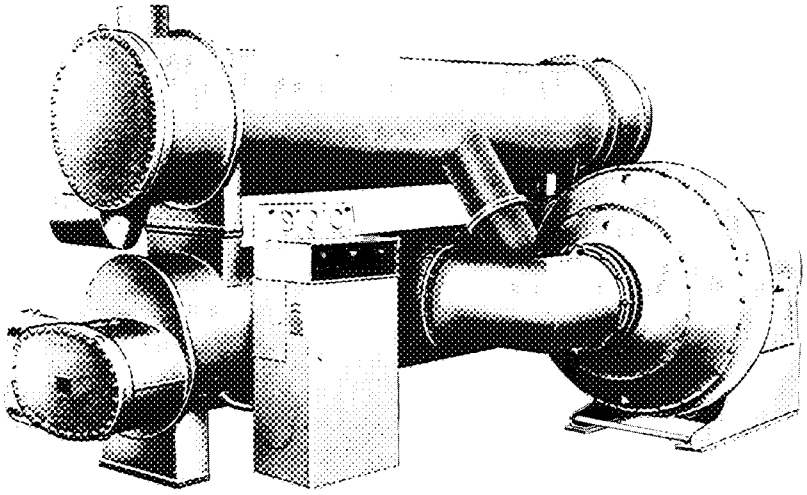
Carrier

Hermetic Centrifugal Liquid Chillers

605 thru 2000 Tons

19C



DESCRIPTION

Carrier 19C Centrifugal Liquid Chillers are large capacity refrigeration machines of compact and functional design They provide chilled water for air conditioning or for process liquid cooling, and may be readily adapted for heat reclaim systems

The 19C unit is so designed that, within the 17 standard sizes of 605 thru 2000 tons nominal capacity, many combinations of compressor, motor, cooler and condenser components can be blended to meet your particular refrigeration requirements

The smooth quiet operation of the 19C unit makes it an excellent choice for roof or upper floor installation

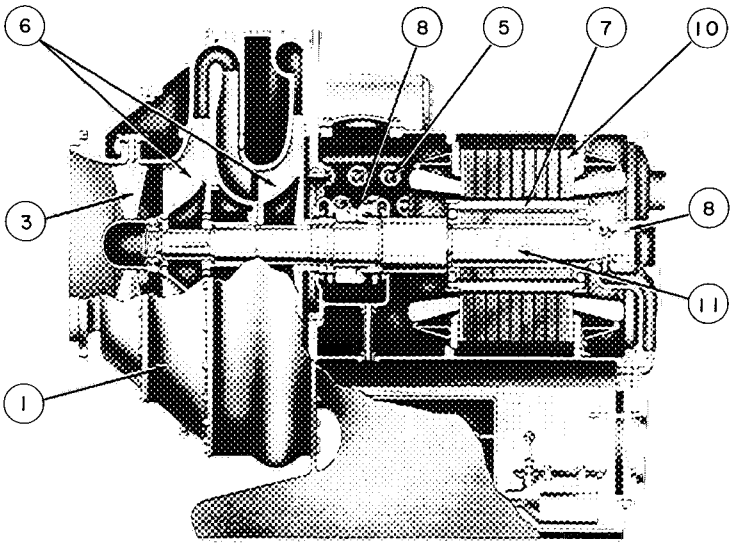
The installations may consist of single machines or multiple-unit systems to cover a wide range of applications

FEATURES

(See detail art, page 2 for item reference)

- **Refrigerant-Cooled Motor** operates at low temperature and high electrical efficiency, stays free of air-borne dirt, water and other contaminants
- **Hermetic Design** eliminates shaft seal with its potential refrigerant leakage, isolates motor and running gear to keep noise and heat from equipment room
- **Internal Thermal Protection** — A Carrier standard, guards motor and bearings against damage from overheat
- **Compact Design** — Single housing (1) and integral shaft for motor and compressor, saves space, reduces bearing maintenance, ensures perfect alignment of all components
- **Low Operating Costs** — Efficient design of economizer (2), capacity regulating guide vanes (3), heat transfer surfaces (4) all reduce costs
- **Low Starting Current** — Star-delta wound motor (5) (standard for 208-550v) and hermetic design reduce initial current demand In low cooling load seasons, Electrical Demand Control will hold current to preset limits
- **Peak Operating Efficiency** is ensured by continual and automatic elimination of water, air and noncondensable gases from the refrigeration system
- **Low Vibration Level** — Assembly of impellers (6) and motor rotor (7) on single shaft ensures perfect balance and quiet operation, allows upper floor installation of unit
- **Simple Installation** — Unit can be placed directly on floor No need for heavy concrete bases Design provides easy alignment of heat exchangers with compressor
- **Reduced Inspection and Maintenance Time** — Easy access to motor bearings (8) and tube bundles (9) allows quick inspection and planned maintenance Motor stator (10) may be removed without dismantling the compressor
- **Rugged Construction** — Substantial shaft (11), thick steel tube sheets (12), finned tubes rolled into grooved tube holes (13), no fins at tube support points (14), closely spaced tube support sheets (15)
- **Automatic Controls** maintain unit at peak efficiency; continuously monitor machine operation to supply the exact cooling capacity required Customer may select either electronic or pneumatic capacity control
- **Elapsed Time Indicator,** by providing a constant record of machine operating hours, facilitates accurate scheduling of machine inspection and maintenance

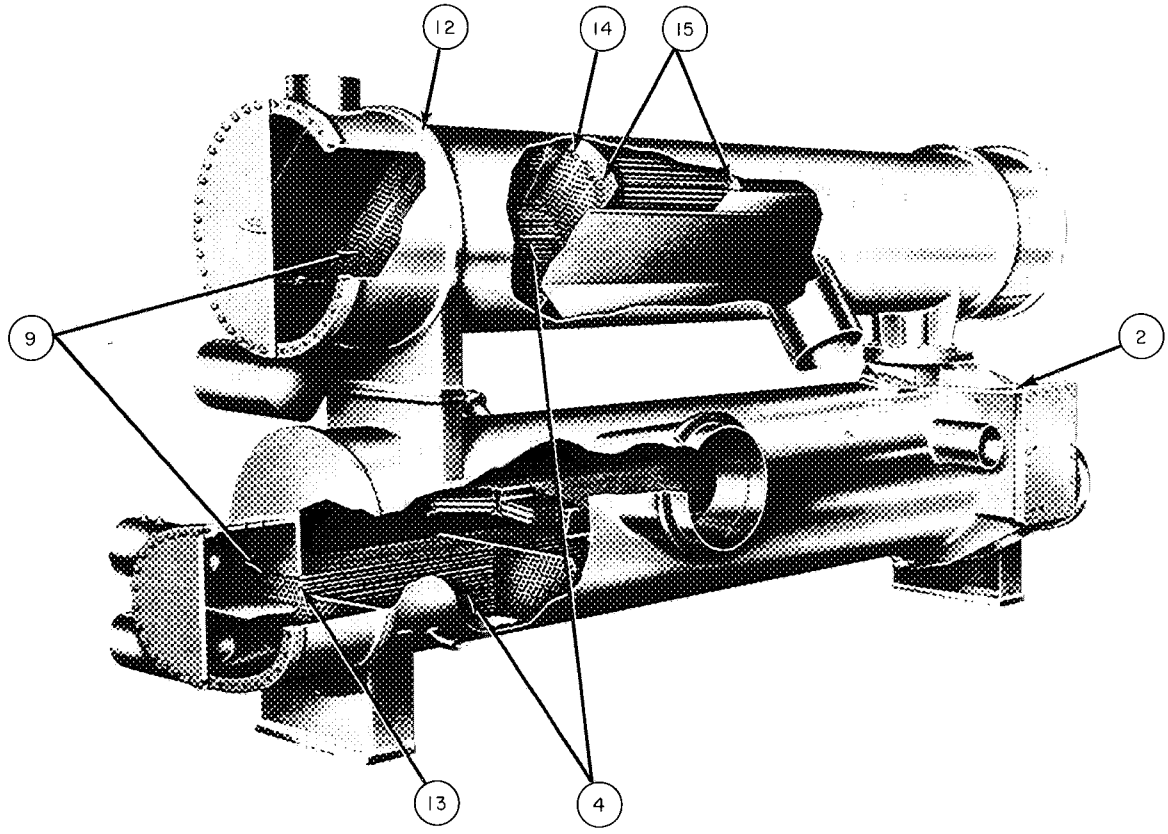
FEATURES (cont)



Compressor

LEGEND

1 – Compressor Housing
2 – Economizer
3 – Guide Vanes
4 – Heat Transfer Surfaces
5 – Motor Terminals
6 – Impeller Wheels
7 – Motor Rotor
8 – Motor Bearings
9 – Tube Bundle
10 – Motor Stator
11 – Compressor Shaft
12 – Tube Sheets
13 – Grooved Tube Holes
14 – Tube Support Points
15 – Tube Support Sheets



Cooler–Condenser

ACCESSORIES

Pumpout Unit (R-114 machines) – This unit is a complete system, containing hermetic motor-compressor, condenser, storage tank, safety controls, pressure gages, valves and piping It requires only electrical hook-up and interconnecting piping to become operational

The unit may be used for transferring or distilling refrigerant, removing air after opening machine, leak testing and for reducing machine pressure during extended shutdown

OPTIONAL EQUIPMENT

200 or 250 psi Water Boxes may be specified in place of standard 150 psi design

150 and 300 lb ASA Flanged Water Connections are available in place of standard welded pipe connections

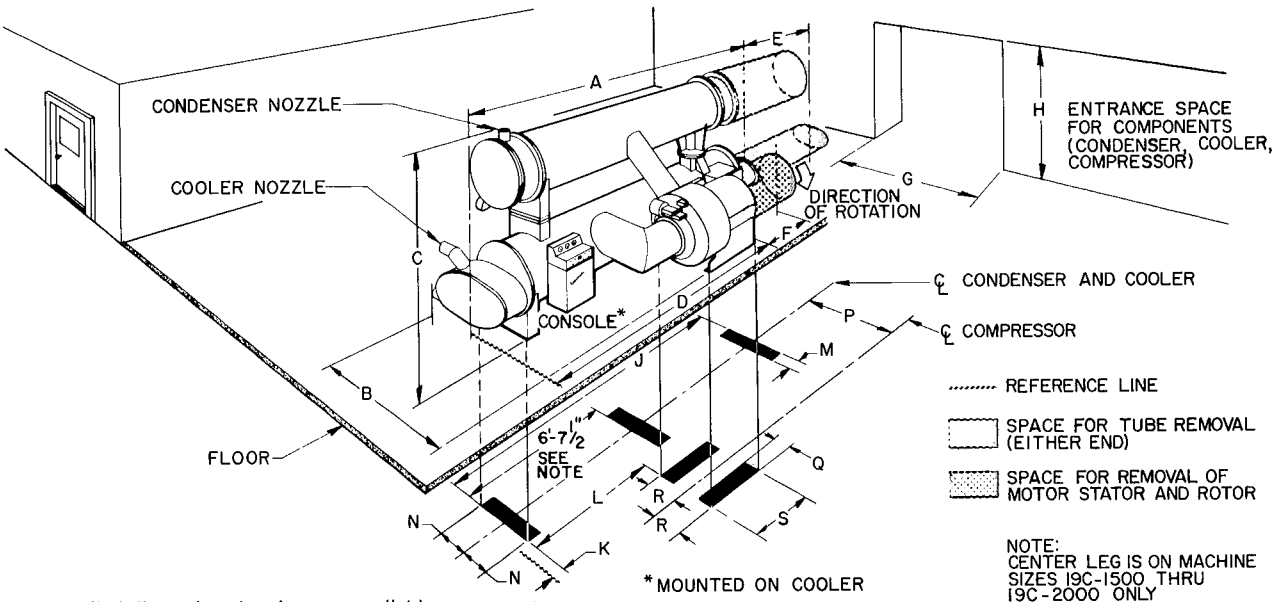
Isolation Pads for Cooler Feet are offered to supplement the standard motor-compressor isolation

Customer may select either electronic or pneumatic capacity control:

Electronic Capacity Control – Electronically amplified signal from resistance element in chilled water line directs hydraulic guide-vane operator

Pneumatic Capacity Control – Pneumatic thermostat in chilled water line acts directly on pneumatic guide-vane positioner

DIMENSIONS



Certified dimension drawings are available on request

UNIT 19C	DIMENSIONS (ft–in.) Length A	Width B	Height C	D	NOZZLE SIZES* (IPS) (in.) Cooler	Cond	MIN SERVICE CLEARANCE† (ft–in.) Tubes E	Motor F	MIN ENTRANCE REQ (ft–in.) Width G	Height H
605	18– 0¼	10– 3¾	8– 4½	14–10	8	8	13– 5¾	5–6	6–10¾	5–5¾
640	18– 0¼	10– 3¾	8– 4½‡	14–10‡	8	8	13– 5¾	5–6‡	6–10¾	5–5¾
720	8– 6	11– 3	8–10½	15– 1‡	8	10	13– 2¾	5–6‡	7– 3¼	5–6¾
810, 840	8– 6	11– 3	8–10½	15– 1**	8	10	13– 2¾	5–6**	7– 3¼	5–6¾
910, 935	8– 6	11– 3	8–10½	16– 1½	8	10	13– 2¾	6–6½	7– 3¼	5–9
985, 1020	18– 6½	11–11	10– 5	16– 1¾	10	10	13– 2½	6–6½	7– 3¼	5–9
1100, 1200	18–10	12–10	10– 5¾	16– 4½	10	10	13– 0¾	6–5¾	7– 8½	6–5½
1265	19– 0½	13– 7	11– 0	16– 5¾	10	12	12–11½	6–5¾	7– 8½	6–5½
1385	19– 0½	13– 7	11– 0	18– 2¼	10	12	12–11½	7–6¾	7– 8½	6–5½
1440	19– 0½	13– 7	11– 5¾	18– 2¼	10	12	12–11½	7–6¾	7– 8½	6–5½
1500	19– 5½	15– 4¾	12– 1¾	18– 4	12	12	12– 9	7–6¾	9– 6	6–5½
1750	19– 5½	15– 4¾	12– 5	18– 4	12	12	12– 9	7–6¾	9– 8¾	6–7½
2000	19– 5½	15– 4¾	13– 1½	18– 4	12	14	12– 9	7–6¾	9– 8¾	6–7½

UNIT 19C	CONTACT SURFACES (ft–in.) J	K	L	M	N	P	Q	R	S
605	14–11½	1– 6¼	8–0½	0–9	1–2¼	5– 7	0–4	1–5	4–10¼
640	14–11½	1– 6¼	8–0½	0–9	1–2¼	5– 7	0–4	1–5‡	4–10¼‡
720	14–11½	1– 9¼	8–0½	0–9	1–2¼	6– 2	0–4	1–5‡	4–10¼‡
810	14–11½	1– 9¼	8–0½	0–9	1–2¼	6– 2	0–4	1–5**	4–10¼**
840, 910, 935	14–11½	1– 9¼	8–0½	0–9	1–2¼	6– 2	0–4	1–7½	5–10
985, 1020	14–11½	1– 9¼	8–0½	0–9	1–2¼	6– 7	0–4	1–7½	5–10
1100, 1200	14–11½	1 11¼	8–0½	1–2	1–9¼	7– 0	0–6	1–7½	5–10
1265	14 11½	2 0½	8–0½	1–2	1–9¼	7– 4	0–6	1–7½	5–10
1385, 1440	14–11½	2– 0½	8–9	1–2	1–9¼	7– 4	0–6	1–7½	5–10
1500, 1750, 2000	14–11¾	2– 3	8–8½	0–9	2–4¼	7–10¾	0–6	1–7½	5–10

*May increase one or two nominal pipe sizes for single pass Nozzle connections are butt-weld 6-in nozzles are sch 40 pipe; all others are sch 20

†Dimension E is the minimum clearance for cooler tube removal from either end (Will also provide sufficient clearance for condenser tube removal) A dimension of 3-ft clearance is required at opposite end of cooler Dimension F is the minimum clearance (beyond D) for removal of motor stator and rotor

‡Increase slightly for 4160 volts

**Increase slightly for 2300 and 4160 volts

NOTES

1 Certified dimension drawings available on request

2 3/4-in FPT vent and drain connections in all water boxes

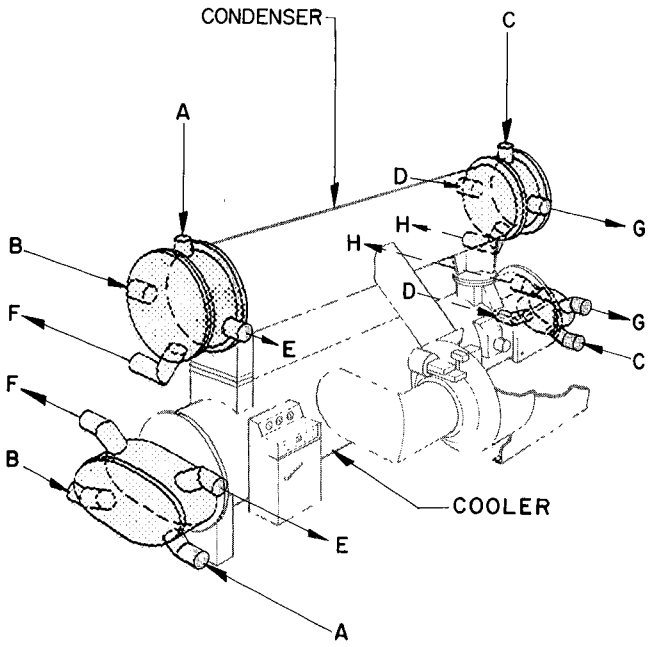
3 5/8-in flare connections on oil cooler for cooling water

DIMENSIONS (cont)

NOZZLE ARRANGEMENTS (All Units)

VESSEL	2- and 4-Pass			1- and 3-Pass		
	Nozzle		Arr	Nozzle		Arr
	In	Out	No.	In	Out	No.
CONDENSER	A	E	31	A	G	34
	A	F	39	A	H	312
	B	E	37	B	G	36
	B	F	313	B	H	316
	C	G	32	C	E	33
	C	H	310	C	F	311
	D	G	38	D	E	35
	D	H	314	D	F	315
COOLER	A	E	41	A	G	47*
	B	F	43	B	H	45
	C	G	42*	C	E	48*
	D	H	44	D	F	46

*Not available with 19C-1200, 1265, 1385, 1440, 1500, 1750, and 2000.



NOTES:

1. Arrows indicate direction of water flow
2. Each vessel uses two nozzles Select nozzle arrangement from table and specify arrangement number on purchase order

PERFORMANCE DATA

The following Performance Data tables contain ratings for seventeen popularly sized machines at commonly used design conditions (2-pass cooler and condenser, 0005 fouling factor and 10 F water temperature rise)

Many additional combinations of cooler, condenser, motor and compressor can be computer matched to meet your specific design requirements

For any component combination or design condition not covered in the tables, obtain the exact machine selection from Carrier's computer center Ask your local Carrier representative for this service

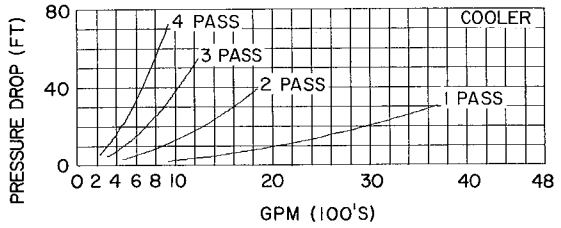
The 19C unit ratings conform to ARI standard 550-66 for centrifugal water chillers

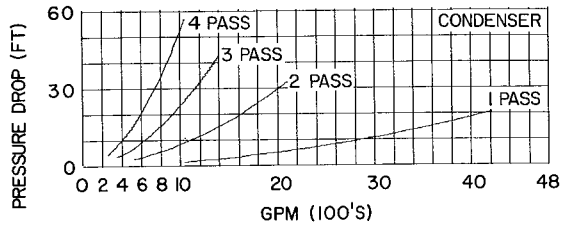
Machine Selection Procedure is given on page 13 foldout

PERFORMANCE DATA 19C605

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	564	568	566	575	592	609	615	616	630	647	660
	IC	5	4	4	3	3	3	3	3	2	2	2
	KW	436	421	415	405	413	421	421	417	415	423	428
91	Tons	574	574	578	576	586	602	619	626	627	641	658
	IC	5	5	4	4	3	3	3	3	3	2	2
	KW	450	445	430	423	412	421	429	429	425	423	431
92	Tons	571	577	583	589	586	596	613	630	637	638	652
	IC	5	5	5	4	4	3	3	3	3	3	2
	KW	452	452	452	438	431	420	429	437	437	434	431
93	Tons	566	572	578	583	599	596	607	624	641	648	650
	IC	5	5	5	5	4	4	3	3	3	3	3
	KW	452	452	452	452	446	439	428	437	446	446	442
94	Tons	561	567	573	578	593	606	607	618	635	650	656
	IC	5	5	5	5	4	4	4	3	3	3	3
	KW	452	452	452	452	445	452	447	437	445	452	452
95	Tons	555	562	568	573	587	601	607	613	629	643	650
	IC	5	5	5	5	4	4	4	4	3	3	3
	KW	451	452	452	452	445	452	452	452	445	452	452
96	Tons	549	556	562	568	580	595	602	608	622	637	644
	IC	5	5	5	5	4	4	4	4	3	3	3
	KW	450	452	452	452	444	452	452	452	445	452	452
97	Tons	543	551	557	563	574	589	596	602	616	631	638
	IC	5	5	5	5	4	4	4	4	3	3	3
	KW	450	452	452	452	444	452	452	452	445	452	452
98	Tons	537	545	552	558	567	583	590	596	609	625	631
	IC	5	5	5	5	4	4	4	4	3	3	3
	KW	450	452	452	452	443	452	452	452	445	452	452
99	Tons	528	539	546	552	560	577	584	590	603	618	625
	IC	5	5	5	5	4	4	4	4	3	3	3
	KW	447	452	452	452	443	452	452	452	445	452	452
100	Tons	517	533	540	547	553	571	578	584	596	612	619
	IC	5	5	5	5	4	4	4	4	3	3	3
	KW	443	452	452	452	442	451	452	452	445	452	452

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	36,555
WEIGHT, RIGGING HEAVY SECTION (lb)	11,590
OUTSIDE TUBE SURFACE, COOLER (sq ft)	3,360
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	2,848
OPERATING CHARGE, R-11 (lb)	1,600
AREA TO INSULATE (sq ft)	202

ELECTRICAL DATA

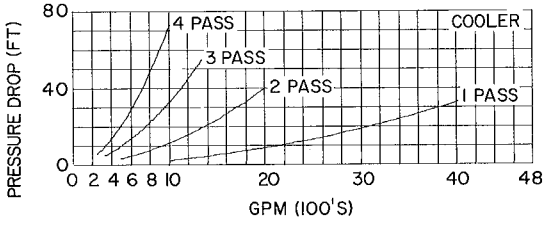
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
N	452	FLA	3 03	2 86	1 43	1 31	1 14	274	153
		LRA Star	1500	1600	800	860	640	-	-
		LRA Delta	4700	5000	2500	2750	2000	500	290
		OLTA	3 28	3 09	1 55	1 42	1 23	296	166

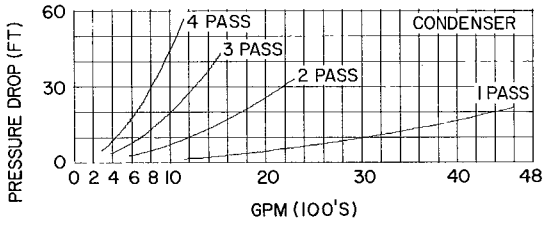
FLA – Full Load Amps per each kw input
KW – Compressor power input (kilowatts)
LRA – Locked Rotor Amps
MTR – Motor
OLTA – Overload Trip Amps per each kw input

PERFORMANCE DATA 19C640

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	583	583	585	592	601	609	610	623	640	658	672
	IC	5	5	4	4	3	3	3	2	2	2	2
	KW	447	442	424	425	413	414	410	408	416	424	430
91	Tons	581	593	594	596	603	612	619	621	634	652	669
	IC	5	5	5	4	4	3	3	3	2	2	2
	KW	449	455	450	432	433	421	422	418	415	424	432
92	Tons	575	592	604	604	606	613	623	630	632	646	663
	IC	5	5	5	5	4	4	3	3	3	2	2
	KW	449	458	464	459	441	442	429	430	426	423	432
93	Tons	570	586	602	615	615	618	624	634	642	643	657
	IC	5	5	5	5	5	4	4	3	3	3	2
	KW	448	457	467	472	467	449	450	437	438	434	432
94	Tons	565	581	597	614	625	626	629	635	646	653	654
	IC	5	5	5	5	5	5	4	4	3	3	3
	KW	448	457	467	476	481	476	458	458	446	447	442
95	Tons	559	575	592	608	625	636	637	640	646	657	665
	IC	5	5	5	5	5	5	5	4	4	3	3
	KW	448	457	466	476	485	490	485	467	467	455	455
96	Tons	554	570	586	602	619	636	648	648	651	658	669
	IC	5	5	5	5	5	5	5	5	4	4	3
	KW	448	457	466	475	485	495	500	494	476	476	463
97	Tons	559	564	580	597	614	631	648	659	659	663	669
	IC	6	5	5	5	5	5	5	5	5	4	4
	KW	473	457	466	475	485	495	505	509	504	485	485
98	Tons	569	568	575	592	608	625	642	659	670	671	675
	IC	6	6	5	5	5	5	5	5	5	5	4
	KW	487	482	466	475	484	494	504	514	519	513	495
99	Tons	580	579	578	586	602	619	636	653	667	674	680
	IC	6	6	6	5	5	5	5	5	5	5	5
	KW	502	496	490	475	484	494	504	514	521	521	521
100	Tons	587	590	589	588	597	614	631	648	662	669	675
	IC	6	6	6	6	5	5	5	5	5	5	5
	KW	515	512	505	499	484	494	504	513	521	521	521

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	37,440
WEIGHT, RIGGING HEAVY SECTION (lb)	11,730
OUTSIDE TUBE SURFACE, COOLER (sq ft)	3,652
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	3,112
OPERATING CHARGE, R-11 (lb)	1,600
AREA TO INSULATE (sq ft)	202

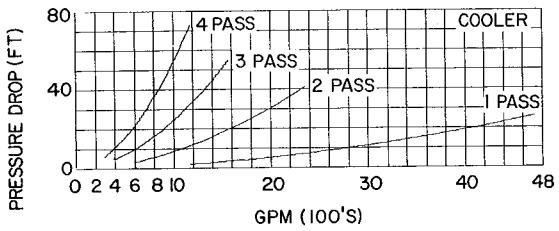
ELECTRICAL DATA

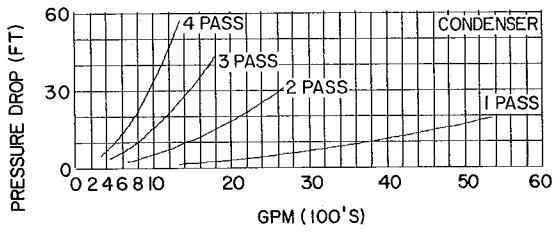
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
P	521	FLA	3 02	2 86	1 43	1 31	1 15	274	152
		LRA Star	1750	1880	940	1000	740	-	-
		LRA Delta	5500	5860	2930	3200	2340	575	320
		OLTA	3 26	3 09	1 54	1 41	1 24	296	164

PERFORMANCE DATA 19C720

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	721	731	740	749	758	766	773	780	786	792	796
	IC	2	2	2	2	2	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521
91	Tons	709	719	730	739	748	756	764	771	777	783	788
	IC	2	2	2	2	2	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521
92	Tons	697	708	718	728	737	746	754	761	768	774	779
	IC	2	2	2	2	2	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521
93	Tons	676	696	707	717	726	735	744	751	758	765	770
	IC	3	2	2	2	2	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521
94	Tons	666	684	695	705	715	724	733	741	748	755	761
	IC	3	2	2	2	2	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521
95	Tons	654	664	683	693	704	713	722	731	738	745	751
	IC	3	3	2	2	2	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521
96	Tons	643	653	662	681	692	702	711	720	728	735	741
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521
97	Tons	631	641	651	669	679	690	700	709	717	724	731
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521
98	Tons	609	630	639	649	667	678	688	697	706	714	721
	IC	3	3	3	3	2	2	2	2	2	2	2
	KW	514	521	521	521	521	521	521	521	521	521	521
99	Tons	599	618	628	638	646	665	675	686	695	703	710
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521
100	Tons	588	596	616	626	635	652	663	673	683	692	700
	IC	4	4	3	3	3	2	2	2	2	2	2
	KW	521	521	521	521	521	521	521	521	521	521	521

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	42,490
WEIGHT, RIGGING HEAVY SECTION (lb)	13,500
OUTSIDE TUBE SURFACE, COOLER (sq ft)	4,282
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	3,633
OPERATING CHARGE, R-11 (lb)	2,000
AREA TO INSULATE (sq ft)	226

ELECTRICAL DATA

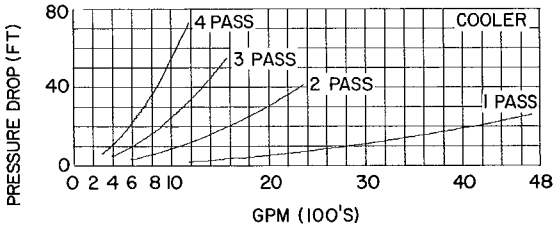
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
P	521	FLA	3 02	2 86	1 43	1 31	1 15	274	152
		LRA Star	1750	1880	940	1000	740	–	–
		LRA Delta	5500	5860	2930	3200	2340	575	320
		OLTA	3 26	3 09	1 54	1 41	1 24	296	164

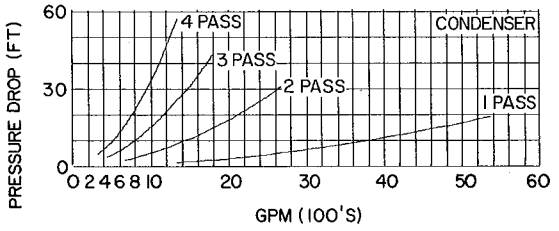
FLA – Full Load Amps per each kw input
KW – Compressor power input (kilowatts)
LRA – Locked Rotor Amps
MTR – Motor
OLTA – Overload Trip Amps per each kw input

PERFORMANCE DATA 19C810

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	789	798	822	833	840	840	840	840	840	840	840
	IC	3	3	2	2	2	2	2	2	2	2	2
	KW	580	579	579	580	577	570	563	558	553	548	545
91	Tons	778	788	809	822	833	840	840	840	840	840	840
	IC	3	3	2	2	2	2	2	2	2	2	2
	KW	579	580	579	580	580	577	570	564	559	554	550
92	Tons	768	778	788	811	822	832	840	840	840	840	840
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	580	580	580	580	580	580	578	571	565	560	556
93	Tons	757	767	777	799	811	822	832	840	840	840	840
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	580	580	580	580	580	580	580	578	572	566	562
94	Tons	745	756	767	776	799	810	821	831	840	840	840
	IC	3	3	3	3	2	2	2	2	2	2	2
	KW	580	580	580	579	580	579	580	580	579	573	568
95	Tons	725	745	756	766	787	798	809	820	830	839	840
	IC	3	3	3	3	2	2	2	2	2	2	2
	KW	572	580	580	580	580	580	579	579	580	580	575
96	Tons	711	733	744	754	764	786	798	809	819	828	837
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	579	580	579	580	580	580	580	580	580	580	580
97	Tons	700	711	732	743	753	774	785	797	807	817	826
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	580	572	580	580	580	580	580	580	580	580	580
98	Tons	689	699	720	731	742	752	773	784	795	805	815
	IC	4	4	3	3	3	3	2	2	2	2	2
	KW	580	580	579	580	580	579	580	580	580	580	580
99	Tons	679	688	697	719	730	740	760	772	783	793	804
	IC	4	4	4	3	3	3	2	2	2	2	2
	KW	580	580	580	580	580	580	580	580	580	580	580
100	Tons	667	677	686	706	718	728	739	759	770	781	792
	IC	4	4	4	3	3	3	3	2	2	2	2
	KW	580	580	580	579	580	579	580	580	580	580	580

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	42,935
WEIGHT, RIGGING HEAVY SECTION (lb)	13,500
OUTSIDE TUBE SURFACE, COOLER (sq ft)	4,282
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	3,633
OPERATING CHARGE, R-11 (lb)	2,000
AREA TO INSULATE (sq ft)	226

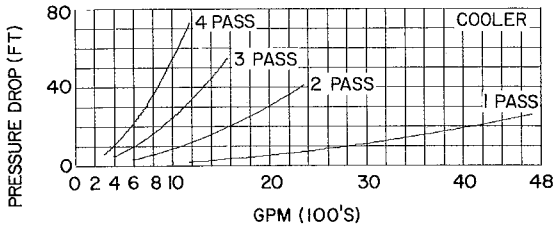
ELECTRICAL DATA

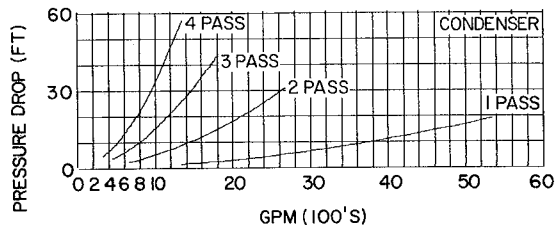
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
Q	580	FLA	3 02	2 86	1 43	1 31	1 14	274	152
		LRA Star	1920	2040	1020	1100	810	–	–
		LRA Delta	6000	6400	3200	3500	2560	650	356
		OLTA	3 26	3 09	1 54	1 41	1 23	296	164

PERFORMANCE DATA 19C840

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F) 38	39	40	41	42	43	44	45	46	47	48
90	Tons	840	840	840	840	840	840	840	840	840	840	840
	IC	4	3	3	2	2	2	2	2	2	2	2
	KW	634	610	602	583	575	568	561	556	551	546	543
91	Tons	840	840	840	840	840	840	840	840	840	840	840
	IC	4	3	3	2	2	2	2	2	2	2	2
	KW	642	619	610	592	583	575	568	562	557	552	548
92	Tons	831	840	840	840	840	840	840	840	840	840	840
	IC	4	4	3	3	2	2	2	2	2	2	2
	KW	642	642	618	610	591	583	575	569	563	558	554
93	Tons	822	831	840	840	840	840	840	840	840	840	840
	IC	4	4	3	3	3	2	2	2	2	2	2
	KW	642	642	622	618	610	591	583	576	570	564	560
94	Tons	811	822	831	840	840	840	840	840	840	840	840
	IC	4	4	4	3	3	2	2	2	2	2	2
	KW	642	642	642	627	619	600	591	584	577	571	566
95	Tons	801	811	822	838	840	840	840	840	840	840	840
	IC	4	4	4	3	3	3	2	2	2	2	2
	KW	642	642	643	635	627	619	600	592	584	578	572
96	Tons	791	801	811	821	840	840	840	840	840	840	840
	IC	4	4	4	4	3	3	2	2	2	2	2
	KW	642	642	642	642	636	627	610	601	593	585	579
97	Tons	771	791	801	811	832	840	840	840	840	840	840
	IC	4	4	4	4	3	3	3	2	2	2	2
	KW	635	642	642	642	639	636	628	610	601	593	587
98	Tons	758	779	790	800	810	836	840	840	840	840	840
	IC	5	4	4	4	3	3	3	3	2	2	2
	KW	642	642	643	643	631	642	637	629	610	602	595
99	Tons	747	762	779	789	799	824	835	840	840	840	840
	IC	5	4	4	4	4	3	3	3	2	2	2
	KW	642	637	642	642	642	642	642	637	620	611	603
100	Tons	737	747	767	778	788	798	823	835	840	840	840
	IC	5	5	4	4	4	4	3	3	3	2	2
	KW	643	643	642	642	642	642	642	643	638	621	612

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	43,710
WEIGHT, RIGGING HEAVY SECTION (lb)	13,500
OUTSIDE TUBE SURFACE, COOLER (sq ft)	4,282
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	3,633
OPERATING CHARGE, R-11 (lb)	2,000
AREA TO INSULATE (sq ft)	226

ELECTRICAL DATA

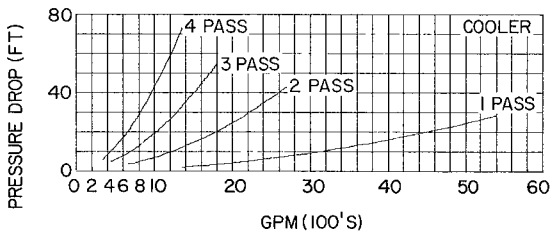
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
R	642	FLA	3 03	2 87	1 43	1 32	1 15	274	153
		LRA Star	2140	2260	1130	1220	900	–	–
		LRA Delta	6700	7100	2550	3900	2840	710	395
		OLTA	3 27	3 10	1 54	1 43	1 24	296	165

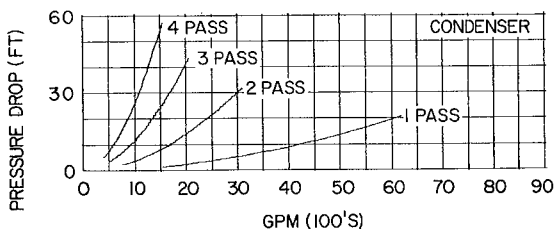
FLA – Full Load Amps per each kw input
KW – Compressor power input (kilowatts)
LRA – Locked Rotor Amps
MTR – Motor
OLTA – Overload Trip Amps per each kw input

PERFORMANCE DATA 19C910

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F) 38	39	40	41	42	43	44	45	46	47	48
90	Tons	864	886	905	916	925	935	935	935	935	935	935
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	642	635	642	642	642	628	619	612	605	599	594
91	Tons	855	876	896	906	916	935	935	935	935	935	935
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	643	636	643	642	642	636	627	619	612	606	600
92	Tons	845	861	885	896	906	926	935	935	935	935	935
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	642	632	642	642	642	637	635	626	619	612	606
93	Tons	836	846	875	886	896	911	934	935	935	935	935
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	642	628	642	642	642	634	642	634	626	619	613
94	Tons	826	836	861	876	886	896	923	935	935	935	935
	IC	4	4	3	3	3	3	2	2	2	2	2
	KW	642	643	640	643	643	642	642	642	634	626	620
95	Tons	816	826	842	864	876	886	909	924	935	935	935
	IC	4	4	3	3	3	3	2	2	2	2	2
	KW	642	642	634	642	642	642	640	642	642	634	627
96	Tons	806	816	826	853	865	876	889	912	924	935	935
	IC	4	4	4	3	3	3	2	2	2	2	2
	KW	643	642	642	642	642	642	634	642	642	642	634
97	Tons	795	805	815	837	853	865	875	900	913	924	935
	IC	4	4	4	3	3	3	3	2	2	2	2
	KW	643	642	642	639	643	643	642	642	642	642	642
98	Tons	784	794	805	814	841	853	864	881	900	913	924
	IC	4	4	4	4	3	3	3	2	2	2	2
	KW	642	642	642	642	642	642	642	637	642	642	642
99	Tons	763	783	794	804	829	841	853	863	888	900	912
	IC	4	4	4	4	3	3	3	3	2	2	2
	KW	635	642	643	642	642	642	642	643	642	642	642
100	Tons	750	771	783	793	803	829	841	852	871	888	900
	IC	5	4	4	4	4	3	3	3	2	2	2
	KW	642	642	643	643	642	643	643	642	639	643	643

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	45,780
WEIGHT, RIGGING HEAVY SECTION (lb)	14,400
OUTSIDE TUBE SURFACE, COOLER (sq ft)	4,899
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	4,142
OPERATING CHARGE, R-11 (lb)	1,900
AREA TO INSULATE (sq ft)	226

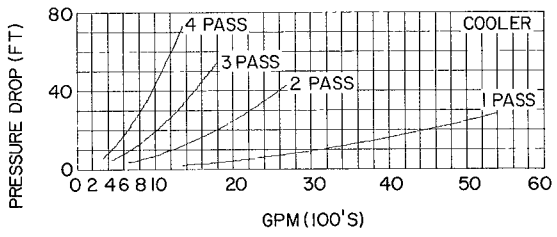
ELECTRICAL DATA

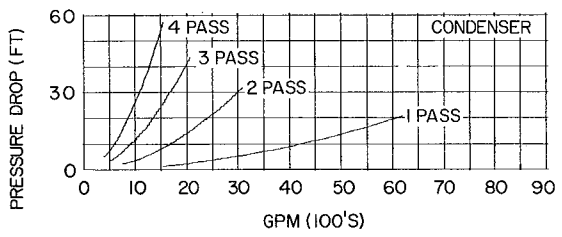
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
R	642	FLA	3 03	2 87	1 43	1 32	1 15	274	153
		LRA Star	2140	2260	1130	1220	900	–	–
		LRA Delta	6700	7100	2550	3900	2840	710	395
		OLTA	3 27	3 10	1 54	1 43	1 24	296	165

PERFORMANCE DATA 19C935

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	910	926	935	935	935	935	935	935	935	935	935
	IC	5	4	4	3	3	2	2	2	2	2	2
	KW	699	684	684	655	647	625	617	609	603	597	592
91	Tons	902	917	935	935	935	935	935	935	935	935	935
	IC	5	4	4	4	3	2	2	2	2	2	2
	KW	699	684	691	683	655	633	624	616	609	603	598
92	Tons	894	907	933	935	935	935	935	935	935	935	935
	IC	5	4	4	4	3	3	2	2	2	2	2
	KW	699	684	697	690	663	654	632	624	616	610	604
93	Tons	886	895	923	935	935	935	935	935	935	935	935
	IC	5	4	4	4	4	3	2	2	2	2	2
	KW	699	681	697	698	690	662	641	632	624	617	610
94	Tons	877	886	911	927	935	935	935	935	935	935	935
	IC	5	5	4	4	4	3	3	2	2	2	2
	KW	699	699	694	699	698	670	662	640	631	624	617
95	Tons	868	878	898	917	927	935	935	935	935	935	935
	IC	5	5	4	4	4	3	3	2	2	2	2
	KW	699	699	692	699	699	679	670	649	639	631	624
96	Tons	859	869	885	907	918	928	935	935	935	935	935
	IC	5	5	4	4	4	4	3	3	2	2	2
	KW	699	699	689	699	699	699	678	670	648	639	632
97	Tons	849	859	872	897	908	918	935	935	935	935	935
	IC	5	5	4	4	4	4	3	3	2	2	2
	KW	699	699	687	699	699	699	688	678	657	648	640
98	Tons	839	850	859	886	897	908	925	935	935	935	935
	IC	5	5	5	4	4	4	3	3	3	2	2
	KW	699	699	699	699	699	699	688	687	678	657	648
99	Tons	829	840	850	874	887	898	908	935	935	935	935
	IC	5	5	5	4	4	4	4	3	3	2	2
	KW	699	699	699	698	699	699	699	697	687	667	657
100	Tons	818	829	840	855	876	887	897	921	935	935	935
	IC	5	5	5	4	4	4	4	3	3	3	2
	KW	699	699	699	691	699	699	699	695	696	687	667

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	46,090
WEIGHT, RIGGING HEAVY SECTION (lb)	14,400
OUTSIDE TUBE SURFACE, COOLER (sq ft)	4,899
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	4,142
OPERATING CHARGE, R-11 (lb)	1,900
AREA TO INSULATE (sq ft)	226

ELECTRICAL DATA

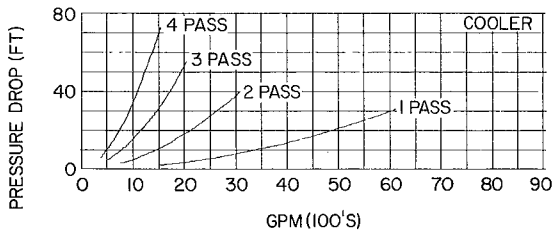
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
S	699	FLA	3 04	2 87	1 44	1 32	1 15	278	153
		LRA Star	2330	2480	1240	1350	980	–	–
		LRA Delta	7300	7800	3900	4300	3100	790	430
		OLTA	3 28	3 10	1 56	1 43	1 24	300	165

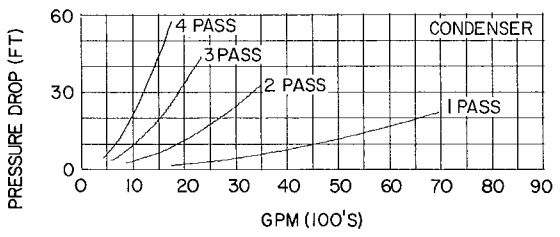
FLA – Full Load Amps per each kw input
KW – Compressor power input (kilowatts)
LRA – Locked Rotor Amps
MTR – Motor
OLTA – Overload Trip Amps per each kw input

PERFORMANCE DATA 19C985

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	920	947	956	959	987	1009	1019	1028	1038	1047	1057
	IC	4	4	4	3	3	3	3	3	2	2	2
	KW	678	692	692	665	678	688	687	686	670	669	668
91	Tons	912	937	956	966	977	1004	1019	1028	1038	1047	1057
	IC	5	4	4	4	3	3	3	3	2	2	2
	KW	699	691	699	699	678	692	694	694	677	676	675
92	Tons	904	927	947	957	967	994	1015	1026	1036	1047	1057
	IC	5	4	4	4	4	3	3	3	3	2	2
	KW	699	691	699	699	699	691	699	699	699	683	682
93	Tons	896	917	938	948	958	984	1005	1016	1026	1047	1057
	IC	5	4	4	4	4	3	3	3	3	2	2
	KW	699	690	699	699	699	691	699	699	699	691	690
94	Tons	887	905	928	939	949	973	995	1006	1016	1041	1057
	IC	5	4	4	4	4	3	3	3	3	2	2
	KW	699	688	699	699	699	690	699	699	699	694	697
95	Tons	878	891	919	929	940	962	985	996	1006	103	1049
	IC	5	4	4	4	4	3	3	3	3	2	2
	KW	699	685	699	699	699	690	699	699	699	694	699
96	Tons	869	879	908	920	930	952	974	986	996	1021	1038
	IC	5	5	4	4	4	3	3	3	3	2	2
	KW	699	699	698	699	699	690	699	699	699	695	699
97	Tons	860	870	894	909	920	937	964	975	986	1007	1028
	IC	5	5	4	4	4	3	3	3	3	2	2
	KW	699	699	696	699	699	687	699	699	699	693	699
98	Tons	850	860	880	899	909	920	952	964	975	991	1016
	IC	5	5	4	4	4	3	3	3	3	2	2
	KW	699	699	693	699	699	683	699	699	699	689	699
99	Tons	840	851	867	888	899	910	937	953	963	975	1004
	IC	5	5	4	4	4	4	3	3	3	3	2
	KW	699	699	690	699	699	699	696	699	699	699	699
100	Tons	829	840	850	877	888	899	913	941	953	962	990
	IC	5	5	5	4	4	4	3	3	3	3	2
	KW	699	699	699	699	699	699	690	699	699	699	697

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	51,390
WEIGHT, RIGGING HEAVY SECTION (lb)	15,800
OUTSIDE TUBE SURFACE, COOLER (sq ft)	5,499
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	4,660
OPERATING CHARGE, R-11 (lb)	2,400
AREA TO INSULATE (sq ft)	251

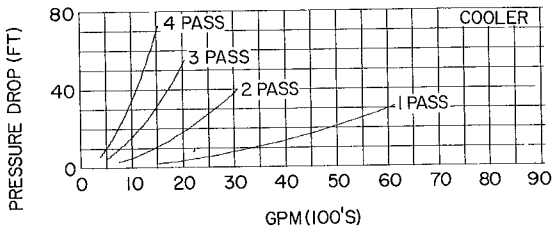
ELECTRICAL DATA

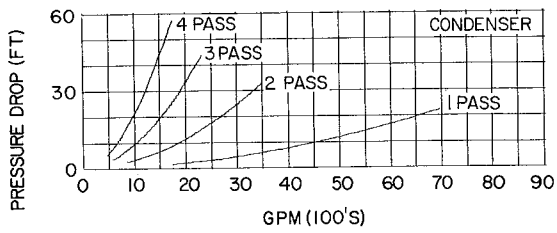
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
S	699	FLA	3 04	2 87	1 44	1 32	1 15	278	153
		LRA Star	2330	2480	1240	1350	980	–	–
		LRA Delta	7300	7800	3900	4300	3100	790	430
		OLTA	3 28	3 10	1 56	1 43	1 24	300	165

PERFORMANCE DATA 19C1020

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	949	952	956	959	987	1009	1019	1028	1038	1047	1057
	IC	5	5	4	3	3	3	3	3	2	2	2
	KW	718	713	686	659	673	682	681	681	664	663	663
91	Tons	962	966	969	973	977	1004	1019	1028	1038	1047	1057
	IC	5	5	5	4	3	3	3	3	2	2	2
	KW	737	732	726	699	672	686	688	688	672	670	670
92	Tons	954	971	981	986	990	994	1019	1028	1038	1047	1057
	IC	5	5	5	5	4	3	3	3	3	2	2
	KW	738	744	744	740	712	685	696	695	694	678	677
93	Tons	944	971	981	990	1000	1008	1012	1028	1038	1047	1057
	IC	5	5	5	5	5	4	3	3	3	2	2
	KW	736	752	752	751	751	726	698	703	702	685	684
94	Tons	943	962	981	990	1000	1009	1019	1028	1038	1047	1057
	IC	6	5	5	5	5	4	4	3	3	3	2
	KW	772	751	759	759	758	735	734	711	709	709	691
95	Tons	942	951	979	990	1000	1009	1019	1028	1038	1047	1057
	IC	6	5	5	5	5	5	4	4	3	3	2
	KW	779	750	766	766	766	766	742	741	717	716	699
96	Tons	932	941	969	990	1000	1009	1019	1028	1038	1047	1057
	IC	6	5	5	5	5	5	4	4	4	3	3
	KW	779	749	765	775	774	773	750	749	748	724	723
97	Tons	923	937	958	986	997	1007	1017	1028	1038	1047	1057
	IC	6	5	5	5	5	5	5	4	4	3	3
	KW	779	748	763	779	779	779	779	757	756	732	731
98	Tons	914	922	948	976	988	998	1008	1028	1038	1047	1057
	IC	6	6	5	5	5	5	5	4	4	4	3
	KW	779	779	763	778	779	779	779	765	764	763	739
99	Tons	905	912	938	966	979	989	999	1022	1038	1047	1057
	IC	6	6	5	5	5	5	5	4	4	4	3
	KW	779	779	762	777	779	779	779	768	772	771	748
100	Tons	896	903	928	955	969	980	990	1009	1035	1047	1057
	IC	6	6	5	5	5	5	5	4	4	4	4
	KW	779	779	762	777	779	779	779	766	779	779	779

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	51,680
WEIGHT, RIGGING HEAVY SECTION (lb)	15,800
OUTSIDE TUBE SURFACE, COOLER (sq ft)	5,499
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	4,660
OPERATING CHARGE, R-11 (lb)	2,400
AREA TO INSULATE (sq ft)	251

ELECTRICAL DATA

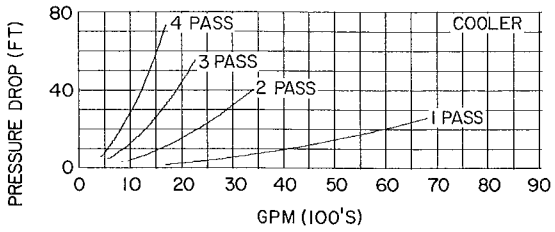
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
T	779	FLA	3 02	2 85	1 43	1 31	1 14	273	150
		LRA Star	2650	2800	1400	1530	1110	–	–
		LRA Delta	8300	8800	4400	4900	3500	875	480
		OLTA	3 26	3 08	1 54	1 41	1 23	295	162

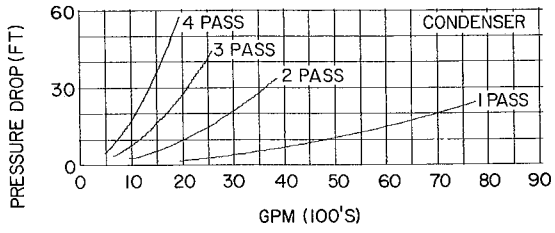
FLA – Full Load Amps per each kw input
KW – Compressor power input (kilowatts)
LRA – Locked Rotor Amps
MTR – Motor
OLTA – Overload Trip Amps per each kw input

PERFORMANCE DATA 19C1100

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	1074	1106	1122	1137	1151	1165	1177	1189	1200	1200	1200
	IC	2	2	2	2	2	2	2	2	2	2	2
	KW	767	779	779	779	779	779	779	779	779	773	768
91	Tons	1059	1090	1106	1122	1136	1150	1163	1175	1187	1197	1200
	IC	3	2	2	2	2	2	2	2	2	2	2
	KW	779	779	779	779	779	779	779	779	779	779	775
92	Tons	1044	1058	1090	1106	1121	1135	1148	1161	1173	1184	1194
	IC	3	3	2	2	2	2	2	2	2	2	2
	KW	779	779	779	779	779	779	779	779	779	779	779
93	Tons	1029	1043	1073	1089	1105	1119	1133	1146	1158	1170	1180
	IC	3	3	2	2	2	2	2	2	2	2	2
	KW	779	779	779	779	779	779	779	779	779	779	779
94	Tons	1013	1027	1041	1072	1088	1103	1118	1131	1144	1155	1166
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	779	779	779	779	779	779	779	779	779	779	779
95	Tons	996	1011	1025	1054	1071	1087	1102	1115	1128	1140	1152
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	779	779	779	779	779	779	779	779	779	779	779
96	Tons	980	995	1010	1023	1053	1069	1085	1099	1113	1125	1137
	IC	3	3	3	3	2	2	2	2	2	2	2
	KW	779	779	779	779	779	779	779	779	779	779	779
97	Tons	948	978	993	1007	1028	1052	1067	1082	1096	1110	1122
	IC	4	3	3	3	2	2	2	2	2	2	2
	KW	779	779	779	779	774	779	779	779	779	779	779
98	Tons	933	946	976	991	1005	1033	1050	1065	1080	1093	1106
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	779	768	779	779	779	779	779	779	779	779	779
99	Tons	918	930	959	974	989	1002	1031	1047	1063	1077	1090
	IC	4	4	3	3	3	3	2	2	2	2	2
	KW	779	779	779	779	779	779	779	779	779	779	779
100	Tons	902	915	927	957	972	986	1009	1029	1045	1059	1073
	IC	4	4	4	3	3	3	2	2	2	2	2
	KW	779	779	779	779	779	779	777	779	779	779	779

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	58,670
WEIGHT, RIGGING HEAVY SECTION (lb)	18,500
OUTSIDE TUBE SURFACE, COOLER (sq ft)	6,110
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	5,189
OPERATING CHARGE, R-11 (lb)	3,600
AREA TO INSULATE (sq ft)	290

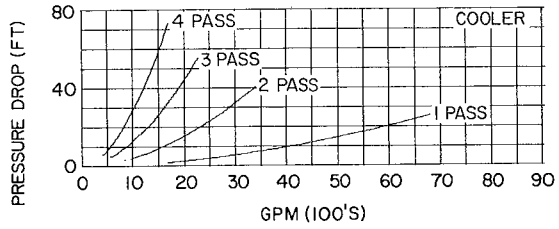
ELECTRICAL DATA

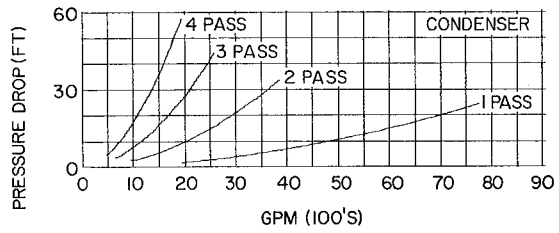
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
T	779	FLA	3 02	2 85	1 43	1 31	1 14	273	150
		LRA Star	2650	2800	1400	1530	1110	–	–
		LRA Delta	8300	8800	4400	4900	3500	875	480
		OLTA	3 26	3 08	1 54	1 41	1 23	295	162

PERFORMANCE DATA 19C1200

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	1171	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	851	862	850	823	811	800	791	783	775	769	764
91	Tons	1151	1191	1200	1200	1200	1200	1200	1200	1200	1200	1200
	IC	3	3	3	3	2	2	2	2	2	2	2
	KW	847	867	861	850	822	811	801	792	784	777	771
92	Tons	1138	1172	1192	1200	1200	1200	1200	1200	1200	1200	1200
	IC	4	3	3	3	2	2	2	2	2	2	2
	KW	867	863	867	861	834	822	811	801	793	786	779
93	Tons	1124	1143	1177	1192	1200	1200	1200	1200	1200	1200	1200
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	867	852	867	867	861	834	822	812	803	795	788
94	Tons	1110	1123	1161	1177	1192	1200	1200	1200	1200	1200	1200
	IC	4	4	3	3	3	2	2	2	2	2	2
	KW	867	867	867	867	867	847	834	823	813	804	796
95	Tons	1095	1109	1134	1161	1177	1191	1200	1200	1200	1200	1200
	IC	4	4	3	3	3	3	2	2	2	2	2
	KW	867	867	858	867	867	867	847	834	824	814	806
96	Tons	1080	1094	1108	1145	1161	1176	1195	1200	1200	1200	1200
	IC	4	4	4	3	3	3	2	2	2	2	2
	KW	867	867	867	867	867	867	856	847	835	825	816
97	Tons	1065	1079	1093	1124	1144	1160	1175	1200	1200	1200	1200
	IC	4	4	4	3	3	3	3	2	2	2	2
	KW	867	867	867	864	867	867	867	860	847	836	826
98	Tons	1049	1064	1078	1092	1127	1143	1159	1177	1200	1200	1200
	IC	4	4	4	4	4	3	3	3	2	2	2
	KW	867	867	867	867	867	867	867	857	861	848	838
99	Tons	1019	1048	1063	1077	1105	1126	1142	1157	1190	1200	1200
	IC	5	4	4	4	3	3	3	3	2	2	2
	KW	867	867	867	867	863	867	867	867	867	861	850
100	Tons	1104	1032	1047	1061	1075	1109	1125	1141	1158	1189	1200
	IC	5	4	4	4	4	3	3	3	2	2	2
	KW	867	867	867	867	867	867	867	867	857	867	862

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	58,980
WEIGHT, RIGGING HEAVY SECTION (lb)	18,500
OUTSIDE TUBE SURFACE, COOLER (sq ft)	6,110
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	5,189
OPERATING CHARGE, R-11 (lb)	3,600
AREA TO INSULATE (sq ft)	290

ELECTRICAL DATA

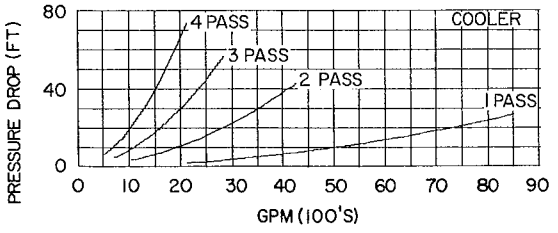
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
U	867	FLA	3 02	2 85	1 43	1 31	1 14	273	151
		LRA Star	2940	3100	1550	1720	1240	–	–
		LRA Delta	9200	9800	4900	5500	3900	975	540
		OLTA	3 25	3 08	1 54	1 41	1 23	295	163

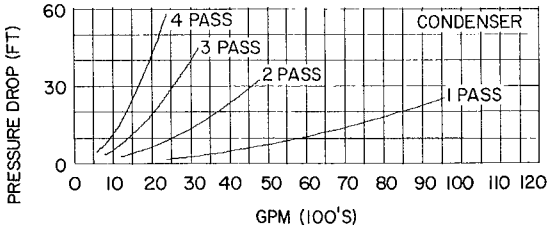
FLA – Full Load Amps per each kw input
KW – Compressor power input (kilowatts)
LRA – Locked Rotor Amps
MTR – Motor
OLTA – Overload Trip Amps per each kw input

PERFORMANCE DATA 19C1265

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	1225	1240	1254	1286	1309	1325	1340	1354	1367	1380	1392
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	867	867	867	861	867	867	867	867	867	867	867
91	Tons	1210	1226	1240	1268	1295	1311	1326	1340	1354	1367	1380
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	867	867	867	859	867	867	867	867	867	867	867
92	Tons	1195	1211	1226	1250	1280	1296	1312	1327	1341	1354	1367
	IC	3	3	3	2	2	2	2	2	2	2	2
	KW	867	867	867	857	867	867	867	867	867	867	867
93	Tons	1176	1196	1212	1226	1264	1281	1297	1312	1327	1340	1353
	IC	3	3	3	3	2	2	2	2	2	2	2
	KW	863	867	867	867	867	867	867	867	867	867	867
94	Tons	1143	1180	1196	1212	1245	1265	1282	1298	1312	1327	1340
	IC	3	3	3	3	2	2	2	2	2	2	2
	KW	851	867	867	867	864	867	867	867	867	867	867
95	Tons	1125	1164	1181	1196	1212	1249	1266	1282	1298	1312	1325
	IC	4	3	3	3	2	2	2	2	2	2	2
	KW	867	867	867	867	852	867	867	867	867	867	867
96	Tons	1110	1133	1164	1180	1196	1232	1249	1266	1282	1297	1311
	IC	4	3	3	3	3	2	2	2	2	2	2
	KW	867	856	867	867	867	867	867	867	867	867	867
97	Tons	1095	1109	1147	1164	1180	1202	1232	1249	1266	1281	1295
	IC	4	4	3	3	3	2	2	2	2	2	2
	KW	867	867	867	867	867	858	867	867	867	867	867
98	Tons	1079	1094	1123	1147	1163	1179	1214	1232	1249	1265	1280
	IC	4	4	3	3	3	3	2	2	2	2	2
	KW	867	867	862	867	867	867	867	867	867	867	867
99	Tons	1063	1078	1093	1129	1146	1162	1185	1214	1231	1248	1263
	IC	4	4	4	3	3	3	2	2	2	2	2
	KW	867	867	867	867	867	867	859	867	867	867	867
100	Tons	1047	1062	1077	1101	1128	1145	1161	1195	1213	1230	1246
	IC	4	4	4	3	3	3	3	2	2	2	2
	KW	867	867	867	859	867	867	867	867	867	867	867

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	67,950
WEIGHT, RIGGING HEAVY SECTION (lb)	21,700
OUTSIDE TUBE SURFACE, COOLER (sq ft)	7,654
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	6,460
OPERATING CHARGE, R-11 (lb)	4,400
AREA TO INSULATE (sq ft)	326

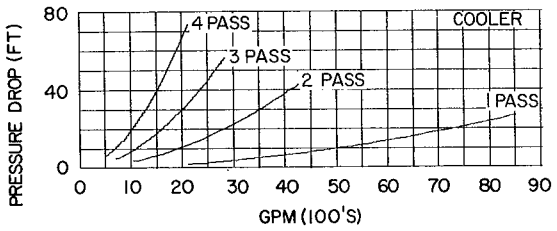
ELECTRICAL DATA

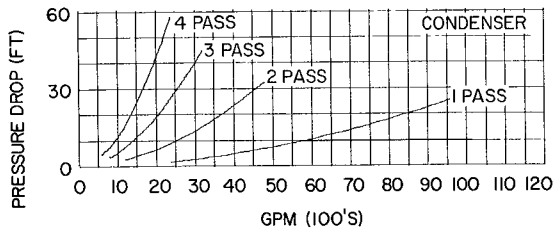
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
U	867	FLA	3 02	2 85	1 43	1 31	1 14	273	151
		LRA Star	2940	3100	1550	1720	1240	–	–
		LRA Delta	9200	9800	4900	5500	3900	975	540
		OLTA	3 25	3 08	1 54	1 41	1 23	295	163

PERFORMANCE DATA 19C1385

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	1297	1336	1346	1356	1394	1432	1455	1464	1489	1500	1500
	IC	4	4	4	3	3	3	3	3	2	2	2
	KW	946	966	962	931	950	969	975	971	956	952	941
91	Tons	1284	1321	1348	1362	1380	1418	1442	1456	1476	1500	1500
	IC	5	4	4	4	3	3	3	3	2	2	2
	KW	975	965	975	975	949	968	975	975	955	962	950
92	Tons	1272	1306	1334	1349	1366	1404	1428	1443	1460	1500	1500
	IC	5	4	4	4	3	3	3	3	2	2	2
	KW	975	964	975	975	949	968	975	975	954	973	960
93	Tons	1260	1291	1321	1335	1349	1390	1415	1430	1445	1485	1500
	IC	5	4	4	4	4	3	3	3	3	2	2
	KW	975	963	975	975	975	967	975	975	975	972	971
94	Tons	1248	1273	1307	1321	1336	1371	1401	1416	1431	1467	1491
	IC	5	4	4	4	4	3	3	3	3	2	2
	KW	975	959	975	975	975	964	975	975	975	968	975
95	Tons	1236	1253	1293	1308	1322	1351	1386	1402	1417	1448	1477
	IC	5	4	4	4	4	3	3	3	3	2	2
	KW	975	955	975	975	975	960	975	975	975	965	975
96	Tons	1223	1236	1277	1293	1308	1332	1371	1388	1403	1430	1462
	IC	5	5	4	4	4	3	3	3	3	2	2
	KW	975	975	974	975	975	956	975	975	975	963	975
97	Tons	1209	1223	1257	1279	1294	1312	1356	1373	1388	1411	1447
	IC	5	5	4	4	4	3	3	3	3	2	2
	KW	975	975	970	975	975	953	975	975	975	960	975
98	Tons	1195	1210	1238	1264	1297	1294	1336	1357	1373	1393	1431
	IC	5	5	4	4	4	4	3	3	3	2	2
	KW	975	975	966	975	975	975	971	975	975	959	975
99	Tons	1180	1196	1218	1249	1264	1279	1316	1341	1358	1373	1414
	IC	5	5	4	4	4	4	3	3	3	3	2
	KW	975	975	963	975	975	975	968	975	975	975	975
100	Tons	1165	1181	1195	1233	1249	1264	1285	1324	1341	1358	1389
	IC	5	5	5	4	4	4	3	3	3	3	2
	KW	975	975	975	975	975	975	957	975	975	975	968

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	68,710
WEIGHT, RIGGING HEAVY SECTION (lb)	21,700
OUTSIDE TUBE SURFACE, COOLER (sq ft)	7,654
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	6,460
OPERATING CHARGE, R-11 (lb)	4,400
AREA TO INSULATE (sq ft)	326

ELECTRICAL DATA

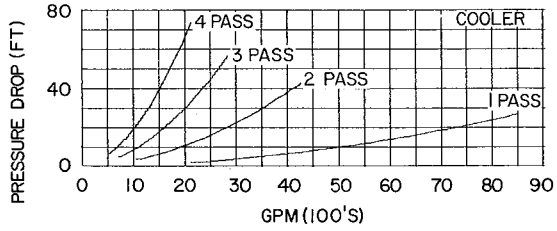
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
V	975	FLA	–	–	1 44	1 32	1 15	275	152
		LRA Star	–	–	1740	1910	1400	–	–
		LRA Delta	–	–	5500	6100	4400	1100	600
		OLTA	–	–	1 56	1 43	1 24	297	164

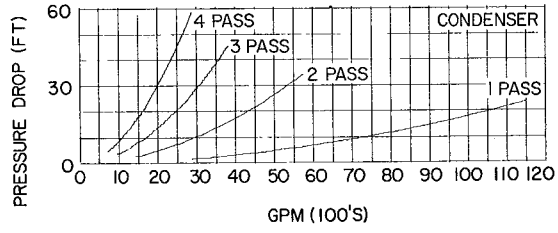
FLA – Full Load Amps per each kw input
KW – Compressor power input (kilowatts)
LRA – Locked Rotor Amps
MTR – Motor
OLTA – Overload Trip Amps per each kw input

PERFORMANCE DATA 19C1440

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	1317	1322	1332	1370	1408	1431	1437	1465	1500	1500	1500
	IC	5	5	3	3	3	3	3	2	2	2	2
	KW	979	972	911	929	948	954	947	936	951	939	928
91	Tons	1334	1340	1346	1356	1394	1433	1456	1462	1490	1500	1500
	IC	5	5	4	3	3	3	3	3	2	2	2
	KW	1004	997	959	929	947	966	972	965	953	948	937
92	Tons	1352	1358	1364	1369	1380	1419	1458	1482	1488	1500	1500
	IC	5	5	5	5	3	3	3	3	3	2	2
	KW	1030	1023	1016	1009	947	965	984	991	984	958	946
93	Tons	1347	1376	1382	1388	1394	1405	1444	1484	1500	1500	1500
	IC	5	5	5	5	5	3	3	3	3	2	2
	KW	1038	1050	1042	1035	1028	965	983	1003	1004	969	956
94	Tons	1334	1372	1400	1406	1412	1418	1430	1469	1500	1500	1500
	IC	5	5	5	5	5	5	3	3	3	3	2
	KW	1037	1058	1069	1062	1055	1048	983	1002	1015	1003	967
95	Tons	1320	1358	1397	1413	1428	1437	1443	1455	1495	1500	1500
	IC	5	5	5	5	5	5	5	3	3	3	2
	KW	1036	1057	1079	1080	1080	1075	1068	1002	1021	1013	978
96	Tons	1306	1344	1383	1401	1416	1430	1460	1467	1480	1500	1500
	IC	5	5	5	5	5	5	4	4	3	3	3
	KW	1035	1056	1078	1080	1080	1080	1060	1053	1021	1024	1012
97	Tons	1289	1330	1369	1388	1403	1417	1445	1485	1493	1500	1500
	IC	5	5	5	5	5	5	4	4	4	3	3
	KW	1032	1056	1077	1080	1080	1080	1059	1080	1073	1035	1023
98	Tons	1272	1313	1355	1375	1390	1404	1429	1470	1487	1500	1500
	IC	5	5	5	5	5	5	4	4	4	4	3
	KW	1029	1053	1077	1080	1080	1080	1058	1079	1080	1078	1034
99	Tons	1255	1297	1338	1361	1377	1391	1414	1455	1472	1487	1500
	IC	6	5	5	5	5	5	4	4	4	4	3
	KW	1080	1050	1074	1080	1080	1080	1057	1078	1080	1080	1046
100	Tons	1242	1279	1321	1347	1363	1378	1395	1439	1458	1473	1498
	IC	6	5	5	5	5	5	4	4	4	4	3
	KW	1080	1048	1071	1080	1080	1080	1054	1077	1080	1080	1057

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	71,820
WEIGHT, RIGGING HEAVY SECTION (lb)	21,700
OUTSIDE TUBE SURFACE, COOLER (sq ft)	7,654
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	7,760
OPERATING CHARGE, R-11 (lb)	4,400
AREA TO INSULATE (sq ft)	326

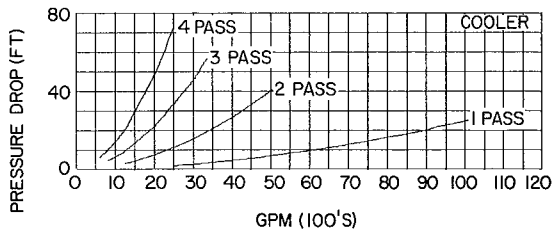
ELECTRICAL DATA

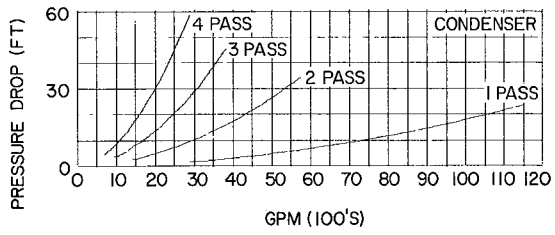
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
W	1080	FLA	–	–	1 43	1 31	1 14	273	151
		LRA Star	–	–	1940	2120	1550	–	–
		LRA Delta	–	–	6100	6800	4860	1200	675
		OLTA	–	–	1 54	1 41	1 23	295	163

PERFORMANCE DATA 19C1500

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F) 38	39	40	41	42	43	44	45	46	47	48
90	Tons	1391	1392	1395	1398	1429	1435	1455	1496	1537	1573	1601
	IC	5	5	4	4	3	3	2	2	2	2	2
	KW	1035	1022	981	972	956	949	931	950	970	986	995
91	Tons	1391	1416	1416	1420	1423	1455	1460	1482	1523	1564	1601
	IC	5	5	5	4	4	3	3	2	2	2	2
	KW	1046	1054	1041	999	990	974	967	949	969	989	1005
92	Tons	1378	1418	1441	1441	1445	1448	1481	1487	1508	1550	1592
	IC	5	5	5	5	4	4	3	3	2	2	2
	KW	1046	1067	1074	1061	1017	1009	993	986	968	988	1009
93	Tons	1366	1405	1434	1450	1465	1470	1474	1507	1513	1535	1578
	IC	5	5	5	5	5	4	3	3	3	2	2
	KW	1046	1067	1080	1080	1080	1037	998	1012	1005	987	1007
94	Tons	1353	1392	1421	1437	1452	1476	1496	1501	1534	1540	1563
	IC	5	5	5	5	5	4	4	3	3	2	2
	KW	1046	1067	1080	1080	1080	1052	1056	1018	1031	1024	1006
95	Tons	1340	1379	1408	1424	1438	1460	1503	1523	1528	1561	1568
	IC	5	5	5	5	5	4	4	4	3	3	3
	KW	1046	1067	1079	1080	1079	1052	1073	1077	1038	1051	1044
96	Tons	1372	1366	1395	1411	1426	1445	1488	1512	1528	1556	1589
	IC	5	5	5	5	5	4	4	4	4	3	3
	KW	1047	1067	1080	1080	1080	1051	1072	1080	1080	1058	1072
97	Tons	1312	1353	1382	1398	1413	1430	1472	1498	1513	1541	1584
	IC	5	5	5	5	5	4	4	4	4	3	3
	KW	1045	1068	1080	1080	1080	1050	1072	1080	1080	1057	1079
98	Tons	1295	1338	1369	1384	1399	1415	1457	1483	1499	1525	1568
	IC	5	5	5	5	5	4	4	4	4	3	3
	KW	1042	1067	1080	1079	1080	1050	1071	1080	1080	1057	1078
99	Tons	1277	1320	1355	1371	1386	1401	1442	1469	1484	1510	1553
	IC	5	5	5	5	5	5	4	4	4	3	3
	KW	1039	1063	1080	1079	1080	1080	1071	1080	1080	1056	1077
100	Tons	1252	1303	1341	1357	1373	1387	1426	1454	1469	1488	1537
	IC	5	5	5	5	5	5	4	4	4	3	3
	KW	1031	1061	1080	1080	1080	1080	1071	1080	1080	1052	1077

IC – Impeller Combination **KW** – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	83,570
WEIGHT, RIGGING HEAVY SECTION (lb)	30,000
OUTSIDE TUBE SURFACE, COOLER (sq ft)	9,165
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	7,760
OPERATING CHARGE, R-11 (lb)	6,400
AREA TO INSULATE (sq ft)	401

ELECTRICAL DATA

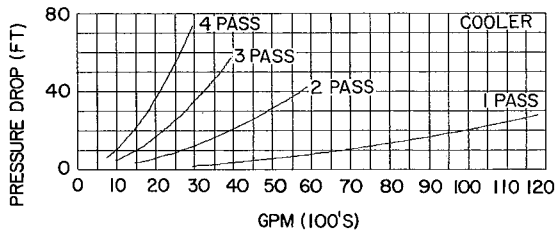
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
W	1080	FLA	–	–	1 43	1 31	1 14	273	151
		LRA Star	–	–	1940	2120	1550	–	–
		LRA Delta	–	–	6100	6800	4860	1200	675
		OLTA	–	–	1 54	1 41	1 23	295	163

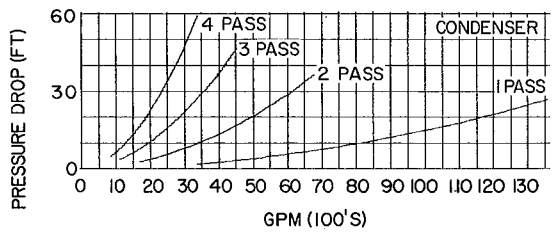
FLA – Full Load Amps per each kw input
KW – Compressor power input (kilowatts)
LRA – Locked Rotor Amps
MTR – Motor
OLTA – Overload Trip Amps per each kw input

PERFORMANCE DATA 19C1750

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F) 38	39	40	41	42	43	44	45	46	47	48
90	Tons	1772	1773	1773	1801	1828	1854	1879	1904	1928	1949	1970
	IC	1	1	1	1	0	0	0	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
91	Tons	1751	1753	1754	1785	1803	1829	1853	1877	1900	1924	1945
	IC	1	1	1	1	0	0	0	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
92	Tons	1730	1733	1734	1759	1778	1803	1828	1851	1874	1894	1920
	IC	1	1	1	1	1	0	0	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
93	Tons	1690	1693	1695	1733	1753	1778	1802	1825	1848	1869	1895
	IC	1	1	1	1	1	0	0	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
94	Tons	1670	1673	1677	1707	1728	1752	1776	1799	1820	1844	1869
	IC	1	1	1	1	1	1	0	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
95	Tons	1645	1652	1658	1681	1703	1727	1750	1773	1795	1819	1843
	IC	1	1	1	1	1	0	0	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
96	Tons	1621	1630	1638	1661	1683	1706	1729	1751	1773	1797	1821
	IC	1	1	1	1	1	1	0	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
97	Tons	1596	1607	1617	1640	1662	1685	1708	1730	1752	1776	1800
	IC	1	1	1	1	1	1	0	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
98	Tons	1570	1582	1593	1616	1638	1661	1684	1706	1728	1752	1776
	IC	1	1	1	1	1	1	1	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
99	Tons	1538	1551	1563	1586	1608	1631	1654	1676	1698	1722	1746
	IC	1	1	1	1	1	1	1	0	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343
100	Tons	1475	1489	1502	1525	1548	1570	1592	1616	1640	1690	1689
	IC	1	1	1	1	1	1	1	1	0	0	0
	KW	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343	1343

IC – Impeller Combination **KW** – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	89,200
WEIGHT, RIGGING HEAVY SECTION (lb)	30,780
OUTSIDE TUBE SURFACE, COOLER (sq ft)	9,580
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	9,090
OPERATING CHARGE, R-11 (lb)	7,500
AREA TO INSULATE (sq ft)	401

ELECTRICAL DATA

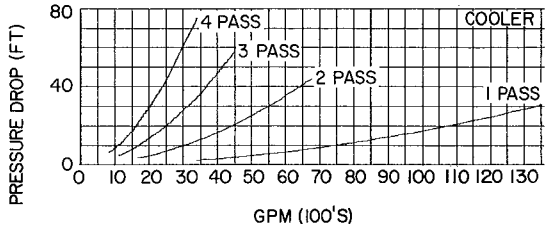
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
Y	1345	FLA	–	–	1 43	1 31	1 14	273	151
		LRA Star	–	–	2650	2900	2100	–	–
		LRA Delta	–	–	8400	9150	6650	1370	830
		OLTA	–	–	1 54	1 41	1 23	295	163

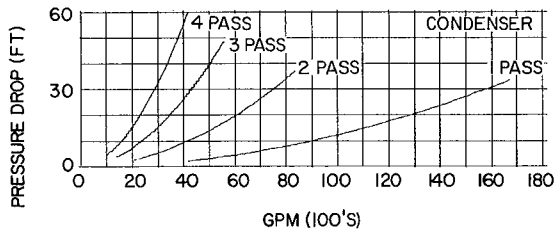
PERFORMANCE DATA

19C2000

ADJ LVG COND WTR TEMP (F)		ADJUSTED LVG CHILLED WATER TEMP (F)										
		38	39	40	41	42	43	44	45	46	47	48
90	Tons	1953	1979	2004	2036	2065	2065	2065	2065	2065	2065	2065
	IC	1	1	1	1	1	1	1	0	0	0	0
	KW	1440	1440	1440	1440	1440	1410	1380	1355	1329	1316	1303
91	Tons	1936	1960	1988	2020	2042	2065	2065	2065	2065	2065	2065
	IC	1	1	1	1	1	1	1	1	0	0	0
	KW	1450	1460	1463	1470	1460	1455	1422	1405	1373	1342	1319
92	Tons	1921	1942	1970	1994	2030	2061	2065	2065	2065	2065	2065
	IC	1	1	1	1	1	1	1	1	0	0	0
	KW	1460	1470	1480	1485	1490	1507	1464	1456	1418	1368	1336
93	Tons	1906	1927	1952	1976	2000	2030	2062	2065	2065	2065	2065
	IC	1	1	1	1	1	1	1	1	1	0	0
	KW	1470	1480	1490	1500	1507	1507	1507	1507	1462	1394	1352
94	Tons	1888	1905	1928	1952	1976	2000	2030	2003	2065	2065	2065
	IC	1	1	1	1	1	1	1	1	1	0	0
	KW	1485	1490	1496	1501	1507	1507	1507	1507	1507	1420	1368
95	Tons	1865	1884	1903	1928	1952	1976	2000	2032	2063	2064	2065
	IC	1	1	1	1	1	1	1	1	1	0	0
	KW	1507	1507	1507	1507	1507	1507	1507	1507	1507	1507	1507
96	Tons	1840	1859	1882	1908	1936	1953	1977	2008	2038	2044	2050
	IC	1	1	1	1	1	1	1	1	1	1	0
	KW	1504	1507	1507	1507	1507	1507	1507	1507	1507	1507	1507
97	Tons	1815	1833	1856	1888	1920	1930	1954	1984	2013	2024	2035
	IC	1	1	1	1	1	1	1	1	1	1	0
	KW	1501	1505	1507	1507	1507	1507	1507	1507	1507	1507	1507
98	Tons	1789	1807	1830	1860	1897	1906	1931	1960	1988	2004	2020
	IC	1	1	1	1	1	1	1	1	1	1	1
	KW	1498	1503	1507	1507	1507	1507	1507	1507	1507	1507	1507
99	Tons	1756	1781	1804	1832	1864	1882	1908	1936	1963	1984	2005
	IC	1	1	1	1	1	1	1	1	1	1	1
	KW	1494	1501	1507	1507	1507	1507	1507	1507	1507	1507	1507
100	Tons	1720	1748	1776	1804	1831	1858	1885	1912	1938	1964	1990
	IC	1	1	1	1	1	1	1	1	1	1	1
	KW	1490	1498	1507	1507	1507	1507	1507	1507	1507	1507	1507

IC – Impeller Combination KW – Kilowatt Input





PHYSICAL DATA

WEIGHT, OPERATING (lb)	99,210
WEIGHT, RIGGING HEAVY SECTION (lb)	33,800
OUTSIDE TUBE SURFACE, COOLER (sq ft)	10,880
OUTSIDE TUBE SURFACE, CONDENSER (sq ft)	11,200
OPERATING CHARGE, R-11 (lb)	7,500
AREA TO INSULATE (sq ft)	421

ELECTRICAL DATA

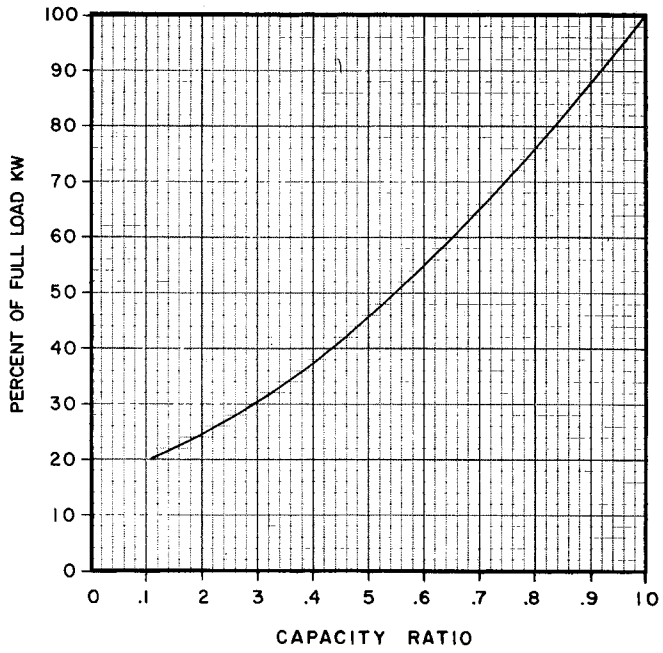
MTR	MAX KW	VOLTS	208	220	440	480	550	2300	4160
XX	1507	FLA	–	–	1 47	1 35	1 18	282	156
		LRA Star	–	–	3000	3200	2400	–	–
		LRA Delta	–	–	9400	10100	7500	1750	1050
		OLTA	–	–	1 59	1 46	1 27	305	168

FLA – Full Load Amps per each kw input **MTR** – Motor
KW – Compr power input (kilowatts) **OLTA** – Overload Trip Amps per each kw input
LRA – Locked Rotor Amps

ELECTRICAL DATA

PARTIAL LOAD POWER REQUIREMENT

When unit is to operate at partial load due to cooling requirement less than design capacity, power requirement can be **estimated** from Partial Load Power Requirement curve and formula below

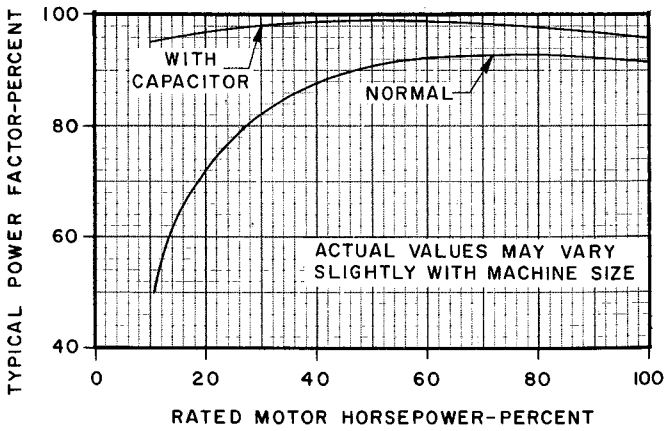


$$\text{Capacity ratio} = \frac{\text{partial load (tons)}}{\text{design capacity}}$$

$$\text{Actual kw input} = \text{design kw input} \times \frac{\text{percent kw input}}{100}$$

Design capacity is the capacity for which machine is selected (100 percent load)

TYPICAL POWER FACTORS



SELECTION PROCEDURE (With Example)

I Determine design conditions:

Required capacity . . . . . 1100 Tons
Leaving chilled water temperature (LCWT) . . . . . 45 F
Leaving condenser water temperature (LWT) . . 95 F
Chilled water temperature rise . . . . . 6 F
Condenser water temperature rise . . . . . 10 F
Water quantity (cooler/condenser) . . . . 4400/3190 gpm
Fouling factor (cooler/condenser) . . 0005/.001
Pressure drop limits (cooler/condenser) . . . . 15/24 ft

II Adjust leaving water temperatures for fouling factor:
For each .0005 of fouling above the first .0005:
COOLER — subtract 2 0 F from LCWT
CONDENSER— add 2 5 F to LWT
45 F — 0 F = 45 F (adj LCWT)
95 F + 2 5 F = 97 5 F (adj LWT)

III Make preliminary selection of unit with nominal capacity equal to or higher than required capacity
Enter Performance Data table and find that 19C1200 with an adjusted LCWT of 45 F and an adjusted LWT of 97 5 F has a rated capacity of 1189 tons.

IV Determine number of passes for cooler and condenser in this selected unit
Enter Cooler and Condenser Pressure Drop Curves and find that: at 4400 gpm (cooler), 1 pass(es) will satisfy pressure drop requirements, and at 3190 gpm (condenser) 2 pass(es) is/are satisfactory

V Readjust leaving water temperature for number of passes selected and for temperature rise:
Enter Pass-Rise Temperature Adjustment table at 6 F rise and 1 pass(es) (cooler) and find:
45 F (LCWT) — 2 F = 43 F final adjusted LCWT
Repeating for condenser: (10 F rise and 2 pass)
97 5 F (LWT) — 0 F = 97 5 F final adjusted LWT

VI Make final unit selection and determine impeller size and power input (kw):
Reenter Performance Data table for 19C1200 with 43 F final adjusted LCWT and 97 5 F final adjusted LWT and find: final unit capacity of 1151 tons; impeller size is 3; power input is 867 kw.
If the selected capacity is less than the required capacity, select the next larger unit and repeat steps III thru VI.

VII Power input correction — Should the selected capacity be greater than the required capacity, the power (kw) may be estimated thus:

$$867 \text{ rated kw} \times \frac{1100 \text{ tons required capacity}}{1151 \text{ tons selected capacity}} = 829 \text{ input kw}$$

Actual input kw may vary slightly from the estimated values

SELECTION FORMULAS

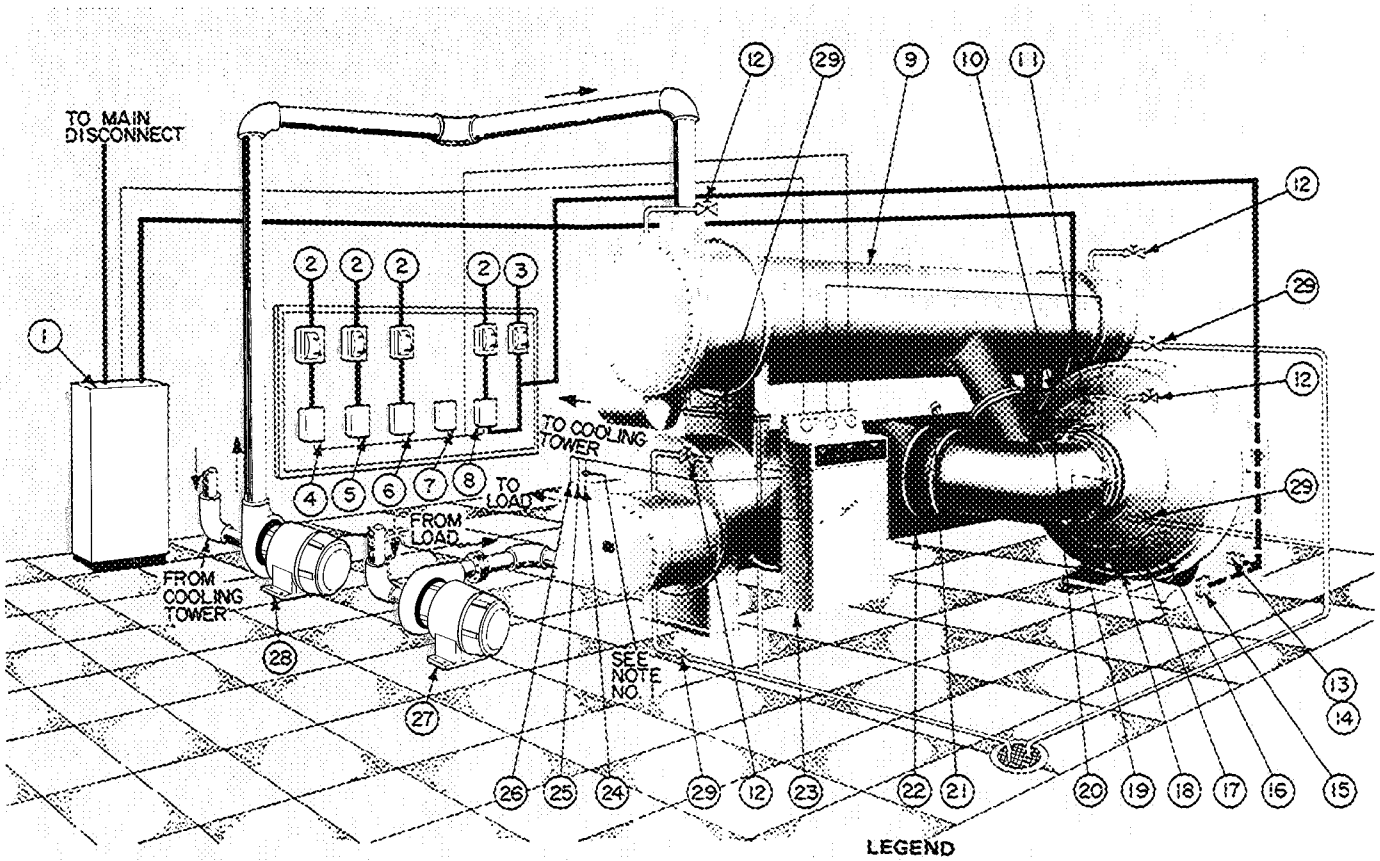
1. Leaving chilled water temp = entering temp minus temp drop
2. Leaving cond water temp = entering temp plus temp rise
3. Cooler water flow rate (gpm) $= \frac{\text{cooling load (tons)} \times 24}{\text{temp drop}}$
4. Cond water flow rate (gpm) $= \frac{\text{cooling load (tons)} \times 29}{\text{temp rise}}$

PASS-RISE TEMPERATURE ADJUSTMENT (°F)

WATER TEMP RISE	COOLER PASSES				CONDENSER PASSES			
	1	2	3	4	1	2	3	4
5	–2 0	0	+1 0	+1 5	+2 0	0	–1 0	–1 0
6	–2 0	0	+1 0	+1 5	+2 0	0	–1 0	–1 0
8	–3.0	0	+1 0	+2 0	+2 5	0	–1 0	–1 5
10	–3 5	0	+1 0	+2 0	+3 0	0	–1 0	–1 5
12	–4 0	0	+1 5	+2 0	+3 5	0	–1 0	–2 0
14	–4 5	0	+1 5	+2 5	+4 0	0	–1 5	–2 0
15	–5 0	0	+1 5	+2 5	+4 5	0	–1 5	–2 0
20	–6 0	0	+2 0	+3 0	+5 5	0	–2 0	–2 5
25	–6 5	0	+2 0	+3 0	+6 0	0	–2 0	–3 0

NOTE: Add to (+) or subtract from (–) design leaving water temperatures per step V of Selection Procedure

TYPICAL PIPING AND WIRING



NOTES:

1. Enclosed in a separate and grounded metallic conduit.
2. Separate 115-volt source for controls, unless transformer is furnished with compressor controller.
3. Use condenser water temp control when machine must operate with tower water below 55 F.
4. Wiring and piping shown do not include all details for a specific installation.
5. Wire per applicable local and national codes.
6. Pipe per standard techniques. See Carrier System Design Manual for details.

LEGEND

1 – Compressor Motor Starter
2 – Fused Disconnect
3 – Fused Disconnect for Oil Heater and Thermostat (115-v)
4 – Cooling Tower Fan Starter
5 – Condenser Water Pump Starter
6 – Cooler Water Pump Starter
7 – Pilot Relay
8 – Oil Pump Starter
9 – Condenser
10 – Compressor Motor Terminal Box
11 – Compressor Motor High Temperature Cutout (in terminal box)
12 – Vent
13 – Oil Pump
14 – Oil Heater and Thermostat
15 – Oil Seal Leakage Pump
16 – Low Oil Pressure Cutout
17 – Oil Cooler Water Solenoid Valve
18 – Guide Vane Control Solenoid Valves
19 – Low Refrigerant Temperature Cutout
20 – Vane Switch
21 – Rupture Disc
22 – Cooler
23 – Control Console
24 – Chilled Water Control Bulb (Electronic Control Only)
25 – Chilled Water Low Temperature Cutout and Recycle Switch
26 – Chilled Water Flow Switch
27 – Condenser Water Pump
28 – Chilled Water Pump
29 – Water Drain Valve

Water Piping
Power Wiring
Control Wiring

CONTROLS

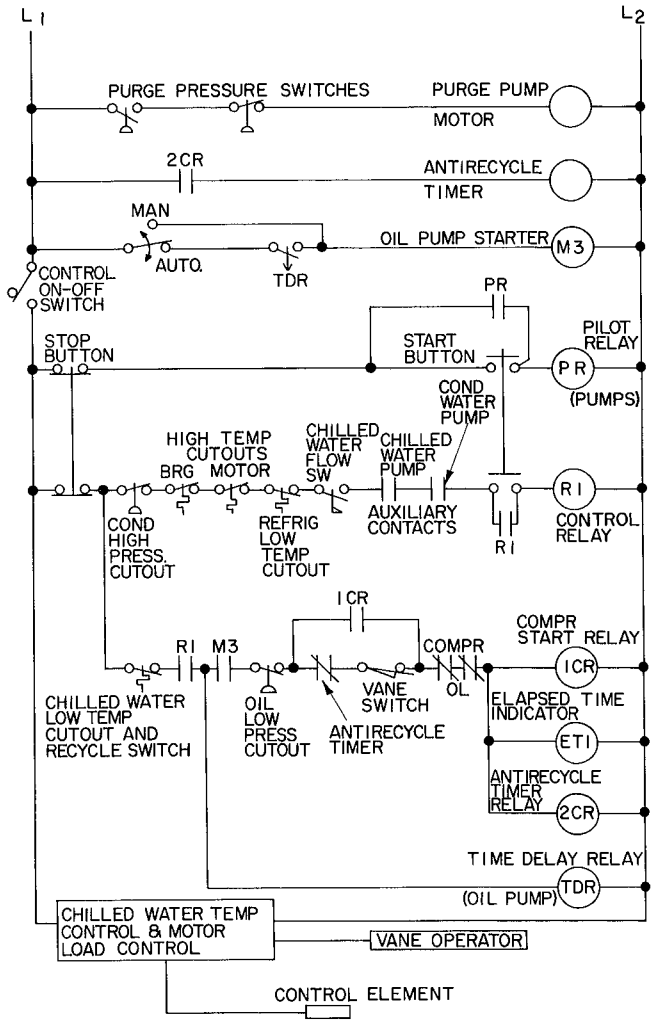
CONTROL SYSTEM

Either electronic or pneumatic controls are available. The position of the compressor guide vanes controls the machine capacity Signals from a chilled water thermostat are received in the machine control console The motor load control then initiates the required response from the automatic guide vane operator A lowered chilled water temperature closes the vanes and reduces the compressor capacity Higher chilled water temperature opens the vanes, increasing compressor capacity.

To ensure no-load starting, the guide vanes are closed before compressor start-up Vanes are hydraulically operated on electronic control systems, and are pneumatically operated on pneumatic control systems

When units are used in multiples, each unit is controlled by its own chilled water thermostat, and water flow may be a series or a parallel arrangement. Lag-lead operation may be used.

CONTROLS (cont)



CONTROL SEQUENCE

Close On-Off Switch — Stop light goes on, potential reaches Start button and machine safeties.

Press Start Button — Control relay R1 closes circuit to oil pump relay Pilot relay PR energizes auxiliary pumps and fan

Water Pumps and Cooling Tower Fan Start — Water pump safeties and water flow switch close to maintain power to relays R1 and PR

Oil Pump Starts — Time delay relay TDR closes circuit to oil pump starter M3 Oil pressure builds up

Guide Vanes Close — Vanes are already closed on pneumatically controlled machines; oil pump closes vanes hydraulically on machines with electronic control

Compressor Starts — Vane-closed switch completes circuit to motor start relay 1CR and compressor motor is energized.

Machine Operates at Desired Capacity — Temperature of chilled water initiates signal to capacity control circuit or pneumatic relay. Control circuit or relay actuates vane operator which positions guide vanes as required Motor load control overrides temperature control

Compressor Recycles — At low cooling loads, chilled water sensing element may stop compressor and recycle it as the water temperature rises The antirecycle timer provides a 20-minute delay between compressor starts, preventing short cycling

Press Stop Button — Control relay R1 opens, motor start relay 1CR is de-energized, compressor stops Oil pump operates during compressor coastdown until time delay relay TDR opens

CONTROL COMPONENTS

Condenser High-Pressure Cutout (manual reset) — Shuts compressor off if condenser pressure reaches set point

Bearing High-Temperature Cutout — Prevents compressor from starting or shuts compressor off if temperature reaches set point

Motor Winding High-Temperature Cutout — Prevents compressor from starting or shuts compressor off if temperature reaches set point

Refrigerant Low-Temperature Cutout — Shuts compressor off if refrigerant temperature drops below set point

Chilled Water Low-Temperature and Recycle Switch — Cycles compressor off if leaving chilled water temperature drops approximately five degrees below design temperature. Automatically recycles compressor to start when leaving chilled water temperature reaches approximately five degrees above design temperature.

Low Oil Pressure Cutout — Prevents compressor from starting until oil pressure reaches required level Automatically stops compressor if oil pressure falls to set point

Vane-Closed Switch — Prevents compressor from starting unless guide vanes are closed Ensures no-load starting

Capacity Control Circuit — Receives signal from temperature sensing element in leaving chilled water and signals guide vane actuator to position vanes for proper capacity A motor load control overrides the chilled water temperature control to prevent compressor motor overload

Guide Vane Actuator — Positions guide vanes in response to signal from capacity control circuit. Actuator is hydraulically operated in electronic control systems, and is pneumatically operated in pneumatic control systems.

Motor Start Relay (1CR) — Energizes compressor motor controller at start-up and acts as a holding relay for compressor motor.

Elapsed Time Indicator — Indicates actual machine running time in hours and tenths to 10,000 hours.

Oil Pump Time Delay Relay (TDR) — Ensures that compressor lubrication continues during coastdown

Antirecycle Timer — Prevents short cycling by providing a 20-minute delay between compressor starts

GUIDE SPECIFICATIONS

Furnish and Install - Carrier Model 19C Hermetic Centrifugal Liquid Chilling Package(s), suitable for chilling gpm of water from - F to - F when supplied with gpm of condensing water at - F and kw maximum power input

Selection of Machine(s) shall be based on scale factors of in the cooler and - - in the condenser. Cooler water pressure drop shall not exceed ft. Condenser water pressure drop shall not exceed - ft.

Machine shall consist of motor-compressor, cooler, condenser, economizer, motor-driven lubricating system, automatic purge system and machine controls.

Machine Construction and safety devices shall be in accordance with the most recent ASA B9 1 Safety Code.

Machine Performance Ratings shall conform to ARI standard 550-66 for centrifugal water chillers

Cooler and Condenser shall be of shell-and-tube type construction Water boxes shall be fabricated steel and securely welded to the heat exchanger tube sheets Water boxes shall be designed for psi working pressure and shall be in accordance with the ASME Code for Unfired Pressure Vessels Water box covers shall be removable to permit tube cleaning Each water box shall be tapped for vent and drain piping connections Tubes shall be of seamless copper, with integral fins, and lands at the tube-support surfaces. Tubes shall be rolled into the tube sheets and shall be individually replaceable Cooler shall be equipped with sufficient eliminator area to prevent liquid carry-over into the compressor Float-operated valves shall be supplied between condenser and cooler to meter refrigerant flow at optimum volume and pressure Cooler shall be provided with a relief device to prevent excessive pressure in the heat exchangers

Compressor shall be of hermetically sealed, two-stage design with cast aluminum alloy impeller wheels Shaft bearings shall be pressure lubricated and designed to minimize thrust wear Journal and thrust bearings shall be readily available for inspection without removal of compressor casing Motor stator shall be arranged for service with only minor compressor disassembly

Motor shall be of the 2-pole, single-speed, nonreversing squirrel-cage induction type, and shall be suitable for volt, 3-phase, 60-Hertz service The motor shall be refrigerant cooled and shall be suitable for operation in a refrigerant atmosphere. Full load operation of motor shall not exceed nameplate kw. Motor under 600 volts shall be built for connection to across-the-line full voltage, star-delta or type reduced voltage starter. Motor above 600 volts shall be suitable for use with across-the-line full voltage, or type reduced voltage starter

Capacity Control shall be accomplished thru automatic positioning of guide vanes within the compressor suction Electronic or pneumatic controller (select one) shall modulate machine capacity in response to changes in leaving chilled water temperature A device shall be provided to limit maximum current draw to any selected value between 40 and 100 percent of full load amperes.

Pressure Lubrication System shall include an automatic oil heater and an oil cooler as integral parts of the compressor motor assembly Machine controls shall ensure compressor lubrication prior to start and during coastdown after machine stop The oil pump shall be suitable for volt, 3-phase, 60-Hertz service.

Refrigerant-Cooled Purge System shall be provided to automatically remove noncondensable gases from the refrigerant system Purge system shall include a separation chamber for the collection and removal of water from the system An indicator light shall be mounted in a conspicuous location to indicate operation of the purge pump

Safety Controls shall be electric, fully automatic and shall be "failsafe." Machine shall shut down for oil low-pressure, chilled water low-temperature, refrigerant low-temperature, condenser high-pressure, motor winding high-temperature, bearing high-temperature, low chilled water flow Controls shall ensure no-load starting of compressor and shall prevent restarts until after a safe preset time

Elapsed Time Indicator shall be furnished to provide a record of total machine operating hours

Initial Charge of Oil and Refrigerant shall be provided by the manufacturer

Magnetic Starter of type shall be furnished for each machine The starter shall be in accordance with the standard starter specifications of the centrifugal manufacturer

Electrical Contractor shall furnish and install all electrical lines, disconnect switches, circuit breakers, auxiliary starters He shall install the main starter and the control wiring according to the diagram furnished by the centrifugal refrigerating machine manufacturer.

Piping Contractor shall make water connections to the oil cooler, and such other water supply and drain connections as are required by the drawing

Machine Factory Finish shall be durable alkyd enamel. Additional painting, if desired, and grouting shall be done by others

Operating and Service Instructions shall be furnished by the manufacturer

CARRIER AIR CONDITIONING COMPANY • SYRACUSE, NEW YORK

Tab 15 Form 19C-3P Supersedes 19C-2P and 19C-1GS Printed in U S A 7-69 Code MA Catalog No 521-904