

Cooling capacity : 160 to 732 kW

Heating capacity : 210 to 925 kW

NEW

**Semi-hermetic double
screw compressors**
**Large choice
of refrigerant fluids**
**convivial regulation
optimizing the operation**
**reduced dimensions
up to 133 kW/m²**
easy installation

**USE****HYDROCIAT series LW**

The **HYDROCIAT series LW** chilled water production units with water-cooled condensers and screw compressors provide efficient solutions to problems encountered in the air conditioning and industrial processing fields.

These units conform to the directives :

- Machines (89/392 CEE modified)
- CEM (589/336 CEE)

► RANGE**HYDROCIAT LW**

1 compressor - 1 refrigerant circuit
3 models : **LW 700 - 800 - 900**

2 compressors - 2 refrigerant circuits
5 models : **LW 1000 - 1200 - 1400 - 1600 - 1800**

HYDROCIAT series LWN

The chilled water production units **without condenser HYDROCIAT series LWN** are designed to be connected to air or water cooled condensers.

They can be associated to numerous models of our range of air-cooled condensers Series EUROPA 2C.

THERMACIAT series LWP

The design of the water/water heat pumps range **HYDROCIAT series LWP** is identical to that of HYDROCIATS series LW.

These machines permit solving various heating problems.

They can also be used in the cooling operation by reversing the hydraulic circuits.

QUICK SELECTION

WATER COND.

Size	Number of circuit(s) *	Number of compressor(s)	R 407c			R 22		
			Cooling capacity kW	Power consumption kW	Heating capacity kW	Cooling capacity kW	Power consumption kW	Heating capacity kW
700 (Z)	1	1	161	47,2	208	175	47,2	222
800 (Z)	1	1	182	55,3	237	198	55,3	253
900 (Z)	1	1	207	60,7	268	225	60,7	286
1000 (Z)	2	2	241	68,5	310	262	68,5	331
1200 (Z)	2	2	279	82,4	361	303	82,4	385
1400 (Z)	2	2	339	96,2	435	368	96,2	464
1600 (Z)	2	2	397	114	511	432	114	546
1800 (Z)	2	2	454	123	577	494	123	617
2150 (Z)	2 (40 /60 %)	2	551	149	700	572	136	708
2500 (Z)	2*	2	655	172	827	682	157	839
2800 (Z)	2*	2	732	193	925	769	178	997

Capacities/Powers indicated for : 7 °C chilled water outlet – 35 °C condenser water outlet

(Z) : to be added in the designation for the units operating with R 407c

* balanced refrigerant circuits

DESCRIPTION

HYDROCIAT series LW

■ Compressor(s)

Twin screw hermetic type (two rotating parts) with the following components :

- Two screws (speed 2900 rpm) mounted on ball bearings (designed for a minimum life of 100.000h), teeth ratio 5/6.
- Incorporated suction gas cooled bipolar drive motor
- Complete electronic safety protection of the motor
- Stage capacity control (models 700 to 1800) and 25 to 100 % continuous (models 2150 à 2800).
- Lubrication by oil injection maintained by pressure difference
- Built in suction strainer
- High pressure check valve to avoid reverse rotation when the unit stops
- By-pass valve to avoid an over pressurisation of the compressor
- Crankcase heater
- Discharge gas high temperature protection
- Oil pressure protection
- Low noise and vibration levels
- Compact dimensions
- Simple and robust construction

■ Built-in oil separator

Installed at the compressor discharge

The large amount of oil injected during the compression cycle necessitates the use of an oil separator.

Oil, after separation from the refrigerant, is strained before being injected into the compressor.

Note :

The refrigerant oil has several important functions to ensure compressor reliability :

- Lubrication of bearings and moving parts, avoiding any direct contact parts.
- Sealing of the clearances between the different mechanical parts and improving volumetric efficiency .
- Cooling the compressor by direct oil injection during the gas compression.

If required, the oil cooling allows discharge temperature limitation.

■ Electric motor

- Largely dimensioned motor for **part-winding start**.
- High efficiency
- Mechanical protection IP54
- Suction gas cooled
- Motor safety devices :

– winding over heating protection (PTC sensors)

– control of balancing and phase rotation direction

■ Evaporator

- Copper tube network
- Steel tube plates
- Steel shell
- Anti-corrosion baffles
- Thermal insulation with polyurethane foam

■ Water cooled condenser

- Copper tube network
- Carbon steel shell
- Carbon steel tube sheets
- Removable cast iron headers
- Safety valves on the refrigerant circuits

Our heat exchangers are approved by the following official organisations :

- **DRIRE** (Service des Mines) : FRANCE
- **TUV** (Self inspection) : ALLEMAGNE
- **SA** (Self inspection) : SUEDE
- **VERITAS** : ESPAGNE
- On request, these exchangers can be built to other standards.

■ HPS economizer system

■ The HPS system permits, under certain operating conditions, an increase of the cooling capacity improving thus considerably the efficiency (EER) of the installation.

■ Accessories

- Filter dryer(s)
- Hygroscopic sight glass(es)
- Thermostatic expansion valve(s)

■ Electrical panel

- Panel conforms to the standards **NF C 15 100 and EN 60 204**
- Main security switch
- **Remote control transformer**
- Power circuit protection
- Remote control circuit protection
- Compressor motor(s) contactor
- General earthing
- **PRS 1 microprocessor electronic module** ensuring the following main functions :
 - Regulation of the chilled water temperature (evaporator inlet or outlet temperature).
 - Possibility of varying the set point as a function of the external temperature.
 - Control of the operating parameters
 - Control of the compressor(s) discharge temperature
 - Counting and balancing of compressor operating times
 - Re-start time delay control
 - 2nd set point control
 - Indication of the different parameters **on 160 character display**
- **temperatures** (water inlet, water outlet, external air, discharge ...).
- **pressures** (high pressure-low pressure-oil pressure)
- Compressor **current**
- compressor operating times
- compressor operating status
- Automatic display of each fault with repair help menu
- Memorisation of last 12 faults with statement of unit operation memorised at the time of each fault.

■ Control and safety devices

- HP safety pressure transducer(s)
- LP safety pressure transducer(s)
- Oil pressure transducer(s)
- High and low pressure safety valves
- Evaporator anti-freeze sensor
- Chilled water control sensor
- Evaporator water flow controller

■ Power regulation

- Staged power control :
 - 3 stages (LW 700 to 900)
 - 6 stages (LW 1000 to 1800)
 - continuous from 25 to 100 % (LW 2150 to 2800).

HYDROCIAT series LWN

The range of water chillers without condenser **HYDROCIAT series LWN** is derived from the HYDROCIAT LW series.

These units can be connected either to water or air cooled condensers. They can be matched to several models of our condensers **EUROPA 2C** range (see technical brochure).

HYDROCIAT series **LWN** are supplied with a safety refrigerant charge.

The HYDROCIAT series LWN is supplied with :

- Twin screw semi-hermetic compressor(s)
- Shell and tube evaporator
- Refrigerant liquid receiver
- Staged power regulation
- Power and remote control electrical cabinet
- Electrical supply :
400 V $\pm 6\%$ - 3ph - 50 Hz + Earth
- PRS 1 electronic microprocessor regulation, surveillance and management module.

■ Accessories

- Identical to the HYDROCIAT series LW.

HYDROCIAT series LWP

The water-water heat pump **THERMACIAT SERIES LWP** range has the same design as the HYDROCIAT series LW.

The energy is recovered from a natural hydrographic system (ground water etc...) or from water in a closed circuit and transferred to the heating circuit by the thermodynamic circuit instead of being rejected by the cooling tower as with standard water chillers.

These water-water heat pumps can be used for cooling by reversing the water circuits (modification of the hydraulic circuits to be accomplished on site).

The water-water heat pump **THERMACIAT series LWP** is supplied with :

- Twin screw semi-hermetic compressor(s)
- Heating water condenser(s)
- Shell and tubes evaporator
- Heating and cooling capacity control
- Power and remote control electrical cabinet
- Electrical supply :
400 V $\pm 6\%$ - 3 ph - 50 Hz + Earth
- PRS1 electronic microprocessor regulation, surveillance and management module.

■ Accessories

- Identical to the HYDROCIAT series LW.

OPTIONS

HYDROCIAT series LW - LWN

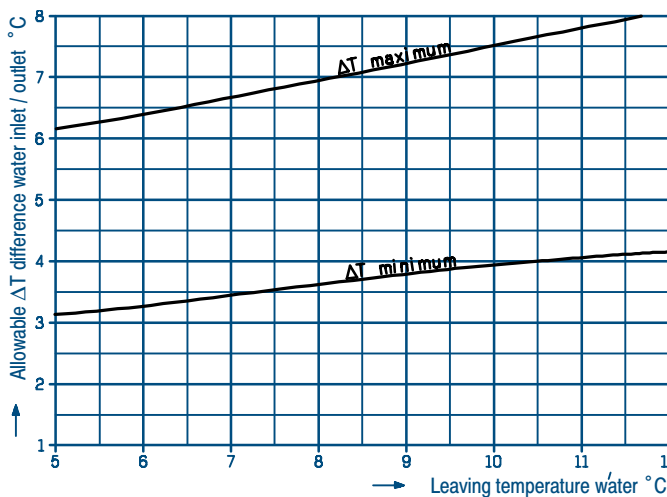
THERMACIAT series LWP

- Phonic insulation cabinet
- Anti-vibratil equipment
 - anti-vibratil mounts
 - evaporator flexible sleeves
 - condenser flexible sleeves (LW - LWP)
 - refrigerant lines sleeves (LWN)
- Electrical cabinet numbered wiring
- Compressor(s) shut off valve(s)
- Constant pressure valve (LWN) : obligatory for the units connected to the remote condensers running at temperatures lower than + 12 °C.

OPERATING LIMITS

HYDROCIAT THERMACIAT	LW	LWP	LWN
Water cooled condenser	YES		NO
• ΔT mini °C	4		
• ΔT maxi °C	8		
• Max. hot water temp. outlet °C	50		
Without condenser	NO		YES
Condensing temperature			
• Mini °C			35
• Maxi °C			55
Evaporator	Variable depending upon the leaving temperature		
• ΔT mini °C	See graph below		
• ΔT maxi °C	See graph below		

EVAPORATOR LIMITS



Example :

For a water outlet temperature : + 7 °C + 5 °C
 ΔT minimum : 3,4 °C Water temp. : 10,4 / 7 °C
 ΔT maximum : 6,7 °C Water temp. : 13,7 / 7 °C

CONDENSER LIMITS

IMPORTANT

To allow a correct running of the LW - LWP units especially during the starting period with a cold condenser loop, a device will have to be added (3 way valve for instance) in order to provide very quickly a **minimum** condenser fluid inlet temperature of **20 °C**

WATER / GLYCOL COEFFICIENTS

- Concentration **30 %** of glycol weight
- Freezing point of the solution : -17,5°C

CORRECTION		NEGATIVE TEMPERATURE	
		K	Calculation
Evaporator	Cooling capacity	0.98	$P_{fc} = P_f \times 0,98$
	Chilled water flow	1.05	$Q_c = \frac{P_{fc} \times 0,86}{\Delta T} \times 1,05$
	Pressure drop	1.15	$\Delta P_c = \Delta P \times 1,15$
	Average temperatures		12 / 7°C
Condenser	Cooling capacity	0.97	$P_{fc} = P_f \times 0,97$
	Hot water flow	1.05	$Q_c = \frac{(P_{fc} + P_a) \times 0,86}{\Delta T} \times 1,05$
	Pressure drop	1.10	$\Delta P_c = \Delta P \times 1,10$
	Average temperatures		35 / 40 °C
Evaporator + condenser	Cooling capacity	0.95	$P_{fc} = P_f \times 0,95$
	Chilled water flow	1.05	$Q_c = \frac{P_{fc} \times 0,86}{\Delta T} \times 1,05$
	Evaporator pressure drop	1.15	$\Delta P_c = \Delta P \times 1,15$
	Hot water flow	1.05	$Q_c = \frac{(P_{fc} + P_a) \times 0,86}{\Delta T} \times 1,05$
	Hot water flow	1.10	$\Delta P_c = \Delta P \times 1,10$

K : Correction coefficients

Values shown in the brochure

Pf : Cooling output as per selection table

Pa : Compressors absorbed power as per selection table

ΔP : Water pressure drop as per curves for the corresponding corrected flow values (Qc)

Values corrected as per above calculations :

Pfc : Corrected cooling output

Qc : Corrected flow, chilled water or hot water

ΔPc : Corrected water pressure drop, evaporator or condenser



Chilled water production units

hydrociat

LW



COOLING AND HEATING CAPACITIES

HYDROCIAT LW - THERMACIAT LWP

R 407C	LW LWP	Chilled water outlet temperature °C	CONDENSER WATER OUTLET TEMPERATURE °C															
			30			35			40			45			50			
			Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	
1 compressor 1 refrigerant circuit	700 Z	Pure water	5	155	40.8	196	151	45.7	197	147	50.6	198	143	55.6	199	138	61.2	199
			6	160	42.1	202	155	46.6	202	151	51.1	202	146	56.3	202	142	61.8	204
			7	166	42.5	209	161	47.2	208	156	51.9	208	151	57.2	208	146	62.9	209
			8	170	43.3	213	166	47.9	214	161	52.5	214	155	57.8	213	150	63.5	214
			10	182	44.6	227	177	49.4	226	171	54.2	225	165	59.6	225	159	65.4	224
			12	193	45.9	239	188	50.9	239	182	55.9	238	176	61.6	238	170	67.5	238
	800 Z	Pure water	5	174	47.1	221	169	53	222	165	58.9	224	159	65	224	154	71.3	225
			6	181	48.9	230	176	54.3	230	170	59.7	230	165	65.8	231	158	71.5	230
			7	188	49.8	238	182	55.3	237	177	60.8	238	170	67	237	164	73.5	238
			8	193	50.6	244	188	56.1	244	182	61.6	244	176	67.9	244	169	74.4	243
			10	206	52	258	200	57.8	258	193	63.6	257	187	70.1	257	179	76.8	256
			12	219	53.9	273	212	59.8	272	204	65.7	270	198	72.4	270	191	79.4	270
	900 Z	Pure water	5	200	52.5	253	194	58.7	253	189	64.9	254	182	71.4	253	176	78.4	254
			6	207	53.9	261	201	59.8	261	194	65.7	260	189	72.4	261	182	79.5	262
			7	213	54.7	268	207	60.7	268	201	66.7	268	195	73.5	269	189	80.7	270
			8	219	55.4	274	213	61.5	275	208	67.6	276	201	74.4	275	194	81.8	276
			10	234	57.1	291	227	63.3	290	221	69.5	291	213	76.4	289	206	83.9	290
			12	247	58.7	306	240	65.1	305	234	71.5	306	226	78.7	305	218	86.4	304
2 compressors 2 refrigerant circuits	1000 Z	Pure water	5	234	60.5	295	227	66.8	294	221	73.1	294	213	81.4	294	206	89.4	295
			6	242	61.1	303	235	67.8	303	227	74.5	302	220	82.2	302	213	90.3	303
			7	247	61.5	309	241	68.5	310	235	75.5	311	227	83.2	310	219	91.3	310
			8	256	62.3	318	248	69.2	317	241	76.1	317	234	83.9	318	225	92.1	317
			10	272	63.8	336	264	70.9	335	256	78	334	247	85.8	333	238	94	332
			12	288	65.1	353	280	72.5	353	271	79.9	351	262	87.9	350	252	96	348
	1200 Z	Pure water	5	269	72.4	341	261	80.5	342	254	88.6	343	245	97.8	343	236	107	343
			6	279	73.2	352	270	81.5	352	262	89.8	352	252	99.1	351	243	108	351
			7	287	73.9	361	279	82.4	361	270	90.9	361	261	100.3	361	251	110	361
			8	295	74.9	370	287	83.4	370	279	91.9	371	269	101	370	259	111	370
			10	314	77	391	305	85.7	391	295	94.4	389	285	104	389	274	113	387
			12	333	79.2	412	323	88	411	313	96.8	410	301	106	407	291	116	407
	1400 Z	Pure water	5	328	84.6	413	318	93.8	412	309	103	412	299	113	412	289	124	413
			6	339	85.4	424	328	94.7	423	318	104	422	308	114	422	297	125	422
			7	349	87.4	436	339	96.2	435	328	105	433	317	116	433	307	127	434
			8	361	88.2	449	350	97.6	448	339	107	446	328	118	446	316	129	445
			10	381	90	471	370	100	470	359	110	469	347	121	468	335	133	468
			12	405	93	498	392	103	495	379	113	492	366	125	491	354	137	491
1600 Z	Pure water	5	387	100	487	375	111	486	363	122	485	351	134	485	339	147	486	
		6	399	102	501	386	113	499	374	124	498	362	136	498	348	149	497	
		7	410	102	512	397	114	511	385	126	511	372	138	510	358	151	509	
		8	422	105	527	409	116	525	397	127	524	383	141	524	369	154	523	
		10	446	107	553	432	119	551	419	131	550	405	144	549	390	159	549	
		12	474	110	584	458	123	581	443	136	579	427	149	576	411	163	574	
1800 Z	Pure water	5	441	108	549	428	120	548	415	132	547	403	145	548	389	159	548	
		6	454	110	564	442	122	564	429	134	563	415	146	561	401	161	562	
		7	467	111	578	454	123	577	442	135	577	428	148	576	413	163	576	
		8	484	113	597	469	125	594	454	137	591	440	150	590	425	165	590	
		10	512	115	627	498	128	626	483	141	624	467	154	621	451	170	621	
		12	546	120	666	528	132	660	511	144	655	495	159	654	477	174	651	

WATER COND.

Pf : Cooling capacity valid for a ΔT as per operating limits

Pa : Compressor(s) absorbed power

Pc : Heating capacity valid for a ΔT as per operating limits



Chilled water production units

hydrociat

LW

COOLING AND HEATING CAPACITIES

HYDROCIAT LW - THERMACIAT LWP

R 22	LW LWP	Chilled water outlet temperature °C	CONDENSER WATER OUTLET TEMPERATURE °C															
			30			35			40			45			50			
			Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	
1 compressor 1 refrigerant circuit	700	Pure water	5	168	40.8	209	164	45.7	210	160	50.6	211	155	55.6	211	150	61.2	211
			6	174	42.1	216	169	46.6	216	164	51.1	215	159	56.3	215	154	61.8	216
			7	180	42.5	223	175	47.2	222	170	51.9	222	164	57.2	221	159	62.9	222
			8	185	43.3	228	180	47.9	228	175	52.5	228	169	57.8	227	163	63.5	227
			10	198	44.6	243	192	49.4	241	186	54.2	240	179	59.6	239	173	65.4	238
			12	210	45.9	256	204	50.9	255	198	55.9	254	191	61.6	253	185	67.5	253
	800	Pure water	5	189	47.1	236	184	53	237	179	58.9	238	173	65	238	167	71.3	238
			6	197	48.9	246	191	54.3	245	185	59.7	245	179	65.8	245	172	71.5	244
			7	204	49.8	254	198	55.3	253	192	60.8	253	185	67	252	178	73.5	252
			8	210	50.6	261	204	56.1	260	198	61.6	260	191	67.9	259	184	74.4	258
			10	224	52	276	217	57.8	275	210	63.6	274	203	70.1	273	195	76.8	272
			12	238	53.9	292	230	59.8	290	222	65.7	288	215	72.4	287	208	79.4	287
900	Pure water	5	217	52.5	270	211	58.7	270	205	64.9	270	198	71.4	269	191	78.4	269	
		6	225	53.9	279	218	59.8	278	211	65.7	277	205	72.4	277	198	79.5	278	
		7	231	54.7	286	225	60.7	286	219	66.7	286	212	73.5	286	205	80.7	286	
		8	238	55.4	293	232	61.5	294	226	67.6	294	218	74.4	292	211	81.8	293	
		10	254	57.1	311	247	63.3	310	240	69.5	310	232	76.4	308	224	83.9	308	
		12	268	58.7	327	261	65.1	326	254	71.5	326	246	78.7	325	237	86.4	323	
2 compressors 2 refrigerant circuits	1000	Pure water	5	254	60.5	315	247	66.8	314	240	73.1	313	232	81.4	313	224	89.4	313
			6	263	61.1	324	255	67.8	323	247	74.5	322	239	82.2	321	231	90.3	321
			7	269	61.5	331	262	68.5	331	255	75.5	331	247	83.2	330	238	91.3	329
			8	278	62.3	340	270	69.2	339	262	76.1	338	254	83.9	338	245	92.1	337
			10	296	63.8	360	287	70.9	358	278	78	356	269	85.8	355	259	94	353
			12	313	65.1	378	304	72.5	377	295	79.9	375	285	87.9	373	274	96	370
	1200	Pure water	5	292	72.4	364	284	80.5	365	276	88.6	365	266	97.8	364	257	107	364
			6	303	73.2	376	294	81.5	376	285	89.8	375	274	99.1	373	264	108	372
			7	312	73.9	386	303	82.4	385	294	90.9	385	284	100.3	384	273	110	383
			8	321	74.9	396	312	83.4	395	303	91.9	395	292	101	393	281	111	392
			10	341	77	418	331	85.7	417	321	94.4	415	310	104	414	298	113	411
			12	362	79.2	441	351	88	439	340	96.8	437	327	106	433	316	116	432
1400	Pure water	5	356	84.6	441	346	93.8	440	336	103	439	325	113	438	314	124	438	
		6	368	85.4	453	357	94.7	452	346	104	450	335	114	449	323	125	448	
		7	379	87.4	466	368	96.2	464	357	105	462	345	116	461	334	127	461	
		8	392	88.2	480	380	97.6	478	368	107	475	356	118	474	343	129	472	
		10	414	90	504	402	100	502	390	110	500	377	121	498	364	133	497	
		12	440	93	533	426	103	529	412	113	525	398	125	523	385	137	522	
1600	Pure water	5	421	100	521	408	111	519	395	122	517	381	134	515	368	147	515	
		6	434	102	536	420	113	533	406	124	530	393	136	529	378	149	527	
		7	446	102	548	432	114	546	418	126	544	404	138	542	389	151	540	
		8	459	105	564	445	116	561	431	127	558	416	141	557	401	154	555	
		10	485	107	592	470	119	589	455	131	586	440	144	584	424	159	583	
		12	515	110	625	498	123	621	481	136	617	464	149	613	447	163	610	
1800	Pure water	5	479	108	587	465	120	585	451	132	583	438	145	583	423	159	582	
		6	494	110	604	480	122	602	466	134	600	451	146	597	436	161	597	
		7	508	111	619	494	123	617	480	135	615	465	148	613	449	163	612	
		8	526	113	639	510	125	635	494	137	631	478	150	628	462	165	627	
		10	557	115	672	541	128	669	525	141	666	508	154	662	490	170	660	
		12	593	120	713	574	132	706	555	144	699	538	159	697	519	174	693	

WATER COND.

Pf : Cooling capacity valid for a ΔT as per operating limits

Pa : Compressor(s) absorbed power

Pc : Heating capacity valid for a ΔT as per operating limits



Chilled water production units

hydrociat

LW



COOLING AND HEATING CAPACITIES

HYDROCIAT LWN

R 407C	1 compressor 1 refrigerant circuit	LWN	Chilled water outlet temperature °C	CONDENSER TEMPERATURE IN °C															
				35			40			45			50			55			
				Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	
1 compressor 1 refrigerant circuit	700 Z	Pure water	5	156	40.8	197	153	44.8	198	148	48.8	197	144	53.8	198	139	58.8	198	
			6	162	41.2	203	157	45.2	202	153	49.3	202	148	54.3	202	144	59.3	203	
			7	167	41.6	209	162	45.7	208	157	49.8	207	153	54.8	208	148	59.8	208	
			8	172	42.1	214	167	46.2	213	163	50.3	213	158	55.4	213	153	60.5	214	
			10	185	43.2	228	179	47.3	226	174	51.4	225	168	56.6	225	163	61.9	225	
			12	197	44.2	241	191	48.	239	186	52.5	239	180	57.7	238	174	63	237	
	800 Z	Pure water	5	178	46.7	225	173	51.2	224	167	55.8	223	163	61.5	225	157	67.2	224	
			6	184	47.2	231	178	51.8	230	173	56.4	229	168	62.1	230	163	67.8	231	
			7	191	47.7	239	186	52.35	238	179	57	236	174	62.75	237	168	68.5	237	
			8	198	48.3	246	192	52.9	245	186	57.6	244	180	63.4	243	175	69.2	244	
			10	211	49.4	260	205	54.1	259	199	58.8	258	193	64.7	258	187	70.6	258	
			12	224	50.5	275	218	55.2	273	212	59.9	272	205	65.9	271	199	72	271	
	900 Z	Pure water	5	201	53	254	196	58.1	254	190	63.3	253	184	69.7	254	178	76.2	254	
			6	208	53.6	262	202	58.7	261	196	63.9	260	190	70.4	260	184	77	261	
			7	215	54.2	269	209	59.4	268	202	64.6	267	197	71.2	268	191	77.8	269	
			8	222	54.8	277	215	60	275	209	65.2	274	203	71.8	275	198	78.5	277	
			10	236	55.9	292	230	61.2	291	224	66.5	291	217	73.2	290	211	80	291	
			12	250	57.1	307	244	62.4	306	237	67.8	305	231	74.6	306	224	81.5	306	
	2 compressors 2 refrigerant circuits	1000 Z	Pure water	5	235	59.5	295	229	65.4	294	224	71.4	295	217	78.7	296	210	86	296
				6	241	60	301	236	65.9	302	230	71.8	302	224	79.1	303	216	86.5	303
				7	248	60.4	308	243	66.3	309	237	72.3	309	230	79.7	310	223	87.1	310
				8	257	60.9	318	251	66.8	318	246	72.8	319	238	80.2	318	230	87.7	318
				10	272	61.9	334	267	67.9	335	261	73.9	335	253	81.3	334	245	88.8	334
				12	290	63	353	283	69	352	277	75	352	269	82.5	352	260	90.1	350
1200 Z		Pure water	5	270	69.8	340	265	76.7	342	259	83.6	343	250	92.2	342	242	100.8	343	
			6	280	70.4	350	273	77.3	350	267	84.2	351	259	93.1	352	250	102	352	
			7	289	71	360	282	77.9	360	275	84.9	360	267	93.4	360	259	102	361	
			8	298	71.5	370	292	78.5	371	284	85.5	370	276	94.2	370	267	103	370	
			10	317	72.6	390	311	79.7	391	304	86.8	391	294	95.4	389	284	104	388	
			12	337	73.9	411	329	81.0	410	321	88.2	409	312	96.6	409	302	105	407	
1400 Z		Pure water	5	330	83	413	321	91.1	412	312	99.2	411	303	109.1	412	293	119	412	
			6	340	83.9	424	331	91.9	423	322	100	422	313	110	423	303	120	423	
			7	351	84.8	436	342	92.9	435	333	101	434	323	111	434	312	121	433	
			8	363	85.8	449	353	93.9	447	343	102	445	333	112	445	322	122	444	
			10	386	87.7	474	375	95.8	471	364	104	468	353	114.5	468	342	125	467	
			12	410	89.7	500	399	97.8	497	387	106	493	375	116.5	492	363	127	490	
1600 Z		Pure water	5	392	96.2	488	381	105.1	486	370	114	484	359	126	485	347	138	485	
			6	404	97.2	501	393	106.6	500	381	116	497	370	127.5	498	358	139	497	
			7	417	98.3	515	405	107.6	513	393	117	510	381	128.5	510	369	140	509	
			8	430	99.3	529	418	108.6	527	406	118	524	394	129.5	524	381	141	522	
			10	456	101	557	444	110.5	555	431	120	551	419	132	551	405	144	549	
			12	482	102	584	470	112.5	583	458	123	581	443	135	578	429	147	576	
1800 Z	Pure water	5	442	109	551	430	119.5	550	417	130	547	404	143	547	391	156	547		
		6	455	110	565	443	120.5	564	431	131	562	417	144.5	562	403	158	561		
		7	470	111	581	457	121.5	579	444	132	576	431	145.5	577	416	159	575		
		8	486	112	598	472	122.5	595	458	133	591	444	147	591	430	161	591		
		10	516	115	631	501	125.5	627	487	136	623	472	150	622	456	164	620		
		12	548	118	666	534	128.5	663	518	139	657	501	153	654	485	167	652		

WATER COND.

Pf : Cooling capacity valid for a ΔT as per operating limits

Pa : Compressor(s) absorbed power

Pc : Heating capacity to be discharged



Chilled water production units

hydrociat LW

COOLING AND HEATING CAPACITIES



HYDROCIAT LWN

WATER COND.

R 407C

2 compressors
2 refrigerant circuits

CONDENSER TEMPERATURE IN °C

LWN	Chilled water outlet temperature °C	35			40			45			50			55					
		Pf	Pa	Pc	Pf	Pa	Pc	Pf	Pa	Pc	Pf	Pa	Pc	Pf	Pa	Pc			
		kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW			
2150 Z	Pure water	5	552	117	669	534	133	668	512	151	663	490	170	660	462	192	654		
		6	568	118	686	552	134	686	530	151	682	506	171	677	477	193	670		
		7	586	118	705	569	134	704	548	152	700	522	172	694	494	193	687		
		8	603	119	722	587	135	722	565	153	718	541	172	713	511	194	706		
		9	619	119	738	602	136	737	582	153	735	557	173	730	528	195	723		
		10	633	119	753	617	135	752	595	154	749	570	173	743	541	195	737		
		11	651	120	771	632	136	768	610	154	763	583	174	757	554	196	750		
		12	670	120	790	650	137	786	625	154	779	598	175	772	567	196	763		
		2500 Z	Pure water	5	653	135	789	634	155	789	607	175	782	577	198	775	542	224	766
				6	674	136	810	656	155	811	628	176	804	598	199	797	563	224	788
				7	694	136	831	678	156	833	649	176	826	618	200	818	584	225	809
				8	714	137	850	698	156	854	670	177	847	639	200	840	604	226	829
9	735			137	872	718	156	875	690	178	868	659	201	860	625	226	851		
10	757			137	894	736	157	893	711	178	890	681	202	882	646	227	873		
11	777			138	915	759	157	916	731	179	910	702	202	904	667	227	894		
12	800			138	938	780	158	937	751	180	931	722	203	925	688	228	917		
2800 Z	Pure water			5	719	154	873	699	173	873	674	195	869	643	219	862	608	246	854
				6	740	155	894	720	174	894	697	196	892	665	220	885	630	247	877
				7	759	155	914	741	175	916	719	197	916	687	221	908	651	249	900
				8	780	156	935	761	176	936	739	198	936	709	222	931	673	250	922
		9	802	156	958	784	176	960	763	198	961	732	223	955	695	251	945		
		10	825	157	982	807	177	983	784	199	983	752	224	976	717	252	968		
		11	850	157	1008	829	178	1006	805	200	1005	773	224	997	736	253	989		
		12	877	158	1035	854	178	1032	827	201	1028	796	225	1021	760	254	1014		

Pf : Cooling capacity valid for a ΔT as per operating limits

Pa : Compressor(s) absorbed power

Pc : Heating capacity to be discharged

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Chilled water production units

hydrociat

LW

COOLING AND HEATING CAPACITIES

HYDROCIAT LW

R 22	LWN	Chilled water outlet temperature °C	CONDENSER TEMPERATURE IN °C															
			35			40			45			50			55			
			Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	Pf kW	Pa kW	Pc kW	
1 compressor 1 refrigerant circuit	700	Pure water	5	170	40.8	211	166	44.8	211	161	48.8	202	156	53.8	210	151	58.8	210
			6	176	41.2	217	171	45.2	216	166	49.3	207	161	54.3	215	156	59.3	215
			7	181	41.6	223	176	45.7	222	171	49.8	213	166	54.8	221	161	59.8	221
			8	187	42.1	229	182	46.2	228	177	50.3	219	172	55.4	227	166	60.5	227
			10	201	43.2	244	195	47.3	242	189	51.4	232	183	56.6	240	177	61.9	239
			12	214	44.2	258	208	48.3	256	202	52.5	246	196	57.7	254	189	63	252
	800	Pure water	5	193	46.7	240	188	51.2	239	182	55.8	229	177	61.5	239	171	67.2	238
			6	200	47.2	247	194	51.8	246	188	56.4	235	183	62.1	245	177	67.8	245
			7	208	47.7	256	202	52.3	254	195	57	243	189	62.7	252	183	68.5	252
			8	215	48.3	263	209	52.9	262	202	57.6	250	196	63.4	259	190	69.2	259
			10	229	49.4	278	223	54.1	277	216	58.8	265	210	64.7	275	203	70.6	274
			12	243	50.5	294	237	55.2	292	230	59.9	281	223	65.9	289	216	72	288
	900	Pure water	5	219	53	272	213	58.1	271	206	63.3	259	200	69.75	270	193	76.2	269
			6	226	53.6	280	220	58.7	279	213	63.9	267	207	70.4	277	200	77	277
			7	234	54.2	288	227	59.4	286	220	64.6	274	214	71.2	285	208	77.8	286
			8	241	54.8	296	234	60	294	227	65.2	282	221	71.8	293	215	78.5	294
			10	257	55.9	313	250	61.2	311	243	66.5	299	236	73.2	309	229	80	309
			12	272	57.1	329	265	62.4	327	258	67.8	315	251	74.6	326	243	81.5	325
2 compressors 2 refrigerant circuits	1000	Pure water	5	255	59.5	315	249	65.4	314	243	71.4	314	236	78.7	315	228	86	314
			6	262	60	322	256	65.9	322	250	71.8	322	243	79.1	322	235	86.5	322
			7	270	60.4	330	264	66.3	330	258	72.3	330	250	79.7	330	242	87.1	329
			8	279	60.9	340	273	66.8	340	267	72.8	340	259	80.2	339	250	87.7	338
			10	296	61.9	358	290	67.9	358	284	73.9	358	275	81.3	356	266	88.8	355
			12	315	63	378	308	69	377	301	75	376	292	82.5	375	283	90.1	373
	1200	Pure water	5	294	69.8	364	288	76.7	365	281	83.6	365	272	92.2	364	263	100.8	364
			6	304	70.4	374	297	77.3	374	290	84.2	374	281	93.1	374	272	102	374
			7	314	71	385	307	77.9	385	299	84.9	384	290	93.4	383	281	102	383
			8	324	71.5	396	317	78.5	396	309	85.5	395	300	94.2	394	290	103	393
			10	345	72.6	418	338	79.7	418	330	86.8	417	320	95.4	415	309	104	413
			12	366	73.9	440	358	81	439	349	88.2	437	339	96.6	436	328	105	433
	1400	Pure water	5	359	83	442	349	91.1	440	339	99.2	438	329	109.1	438	318	119	437
			6	370	83.9	454	360	91.9	452	350	100	450	340	110	450	329	120	449
			7	382	84.8	467	372	92.9	465	362	101	463	351	111	462	339	121	460
			8	395	85.8	481	384	93.9	478	373	102	475	362	112	474	350	122	472
			10	420	87.7	508	408	95.8	504	396	104	500	384	114.5	499	372	125	497
			12	446	89.7	536	434	97.8	532	421	106	527	408	116.5	525	395	127	522
1600	Pure water	5	426	96.2	522	414	105.1	519	402	114	516	390	126	516	377	138	515	
		6	439	97.2	536	427	106.6	534	414	116	530	402	127.5	530	389	139	528	
		7	453	98.3	551	440	107.6	548	427	117	544	414	128.5	543	401	140	541	
		8	467	99.3	566	454	108.6	563	441	118	559	428	129.5	558	414	141	555	
		10	496	101	597	483	110.5	594	469	120	589	455	132	587	440	144	584	
		12	524	102	626	511	112.5	624	498	123	621	482	135	617	466	147	613	
1800	Pure water	5	480	109	589	467	119.5	587	453	130	583	439	143	582	425	156	581	
		6	495	110	605	482	120.5	603	468	131	599	453	144.5	598	438	158	596	
		7	511	111	622	497	121.5	619	483	132	615	468	145.5	614	452	159	611	
		8	528	112	640	513	122.5	636	498	133	631	483	147	630	467	161	628	
		10	561	115	676	545	125.5	671	529	136	665	513	150	663	496	164	660	
		12	596	118	714	580	128.5	709	563	139	702	545	153	698	527	167	694	

WATER COND.

Pf : Cooling capacity valid for a ΔT as per operating limits

Pa : Compressor(s) absorbed power

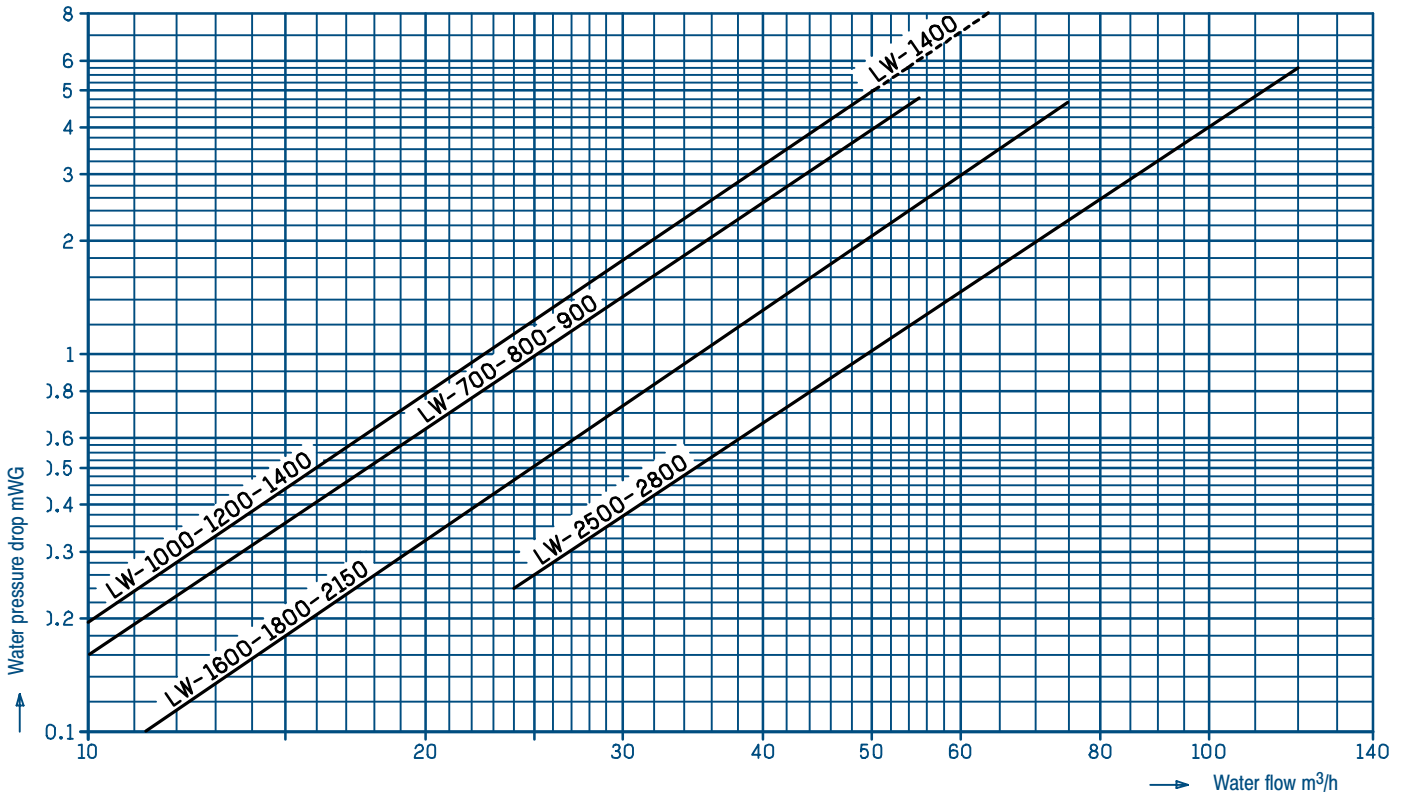
Pc : Heating capacity to be discharged



WATER PRESSURE DROP

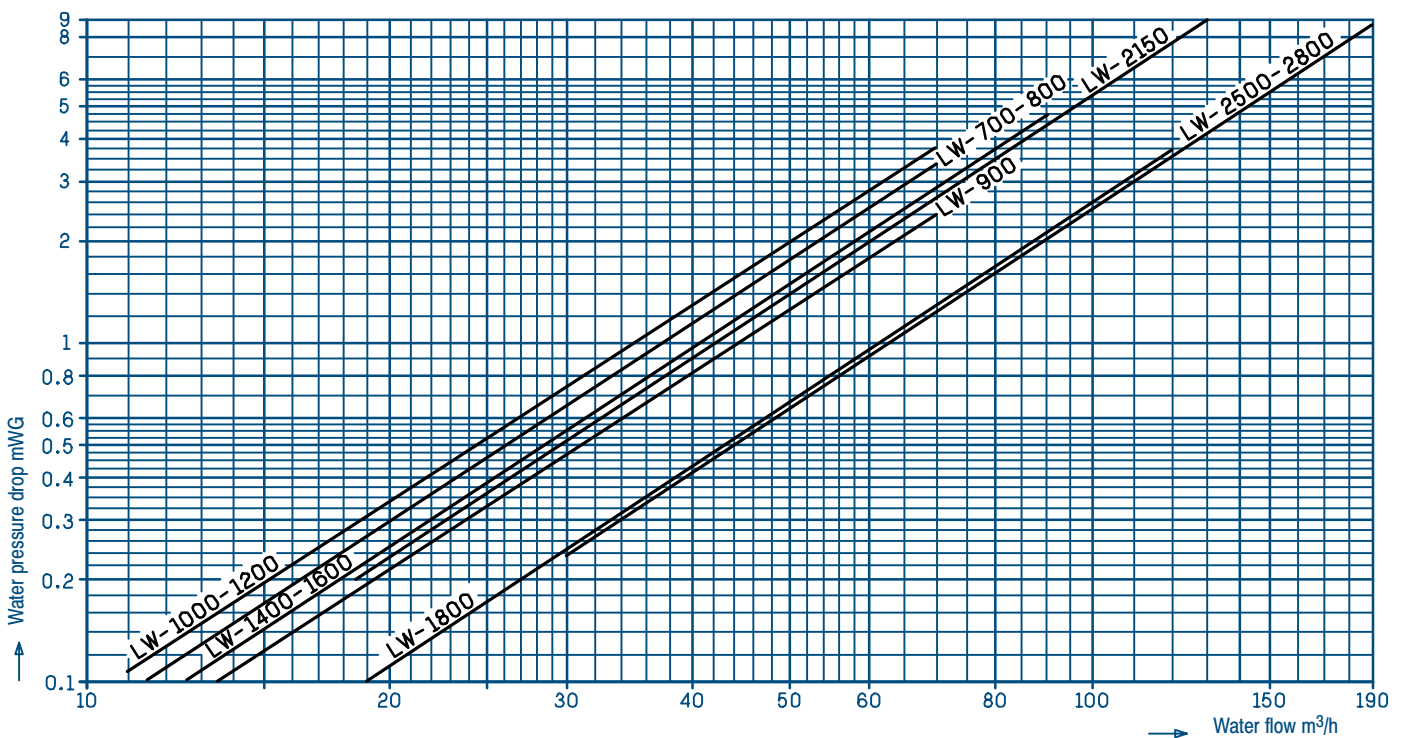
HYDROCIAT LW - LWN / THERMACIAT LWP

■ In the evaporator



HYDROCIAT LW / THERMACIAT LWP

■ In the condenser



TECHNICAL AND ELECTRICAL CHARACTERISTICS

■ 1 compressor, 1 refrigerant circuit

HYDROCIAT LW - LWN - LWP		700	800	900
Compressor	Number	1		
	Type	Semi-hermetic twin screw		
	Rotation speed	2900		
	Refrigerant fluid	R 22 or R 407c		
	Refrigerant fluid R 22 - R 407c kg	28	30	32
Capacity control		100-75-50-0		
Evaporator	Number	1		
	Type	Shell and tube		
	Water content l	55		
Water cooled condenser	Number	1		
	Type	Shell and tube		
	Water content l	19.5	19.5	25
Vessel LWN	Capacity l	90	90	90
COMPRESSOR				
Voltage 400 V - 3 ph - 50 Hz +Earth	Max. nominal current A	124	144	162
	Starting current (part winding) A	290	350	423
AUXILIARY CIRCUIT				
230 V - 1 ph - 50 Hz	Nominal current A	2	2	2

■ 2 compressors, 2 refrigerant circuits

HYDROCIAT LW - LWN - LWP		1000	1200	1400	1600	1800
Compressors	Number	2				
	Type	Semi-hermetic twin screw				
	Rotation speed	2900				
	Refrigerant fluid R 22 - R 407c kg	25 + 25	27 + 27	28 + 28	30 + 30	32 + 32
Capacity control		100-88-75-50-38-25-0				
Evaporator	Number	1				
	Type	Shell and tube				
	Water content l	69	69	83	140	140
Water-cooled condenser	Number	1				
	Type	Shell and tube				
	Water content l	28	28	36	36	49
Vessel LWN	Capacity l	2 x 80	2 x 80	2 x 80	2 x 80	2 x 80
COMPRESSOR						
Voltage 400 V - 3 ph - 50 Hz + Earth	Max. nominal current A	158 (2 x 79)	196 (2 x 98)	248 (2 x 124)	288 (2 x 144)	324 (2 x 162)
	Starting current (part winding) A	287	360	414	494	585
AUXILIARY CIRCUIT						
230 V - 1 ph - 50 Hz	Nominal current A	4	4	4	4	4



Chilled water production units

hydrociat

LW

TECHNICAL AND ELECTRICAL CHARACTERISTICS

■ 2 compressors, 2 refrigerant circuits

HYDROCIAT series LW - LWN - LWP		2150	2500	2800
Compressor	Number	2		
	Type	Semi-hermetic twin screw		
	Rotation speed	2900		
	Refrigerant fluid	R 22 or R 407c		
	Refrigerant fluid R 22 - R 407c kg	108	126	140
Capacity control		Continuous from 25 to 100 %		
Evaporator	Number	1		
	Type	Shell and tube		
	Water content I	140	188	220
Water cooled condenser	Number	1		
	Type	Shell and tube		
	Water content I	103	150	193
Vessel LWN	Capacity I	100 + 200	2 x 190	2 x 250
COMPRESSOR				
Voltage 400 V - 3 ph - 50 Hz +Earth	Max. nominal current A	377 (162 + 215)	430 (2 x 215)	462 (2 x 231)
	Starting current (part winding) A	733	786	846
AUXILIARY CIRCUIT				
230 V - 1 ph - 50 Hz	Nominal current A	4	4	4

WATER COND.

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SOUND LEVELS

■ Acoustic pressure levels ref $2 \times 10^{-5} \text{ Pa} \pm 3 \text{ dB}$

Measurement conditions :

- free field
- at 5 m from the machine, 1.50 m from the ground
- directivity 2

■ Acoustic levels ref $2 \times 10^{-12} \text{ Pa} \pm 3 \text{ dB}$

Standard version

(without phonic insulation box)

WATER COND.

LW - LWP LWN	PRESSURE LEVEL SPECTRUM (dB)							Global pressure dB(A)	Global output dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
700	41	38	65	70	69	62	57	72	94
800	39	51	68	71	70	63	59	73	95
900	52	51	61	71	71	62	58	73	95
1000	52	50	68	71	70	62	62	73	95
1200	53	52	71	72	70	63	64	74	96
1400	44	41	68	73	72	65	60	75	97
1600	42	54	71	74	73	66	62	76	98
1800	55	54	64	74	74	65	61	76	98
2150									
2500									
2800									

Standard version

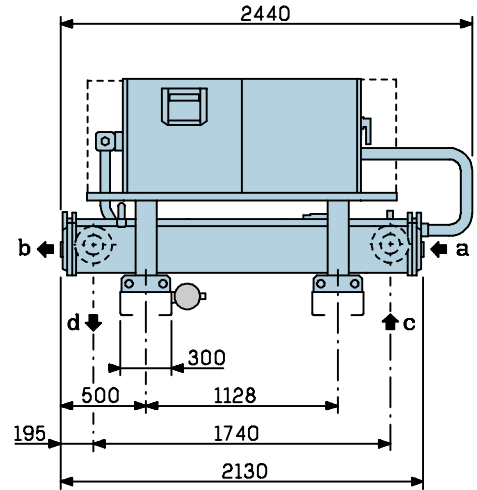
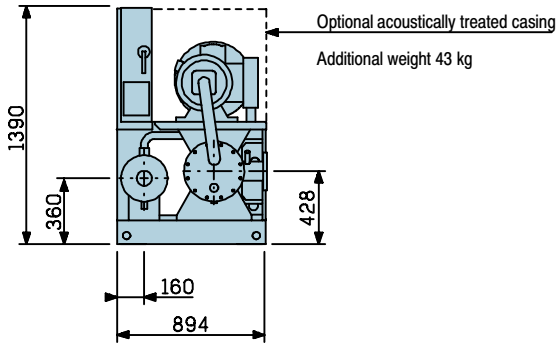
(with phonic insulation box, optional)

LW - LWP LWN	PRESSURE LEVEL SPECTRUM (dB)							Global pressure dB(A)	Global output dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
700	49	37	65	58	61	57	47	64	86
800	47	50	68	59	62	58	49	65	87
900	60	50	61	59	63	57	48	65	87
1000	60	49	68	59	63	57	52	65	87
1200	61	51	71	60	62	58	54	66	88
1400	52	40	68	61	64	60	50	67	89
1600	50	53	71	62	65	61	52	68	90
1800	63	53	64	62	66	60	51	68	90
2150									
2500									
2800									

DIMENSIONS

HYDROCIAT LW - THERMACIAT LWP

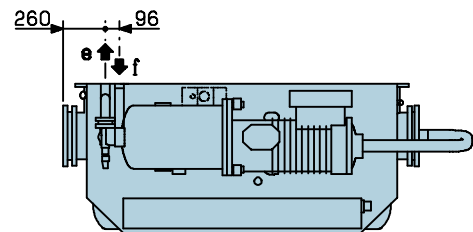
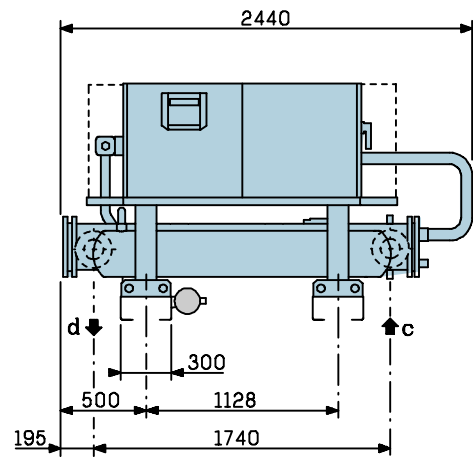
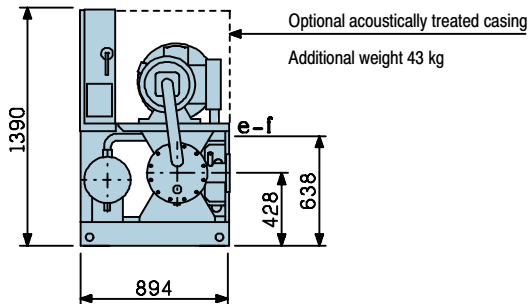
■ 1 compressor, 1 refrigerant circuit



LW - LWP	a - b	c - d	Mass kg	
			empty	in service
700	Connectors G3"	PN 16 DN 100	1145	1220
800	Connectors G3"	PN 16 DN 100	1150	1225
900	Connectors G3"	PN 16 DN 100	1190	1265

HYDROCIAT LWN

■ 1 compressor, 1 refrigerant circuit



- a : Condenser cooling water inlet
- b : Condenser cooling water outlet
- c : Chilled water inlet
- d : Chilled water outlet
- e : Discharge piping
- f : Liquid return piping

NOTA : Electric connections to be made on the right of electrical panel

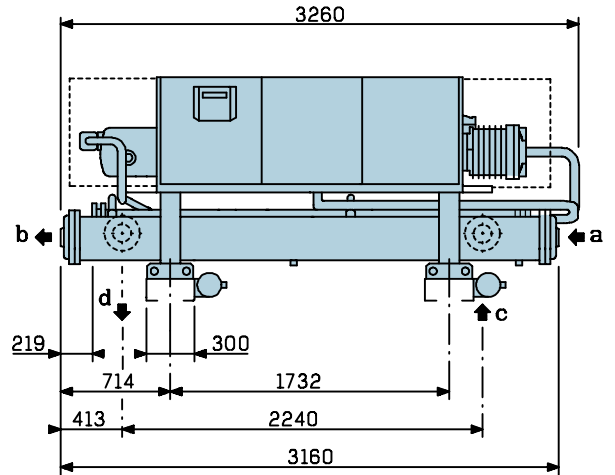
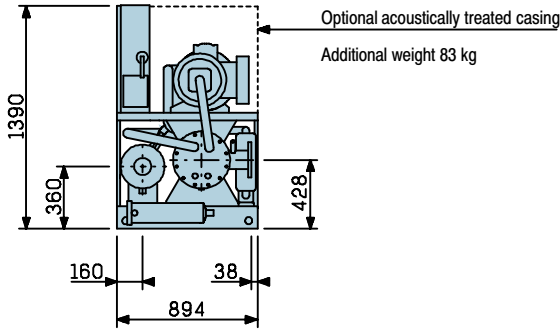
LWN	c - d	e pipe Ø	f pipe Ø	Mass kg	
				empty	in service
700	PN 16 DN 100	2" 1/8	1" 5/8	1050	1125
800	PN 16 DN 100	2" 1/8	1" 5/8	1055	1130
900	PN 16 DN 100	2" 1/8	2" 1/8	1075	1150

DIMENSIONS

HYDROCIAT LW - THERMACIAT LWP

■ 2 compressors, 2 refrigerant circuits

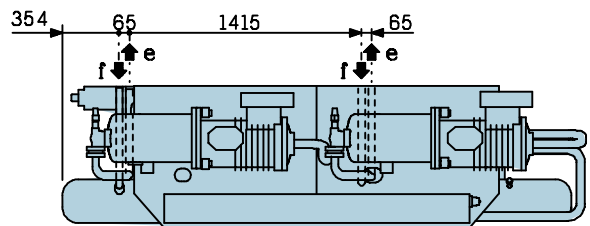
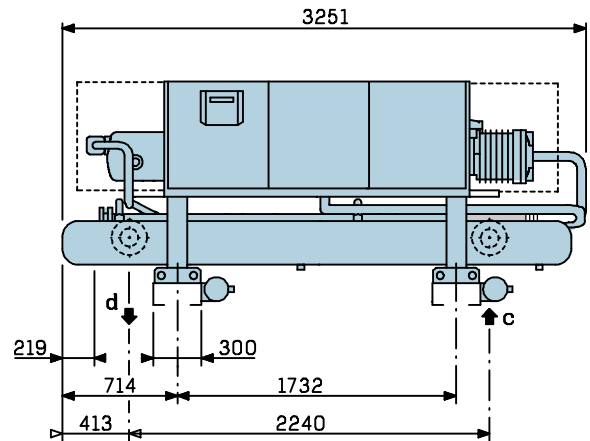
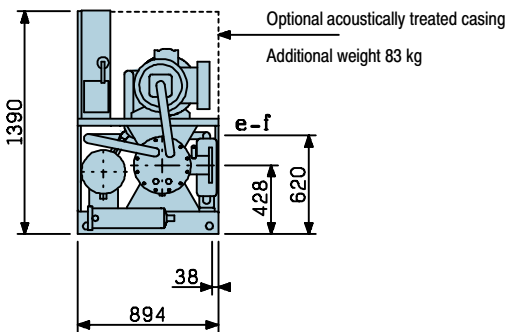
WATER COND.



LW - LWP	a - b	c - d	Mass kg	
			empty	in service
1000	Connectors G3"	PN 16 DN 100	1360	1450
1200	Connectors G3"	PN 16 DN 100	1380	1470

HYDROCIAT LWN

■ 2 compressors, 2 refrigerant circuits



- a : Condenser cooling water inlet
- b : Condenser cooling water outlet
- c : Chilled water inlet
- d : Chilled water outlet
- e : Discharge piping
- f : Liquid return piping

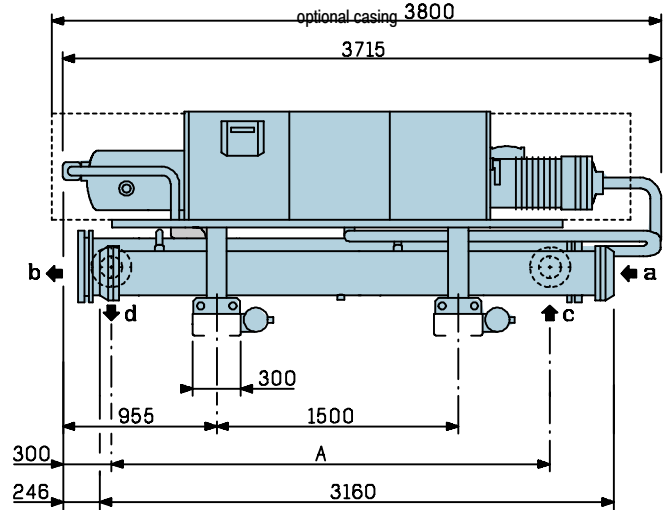
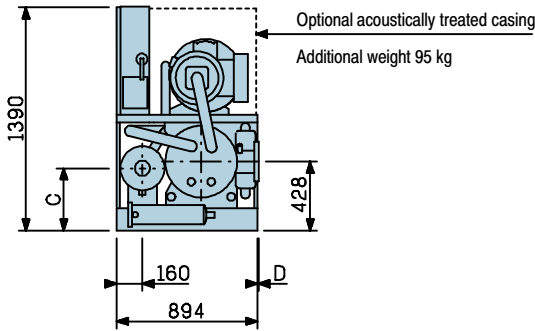
NOTA : Electric connections to be made on the right of electrical panel

LWN	c - d	e pipe Ø	f pipe Ø	Mass kg	
				empty	in service
1000	PN 16 DN 100	1" 5/8	1" 3/8	1260	1350
1200	PN 16 DN 100	2" 1/8	1" 3/8	1270	1360

DIMENSIONS

HYDROCIAT LW - THERMACIAT LWP

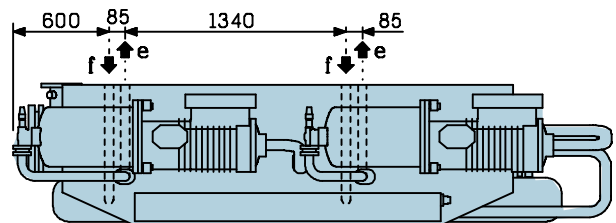
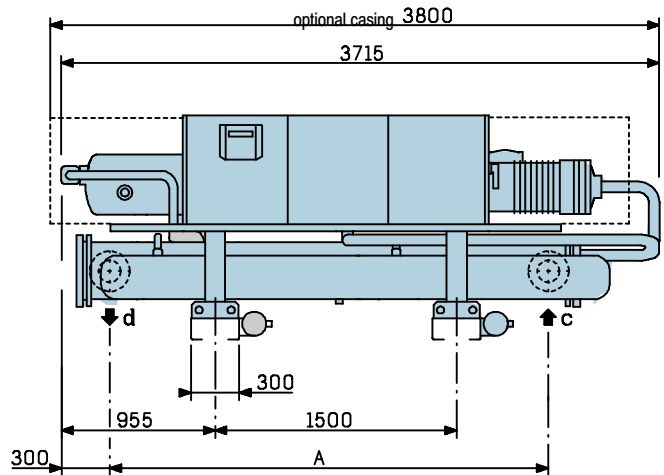
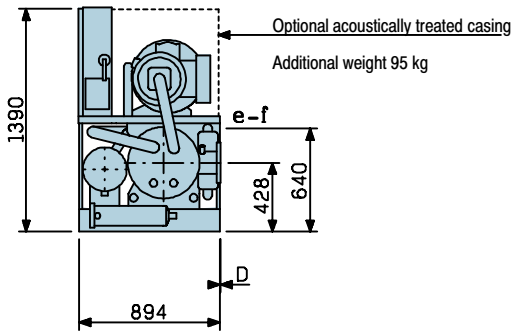
■ 2 compressors, 2 refrigerant circuits



LW - LWP	A	C	D	a - b	c - d	Mass kg	
						empty	in service
1400	2740	360	40	Connectors G3"	PN 16 DN 100	1600	1710
1600	2720	360	0	Connectors G3"	PN 16 DN 125	1835	2030
1800	2720	387	0	PN 16 DN 100	PN 16 DN 125	1960	2128

HYDROCIAT LWN

■ 2 compressors, 2 refrigerant circuits



- a : Condenser cooling water inlet
- b : Condenser cooling water outlet
- c : Chilled water inlet
- d : Chilled water outlet
- e : Discharge piping
- f : Liquid return piping

NOTA : Electrical connections to be made on the left of electric panel

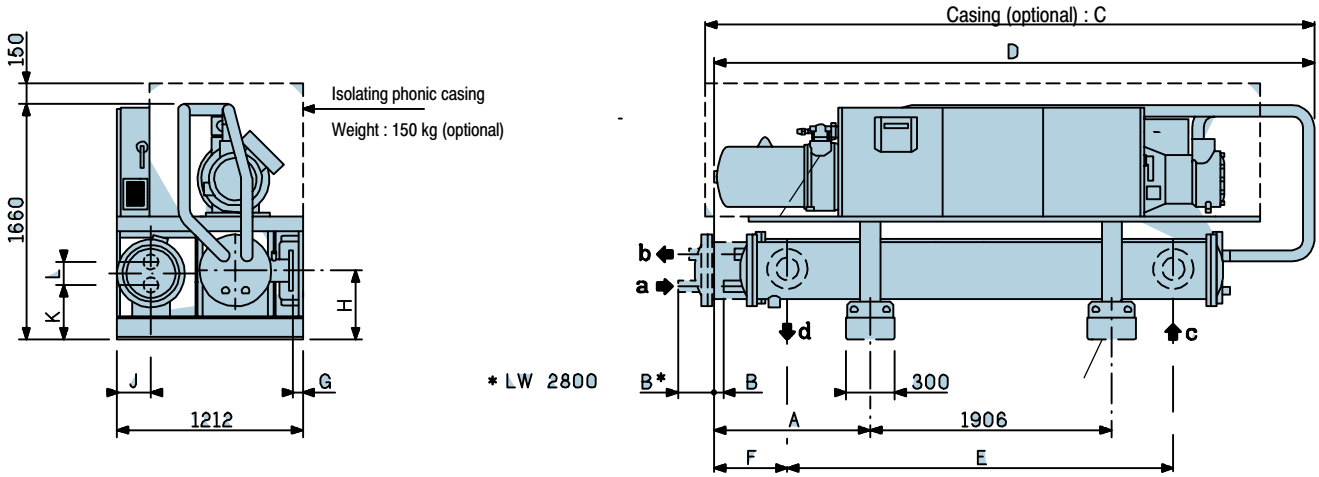
LWN	A	D	c - d	e pipe Ø	f pipe Ø	Mass kg	
						empty	in service
1400	2740	40	PN 16 DN 100	2" 1/8	1" 5/8	1470	1580
1600	2720	0	PN 16 DN 125	2" 1/8	1" 5/8	1700	1895
1800	2720	0	PN 16 DN 125	2" 1/8	2" 1/8	1805	1973

DIMENSIONS

HYDROCIAT LW - THERMACIAT LWP

■ 2 compressors, 2 refrigerant circuits

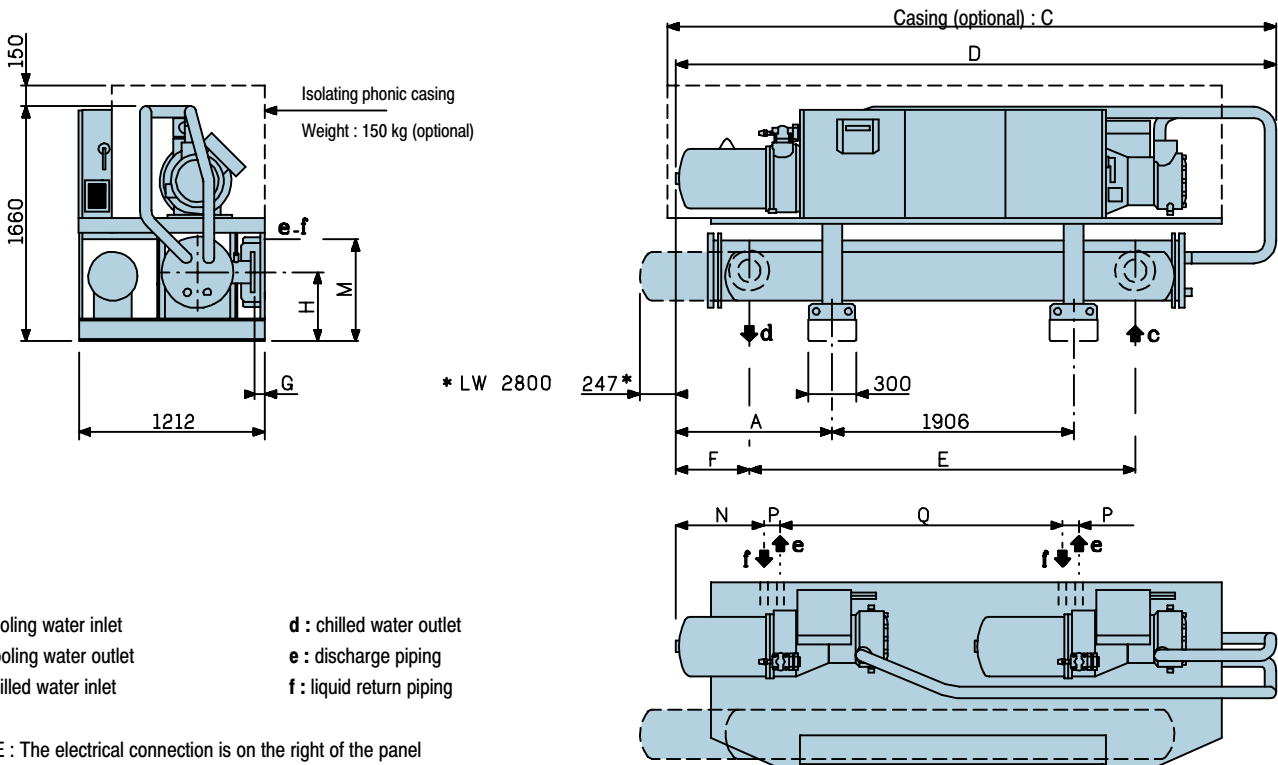
WATER COND.



LW LWP	A	B	C	D	E	F	G	H	J	K	L	a - b VITAU LIC		c - d		Mass kg	
																empty	in service
2150	895	95	4140	4098	2720	535	70	472	245	342	172	PN 16 DN 125	PN 16 DN 125	2750	2995		
2500	895	95	4140	4098	2680	555	50	472	245	353	200	PN 16 DN 150	PN 16 DN 150	3450	3750		
2800	895	397	4390	4348	3180	305	50	472	245	353	200	PN 16 DN 150	PN 16 DN 150	3750	4095		

HYDROCIAT LWN

■ 2 compressors, 2 refrigerant circuits



- a : cooling water inlet
- b : cooling water outlet
- c : chilled water inlet
- d : chilled water outlet
- e : discharge piping
- f : liquid return piping

NOTE : The electrical connection is on the right of the panel

LWN	A	C	D	E	F	G	H	M	N	P	Q	c - d	e pipe Ø		f pipe Ø		Mass kg	
																	empty	in service
2150	895	4140	4098	2720	535	70	472					PN 16 DN 125	2" 1/8 2" 5/8	2" 1/8 2" 5/8	2700	2900		
2500	895	4140	4098	2680	555	50	472					PN 16 DN 150	2 x 2" 5/8	2 x 2" 5/8	3400	3600		
2800	895	4390	4348	3180	305	50	472					PN 16 DN 150	2 x 2" 5/8	2 x 2" 5/8	3700	3950		

Dimensions
on order

RECOMMENDATIONS FOR ASSEMBLY

HYDROCIAT series LW

THERMACIAT series LWP

■ Siting

The **HYDROCIAT Series LW** and **THERMACIAT Series LWP** are units designed for location in a plant room sheltered from adverse weather and frost.

- A free space of 1 m all around the unit must be planned to gain access to the electrical panel and the other elements of the unit.
- It is also necessary to leave on one side a space equal to the length of the unit for possible withdrawal of an exchanger.
- The sound level problems must be studied in detail. Therefore, before the positioning, study and treat, if need be with the assistance of a sound technician, the various possible noise transmissions as a function of the plant room and its structure. Install the unit, if necessary, on antivibratil mounts and equip the piping with flexible connectors (equipment recommended and proposed as an option).

■ Electrical connections

All the indications necessary for the electrical connections are mentioned on the electrical diagram enclosed with the unit (must be respected).

- These connections will be carried out in accordance with accepted engineering practice and conform to the regulations in force.
- Leave the panel under voltage to permit electrical supply to the crankcase heater.
- The departure of the electrical supply line must be equipped with an isolator or a motor circuit breaker (to be planned by the installer).

■ Hydraulic connections

The hydraulic connections will be carried out in accordance with accepted engineering practice. In particular, plan the accessories indispensable to all hydraulic circuit :

- Expansion vessel
- Drains at low points for drainage
- Isolating valves
- Air vents at high points, etc.
- Make sure that the water content of the installation is sufficient. If need be, plan a buffer tank.

■ Commissioning

- Comply with our maintenance guide.

■ Maintenance

- Refer to the maintenance brochure delivered with each unit
- Take out a maintenance contract

HYDROCIAT series LWN

■ Siting

The **HYDROCIATs Series LWN** are units designed to be installed in a technical plant, sheltered from adverse weather and frost;

- A 1 m space all around the unit must be left for access to the electrical panel and other elements of the unit.
- It is also necessary to leave, on one side, a space equal to the length of the unit for the possible withdrawal of an exchanger.
- The problems of sound level must be studied in detail. Therefore, before the positioning, study and treat, if need be with the assistance of a sound technician, the various possible transmissions of noise, as a function of the technical plant and its structure. If necessary, install the unit on antivibratil mounts and equip the pipings with flexible connectors (equipment recommended and proposed as an option).

■ Electrical connections

All the indications necessary for the electrical connections are mentioned on the electrical diagram enclosed with the unit (must be respected).

- These connections will be carried out in accordance with accepted engineering practice and conform to the regulations in force.
- Lead the output and remote control supplies. to the entry terminals.
- Carry out the respective liaisons between the condenser fans (outside) and the corresponding connecting terminals of the electrical panel (inside)
- Leave the panel under voltage to permit electrical supply to the crankcase heater.
- The departure of the electrical supply line must be equipped with an isolator or a motor circuit breaker (to be planned by the installer).

■ Hydraulic connections

- The hydraulic connections are to be carried out in accordance with accepted engineering practice. In particular, plan accessories indispensable to all hydraulic circuits :
 - Expansion vessel
 - Drains at low points
 - Isolating valves
 - Air vents at high points, etc.
 - Make sure that the water contents of the installation is sufficient. If need be, plan a buffer tank

■ Refrigerant connections

- The works are to be carried out respecting the strictest accepted engineering practice and generally include :
 - Installation of refrigerant piping between the internal part and the condenser – Discharge and liquid pipes.
 - Study with care the design (slope, diameter and trap to facilitate the return of oil to the compressor, particularly in capacity reduction).
 - Fixation of antivibratil sleeves if the unit is mounted on antivibratil mounts
 - The length of connections between the 2 units will always be the shortest possible (max. developed length : 15m, 6m of change in level; in case of doubt, consult our technical departments).
 - Vacuuming of the circuit, charging, commissioning.

■ Maintenance

- Refer to the maintenance brochure delivered with each unit.
- Take out a maintenance contract