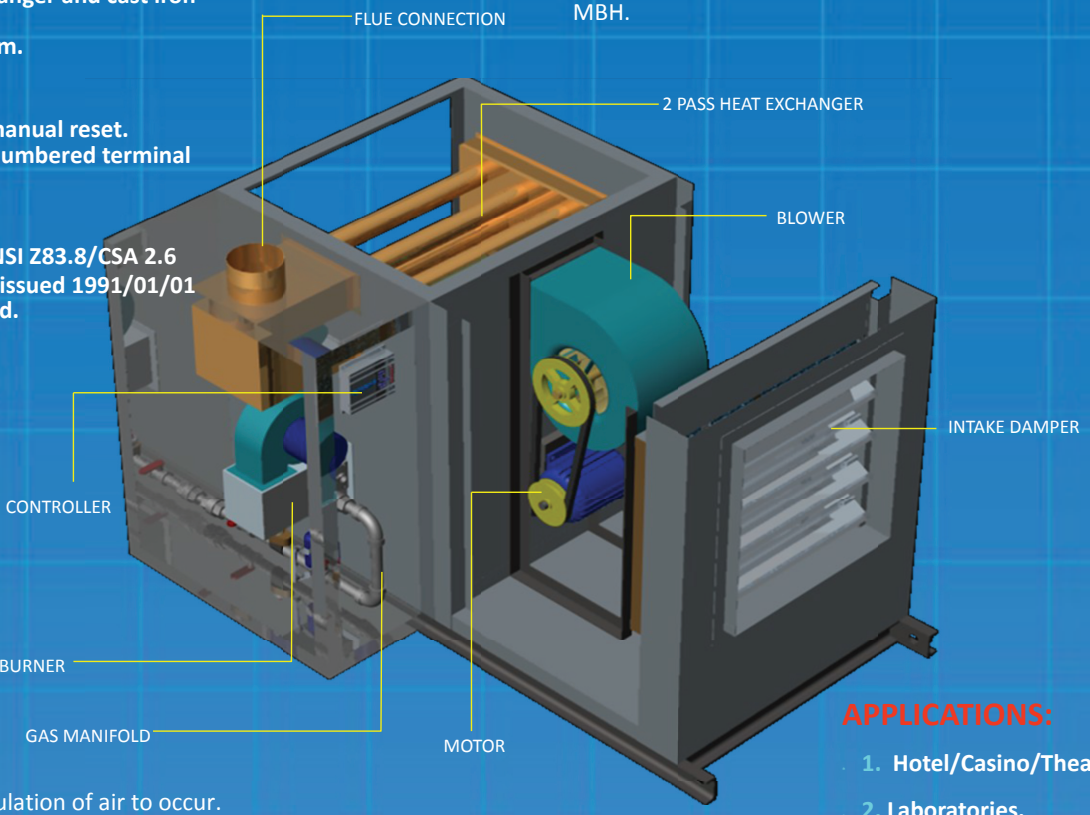
And many more...

KEY SPECIFICATIONS:

SS TWO PASS DRUM& TUBE HEAT EXCHANGER W/ FORCED DRAFT POWER BURNER.

BEST TURNDOWN RATIO FOR POWER BURNERS IN THE INDUSTRY (UP TO 60:1)

INPUTS OF 200, 400,600,1000, 1500, 2000, 2500 & 3000 MBH.



OPTIONAL FEATURES:

80/20 MIX BOX — Allows the recirculation of air to occur. This will provide a cost effective way of space heating.

HINGED ACCESS DOORS —Optional on filter section, motor section and weather housing. Comes w/ #140 ventlock handles, #310 ventlock handles upgrade available.

HORIZONTAL DISCHARGE HEAD — 180 deg. Vertical and horizontal adjustment w/ 360 deg. of free rotation.

And many more...

APPLICATIONS:

1. **Hotel/Casino/Theatre.**
2. **Laboratories.**
3. **Manufacturing Facilities.**
4. **Schools & Natatoriums.**

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