Models:

A5ACV□100□CR

A5ACV□135□CR

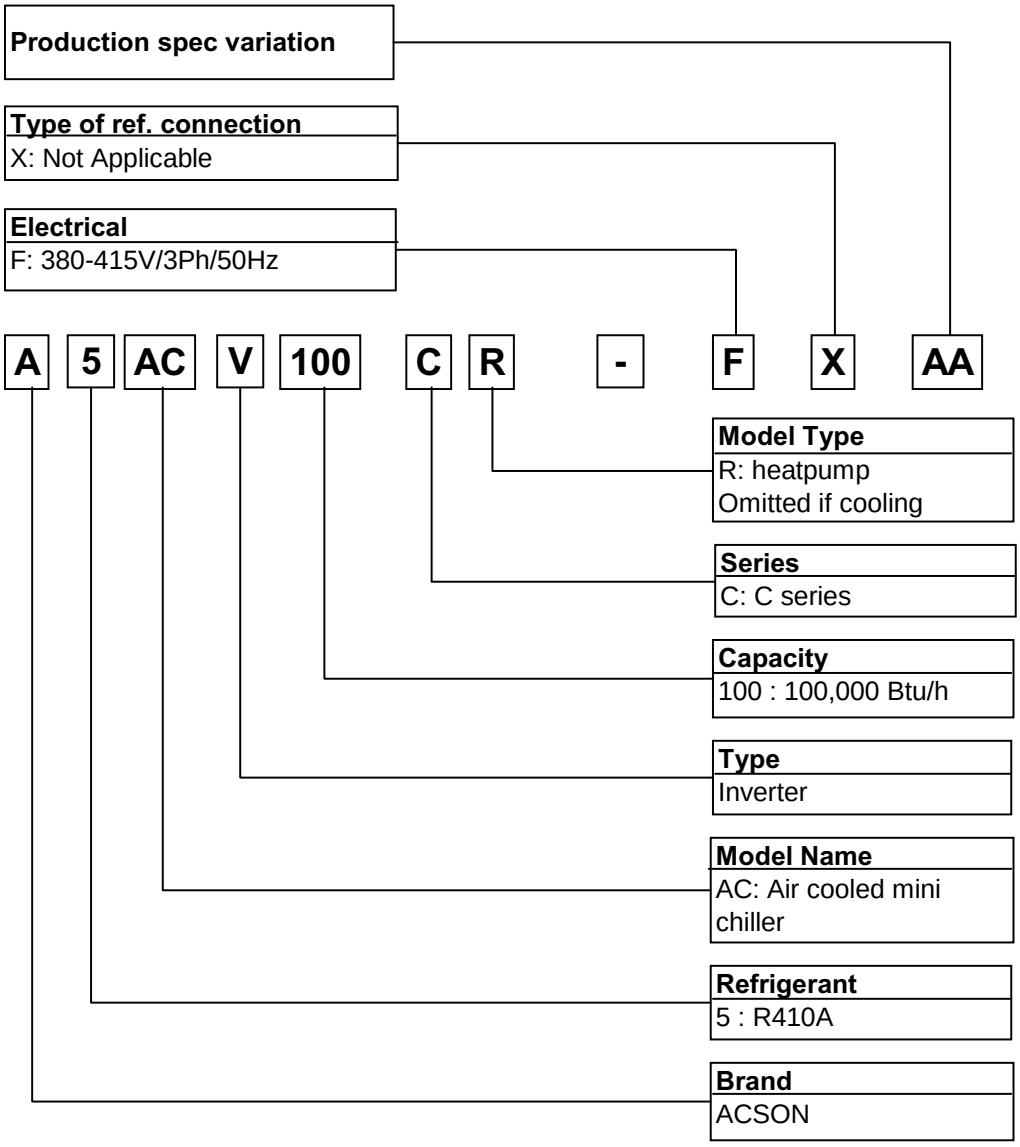
ACSON International

Air-Cooled Chiller (R410A Inverter Series)

A5ACV - 2005

CONTENTS

1. NOMENCLATURE



2. FEATUERS

TRUE DUAL CIRCUITS BPHE

The true dual BPHE puts the secondary circuit (water) in contact with 2 primary circuits (refrigerant). So even if one primary circuit is shut off, each secondary channel is still in contact with a primary channel.

INVERTER COMPRESSOR

Inverter compressor is programmed to run at the optimum speed, which is regulated by the input frequency as it can varies according to the heat load requirement.
Inverter advantages are :

- Less start & stop – Frequency regulated compressor resulting in lesser in the sense of start and stop of compressor, which greatly reduces the energy consumption.
- Fast cooling/heating – Inverter compressor has the ability to produce faster cooling/heating capacity at the frequency higher than the dominant capacity frequency.
- Smart loading/unloading – with the integration of built in system algorithm; inverter compressor could control the system's loading and unloading sophisticatedly.
- Better compressor reliability – Reliability of inverter compressor is always better since there is lesser on/off of the system especially during low load condition.

ELIMINATION OF WATER TANK

Inverter system provides constant water temperature band, or much lesser water temperature fluctuation. With this, water tank of the mini chiller system can be eliminated.

BUILT IN FAN SPEED

The built in algorithm now controls fan speed, resulting in cost saving since installation of external FSC (Fan speed controller) can be exempted.

SAFETY PROCTECTION

- High & low pressure switches
- Anti-freeze protection sensor
- Discharge temperature sensor
- Over pressure relief valve
- Water pressure differential switch
- Anti-freeze heater on BPHE
- Compressor, water pump overload protector

ANTI CORROSION HEAT EXCHANGER

Gold aluminum fin is offered as standard material of the condenser heat exchanger of this series of chiller.

MODULAR INSTALLATION

A network up to 50chillers in a system is possible. Control on the operation of the chillers will be done through the microprocessor controller. The external water piping connection can be made either from the left or right side of the unit.

3. PRODUCT LINE-UP

A5ACV PRODUCT LINE-UP

	Heat pump model	Nomenclature	Classification							
			Wired handset WCCH	Gold Fin	Isolator Switch	Scroll compressor	Capillary tube (normal circuit)	EXV (Inverter circuit)	Pump only	Brass adaptor BSPT 1 1/4
A5ACV	100CR	FXAA	X	X	X	X	X	X	X	X
	135CR	FXAA	X	X	X	X	X	X	X	X

4. SPECIFICATIONS

GENERAL DATA - HEAT PUMP R410A INVERTER

MODEL				A5ACV100CR	A5ACV135CR
NOMINAL COOLING CAPACITY			Btu/h	95000	131500
			W	27800	38540
NOMINAL HEATING CAPACITY			Btu/h	100000	141500
			W	29300	41470
NOMINAL TOTAL INPUT POWER	COOLING		W	12000	15750
	HEATING		W	11400	16250
NOMINAL RUNNING CURRENT	COOLING		A	24.4	30.0
	HEATING		A	23.9	31.4
POWER SOURCE			V/Ph/Hz	380-415 / 3 / 50	
REFRIGERANT TYPE				R410A	
CONTROL				ELECTRONIC EXPANSION VALVE / CAPILLARY TUBE	
UNIT DIMENSION	HEIGHT		mm/in	1260 / 49.6	1260 / 49.6
	WIDTH		mm/in	1500 / 59.1	1800 / 70.9
	DEPTH		mm/in	900 / 35.4	1150 / 45.3
PACKING DIMENSION	HEIGHT		mm/in	1452 / 57.2	1452 / 57.2
	WIDTH		mm/in	1732 / 68.2	2032 / 80.0
	DEPTH		mm/in	1032 / 40.6	1282 / 50.5
UNIT WEIGHT			kg/lb	360 / 794	560 / 1235
SOUND PRESSURE LEVEL			dBA	63	67
EVAPORATOR					
NOMINAL WATER FLOW	COOLING		l/s / m^3/hr	1.3 (4.8)	1.8 (6.6)
	HEATING		l/s / m^3/hr	1.4 (5.0)	2.0 (7.1)
CONDENSER FAN					
TYPE/DRIVE				PROPELLER / DIRECT	
QUANTITY				2	2
HYDRAULIC KIT					
PUMP	TYPE			HORIZONTAL MULTISTAGE END-SUCTION	
	MAX. WATER OPER. PRESSURE		kPa / psi	1000 / 145	
	WATER FLOW RATE	COOLING	l/s / m^3/hr	1.3 (4.8)	1.8 (6.6)
		HEATING	l/s / m^3/hr	1.4 (5.0)	2.0 (7.1)
PIPING	INSTALLATION PIPE CONNECITON		mm/in	31.75 / 1 1/4	
	HEAD	COOLING	m	17.3	16.5
		HEATING	m	15.7	14.5
TANK	MATERIAL			NOT APPLICABLE	
	CAPACITY/VOLUME		L / ft^3	NOT APPLICABLE	
COMPRESSOR					
TYPE				SCROLL	SCROLL
STAGE OF CAPACITY CONTROL (Btu/h)				73000 - 122000	99000 - 149000
REFRIGERANT					
CHARGING MASS			kg/lb	4.7 x2 / 10.4 x2	6.0 x2 / 13.2 x2

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.
2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.
3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :
a) COOLING - 12°C / 7°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 35°C AIR AMBIENT TEMPERATURE.
b) HEATING - 40°C / 45°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 7°C AIR AMBIENT TEMPERATURE.
4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS B 8615 JIS C 9612 STANDARD.

ELECTRICAL DATA - HEAT PUMP R410A INVERTER

MODEL			A5ACV100CR	A5ACV135CR
CONDENSER FAN MOTOR	INSULATION GRADE		F	F
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	
	RATED INPUT POWER	W	500	1430
	RATED RUNNING CURRENT	A	2.2	6.0
	MOTOR OUTPUT	W	200 x2	450 x2
	POLES		8	6
COMPRESSOR	INSULATION GRADE		NA	NA
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	
	CAPACITOR	μF	NA	NA
	RATED INPUT POWER (COOLING)	W	10500	13520
	RATED INPUT POWER (HEATING)	W	9900	14020
	RATED RUNNING CURRENT (COOLING)	A	21.9	25.9
	RATED RUNNING CURRENT (HEATING)	A	21.3	27.0
	LOCKED ROTOR AMP.	A	67 / -	111 / -
WATER PUMP	INSULATION GRADE		F	F
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	
	RATED INPUT POWER (COOLING)	W	1013	882
	RATED INPUT POWER (HEATING)	W	1026	907
	RATED RUNNING CURRENT (COOLING)	A	2.0	2.0
	RATED RUNNING CURRENT (HEATING)	A	2.0	2.0

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151.

COMPONENTS DATA

MODEL				A5ACV100CR	A5ACV135CR
CONDENSER FAN	TYPE			PROPELLER	
	Q'TY			2	
	MATERIAL			ALUMINIUM	
	DRIVE			DIRECT	
	DIAMETER		mm/in	609.6 / 24	660.4 / 26
CONDENSER FAN MOTOR	TYPE			INDUCTION	
	Q'TY			2	2
	INDEX OF PROTECTION (IP)			NA	NA
COMPRESSOR	TYPE			SCROLL + AC INVERTER SCROLL	
	OIL TYPE			POE	POE
	OIL AMOUNT	SCROLL	cm^3 / fl.oz.	1700 / 57.5	3250 / 110
		INVERTER S.	cm^3 / fl.oz.	2300 / 77.8	2300 / 77.8
CONDENSER COIL	TYPE			CROSS FINNED TUBES	
	TUBE	MATERIAL		CORRUGATED INNER GROOVED COPPER	
		DIAMETER	mm/in	9.52 / 3/8	
		THICKNESS	mm/in	0.372 / 0.015	
	FIN	MATERIAL		ALUMINIUM	
		THICKNESS	mm/in	0.12 / 0.005	
		FACE AREA	m^2 / ft^2	1.37 / 14.7	1.79 / 19.3
		ROW		2	
		FIN PER INCH		14	
BPHE	TYPE			BRAZED PLATE HEAT EXCHANGER	
	MATERIAL			STAINLESS STEEL	
PUMP	TYPE			HORIZONTAL MULTISTAGE END-SUCTION	
	MATERIAL			CAST IRON & STAINLESS STEEL	
CASING	MATERIAL			ELECTRO-GALVANIZED MILD STEEL	
	COLOUR			LIGHT GREY- PE775104	

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

SAFETY DEVICES

MODEL				A5ACV100CR	A5ACV135CR
SAFETY DEVICE	HIGH PRESSURE SWITCH	TYPE		NC	NC
		OPEN	Pa / psi	4140 / 600	4140 / 600
		CLOSE	Pa / psi	3312 / 480	3312 / 480
	LOW PRESSURE SWITCH	TYPE		NC	NC
		OPEN	Pa / psi	124 / 18	124 / 18
		CLOSE	Pa / psi	193 / 28	193 / 28
	PHASE PROTECTION			BUILT IN ON BOARD	
	DIFFERENTIAL PRESSURE SWITCH			YES	YES
	ANTI-FREEZE PROTECTION SENSOR			YES	YES
	DISCH. THERMOSTAT SETTING		°C / °F	110 / 230	111 / 230
	OVER PRESSURE RELIEF VALVE			YES	YES
	ANTI-FREEZE HEATER ON BPHE			YES	YES
	PUMP OLP			YES	YES
	COMPRESSOR OLP			YES	YES

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

5. SOUND DATA

SOUND PRESSURE LEVEL

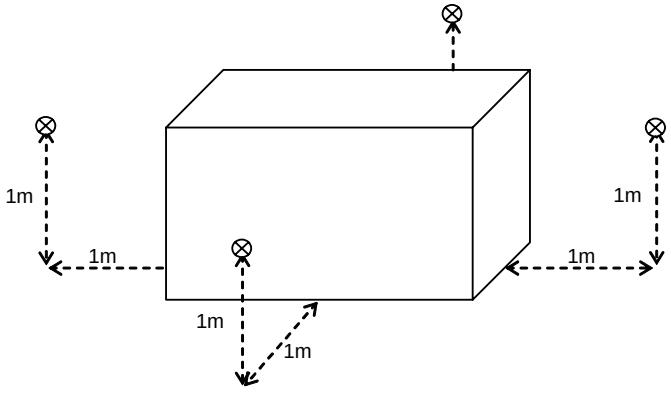
Model	1/1 Octave Sound Pressure Level (dB, ref 20μPa)							Overall
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	(dBA)
A5ACV100CR	60.7	58.3	57.4	57.6	56.3	53.2	53.3	62.9
A5ACV135CR	66.3	58.0	58.4	62.0	60.5	58.1	52.0	66.7

Tested according to JIS B 8615 & JIS C 9612
Microphone position : 1m from each side

SOUND POWER LEVEL

Model	1/1 Octave Sound Power Level (dB, ref 1pW)							Overall
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	(dBA)
A5ACV100CR	75.5	74.7	72.4	72.4	71.0	67.4	67.8	77.6
A5ACV135CR	79.7	72.5	74.0	75.7	74.5	71.3	66.3	80.5

Tested according to ISO 3741

Model	Measuring location (for Sound Pressure Level)
A5ACV100CR A5ACV135CR	 Standard : JIS B 8615, JIS C 9612 Microphone position : 1m from each side

6. PERFORMANCE TABLES

MODEL : A5ACV100 / 135CR - COOLING

MODEL	LEAVING WATER TEMP (°C)	AMBIENT TEMPERATURE ON CONDENSOR (°C)												WATER FLOW RATE	AVAIL. HEAD PRESS.	PUMP INPUT POWER	PUMP INPUT AMP
		19			20			25			28						
		COOL CAP.	POWER INPUT	RUNNING CURRENT	COOL CAP.	POWER INPUT	RUNNING CURRENT	COOL CAP.	POWER INPUT	RUNNING CURRENT	COOL CAP.	POWER INPUT	RUNNING CURRENT				
		kW	kW	A	kW	kW	A	kW	kW	A	kW	kW	A	m^3/hr	kPa	W	A
A5ACV100CR	4	30.76	8.99	18.28	30.29	9.15	18.60	27.91	9.93	20.19	26.48	10.40	21.15	3.98	217.54	951	1.83
	5	31.84	9.05	18.39	31.48	9.20	18.71	31.48	10.04	20.42	27.73	10.57	21.49	4.25	203.33	975	1.87
	6	32.68	9.09	18.48	32.33	9.26	18.83	32.33	10.16	20.66	28.60	10.72	21.80	4.40	194.90	987	1.90
	7	34.00	9.15	18.61	33.88	9.32	18.95	31.59	10.27	20.87	30.22	10.91	22.17	4.79	172.70	1013	1.95
	8	34.36	9.18	18.67	34.01	9.38	19.07	34.01	10.40	21.14	30.33	11.03	22.43	4.83	170.46	1015	1.95
	9	35.20	9.23	18.76	34.85	9.44	19.18	34.85	10.52	21.38	31.20	11.19	22.74	4.86	168.20	1017	1.95
	10	35.80	9.27	18.84	35.34	9.50	19.30	33.06	10.64	21.63	31.69	11.33	23.03	4.90	165.93	1019	1.96
A5ACV135CR	4	42.21	11.84	22.49	41.56	12.05	22.88	38.30	13.08	24.84	36.34	13.70	26.01	5.46	204.78	817	1.81
	5	43.69	11.91	22.62	43.20	12.12	23.02	43.20	13.22	25.11	38.05	13.92	26.43	5.83	193.19	838	1.86
	6	44.84	11.97	22.73	44.36	12.20	23.16	44.36	13.38	25.41	39.24	14.12	26.82	6.04	186.19	850	1.89
	7	46.66	12.05	22.89	46.49	12.27	23.31	43.35	13.52	25.68	41.47	14.36	27.27	6.57	167.40	879	1.95
	8	47.15	12.09	22.96	46.67	12.35	23.45	46.67	13.69	26.00	41.62	14.53	27.59	6.62	165.47	881	1.96
	9	48.30	12.15	23.08	47.82	12.42	23.60	47.82	13.85	26.30	42.81	14.73	27.97	6.67	163.53	884	1.96
	10	49.12	12.20	23.17	48.49	12.50	23.74	45.36	14.01	26.61	43.48	14.91	28.32	6.72	161.57	887	1.97

MODEL	LEAVING WATER TEMP (°C)	AMBIENT TEMPERATURE ON CONDENSOR (°C)												WATER FLOW RATE	AVAIL. HEAD PRESS.	PUMP INPUT POWER	PUMP INPUT AMP
		30			32			35			40						
		COOL CAP.	POWER INPUT	RUNNING CURRENT	COOL CAP.	POWER INPUT	RUNNING CURRENT	COOL CAP.	POWER INPUT	RUNNING CURRENT	COOL CAP.	POWER INPUT	RUNNING CURRENT				
		kW	kW	A	kW	kW	A	kW	kW	A	kW	kW	A	m^3/hr	kPa	W	A
A5ACV100CR	4	25.53	10.72	21.78	24.58	11.03	22.42	23.16	11.50	23.38	20.78	12.28	24.97	3.98	217.54	951	1.83
	5	26.79	10.92	22.20	25.85	11.27	22.91	24.72	11.73	23.85	22.10	12.67	25.77	4.25	203.33	975	1.87
	6	27.66	11.10	22.56	26.73	11.47	23.33	25.61	11.98	24.36	23.00	12.97	26.37	4.40	194.90	987	1.90
	7	29.31	11.33	23.04	28.39	11.76	23.90	27.84	12.00	24.40	24.74	13.46	27.36	4.79	172.70	1013	1.95
	8	29.41	11.46	23.29	28.49	11.88	24.15	28.06	12.49	25.39	24.81	13.57	27.59	4.83	170.46	1015	1.95
	9	30.29	11.63	23.65	29.37	12.08	24.56	28.28	12.74	25.90	25.72	13.87	28.19	4.86	168.20	1017	1.95
	10	30.78	11.78	23.96	38.65	12.24	24.89	28.49	12.93	26.28	26.21	14.07	28.61	4.90	165.93	1019	1.96
A5ACV135CR	4	35.03	14.11	26.79	33.73	14.52	27.58	31.77	15.14	28.75	28.51	16.17	30.71	5.46	204.78	817	1.81
	5	36.76	14.38	27.31	35.47	14.84	28.19	33.91	15.45	29.34	30.32	16.69	31.69	5.83	193.19	838	1.86
	6	37.96	14.61	27.75	36.68	15.11	28.69	35.14	15.78	29.97	31.56	17.08	32.44	6.04	186.19	850	1.89
	7	40.21	14.92	28.34	38.96	15.48	29.40	38.20	15.80	30.01	33.94	17.72	33.66	6.57	167.40	879	1.95
	8	40.36	15.08	28.64	39.10	15.64	29.70	38.50	16.44	31.23	34.05	17.87	33.93	6.62	165.47	881	1.96
	9	41.56	15.32	29.09	40.30	15.91	30.21	38.80	16.77	31.85	35.29	18.26	34.68	6.67	163.53	884	1.96
	10	42.23	15.52	29.47	53.03	16.12	30.61	39.10	17.02	32.33	35.96	18.53	35.19	6.72	161.57	887	1.97

MODEL	LEAVING WATER TEMP (°C)	AMBIENT TEMPERATURE ON CONDENSOR (°C)						WATER FLOW RATE	AVAIL. HEAD PRESS.	PUMP INPUT POWER	PUMP INPUT AMP
		42			46						
		COOL CAP.	POWER INPUT	RUNNING CURRENT	COOL CAP.	POWER INPUT	RUNNING CURRENT				
		kW	kW	A	kW	kW	A	m^3/hr	kPa	W	A
A5ACV100CR	4	19.83	12.59	25.60	17.93	13.22	26.88	3.98	217.54	951	1.83
	5	21.16	13.02	26.48	19.12	14.21	28.88	4.25	203.33	975	1.87
	6	22.07	13.35	27.13	20.04	14.48	29.43	4.40	194.90	987	1.90
	7	23.82	13.88	28.23	21.51	14.97	30.43	4.79	172.70	1013	1.95
	8	23.89	13.99	28.45	21.89	15.02	30.53	4.83	170.46	1015	1.95
	9	24.81	14.32	29.10	22.82	15.29	31.08	4.86	168.20	1017	1.95
	10	25.30	14.53	29.54	23.47	15.45	31.40	4.90	165.93	1019	1.96
A5ACV135CR	4	27.21	16.58	31.49	24.60	17.41	33.06	5.46	204.78	817	1.81
	5	29.03	17.15	32.57	26.24	18.70	35.52	5.83	193.19	838	1.86
	6	30.28	17.57	33.38	27.50	19.06	36.20	6.04	186.19	850	1.89
	7	32.69	18.28	34.72	29.52	19.71	37.43	6.57	167.40	879	1.95
	8	32.79	18.42	34.99	30.04	19.77	37.55	6.62	165.47	881	1.96
	9	34.04	18.85	35.80	31.31	20.13	38.23	6.67	163.53	884	1.96
	10	34.71	19.13	36.34	32.21	20.34	38.63	6.72	161.57	887	1.97

MODEL : A5ACV100 / 135CR - HEATING

MODEL	LEAVING WATER TEMP (°C)	AMBIENT TEMPERATURE ON CONDENSOR (°C)									WATER FLOW RATE	AVAIL. HEAD PRESS.	PUMP INPUT POWER	PUMP INPUT AMP
		-7			-5			0						
		HEAT CAP.	POWER INPUT	RUNNING CURRENT	HEAT CAP.	POWER INPUT	RUNNING CURRENT	HEAT CAP.	POWER INPUT	RUNNING CURRENT				
		kW	kW	A	kW	kW	A	kW	kW	A	m^3/hr	kPa	W	A
A5ACV100CR	35	28.34	9.48	19.82	29.27	9.52	19.92	31.59	9.64	20.16	6.31	70.13	1049	2.03
	40	24.46	10.13	21.19	25.58	10.19	21.33	28.38	10.36	21.67	5.90	100.29	1050	2.03
	45	20.58	10.78	22.56	21.90	10.87	22.74	25.17	11.08	23.18	5.04	157.28	1026	1.99
	50	16.71	11.44	23.92	18.21	11.54	24.14	21.96	11.80	24.69	4.64	181.53	1003	1.94
	55	12.83	12.09	25.29	14.52	12.22	25.55	18.75	12.53	26.21	4.24	203.68	974	1.89
A5ACV135CR	35	38.39	13.55	26.07	39.65	13.61	26.20	42.79	13.78	26.51	7.87	113.65	943	2.03
	40	33.13	14.48	27.87	34.65	14.58	28.05	38.45	14.81	28.50	7.33	137.31	917	1.98
	45	27.88	15.42	29.67	29.66	15.54	29.91	34.10	15.84	30.49	6.83	157.55	892	1.92
	50	22.63	16.35	31.47	24.66	16.50	31.76	29.75	16.88	32.48	6.28	177.85	863	1.86
	55	17.38	17.29	33.27	19.67	17.47	33.61	25.40	17.91	34.47	5.75	195.90	834	1.60

MODEL	LEAVING WATER TEMP (°C)	AMBIENT TEMPERATURE ON CONDENSOR (°C)									WATER FLOW RATE	AVAIL. HEAD PRESS.	PUMP INPUT POWER	PUMP INPUT AMP
		4			7			10						
		HEAT CAP.	POWER INPUT	RUNNING CURRENT	HEAT CAP.	POWER INPUT	RUNNING CURRENT	HEAT CAP.	POWER INPUT	RUNNING CURRENT				
		kW	kW	A	kW	kW	A	kW	kW	A	m^3/hr	kPa	W	A
A5ACV100CR	35	31.17	9.73	20.35	36.69	9.80	20.50	36.69	9.80	20.50	6.31	70.13	1049	2.03
	40	29.00	10.49	21.94	34.29	10.64	22.25	34.29	10.64	22.25	5.90	100.29	1050	2.03
	45	27.80	11.25	23.54	29.31	11.40	23.85	31.47	11.47	24.00	5.04	157.28	1026	1.99
	50	24.64	12.01	25.13	26.97	12.18	25.48	29.48	12.31	25.76	4.64	181.53	1003	1.94
	55	22.14	12.78	26.73	24.68	12.96	27.12	31.45	13.15	27.51	4.24	203.68	974	1.89
A5ACV135CR	35	42.23	13.91	26.77	45.74	14.07	27.07	49.69	14.01	26.96	7.87	113.65	943	2.03
	40	39.28	15.00	28.86	42.60	15.18	29.22	46.44	15.21	29.27	7.33	137.31	917	1.98
	45	37.65	16.09	30.96	39.70	16.30	31.37	42.63	16.41	31.57	6.83	157.55	892	1.92
	50	33.38	17.18	33.06	36.53	17.42	33.52	39.93	17.60	33.88	6.28	177.85	863	1.86
	55	29.99	18.27	35.16	33.43	18.54	35.67	42.60	18.80	36.19	5.75	195.90	834	1.60

MODEL	LEAVING WATER TEMP (°C)	AMBIENT TEMPERATURE ON CONDENSOR (°C)						WATER FLOW RATE	AVAIL. HEAD PRESS.	PUMP INPUT POWER	PUMP INPUT AMP
		15			21						
		HEAT CAP.	POWER INPUT	RUNNING CURRENT	HEAT CAP.	POWER INPUT	RUNNING CURRENT				
		kW	kW	A	kW	kW	A	m^3/hr	kPa	W	A
A5ACV100CR	35	42.37	10.00	20.92	47.99	10.09	21.11	6.31	70.13	1049	2.03
	40	39.62	10.87	22.73	44.91	11.01	23.04	5.90	100.29	1050	2.03
	45	36.71	11.73	24.54	41.84	11.93	24.96	5.04	157.28	1026	1.99
	50	34.14	12.60	26.35	38.76	12.85	26.89	4.64	181.53	1003	1.94
	55	35.68	13.46	28.16	36.53	13.77	28.81	4.24	203.68	974	1.89
A5ACV135CR	35	57.38	14.30	27.52	65.00	14.43	27.77	7.87	113.65	943	2.03
	40	53.67	15.54	29.90	60.84	15.75	30.31	7.33	137.31	917	1.98
	45	49.72	16.78	32.28	56.67	17.06	32.84	6.83	157.55	892	1.92
	50	46.24	18.01	34.66	52.50	18.38	35.37	6.28	177.85	863	1.86
	55	48.33	19.25	37.04	49.48	19.69	37.90	5.75	195.90	834	1.60

7. TECHNICAL DATA

WATER PRESSURE DROP VS FLOW RATE

MODEL : A5ACV100CR - COOLING

Flow rate m^3/hr	Available Head Pressure kPa	System Pressure Drop kPa
3.98	217.54	19.60
4.25	203.33	25.24
4.40	194.90	29.39
4.79	172.70	38.73
4.83	170.46	39.54
4.86	168.20	39.60
4.90	165.93	39.78

MODEL : A5ACV100CR - HEATING

Flow rate m^3/hr	Available Head Pressure kPa	System Pressure Drop kPa
6.31	70.13	86.93
5.90	100.29	71.47
5.04	157.28	45.37
4.64	181.53	41.41
4.24	203.68	28.08

MODEL : A5ACV135CR - COOLING

Flow rate m^3/hr	Available Head Pressure kPa	System Pressure Drop kPa
5.51	203.30	51.25
5.89	191.48	57.61
6.10	184.35	60.38
6.63	165.20	71.16
6.68	163.24	73.16
6.73	161.26	73.29
6.78	159.26	73.47

MODEL : A5ACV135CR - HEATING

Flow rate m^3/hr	Available Head Pressure kPa	System Pressure Drop kPa
8.22	97.28	104.54
7.65	123.21	91.34
7.13	145.40	78.24
6.56	167.66	66.89
6.01	187.46	59.81

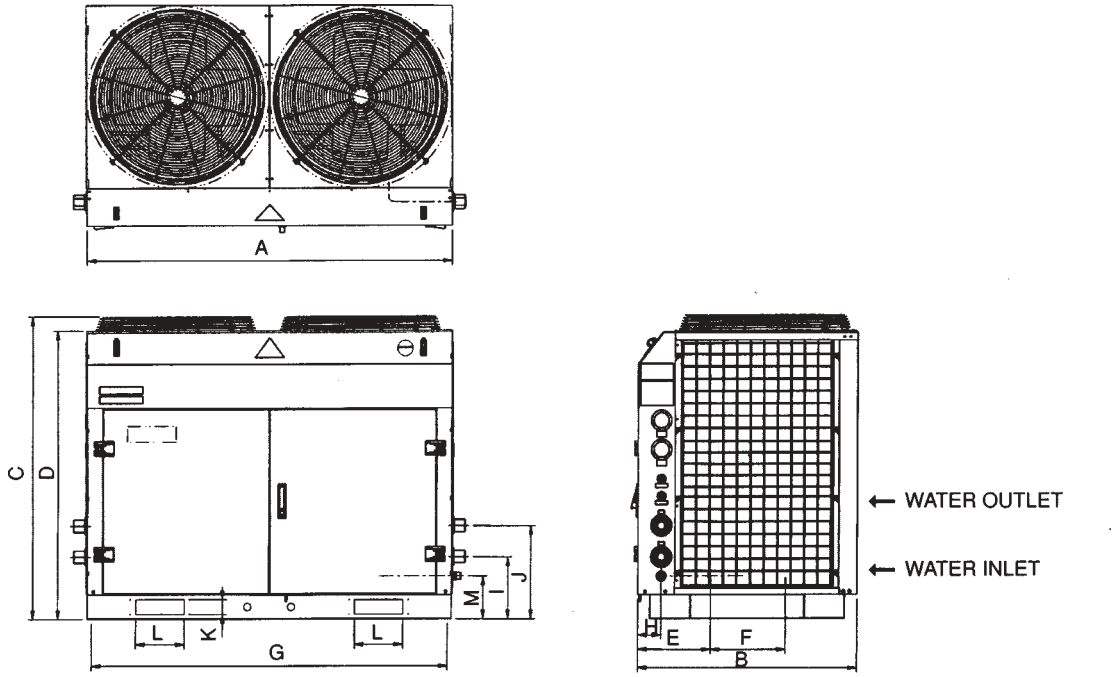
CORRECTION FACTORS WITH GLYCOL USE

	CAPACITY FACTOR			
	GLYCOL			
LWT/ deg C	**10**	**20**	**30**	**40**
-5		0.89	0.87	0.77
-3.9		0.9	0.876	0.781
-1.1	0.925	0.925	0.892	0.796
1.7	0.945	0.938	0.906	0.809
4.4	0.956	0.949	0.918	0.82
7.2	0.965	0.958	0.927	0.829
10	0.962	0.957	0.926	0.828

GLYCOL %	WATER FLOW	PRESSURE DROP
10	1.015	1.06
20	1.04	1.12
30	1.08	1.18
40	1.135	1.24

8. OUTLINES AND DIMENSIONS

MODEL : A5ACV100 / 135CR

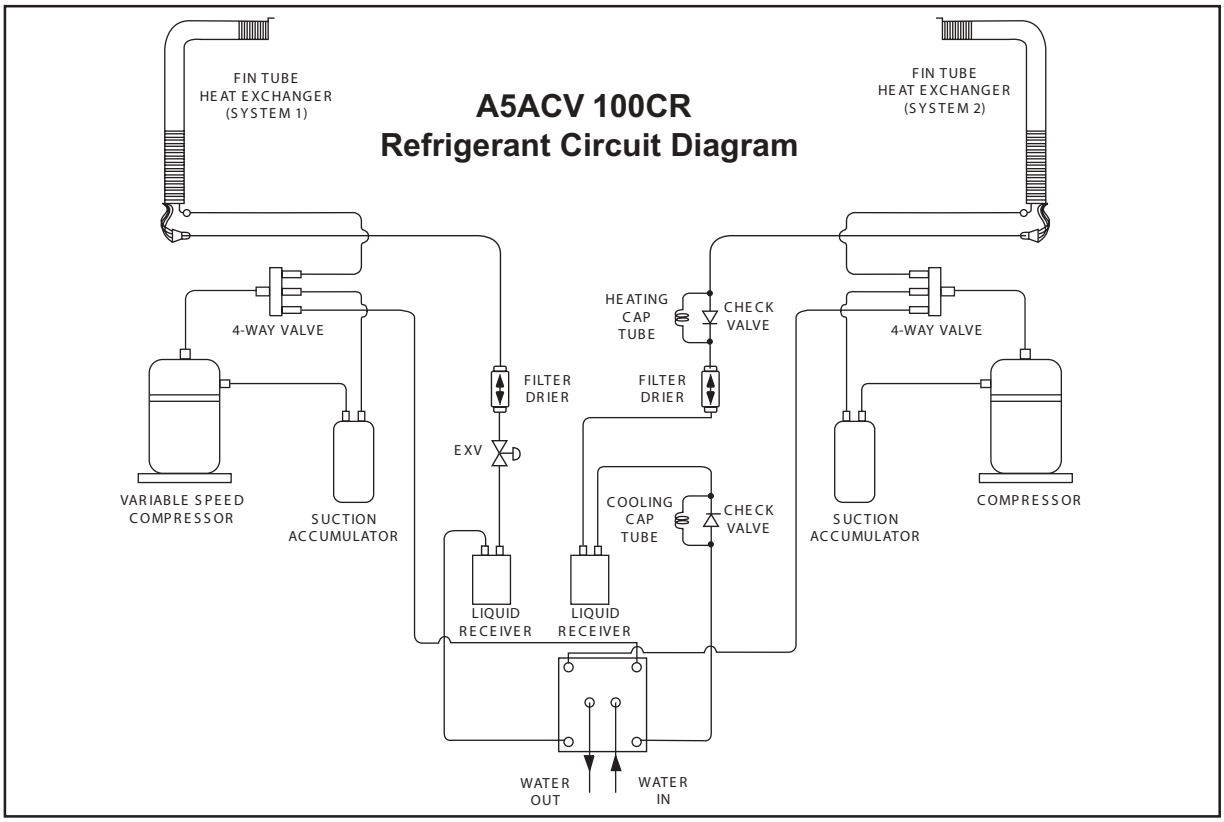


Model	A	B	C	D	E	F	G
						Base Leg Hole	
A5ACV100CR	1500	900	1245	1190	297.5	307.5	1446
A5ACV135CR	1800	1150	1245	1190	347.5	416	1766

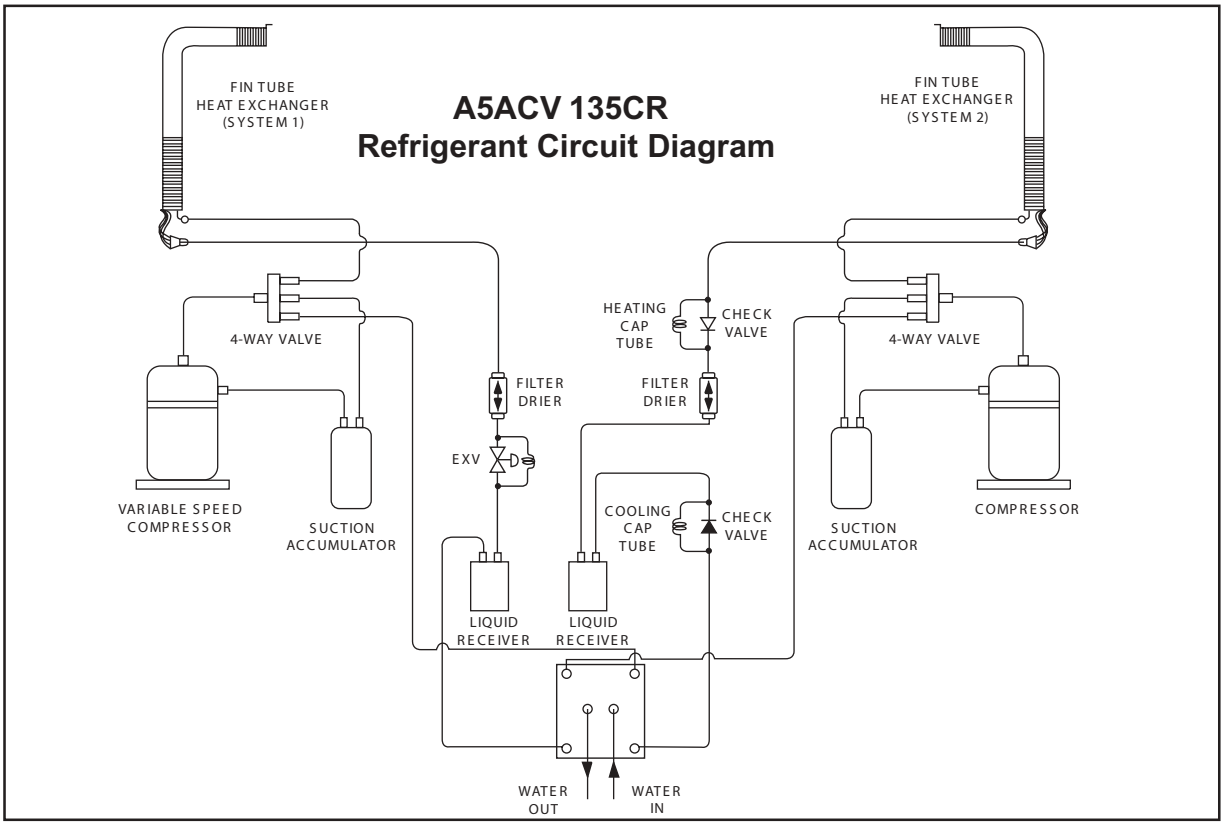
Model	H	I	J	K	L	M
A5ACV100CR	100	265	385	60	200	170
A5ACV135CR	10	265	385	60	200	170

9. REFRIGERANT CIRCUIT DIAGRAMS

MODEL : A5ACV 100CR

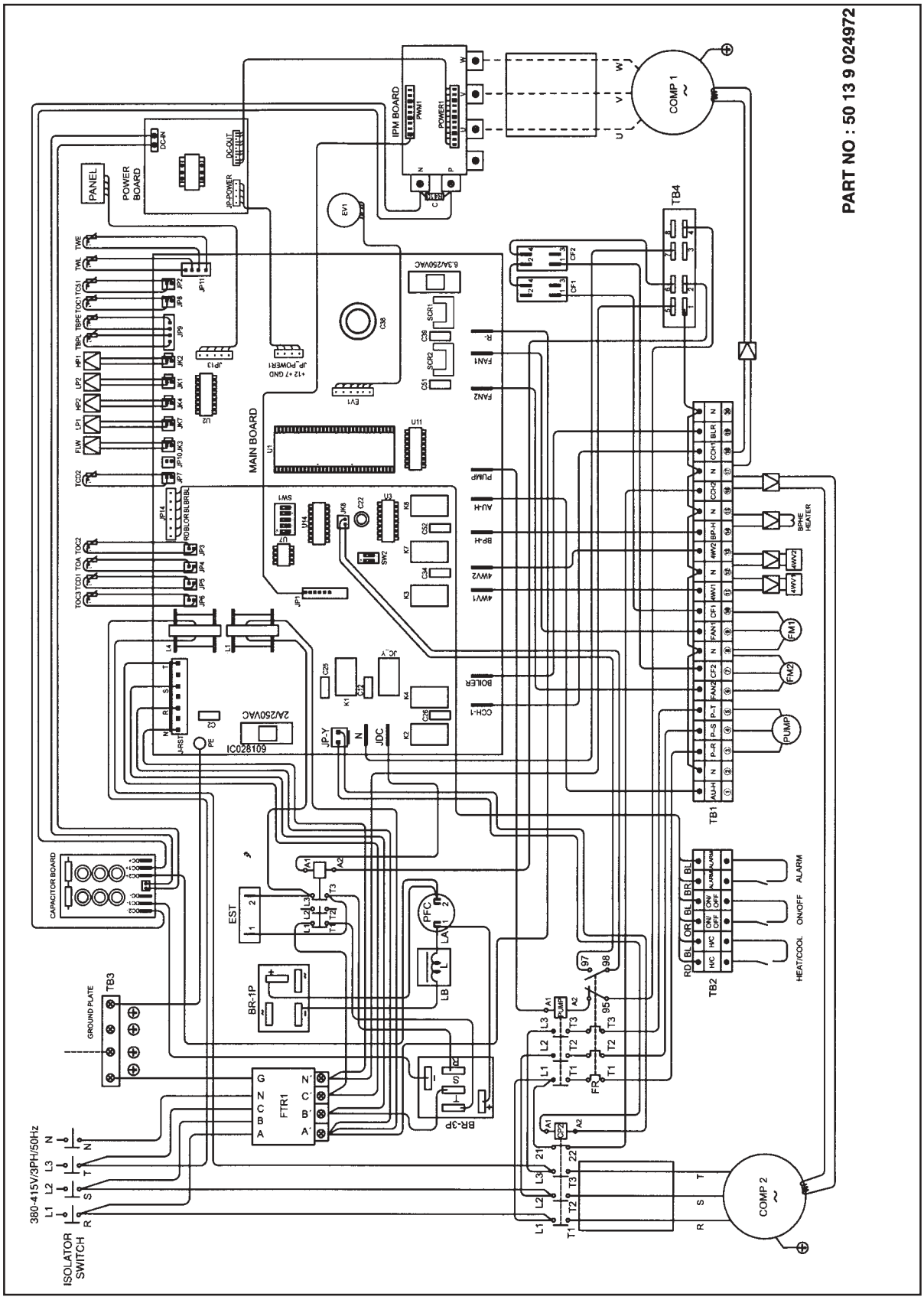


MODEL : A5ACV 135CR



10. WIRING DIAGRAMS

MODEL : A5ACV 100/135CR



11. CHILLER PANEL CONTROLLER

1. SAFETY CONSIDERATION

Only specially trained and technicians and installers are authorized to install and service this equipment.

1.1 General Installation Recommendations

- Only supply DC voltage (9-17V, typically 12V, maximum current 200mA) as a power source to the device.
- Input contact voltage supply should limit to 12VDC or 24VAC.
- Isolated all the low voltage wiring (communication bus, etc) from high voltage power supply wiring.

2. GENERAL DESCRIPTION

2.1 GENERAL

The chiller panel controller is designed to control the chiller operation. This device allows the user to have customized control for each connected unit.

2.2 FEATURES

The requirements of user friendly and easy to use have been taken into account in designing this chiller panel controller. It can do the task as follow:

- Whole system configuration
- Unique parameter settings
- Operation status display
- Tracing fault record (easy in hardware troubleshooting)

The display is shown in an 8-lines graphical LCD display. There are 8 dedicated keys available in the panel,

- Menu selection
- Navigation on the screen
- Modification of the selected value

During first start-up, the panel will have a default configuration (timer schedule, set point, miscellaneous settings, etc). User can do the changes on that particular configuration later.

2.3 PANEL POSITION

The chiller panel controller can be installed anywhere, as long as it is easy to accessed by authorized personnel.

The requirements of installation are:

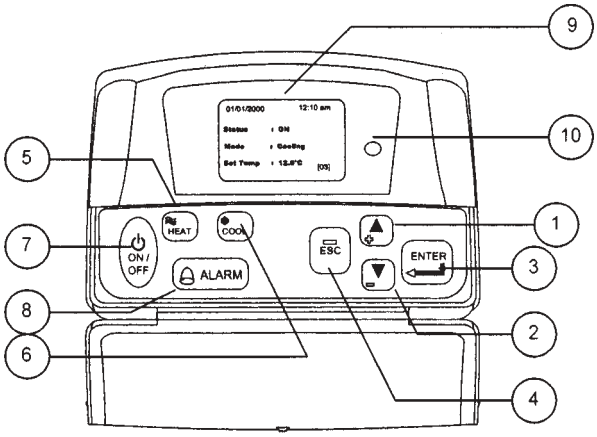
- Avoid exposure to shocks
- Avoid any source of electromagnetic pollution
- Avoid installation on uneven vertical surface

2.4 OPERATION ENVIRONMENTAL CONDITION

- Temperature:
  -10°C to 47°C operating temperature
  -20°C to 85°C storage temperature

- Relative Humidity:
  0 to 95% non-condensing

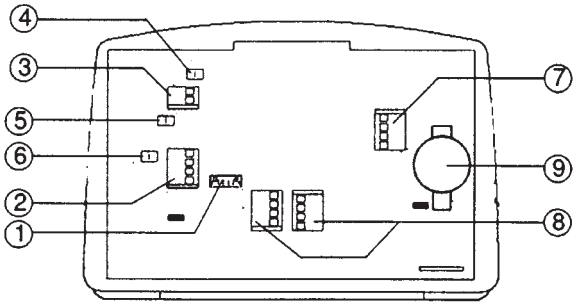
3. HARDWARE DESCRIPTION



Front View

Legend

1 & 2	Navigation key
3	Execute instruction key
4	Cancel instruction key
5	Switching to heat mode shortcut key
6	Switching to cool mode shortcut key
7	Toggle ON/OFF shortcut key
8	Show alarm key
9	Graphical LCD display
10	ON/OFF indicator



Back View

Legend

1 & 2	Chiller terminal unit connection
3	*Not available*
4	CMOS reset jumper (JH2)
5	Chiller bus resistor or configuration (JH3)
6	*Not available*
7	*Not available*
8	*Not available*
9	*Not available*
10	Backup battery

3.1 Key Explanation

The 2 navigation keys permit item selection and modifying the selected value.

ENTER key is used to execute the navigation instruction

ESC key is used to cancel the navigation instruction

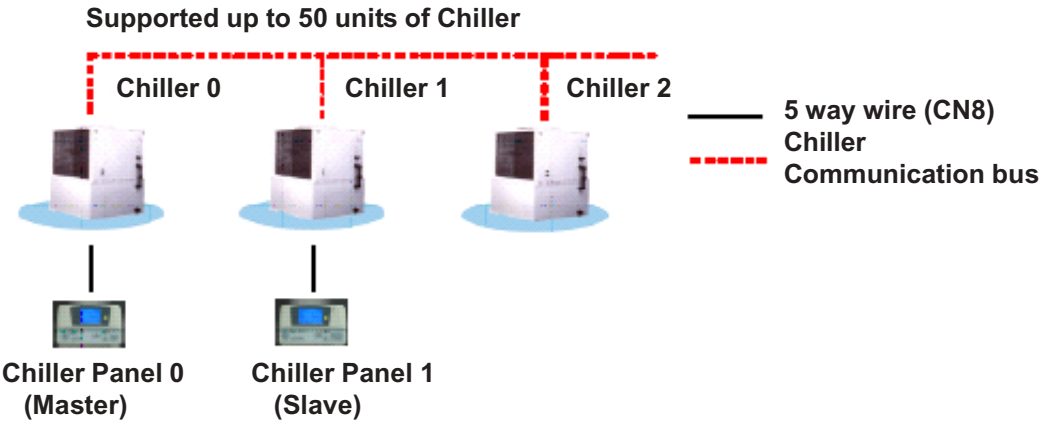
Shortcut key to switch the operation mode in the summary pages

Shortcut key to trigger ON/OFF in the summary pages

Shortcut key to show fault / alarm in the summary pages

4. INSTALLATION

4.1 CHILLER BUS

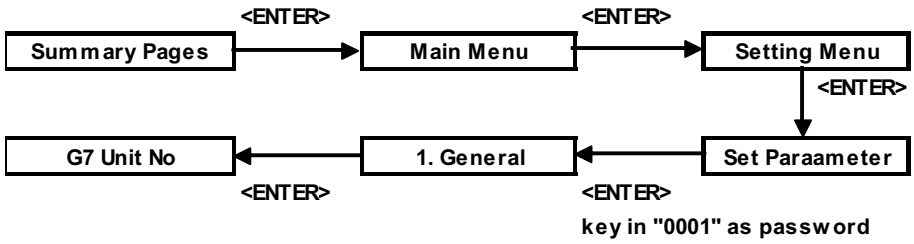


CHILLER NETWORK

Chiller panel needs to be energized with +12Vdc. The 5 way wires that provided is once on the easiest solution to establish a communication between the panel and chiller main board (CN8-JP13). If the 5-way wires socket has been occupied in main board, just using 2 insulation wired are needed to establish a communication between panel and chiller main board.

Chiller panel can support maximum up to 50 units of chiller. In the chiller network, duplication of main board unit address is not allowed. Each chiller main board should have their unique unit address (0-50).
For first time running, user need to assign a unique unit address to each main board in the chiller network. User should follow the procedure below:

- Only power ON one main board at once time. Make sure not others main boards are energized.
- By using the panel connected to the main board.



- Key in unique unit address and press ENTER to execute.
- De-energized the main board and repeat the procedures again all the main boards have been assigned a unique unit address.

IMPORTANT : Do not assign a same unit address to more than one chiller main board.

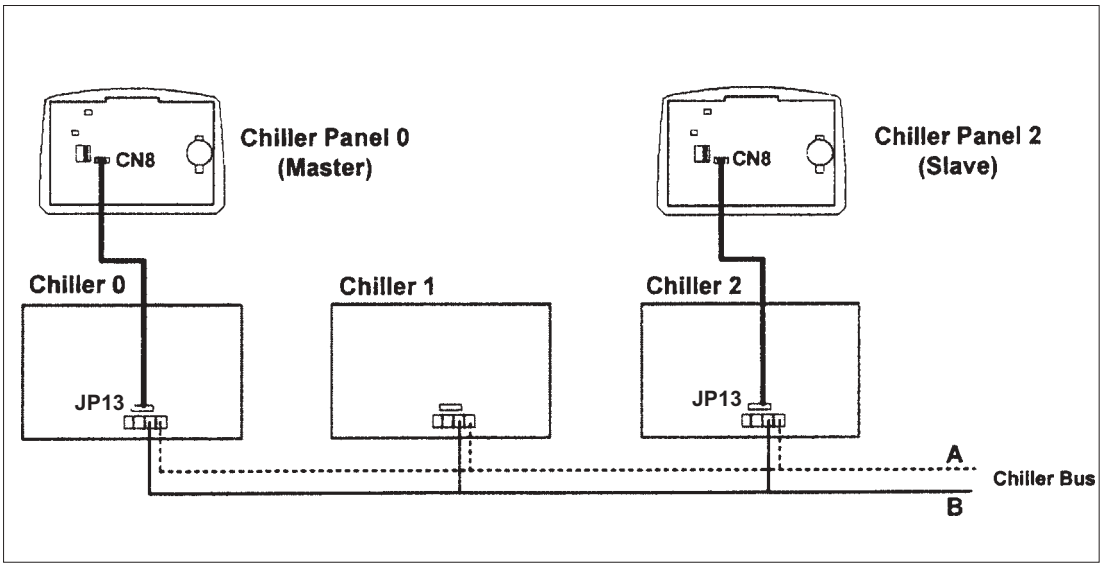
RECOMMENDATION : Please select a coherant model (G1 Model) to all the chiller main boards in the same network.

4.2 OTHERS CONFIGURATION

- JH2 in chiller panel should let it open (put the jumper header on one pin only) all the time unless user need to do CMOS reset to that particular panel.
- JH3 should let it open (put the jumper header on one pin only) all the time as well.
- Remember to put in the coin cell battery on the panel. Without the backup battery, the panel will always reset the time to 12:00am, 1st Jan 2000.

4.3 INSTALLATION OF THE CHILLER PANEL CONTROLLER

- Disconnect the unit and ensure no others unit energy source that supplies the panel.
- Open the rear panel of the Chiller Panel (insert a 'flat-head' screwdriver in the top joint of main casing with rear panel to open the real panel).
- Pass the necessary wires of the panel across the large opening in the rear panel. Place the rear panel flat support against the wall and make marks on the wall through the four installation holes (inner and outer).
- Drill four appropriate holes in the marked places.
- Attach the rear panel to the wall and put on the screws on it. Ensure that all cables are passed through the hole of the rear panel.
- Connect the wires to the corresponding terminal according to the wiring bus network. The power supply and communication wires must be correctly connected to ensure that the panel works.
- Close the chiller panel (ensure the bottom joint is aligned for the casing, then complete others joint part. Ensure that the contacts at the back of the panel are aligned with each others).



BUS WIRING DIAGRAM

5. SOFTWARE DESCRIPTION

5.1 INTRODUCTION

The Chiller Panel Controller can be used to control / display the status of Chiller.

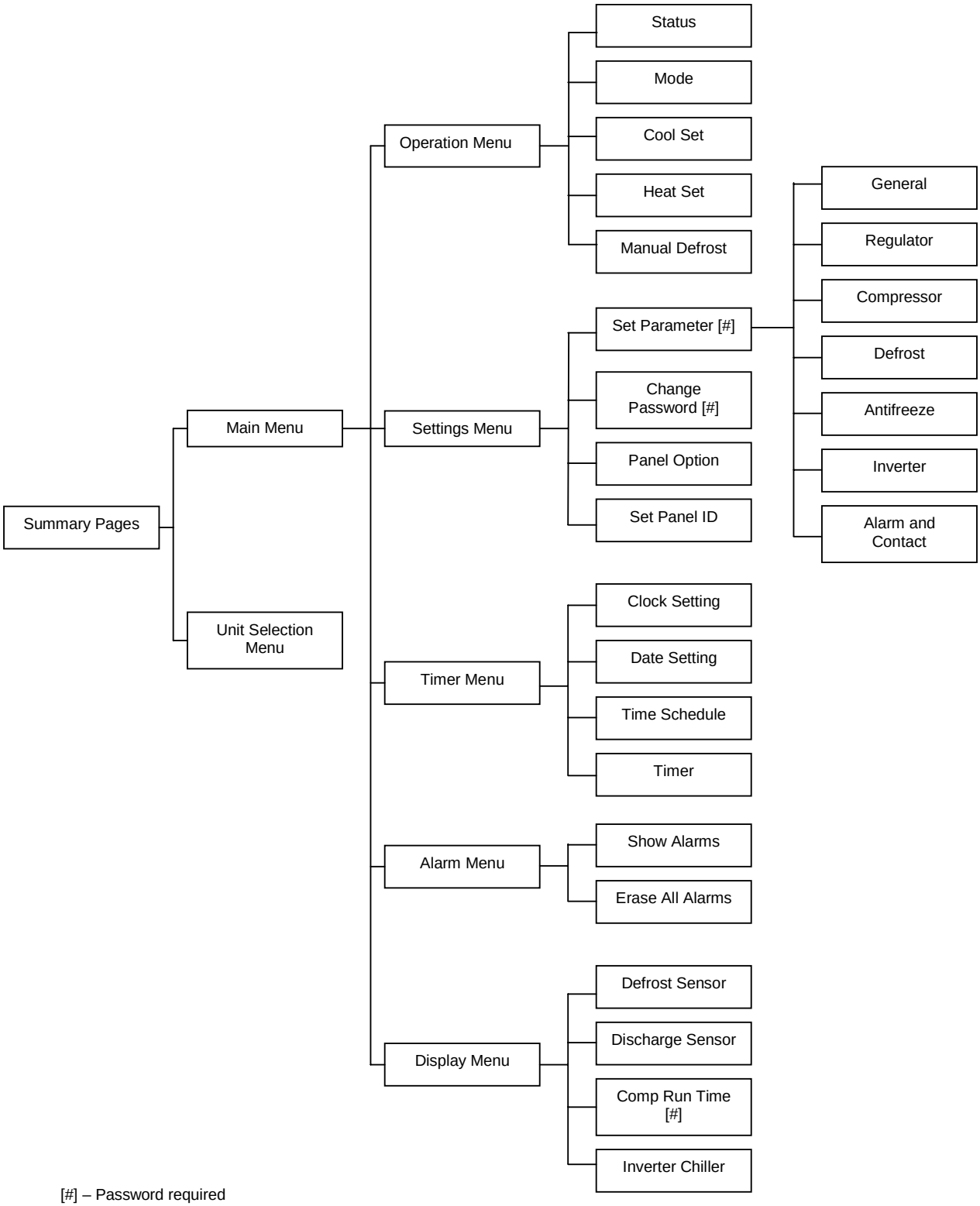
Status viewing:

- ON/OFF status
- Mode (Cooling / Heating/ Boiling)
- Mode set temperature
- Compressor status (ON/OFF/ DEFROST)
- Water in, Water Out, Outdoor air and Panel temperature
- Chiller model (Chiller, Heat Pump, Chiller/ Boiler, Chiller+Boiler, Heat Pump/Boiler, Heat Pump+ Boiler)
- Advance parameter settings
- Defrost sensor temperatures
- Compressor discharge sensor temperatures
- Compressor run times
- Incoming alarm/ fault/ error

Status settings:

- ON/OFF switching
- Mode setting (Cooling / Heating/ Boiling)
- Mode set temperature
- Manual entering defrost
- Advance parameter settings
- Password changing
- Panel option setting (Backlight, Alarm Buzzer, Screen saver, Contrast, Brightness, temperature unit)
- Time and date settings
- Clearing compressor run time

5.2 MENU STRUCTURES



[#] – Password required

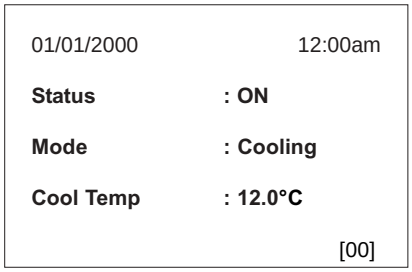
5.3 CHILLER MENU STRUCTURE

5.3.1 SUMMARY PAGES

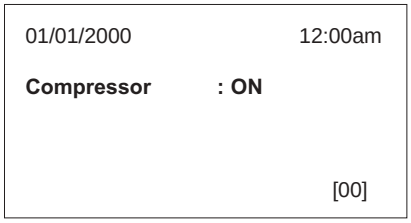
There are 4 pages in **[Summary Pages]**. Press **UP** or **DOWN** for page scrolling. Press **ENTER** to go to **[Main Menu]**. Time and date are shown on top of each page. Beside that, the bottom of each page shows current control unit of the Chiller.

For example: [00] - Chiller Panel controls Chiller ID 0 currently
[03] - Chiller Panel controls Chiller ID 3 currently
[All] - Chiller Panel controls all Chiller currently

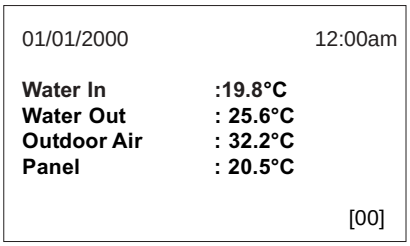
1st page: Display ON/OFF status, Mode settings and Temperature settings.



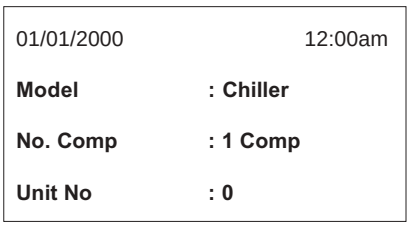
2nd page: Display Compressor status.



3rd page: Display Water In, Water Out, Outdoor air and Panel temperature

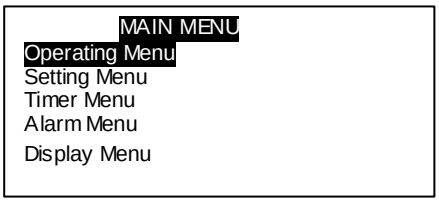


4th page: Display Chiller model, Compressor No. and Chiller ID.



5.3.2 MAIN MENU

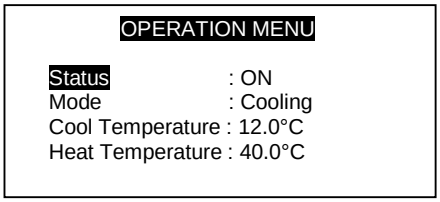
Press **ENTER** in **[Summary Pages]** to go into this menu



There are 5 sub menus in [**Main Menu].** Press **UP** or **DOWN** to select sub menus, **ENTER** to enter into the sub menu or press **ESC** to exit to **[Summary Pages]**

5.3.2.1 OPERATION MENU

Select [Operation Menu] in [Main Menu] and press ENTER to go into this menu.

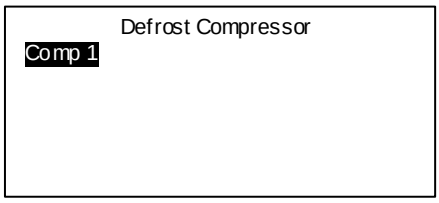


Some normal settings can be found here. Press **UP** or **DOWN** to select each settings, **ENTER** to start the setting or press **ESC** here to exit to **[Main Menu]**

Settings : -ON/OFF unit
- Mode changing (Cooling/ Heating/ Boiling)
- Cooling temperature setting
- Manual Defrost Selection

5.3.2.1.1 MANUAL DEFROST

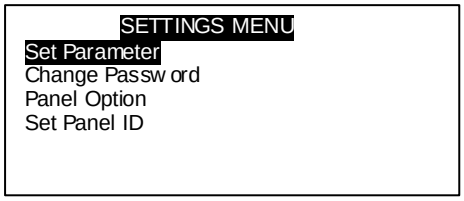
Select **[Manual Defrost]** in **[Operation Menu**] and press **ENTER** to go into this menu.



This menu lets user select one compressor to enter into defrost cycle manually, as long as the environment fulfill the defrost requirement.

5.3.2.2 SETTINGS MENU

Select **[Settings Menu]** in **[Main Menu]** and press **ENTER** to go into this menu.

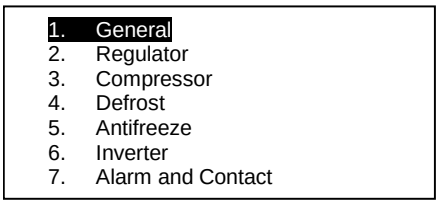


Some advance settings can be found here. Press **UP** or **DOWN** to select settings, **ENTER** to start the setting or press ESC here to exit to **[Main Menu].**

Settings
- Set Parameter
- Password Changing
- Panel Option
- Set Panel ID

5.3.2.2.1 SET PARAMETER

Select **[Set Parameter]** in **[Settings Menu]** and press **ENTER** to go into this menu.

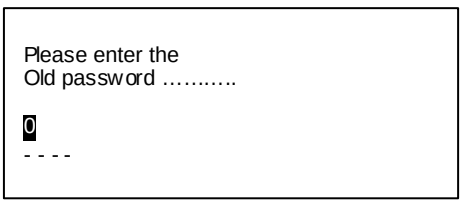


There are 7 groups of advance parameters for user to set in this menu, Press **UP** or **DOWN** to select the group, **ENTER** to go into the group or **ESC** to exit to **[Setting Menu]**.

Settings:
- General
- Regulator
- Compressor
- Defrost
- Antifreeze
- Inverter
- Alarm and Contact

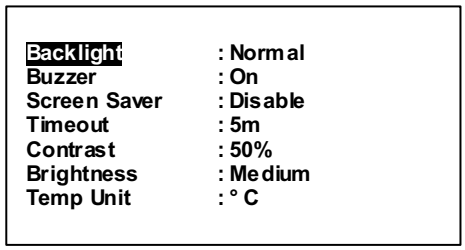
5.3.2.2.2 PASSWORD CHANGING

Select **[Password Changing]** in **[Setting Menu]** and Press **ENTER** to go into this menu.



User can change the old password in this menu.
Press **ESC** to exit to **[Settings Menu]**.

5.3.2.2.3 PANEL OPTION
Select **[Panel Option]** in **[Setting Menu]** and Press **ENTER** to go into this menu.

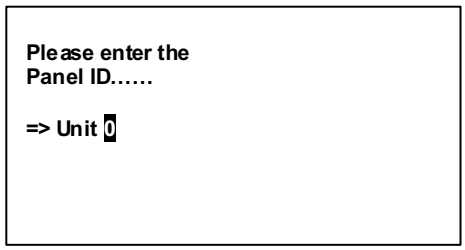


User can do some miscellaneous for the panel. These settings would not affect whole system performance.

Settings - Toggle Backlight
- Alarm Buzzer
- Enable / Disable Screen Saver
- Screen Saver timeout
- Contrast display
- Backlight brightness
- Temperature unit

Press **ESC** to exit to **[Settings Menu]**

5.3.2.2.4 SET PANEL ID
Select **[Set Panel ID]** in **[Settings Menu]** and press **ENTER** to go into this menu.



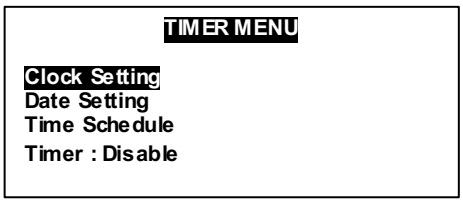
User can assign the ID no, to the panel.
Example: If ID no. 0 has been assigned, the panel acts like Master Panel Unit. It can choose to control each Chiller in the network.

If other ID no. (1-50) has been assigned, the panel acts like Slave Panel Unit. It is dedicated to one particular Chiller. It can only control the Chiller with same ID in the network.

Press **[ESC]** to exit to **[Settings Menu]**

5.3.2.3 TIMER MENU

Select **[Timer Menu]** in **[Main Menu]** and press **ENTER** to go into this menu.

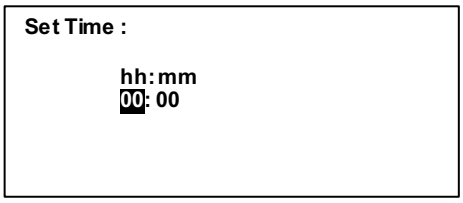


All the timer/ schedule settings are included in this menu. Press **UP** or **DOWN** to select each settings. **ENTER** to start the setting or press **ESC** here to exit to **[Main Menu].**

Settings:
- Set Clock
- Set Date
- Set Schedule (7 days Programmable Timer)
- Enable/ Disable Timer Schedule

5.3.2.3.1 SET CLOCK

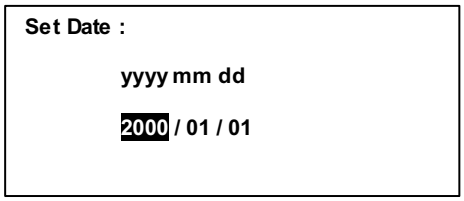
Select **[Clock Setting]** in **[Timer Menu]** and press **ENTER** to go into this menu.



User can set the time in this menu. The time setting is in 24-hour format.

Pres **[ESC]** to exit to **[Timer Menu].**

5.3.2.3.2 SET DATE
Select **[Date Setting]** in **[Timer Menu]** and press **ENTER** to go into this menu.

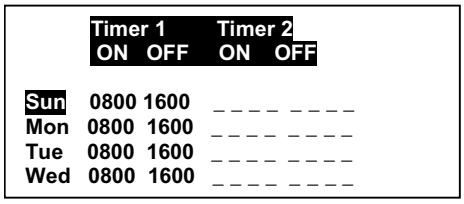


User can set the date in this menu. The date is set according to sequence below:

(year) / (month) / (day)

Press **[ESC]** to exit to **[Timer Menu]**.

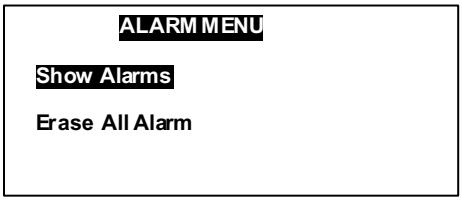
5.3.2.3.3 SET SCHEDULE
Select **[Schedule Timer]** in **[Timer Menu]** and press **ENTER** to go into this menu.



This is the 7 days programmable timer schedule menu. There are 2 ON/OFF events in one day. User can choose to set each day of week (Sunday - Saturday) ON/OFF timer. Before this schedule carry their effect to the Chiller, user need to set the **[Timer]** in **[Timer Menu]** to enable.

Press **[ESC]** to exit to **[Timer Menu]**.

5.3.2.4 ALARM MENU
Select **[Alarm Menu]** in **[Main Menu]** and press **ENTER** to go into this menu.

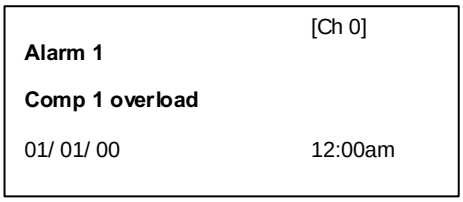


This place keeps records for all previous occurred fault/ alarms. User can view the alarm history and clear that record (alarm history) as well. The panel can keep up to 20 fault/ alarm records.

Press **ESC** to exit to **[Main Menu]**

5.3.2.4.1 SHOW ALARMS

Select **[Show Alarms]** in **[Alarm Menu]** and press **ENTER** to go into this menu.



User can view all the fault/ alarm records in this menu.

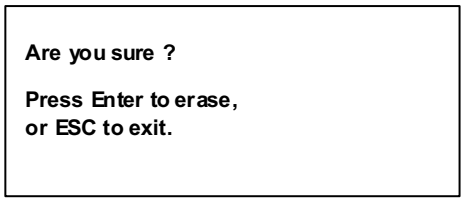
The record shows
- Alarm type
- Alarm occurred date
- Alarm occurred time
- Alarm occurred unit (Chiller ID)

Beside that, user can erase the alarm record in this menu.

Press **[ESC]** to exit to **[Alarm Menu].**

5.3.2.4.2 ERASE ALL ALARMS

Select **[Erase All Alarms]** in **[Alarm Menu]** and press **ENTER** to go into this menu.

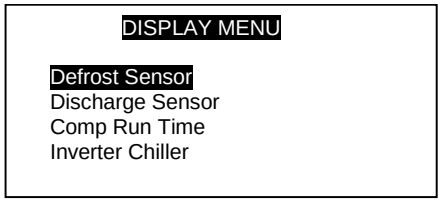


User can erase all the alarm / fault records at once in this menu.

Press **[ESC]** to exit to **[Alarm Menu].**

5.3.2.5 DISPLAY MENU

Select **[Display Menu]** in **[Main Menu]** and press **ENTER** to go into this menu.

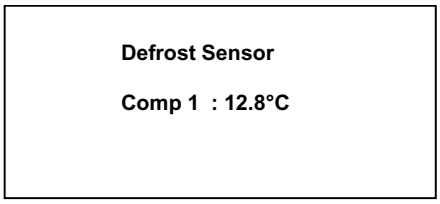


This menu display Defrost Sensor temperature, Compressor Discharge sensor temperature, Compressor Run Time and Inverter Chiller. Beside that, user can clear each Compressor Run Time for Chiller.

Press **[ESC]** to exit to **[Main Menu]**

5.3.2.5.1 DEFROST SENSOR

Select **[Defrost Sensor]** in **[Display Menu]** and press **ENTER** to go into this menu.

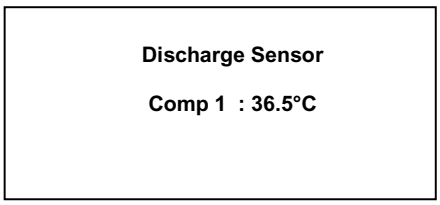


User can view the defrost sensor temperature for each compressor in the Chiller.

Press **[ESC]** to exit to **[Display Menu]**

5.3.2.5.2 DISCHARGE SENSOR

Select **[Discharge Sensor]** in **[Display Menu]** and press **ENTER** to go into this menu.

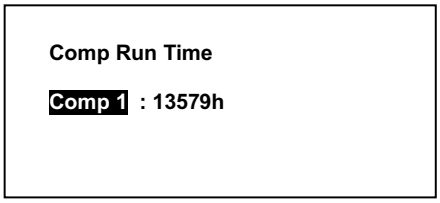


User can view the discharge sensor temperature for each compressor in the Chiller.

Press **[ESC]** to exit to **[Display Menu]**.

5.3.2.5.3 COMP RUN TIME

Select **[Comp Run Time]** in **[Display Menu]** and press **ENTER** to go into this menu.

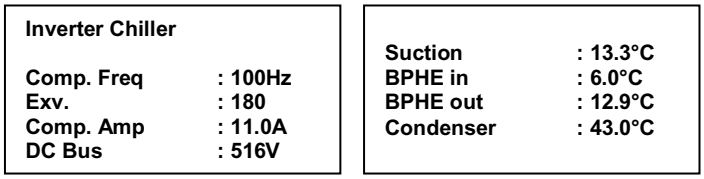


User can view the compressor run time for each compressor in the Chiller. Beside that, user can clear each compressor run time in this menu. User needs to key in the correct password before clearing the compressor run time.

Press **[ESC]** to exit to **[Display Menu]**.

5.3.2.5.4 INVERTER CHILLER

Select **[Inverter Chiller]** in **[Display Menu]** and press **ENTER** to go into this menu.



This menu display compressor frequency, EXV opening, DC voltage, Current, Suction Sensor, BPHE in sensor, BPHE out sensor and condenser in sensor.

Press **[ESC]** to exit to **[Display Menu]**.

6. OPERATION USER MANUAL

6.1 STARTING

Chiller panel can be set as Master or Slave panel unit. When the Panel ID is set to '0', it acts like a Master panel, whereas it is Slave panel if Panel ID is set to others number (1-50).

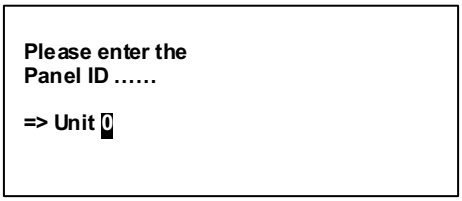
Chiller panel can control the Chiller if both ID no. (Panel ID and Chiller ID) are same.

For example: Panel ID 1 can only control Chiller ID 1

Master Panel can choose to control each Chiller or control all Chiller at once in the network.

For example : Panel ID 0 (master) can control Chiller ID 0 / ID 1/ ID 32 .... or all Chillers at once.

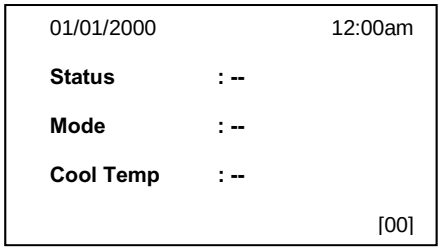
Panel ID can be set in **Set Panel ID** in **Settings Menu**.



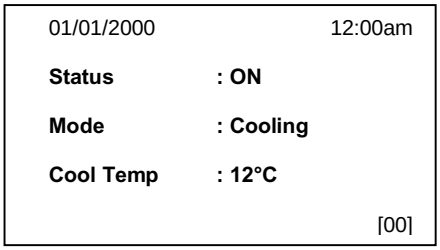
6.2 CHILLER OPERATION CONTROL

6.2.1 STARTING

During power on for the Chiller Panel, it needs to take several times to collect information from the Chiller. At this time, all the status will show "--". Please ensure the particular Chiller exists in the network. When the process is completed, user can start to control the Chiller using the panel.



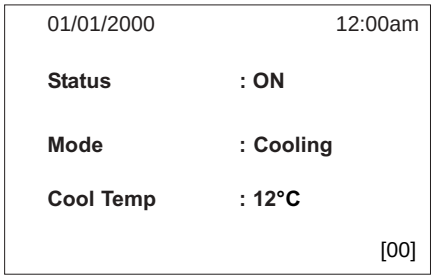
In gathering information process



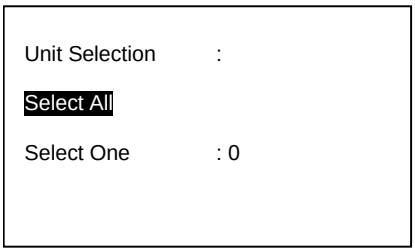
Gathering information completed

6.2.2 CHANGING DISPLAY UNIT

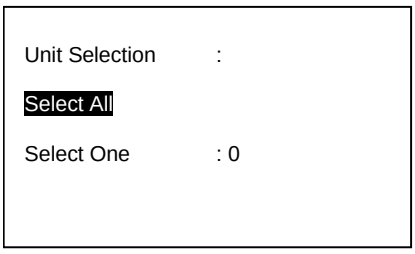
Chiller Panel (Master) can choose to choose to control / display each Chiller status. This can be done in **[Summary Pages]** only.



*In **[Summary Pages]**, press and hold **ENTER** buttom (1 second) to go into **[Unit Selection]** menu.*



*Select "**Select All**" and press **ENTER** if user want to control all Chilelr in the network, or select "**Select One**" to control a particular Chiller. Press ESC to exit to **[Summary Pages].***



*Select a Chiller ID via **UP** or **DOWN** and press **ENTER** to confirm or **ESC** to cancel.*

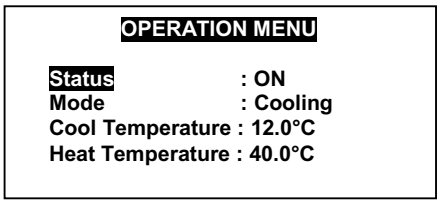
6.2.3 SWITCHING ON/OFF

There are several ways to switch ON/OFF for the Chiller.

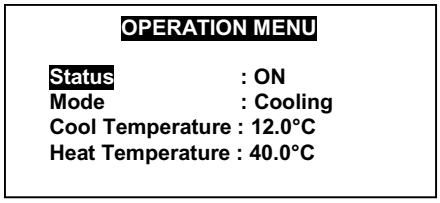
i) [Summary Pages]

Press and hold **ON/OFF** button (hold 1 second). Please note that the **ON/OFF** button will only function in **[Summary Pages].**

ii) [Operation Menu]



*In **[Operation Menu]**, select **"Status"** and press **ENTER.***



*Toggle **ON/OFF** via **UP** or **DOWN** button, and then press **ENTER** to confirm the change or **ESC** to cancel.*

iii) [Timer Menu]

7 days programmable time can turn chiller ON/OFF. User can set the schedule in this **[Timer Menu]**. Please refer **6.2.11 (page 40)** for schedule settings.

6.2.4 SWITCHING MODE

There are several ways to switch the mode for the Chiller. Please take note that some mode cannot be set due to current Chiller model settings.

Chiller Model	Mode		
	Cooling	Heating	Boiling
Chiller	√	x	x
Heat Pump	√	√	x
Chiller / Boiler	√	x	√
Heat Pump / Boiler	√	√	√
Chiller + Boiler	√	x	Auto
Heat Pump + Boiler	√	√	Auto

√ - Allow to set

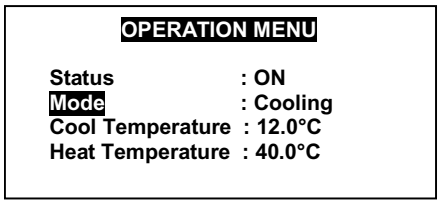
x - Not Allow to set

Auto - Turn ON automatically

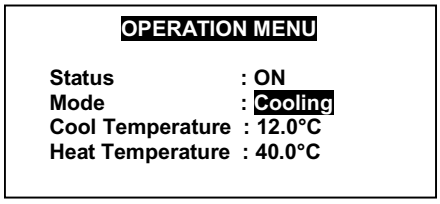
i) **[Summary Pages]**

Cooling - Press and hold **COOL** button.
Heating - Press and hold **HEAT** button (if it allows to set).
Boiling - Press and hold **HEAT** button again (if it allows to set).

ii) **[Operation Menu]**



*In **[Operation Menu]**, select "**Mode**" and press **ENTER** to start setting or **ESC** to exit to **[Main Menu]***



*Toggle **ON/OFF** via **UP** or **DOWN** button, and then press **ENTER** to confirm the change or **ESC** to cancel.*

6.2.5 CHANGING MODE SET TEMPERATURE

There are 2 ways to change the mode set temperature for the Chiller.

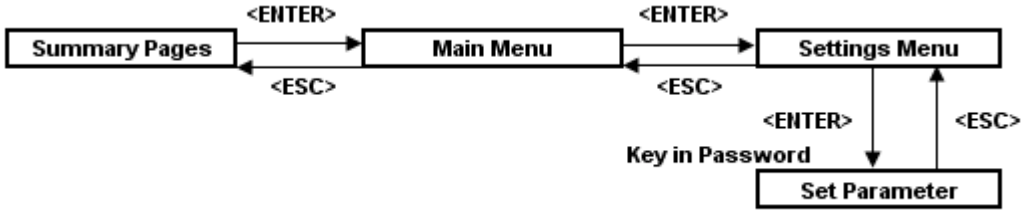
i) [Operation Menu]

OPERATION MENU	
Status	: ON
Mode	: Cooling
Cool Temperature	: 12.0° C
Heat Temperature	: 40.0° C

*In **[Operation Menu]**, select "**Cool Temp" / "Heat Temp"** and press **ENTER** start setting or **ESC** to exit to **[Main Menu].***

OPERATION MENU	
Status	: ON
Mode	: Cooling
Cool Temperature	: 12.0° C
Heat Temperature	: 40.0° C

*Change value via **UP** or **DOWN** button, and then press **ENTER** to confirm the change or **ESC** to cancel.*



1. General
2. Regulator
3. Compressor
4. Defrost
5. Antifreeze
6. Inverter
7. Alarm and Contact

*In **[Set Parameter],** select "**Regulator"** and press **ENTER**. Press **ESC** to exit to **[Main Menu]**.*

R1 Cool SP	: 12.0°C
R2 Cool Diff	: 3.0°C
R3 Heat SP	: 40.0°C
R4 Heat Diff	: 3.0°C
R5 Min Cool SP	: -20°C
R6 Max Cool SP	: 40°C
R7 Min Heat SP	: -20°C

*Select **"R3"/ "R5"** and press **ENTER** to start setting or **ESC** to exit to **[Set Parameter]** menu.*

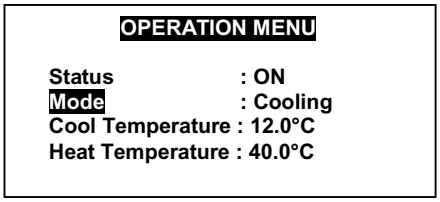
R1 Cool SP	: 12.0°C
R2 Cool Diff	: 3.0°C
R3 Heat SP	: 40.0°C
R4 Heat Diff	: 3.0°C
R5 Min Cool SP	: -20°C
R6 Max Cool SP	: 40°C
R7 Min Heat SP	: -20°C

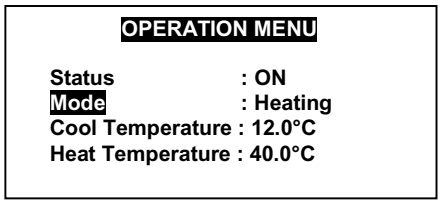
*Change value via **UP** or **DOWN** button. The boarderline is limited by **R5&R6** (cool), **R7&R8**(heat). Press **ENTER** to confirm or **ESC** to cancel.*

6.2.6 MANUAL DEFROST

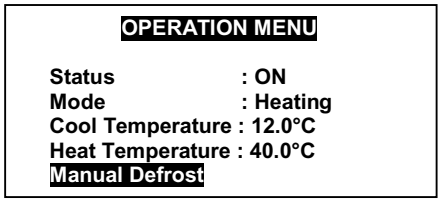
User can choose which compressor will go into manual defrost cycle by using the Chiller Panel, as long as the condition is fulfilled with defrost condition. This can be done in **[Operation Menu].**

Please take note that **"Manual Defrost"** option will only available in HEATING mode. It will disappear in COOLING/ BOILING mode.

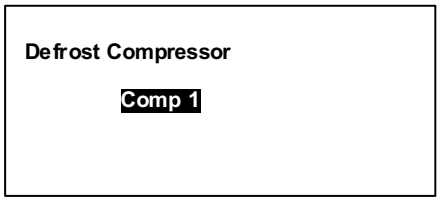




"Manual Defrost" *disappear when Chiller not in HEATING mode*



*In **[Operation Menu]**, select **[Manual Defrost]**, press **ENTER** to go into it, or ESC to exit to **[Main Menu]**.*

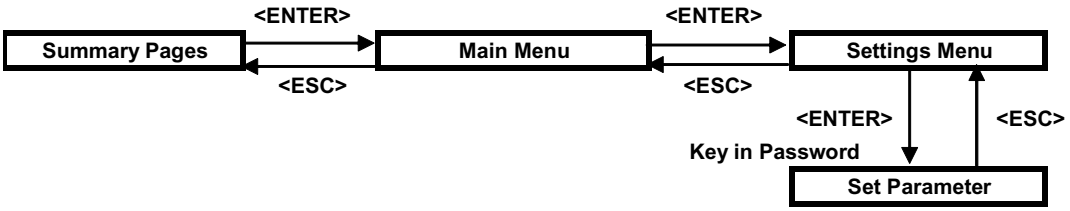


*Select which compressor to go into defrost cycle via **UP** or **DOWN** button. Press **ENTER** to confirm or **ESC** to exit to **[Operation Menu]**.*

6.2.7 ADVANCE PARAMETER SETTINGS

The Chiller Panel provide user a lot of advance parameter settings for the Chiller. The parameters are divided into 7 groups. There all are stored in **[Set Parameter]** menu and it is password-protected layer in the panel.

**** CAUTION : INPROPER SETTINGS WILL CAUSE PERMANENT DAMAGE TO THE CHILLER !!!***



7 groups of Advance Parameter:

1) General

G1 Mode	: Chiller
G2 No. Comp	: 1 Comp
G3 On/Off in	: Disable
G4 Cool/Heat in	: Disable
G5 Ext Alarm in	: Disable
G6 Water sys	: Isolated
G7 Unit No	: 0

2) Regulator

R1 Cool SP	: 12.0°C
R2 Cool Diff	: 3.0°C
R3 Heat SP	: 40.0°C
R4 Heat Diff	: 3.0°C
R5 Min Cool SP	: -20°C
R6 Max Cool SP	: 40°C
R7 Min Heat SP	: -20°C

R8 Max Heat SP	: 90°C
R9 Ax Heat SP	: 5.0°C
R10 Ax Heat Diff	: 2.0°C
R11 Au Bo SP	: 5.0°C
R12 Au Bo Diff	: 2.0°C
R13 Au Bo Start	: 30m

3) Compressor

C1 Min Run	: 12s
C2 Min Stop	: 240s
C3 2On Interval	: 360s
C4 2Cp ON Dly	: 15s
C5 P-Cp ON Dly	: 60s
C6 Cp-P OFF Dly	: 40°C
C7 Cp Cut Off	: 120°C

4) Condenser Defrost

D1 Start Temp	: -3°C
D2 End Temp	: 14°C
D3 Max Dura	: 10m
D4 Interval	: 45m
D5 Dly Bfr Def	: 0s
D6 Dly Aft Def	: 0s

5) Cool Mode Antifreeze

A1 Heater SP	: 5°C
A2 Heater Diff	: 2.0°C
A3 Sensor	: Leave
A4 Alarm SP	: 3°C
A5 Alarm Diff	: 2.0°C

6) Inverter

V1 Cp Freq	: 100Hz
V2 EXV	: 180
V3 Cp Manual	: Disable
V4 EXV Manual	: Disable
V5 Def Mode	: Disable

7) Alarm and Contact

P1 FS Confirm	: 5s
P2 FS Delay	: 180s
P3 LP Delay	: 30s
P4 CO Reset	: Manual
P5 HP Reset	: Auto
P6 LP Reset	: Auto
P7 FO Reset	: Manual

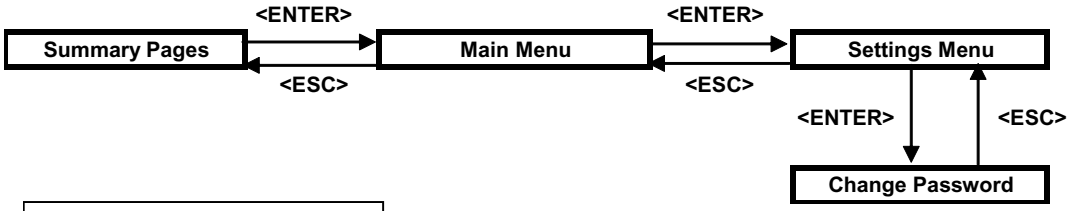
P8 RO Reset	: Manual
P9 FS Reset	: Manual
P10 Aux Reset	: Manual
P11 A/F Reset	: Manual
P12 CO Contact	: Normal
P13 HP Contact	: Normal
P14 LP Contact	: Normal

P15 FO Contact	: Normal
P16 PO Contact	: Normal
P17 FS Contact	: Normal
P18 EA Contact	: Normal
P19 DE Contact	: Normal

Please refer to **8. APPENDIX** for detail desciption.

6.2.8 CHANGING PASSWORD

For security purpose, some places in the panel are password-proctected. User can change the password at anytime.



Please enter the **Old password ----------** **0** **----**	*User needs to enter the old password in order to change the password.* *Change the 1st digit value via **UP** or **DOWN.** Press **ENTER** to start enter 2nd digit and the rest, or **ESC** to exit at anytime.*

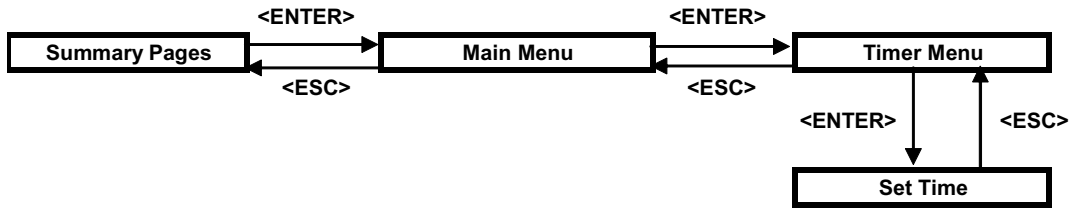
Password accepted . . . **Access granted !**	**Password error . . .** **Access denied !**
If password correct, this message will be shown and proceed to new password settings.	*If password not correct, this message will be shown and exit to **[settings Menu]***

Please enter the **New password ----------** **0** **----**	*Same as previous, **UP DOWN** to change value, **ENTER** to go to next digit, **ESC** to exit.* *User is not allowed to set the password to 0000.*

New password **Has been set …….**	**New password** **'0 0 0 0'** **Is not accepted ……**
*If new password is accepted, this message will be shown and then exit to **[Settings Menu]**.*	*If new password is '0000', this message will be shown and then exit to **[Settings Menu]**.* *The password remains as previous.*

6.2.9 CLOCK SETTING

User can set the clock for the panel.



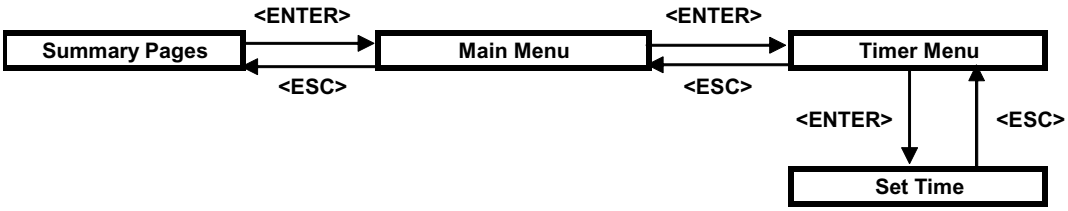
Set Time : hh mm 00 : 00

UP *or* ***DOWN*** *to change 'hour'.* ***ENTER*** *to set 'minute' or* ***ESC*** *to exit to* ***[Timer Menu].***

UP *or* ***DOWN*** *to change 'minute'.* ***ENTER*** *to confirm or* ***ESC*** *to set 'hour'again.*

6.2.10 DATE SETTING

User can set the date for the panel.



Set Time : yyyy hh mm 2000 /01 / 01

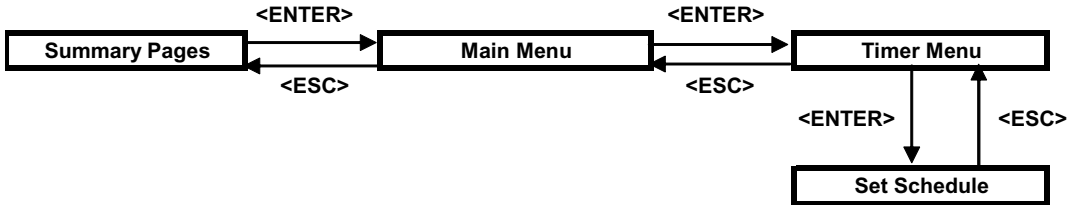
UP *or* ***DOWN*** *to change 'year'.* ***ENTER*** *to set 'month' or* ***ESC*** *to exit to [Timer Menu].*

UP *or* ***DOWN*** *to change 'month'.* ***ENTER*** *to set 'day' or* ***ESC*** *to set 'year' again.*

UP *or* ***DOWN*** *to change 'day'.* ***ENTER*** *to confirm or* ***ESC*** *to set 'month' again.*

6.2.11 7 DAYS PRPGRAMMABLE SETTING

The are 2 ON/OFF events in one day for the schedule. This schedule is applicable to all the chillers in the network.



	Timer 1		Timer 2	
	ON	OFF	ON	OFF
Sun	0800	1600	_ _ _ _	_ _ _ _
Mon	0800	1600	_ _ _ _	_ _ _ _
Tue	0800	1600	_ _ _ _	_ _ _ _
Wed	0800	1600	_ _ _ _	_ _ _ _

UP or ***DOWN*** *select day of week,* ***ENTER*** *to select event or* ***ESC*** *to exit to* ***[Timer Menu]****.*

	Timer 1		Timer 2	
	ON	OFF	ON	OFF
Sun	0800	1600	_ _ _ _	_ _ _ _
Mon	0800	1600	_ _ _ _	_ _ _ _
Tue	0800	1600	_ _ _ _	_ _ _ _
Wed	0800	1600	_ _ _ _	_ _ _ _

UP *or* ***DOWN*** *select event.* ***ENTER*** *to start setting or* ***ESC*** *to back to select day of week.*

Event setting is same like time setting. User can disable the event by set it to '- - - -'

Before the schedule will carry the effect, user need to set **ENABLE** for "**TIMER**" in **[Timer Menu]**.

TIMER MENU

Set Time
Set Date
Set Schedule
Timer : Disable

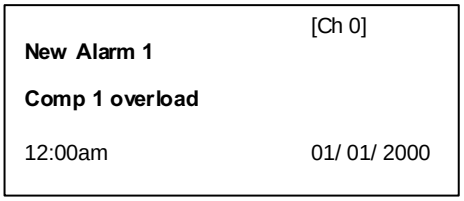
*Select "****Timer"*** *and press* ***ENTER*** *to start the settings.* ***UP*** *or* ***DOWN*** *to toggle Enable/ Disable,* ***ENTER*** *to confirm or* ***ESC*** *to cancel.*

6.2.12 VIEWING ALARM / ERASE ALARM RECORD

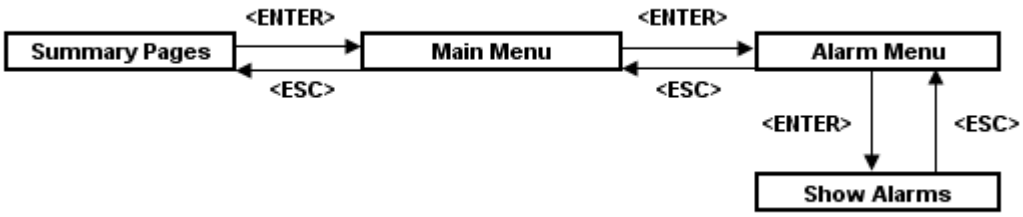
Whenever a new fault/ alarm is occurred, there will be a message pop up to show the fault/ alarm. Backlight will blinking with beeping sound (if "**Alarm Buzzer**" is set ON). If the fault/ alarm has not been dissolved from the Chiller, a sign **[A]** will be shown in the **[Summary Pages]**.(from pop up menu) automatically if the fault/ alarms have been dissolved.

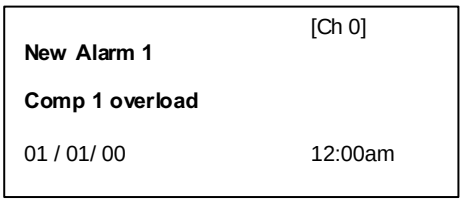
While the fault/ alarms have not been dissolved (sign **[A]**), user can check that fault/ alarm by to into [**Alarm Menu].** If all the fault/ alarm have been dissolved, user can view the fault/alarm historty records in **[Alarm Menu]** as well. Screen saver will be deactivated while all the alarms have not been dissolved.

If panel ID is set 0 (Master panel), it can receive and view all the fault / alarms from all chillers in the network.

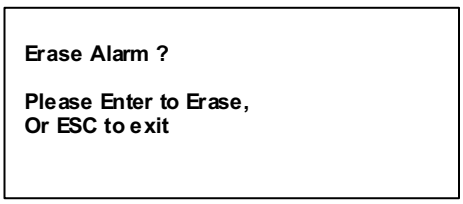


[Ch 0] show alarm occurred unit.
Press any button to stop backlight blinking and beeping.
*Press **ESC** again to exit to normal page.*





*Press **UP** or **DOWN** to scroll the record.*
*Press **ENTER** if user want to erase the record, or **ESC** to exit to **[Alarm Menu]**.*

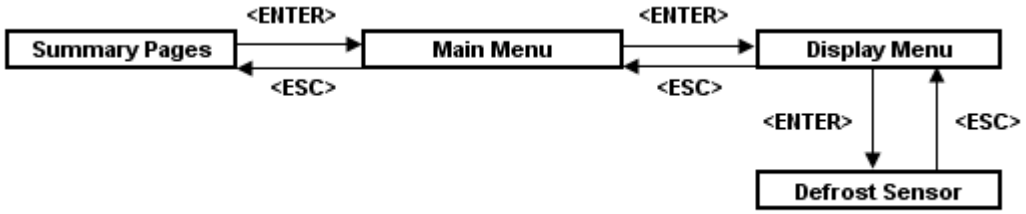


*Press **ENTER** to erase the alarm, or **ESC** to cancel.*

User can erase all the fault/ alarm record at once time through **[Erase All Alarm]** in **[Alarm Menu].**

6.2.13 VIEWING DEFROST SENSOR TEMPERATURE

The Chiller Panel displays defrost sensor temperature for each compressor in **[Defrost Sensor]** in **[Display Menu]**.



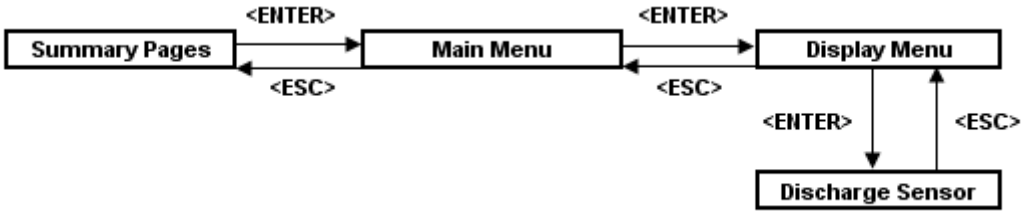
Defrost Sensor

Comp 1 : 12.8°C

*Press **ESC** to exit to **[Display Menu]***

6.2.14 VIEWING COMPRESSOR DISCHARGE TEMPERATURE

The Chiller Panel displays compressor discharge temperature for each compressor in **[Discharge Sensor]** in **[Display Menu]**.



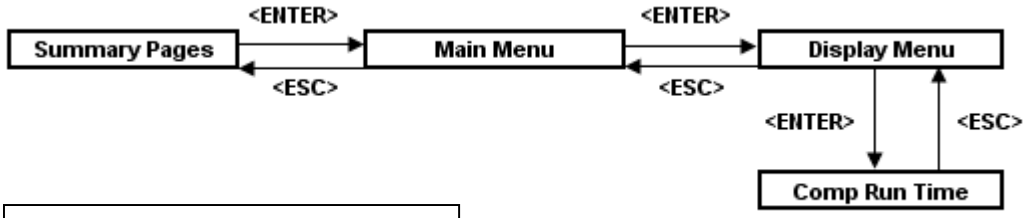
Discharge Sensor

Comp 1 : 36.5°C

*Press **ESC** to exit to **[Display Menu]***

6.2.15 VIEWING / CLEAR COMPRESSOR RUN TIME

User can view/ clear the compressor run time for the Chiller in ***[Comp Run Time]*** in ***[Display Menu]***.



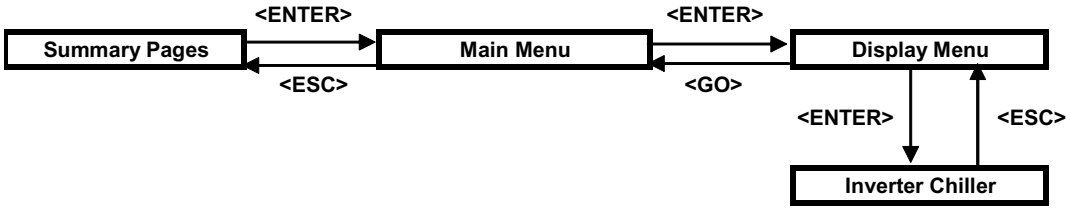
Comp Run Time **Comp 1 : 13579h**

*Press **UP** or **DOWN** to select the compressor. **ENTER** to start clear the run time, or **ESC** to exit to **[Display Menu].***

Clear Run Time ? **Press Enter to Clear** **Or ESC to exit.**

*Press **ENTER** and key in the password to confirm or **ESC** to cancel*

6.2.16 VIEWING INVERTER CHILLER



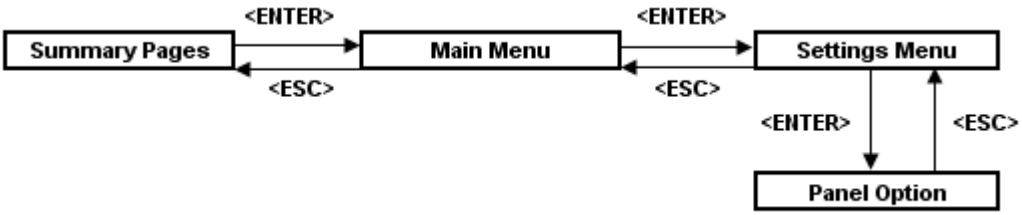
Inverter Chiller	
Comp. Freq	**: 100Hz**
Exv.	**: 180**
Comp. Amp	**: 11.0A**
DC Bus	**: 516V**

Suction	**: 13.3°C**
BPHE in	**: 6.0°C**
BPHE out	**: 12.9°C**
Condenser	**: 43.0°C**

Press ***ESC*** to exit to ***[Display Menu]***

6.2.17 MISCELLANEOUS SETTINGS

User can do some miscellaneous settings to the panel.



Backlight	: Normal
Buzzer	: On
Screen Saver	: Disable
Timeout	: 5m
Contrast	: 50%
Brightness	: Medium
Temp Unit	: ° C

*Press **UP** or **DOWN** to select the item. **ENTER** to set, or **ESC** to exit to **[Settings Menu]**.*

*Press **UP** or **DOWN** to toggle the value. **ENTER** to confirm, or **ESC** to cancel.*

Parameter	Value	Description
Backlight	Normal	Turn ON backlight for 30s via key press
	Always	Always ON backlight
Buzzer	ON	Enable beeping sound when fault/ alarm occurred
	OFF	Disable beeping sound when fault/ alarm occurred
*Screen Saver	Enable	Show screen saver when timeout
	Disable	No screen save
*Timeout	1-30m	Timeout for showing screen saver
Contrast	0-100%	Adjust the contrast setting for the LCD panel
Brightness	OFF	No backlight
	Low, Medium, High	Adjust the backlight intensity
Temp Unit	°C	Display temperature in degree Celsius
	°F	Display temperature in degree Fahrenheit

* This product must be branded. Screen saver will be deactivated for brand less panel

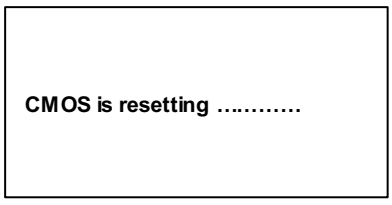
6.3 CMOS RESET

- CMOS reset allows user to reset some settings to default value such as:

  Password -> 0001
  Backlight -> Normal
  Buzzer -> ON
  Screen Saver -> Disable
  Timeout -> 5m
  Contrast -> 50%
  Brightness -> Medium
  Temp Unit -> °C

- Procedures

  1. Power OFF the panel
  2. Close the jumper JH2 with the provided jumper header
  3. Power ON the panel and the LCD panel should display as follow:



  4. Remove the jumper header (put the jumper header on 1 pin only), power OFF and then power ON the panel.

7. PROBLEM AND TROUBLESHOOTING

	Symptoms	Possible Cause	Troubleshooting
1	Panel gets hot abnormally	- Wiring fault in 12VDC supply	- Change a new panel module and turn ON the unit again after the verification
2	The LCD no display (blank screen)	- Wiring fault in 12VDC supply - No power supply - Voltage supply too low - Module defective	- Correct the wiring problem - Check the wiring and supply 12VDC to panel - Check the power source - Change a new panel module
3	- -' for all status (quite a long time)	-Panel cannot/ not yet received the information from chiller or FCU completely - That particular unit address is not recognized by the panel - Module defective	- Ensure the selected unit exits in the network - Ensure the wiring is correct - Ensure the wiring is not defective -Ensure the wiring has been isolated from high power cable - Select a coherent unit address on the panel (refer to 6.2.2) - Change a new module
4	ON/ OFF, COOL or HEAT button not function	- Software limitation - Module defective	- Ensure it is pressed (hold 1s) in [Summary Pages] not in other menu. - Change a new module
5	Cannot switch to HEATING mode	- Software limitation	- Ensure this mode is available in current "Model" of Chiller, please refer to 6.2.4
6	Cannot switch to BOILING mode	- Software limitation	- Ensure this mode is available in current "Model" of Chiller, please refer to 6.2.4
7	No "Manual Defrost" item	- Software limitation	- Ensure current running mode is HEATING
8	Cannot step inside [Set Parameter]	- Software limitation. Panel has not received all the information from chiller completely	- Refer to symptoms 3
9	7 Days Programmable Timer not function	- Software limitation. User did not activate the schedule	Control of Chiller: - Ensure the "Timer" in [Timer Menu] is set ENABLE Control of Chiller: - Ensure the 'Timer" in [Operation Menu] is set ENABLE
10	No beeping sound when new alarm occurred	- Software limitation. User did not set ON to the alarm buzzer	- Ensure "Buzzer" in [Panel Option] is set ON
11	No screen saver after timeout	- Software limitation. User did not set ENABLE to the screen saver	- Ensure "Screen Saver" in [Panel Option] I set ENABLE
12	Time always reset to 12:00am, 1st Jan 2000	- No backup battery - Energy of the backup battery is low	- Replace coin cell battery
13	Panel stop operation. Whole operation freezing (hang)	- Unstable power supply - Energy of the backup battery is low	- Power off the panel. Take out the backup battery as well. Replace with a new 3V coil cell battery if necessary. Put back the backup battery into the panel and power on again

8. APPENDIX

	General	Unit	Default	Min	Max	Resolution
G1	Model 0=Chiller 1=Heat pump, 2=Chiller/ Boiler, 3=Heat pump/ Boiler, 4=Chiller+Boiler 5=Heat pump+Boiller	Flag	4 (Chiller+Boiler)	0	2	1
G2	Number of compressor 1=1 compressor, 2=2 compressor, 3=3 compressor, 4=4 compressor	Flag	1	1	4	1
G3	On/Off input 0=disable, 1=enable	Flag	0 (disable)	0	1	1
G4	Coo/ Heat input 0=disable, 1=enable	Flag	0 (disable)	0	1	1
G5	External alarm input 0=disable, 1=enable	Flag	0 (disable)	0	1	1
G6	Water system for chiller network 0=independent, 1=modular	Flag	0 (disable)	0	1	1
G7	Unit number	Flag	0	0	50	1

	REGULATOR	Unit	Default	Min	Max	Resolution
R1	Cooling set-point	°C (F)	12 (53.6)	7(44.6)	20(68)	0.1
R2	Cooling differential	°C (F)	1.5* (2.7)	0.4 (0.7)	10 (18)	0.1
R3	Heating set-point	°C (F)	40 (104)	30(86)	50(122)	0.1
R4	Heating differential	°C (F)	1.5* (2.7)	0.4 (0.7)	10 (18)	0.1
R5	Minimum Cooling set-point	°C (F)	7 (44.6)	-20 (-4)	20(68)	1
R6	Maximum Cooling set-point	°C (F)	20 (68)	7(44.6)	40 (104)	1
R7	Minimum Heating set-point	°C (F)	30 (86)	-20 (-4)	50(122)	1
R8	Maximum Heating set-point	°C (F)	50 (122)	30(86)	90 (194)	1
R9	Auxiliary heater set-point(threshold below below heating set-point)	°C (F)	5 (9)	0 (0)	40 (72)	0.1
R10	Auxiliary heater differential	°C (F)	2 (3.6)	0.4 (0.7)	10 (18)	0.1
R11	Auto boiler set-point(threshold below Heating set-point)	°C (F)	5 (9)	0 (0)	40 (72)	0.1
R12	Auto boiler differential	°C (F)	2 (3.6)	0.4 (0.7)	10 (18)	0.1
R13	Auto boiler start time threshold	min	30	0	199	1

	COMPRESSOR	Unit	Default	Min	Max	Resolution
C1	Compressor minimum run time	sec	120	0	1990	10
C2	Compressor minimum stop time	sec	180	0	1990	10
C3	Time interval between two starts	sec	450	0	1990	10
C4	Start delay between two compressors	sec	15	0	199	1
C5	Pump on →compressor on delay	sec	180	0	1990	10
C6	Comp off →pump off delay	sec	60	0	199	10
C7	Discharge cut-off-set-point	°C (F)	120(248)	0 (32)	150 (302)	1

	CONDENSER DEFROST	Unit	Default	Min	Max	Resolution
D1	Start defrost temperature	°C (F)	0 (32)	-20 (-4)	14(57)	1
D2	End defrost temperature	°C (F)	14 (57)	0(32)	40 (104)	1
D3	Maximum duration of defrost cycle	min	10	1	40	1
D4	Defrost interval time	min	45	0	199	1
D5	Delay before defrosting	sec	0	0	1990	10
D6	Delay after defrosting	sec	120	0	1990	10

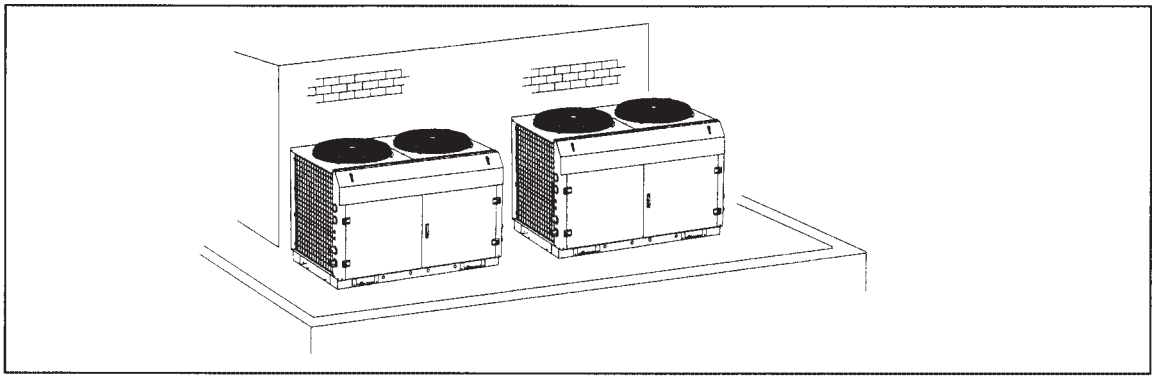
	COOL MODE ANTIFREEZE	Unit	Default	Min	Max	Resolution
A1	Antifreeze heater set-point	°C (F)	5 (41)	-40 (-40)	40 (104)	1
A2	Antifreeze heater differential	°C (F)	2 (3.6)	0.4 (0.7)	10 (18)	0.1
A3	Antifreeze sensor select 0=Leaving water, 1=Entering water	Flag	0 (leaving)	0	1	1
A4	Antifreeze alarm set-point	°C (F)	3 (37)	-40 (-40)	40(104)	1
A5	Antifreeze alarm differential	°C (F)	2 (3.6)	0.4 (0.7)	10 (18)	0.1

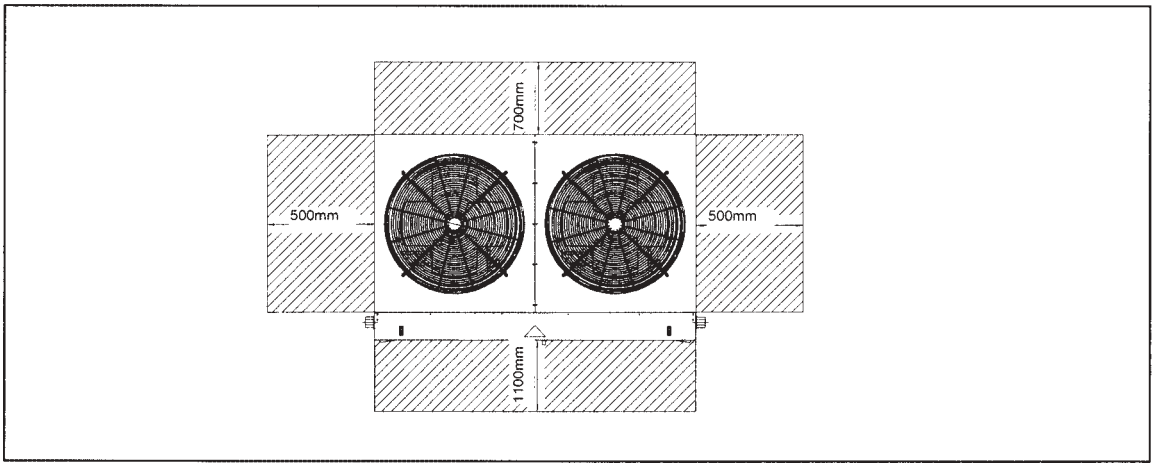
	ALARM AND CONTACT	Unit	Default	Min	Max	Resolution
P1	Flow switch confirmation time	sec	5	0	199	1
P2	Flow switch alarm delay at pump start	sec	120	0	199	1
P3	Low pressure alarm delay at compressor start up	sec	30	0	199	1
P4	Comp overload alarm reset type 0=Manual reset, 1=Auto reset	Flag	0 (manual)	0	1	1
P5	High pressure alarm reset type 0=Manual reset, 1=Auto reset	Flag	1 (auto)	0	1	1
P6	Low pressure alarm reset 0=Manual reset, 1=Auto reset	Flag	1 (auto)	0	1	1
P7	Fan overload alarm reset type 0=Manual reset, 1=Auto reset	Flag	1 (auto)	0	1	1
P8	Pump overload alarm reset type 0=Manual reset, 1=Auto reset	Flag	0 (manual)	0	1	1
P9	Flow switch alarm reset type 0=Manual reset, 1=Auto reset	Flag	0 (manual)	0	1	1
P10	Auxiliary alarm reset type 0=Manual reset, 1=Auto reset	Flag	1 (auto)	0	1	1
P11	Antifreeze alarm reset type 0=Manual reset, 1=Auto reset	Flag	1 (auto)	0	1	1
P12	Comp overload contact type 0=Normally close(NC) 1=Normally open(NO)	Flag	0 (NC)	0	1	1
P13	High pressure contact type 0=Normally close(NC) 1=Normally open(NO)	Flag	0 (NC)	0	1	1
P14	Low pressure contact type 0=Normally close(NC) 1=Normally open(NO)	Flag	0 (NC)	0	1	1
P15	Fan overload contact type 0=Normally close(NC) 1=Normally open(NO)	Flag	0 (NC)	0	1	1
P16	Pump overload contact type 0=Normally close(NC) 1=Normally open(NO)	Flag	0 (NC)	0	1	1
P17	Flow switch contact type 0=Normally close(NC) 1=Normally open(NO)	Flag	0 (NC)	0	1	1
P18	External alarm contact type 0=Normally close(NC) 1=Normally open(NO)	Flag	0 (NC)	0	1	1
P19	Defrost end contact type 0=Normally close(NC) 1=Normally open(NO)	Flag	0 (NC)	0	1	1

	INVERTER	Unit	Default	Min	Max	Resolution
V1	Compressor frequency	Hz	Auto	0	120	1
V2	EXV Opening	Flag	Auto	0	480	1
V3	Compressor manual setting 0= disable 1= enable	Flag	0(disable)	0	1	1
V4	EXV Manual setting 0=disable 1= enable	Flag	0(disable)	0	1	1
V5	Defrost Mode 0= disable 1= enable	Flag	0(disable)	0	1	1

12. INSTALLATION

A5ACV 100 / 135CR





SAFETY PRECAUTIONS

Before installing the air conditioner unit, please read the following safety precautions carefully

Warning

- Installation and maintenance should be performed by qualified persons who are familiar with local code and regulation, and experienced with this type of appliance.
- All field wiring must be installed in accordance with the national wiring regulation.
- Ensure that the rated voltage of the unit corresponds to that of the name plate before commencing wiring work according to the wiring diagram.
- The unit must be GROUNDED to prevent possible hazards due to installation failure.
- All electrical wiring must not touch the refrigerant piping, compressor or any moving parts of the fan motors.
- Confirm that the unit has been switched OFF before installing or servicing the unit.
- Do not touch the compressor or refrigerant piping without wearing gloves.

Caution

Please take note of the following important points when installing.

- **Do not install the unit where leakage of flammable gas may occur.**

If gas leaks and accumulates around the unit, it may cause fire ignition.

- **Ensure that the drainage piping is connected properly.**

If the drainage piping is not connected properly, it may cause water leakage which will dampen the furniture.

- **Do not overcharge the unit.**

This unit is factory pre-charged. Overcharge will cause over-current or damage to the compressor.

- **Ensure that the units panel is closed after service or installation.**

Unsecured panels will cause unit to operate noisily.

INSTALLATION LOCATION

- Installation work should be done by the authorized dealer or qualified contractor. Never install the unit yourself.
- Make sure there is sufficient airflow around the unit.
- Vibration isolator should be provided to reduce the vibration and noise of the unit.
- There should be sufficient space allocated for servicing and maintenance when installing the unit.

TRANSPORTATION

- The unit should be lifted using a crane. Ensure that the hanger belts are not touching the coil, top panel and front panel (use protective panel) as shown in Figure 1.
- The bolt of the base and channel support can be removed after putting the unit on the fixed location.

Figure 1

WATER PIPING AND FITTING

- All water pipe must be insulated to prevent capacity losses and condensation.
- Install a 40-60 mesh strainer to ensure water quality is good.
- Water pipe recommended are black steel pipe and copper pipe.
- During installation, the piping of the unit should be clamp before rotating the installation pipe to reduce the moment induce on the unit piping.
- Users are recommended to install the pipe and accessories as shown in Figure 2.
- An air vent must be installed at the highest position, while a drainage plug at the lowest position of the water circuit. Open the air vent to release any air trap in the water circuit.
- Run the clean water through the water inlet and operate the pump to drain out the dirty water. Clean the strainer after running the pump for 30 minutes.
- Fill up the water circuit after connecting the pipes and equipment. Check water leakage at all connections and joints. Do not start the unit when the system is leaking.
- To optimize the capacity of the system, ensure that the system is free of air bubbles. The air trapped in the system would make the system unbalanced.

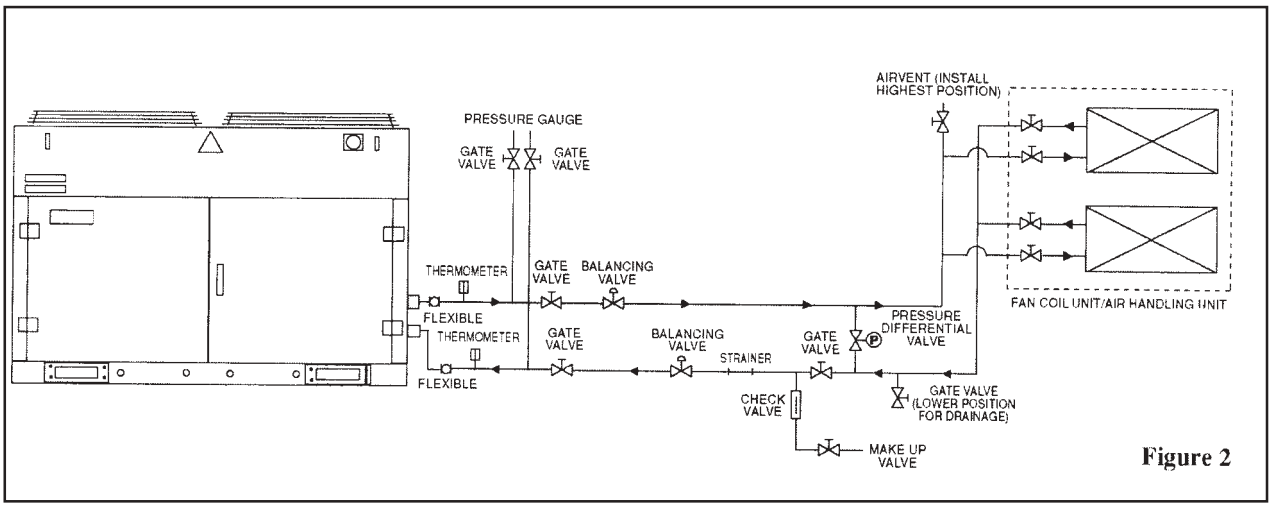


Figure 2

CAUTION

- Do not allow water to remain in the water pipes if the unit is not operating for a long period. Water must be drained out if the unit is not running during winter. Failing to do so would cause the pipe to crack.
- Do not drink the chilled water in the unit.

ELECTRICAL AND WIRING

- Refer to the wiring diagram provided on the unit when making electrical wiring.
- Do not ground any electrical equipment to the water piping.

Model	A5ACV 100CR	A5ACV 135CR
Voltage Range **	380 - 415V /3Ph /50Hz + N + ⏚	
Recommended Fuse * A	40	60
Power Supply Cable Size * mm^2 Number of Conductor	10 5	
Interconnection Cable Size * mm^2	1.5	

IMPORTANT : * The figures shown in the table are for information purpose only. They should be checked and selected to comply with the local/national codes of regulations. This is also subjected to the type of installation and conductors used.

** The appropriate voltage range should be checked with label data on the unit.

WARNING

- All terminals and connection must be tightened.
- Avoid any wires from touching the refrigerant pipe. Apply insulation if necessary.
- Avoid any wires from touching the moving components such as, fan motor, pump & compressor.

WATER PIPINGS SYSTEM SETUP

- Fill up the water circuit after connecing all the pipes and equipment. Perform leak checks for all connections and joints. Do not start the unit when the system is leaking.
- To optimize the capacity of the system, ensure that the system is free of air bubbles. The air trapped in the system would make the system unbalanced.

REFRIGERANT CIRCUIT

- All mini chiller units are pre-charged with R410A refrigerant. The only piping that needs to be done is the water piping from mini chiller (outdoor) to the fan coil unit (indoor).

SAFETY AND CAUTIONS

It is advisable to read through all the safety precautions before installing and commissioning of the unit.

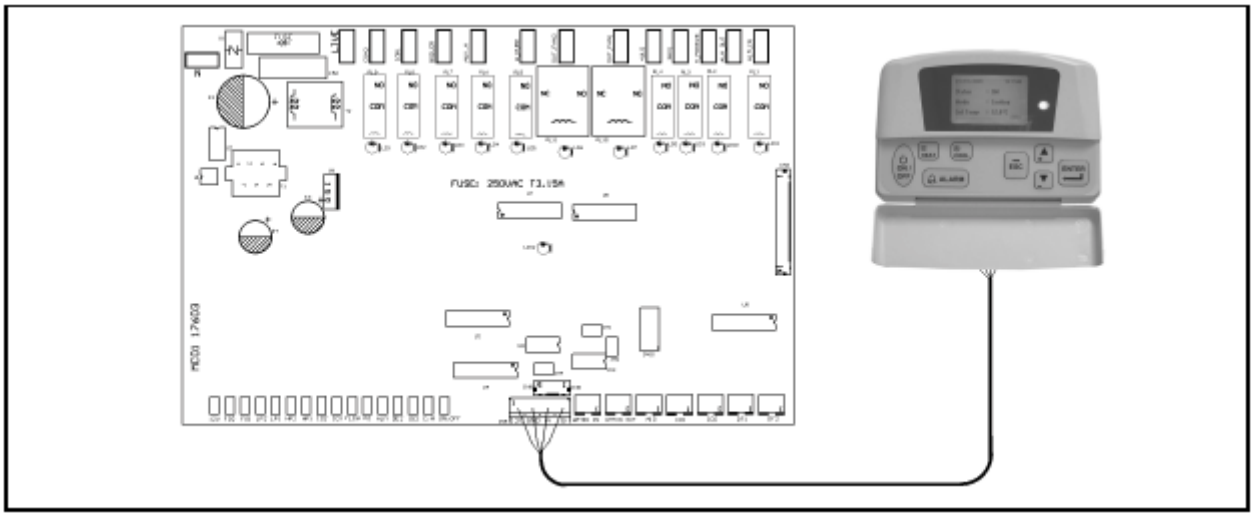
- Contact your dealer for installation, reinstallation or dismantling of unit. Improper handling of unit could result in leaks, electrical shock or unit malfunction.
- Use the controller handset to switch on/off the unit. Do not plug off the main power supply directly, it would cause the unit to breakdown.
- Improper connections and fastening could cause electric shock, short circuit and fire.
- Do not introduce foreign objects such as fingers, sticks etc. into the air inlet and outlet.
- Do not spray any chemical agents or flammable agents to the unit. It would cause fire or explosion.
- Do not climb or place objects on top of the mini chiller.
- Do not operate the chiller with wet hands. It would result in electric shock.
- Do not use fuse of different amperage than stated. Using wire, etc. to replace a fuse could cause equipment damage or fire.
- Provide proper grounding for the mini chiller. Do not connect the ground wire to gas piping, water piping, lighting rods or telephone ground wire. Improper grounding could cause electrical shock.
- Do not attempt to do any service or maintenance when unit is operating.
- Do not change the settings of the safety devices.
- Do not consume the chilled water in the unit.
- Do not allow water to remain in the water pipes if the unit is not operating for a long period. Water must be drained out if the unit is not running during winter. Failing to do so would cause the pipe to crack.
- Do not touch the aluminum fin coil. It would damage the coil or cause injury.

Caution

- R410A must be charged as liquid. Usually R410A cylinder is equipped with a dip-pipe for liquid withdrawal. If there is no dip-pipe, the cylinder should be inverted so as to withdraw liquid R410A from the valve.
- Do not top-up when servicing leak, as this will reduce the unit performance. Vacuum the unit thoroughly and then charge the unit with fresh R410A according to the amount recommended in the specification.

CONTROL OPERATION GUIDE

The unit is equipped with a microprocessor controller board. The microprocessor contorller is provided to give temperature control for the system by accurately measuring and controlling the water entering and water leaving temperature. The temperature setting in the unit is preset in the factory. It is not recommended to change the setting unless necessary. A wired contoller handset is connected to the microprocessor board. Every parameter setting and reading can be observed from the LCD of the handset.



1. Handset location
   The handset is located on a metal bracket behind the right door panel.
2. LED Display (microprocessor board)
   The keypad LED will light up when the unit is turned on.
3. LCD display (contoller handset)
   During normal operations, the LCD can display the entering water temperature, the leaving water temperature, the entering water set point temperature, compressor on or off status and outdoor air temperature. When malfunctioning occurred, the LCD would blink. The display would show the faulty parameter and the date and time of the occurance.
4. Controller functioning specification
   There is a 3 minute delay for the compressor and fan motor to restart (default setting). During defrosting, fan motor is not running.

13. SPECIAL PRECAUTIONS FOR R410A

SPECIAL PRECAUTIONS WHEN DEALING WITH REFRIGERANTR R410A UNIT

1) WHAT IS NEW REFRIGERANT R410A?
R410A is a new HFC refrigerant which does not damage the ozone layer. The working pressure of this new refrigerant is 1.6 times higher than conventional refrigerant (R22), thus proper installation / servicing is essential.

2) COMPONENTS
Mixture of composition by weight : R32(50%) and R125(50%)

3) CHARACTERISTIC
- R410A liquid and vapor components have different compositions when the fluid evaporates or condenses. Hence, when leak occurs and only vapor leaks out, the composition of the refrigerant mixture left in the system will change and subsequently affect the system performance. **DO NOT** add new refrigerant to leaked system. It is recommended that the system be evacuated thoroughly before recharging with R410A.
- When refrigerant R410A is used, the composition will differ depending on whether it is in gaseous or liquid phase.
  Hence when charging R410A, ensure that only liquid is being withdrawn from the cylinder or can. This is to make certain that only original composition of R410A is being charged into the system.
- POE oil is used as lubricant for R410A compressor, which is different from the mineral oil used for R22 compressor.
  Extra precaution must be taken to avoid exposing the R410A system to moist air.

4) CHECK LIST BEFORE INSTALLATION / SERVICING
- Tubing
  Refrigerant R410A is more easily affected by dust or moisture compared with R22, make sure to temporarily cover the ends of the tubing prior to installation
- Compressor oil
  No additional charge of compressor oil is permitted.
- Refrigerant
  No other refrigerant other that R410A
- Tools (size of service port is different from R22 system)
  Tools specifically for R410A only (must not be used for R22 or other refrigerant)
  i) Gauge manifold and charging hose
  ii) Gas leak detector
  iii) Refrigerant cylinder/charging cylinder
  iv) Vacuum pump c/w adapter
  v) Flare tools
  vi) Refrigerant recovery machine

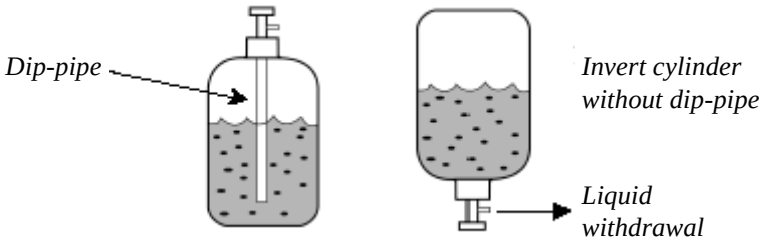
5) HANDLING AND INSTALLATION GUIDELINES
Like R22 systems, the handling and installation of R410A system are closely similar. All precautionary measures; such as ensuring no moisture, no dirt or chips in the system, clean brazing using nitrogen, and thorough leak check and vacuuming are equally important requirements. However, due to its hydroscopic POE oil, additional precautions must be taken to ensure optimum and trouble-free system operation.

a) During installation or servicing, avoid prolong exposure of the internal part of the refrigerant system to moist air. Residual POE oil in the piping and components can absorb moisture from the air.

b) Ensure that the compressor is not expose to open air for more than the recommended time specified by its manufacturer (typically less than 10 minutes). Removed the seal-plugs only when the compressor is about to be brazed.

c) The system should be thoroughly vacuumed to 1.0 Pa (700mmHg) or lower. This vacuuming level is more stringent than R22 system so as to ensure no incompressible gas and moisture in the system.

d) When charging R410A, ensure that only liquid is being withdrawn from the cylinder or can. This is to ensure that only the original composition of R410A is being delivered into the system. The liquid composition can be different from the vapor composition.



e) Normally, the R410A cylinder or can is being equipped with a dip-pipe for liquid withdrawal. However, if the dip-pipe is not available, invert the cylinder or can so as to withdraw liquid from the valve at the bottom.

14. SERVICING AND MAINTENANCE

SERVICING

Servicing or maintenance of these unit must be carried out by experienced personnel with specific training in refrigeration. Repeated check the safety devices and continuous cycling of control components must be analyzed and corrected before being reset.

The simple design of the refrigeration circuit totally eliminates potential problems during normal unit operation. No maintenance work is needed on the refrigeration circuit as long as the unit is operating normally.

Ease of maintenance has been taken into consideration during the design stage such that the unit is easily accessible for servicing and maintenance. By accessing from the front panel of the unit, servicing and maintenance operation can be done easily. The electrical components are especially easy to access since it is located in the terminal box on top of the front panel.

Under normal circumstances, these chiller require only a check and cleaning of air intake through the coil surface only. These can be done monthly or quarterly depending on the surrounding where the units are installed.

When the surrounding is very oily or dusty, then the coils must be regularly cleaned by a qualified air conditioner service technician to ensure sufficient cooling capacity and efficient unit operation. The normal life span might be shortened if no proper service is provided.

MAINTENANCE

For consistent performance and durability, always conduct proper and regular maintenance to the unit.

For prolong period of operation time, the heat exchanger will become dirty impairing its effectiveness and reducing the performance of the units. Consult your local dealer about the cleaning of the heat exchanger.

No major maintenance or servicing needed for the internal water circuit in the unit except the water pump failure. It is advised that regular check on the stainer to be conducted and change the water stainer if it is dirty or choked.

Always check the water level in the system, in order to protect the moving components in the hydraulic kit from over heating and excessive wear.

15. TROUBLESHOOTING

When any malfunction is occurred, immediately switch off the power supply to the unit, and contact the local dealer, if necessary. Some simple troubleshooting tips are given below:

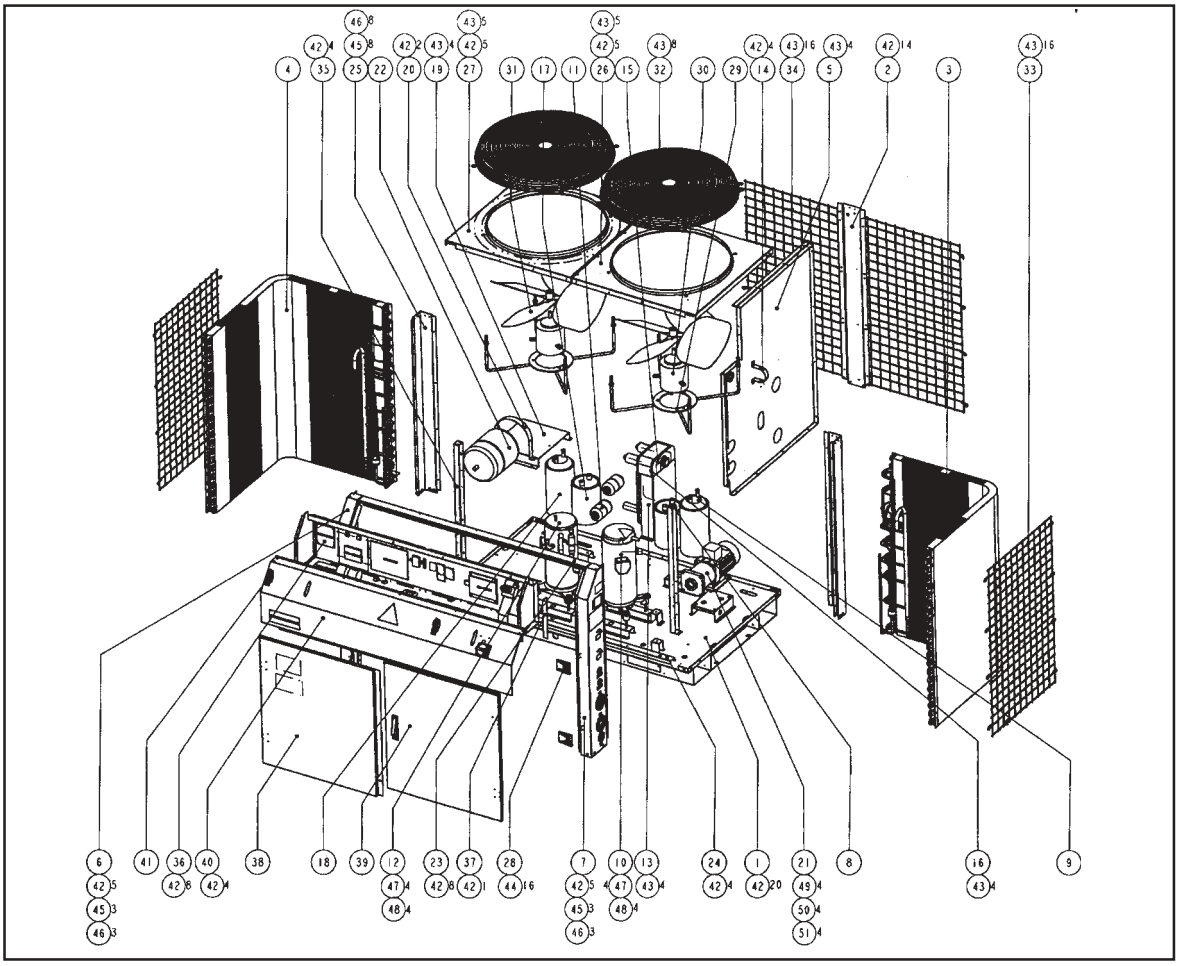
SYMPTONS	PROBLEM CAUSES	REMEDIAL ACTION
1. Compressor does not start.	• No power supply. • Fuses blown or automatic circuit break down open. • Defective contactor or coil. • Unit is stopped because safety device has tripped. • Loose wires. • Compressor faulty.	• Check power supply. • Look for short circuit or grounded wires in motor windings. Replace fuses and reset circuit breakers when the fault has been corrected. Check tightness and soundness of all electrical connections. • Repair or replace. • Determine the type of safety shut down and correct the default before the unit is restarted. • Check wire connections and tighten terminal screws. • Contact local dealer.
2. Fan does not work.	• No power supply. • Fan motor faulty.	• Check power supply. • Contact local dealer
3. Unit does work, but insufficient cooling.	• Thermostats setting too high. • Condenser coil dirty. • Obstacle blocking air inlet or outlet of the unit. • Insufficient refrigerant in the system. • Improper water flow rate, • Water in the system is contaminated.	• Reset thermostat. • Contact local dealer. • Remove obstacles. • Contact local dealer. • Contact local dealer. • Contact local dealer.
4. Flow switch error.	• No water in the system. • Low water level in the system.	• Check water supply. • Check water supply.

ERROR CODE

ERROR DISPLAY	ERROR DESCRIPTION	RESET (default)	CONTROL MEASURE				
			PUMP	SYSTEM1		SYSTEM 2	
				COMP	FAN	COMP	FAN
Phase Missing	Phase missing	Manual	OFF	OFF	OFF	OFF	OFF
Phase Seq Error	Wrong phase sequencing	Manual	OFF	OFF	OFF	OFF	OFF
Memory Error	EEPROM read/write error	Auto	OFF	OFF	OFF	OFF	OFF
Entering Water sensor Open/Short	BPHE water in sensor error	Auto	OFF	OFF	OFF	OFF	OFF
Leaving water sensor Open/Short	BPHE water out sensor error	Auto	OFF	OFF	OFF	OFF	OFF
Outdoor Air sensor Open/Short	Ambient temp sensor error	Auto	OFF	OFF	OFF	OFF	OFF
Water Flow Error	Cv contact opened	Manual	OFF	OFF	OFF	OFF	OFF
Cool Mode Antifreeze	Leaving water temp too low	Auto	OFF	OFF	OFF	OFF	OFF
OV/UN Voltage	Comp High Voltage (>490V)	<460V, Auto	OFF	OFF	OFF	OFF	OFF
OV/UN Voltage	Comp Low Voltage (<310V)	>340V, Auto	OFF	OFF	OFF	OFF	OFF
Pump Overload	Pump OLP closed	Auto	OFF	OFF	OFF	OFF	OFF
IPM Error	IPM over-current or overheat	Auto	-	OFF	OFF	-	-
Comp 1 Overload	Comp 1 overload	Auto	-	OFF	OFF	-	-
Comp 1 Discharge Overheat	Comp 1 discharge overheat	Auto	-	OFF	OFF	-	-
High Pressure 1	System 1 high pressure	Auto	-	OFF	OFF	-	-
Low Pressure 1	System 1 low pressure	Auto	-	OFF	OFF	-	-
Comp 1 Defrost sensor Open/Short	Coil out system 1 sensor error	Auto	-	OFF	OFF	-	-
Comp 1 Suct sensor Open/Short	Suction comp system 1 sensor error	Auto	-	OFF	OFF	-	-
Comp 1 Discharge sensor Open/Short	Discharge comp system 1 sensor error	Auto	-	OFF	OFF	-	-
Coil 1 Inlet Temp Open/Short	Coil In system 1 sensor error	Auto	-	OFF	OFF	-	-
V-Hx Inlet Temp sensor Open/Short	BPHE refrigerant in sensor error	Auto	-	OFF	OFF	-	-
V-Hx Outlet Temp Open/Short	BPHE refrigerant out sensor error	Auto	-	OFF	OFF	-	-
Comp 2 Overload	Comp 2 overload	Auto	-	-	-	OFF	OFF
High Pressure 2	System 2 high pressure	Auto	-	-	-	OFF	OFF
Low Pressure 2	System 2 low pressure	Auto	-	-	-	OFF	OFF
Comp 2 Defrost sensor Open/Short	Coil out system 2 sensor error	Auto	-	-	-	OFF	OFF
Comp 2 Discharge sensor Open/Short/Overheat	Discharge comp system 2 sensor error	Auto	-	-	-	OFF	OFF

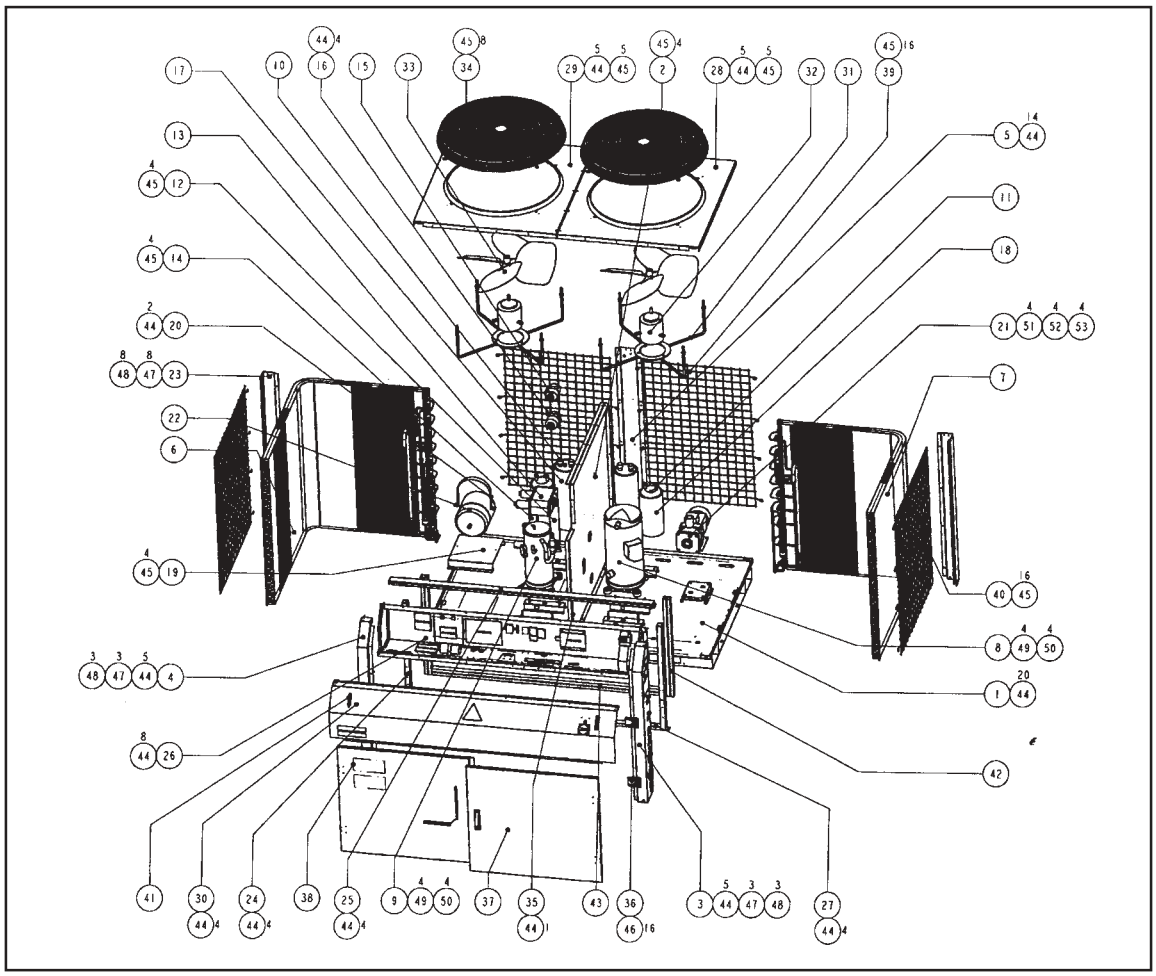
16. EXPLODED VIEW AND PART LISTS

MODEL : A5ACV100CR



NO	DESCRIPTIONS	PART NO	NO	DESCRIPTIONS	PART NO
1	ASSY, PANEL BASE MAIN	50 01 4 077857	27	PANEL, ORIFICE LEFT	01 01 4 054979
2	ASSY, COIL SUPPORT	50 01 4 077861	28	HINGE, DOOR	01 02 9 016097
3	ASSY, COIL RIGHT	50 01 4 077891	29	BRACKET, MOTOR	01 01 4 055742
4	ASSY, COIL LEFT	50 01 4 077893	30	MOTOR	03 03 9 015509
5	ASSY, PARTITION PANEL	50 01 4 077863	31	FAN BLADE 24”	03 02 9 015512
6	ASSY, LEFT PANEL	50 01 4 078226	32	FAN GUARD	01 02 4 055748
7	ASSY, RIGHT PANEL	50 01 4 078227	33	COIL GUARD, LEFT/RIGHT	01 02 4 055744
8	ACCUMULATOR	02 11 9 015506	34	COIL GUARD, BACK	01 02 4 055745
9	LIQUID RECEIVER	02 11 9 024280	35	PANEL, TERMINAL BOX SUPPORT	01 01 4 054717
10	COMPRESSOR ASSY	50 04 9 024063	36	ASSY, TERMINAL BOX MAIN	50 04 4 078888
11	FILTER DRIER	02 16 4 034987	37	PLATE, PARTITION	01 01 4 056603
12	COMP. ASSY INVERTER	50 04 9 024220	38	ASSY DOOR PANEL LEFT MAIN	50 01 4 077898
13	BRACKET, BPHE	01 01 4 077865	39	ASSY, DOOR PANEL RIGHT MAIN	50 01 4 074753
14	CLIP, FILTER DRIER	01 01 4 054752	40	ASSY, FRONT PANEL MAIN	50 01 4 059205
15	ASSY, BPHE	50 02 4 077897	41	ASSY, PANEL HOOK	50 12 9 016096
16	CLAMP, BPHE	01 01 4 077866	42	SCREW, PTT SUS M4X12	07 01 9 010836
17	INS, ACCUMULATOR BODY	06 01 4 056072	43	SCREW, JD COATING P.T. M5X16	07 01 9 010839
18	INS, LIQUID RECEIVER BODY	06 01 4 056068	44	SCREW, TRUST HEAD PHILIP	07 01 4 002221
19	SUPPORT, EXPANSION TANK	01 01 4 054712	45	BOLT HEX M8X20	07 03 4 003822
20	CLAMP, EXPANSION TANK	01 01 4 054754	46	WASHER, SPRING	07 04 4 002246
21	WATER PUMP CH4-40	04 13 9 021185	47	NUT, C/W FLANGE M8	07 02 4 059149
22	TANK, EXPANSION 8L	05 01 4 001497	48	SPACER	-
23	PANEL, SUPPORT FRONT	01 0 1 4 054749	49	SCREW, PHILP PAN HEAD	07 01 4 010157
24	SUPPORT, FLUTTED WIRE	01 01 4 054762	50	WASHER, SPRING	07 04 4 003769
25	STRUCTURE, BACK L/R	01 01 4 054710	51	WASHER, FLAT	07 01 4 003768
26	PANEL, ORIFICE RIGHT	01 01 4 054980			

MODEL : A5ACV135CR



NO	DESCRIPTIONS	PART NO	NO	DESCRIPTIONS	PART NO
1	ASSY, PANEL BASE MAIN	50 01 4 079125	28	PANEL, RIGHT ORIFICE	01 01 4 054720
2	ASSY, PARTITION PANEL	50 01 4 079128	29	PANEL, LEFT ORIFICE	01 01 4 054719
3	ASSY, RIGHT PANEL	50 01 4 078227	30	ASSY, FRONT PANEL MAIN	50 01 4 059202
4	ASSY, LEFT PANEL	50 01 4 078226	31	BRACKET, MOTOR	01 01 4 055741
5	ASSY, COIL SUPPORT	50 01 4 077861	32	MOTOR	03 03 9 018421
6	ASSY, COIL LEFT	50 02 4 079161	33	FAN BLADE 26”	03 02 9 015513
7	ASSY, COIL RIGHT	50 02 4 079163	34	FAN GUARD	01 02 4 055747
8	COMPRESSOR ASSY	50 04 9 024296	35	PLATE, PARTITION	01 01 4 056603
9	COMP. ASSY INVERTER	50 04 9 024220	36	HINGE, DOOR	01 02 9 016097
10	ACCUMULATOR	02 11 9 015245	37	ASSY DOOR PANEL RIGHT MAIN	50 01 4 074751
11	LIQUID RECEIVER	02 11 9 024280	38	ASSY, DOOR PANEL LEFT MAIN	50 01 4 079133
12	BRACKET, BPHE	01 01 4 077865	39	COIL GUARD, BACK	01 02 4 055743
13	ASSY, BPHE	50 02 4 079159	40	COIL GUARD, LEFT/RIGHT	01 02 4 055746
14	CLAMP, BPHE	01 01 4 079131	41	ASSY, PANEL HOOK	50 12 9 016096
15	FILTER DRIER	02 16 4 034987	42	PVC, TRUNKING	12 02 4 057612
16	CLIP, FILTER DRIER	01 01 4 054752	43	PVC, TRUNKING	12 02 4 057615
17	INS, ACCUMULATOR BODY	06 01 4 056067	44	SCREW, PTT SUS M4X12	07 01 9 010836
18	INS, LIQUID RECEIVER BODY	06 01 4 056068	45	SCREW, JD COATING P.T.	07 01 9 010839
19	SUPPORT, EXPANSION TANK	01 01 4 054712	46	SCREW, PHILP PAN HEAD	07 01 4 002221
20	CLAMP, EXPANSION TANK	01 01 4 054754	47	BOLT HEX M8X20	07 03 4 003822
21	WATER PUMP CH8-30	04 13 9 021186	48	WASHER, SPRING	07 04 4 002246
22	TANK, EXPANSION 8L	05 01 4 001497	49	NUT, C/W FLANGE M8	07 02 4 059149
23	STRUCTURE, BACK L/R	01 01 4 054710	50	SPACER	-
24	PANEL, TERMINAL BOX SUPPORT	01 01 4 054717	51	SCREW, PHILIP PAN HEAD	07 01 4 010157
25	PANEL, SUPPORT FRONT	01 01 4 054730	52	WASHER, SPRING	07 04 4 003769
26	ASSY, TERMINAL BOX MAIN	50 04 4 079552	53	WASHER, FLAT	07 01 4 003768
27	SUPPORT, WIRE BOARD	01 01 4 054724			

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