Form No: USS0409A

ACDX

Air Cooled Chillers with Rotary Screw Compressor

40 to 255 Tons

Features

- Reliable rotary screw compressor performance
- Compatible with HFC refrigerants
- Advanced proacitive microcomputer
- Rated with HCFC-22
- Built-in redundancy
- Quiet operation

DUNHAM-BUSH®

Products That Perform...By People Who Care

UNIT FEATURES

The ACDX line of air-cooled packaged chillers continues the 30-year Dunham-Bush tradition of providing the finest rotary screw compressor packages available in the world today. No other manufacturer can match Dunham-Bush's experience or quality commitment.

REDUCED FIRST COST

- Equipment Savings- The ACDX is a packaged air cooled chiller eliminating the need for cooling towers, condenser water pumps and piping, as well as associated controls and wiring.
- Installation Savings- Each ACDX chiller is completely charged and factory tested in order to reduce start-up problems. Rated and certified in accordance with ARI Standard 590-98. Labor saving options include single source power connection, disconnects, control transformers and convenience outlets. All units include rigging holes and factory installed water temperature sensors.
- Increase Usable Space- The entire chiller is mounted outdoors which eliminates up to 300 square feet of equipment room space when you consider the size of a water cooled chiller, condenser water pumps and clearance requirements.
- Delay Equipment Purchase- Installation can conveniently occur late in the building schedule. Indoor chillers, in contrast, must be scheduled around interior finishing. The ACDX is an ideal choice for fast track jobs.

REDUCED MAINTENANCE COST

- Eliminated Water Treatment- The cost of labor and chemicals required for cooling tower water treatment is eliminated with air cooled chillers.
- Cooling Tower Water Requirements- Cooling tower make-up can be very significant.
- Condenser Water Loop Maintenance- Water cooled condenser, pumps and plumbing all require occasional maintenance. Eventual water leaks and scaling of pipes cannot be avoided.

REDUNDANCY

70% BACK UP- The ACDX offers greater redundancy, in case of service requirements, than any other chiller available. This is the ideal selection for critical applications, especially when combined with the reliability of screw compressors. Up to 70% back up is offered on the compressor and condenser on 3 compressor units.

INDEPENDENT REFRIGERATION CIRCUITS- The Independent refrigerant circuits also add to the chiller reliability. Oil control problems, associated with parallel compressors, are completely eliminated. There also is no chance of a failed compressor contaminating the remaining compressors.

QUIET OPERATION

This compressor is, quite simply, the quietest compressor in its size range. The inherently balanced compression results in a compressor vibration amplitude of only 7 microns. The compressor noise also occurs at a higher vibration frequency allowing effective attenuation by the optional compressor acoustical enclosure and equipment room walls. The screw compressor is quieter than competitive screw compressors due to the ribbed, double wall construction and the greater amount of rotor surface area.

INFINITELY MODULATING CAPACITY CONTROL

Precise control of leaving water temperature is maintained by the modulating slide valve control mechanism, offered by the screw compressor, in combination with a microprocessor based, supply water temperature controller.

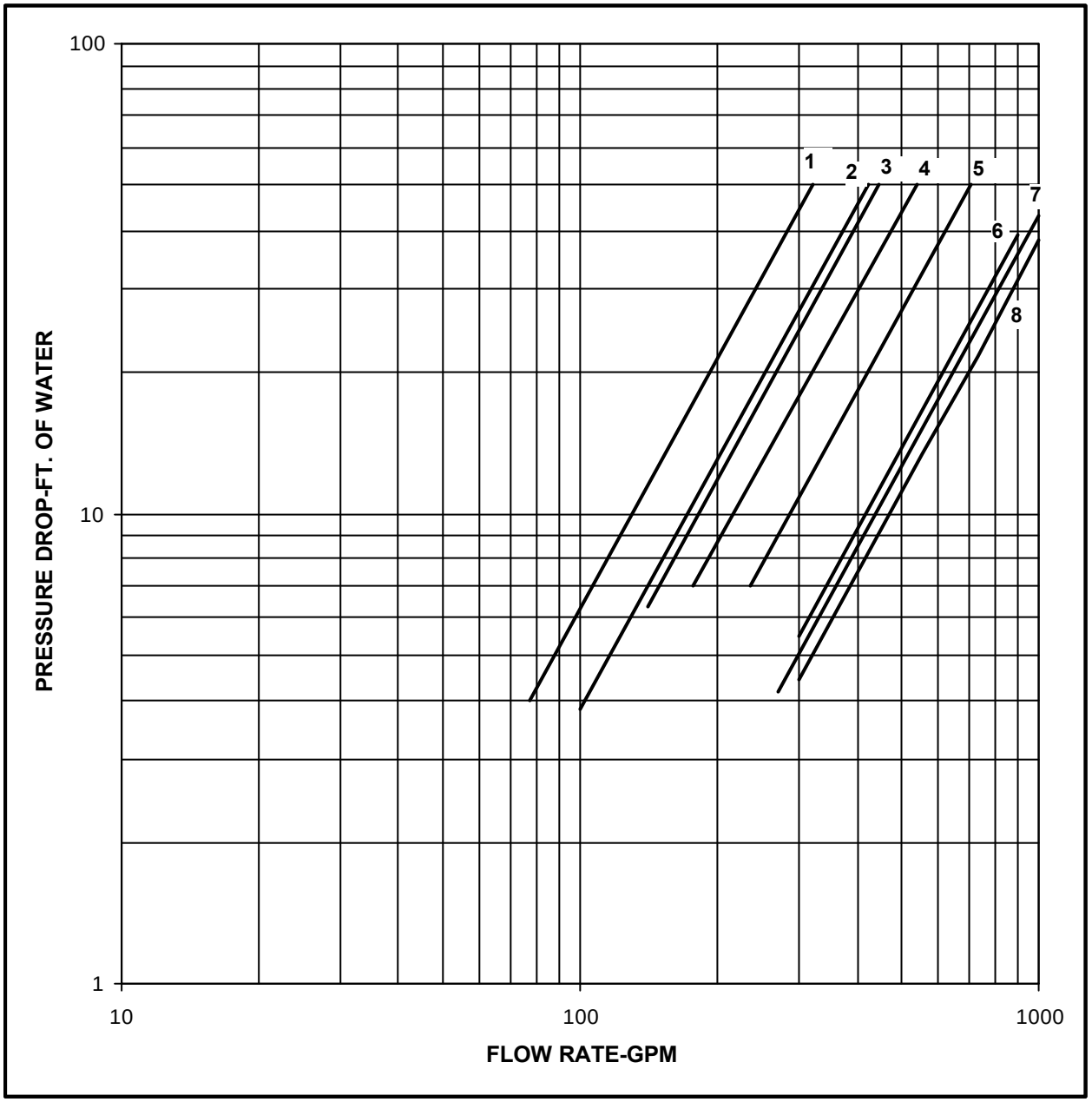
Leaving water temperature variations are controlled to less than 1/2°F accuracy; 5 times the accuracy of reciprocating compressors. Maintaining constant supply water temperature allows much closer control of comfort conditions.

PERFORMANCE DATA

LWT	MODEL	AMBIENT TEMPERATURE, °F															
°F	ACDX	85.0				95.0				105.0				115.0			
		TR	KW	EER	NPLV	TR	KW	EER	NPLV	TR	KW	EER	NPLV	TR	KW	EER	NPLV
42.0	040	42.0	39.5	11.11	13.17	39.2	44.5	9.34	12.78	36.2	49.2	7.89	11.77	33.3	54.7	6.60	10.81
	050	52.2	50.0	11.06	12.95	48.6	55.7	9.36	12.21	45.0	61.7	7.91	11.31	41.4	68.5	6.62	10.45
	060	64.7	61.0	11.12	12.91	60.1	68.1	9.37	12.15	55.5	75.1	7.93	11.27	51.0	83.1	6.66	10.42
	080	84.8	79.4	11.17	14.16	78.8	89.2	9.37	13.43	72.4	98.4	7.89	12.61	66.1	109.2	6.56	11.78
	095	104.3	97.8	11.07	13.77	97.4	109.4	9.38	12.85	90.5	121.0	7.97	11.88	83.5	132.8	6.77	10.97
	120	129.1	123.9	11.13	13.87	120.3	137.9	9.43	12.97	111.5	152.4	7.98	11.99	102.5	167.7	6.73	11.20
	150	154.8	145.2	11.06	13.90	144.5	162.4	9.36	13.02	134.2	179.8	7.95	12.09	123.8	197.5	6.75	11.25
	170	179.1	171.2	11.08	13.82	167.0	190.9	9.38	12.97	154.8	211.2	7.94	12.06	142.4	232.2	6.70	11.29
	185	192.9	187.0	11.03	13.47	180.0	207.8	9.36	12.65	166.8	229.6	7.93	11.76	153.5	252.5	6.69	11.04
	210	210.8	193.7	11.29	14.04	196.8	216.7	9.56	13.25	182.8	239.9	8.12	12.44	168.7	263.5	6.89	11.73
	235	232.0	219.8	11.13	14.10	216.4	245.2	9.42	13.02	200.7	271.3	7.98	12.24	184.8	298.2	6.75	11.61
	255	253.8	245.0	11.06	13.55	236.4	272.9	9.35	12.81	219.1	301.7	7.92	12.00	201.3	331.9	6.67	11.44
44.0	040	43.6	40.2	11.36	13.40	40.7	45.2	9.56	13.07	37.6	49.9	8.10	12.05	34.6	55.5	6.77	11.08
	050	54.2	50.8	11.32	13.16	50.5	56.5	9.60	12.44	46.8	62.5	8.13	11.54	43.0	69.3	6.80	10.67
	060	67.1	62.0	11.37	13.29	62.3	69.1	9.60	12.37	57.6	76.1	8.14	11.49	52.9	84.1	6.84	10.64
	080	88.2	80.8	11.43	14.37	81.9	90.6	9.60	13.68	75.3	99.8	8.10	12.89	68.8	110.7	6.74	12.05
	095	108.2	99.7	11.30	13.98	101.2	111.3	9.60	13.05	94.1	122.9	8.18	12.07	87.0	134.5	6.98	11.20
	120	133.9	126.2	11.37	14.10	125.0	140.1	9.65	13.21	116.0	154.7	8.19	12.24	106.8	170.2	6.91	11.39
	150	160.7	148.0	11.29	14.11	150.2	165.1	9.60	13.21	139.7	182.4	8.17	12.31	129.0	200.1	6.95	11.42
	170	185.9	174.3	11.32	14.04	173.5	194.1	9.60	13.19	161.0	214.4	8.14	12.30	148.3	235.6	6.89	11.48
	185	200.2	190.2	11.28	13.68	186.8	211.4	9.57	12.87	173.6	233.1	8.14	12.13	159.8	256.3	6.87	11.22
	210	218.9	197.5	11.52	14.24	204.6	220.5	9.78	13.39	190.3	243.4	8.34	12.62	175.8	266.9	7.10	11.89
	235	240.9	223.8	11.37	14.26	224.9	249.4	9.65	13.18	208.7	275.5	8.19	12.45	192.5	302.5	6.94	11.80
	255	263.4	249.5	11.29	13.75	245.6	277.6	9.57	12.98	227.8	306.3	8.12	12.26	209.6	336.9	6.85	11.65
45.0	040	44.4	40.6	11.48	14.31	41.5	45.5	9.67	13.22	38.3	50.2	8.20	12.19	35.3	55.9	6.86	11.21
	050	55.2	51.2	11.45	13.27	51.4	56.9	9.72	12.55	47.7	62.9	8.24	11.65	43.9	69.7	6.90	10.79
	060	68.3	62.5	11.50	13.40	63.4	69.6	9.71	12.48	58.7	76.6	8.24	11.60	53.9	84.7	6.92	10.74
	080	89.9	81.5	11.56	14.57	83.5	91.3	9.72	13.81	76.8	100.4	8.21	13.01	70.2	111.5	6.83	12.19
	095	110.2	100.8	11.41	14.10	103.1	112.2	9.72	13.10	96.0	123.7	8.29	12.16	88.8	135.4	7.08	11.31
	120	136.3	127.3	11.48	14.21	127.3	141.3	9.76	13.30	118.3	155.8	8.30	12.49	108.9	171.3	7.01	11.53
	150	163.8	149.4	11.41	14.24	153.0	166.6	9.70	13.32	142.5	183.7	8.28	12.39	131.7	201.3	7.05	11.55
	170	189.4	175.9	11.44	14.15	176.8	195.7	9.71	13.31	164.2	216.1	8.25	12.52	151.5	237.2	6.99	11.62
	185	203.8	191.9	11.39	13.79	190.3	212.9	9.69	12.93	176.8	235.0	8.23	12.22	163.1	258.0	6.97	11.37
	210	223.1	199.3	11.65	14.33	208.5	222.3	9.90	13.51	194.0	245.4	8.44	12.73	179.5	268.7	7.20	12.02
	235	245.4	226.0	11.49	14.37	229.1	251.4	9.76	13.29	212.9	277.6	8.29	12.66	196.5	304.5	7.04	11.92
	255	268.2	251.8	11.41	13.80	250.3	279.7	9.69	13.10	232.3	308.8	8.22	12.32	213.9	339.6	6.94	11.72
46.0	040	45.3	40.9	11.61	14.47	42.2	45.9	9.79	13.37	39.1	50.5	8.31	12.34	36.0	56.2	6.95	11.35
	050	56.2	51.6	11.58	13.62	52.4	57.3	9.84	12.67	48.6	63.3	8.35	11.77	44.7	70.1	6.99	10.90
	060	69.5	63.0	11.62	13.51	64.6	70.1	9.83	12.59	59.8	77.1	8.35	11.71	54.9	85.2	7.01	10.85
	080	91.6	82.3	11.69	14.69	85.1	92.0	9.83	13.93	78.3	101.1	8.32	13.14	71.6	112.3	6.92	12.32
	095	112.3	101.8	11.52	14.20	105.1	113.2	9.82	13.21	97.9	124.6	8.40	12.27	90.6	136.4	7.18	11.44
	120	138.9	128.3	11.61	14.33	129.7	142.5	9.87	13.37	120.5	157.1	8.39	12.60	111.1	172.7	7.10	11.63
	150	166.8	150.9	11.52	14.34	156.0	167.9	9.82	13.39	145.3	185.2	8.38	12.46	134.4	202.6	7.15	11.66
	170	192.9	177.5	11.55	14.26	180.2	197.3	9.83	13.34	167.4	217.7	8.36	12.60	154.4	239.0	7.08	11.72
	185	207.4	193.6	11.50	13.90	193.9	214.7	9.80	13.01	180.1	236.8	8.33	12.35	166.3	260.1	7.05	11.46
	210	227.2	201.3	11.77	14.40	212.6	224.0	10.03	13.61	197.9	247.2	8.56	12.81	183.2	270.4	7.31	12.13
	235	249.9	228.0	11.61	14.47	233.6	253.5	9.87	13.36	217.1	279.6	8.41	12.73	200.4	306.8	7.13	12.03
	255	273.1	254.1	11.52	13.90	255.0	282.0	9.79	13.20	236.7	311.3	8.31	12.64	218.2	341.9	7.03	11.85
48.0	040	47.0	41.6	11.87	14.78	43.8	46.5	10.02	13.67	40.5	51.2	8.53	12.62	37.3	57.0	7.12	11.61
	050	58.3	52.5	11.84	13.85	54.4	58.1	10.08	12.89	50.5	64.1	8.57	11.99	46.4	70.9	7.19	11.12
	060	72.0	64.0	11.87	13.73	66.9	71.1	10.06	12.81	62.0	78.1	8.56	11.93	57.0	86.3	7.19	11.06
	080	95.2	83.7	11.96	14.92	88.3	93.4	10.07	14.18	81.4	102.5	8.55	13.39	74.4	113.9	7.10	12.59
	095	116.5	103.7	11.76	14.43	109.1	115.1	10.05	13.46	101.8	126.5	8.62	12.52	94.4	138.1	7.39	11.66
	120	143.9	130.6	11.84	14.49	134.5	144.8	10.09	13.58	125.2	159.5	8.60	12.86	115.6	175.3	7.28	11.85
	150	173.1	153.7	11.77	14.56	162.1	170.8	10.05	13.61	151.1	187.9	8.61	12.71	140.0	205.4	7.36	11.88
	170	199.9	180.8	11.78	14.48	187.0	200.6	10.05	13.56	174.0	220.9	8.56	12.84	160.7	242.4	7.27	11.98
	185	214.8	197.0	11.72	14.05	200.9	218.3	10.00	13.21	187.0	240.4	8.53	12.58	172.9	263.9	7.23	11.64
	210	235.8	205.2	12.01	14.60	220.7	228.1	10.25	13.82	205.8	250.9	8.78	13.03	190.7	274.0	7.52	12.32
	235	259.1	232.3	11.83	14.69	242.4	257.8	10.10	13.81	225.6	283.8	8.62	12.92	208.6	311.1	7.33	12.19
	255	283.2	258.3	11.77	14.10	264.5	286.8	10.01	13.33	246.0	316.0	8.52	12.85	227.0	347.0	7.22	12.08
50.0	040	48.6	42.3	12.11	15.10	45.3	47.2	10.24	13.97	42.0	51.8	8.74	12.91	38.7	57.8	7.30	11.88
	050	60.4	53.3	12.11	14.08	56.4	58.9	10.33	13.12	52.4	64.9	8.79	12.22	48.2	71.7	7.39	11.35
	060	74.3	65.0	12.08	13.95	69.3	72.1	10.29	13.03	64.3	79.1	8.77	12.15	59.1	87.3	7.37	11.28
	080	98.5	85.2	12.19	15.15	91.6	94.9	10.31	14.42	84.5	103.9	8.77	13.64	77.3	115.5	7.29	12.84
	095	120.8	105.6	12.01	14.57	113.3	116.9	10.29	13.70	105.8	128.3	8.85	12.84	98.3	139.9	7.60	11.87
	120	148.9	132.9	12.07	14.71	139.4	147.2	10.30	13.81	129.9	162.0	8.79	13.12	120.1	177.8	7.47	12.08
	150	179.6	156.6	12.02	14.69	168.3	173.6	10.29	13.85	157.1	190.6	8.83	13.07	145.8	207.9	7.58	12.13
	170	207.2	184.1	12.02	14.64	193.9	203.9	10.26	13.78	180.6	224.4	8.77	13.12	167.2	245.9	7.47	12.15
	185	222.4	200.5	11.95	14.21	208.2	221.9	10.21	13.38	194.5	244.2	8.74	12.79	179.6	268.1	7.41	11.87
	210	244.5	209.2	12.25	14.76	229.1	231.8	10.49	13.99	213.9	254.6	9.01	13.33	198.6	277.6	7.74	12.54
	235	268.5	236.5	12.08	14.86	251.4	262.0	10.32	14.03	234.3	288.2	8.83	13.22	217.0	315.5	7.53	12.43
	255	293.2	262.9	12.00	14.25	274.3	291.2	10.23	13.55	255.3	320.8	8.73	13.03	236.0	352.1	7.40	12.24

NOTES:
1.) Ratings based on ARI Standard 550/590-1998. 10°F water range in evaporator and .0001 fouling factor.
2.) Interpolation between ratings is permissible but extrapolation is NOT.
3.) KW is for compressor only. Fan power is shown in PHYSICAL DATA.
4.) EER is for entire unit.
5.) For 50 Hz operation, consult factory.
6.) ACDX210, ACDX235, ACDX255 fall outside the scope of the ARI certification program.

EVAPORATOR WATER: PRESSURE DROP



MODEL SIZE ACDX	CURVE NO.	MINIMUM GPM	MAXIMUM GPM
040, 050	1	86	315
060	2	104	420
080	3	140	440
095	4	175	519
120	5	236	697
150, 170	7	267	1060
185	6	298	881
210, 235, 255	8	298	1117

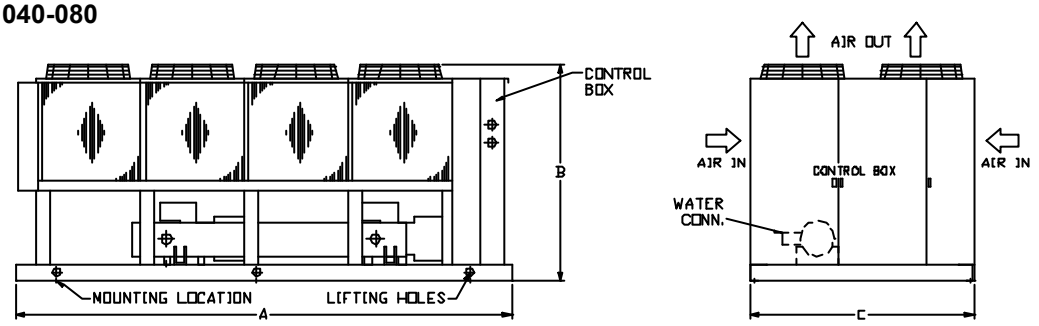
NOTE: Constant water flow through the evaporator is required with a minimum of three gallons per ton of system water loop volume. System volume should increase up to ten gallons per ton for process loads, low load applications with small temperature ranges, or systems with widely fluctuating loads.

PHYSICAL DATA

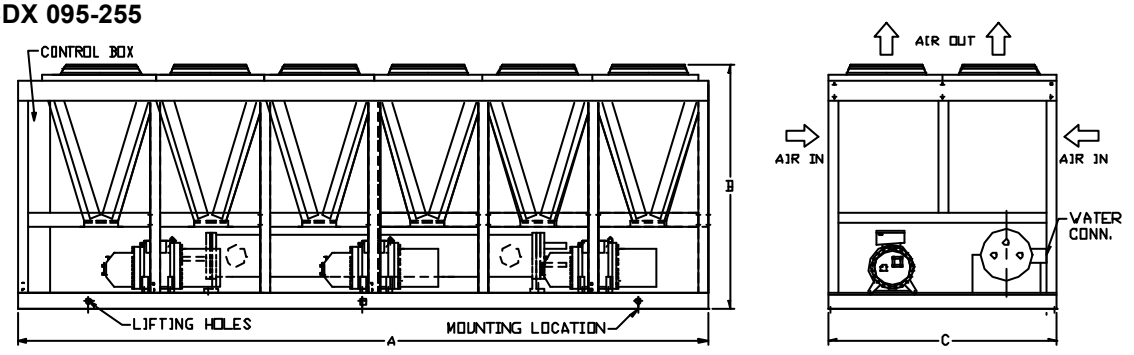
		MODELS ACDX											
		40	50	60	80	95	120	150	170	185	210	235	255
Compressor Qty. & HP	Circuit #1	(1)50HP	(1)60HP	(1)75HP	(1)50HP	(1)60HP	(1)75HP	(1)60HP	(1)60HP	(1)75HP	(1)60HP	(1)60HP	(1)75HP
	Circuit #2	-	-	-	(1)50HP	(1)60HP	(1)75HP	(1)60HP	(1)75HP	(1)75HP	(2)60HP	(2)60HP	(2)75HP
	Circuit #3	-	-	-	-	-	-	(1)60HP	(1)75HP	(1)75HP	(3)60HP	(3)75HP	(3)75HP
	Circuit #4	-	-	-	-	-	-	-	-	-	(4)60HP	(4)75HP	(4)75HP
Capacity Control Infinite To		30%	30%	30%	15%	15%	15%	10%	10%	10%	6.3%	6.3%	6.3%
Low Ambient Operation	Standard Fan Cycling	30°F	30°F	30°F	30°F	30°F	30°F	30°F	30°F	30°F	30°F	30°F	30°F
	Option of Var. Speed Fan	0°F	0°F	0°F	0°F	0°F	0°F	0°F	0°F	0°F	0°F	0°F	0°F
Condenser Fans	No. & Dia.	(4)30	(6)30	(6)30	(8)30	(8)31.5	(8)31.5	(12)31.5	(12)31.5	(12)31.5	(16)31.5	(16)31.5	(16)31.5
	No. & HP	(4)1.5	(6)1.0	(6)1.5	(8)1.5	(8)2.0	(8)2.0	(12)2.0	(12)2.0	(12)2.0	(16)2.0	(16)2.0	(16)2.0
	Total KW	5.9	6.6	8.8	11.8	15.2	15.2	22.8	22.8	22.8	30.4	30.4	30.4
Chiller Barrel	No. Circuits	1	1	1	2	2	2	3	3	3	4	4	4
	Dia. & Length	10-60	11-60	13-60	14-102	16-112	16-122	18-122	18-122	20-122	20-122	20-122	20-122
	Volume (gal.)	9	11	17	30	43	46	60	60	68	68	68	68
Approx. Operating Wt. (lbs.)		3200	4590	4905	7560	9840	10460	13840	14290	15280	17830	18280	18725
Approx. Shipping Wt. (lbs.)		3125	4490	4755	7285	9480	10080	13340	13790	14710	17265	17710	18155
Operating Charge (lbs.)(R-22)		78	96	120	156	196	234	288	326	360	432	469	507

DIMENSIONS

ACDX 040-080



ACDX 095-255



MODEL ACDX	LENGTH (A)	HEIGHT (B)	WIDTH (C)	CONNECTION
040	101	79	86	4 in. NPT
050	141	79	86	4 in. NPT
060	141	79	86	4 in. NPT
080	191	84	86	5 in. VIC
095	181 1/2	88	88	6 in. VIC
120	181 1/2	88	88	6 in. VIC
150	265 1/2	88	88	8 in. VIC
170	265 1/2	88	88	8 in. VIC
185	265 1/2	91 1/2	88	10 in. VIC
210, 235, 255	349 1/2	91 1/2	88	10 in. VIC

NOTES:

1.) All dimensions are in inches
2.) Clearance required.
Sides: 72”
Control End: 60”
Back End: 48”
Refer to I&O Manual for multiple unit installation.
3.) Dimensions not to be used for construction. Consult sales office for detailed certified drawings.

ELECTRICAL DATA

UNIT	(9)	(1)UNIT			COMPRESSOR				CONDENSER FAN MOTORS						(6&7) CRANKCASE HEATERS			(5) COOLER HEATERS			(2) FIELD WIRE	
MODEL	SUPPLY	RLA	MCA	MFS	QTY	RLA	LRA EA		STANDARD			LOW AMB. OPTION				WATTS	FLA	QTY	WATTS	FLA	WIRE	QTY
SIZE	VOLTAGE					EA	(AL)	(YD)	QTY	HP	FLA EA	QTY	HP	FLA EA	QTY	EA	EA		EA	EA	SIZE	PER POLE
AK	208	156	189	300	1	132	1040	347	4	1.5	5.9	2/2	1.5/1	5.9/4.8	1	200	1.7	1	420	3.7	3/0	1
040 AN	230	148	179	300	1	124	1040	347	4	1.5	5.9	2/2	1.5/1	5.9/4.8	1	200	1.7	1	420	3.7	3/0	1
AR	460	86	105	175	1	74	422	141	4	1.5	3.0	2/2	1.5/1	3.0/2.4	1	200	1.7	1	420	3.7	#2	1
AK	208	181	222	350	1	164	1228	409	6	1	4.8	6	1	4.8	1	200	1.7	1	420	3.7	4/0	1
050 AN	230	169	207	350	1	152	1228	409	6	1	4.8	6	1	4.8	1	200	1.7	1	420	3.7	4/0	1
AR	460	99	122	200	1	91	485	162	6	1	2.4	6	1	2.4	1	200	1.7	1	420	3.7	#1	1
AK	208	237	287	450	1	201	1415	472	6	1.5	5.9	4/2	1.5/1	5.9/4.8	1	200	1.7	1	560	4.9	350	1
060 AN	230	220	266	400	1	184	1415	472	6	1.5	5.9	4/2	1.5/1	5.9/4.8	1	200	1.7	1	560	4.9	300	1
AR	460	116	141	225	1	98	539	180	6	1.5	3.0	4/2	1.5/1	3/2.4	1	200	1.7	1	560	4.9	1/0	1
AK	208	312	345	450	2	132	1040	347	8	1.5	5.9	6/2	1.5/1	5.9/4.8	2	200	1.7	2	420	3.7	500	1
080 AN	230	172	327	450	2	124	1040	347	8	1.5	5.9	6/2	1.5/1	5.9/4.8	2	200	1.7	2	420	3.7	400	1
AR	460	98	191	250	2	74	422	141	8	1.5	3.0	6/2	1.5/1	3.0/2.4	2	200	1.7	2	420	3.7	3/0	1
AK	208	391	432	550	2	165	1228	409	8	2.0	7.6	8	2.0	7.6	2	200	1.7	2	560	4.9	4/0	2
095 AN	230	366	404	550	2	154	1228	409	8	2.0	7.2	8	2.0	7.2	2	200	1.7	2	560	4.9	4/0	2
AR	460	183	202	250	2	77	485	162	8	2.0	3.6	8	2.0	3.6	2	200	1.7	2	560	4.9	250	1
AK	208	475	527	700	2	207	1415	472	8	2.0	7.6	8	2.0	7.6	2	200	1.7	2	560	4.9	300	2
120 AN	230	438	485	650	2	190	1415	472	8	2.0	7.2	8	2.0	7.2	2	200	1.7	2	560	4.9	250	2
AR	460	217	240	300	2	94	439	180	8	2.0	3.6	8	2.0	3.6	2	200	1.7	2	560	4.9	300	1
AK	208	583	626	750	3	164	1228	409	12	2.0	7.6	8	2.0	7.6	3	200	1.7	2	560	4.9	400	2
150 AN	230	548	587	700	3	154	1228	409	12	2.0	7.2	8	2.0	7.2	3	200	1.7	2	560	4.9	300	2
AR	460	274	293	350	3	77	485	162	12	2.0	3.6	8	2.0	3.6	3	200	1.7	2	560	4.9	400	1
AK	208	669	710	850	1/2	164/207	1228/1415	409/472	12	2.0	7.6	12	2.0	7.6	3	200	1.7	2	560	4.9	300	3
170 AN	230	620	660	800	1/2	154/190	1228/1415	409/472	12	2.0	7.2	12	2.0	7.2	3	200	1.7	2	560	4.9	400	2
AR	460	308	328	400	1/2	77/94	485/539	162/180	12	2.0	3.6	12	2.0	3.6	3	200	1.7	2	560	4.9	500	1
AK	208	715	767	950	3	208	1415	472	12	2.0	7.6	12	2.0	7.6	3	200	1.7	3	420	3.7	300	3
185 AN	230	656	704	850	3	190	1415	472	12	2.0	7.2	12	2.0	7.2	3	200	1.7	3	420	3.7	500	2
AR	460	328	352	400	3	95	539	180	12	2.0	3.6	12	2.0	3.6	3	200	1.7	3	420	3.7	500	1
AK	208	778	819	950	4	164	1228	409	16	2.0	7.6	16	2.0	7.6	4	200	1.7	3	420	3.7	300	3
210 AN	230	731	770	900	4	154	1228	409	16	2.0	7.2	16	2.0	7.2	4	200	1.7	3	420	3.7	500	2
AR	460	366	385	450	4	77	485	162	16	2.0	3.6	16	2.0	3.6	4	200	1.7	3	420	3.7	500	1
AK	208	864	905	1050	2/2	164/207	1228/1415	409/472	16	2.0	7.6	16	2.0	7.6	4	200	1.7	3	420	3.7	300	3
235 AN	230	803	842	950	2/2	154/190	1228/1415	409/472	16	2.0	7.2	16	2.0	7.2	4	200	1.7	3	420	3.7	500	2
AR	460	400	419	450	2/2	77/94	485/539	162/180	16	2.0	3.6	16	2.0	3.6	4	200	1.7	3	420	3.7	500	1
AK	208	950	1001	1200	4	207	1415	472	16	2.0	7.6	16	2.0	7.6	4	200	1.7	3	420	3.7	300	3
255 AN	230	875	928	1100	4	190	1415	472	16	2.0	7.2	16	2.0	7.2	4	200	1.7	3	420	3.7	500	2
AR	460	434	457	550	4	94	539	180	16	2.0	3.6	16	2.0	3.6	4	200	1.7	3	420	3.7	500	1

LEGEND

MCA Minimum circuit ampacity per NEC430-24
MFS Maximum allowable dual element fuse size
RLA Rated load amps
LRA Locked rotor amps
FLA Full load amps
HP Horsepower

GENERAL ELECTRICAL NOTES

1. Main power must be supplied from a single fused power source. Power supply is three phase. **Use 460/3/60 electrical data for 400/3/50 supply voltage**.
2. The maximum incoming wire size is 500 mcm. On units requiring greater than 500 mcm wire, the factory supplied field power terminal block will accept two or more parallel wires per pole. Wire size based on copper conductors with 75°C insulation per NEC Table 310-16, 3 conductors per conduit.
3. Standard compressor starting is XL.
4. Control circuit power (115-1-60) must field supplied from a separate field mounted fused disconnect (15 amp max. fuse size) unless the factory mounted and wired control transformer option is ordered.
5. Cooler heater power (115VAC) must be field-supplied from a separate field-mounted fused disconnect (15 amp max. fuse size).
6. Crankcase heaters are wired in the control circuit. On units with field supplied control circuit power, the 15 amp fused disconnect switch must be closed (on) at all times for heater operation. On units ordered with the control transformer option, the main unit power (and local safety switch, if used) must be closed (on) at all times for heater operation.
7. The compressor crankcase heaters must be energized for 24 hours before the unit is initially started or after a prolonged open disconnect.
8. All field wiring must be in accordance with all applicable local and national codes.
9. VOLTAGE TOLERANCES:
   1) 208 volt: min. 187, max. 229
   2) 230 volt: min. 207, max. 253
   3) 460 volt: min. 414, max. 506
   4) 400 volt: min. 360, max. 440

ENGINEERING GUIDE SPECIFICATIONS

General

Furnish and install as shown on plans, a DB Model ACDX _____Air Cooled Package Chiller.

The unit is to be completely factory assembled and wired in a single package complete with screw compressor(s), cooler, air cooled condenser, starting control and safety and operating controls. It is to be given a complete factory operating and control sequence test under load conditions and is to be shipped with full operating charge of R-22 and full oil charge.

The overall dimension shall not exceed _____inches in length, _____inches in width, and _____inches in height.

The unit shall be built in accordance with all applicable national and local codes including the ANSI B31.5 refrigerant piping; ASHRAE Standard safety code; the National Electrical Code and applicable ASME code for Unfired Pressure Vessels.

The unit shall be furnished for operating on a _____V, three phase, _____Hertz power supply and to have an EER rating not to be less than _____.

Capacity

The air cooled packaged chiller shall have a capacity of not less than _____ tons when cooling _____GPM of water from _____F° to _____F°. When operating in ambient temperature of _____°F. The foregoing capacity shall be based on .0001 water side fouling factor for the cooler. Water pressure drop shall not exceed _____ feet of water**. Unit shall be rated in accordance with or certified per ARI Standard 590-98.**

Construction

Unit will be designed for maximum corrosion protection with all panels being of heavy gauge, UL90 approved galvanized construction. The base and legs shall be of 10 gauge galvanized channels. Frame members are constructed of 12 gauge, galvanized steel.

Evaporator

Cooler shall be direct expansion, shell and tube type. The shell shall be fabricated from carbon steel pipe, with innerfinned copper tubes, and tube sheets of heavy gauge carbon steel. ACDX040-060 have welded construction. ACDX080-185 have removable heads and roller expanded tubes. The heads shall be constructed of carbon steel with multiple pass baffles. The cooler shall be insulated with not less than 3/4” of closed cell foamed plastic with vapor seal. Cooler shall be designed, constructed and inspected to comply with current ASME code for unfired pressure vessels. Shell side (water) design working pressure is to be 200 PSIG and tube side (refrigerant) design working pressure is to be 250 PSIG. A thermostatically controlled electric resistance heater cable is to be wrapped around the shell to prevent freezing down to –20°F. outdoor temperature. The coolers are to be circuited so that no more than one compressor is connected to an independent refrigerant circuit.

Condenser

The condenser coil is to be constructed of copper tubes and die formed aluminum fins having self-spacing collars. Fins are to be mechanically bonded to the tubes.
Refrigerant sub-cooling is to be incorporated into the coil. Baffles shall separate each condenser fan.

Fans

The condenser shall have direct-drive, heavy duty, aluminum or PPG bladed fans. Motors are to be 6 pole, slow speed type with internal overloads and are to be permanently lubricated. Belt driven designs are not acceptable due to excessive maintenance requirements.

Compressor

The overall compressor design shall include suction cooled motor, integral lubrication system utilizing compressor pressure differential, and semi-hermetic design.

The rotors are to be precisely made from ductile cast iron. Male rotors are to have five lobes and female rotors six lobes.

The casing is to be constructed from a high strength iron casting, having reinforced double wall construction, to provide a rigid structure and minimize the transmission of noise.

Four roller bearings are to be used to support the rotors and be designed to absorb the radial loads. Four ball bearings are also required to adsorb the axial thrust and to position the rotors.

An 80 mesh reinforced stainless steel strainer shall be provided at the suction of the compressor.

A two-pole hermetic squirrel cage motor is to be supplied. This is to be wound for three phase operation. A weather resistant terminal box, located in an accessible location on the compressor, shall contain all connection terminals.

An oil separator which is an integral part of the compressor compartment is to be furnished. An impingement plate is to be directly connected to the discharge end of the compressor. An easily removable 150 mesh stainless steel oil strainer is to be installed in the compressor body. An electric crankcase oil heater shall be provided to maintain the proper oil temperature when the system is not in operation.

Capacity Control

An infinitely variable capacity control system that is capable of exactly matching the demand requirement of the system is to be supplied. A microprocessor based controller shall modulate a compressor slide valve, in response to supply water temperature, and maintain water temperature within 1/2°F of setpoint. This system is to provide precise and stable control of supply water temperature over the complete range of operating conditions. It shall be capable of a system capacity control range from 100% to _____% at specified conditions.

Refrigerant Circuit

Each compressor shall be provided with an independent refrigerant circuit for maximum standby protection. Parallel compressors are not acceptable due to oil control problems and cross contamination. Each refrigerant circuit shall include expansion valve, sight glass, moisture indicator, solenoid valve, replaceable core filter drier, liquid line shut off valves, charging and gauge connections and discharge line check valve.

Control Center

The Control Center is to be a fully enclosed steel cabinet with hinged access doors. Dual compartments separating safety and operating controls from the power controls are to be provided.

ACDX40-120 Microprocessor	ACDX150-255 (Optional 40-120) Microcomputer
• High pressure cutout, manual reset • Low pressure cutout, manual reset • Solid state thermal overloads, manual reset • High discharge temperature manual reset • Freeze up thermostat, manual reset • Phase failure, undervoltage and reversal protection • Single point power terminal block • Compressor contactors • Condenser fan contactors • Inherent fan overload protection • Microprocessor load controller • Control labeling • Numbered terminal strips • Alarm contacts for high pressure, high temperature, and low pressure (optional)	**Control** • Staging and loading • Lead/lag and load balance • Ramp up at start-up • Alarm output and customer interlocks **Protection** • Low and high pressure, freeze up • Sensor failure • High oil and motor temperature • Anti-recycle timing **Readouts** • Analog Inputs: leaving water and ambient temperatures evaporator and condenser pressure, amps • Digital Inputs: compressor contactor, flow switch(optional) **Setpoints** • Leaving water temperature, freeze up temperature, high and low pressure, amp limit, ramp up **Alarm History**

OPTIONS

Star-Delta Open Transition Start- A Star-Delta Start is to be provided to minimize current in-rush for each compressor.

Control Transformer- Provides 115 volt control power.

Convenience Outlet- A 115 volt convenience outlet is to be provided and powered through the control transformer.

Control transformer-supply control power from main power supply.

Indicating Lights- Indicating lights visible from the unit exterior, indicate normal compressor operation, high pressure failure or high oil temperature failure and power to the control panel.

Pressure Gauges- (Electro Mechanical Control) Each unit is to be supplied with factory mounted and piped suction and discharge pressure gauges for each refrigerant circuit. Each gauge is to have its own manual shut-off valve.

Ambient Control to 0°F- Variable speed drive on the last fan cycled shall control discharge pressure. This system is to be used in conjunction with the standard fan cycling controls furnished with the unit. The compressor shall be enclosed in a sheet metal cabinet for maintaining oil temperature during cold starts.

Compressor Short Circuit Protection– Individual (fuses) (circuit breakers) are to be provided to provide branch short circuit protection.

Grilles- Full height grille panels to enclose entire unit with no change in capacity.

Fin Guard- Wire mesh screen covering exposed vertical fin surface.