

**APPENDIX A: Pre – Functional Check List**

<b>B</b>	<b>Refrigerant</b>		
1	Full operating charge of refrigerant and oil	Yes	No
2	Unit factory leak tested and report is attached	Yes	No
3	Relief piped	Yes	No
<b>C</b>	<b>Electrical</b>		
1	Lugs tightened by chiller startup technician	Yes	No
2	Safety disconnect switch installed in an accessible location	Yes	No
3	Lug sizing matches wire size requirement	Yes	No
4	Primary and secondary fused control power transformer provided	Yes	No
5	Star-delta starter provided	Yes	No
7	VFD installed (if applicable)	Yes	No
8	Unit Voltage and Amp verified	Yes	No
<b>D</b>	<b>Controls – Installation</b>		
1	Control panel accessible and labeled properly	Yes	No
2	All sensors are installed and calibrated	Yes	No
3	Safety items installed and verified		
<b>E</b>	<b>Controls – Startup</b>		
1	Remote start and stop signal verified	Yes	No
2	Chilled water reset signal verified	Yes	No
3	Demand limiting signal verified	Yes	No
4	Unit "run" sequences verified	Yes	No
5	Unit "alarm" sequences verified	Yes	No
<b>F</b>	<b>Mechanical – Startup</b>		
1	Manufacturer's startup checklist completed and attached	Yes	No
2	The following safety controls are operational and have been verified		
a.	Low chilled water temperature	Yes	No
b.	High refrigerant pressure	Yes	No
c.	Low oil flow protection	Yes	No
d.	Loss of chilled water flow	Yes	No
e.	Loss of refrigerant protection	Yes	No
f.	Motor current overload	Yes	No
g.	Phase reversal/unbalance/single phasing	Yes	No
h.	Over/under voltage	Yes	No
i.	Failure of water temperature sensor used by controller	Yes	No
j.	Full load test to verify load limiting	Yes	No

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k.	System starts and runs without any unusual noise or vibration	Yes	No
<b>G</b>	<b>TAB</b>		
1	Chilled water strainer is clean	Yes	No
2	Evaporator pressure drop (ft)	Yes	No
3	Chilled water flow rate (gpm)	Yes	No

**'No' Responses**

Item	Date	Reason for 'No' Response

**APPENDIX A: Pre – Functional Check List**

**Pumps**

**PROJECT :**

**DATE :**

**Instructions:**

*Step 1: Circle Yes or No and fill in with requested information.*

*Step 2: Explain all "No" responses at the bottom of the checklist.*

Item	Task Description	Response	
		Submitted	Delivered
<b>1</b>	<b>Delivery Book</b>		
<b>A</b>	<b>Model Verification</b>	Submitted	Delivered
1	Manufacturer		
2	Model		
3	Serial Number	N/A	
4	Pump Type		
5	Impeller diameter (in)		
6	Inlet / Outlet Sizes (in)		
7	Capacity / Head (gpm / ft wg)		
8	Motor Speed / Power (rpm / hp)		
9	Motor Voltage / Phase / Frequency (V / - / Hz)		
<b>B</b>	<b>Physical Check</b>		
1	Unit is free from physical damage	Yes	No
2	All components present	Yes	No
3	The water openings are sealed with plastic plugs	Yes	No
4	Unit tags affixed	Yes	No
5	Installation and startup manual provided	Yes	No
6	Manufacturer's ratings readable/accurate	Yes	No
<b>2</b>	<b>Construction Checklist</b>		
<b>A</b>	<b>Installation of Pump</b>		
1	Unit secured as required by manufacturer and specifications	Yes	No
2	Adequate clearance around unit for service	Yes	No
3	All components accessible for maintenance	Yes	No
4	Unit can be removed from building	Yes	No
5	Unit labeled and is easy to see	Yes	No
<b>B</b>	<b>Piping</b>		
1	All piping components have been installed (In the correct order) as required by detail drawing	Yes	No
2	Piping arranged for ease of unit removal	Yes	No
3	Piping supported as required by specifications	Yes	No

**APPENDIX A: Pre – Functional Check List**

4	Piping is clean	Yes	No
5	Piping insulation complete and installed as per specifications	Yes	No
6	Shut-off valves and unions installed on inlet and outlet of pump	Yes	No
7	Pressure gauges installed on inlet and outlet of pump	Yes	No
8	All valves and test ports are easily accessible	Yes	No
9	Valve tags attached	Yes	No
<b>C</b>	<b>Electrical</b>		
1	Safety disconnect installed in accessible location	Yes	No
2	Motor rotation in the proper direction	Yes	No
3	All electrical connections are tight	Yes	No
4	All electrical components are grounded	Yes	No
<b>D</b>	<b>Mechanical – Startup</b>		
1	Unit checked, aligned, and certified prior to startup and report submitted	Yes	No
2	Unit and motor lubricated before startup	Yes	No
3	Pump shaft rotates easily with power turned off	Yes	No
4	System starts and runs without any unusual noise or vibration	Yes	No
5	Manufacturer's startup checklist completed and attached	Yes	No
<b>E</b>	<b>TAB</b>		
1	Flow Rate, gpm		
2	Inlet pressure (ft) / Outlet pressure (ft)	/	/
3	Motor rotation in the proper direction	Yes	No
4	Motor overload verified	Yes	No
5	Motor voltage and amps verified - each phase	Yes	No
6	Start-up strainer removed (after 24 hours)	Yes	No

**'No' Responses**

Item	Date	Reason for 'No' Response

## Piping and Insulation

PROJECT :

DATE :

**Instructions:**

*Step 1: Circle Yes or No and fill in with requested information.*

*Step 2: Explain all "No" responses at the bottom of the checklist.*

Item	Task Description	Response	
		Submitted	Delivered
1	<b>System Checks</b>		
A	<b>Installation Checks</b>		
1	Piping is clean, dry and free of damage prior to installation	Yes	No
2	Pressure and leakage tests performed and reports have been submitted prior to insulation installation.	Yes	No
3	All chilled water piping is insulated with 1-1/2 inch thick fiberglass pipe insulation with vapor barrier except runouts to radiant cooling panels located beyond 1'-0" within room being served	Yes	No
4	Secondary chilled water, low temperature chilled water (2 1/2 inch thick), fan coil drain piping (1/2" thick), and piping with electric trace freeze protection is insulated in the same manner as the chilled water pipes.	Yes	No
5	All chilled water pumps are insulated with a 1 1/2 inch thick rectangular box made of Manville 817 rigid fiberglass board having a density of 6 lb/ft <sup>3</sup> with a rated vinyl coated and embossed laminate vapor seal (ASJ) jacket.	Yes	No
6	The insulation box for the pump is open at top and bottom with a removable top to effect a complete insulation for each base mounted pump.	Yes	No
7	The pipe insulation sections are firmly butted together and the longitudinal seam of the vapor barrier is cemented with Foster No. 85-75.	Yes	No
8	End joints are sealed with a minimum of 3 inch wide factory furnished vapor barrier strips cemented with Foster No. 85-75.	Yes	No
9	All fittings, valves, strainers etc. is insulated as described in the specifications	Yes	No
10	Exterior piping has a 0.016 inch aluminum jacket with moisture barrier lock seam and Gasco of equal factory applied fittings in lieu of glass cloth jackets. A sample is submitted.	Yes	No

**'No' Responses**

Item	Date	Reason for 'No' Response