**This Prefunctional Checklist should be completed as part of startup and initial checkout of the equipment in preparation for Functional Performance testing.**

|  |  |
| --- | --- |
| PC: | **23 09 16** |
| **ITEM:** | **Refrigeration Monitoring Systems** |
| **ID:** |  |
| **AREA SERVED:** |  |

Form Filled Out By:

|  |  |  |
| --- | --- | --- |
|  | Name & Company | Date |
| GC |  |  |
| MC |  |  |
| EC |  |  |
| BC |  |  |
| RMCSC |  |  |
| OR |  |  |
| A/E |  |  |
| CA |  |  |

GC = General Contractor; MC = Mechanical Contractor; EC = Electrical Contractor; BC = Balancing Contractor; RMCSC = Refrigerant Monitoring Control System Contractor; OR = Owner Representative; A/E = Architect/Engineer; CA = Commissioning Agent

XX = No Initials Required

# DOCUMENTATION VERIFICATION

Check if OK. Enter note number if deficient.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Item** | **GC** | **MC** | **EC** | **BC** | **RMCSC** | **OR** | **A/E** | **CA** |
| Product information submitted |  |  |  |  |  |  |  |  |
| Shop drawings submitted |  |  |  |  |  |  |  |  |
| Equipment Cut Sheets |  |  |  |  |  |  |  |  |
| Manufacturer’s installation instructions submitted |  |  |  |  |  |  |  |  |
| Manufacturer’s startup instructions submitted |  |  |  |  |  |  |  |  |
| Coordination drawings |  |  |  |  |  |  |  |  |
| O & M Manuals submitted |  |  |  |  |  |  |  |  |
| Manufacturer’s representative start-up and check out complete and report submitted. |  |  |  |  |  |  |  |  |

# MODEL VERIFICATION

Fill in requested information.

|  |  |  |  |
| --- | --- | --- | --- |
| **Cellular broad Band Modem** | Installed | **Submitted** | **Specified** |
| Manufacturer |  |  |  |
| Model |  |  |  |
| Serial No. |  |  |  |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Laptop Computer** | Installed | **Submitted** | **Specified** |
| Manufacturer |  |  |  |
| Model |  |  |  |
| Serial No. |  |  |  |
| Hard drive space |  |  |  |
| Read/Write CD Drive |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Desktop Computer** | Installed | **Submitted** | **Specified** |
| Manufacturer |  |  |  |
| Model |  |  |  |
| Serial No. |  |  |  |
| Hard drive space |  |  |  |
| Read/Write CD Drive |  |  |  |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Printer** | Installed | **Submitted** | **Specified** |
| Manufacturer |  |  |  |
| Model |  |  |  |
| Serial No. |  |  |  |
| Ink Jet |  |  |  |

# INSTALLATION VERIFICATION

**This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.**

Check if OK. Enter Outstanding Item Note number if deficient.

| **No** | **Item** | **GC** | **MC** | **EC** | **BC** | **RMCSC** | **OR** | **A/E** | **CA** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | AK-SM is mounted level, dry, and free of major vibrations. |  |  |  |  |  |  |  |  |
| 2 | Confirm temperature in the space where the AK-SM is mounted is in the range of (14-131 degrees F) |  |  |  |  |  |  |  |  |
| 3 | Wires enter panel are inserted through rubber grommets and properly supported to avoid strain at terminations |  |  |  |  |  |  |  |  |
| 4 | Confirm cable type is twisted in pairs with a screen |  |  |  |  |  |  |  |  |
| 5 | Confirm cable length does not exceed 4000 feet (1200M). IF cable exceeds this requirement confirm repeaters are used. |  |  |  |  |  |  |  |  |
| 6 | Confirm all wiring terminations are correct and secure |  |  |  |  |  |  |  |  |
| 7 | Confirm USB Ports are easily accessible |  |  |  |  |  |  |  |  |
| 8 | (Lon RS485 Network) Communication wiring: Confirm any repeaters used have a 120 Ohm resistor in place. |  |  |  |  |  |  |  |  |
| 9 | Confirm that the last controller on the network run has its end of line resistor enabled. |  |  |  |  |  |  |  |  |
| 10 | Confirm rotary address switch (Located behind keypad) is set to 0. Zero defines AK-SM 800 as the master noted on the host network. |  |  |  |  |  |  |  |  |
| 11 | Confirm unit has a valid Master IP Address (Configuration/Comm screen) |  |  |  |  |  |  |  |  |
| 12 | Confirm the Host Network is enabled |  |  |  |  |  |  |  |  |
| 13 | Language, Date, Time, Time of Day Schedule, Holiday schedule, Passwords are all entered into the unit. |  |  |  |  |  |  |  |  |
| 14 | Confirm the Domain Name System (DNS) is set to YES. |  |  |  |  |  |  |  |  |
| 15 | Confirm Dynamic Host Configuration Protocol (DHCP) is set to YES |  |  |  |  |  |  |  |  |
| 16 | Web Server Port – Confirm the web server port is changed from the factory default (Port 80) |  |  |  |  |  |  |  |  |
| 17 | FTP Server port – Confirm the factory default is changed to something other than port 21 |  |  |  |  |  |  |  |  |
| 18 | Confirm the default users name and password used to log into the AK-SM series controller has been changed to a specific user name and password. |  |  |  |  |  |  |  |  |
| 19 | Confirm AK-SM is behind a well configured router/firewall |  |  |  |  |  |  |  |  |
| 20 | Confirm RMCS system communicates via serial and Ethernet connectivity |  |  |  |  |  |  |  |  |
| 21 | Confirm keypad is securely snapped in place |  |  |  |  |  |  |  |  |
| 22 | Confirm centralized access to all devices from a single location. |  |  |  |  |  |  |  |  |
| 23 | Confirm remote broad band access via cellular communication device |  |  |  |  |  |  |  |  |
| 24 | Confirm remote accessibility via http using public infrastructure |  |  |  |  |  |  |  |  |
| 25 | Confirm graphic display of all temperatures, alarms, and data points. |  |  |  |  |  |  |  |  |
| 26 | Confirm multiple levels of password protected access is available |  |  |  |  |  |  |  |  |
| 27 | Confirm lighting circuits are wired in the Normally Closed Position. This will ensure that if power fails to the AK-SM or I/O modules the lighting system will “Fail Safe””ON” |  |  |  |  |  |  |  |  |
| 28 | Confirm lighting schedule is configured |  |  |  |  |  |  |  |  |
| 29 | Confirm proper power source is available |  |  |  |  |  |  |  |  |
| 30 | Confirm Phase loss Protector is in place and adjusted as specified. |  |  |  |  |  |  |  |  |
| 31 | **Cellular Modem:** Confirm a commercial broad band data modem is installed and has a clear strong signal for use with the RMCS System. |  |  |  |  |  |  |  |  |
| 32 | Confirm the power supply for the control voltage on the control relays are fused to protect overloading. |  |  |  |  |  |  |  |  |
| 33 | Each multiplex refrigeration compressor system has one dedicated Individual Control Unit (ICU) |  |  |  |  |  |  |  |  |
| 34 | Control wiring routing: Confirm all control wiring is installed separately from any wires carrying Alternating Current. |  |  |  |  |  |  |  |  |
| 35 | Storage Rooms: Confirm one temperature probe is installed in each refrigerated walk-in box and refrigerated processing room. Probe is installed in the return air to the unit coolers |  |  |  |  |  |  |  |  |
| 36 | Sales Area: Confirm one temperature and one dewpoint probe for each sales area air handlers being controlled is correctly installed and operational. |  |  |  |  |  |  |  |  |
| 37 | Refrigerated Display Cases: Confirm supply and return air temperature sensors are mounted securely. |  |  |  |  |  |  |  |  |
| 38 | Low Temperature Circuits: Verify a suction temperature sensor is installed on each suction circuit operating below 10 deg F. This should be installed at the compressor suction header. |  |  |  |  |  |  |  |  |
| 39 | Confirm all initial software soft ware points are programmed as indicated in Specification Section 23 09 16 Refrigerant Monitoring |  |  |  |  |  |  |  |  |
| 40 | Verify all analog inputs have an identification tag at the input sensor/transducer to identify inputs. |  |  |  |  |  |  |  |  |
| 41 | Confirm all alarm points programmed and send out alarms to a 24 hours monitoring service for the first 90 days of the warranty after final acceptance. |  |  |  |  |  |  |  |  |
| 42 | Provide system report to the CxA for review and confirmation of settings |  |  |  |  |  |  |  |  |
| 43 | Provide history CSV files of daily export of log data at 10 minute time intervals. |  |  |  |  |  |  |  |  |

# OUTSTANDING ITEMS

Note outstanding items in table below. Use numbers referenced above.

|  |  |  |
| --- | --- | --- |
| Resolved (Initial / Date) | **Note** | Description |
|  | **1.** |  |
|  | **2.** |  |
|  | **3.** |  |
|  | **4.** |  |
|  | **5.** |  |
|  | **6.** |  |
|  | **7.** |  |
|  | **8.** |  |
|  | **9.** |  |
|  | **10.** |  |

# FIELD NOTES

Fill in as appropriate.

|  |
| --- |
|  |
|  |
|  |
|  |
|  |

# SIGN OFF

System / Equipment have been installed in accordance with the Contract Documents and is ready for Functional Testing.

|  |  |  |
| --- | --- | --- |
|  | **Signature** | **Date** |
| **Contractor’s Representative** |  |  |
| **A /E Representative** |  |  |
| **Commissioning Agent** |  |  |
| **Owner’s Representative** |  |  |

##### END OF CHECKLIST