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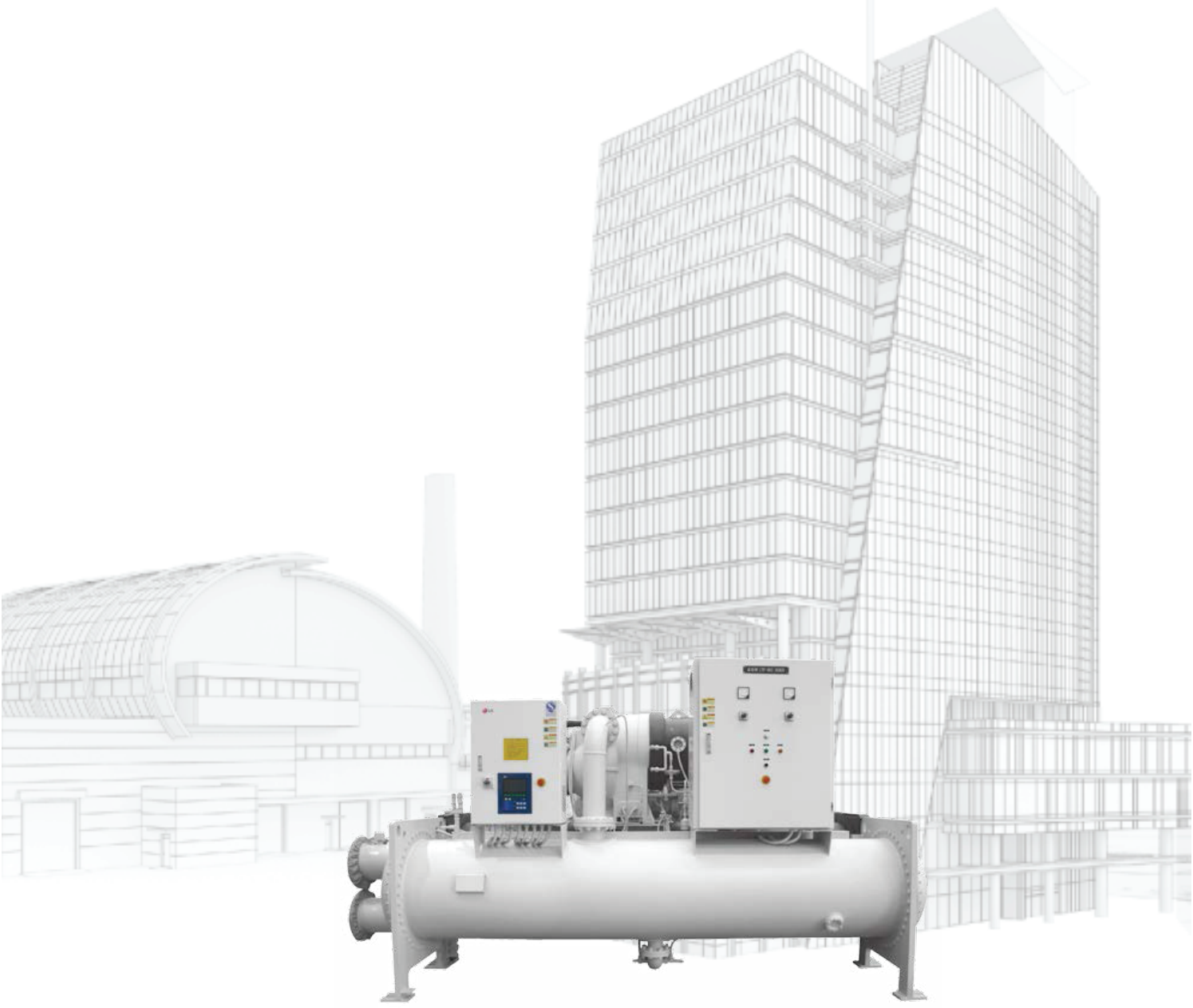
AHRI CERTIFIED
www.ahridirectory.org
Water-Cooled Chillers
AHRI Standard 550/590

LG

LG HVAC SOLUTION

CENTRIFUGAL CHILLER

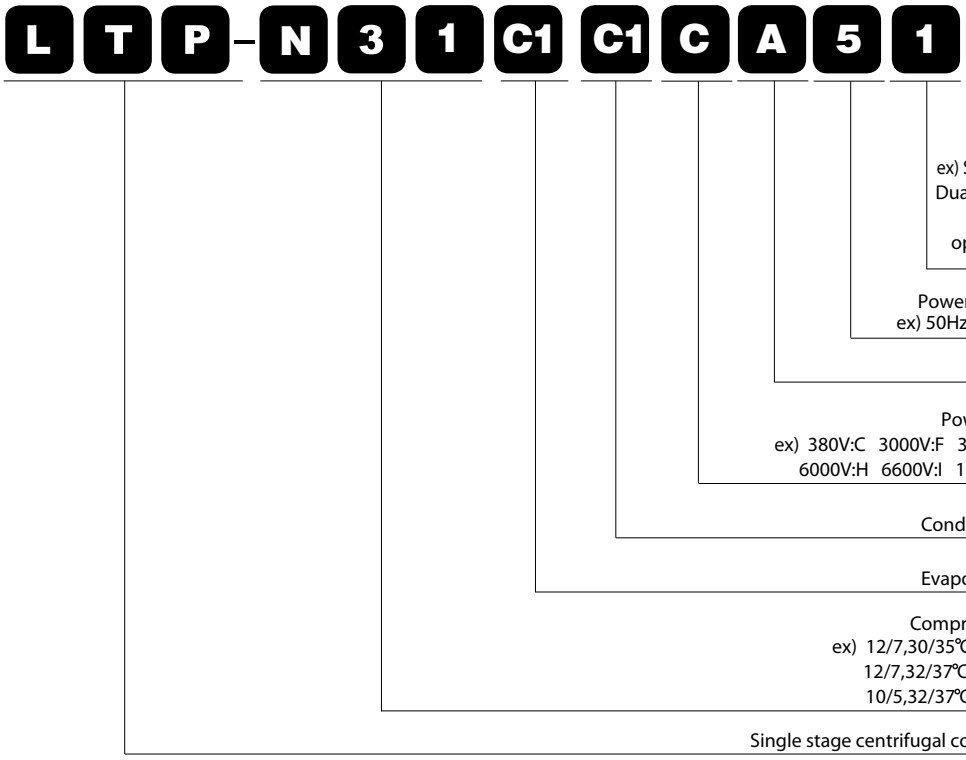


INTRODUCTION

Contents

Nomenclature

Identification Rule



Line Up

USRT	100	200	300	400	500	1,000	2,000	3,000	4,200
			300 RT — 2,200 RT (R134a)				Special Order: 2,000 RT — 4,200 RT (R134a)		

FEATURE

Eco-Friendly chiller

The LG chillers use chlorine–free HFC–134a refrigerant having zero ozone–depletion potential and no phase–out date.
LG chiller will work as an excellent harmony with environmental friendly facilities.

Saving installation space

LG' s optimized chiller using positive pressure refrigerant minimizes the machine room space and so returns a valuable extra space and a cost saving to the customers.

Simple bolting construction

The evaporator,condenser,and compressor are final–assembled with simple bolting and flange connections,LG chiller provides and excellent solution for the retrofit and replacement jobs where and critial difficulties in and installation works within a limited space.

Oil heater

The oil heater installed in the oil sump is mainly used to dry out the refngerant mixed in the reclaimed oil from the transmission and the evaporator.Alsc, the heater prevents the abrupt mix of oil and refrigerant while compressor shutdown and pre–heats the oil before start–up All the operation of the heater is controlled by the microprocessor controller.

Oil cooler

A compact refrigerant–oil heat exchanger is used for the oil cooler. The liquid refrigerant is safe and effective cooling source in the system.
A small amount of liquid refrigerant is extracted at the bottom of the condenser and it cools the hot oil(after lubricating the transmission sytem)at the heat exchanger and returns to the evaporator.

Oil reservoir

During the power failure, oil reservoir shall auromatically supply oil for compressor bearings to prevent any compressor damage.

Durable heat exchanger

Expansion of tube in double–grooved hole at tube sheet prevents leakage and increases durability of heat exchanger.

Aerodynamically-contoured impeller

Impellers are aerodynamically contoured to improve compressor efficiency.The blade 3d profiles are designed by using 3D–CFD(Computational Fluid Dynamics)and design database based on compressor tests.

Inlet guide vane

LG chiller adopts IGV(Lnlet Guide Vanes)for the capacity control. However,the vane operating is precisely controlled by a motor and linkage structure.
9 pie–slice shaped guide vanes are connected each other with linkage for equal rotating movement of the vanes.Precise and smooth control of the chilled water temperature can be confirmed with simple device.

Refrigerant-cooled semi-hermetic motor

The mortor is bolt–connected to the compressor gear housing and the shaft labyrinth seal prevents refrigerant leakage from the motor to the gear box.This semi–hermetic motor is more compact and makes less noise than the air–cooled motor No heat is ejected to the machine room.
No expensive mechanical seal is required.
Using motor shaft as a bull gear shaft,no coupling is needed and it minimizes the shaft alignment problems.Like oil cooler,the motor is cooled by the condensed liquid refrigerant.
The liquid refrigerant is sprayed to the several stator locations and the liquid flow rate is designed by a lot of motor tests.

Oil pump

The oil pump is driven by an electric motor from the separate power source to prevent the lubrication failure due to abnormal compressor shutdown.It delivers fluedn oil to the gears and the 4 journal bearings when compressor start–up and normal operation.

Heat exchangers

LG heat exchangers are designed by exclusive design software employing database taken from huge number of experiments.
The experimental facilitier shown below are equipped to produce reliable experimental database.

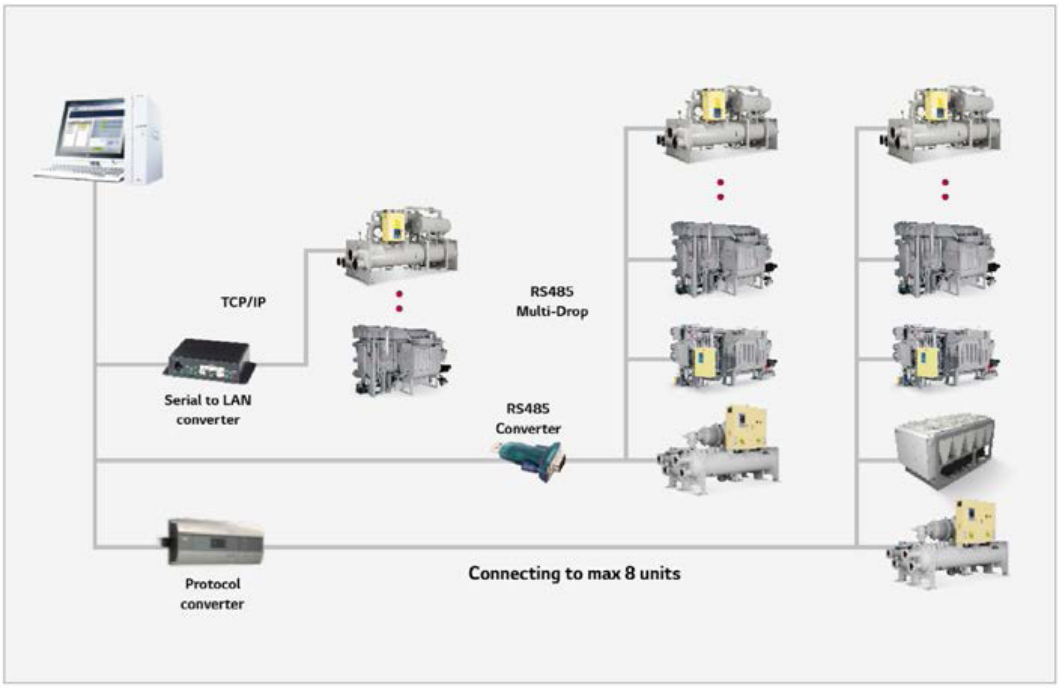
High performance tubes

Heat transfer coefficients on inner surface are significantly enhanced by selecting optimal ridge size and angle without sacrificing pressure drop.In addition,enhancement of heat transfer on orter surfaces are respectively designed and tested for easy condensation and evaporation.

Microprocessor

BMS (Building Management System)

Using industrial standard protocol converters, the chiller can be interfaced with the BMS (Building Management System).
The reomote monitoring and control of the chillers is possible via BACnet/Ethernet, BACnet/IP.Modbus, Modem or RS485



The chillers can be managed up to 255 units when using communicaton of RS485 or TCP/IP.

Unit performance test

LG has eastablisted one of the largest chiller testing facility in the world. Each LG chiller is thoroughly tested prior to shipment and is delivered to the customer with full test data included.
Performance test facilities are able to test up to 3,000RT, 110kV and also available to accurately recreate a wide variety of environmental conditions, helping the company to tailor its products to the greatest number of markets.

Performance test facilities

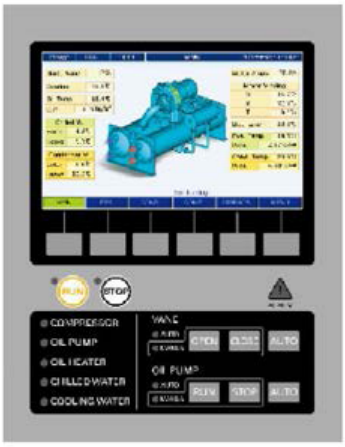
FEATURE

Microprocessor

State–of–ther–art controller

A high quality 7–inch display and a variety of communication ports make sysem operation and maintenance far more convenient.

- 7–inch color LCD screen with high resolution (800×480)
- Operation scheduling function
- Real time trend display
- Surge protection function
- Advanced algorithm for highly effective temperature and safety control
- Running data acquisition
- Easy–to–read display of operational data
- Certified EMS
- communication supported:RS485(standard) and Ethernet (optional)
- Communication protocol supported: Modbus (standard), BACnet
- Direct control of water pumps and cooling tower
- Language: English/Chinese/Korean
- Auto–printing function (optional)



7” Color LCD with high resolution

Operation data trend

Reserve operation

State of evaporator

State of condenser

State of compressor

Operation history

Option

ITEMS	Basic specifications	Option
Dewelded option		O
Refrigerant isolation valve (TBD)		O
Pump-down unit (TBD)		O
Unit-mount Pump-out unit (TBD)		O
Hot gas bypass		O
Non-standard pass on the Evaporator or the Condenser		O
Non stand Flange water-boxes on the Evaporator or the Condenser（GB,HG,ASME,DIN)		O
Higher pressure water side construction (Max. 20kg/cm ^{2})		O
Non-standard tubes (such as Cupro- Nickel or Titanium or etc.)		O
Outdoor installation construction (non-hazardous areas)		O
Special construction for hazardous area installation		O
Dual compressor (over 2,000RT)		O
BACnet™ protocol converter module		O
MODBUS™ protocol converter module		O
Remote unit control panel (max. 1000m)		O
Factory-charged refrigerant		O
Sectional shipment (in 3 parts with inter-connection pipes)		O
Factory-completed thermal-insulation		O
Factory sound attenuation work		O
Spring isolation kit		O
Witness performance test at the factory		O
Warranty extension		O
Starter		O
• Enclosure protection grade up (IP 54)		O
• Power factor correction condenser		O
• High voltage vacuum circuit breaker (Fixed or upgrade to Draw-out type)		O
• High voltage vacuum contractor switch (upgrade to Draw-out type)		O
• Surge arrestor		O
• Ground fault protection for (motor)		O
• Over-voltage protection (motor)		O
• Under-voltage protection (motor)		O
• Watt hour meter		O
• Etc.		O
•TBD : To Be Developed(whon customer order)		

SPECIFICATION

Performance Data (GB Conditions)

Model code	Unit Coling capacity		Input power	Evaporator			Condenser			Rigging weight	Operating weight	Dimensions		
				Flow	Presser drop	Nozzle	Flow	Presser drop	Conn. Size			Length	Width	Height
N series	usRT	KW	kW	m^3/h	mH_2O	A	m^3/h	mH_2O	A	Ton	Ton	mm	mm	mm
LTP-N31C1C1CB51	350	1231	202	212	5.5	200	265	7.5	200	6.8	7.7	4268	1810	2365
LTP-N32C2C2CC51	400	1406	230	242	5.6	200	302	8.5	200	7.1	8.2			
LTP-N33C3C3CD51	450	1582	259	272	5.7	200	340	8.5	200	7.3	8.5			
LTP-N34C4C4CE51	500	1758	288	302	5.7	200	378	8.4	200	7.5	8.8			
LTP-N41D1D1CF51	550	1934	317	333	6.9	250	416	9.3	250	8.8	10.3	4395	2024	2500
LTP-N42D2D2CG51	600	2110	345	363	6.9	250	454	9.2	250	9.0	10.5			
LTP-N43D3D3CG51	650	2285	374	393	7.0	250	491	9.2	250	9.3	10.7			
LTP-N44D4D4CH51	700	2461	402	423	7.0	250	529	8.8	250	9.5	11.2			
LTP-N51E1E1CI51	750	2637	431	454	6.5	250	567	10.0	300	13.5	15.6	4509	2268	2635
LTP-N52E2E2CJ51	800	2813	460	484	6.5	250	605	9.9	300	13.7	15.9			
LTP-N53E3E3CK51	850	2989	489	514	6.6	250	643	10.0	300	13.9	16.3			
LTP-N54E4E4CL51	900	3164	517	544	6.5	250	680	9.9	300	14.2	16.7			
LTP-N55E5E5CM51	1000	3516	574	605	6.6	250	756	9.9	300	14.3	16.9			
LTP-N61F1F1JN51	1100	3868	632	665	5.7	300	832	8.5	350	15.1	17.5	4621	2496	2941
LTP-N62F2F2JO51	1200	4219	690	726	6.3	300	907	9.1	350	15.6	18.2			
LTP-N63F3F3JP51	1300	4571	747	786	6.8	300	983	9.1	350	16.1	19.0			
LTP-N64F4F4JQ51	1400	4922	804	847	6.8	300	1058	9.0	350	17.0	19.7			
LTP-N65F5F5JR51	1500	5274	861	907	6.9	300	1134	10.0	350	17.1	19.8			
LTP-N71G1G1JS51	1600	5626	919	968	9.1	400	1210	11.4	450	23.2	25.5	5587	3312	3481
LTP-N72G2G2JT51	1700	5977	976	1028	10.8	400	1285	13.4	450	23.7	26.1			
LTP-N73G3G3JU51	1800	6329	1033	1089	10.8	400	1361	13.4	450	24.3	26.8			
LTP-N81H1H1JV51	1900	6680	1090	1149	10.5	400	1436	13.0	450	24.9	27.5	5587	3312	3481
LTP-N82H2H2JW51	2000	7032	1147	1210	10.5	400	1512	13.0	450	25.2	27.9			
LTP-N83H3H3JX51	2100	7384	1204	1270	10.5	400	1587	12.9	450	25.5	28.3			
LTP-N64FDFDJQ52	2800	9845	1608	1693	4.0	500	2117	5.0	500	34.8	39.0	8443	2458	2925
LTP-N71GAGAJS52	3200	11251	1838	1935	4.0	550	2419	5.0	550	46.9	51.9	10370	3383	3525
LTP-N83HCHCJX52	4200	14767	2409	2540	4.0	600	3175	5.0	600	51.7	58.5	10370	3383	3525

NOTE : 1.Account for unit operating conditions :

Evaporator:Leaving water temperature is 7 , Flow is 0.172m ^{3}/(hkW) ;

Condenser:Entering water temperature is 30 , Flow is 0.215m ^{3}/(hkW) ;

2.Fouling factor:Evap.0.018m ^{2} /kW,Cond.0.044m ^{2} /kW ;

3.Evaporator and Condenser water pass number are 2 (>2100RT water pass number are 1) ;

4.Maximum water side pressure are both 10kgf/cm ^{2} ;

5.This spec. sheets are about LG Chiller standard model.For other than the above model of this table,contact nearest LGE office.

6.Specifications are subject to change without prior notification.

Performance Data (Process Conditions)

Model code	Design Condition: 12℃ /7℃ -32℃ /37℃						
	Unit Coling capacity		Input power	Evaporator		Condenser	
				Flow	Presser drop	Flow	Presser drop
R series	usRT	KW	KW	m^3/h	mH_2O	m^3/h	mH_2O
LTP-R31C1C1CB51	300	1055	180	181	5.5	212	7.7
LTP-R32C2C2CC51	350	1231	210	212	5.5	248	8.6
LTP-R33C3C3CD51	400	1406	240	242	5.6	283	8.7
LTP-R34C4C4CE51	450	1582	270	272	5.7	319	8.6
LTP-R41D1D1CF51	500	1758	300	302	7.0	354	9.3
LTP-R42D2D2CG51	550	1934	330	333	7.0	389	9.4
LTP-R43D3D3CG51	600	2110	359	363	7.1	425	9.4
LTP-R44D4D4CH51	650	2285	389	393	7.1	460	9.0
LTP-R51E1E1CI51	700	2461	419	423	6.6	496	10.2
LTP-R52E2E2CJ51	750	2637	449	454	6.6	531	10.1
LTP-R53E3E3CK51	800	2813	479	484	6.7	566	10.4
LTP-R54E4E4CL51	850	2989	509	514	6.6	602	10.1
LTP-R55E5E5CM51	900	3164	539	544	6.7	637	10.0
LTP-R61F1F1JN51	1000	3516	599	605	5.8	708	8.7
LTP-R62F2F2JO51	1100	3868	658	665	6.4	779	9.3
LTP-R63F3F3JP51	1200	4219	718	726	6.9	849	9.3
LTP-R64F4F4JQ51	1300	4571	778	786	6.9	920	8.0
LTP-R65F5F5JR51	1400	4922	837	847	7.0	991	10.1
LTP-R71G1G1JS51	1500	5274	898	907	9.3	1062	11.6
LTP-R72G2G2JT51	1600	5626	957	968	10.9	1132	13.6
LTP-R73G3G3JU51	1700	5977	1017	1028	11.0	1203	13.5
LTP-R81H1H1JV51	1800	6329	1076	1089	10.6	1274	13.2
LTP-R82H2H2JW51	1900	6680	1135	1149	10.6	1344	13.2
LTP-R83H3H3JX51	2000	7032	1195	1210	10.6	1415	13.0
LTP-R64FDFDJQ52	2600	9142	1555	1572	4.0	1840	5.0
LTP-R71GAGAJS52	3000	10548	1795	1814	4.0	2123	5.0
LTP-R83HCHCJX52	4000	14064	2389	2419	4.0	2830	5.0

Model code	冷水：10-5℃；冷却水：32-37℃						
	Unit Coling capacity		Input power	Evaporator		Condenser	
				Flow	Presser drop	Flow	Presser drop
T series	usRT	KW	KW	m^3/h	mH_2O	m^3/h	mH_2O
LTP-T31C1C1CB51	300	1055	188	181	3.5	214	5.5
LTP-T32C2C2CC51	350	1231	219	212	3.5	249	6.4
LTP-T33C3C3CD51	400	1406	250	242	3.5	285	6.4
LTP-T34C4C4CE51	450	1582	282	272	3.7	321	6.3
LTP-T41D1D1CF51	500	1758	313	302	4.9	356	6.8
LTP-T42D2D2CG51	550	1934	344	333	4.9	392	6.7
LTP-T43D3D3CG51	600	2110	375	363	5.0	427	6.6
LTP-T44D4D4CH51	650	2285	406	393	4.9	463	6.1
LTP-T51E1E1CI51	700	2461	437	423	4.3	499	7.9
LTP-T52E2E2CJ51	750	2637	469	454	4.5	534	7.8
LTP-T53E3E3CK51	800	2813	500	484	4.6	570	8.0
LTP-T54E4E4CL51	850	2989	531	514	4.5	605	7.4
LTP-T55E5E5CM51	900	3164	562	544	4.6	641	7.6
LTP-T61F1F1JN51	1000	3516	625	605	3.0	712	7.1
LTP-T62F2F2JO51	1100	3868	687	665	3.6	783	7.8
LTP-T63F3F3JP51	1200	4219	749	726	4.1	855	7.8
LTP-T64F4F4JQ51	1300	4571	811	786	4.0	926	8.4
LTP-T65F5F5JR51	1400	4922	874	847	4.4	997	8.5
LTP-T71G1G1JS51	1500	5274	936	907	6.4	1068	9.7
LTP-T72G2G2JT51	1600	5626	998	968	8.1	1139	11.7
LTP-T73G3G3JU51	1700	5977	1060	1028	8.2	1211	11.8
LTP-T81H1H1JV51	1800	6329	1122	1089	8.7	1282	11.3
LTP-T82H2H2JW51	1900	6680	1184	1149	7.9	1353	13.2
LTP-T83H3H3JX51	2000	7032	1247	1210	7.6	1424	12.9
LTP-T64FDFDJQ52	2600	9142	1622	1572	2.0	1852	3.8
LTP-T71GAGAJS52	3000	10548	1872	1814	2.0	2136	3.8
LTP-T83HCHCJX52	4000	14064	2494	2419	2.0	2848	3.8

NOTE： 1.Fouling factor:Evap.0.018m ^{2}/kW,Cond.0.044m ^{2}/kW；

2.Evaporator and Condenser water pass number are 2 (>2100RT water pass number are 1)；

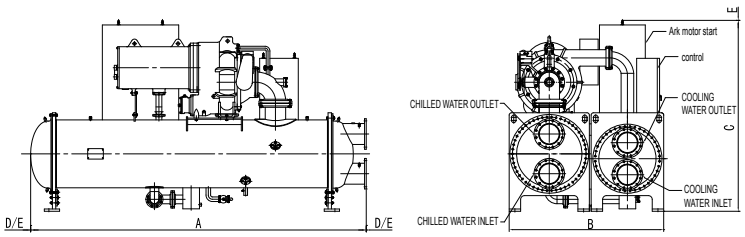
3.Maximum water side pressure are both 10kgf/cm ^{2}；

4.This spec. sheets are about LG Chiller standard model.For other than the above model of this table,contact nearest LGE office.

5.Specifications are subject to change without prior notification.

DRAWING

LTP-N31C1C1CB51~ LTP-N44D4D4CH51



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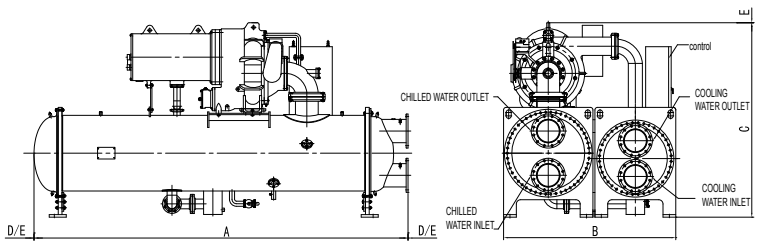

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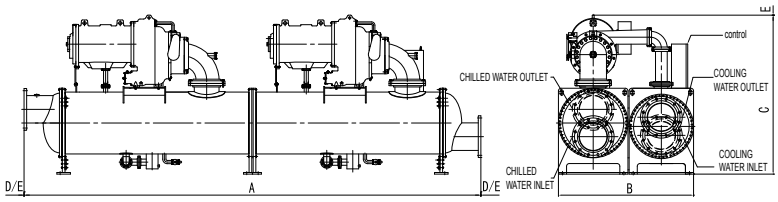


Precautions

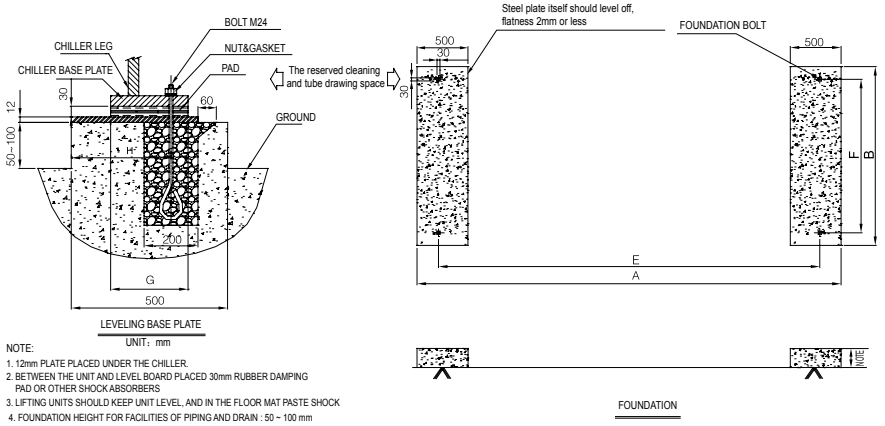
1. The height is measured from the bottom of the heat exchanger bed.
This value does not include the height of the foundation and the vibration-absorbing pedestal.
2. All of the chilled water and cooling water connection flanges are of KS 10 kg/cm2G.
3. The water pipe facility shall be designed to preventing external force to the chiller.
4. The minimum spaces shall be provided around the chiller as follow :
• Length direction of the chiller: 1,500 mm
O ne of the left and the right side shall be provided with space for pipe replacement.
• Control panel : 1,200mm
• Others : 1,000mm

UNIT : mm

EVAP. & COND. CODE		A (Length)	B (Width)	C (Height)	D (Tube drawingspace)	E (Maintenance Space)
NO.3 Frame	C1~C4	4268	1810	2365	3700	1500
NO.4 Frame	D1~D4	4395	2024	2500	3700	1500
NO.5 Frame	E1~E5	4509	2268	2635	3700	1500
NO.6 Frame	F1~F5	4621	2496	2941	3700	1500
NO.7~8 Frame	G1~G3,H1~H3	5587	3312	3481	5000	1500
Dual 6 Frame	FA~FE	8443	2458	2925	6530	1500
Dual7~8 Frame	GA~GC,HA~HC	10370	3383	3525	9330	1500

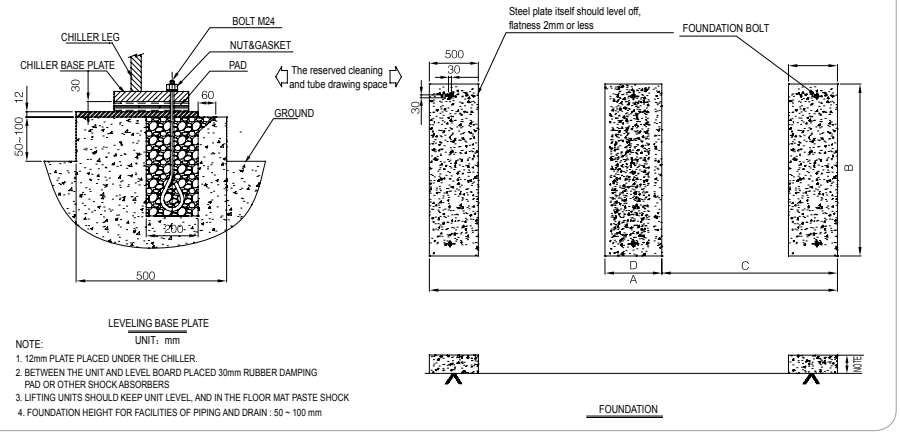
DRAWING

LTP-N31C1C1CB51~LTP-N83H3H3JX51



NOTE:
1. 12mm PLATE PLACED UNDER THE CHILLER.
2. BETWEEN THE UNIT AND LEVEL BOARD PLACED 30mm RUBBER DAMPING PAD OR OTHER SHOCK ABSORBERS
3. LIFTING UNITS SHOULD KEEP UNIT LEVEL, AND IN THE FLOOR MAT PASTE SHOCK
4. FOUNDATION HEIGHT FOR FACILITIES OF PIPING AND DRAIN : 50 ~ 100 mm

LTP-N61FAFAJN52~LTP-N83HCHCJX52



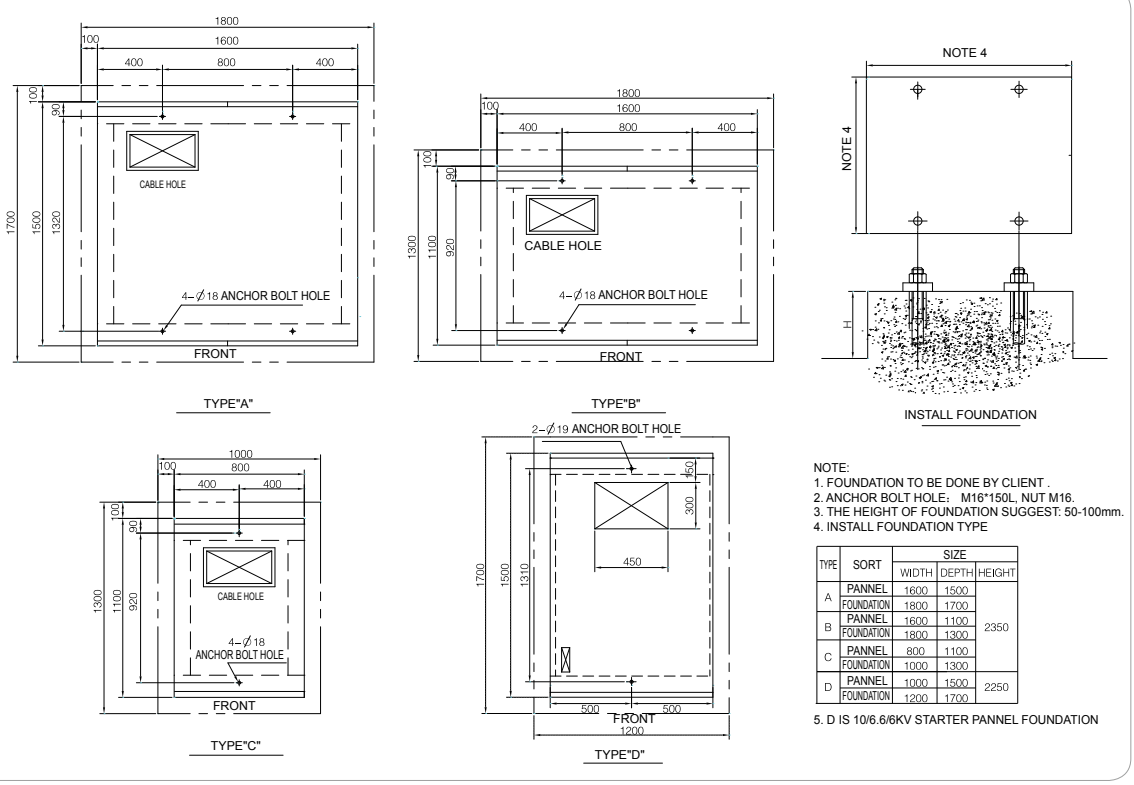
NOTE:
1. 12mm PLATE PLACED UNDER THE CHILLER.
2. BETWEEN THE UNIT AND LEVEL BOARD PLACED 30mm RUBBER DAMPING PAD OR OTHER SHOCK ABSORBERS
3. LIFTING UNITS SHOULD KEEP UNIT LEVEL, AND IN THE FLOOR MAT PASTE SHOCK
4. FOUNDATION HEIGHT FOR FACILITIES OF PIPING AND DRAIN : 50 ~ 100 mm

UNIT : mm

EVAP./COND. CODE		A	B	C	D	E	F	G	H
NO.3 Frame	C1~C4	4166	1756	–	–	3746	1506	200	290
NO.4 Frame	D1~D4	4166	2124	–	–	3746	1874	200	290
NO.5 Frame	E1~E5	4100	2370	–	–	3730	2120	250	315
NO.6 Frame	F1~F5	4100	2596	–	–	3730	2346	250	315
NO.7~8 Frame	G1~G3,H1~H3	4898	3234	–	–	4578	2884	380	340
Dual 6 Frame	FA~FE	7669	2618	3627	500	–	–	–	–
Dual7~8 Frame	GA~GC,HA~HC	9358	3324	4276	600	–	–	–	–

OTHER

Stater



NOTE:
1. FOUNDATION TO BE DONE BY CLIENT .
2. ANCHOR BOLT HOLE： M16*150L, NUT M16.
3. THE HEIGHT OF FOUNDATION SUGGEST: 50-100mm.
4. INSTALL FOUNDATION TYPE

TYPE	SORT	SIZE		
		WIDTH	DEPTH	HEIGHT
A	PANNEL	1600	1500	2350
	FOUNDATION	1800	1700	
B	PANNEL	1600	1100	
	FOUNDATION	1800	1300	
C	PANNEL	800	1100	
	FOUNDATION	1000	1300	
D	PANNEL	1000	1500	2250
	FOUNDATION	1200	1700	

5. D IS 10/6.6/6KV STARTER PANNEL FOUNDATION

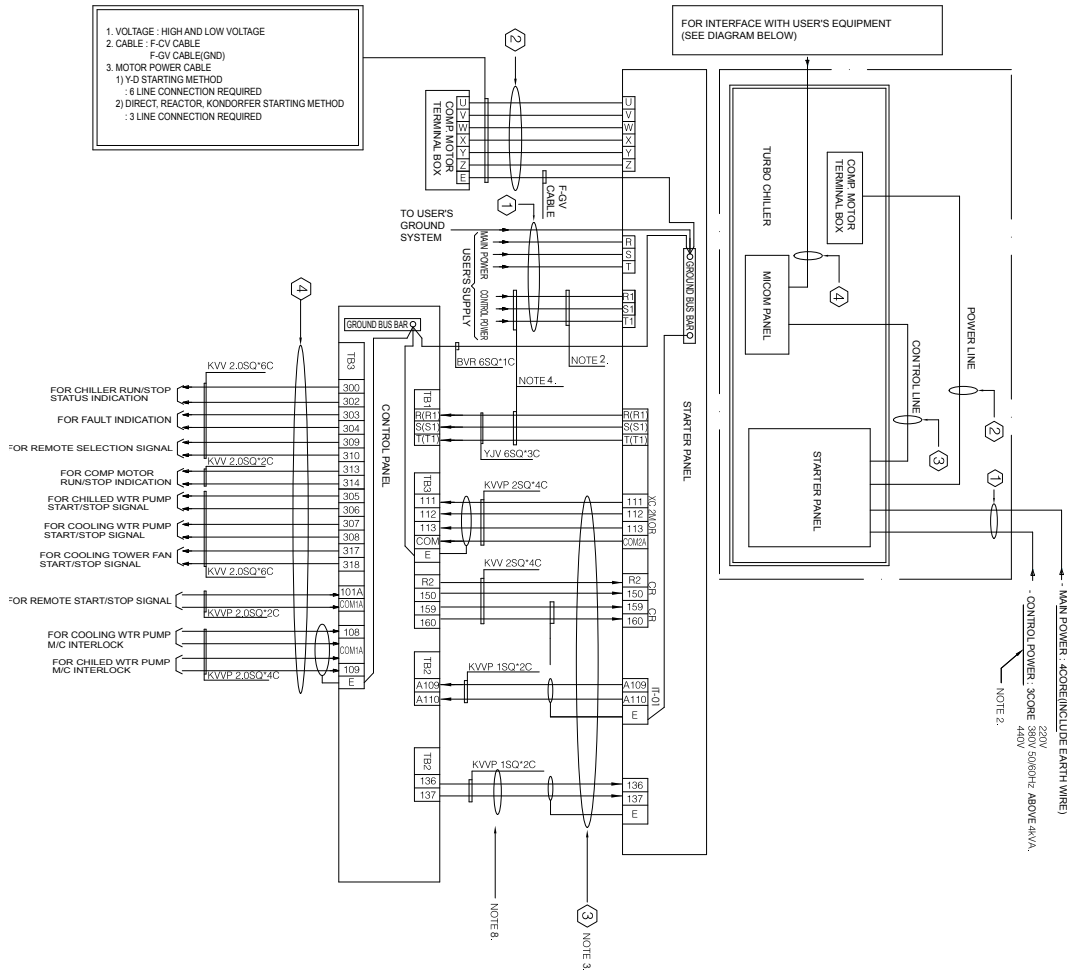
Motor Parameter Table

MOTOR CODE	MOTOR SIZE (KW)	voltage classes					
		380V	3000V	3300V	6000V	6600V	10000V
PA	190	352.7	44.7	40.6	22.3	20.3	13.4
PB	220	408.4	51.7	47.0	25.9	23.5	15.5
PC	240	445.6	56.4	51.3	28.2	25.7	16.9
PD	270	501.2	63.5	57.7	31.7	28.9	19.0
PE	315	584.8	74.1	67.3	37.0	33.7	22.2
PF	340	631.2	80.0	72.7	40.0	36.3	24.0
PG	380	698.0	88.4	80.4	44.2	40.2	26.5
PH	420	767.1	97.2	88.3	48.6	44.2	29.1
PI	460	844.9	107.0	97.3	53.5	48.6	32.1
PJ	490	900.0	114.0	103.6	57.0	51.8	34.2
PK	520	955.1	121.0	110.0	60.5	55.0	36.3
PL	540	991.8	125.6	114.2	62.8	57.1	37.7

MOTOR CODE	MOTOR SIZE (KW)	voltage classes					
		380V	3000V	3300V	6000V	6600V	10000V
PM	610	1120.4	141.9	129.0	71.0	64.5	42.6
PN	650	1193.9	151.2	137.5	75.6	68.7	45.4
PO	710	1304.1	165.2	150.2	82.6	75.1	49.6
PP	760	1395.9	176.8	160.7	88.4	80.4	53.0
PQ	830	1524.5	193.1	175.5	96.6	87.8	57.9
PR	920	1689.8	214.1	194.6	107.0	97.4	64.2
PS	1050		244.3	222.1	122.1	111.0	73.3
PT	1100		255.9	232.7	128.0	116.3	76.8
PU	1150		267.6	243.2	133.8	121.6	80.3
PV	1200		279.2	253.8	139.6	126.9	83.8
PW	1250		290.8	264.4	145.4	132.2	87.2
PX	1300		302.4	275.0	151.2	137.5	90.7

OTHER

Interface Connection Diagram

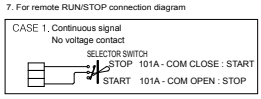


NOTE

1.Reference LGC standard : F8-174
2.These parts should be connected with only high voltage starter panel(3300V,6600V).
3.Control signal wire should be 2.0SQ, or above.[SQ=mm]
4.Control power cable shouled be 5.5SQ, or above.[SQ=mm]
5.Reference DWG : Schematic Diagram
6.Work Scope

Symbol	①	②	③	④	Remarks
Description	1st PWR	2nd PWR	2nd CON'T	INTERFACE (User Interface)	PWR : Power CON'T : Control
Standard Supply Scope	BUYER	BUYER	BUYER	BUYER	
Final Supply Scope	( )	( )	( )	( )	

7. For remote RUN/STOP connection diagram



8. Connect when the chiller use VFD.

ABSORPTION CHILLER

CENTRIFUGAL CHILLER

HEAT PUMP UNITS

SCREW CHILLER

SCROLL CHILLER

AIR-SIDE CHILLER

Fi.Mar.1.0

LG *HVAC SOLUTION*