



SCREW
COMPRESSORS
TYPE
AIR COOLED
PACKAGE
CHILLERS

90 RT - 300 RT



 R407C
Zero Ozone Depletion Potential

50Hz

Smartech Sales & Services Sdn. Bhd.
(829707-K)

No.15, Jalan PJS 1/27, (Jalan Petaling Utama 6), Petaling Utama, Batu 7,
Off Jalan Klang Lama, 46000 Petaling Jaya, Selangor.
T: 603-7783 7288 / 7782 2788 F: 603-7782 3788
W: www.smart-hvac.com.my

Specifications in this catalogue are subject to change without notice in order for SMARTECH to bring the latest innovations to their customers.

*Smartwise Innovations...
Towards Green, Quality & Reliability Solutions*

 **smartech**

SSCD SERIES



INTRODUCTION

This series of Multiple Screw Compressors Type Air Cooled Package Chillers were developed by a group of industry engineers, each of them with over 20 years of experience in the design, manufacturing, installation and service of electric chillers, packaged air-conditioners, split air-conditioners, fancoils, handling units, and related products.

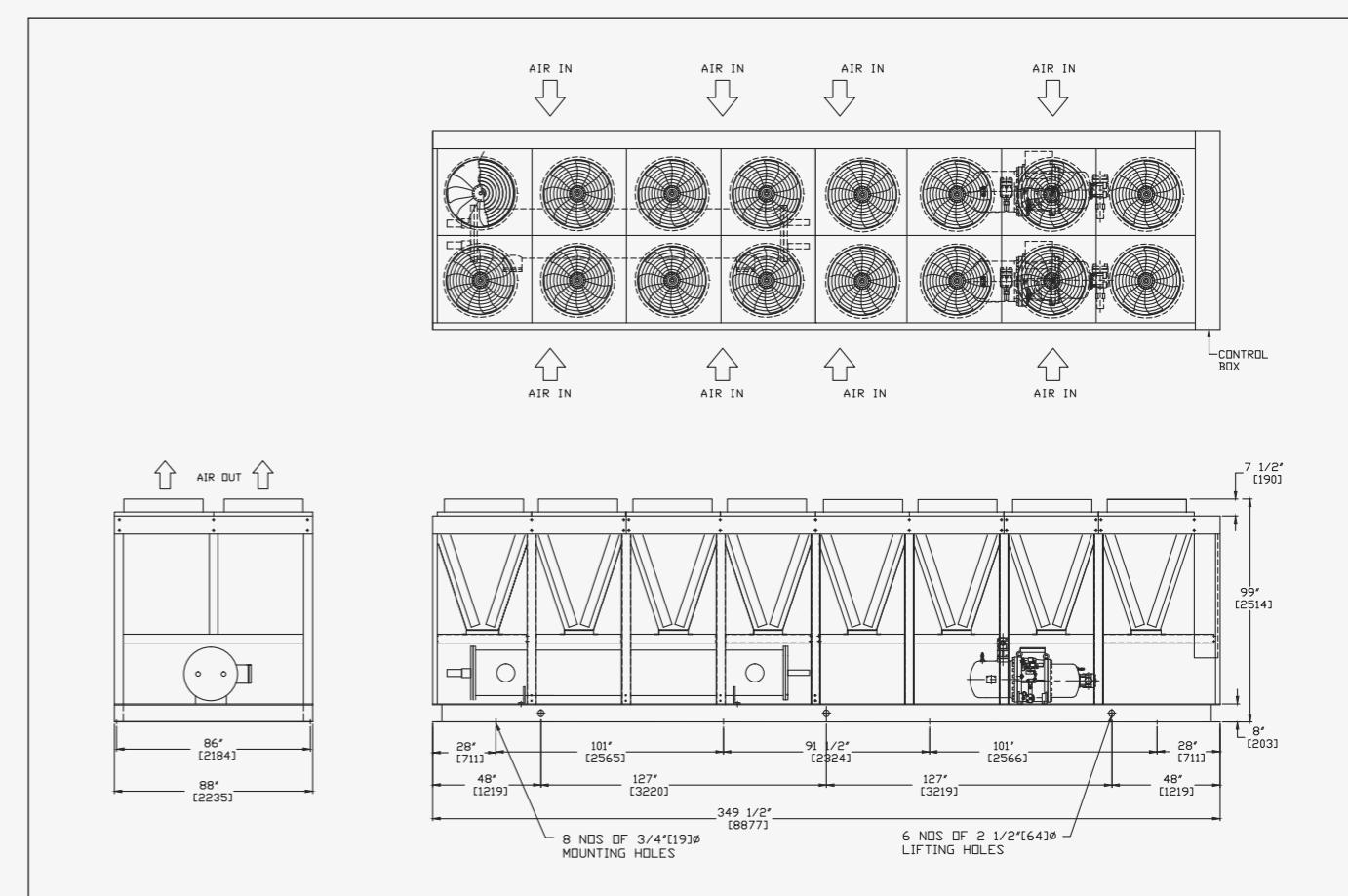
- The Group is fully committed to innovative design, new and advance technology, value engineering and to provide expert personalized service to architects, consulting engineers, developers, building owners and contractors.
- The company's ability and courage to utilize and adopt latest technology, combined with fullest personalized assistance, has enabled the company to provide architects, consultants and developers various customized solutions to their various demanding application requirements.
- The company has the unique expertise and experience to custom design and fabricates equipment for installations in marine and corrosive environment, explosive and hazardous environment, low noise environment and any other special application needs!

Nomenclature

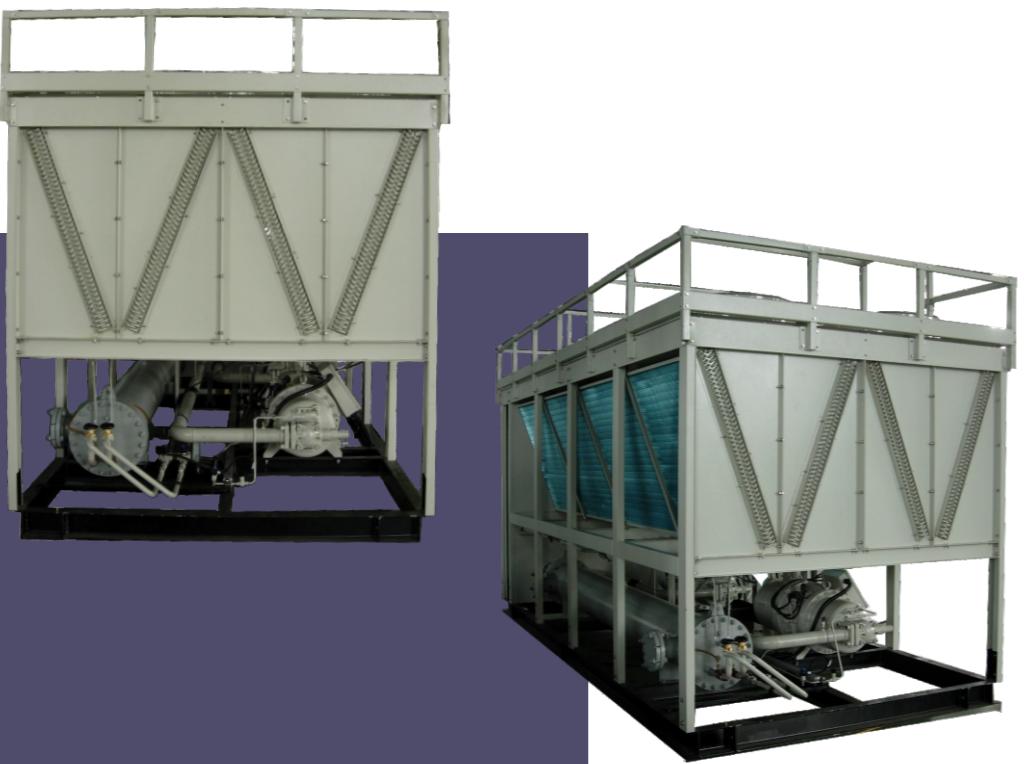
SSCD	90	-	5	A	R7
SMARTech Chiller Screw Compressor DX Evaporator	Nominal Cooling Tons	50Hz	Air Cooled Type	R7 - R407C	

DIMENSION DATA

SSCD 300

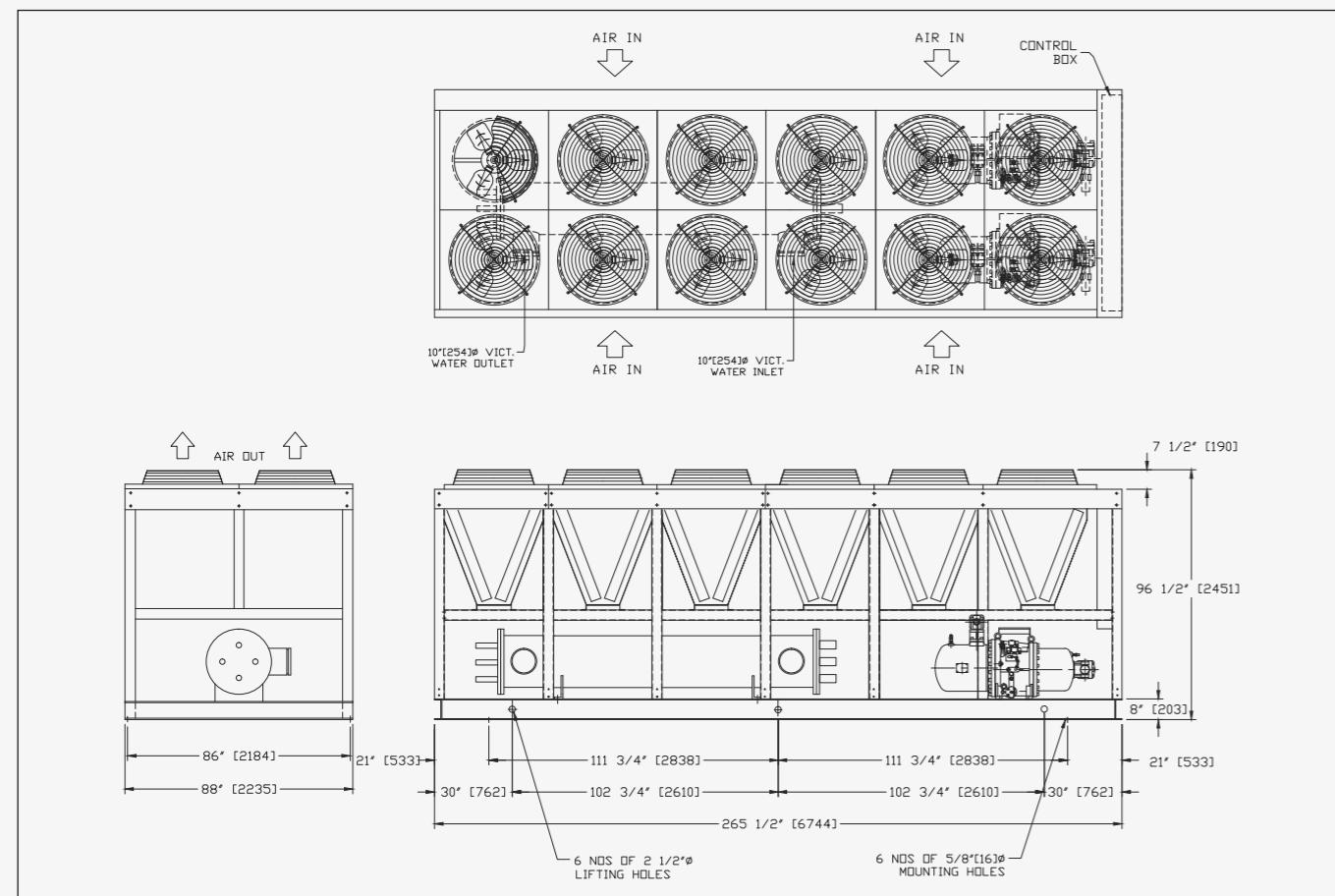


Note: All dimensions are in inches.

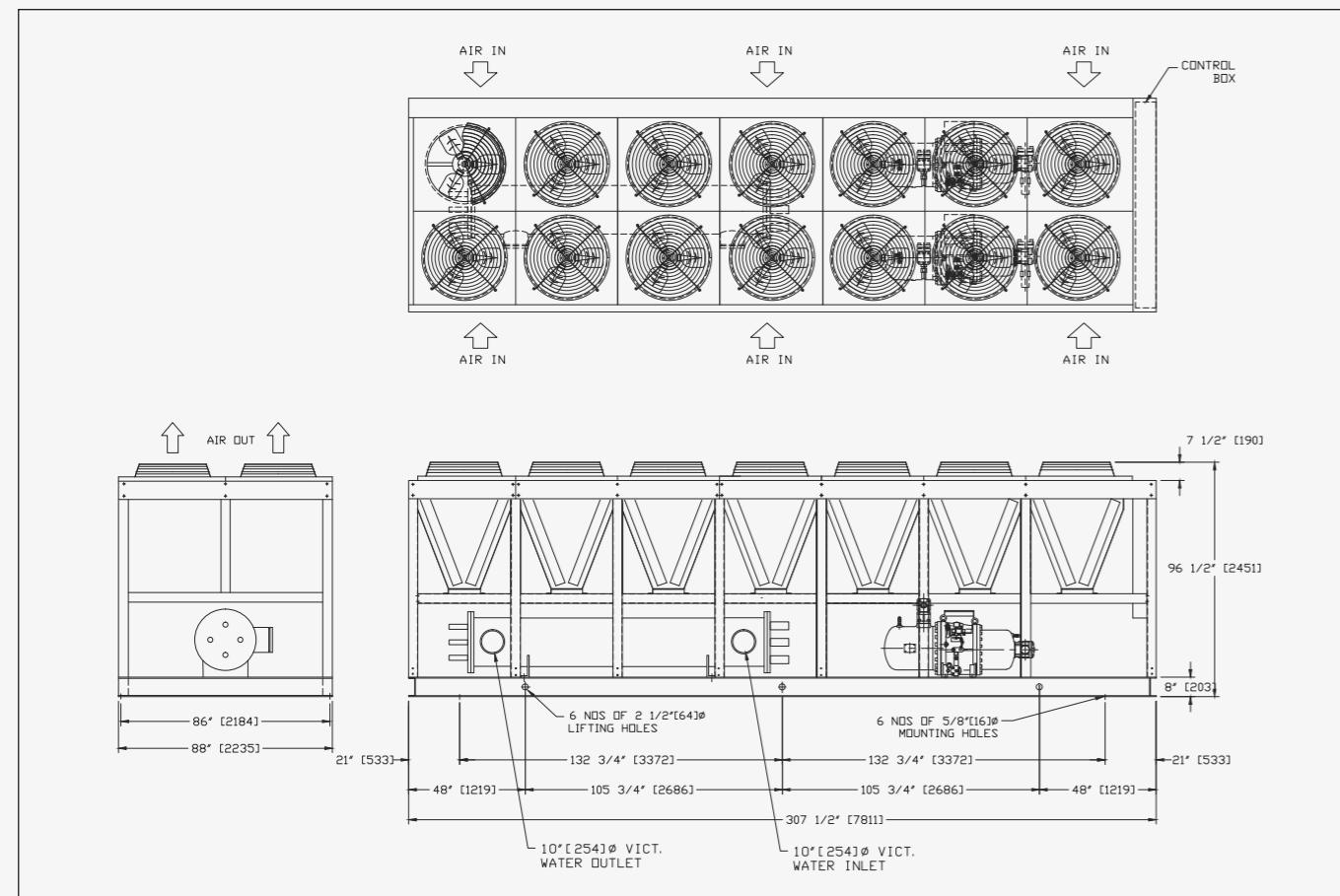


DIMENSION DATA

SSCD 210



SSCD 245



Note: All dimensions are in inches.

SCREW COMPRESSORS AIR COOLED PACKAGE CHILLERS



GENERAL DESCRIPTION

The Air Cooled Screw Chillers are designed and manufactured to ensure efficient and reliable performance and to provide an economical system of air conditioning for residential, commercial and industrial buildings. The air-cooled scroll chillers can also be suitably piped and connected to provide chilled water or cold brine solution for process cooling purpose.

Each air-cooled screw chiller consists of an outdoor weatherproof casing constructed from heavy gauge galvanized steel coated with oven-baked epoxy polyester paint; two or multiple screw compressors with minimum two independent refrigerant circuits; a large surface area Copper tubes-Aluminium fins condenser coil for efficient heat transfer; a shell and tubes type evaporator; two or multiple axial propeller fans with direct drive inductions motors; factory packaged and prewired power and control panel; and a microprocessor based controller for capacity steps modulation and safety protections.

The air-cooled screw chillers are suitable for outdoor installation with free and unducted condenser fans air discharge.

APPLICATIONS SERVED

Industrial Process Cooling

Although the term industrial lends one to think tough & rugged, industrial process applications can actually be quite sensitive. Many of these applications need tight temperature control to maintain their quality of product. We, at Smartech understand these needs and realize that your process is your lifeblood. Accurate temperature control and 24/7 reliability are our top priorities. This list show some common process cooling applications:

- Plastics processing
- Metal die-casting cooling
- Injection mold cooling
- Extrusion cooling
- Laser cooling
- Welding machine cooling
- Dry cleaning cooling
- Oil cooling

Food Processing Cooling

Food processing can be some of the most critical cooling applications due to their use of meats & poultry. In dealing with food, in general, temperature control is paramount. If your chiller does not hold temperature, you lose product. We have experience in the various food processing cooling applications and can help you find a solution to yours. Here are just a few applications we have handled previously:

- Bakery cooling
- Winery cooling
- Batch cooling
- Brewery cooling
- Brine / Marinade cooling
- Ice cream / Slushy machine cooling
- Vacuum meat tumbler / massager cooling

Medical & Laboratory Cooling

Medical equipment is a high dollar investment. It deserves to be cooled by a dependable, specially designed chiller. Our chillers provide proven reliability to sustain operation and prevent damage from overheating. Several applications are listed below:

- M.R.I cooling
- P.E.T Scan cooling
- Clean room air conditioning
- Lab testing
- C.A.T. Scan cooling

Specialty applications

Have a special or custom application? No problem. Custom chiller applications are where we thrive. We are here to help. Some previous custom projects are:

- Ice Rink cooling
- Stainless steel frame, cabinet and control panel construction
- Explosion proof chillers for all electrical area classifications
- Ultra Low Sound requirement.

Standard options available to meet any customer requirement:

- Installed insulated stainless steel tanks from 50 - 2000 gallons
- Hydronic pump packages with process pumping and recirculating pump options
- Nema 4 flow switch
- Alarm beacon with audible horn
- Waterside pressure relief bypass valve
- Process fluid inline separator
- Process fluid inline filter
- Extended compressor warranty
- Custom color paint to match any international color code
- High and low ambient operations options
- Low temperature options available

MECHANICAL SPECIFICATIONS AND FEATURES

RANGE

The Chiller has 9 cooling capacity sizes from 90 to 300 tons and available with HFC-407C refrigerant.

SCREW COMPRESSOR

- Separate refrigerant circuit for each compressor
- Semi-hermetic, horizontal screw type
- Two-pole hermetic motor
- Suction gas cooled motor
- Integral lubrication system using pressure differential
- Cast iron housing
- Infinite variable slide valve unloading
- Integral oil separator
- Compressor oil sump heaters



SHELL & TUBE EVAPORATOR

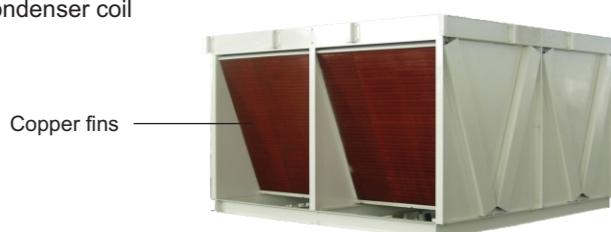
The adoption of a dedicate, high efficiency exchange tube allowed to exalt performances increasing the cooling capacities by values close to 10%. This performance improvement can be alternatively translated into a raising of the evaporation temperature and then in an optimisation of the COP of the cooling system, not only in combination with R407C but also with the other refrigerants.

- Header tube sheet, shell, refrigerant and water connections are made of carbon steel
- High efficiency exchange tubes are in copper, internally finned.
- Baffles are made of brass or other suitable material (carbon steel)
- The bolt system is made of steel alloys or stainless steel depending on working conditions and temperatures, while gaskets are made of an asbestos free compound.



CONDENSER COIL

- Constructed from staggered rows of inner ridged copper tubes mechanically expanded into die-formed aluminium fins for positive bonding and efficient Heat rejection
- The pre-coated Aluminium fins improve corrosion resistance and maintain the fins surface for efficient Heat rejection
- The condenser coil is pressure tested up to 450psig with dry nitrogen under water for leaks
- Optional copper fins condenser coil



AXIAL PROPELLER FANS

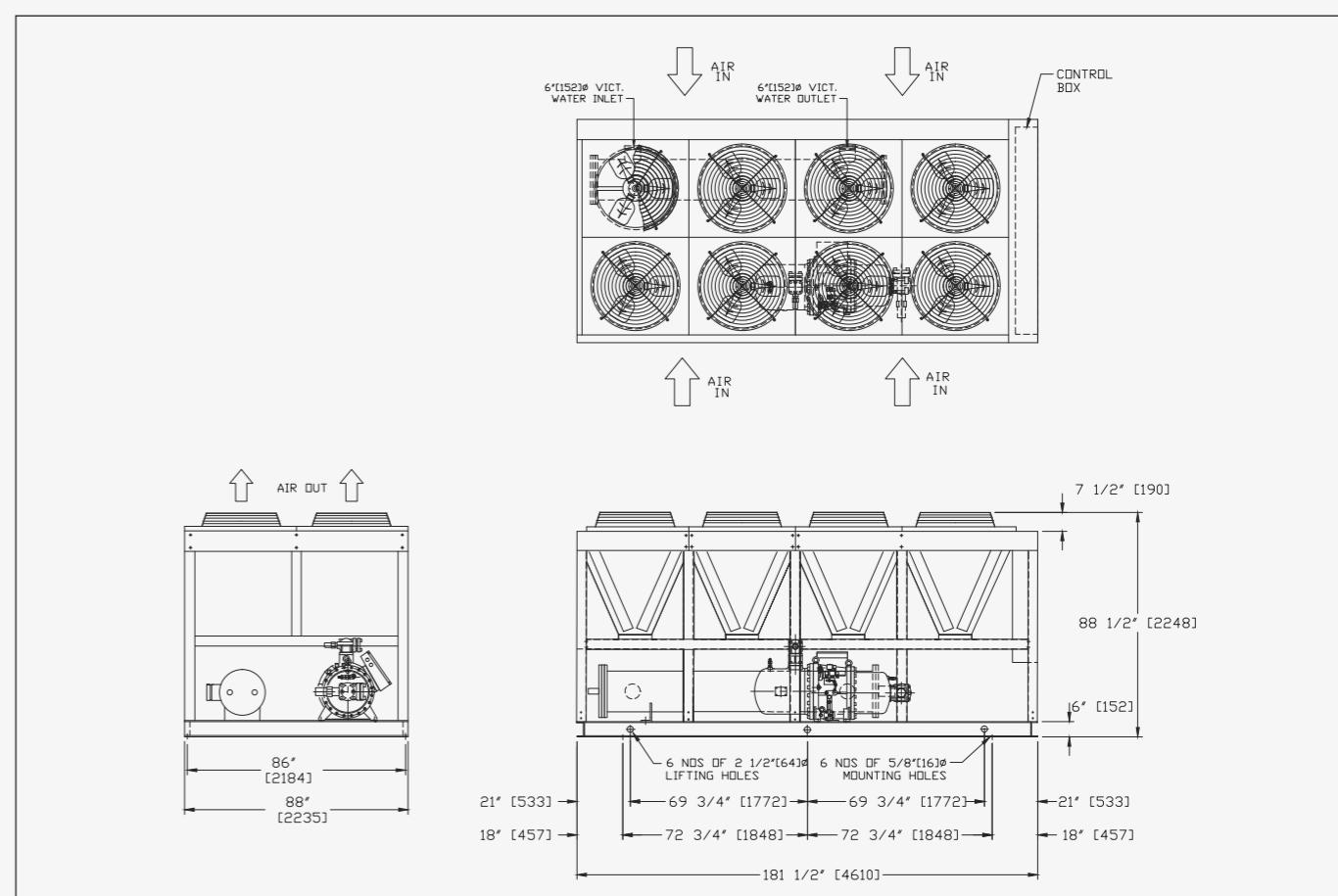
- The patented and unique designed axial propellers are selected to deliver high condenser air flow rates, with noise level and low motor power consumption
- The 3-phase, high starting torque, direct drive condenser fan motor run at maximum speed of 1140 rpm for low noise operation
- All condenser fan motors are provided with either internal line break motor protection or external mounted overload protector; and suitable for outdoor installations with minimum IP54 protection
- Optional variable fan speed control or fan cycling in response to condensing head pressure, during low ambient condition

REFRIGERATION SPECIALTIES

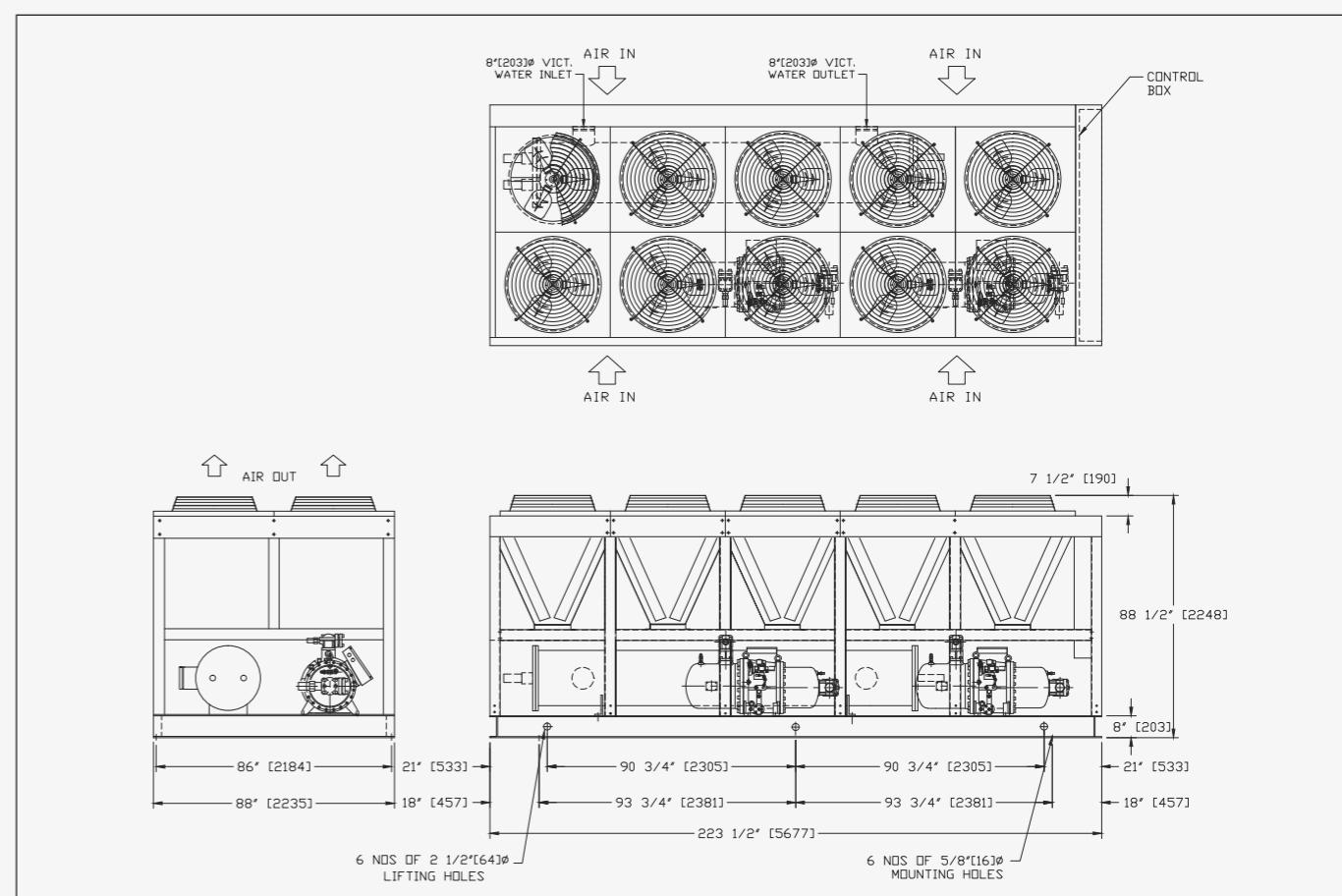
- Thermal expansion valve(s)
- Sight glass with moisture indicator(s)
- Liquid line solenoid valve(s)
- Liquid line shut off valve(s)
- Removable core filter/drier(s)
- Charging and gauge connections
- Compressor discharge check valve(s) and stop valve(s)
- Compressor suction stop valve(s)
- High pressure relief valve(s)
- Refrigerant charge
- Oil charge

DIMENSION DATA

SSCD 125



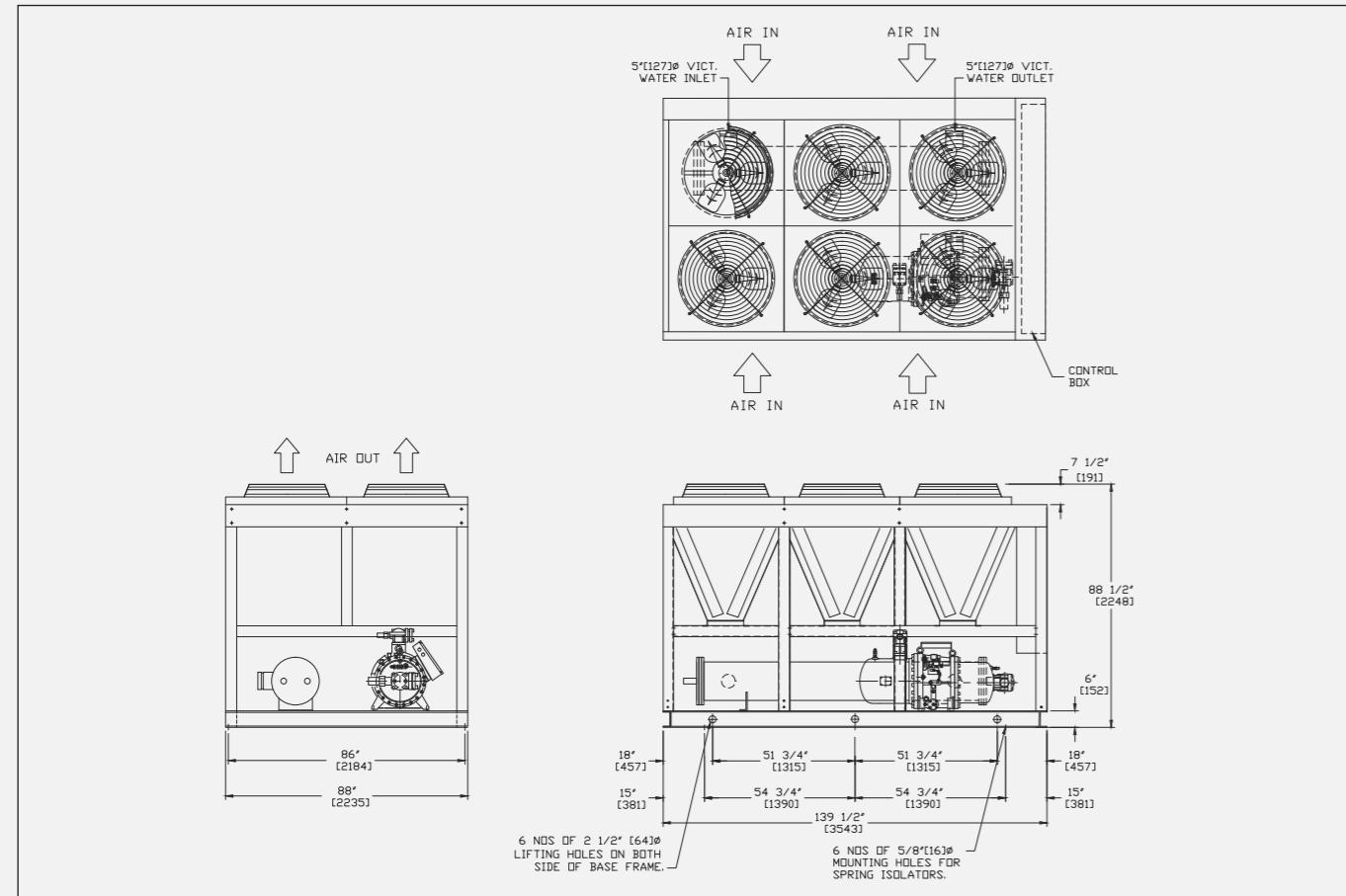
SSCD 180



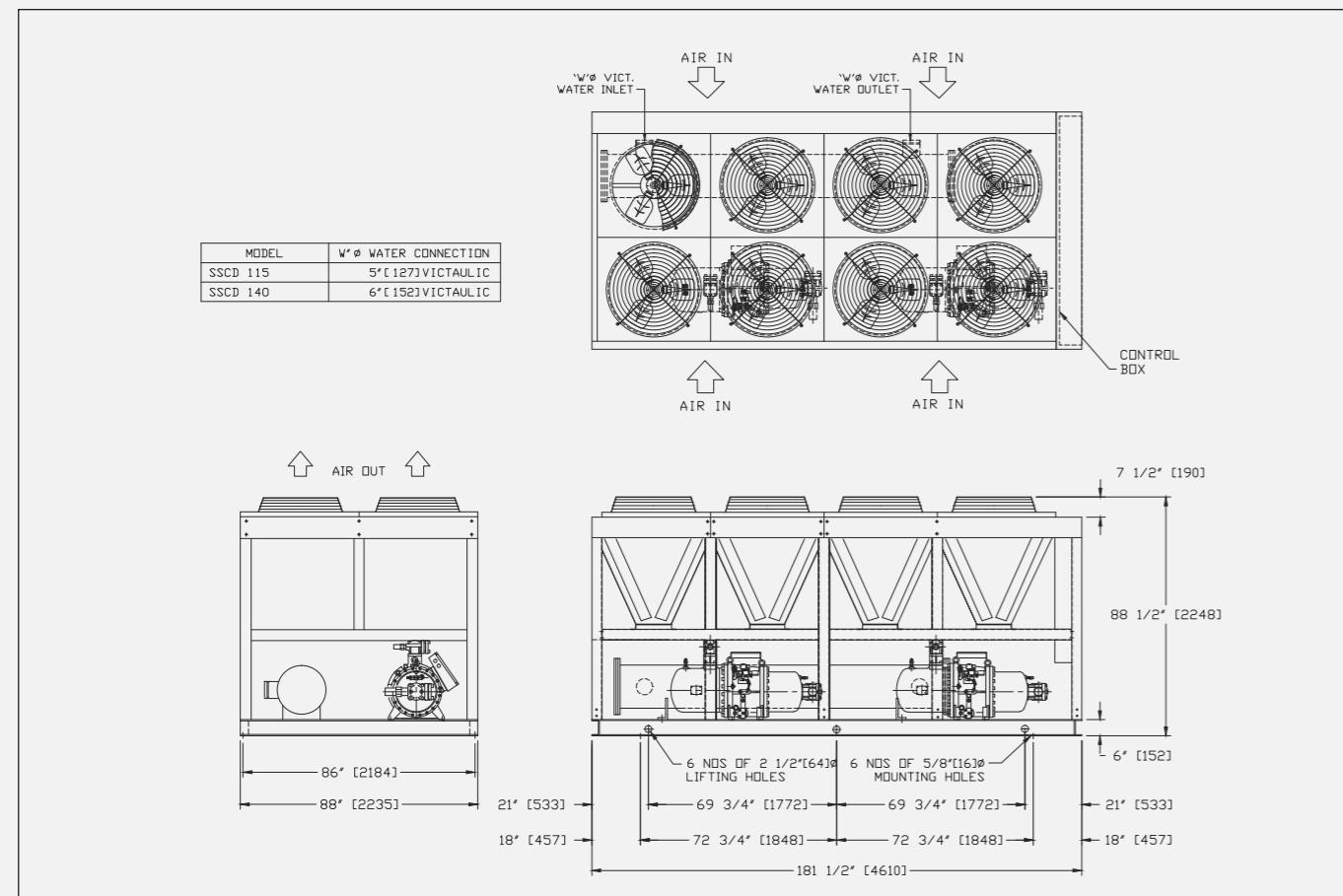
Note: All dimensions are in inches.

DIMENSION DATA

SSCD 90 & SSCD 105



SSCD 115 & 140



Note: All dimensions are in inches.

POWER AND CONTROL PANEL

Each chiller is packaged with a power and control panel which is ready to accept rated 3 phase 50Hz electrical supply from a remote mounted isolator.

The power panel is furnished with factory pre-wired and mounted S/D starter for compressors, DOL starters for condenser fan motors. MCBs for compressors and fan motors, external overload protectors for compressors and/or fan motors. Power, alarm and compressor run lights to indicate unit operation status.

The heart of the control panel is the highly reliable SMART-Advance **SMT³** microprocessor based controller with advance compressor management logic for screw compressors in response to required chilled water outlet set-point temperature. **SMT³** controller is designed specifically for the hostile environment of the HVAC/R industry and had customers in mind. **SMT³** controller provides flexibility with set points and control options that can be selected prior to commissioning a system or when the unit is live and functioning. Displays, alarms and other interfaces are accomplished in a clear and simple language that informs the user as to the status of the controller.

The **SMT³** controller provides the following safety protections, control functions and features:

- A user friendly back-lit 132 by 64 pixels **SMT-D'** display panel with 6 silicon rubber buttons allows carrying out all program operations.
- Staggered starting of compressors to reduce current in-rush.
- To prevent compressors short-cycling (on and off repeatedly) which can cause overheating of compressors and premature failures or burnt-out of compressors.
- Lead-lag control of compressors operation and auto-balancing of compressors run-hours
- Retains up to 99 alarm histories complete with time of failure together with data stamping on critical sensor readings in an alarm history.
- Monitoring of the following readings and status:
 - Leaving and entering chilled water temperature
 - Compressors suction and discharge pressure
 - Compressors discharge temperature
 - Compressor operating current
 - Chilled water flow switch status
 - Compressor oil level status
 - External start/stop status
- Safety protections as below to insure system reliability:
 - Chilled water freeze protection
 - Chilled water flow loss
 - Low suction pressure/high discharge pressure
 - Low oil level
 - Low pressure differential
 - Sensor failure
 - Compressor over-current
- Various optional add-on cards are available for direct interfacing to Building Management System (BMS) through standard communication protocols such as ModBus RTU (RS485/TCPIP), BACnet (RS485/MSTP/TCPIP) and LonWorks (FTT 10).



OPTIONAL ACCESSORIES

HEAT RECOVERY / DESUPERHEATERS

This can be factory supplied and installed to get free hot water up to as high as 55°C.

OTHER OPTIONAL ACCESSORIES

- Coated or uncoated copper fins coils in lieu of pre-coated aluminium fins coils.
- Water flow switch to be shipped loose.
- Spring isolators to be shipped loose.
- Rubber-in-shear isolator to be shipped loose.



INTEGRATED PUMP TANK STATION

Process pump package can be integrated with or without a tank station. These tanks are offered in all 304SS material and fully insulated with high-quality foam insulation. Pumps are available up to 25HP and in other constructions up to 60HP with 304SS material. This section will be integral to the chiller skid and within a framed enclosure with rain shield.

PERFORMANCE TABLE



LWT °F	CHILLER MODEL SSDC	AMBIENT AIR TEMPERATURE °F					
		85.00		95.00		105.00	
		TONS	KWI	TONS	KWI	TONS	KWI
40.00	90	89.0	100.3	79.3	111.8	68.8	124.1
	105	103.8	118.9	92.2	132.4	82.2	143.8
	115	111.2	127.4	99.3	142.2	86.4	157.8
	125	122.0	138.0	108.5	153.8	95.4	168.9
	140	141.6	159.4	124.4	179.6	110.9	195.0
	180	178.1	208.2	157.9	231.8	142.8	249.0
	210	205.7	237.8	182.5	264.8	162.4	287.6
	245	240.3	279.2	213.1	310.8	189.7	337.8
	300	302.4	361.6	267.0	402.6	240.5	432.8
	90	93.1	101.1	83.1	112.6	72.6	125.0
	105	108.7	119.7	96.9	133.4	86.7	144.9
	115	116.3	128.4	104.3	143.2	91.1	159.0
	125	127.7	139.1	114.0	154.9	100.6	170.1
	140	148.2	160.6	130.7	180.8	116.9	196.4
42.00	180	186.5	209.6	166.0	233.4	150.6	251.0
	210	215.4	239.4	191.8	266.8	171.3	289.8
	245	251.6	281.2	224.0	313.2	200.1	340.2
	300	316.8	364.2	280.8	405.6	253.9	436.0
	90	97.4	101.8	90.0	113.5	76.5	125.9
	105	113.8	120.6	105.0	134.3	91.3	146.0
	115	121.7	129.4	115.0	144.2	96.0	160.2
	125	133.6	140.1	125.0	156.1	106.0	171.4
	140	155.0	161.8	140.0	182.2	123.2	198.0
	180	195.1	211.2	180.0	235.2	1158.6	252.8
	210	225.4	241.2	210.0	268.6	180.5	292.0
	245	263.3	283.2	245.0	315.4	210.8	342.8
	300	331.7	367.0	300.0	408.6	267.6	439.2
44.00	90	101.8	102.6	91.6	114.3	80.5	126.8
	105	119.0	121.6	106.7	135.3	96.1	147.0
	115	127.2	130.4	114.7	145.2	101.0	161.2
	125	139.6	141.2	125.5	157.2	111.6	172.6
	140	162.1	163.2	144.0	183.6	129.7	199.4
	180	204.0	212.8	182.7	236.8	166.8	254.6
	210	235.7	121.6	211.2	270.6	190.0	294.0
	245	275.4	285.4	246.7	317.8	221.9	345.2
	300	347.0	369.8	309.8	411.6	281.8	442.4
	90	106.3	103.4	96.3	114.3	84.6	127.8
	105	124.4	122.5	111.8	136.3	101.0	148.1
	115	132.8	131.4	120.1	146.4	106.1	162.4
	125	145.9	142.3	131.9	158.4	117.3	173.9
	140	169.4	164.4	150.9	185.0	136.3	200.8
48.00	180	213.2	214.6	191.5	238.6	175.2	256.6
	210	246.4	122.5	221.4	272.6	199.7	296.2
	245	287.8	287.8	258.6	320.2	233.3	347.8
	300	362.9	372.6	324.9	414.6	296.4	445.6
	90	111.0	104.3	100.7	116.1	88.9	128.7
	105	129.9	123.5	117.5	137.4	106.1	149.2
	115	138.7	132.6	126.0	147.6	111.4	163.8
	125	152.4	143.5	138.0	159.6	123.2	175.2
	140	176.9	165.8	158.5	186.4	143.1	202.4
	180	222.7	216.4	200.6	240.4	184.0	258.4
	210	257.3	247.0	232.5	274.8	209.7	298.4
	245	300.6	290.0	271.6	322.6	245.0	350.4
	300	379.2	375.6	340.6	417.6	311.4	449.0

PHYSICAL SPECIFICATIONS

Model	NOMINAL COOLING CAPACITY		SSCD 105		SSCD 115		SSCD 125		SSCD 140		SSCD 180		SSCD 210		SSCD 245		SSCD 300	
COMPRESSOR	TYPE	-	RT	90	105	115	125	140	140	180	210	245	300	2950	2950	2950	2950	
	RPM	RPM	-	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950	
QUANTITY																		
MIN. % UNIT CAPACITY REDUCTION	%	25.0%	25.0%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	
EVAPORATOR	WATER FLOW RATE	USGPM	259	304	326	361	410	518	608	709	840	840	840	840	840	840	840	840
WATER CONNECTION	WATER PRESSURE DROP	FT WG	15.7	17.4	20.1	20.8	15.4	15.1	18	15.4	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
	INCH (MM)	5 [127]	5 [127]	5 [127]	5 [127]	6 [152.4]	6 [152.4]	8 [203.2]	10 [254]	10 [254]	10 [254]	10 [254]	10 [254]	10 [254]	10 [254]	10 [254]	10 [254]	10 [254]
CONDENSER	CONDENSER FAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DIRECT DRIVE PROPELLER FAN
FAN MOTOR	INPUT QUANTITY	kW	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	AIR FLOW	CFM	73,800	70,200	98,400	93,600	11,700	154,800	180,600	196,800	196,800	196,800	196,800	196,800	196,800	196,800	196,800	196,800
ELECTRICAL	NOMINAL POWER SUPPLY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400 / 3 / 50
UNIT RLA	A	216.0	250.3	279.4	296.5	340.6	434.8	500.6	587.6	745.0	745.0</							