



OWNERS MANUAL

COOLPAK CP AIR COOLED RANGE

MODEL PURCHASED

SERIAL NUMBER

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Contents

	<u>Page</u>
1) Overview	2
2) Application.....	2
3) Installation Position of Chiller	3
4) Maintenance	4
5) First time operation	5
6) Chiller start up	6
7) Digital Temperature Controller	7
8) Temperature Set-point adjustment	7
9) Technical table	8-9
10) Troubleshooting	10
11) Refrigeration Schematic of air cooled chiller.....	12
12) Chiller options.....	13
 Supplied separately	
13) Electrical drawings CP5 to CP15.....	13
14) Electrical drawings CP20 to CP130	14

1) **Overview**

Thank you for selecting a Coolpak process water chiller. In order to use the chiller correctly and efficiently, please read the following instructions in detail.

This chiller is designed to be safe provided that it is installed, operated and maintained correctly.

The chiller contains electrical and moving components. It therefore must be isolated from the electrical supply before commencing installation works.

All maintenance must be carried out by suitably qualified technicians who have a good knowledge of all necessary precautions associated with refrigeration equipment.

The liquids to be cooled must be suitable for the application of the chiller and we strongly recommend that the liquids used are water or mixtures of glycol and water.

The cooling medium must not contain any flammable substances.

The chiller contains refrigerants under pressure. If the chiller is no longer required it is essential that the refrigerant is reclaimed from the unit before disposal.

If the chiller is placed out-doors it must be undercover for protection against direct rain and sunlight.

Connection hoses must be suitable for the minimum and the maximum temperature and maximum pressure of the chiller.

Fleming Dynamic Chillers cannot be held responsible for liabilities created by substandard electrical wiring and installation practices external to the chiller.

Every chiller is crated prior to shipment to avoid damage in transit. Before accepting delivery, check the overall equipment condition for any visible damage. The chiller should be inspected for hidden damages at the first available opportunity.

Please do not hesitate to ask any questions pertinent to the chiller by contacting Fleming Dynamic Chillers specifying the serial No. as indicated on the nameplate.

2) **Application**

Coolpak is designed to meet the cooling requirements of all machinery and processing equipment across all industry.

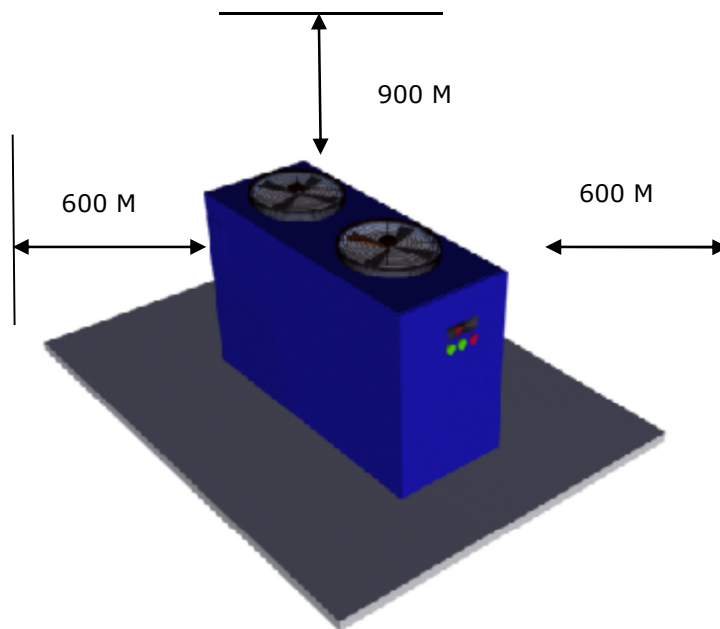
When in operation, water of a controlled temperature is circulated through the cooling channels of the process. The process connected to the chiller must be able to stand the maximum pump pressure of the chiller. In the standard range the temperature range is 7°C to 30°C.

3) **Installation Position of chiller**

When installing indoors it is important to provide ample space around the chiller in order for the system to breathe as it will reject significant amounts of heat.

The condenser inlets must have sufficient air supply and hot air from exhaust cannot be sucked back into the chiller as this will reduce the chillers performance.

If the chiller is placed in a small room with low floor-to-ceiling height the hot air must be ducted from the room and the chiller. The cross section of the air duct must be at least the same size as the air outlet(s) of the chiller.



4) **Maintenance**

The power supply must be switched off before cleaning the chiller. The condenser should be cleaned frequently by blowing compressed air in the opposite direction to that of the air direction of the fan. The cleaning interval depends on the location of the chiller.

We strongly recommend all Coolpak customers to consider a preventative maintenance service by our trained Coolpak technicians to ensure the chiller remains in peak operational condition. This eliminates costly down time and increases the operational life of the chiller.

Standard annual preventative includes approximately four to six hours onsite labour plus associated cost for induction, consumables or company regulation PPE (personal protection equipment) .

Our standard preventative maintenance consists of the following checks

• Operation	Frequency
• Clean Condenser Coil	6 monthly
• Check For Evidence Of Moisture In Refrigerant	6 monthly
• Check For Refrigerant Blockages	6 monthly
• Check For Evidence Of Refrigerant Leaks	6 monthly
• Check Refrigerant Operating Pressures	6 monthly
• Check Flow Rates & Pressure In Water Circuit	6 monthly
• Check For Integrity Of Electrical Connections	6 monthly
• Check Current Draw On All Motors	12 monthly
• Clean Out Buffer Tank	12 monthly

5) **First Time Operation**

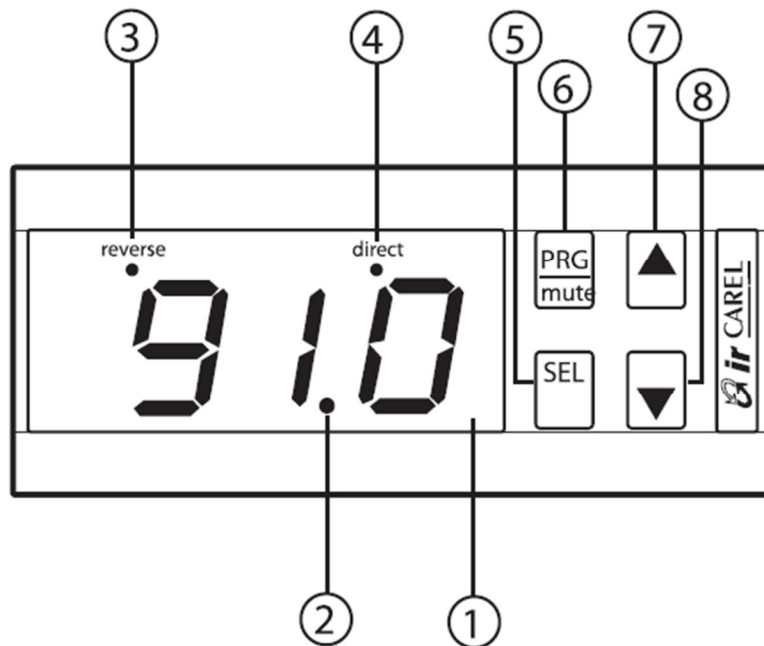
Before first time operation, please confirm the following:

1. Check the nameplate to confirm the correct supply voltage.
2. The electrical connection to the Chiller must be carried out by a licensed Electrician
3. On power up please check the phase rotation and or loss relay have both an orange light and green light for the initial start-up. If both lights on the phase relay are not illuminated the system will NOT START.
4. If both lights are not on then one of the three phases must be rotated or each phase must be tested for presence.
5. Single phase machines Voltage: 220~240V/50HZ; L is the line phase (active) the neutral wire is N and the earthed wire is E.
6. On three phase machines voltage 415V/50HZ the phase terminals are R S T Only a neutral connection may be required pending the capacity of the machine. It is important to check if the terminal strip as a neutral terminal
7. The chilled water piping must be connected to the machine that it serves with suitably sized water pipe and insulated pending the operating temperature of the machine.
8. Before starting the water pump, please ensure that water has been added to the system and that the air has been bled. To bleed the air from the pump the nut must be carefully loosened on the pump housing to enable the air to escape from the system.
9. Once the pump has started is should be carefully checked for the correct running direction to ensure correct operation.
10. The chiller must not be placed close to machines or plant equipment emitting high quantities of heat.
11. Check that none of the air inlets in front of the condensers are covered.

6) **Chiller start up**

1. Press the "ON / OFF" button to start the chiller. When the green RUN indicator light illuminates, the chilled water pump is started.
2. The start of the compressor and the condenser fan is delayed whereby if there is one compressor the delay is approximately 3 minutes. If there are two compressors the second compressor will start shortly after the first.
3. The pump will run continuously and the return chilled water temperature will be monitored and compared with the temperature set point. When the temperature rises 2°C above the set point the compressor and condenser fan will be started.
4. If the red fault light appears either the pump and/or the compressor will be stopped immediately. Please refer to the fault table at the rear of this manual.
5. To shut down the system press the "ON / OFF" button to turn off the machine. If the system is not in use for a long period of time we recommend that the power be isolated and the cooling media drained from the tank.

7) Temperature Controller



Temperature Controller Operation

- 1 Display: shows the value measured by the connected temperature sensor. In the event of an alarm condition the sensor value will be displayed alternately with the codes of the active alarms. When programming the controller, the display shows the parameter codes being introduced and their values.
- 2 Decimal Point LED: lights up when the controlled parameter is displayed.
- 3 Reverse LED: - This is not applicable to our range of equipment.
- 4 Direct LED: flashes when the compressor and condenser fan has been enabled

8) Temperature Set-point adjustment

- 5 SEL Button: displays and/or allows you to select the Set-point. To change the Set-point press the SEL button .Use the up ▲ and down ▼ arrow buttons to change the value. Once the temperature Set-point has been changed push the SEL button to hold the Set-point change and return you to the main display.

PLEASE NOTE: We strongly recommend that this temperature be set not less than 10°C as it is displaying the return chilled water temperature.

9) Technical Table

All cooling capacities are based on an ambient operating environment of 40°C.

MODEL		CP-3	CP-5	CP-7	CP-12	CP-15	CP20
Cooling capacity @ 5°C	KW	2.38	4.75	6.84	11.4	13.49	18.05
Cooling capacity @ 10°C	KW	2.47	5.2	7.6	12.45	15.01	19.95
Cooling capacity @ 15°C	KW	2.57	5.67	8.55	14.13	17.01	23.4
Cooling capacity @ 20°C	KW	3.24	6.48	10.17	16.38	18.9	27.9
Input power	KW	1.42	2.35	3.55	5.85	6.36	9.31
Power Requirement		1PH - 240V - 50Hz		3PH - 415V - 50Hz (Three Phase Plus Neutral)			
Maximum current draw	A	6.9	4.7	5.8	9.4	10.9	15.5
Refrigerant	Type	R407C					
	KG	1	2	2.3	3.6	4.5	2.8*2
	Type of control	TX Valve					
Compressor	Type	hermetic rotary			hermetic scroll		
	Power (KW)	0.89	1.52	2.68	4.63	5.2	3.43*2
condenser	Air flow (m ³ /h)	1000	2000	3000	5000	6000	8000
Evaporator	Water flow (m ³ /h)	0.56	1.53	1.53	2.55	3.02	3.93
	Inlet/Outlet connections	1/2"	1/2"	1"	1"	1"	1"
	Type	Stainless Steel Coil in Stainless steel tank					
Tank Volume	Ltr	20	40	50	70	70	120
Pump	Flow (l/h)	560	2120	2120	2650	4470	4470
	Pressure (kpa)	350	350	350	350	350	350
	kw	0.45	0.56	0.56	0.66	1	1
Dimensions L/W/H	Length (mm)	750	930	1020	1140	1140	1310
	width (mm)	550	520	520	560	560	720
	height (mm)	800	975	975	1040	1040	1270
Weight	Kg	85	100	135	175	180	310

MODEL		CP-25	CP-30	CP-40	CP-50	CP-60	CP-80	CP-100	CP-130
Cooling capacity @ 5°C	KW	22.8	26.98	30.4	43.7	53.2	65.5	87.4	104.5
Cooling capacity @ 10°C	KW	24.89	30.02	34.2	49.4	60.8	74.1	100.7	115.9
Cooling capacity @ 15°C	KW	28.26	34.02	38.16	56.16	68.4	85.14	117	144
Cooling capacity @ 20°C	KW	32.76	37.8	46.8	63.36	80.1	90.9	140.4	171
Input power	KW	12.5	13.65	17.2	22.05	24.29	33.4	43	54
Power Requirement	3PH - 415V - 50Hz (Three Phase Plus Nuetral)								
Maximum current draw	A	17.9	20.2	26.7	35.7	38.7	54	72	86.1
Refrigerant	Type	R407C							
	KG	3.6*2	4.5*2	6*2	7.5*2	9.2*2	11.3*2	14.5*2	18.6*2
	Type of control	TX Valve							
Compressor	Type	hermetic scroll							
	Power (KW)	4.63*2	5.2*2	6.75*2	9*2	10.1*2	13.6*2	17.7*2	22*2
condenser	Air flow (m ³ /h)	10000	12000	15000	20000	25000	30000	40000	50000
Evaporator	Water flow (m ³ /h)	5.11	5.89	7.86	10.22	10.22	16.33	21.29	26.3
	Inlet/Outlet connections	1"	1-1/2"	2"	2"	2-1/2"	2-1/2"	2-1/2"	3"
	Type	Copper Coil in Stainless steel tank							
Tank Volume	Ltr	200	200	270	350	350	420	580	580
Pump	Flow (l/h)	5300	6900	8200	10800	10800	20000	20000	31800
	Pressure (kpa)	350	350	350	350	350	350	350	350
	kw	1.1	1.29	1.56	2.15	2.15	4	4	5.5
Dimensions L/W/H	Length (mm)	1680	1680	1800	2000	2000	2200	2000	2200
	width (mm)	810	810	990	1130	1130	1100	1500	1700
	height (mm)	1280	1280	1680	1720	1914	2000	2000	2000
Weight	Kg	450	530	750	835	920	1150	1350	1600

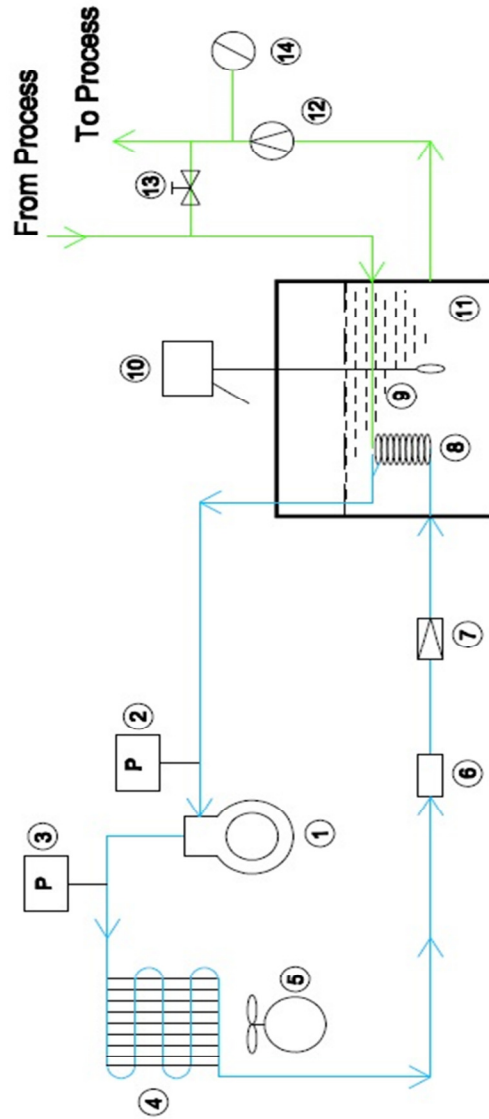
10) Troubleshooting

State	Reason	Solution
Power connected but unit cannot be operated	<ul style="list-style-type: none"> • Check Fuse • Faulty Reverse relay 	<ul style="list-style-type: none"> • Replace fuse • Replace reverse relay
Overload is activated	<ul style="list-style-type: none"> • Power supply has grounded or short in electrical circuit. • Faulty compressor, pump or motor. 	<ul style="list-style-type: none"> • If all these items are working, the overload switch may be faulty
Reverse phase	<ul style="list-style-type: none"> • Pump, compressor or fan is running reversed • Missing one phase 	<ul style="list-style-type: none"> • Exchange any two phases of the power supply • Test the three-phase source with a multimeter • Check power supply
Over temperature indicator is on	<ul style="list-style-type: none"> • The high pressure switch has shut off • The high pressure switch is faulty 	<ul style="list-style-type: none"> • Please deal with the problem according to Footnote 1, clean the condenser • Replace pressure switch
Low refrigerant	<ul style="list-style-type: none"> • Low-pressure switch has shut itself off due to low refrigerant level • Evaporator has frozen • Faulty temperature controller or transducer 	<ul style="list-style-type: none"> • Deal with the problem according to Footnote 2 • Check whether the expansion water tank is low on water and the circulating pump is running or not; if that is not the problem the chiller should be stopped and restarted or reset the low-pressure switch by pressing "RESET" • If the evaporator has frozen, douse with warm water to melt the ice after drawing off the iced water. • Replace evaporator or repair it; • <u>Note:</u> Do not use hard implements to break the ice, because that could damage the copper tube or damage the compressor
Overload and the fault indicator is lit	<ul style="list-style-type: none"> • Abnormal voltage • Damaged compressor bearing, motor, or pump • The overload relay is too small or its set value is too low • Bad circuit joint 	<ul style="list-style-type: none"> • Decreasing or unstable voltage. Adjust the voltage and check for missing phase • Replace bearing. • Deal with the problem according to Footnote 1 • Change to larger overload relay, or adjust the normal value higher
The fault indicator is not on, but the compressor is not running	<ul style="list-style-type: none"> • The protection device has shut itself off. 	<ul style="list-style-type: none"> • Please deal with the problem according to Footnote 4
Water in the		

<p>water tank will not cool, or the low pressure switch has shut off</p>	<ul style="list-style-type: none"> • The chiller is undersized • Low refrigerant • The water tank is contaminated by the refrigerant gas • Damaged valve • Temperature is set too high • Faulty temperature indicator • Faulty temperature sensor 	<ul style="list-style-type: none"> • Replace with a higher capacity machine • Deal with the problem according to Footnote 3 • Clean tank, re-gas after dealing with the problem with drying agent for the expansion valve while in vacuum • Change the compressor, check according to Footnote 3 • Adjust the temperature lower • Replace switch • If the efficiency is low, it can be dealt according to Footnote 1 • Replace sensor
<p>Low Water level</p>	<ul style="list-style-type: none"> • Insufficient water in tank • Low water flow 	<ul style="list-style-type: none"> • Add water into the water tank • Check that each valve is fully open

11) Refrigeration Schematic - Air Cooled Chiller

**COOLPAK "AIR COOLED"
REFRIGERATION SCHEMATIC**



LEGEND:

- 1. Compressor
- 2. LP Cut Out (Low pressure)
- 3. HP Cut Out (High pressure)
- 4. Condenser
- 5. Condenser Fan (s)
- 6. Liquid Line Dryer
- 7. TX Valve
- 8. Evaporator
- 9. Low Water Level
- 10. Digital Temperature Controller
- 11. Stainless Steel Tank
- 12. Multistage Pump
- 13. By-Pass
- 14. Water Pressure Gauge

Water Circuit
Refrigeration Circuit

FLEMING Dynamic Chillers Your process water chiller specialist	coolpak
	CoolPak Air Cooled Refrigerator Schematic
	2.02.11 Drg: 1

12) **Chiller options**

Coolpak has a range of options and in many cases is custom designed to suit the application. Some options include

1. Water Cooled Condenser
2. Closed systems without tank
3. Close Tolerance on water supply temperature +/- 0.1°C
4. Tandem configurations – slave master
5. Web Enabled & microprocessor control
6. Flood-back prevention
7. Remote fault indication & switching