YORK®	YCWS WATER COOLED SCREW CHILLER	
START-UP CHECKLIST	Supersedes: NOTHING	Form 201.24-SU1(103)

Use this form in conjunction with the appropriate Installation, Operation and Maintenance Manual.

JOB NAME: _____ SALES ORDER #: _____

LOCATION: _____ SOLD BY: _____

CHILLER MODEL #: _____ SERIAL #: _____

COMPRESSOR #1: MODEL #: _____ SERIAL #: _____

COMPRESSOR #2: MODEL #: _____ SERIAL #: _____

INSTALLING CONTRACTOR: _____

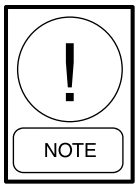
START-UP TECHNICIAN/COMPANY: _____

UNIT CHECKS (NO POWER)

CHECK THE SYSTEM 24 HOURS PRIOR TO INITIAL START.

- ❑ 1. Inspect the unit for shipping or installation damage.
- ❑ 2. Ensure that all piping has been completed. Refer to pages 24, 25, 26, and 96 in Form 201.24-NM3(901).
- ❑ 3. Check that the unit is pressurized and that there are no piping leaks.
- ❑ 4. Open each compressor suction service valve, discharge service valve, liquid line stop valve, and oil line ball valves.
- ❑ 5. The compressor oil level should be maintained so that an oil level is visible in either of the two oil separator sight glasses. Oil level should always be maintained, running or not, above the bottom of the lower sight glass and below the top of the upper sight glass.

  If it is necessary to add oil, connect a YORK oil pump to the charging valve near the oil separator, but do not tighten the flare nut on the delivery tubing. With the bottom (suction end) of the pump submerged in oil to avoid entrance of air, operate the pump until oil drips from the flare nut joint, allowing the air to be expelled, and tighten the flare nut. Open the compressor oil charging valve and pump in oil until it reaches the proper level as described earlier.



In actual operation, due to splashing, an oil level may be seen in both sight glasses. Run the compressor for a few minutes, shut the system down, and ensure there is an oil level showing in the bottom or top sight glass with the compressor off.

- ❑ 6. Ensure water pumps are on. Check and adjust water pump flow rate. Pressure drop across the cooler (evaporator) must be between the min/max requirements. Refer to Section 9, page 86 in Form 201.24-NM3(901).

• Excessive flow may cause catastrophic damage to the evaporator.

• Flows below the minimum published flow may cause excessive compressor cycling, erratic TXV control, slugging, and compressor failure.

- ❑ 7. Check the control panel to ensure it is free of foreign material (wires, metal chips, etc.).
- ❑ 8. Visually inspect wiring (power and control). Wiring MUST meet N.E.C. and local codes.
- ❑ 9. Check tightness of power wiring inside the power panel on both sides of the motor contactors and inside the motor terminal boxes.
- ❑ 10. Check for proper size fuses in main and control circuits. Refer to Electrical Data in the IOM for Min-Max fuse sizes.

❑ 11. Verify that power supply voltage matches the 3-phase power requirements of the compressor. See chiller nameplate and Refer to Section 4, page 31 in Form 201.24-NM3(901).

❑ 12. Be certain all water temperature sensors are inserted completely in their respective wells and are coated with heat conductive compound.

❑ 13. Ensure that evaporator TXV bulbs are strapped onto the suction lines at 4 or 8 o'clock positions.

PANEL CHECKS - (24 HOURS PRIOR TO INITIAL START)

POWER ON – BOTH SYSTEM SWITCHES "OFF"

❑ 1. Apply 3-phase power and verify its value.

❑ 2. Apply 115VAC and verify its value on the terminal block XCCTB in the Power Panel. Make the measurement between terminals 3 and N. The voltage should be 115VAC +/- 10%.

❑ 3. Ensure the heaters on each compressor are on. Allow the compressor heaters to remain on a minimum of 24 hours before start-up. This is important to ensure that no liquid refrigerant is in the compressor at start-up.

❑ 4. Program the dip switches on the microprocessor board for the desired operating requirements. Refer to Section 7.4, page 54 in Form 201.24-NM3(901).

OPEN = Left side of switch pushed down. CLOSED = Right side of switch pushed down.

SWITCH	SWITCH "OPEN" SETTINGS	SWITCH "CLOSED" SETTINGS
1	Water Cooling	Brine Cooling
2	Standard Ambient Control	Low Ambient Control
3	Refrigerant R-407C	Refrigerant R-22
4	YCWS	YCAS
5	Motor Current Avg. Enabled	Motor Current Avg. Disabled
6	Heat Recovery Disabled	Heat Recovery Enabled
7	Spare	-
8	Spare	-

Verify the dip switch selections by repeatedly pressing the OPTIONS Key on the control panel, and viewing the display.

❑ 5. Using the PROGRAM key on the micro-panel keypad select the operating values for the desired cutouts, safeties, etc. and record them on the Programmed Values Table below. Refer to Section 7.9, pages 72 - 76 in Form 201.24-NM3(901) for details.

PROGRAMMED VALUES

Refrigerant Type per Steps 4 and 11 of "Panel Checks"
= _____

Disch Press Cutout = _____ PSIG (kPa)

Disch Press Unld = _____ PSIG (kPa)

Suction Press Cutout = _____ PSIG (kPa)

High Amb Cutout = _____ °F (°C)

Low Amb Cutout = _____ °F (°C)

Leaving Chilled Liquid Temp Cutout = _____ °F (°C)

High Motor Current Unload = _____ % FLA

Anti-Recycle Time = _____ Secs

❑ 6. Program the Chilled Liquid Setpoint/Range and record:

Setpoint = _____ °F (°C)

Range = ± _____ °F (°C)

Keep in mind that for setpoint temperatures below 40ºF (4.4ºC) dip switch 1 must be "CLOSED" for brine cooling.

❑ 7. Ensure that the CLK jumper J18 on the Microprocessor Board is in the ON position (Top 2 pins).

❑ 8. Set the Time and Date. Refer to Section 7, page 69 in Form 201.24-NM3(901) for details.

❑ 9. Program the Daily Schedule start and stop times. If the chiller is not cycled by the daily schedule, all "00.00's should be programmed into the schedule. Refer to Section 7, page 70 in Form 201.24-NM3(901) for details.

❑ 10. Record the EPROM Software version. Display the version by pressing OPER DATA key followed by the * key.

EPROM Version _____

❑ 11. Unit Set-Up mode will allow the Start-up Technician to view the factory programming values. Normal use and service will not require any changes. These values should be recorded in the following table. To access the Unit Set-up Mode, use the keystrokes PROGRAM, 5144, ENTER. Display the program values by repeatedly pressing the ENTER key.

RECORD THE FACTORY PROGRAMMED VALUES

Setup Mode Value	Programmable Range	Actual
Refrigerant Type	R-22 or R407c	
R-407c Chiller Type	Optimized or Drop-in	
Unit Type	YCAS or YCWS	
Heat Recovery Unit	Enable or Disable	
Sys 1 100% Full Load Amps	75 to 500 Amps	
Sys 2 100% Full Load Amps	75 to 500 Amps	
Sys 1 Motor Protector Input	1.0 to 5.0 volts	
Sys 2 Motor Protector Input	1.0 to 5.0 volts	
Oil Cooling On	167 to 203ºF 180ºF default	
Oil Cooling Diff	9 to 18ºF 9ºF default	
Discharge Cooling On	176.0 to 239.0ºF 18ºF default	
Discharge Cooling Diff	7.2 to 27.0 ºF 18ºF default	
Sys 1 Operating Hours	0 to 99,999	
Sys 2 Operating Hours	0 to 99,999	
Sys 1 Starts	0 to 99,999	
Sys 2 Starts	0 to 99,999	

❑ 12. OPTIONAL

The York Micropanel is equipped with a "Service Mode" feature that allows the technician to manually operate some of the outputs, such as a LLSV (Liquid Line Solenoid Valve) and also to view input values for transducers and thermistors.

This feature can aid in troubleshooting, and is not a required part of routine start-up procedure.

The following steps/keystrokes allow access to the Service Mode:

a. Turn Unit Switch OFF

b. PROGRAM, 9675, ENTER

c. FUNCTION

d. OPER DATA

e. Use the ↑ Arrow to scroll/display information

f. Use the ENTER key to toggle outputs on and off, where applicable

g. Press STATUS key to exit Service Mode.

INITIAL START-UP

After the control panel has been programmed and the compressor heater has been on for 24 hours prior to start-up, the chiller may be placed into operation.

❑ 1. Place the System Switches on the Microprocessor Board to the ON position.

❑ 2. The compressor will start and a flow of refrigerant will be noted in the sight glass. After several minutes of operation, the bubbles in the sight glass will disappear and there will be a solid column of liquid when the TXV stabilizes. After the water temperature stabilizes at desired operating conditions, the oil should be clear.

❑ 3. Allow the compressor to run a short time, being ready to stop it immediately if any unusual noise or adverse conditions develop. Immediately at start-up, the compressor will make sounds different from its normal high-pitched sound. This is due to the compressor coming up to speed and lubrication changing from liquid refrigerant to oil. This should be of no concern and lasts for only a short time.

❑ 4. Check the "SYSTEM DATA" parameters and compare to gauge readings.

CHECKING SUBCOOLING AND SUPERHEAT

The subcooling should always be checked when charging the system with refrigerant and/or before setting the superheat.

When the refrigerant charge is correct, there will be no bubbles in the liquid sight glass with the system operating under full load conditions, and there will be 10 - 15°F (6 - 8°C) subcooled liquid leaving the condenser. An overcharged system should be guarded against.

Normal discharge pressures should correspond to the leaving condenser water temperature as follows:

Take the leaving condenser temperature (ºF) and add 7-11ºF to find the normal discharge pressure range.

Example:

Leaving Condenser Water Temperature is 84ºF. Add 7-11ºF to get 91-95ºF. Refer to the R22-PT Conversion Chart to get the normal discharge pressure range of 170-182 psi.

The subcooling temperature of each system should be calculated by recording the temperature of the liquid line at the outlet of the condenser and subtracting it from the recorded liquid line pressure at the liquid stop valve, converted to temperature from the temperature/pressure chart.

Example:

Liquid line pressure =		
202 PSIG converted to	102°F	(39°C)
minus liquid line temp.	- 87°F	(31°C)
SUBCOOLING =	15°F	(8°C)

The subcooling should be adjusted to 12 - 15°F (7 - 8°C)

❑ 1. Record the liquid line pressure and its corresponding temperature, liquid line temperature and subcooling.

	SYS 1	SYS 2		
Liq Line Press =	_____	_____	PSIG	(kPa)
Temp =	_____	_____	°F	(°C)
Liq Line Temp =	_____	_____	°F	(°C)
Subcooling =	_____	_____	°F	(°C)

After the subcooling is set, the suction superheat should be checked. The superheat should be checked only after steady state operation of the chiller has been established, the leaving water temperature has been pulled down to the required leaving water temperature, and the unit is running in a fully loaded condition. Correct superheat setting for a system is 10 - 15°F (6 - 8°C).

The superheat is calculated as the difference between the actual temperature of the returned refrigerant gas in the suction line entering the compressor and the temperature corresponding to the suction pressure as shown in a standard pressure/temperature chart.

Example:

Suction Temp =	46°F	(8°C)
minus Suction Press 60 PSIG converted to Temp	- 34°F	(1°C)
	12°F	(7°C)

The suction temperature should be taken 6" (15 cm) before the compressor suction service valve, and the suction pressure is taken at the compressor suction service valve.

If an adjustment needs to be made, the expansion valve adjusting screw should be turned not more than one turn at a time, allowing sufficient time (approximately 15 minutes) between adjustments for the system and the thermal expansion valve to respond and settle out. Ensure that superheat is set at 10 - 15°F (6 - 8°C).

❑ 2. Record the suction temperature, suction pressure, suction pressure converted to temperature, and superheat of each system below:

	SYS 1	SYS 2		
Suction Temp =	_____	_____	PSIG	(kPa)
Suction Temp =	_____	_____	°F	(°C)
Temp =	_____	_____	°F	(°C)
Superheat =	_____	_____	°F	(°C)

If the unit is functioning satisfactorily during the initial operating period, no safeties trip and the compressors load and unload to control water temperature, the chiller is ready to be placed into operation.

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Supersedes: NOTHING