SECTION 21 08 00

**COMMISSIONING OF FIRE SUPPRESSION**

**BASED ON DFD MASTER SPECIFICATION DATED 02/27/15**

***This section has been written to cover most (but not all) situations that you will encounter. Depending on the requirements of your specific project, you may have to add material, delete items, or modify what is currently written. The Division of Facilities Development expects changes and comments from you.***

**P A R T 1 ‑ G E N E R A L**

**SCOPE**

This section includes commissioning forms for construction verification and functional performance testing. Included are the following topics:

PART 1 - GENERAL

Scope

Related Work

Reference

Submittals

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

***DO NOT INCLUDE ANY COMMISSIONING FORMS for PRELIMINARY review. Just edit the list below and only submit pages 21 08 00-1 through 21 08 00-2 with strikethroughs.***

Commissioning Forms

CV-21 10 00 Air Compressor

CV-21 10 00 Water Based Fire Suppression System

CV-21 30 00 Fire and Pressure Booster Pumps

**RELATED WORK**

Section 01 91 01 or 01 91 02 – Commissioning Process

**REFERENCE**

Applicable provisions of Division 1 shall govern work under this section.

**SUBMITTALS**

Reference the General Conditions of the Contract for submittal requirements.

Reference Section 01 91 01 or 01 91 02 Commissioning Process for Construction Verification Checklist and Functional Performance Test submittal requirements.

**P A R T 2 – P RO D U C T S**

(Not Used)

**P A R T 3 – E X E C U T I O N**

**COMMISSIONING FORMS**

Commissioning forms are to be filled in as work progresses by the individuals responsible for installation and shall be completed for each installation phase.

Provide a description of the work completed since the last entry, the percentage of the total work completed for the system for that area and the step of installation or finalization.

Circle Yes or No for each commissioning form item. If the information requested for an item does not apply to the given stage of installation for the system, list it as “N/A”. Explain all discrepancies, negative responses or N/A responses in the negative responses section.

Once the work is 100% complete and the responses to each item are complete and resolved for a given commissioning forms group, mark as complete, initial and date in the spaces provided.

Provide copies of the commissioning forms to the commissioning agent 2 days prior to construction progress meetings.

***Edit the individual construction verification checklists and provide additional checklists as needed to reflect the verification requirements of assemblies, components, equipment and systems to be commissioned on this project.***

***DO NOT INCLUDE ANY of the following***

***COMMISSIONING FORMS for PRELIMINARY review. Just edit the list in Part I above and only submit pages***

***21 08 00-1 through 21 08 00-2 with strikethroughs.***

**CV-21 10 00 – Air Compressor**

**Equipment Identification/Tag: \_\_\_\_\_\_**

**Location:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |
| --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* |
| 1 | Manufacturer |  |  |
| 2 | Model |  |  |
| 3 | Serial Number |  |  |
| 4 | Capacity (scfm @ psi) | **@** | **@** |
| 5 | Receiver capacity (gal) |  |  |
| 6 | Power / Speed (hp / rpm) |  |  |
| 7 | Voltage / Phase / Frequency (V / - / Hz) | **/ /** | **/ /** |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

| **Group/Item** | **Group/Task Description** | **Response** |
| --- | --- | --- |
| *B* | *PHYSICAL CHECKS* |
| 1 | Unit is free from physical damage. | YES | NO |
| 2 | The air openings are sealed with plastic plugs. | YES | NO |
| 3 | All components present. | YES | NO |
| 4 | Installation and startup manual provided. | YES | NO |
| 5 | Unit tags affixed. | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |
| *C* | *INSTALLATION* |
| 1 | Unit secured as required by manufacturer and specifications. | YES | NO |
| 2 | Unit is isolated from the building structure (to reduce vibration and noise) | YES | NO |
| 3 | Adequate clearance around unit for service. | YES | NO |
| 4 | All components accessible for maintenance. | YES | NO |
| 5 | Unit labeled and is easy to see. | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |
| *D* | *PIPING* |
| 1 | All piping components have been installed (in the correct order) as required by contract document or manufacturer. | YES | NO |
| 2 | Piping arranged for ease of unit removal. | YES | NO |
| 3 | Piping supported as required by specifications. | YES | NO |
| 4 | Piping is clean. | YES | NO |
| 5 | Pressure relief valve installed and is operational. | YES | NO |
| 6 | Automatic condensate drain piped to nearest floor drain. | YES | NO |
| 7 | Cartridge filter-silencer with pre and post isolation valves installed in piping for each compressor. | YES | NO |
| 8 | Piping and valves properly checked and free of leaks. | YES | NO |
| 9 | Valve tags attached. | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |
| *E* | *ELECTRICAL* |
| 1 | Local disconnect installed in accessible and visible 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 |
| 5 | Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible conduit to a fixed junction box. | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |
| *F* | *MECHANICAL STARTUP* |
| 1 | Belt sheaves have been properly aligned per the specifications. | YES | NO |
| 2 | Belt tension has been reviewed and adjusted after start-up of unit and again after 80 hours of operation. | YES | NO |
| 3 | Motor / compressor rotation is in the proper direction | YES | NO |
| 4 | System starts and runs free from unusual noise or vibration | YES | NO |
| 5 | Manufacturer's startup checklist completed and attached | YES | NO |
| 6 | Protective shrouds for belts in place and secure | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Negative Responses**

| **Group/****Item** | **Date****Found** | **Found****By** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-21 10 00 – Water Based Fire Suppression System**

**Equipment Identification/Tag: \_\_\_\_\_\_**

**Location:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) PRE-INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. All piping, sprinkler heads, valves, fire department connections, etc. are clean and free of damage prior to installation.
2. Temporary protective coating is provided on cast iron and steel valves during storage.
3. Temporary end caps are provided on piping and fittings until installation.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) PIPING INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** | **10)** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Piping is free to expand and contract without noise or damage to hangers, joints, or the building.
2. Joint compound or tape is only applied on male threads.
3. Piping is installed with sufficient pitch and arranged in a manner to ensure drainage of entire system.
4. Changes in pipe sizes are made with the proper size reducing fittings, reducing elbow or reducing tees, and no bushings are utilized.
5. Connections between dissimilar pipe materials are made with dielectric fittings.
6. Pipe hanger spacing complies with specification requirements.
7. Total unsupported length from last hanger to end of sprinkler conforms with specification requirements.
8. All equipment requiring maintenance is accessible (valves, strainers, etc.).
9. Piping allows access to equipment that is part of this system or another system (e.g., air terminal units are accessible).
10. Piping is installed a minimum of 7" above suspended ceiling to allow for lighting fixture installation or relocation.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**C) VALVE & FITTING INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Inspector's test connection is installed.
2. All fire hose valves and cabinets are installed with adequate clearance for hose connection.
3. Thread patterns of hose valves and fire department connections match the local Fire Department requirements.
4. All valves can be fully operated without removal or alteration of handle.
5. Riser shutoff valve and a capped hose thread drain valve at the bottom of each riser provided.
6. Auxiliary drain connections provided for all low points in system.
7. All monitoring and tampering devices installed and operation verified.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**D) SPRINKLER HEAD INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Extra sprinkler heads according to NFPA-13 (proportional to types and temperature ratings used) and a sprinkler wrench are provided in a cabinet located where the temperature does not exceed 100 degrees F.
2. Head guards are installed on sprinklers less than 7' 6" above floor in areas having exposed ceiling.
3. No sprinkler heads are located closer to any obstruction than 3 times the maximum dimension of any obstruction up to a maximum distance of 24".
4. Sprinkler heads are located under exposed fixed obstructions where the obstruction is greater than 48".
5. Sprinkler heads are located in the center of the ceiling tiles and head escutcheon plates are tight to the ceiling.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**E) TESTING CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Piping tested utilizing water at 200 psi or 50 psig greater than system pressure for a duration of 2 hours.
2. All leaks identified during testing have been repaired and test re-done until satisfactory conditions are accomplished.
3. Test conducted with DFD present and all piping of tested system or section visible during testing.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**F) FINALIZATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. All exposed piping which passes through a wall, ceiling or floor is provided with escutcheon plates.
2. Pipe labeling and direction of flow is provided per specification requirements.
3. All penetrations through fire rated wall assemblies have been sealed per specification requirements.
4. All penetrations through non-rated wall assemblies have been sealed per specification requirements for given space type.
5. Record drawings have been updated to reflect any changes made.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-21 30 00 – Fire and Pressure Booster Pumps**

**Equipment Identification/Tag:\_\_\_\_\_\_**

**Location:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |
| --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* |
| 1 | Manufacturer |  |  |
| 2 | Model |  |  |
| 3 | Serial Number |  |  |
| 4 | Pump Type |  |  |
| 5 | Rated GPM / Head (gpm / ft) | **/** | **/** |
| 6 | Inlet / Outlet Sizes (in / in) | **/** | **/** |
| 7 | Impeller diameter (in) |  |  |
| 8 | Motor Power / Speed (hp / rpm) | **/** | **/** |
| 9 | Voltage / Phase / Frequency (V / - / Hz) | **/ /** | **/ /** |
| 10 | Static Supply / Pump Churn Pressure (psi / psi) | **/** | **/** |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

| **Group/Item** | **Group/Task Description** | **Response** |
| --- | --- | --- |
| *B* | *PHYSICAL CHECKS* |
| 1 | Unit is free from physical damage. | YES | NO |
| 2 | The water openings are sealed with plastic plugs. | YES | NO |
| 3 | All components present. | YES | NO |
| 4 | Installation and startup manual provided. | YES | NO |
| 5 | Unit tags affixed. | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |
| *C* | *INSTALLATION* |
| 1 | Unit is set on concrete housekeeping pad or inertia base, is level, and securely bolted and grouted to pad/base. | YES | NO |
| 2 | Equipment location coordinated with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. | YES | NO |
| 3 | Adequate clearance around unit for service. | YES | NO |
| 4 | All components accessible for maintenance. | YES | NO |
| 6 | Automatic air vent, drain valve, relief valve and pressure gauges provided on pump casings. | YES | NO |
| 7 | Drains for bases, seals, casing and relief valves, piped to nearest floor drain. | YES | NO |
| 8 | Unit labeled and is easy to see. | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |
| *D* | *WATER PIPING* |
| 1 | All piping components have been installed (in the correct order) as required by contract document or manufacturer. | YES | NO |
| 2 | Pressure sensor line from between pump discharge check valve and shutoff valve to pump controller pressure switch provided. | YES | NO |
| 3 | Bronze swing check valve with two test valves and intermediate tee with 1/4" test plug provided at pump and at controller for testing and relieving pressure. | YES | NO |
| 4 | Piping arranged for ease of unit removal. | YES | NO |
| 5 | Piping supported as required by specifications. | YES | NO |
| 6 | Piping is clean. | YES | NO |
| 7 | Piping and valves properly checked and free of leaks. | YES | NO |
| 8 | Valve tamper switches installed on all isolation valves and operation verified. | YES | NO |
| 9 | All valves and test ports are easily accessible. | YES | NO |
| 10 | Valve tags attached. | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |
| *E* | *ELECTRICAL* |
| 1 | Local disconnect installed in accessible and visible 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 |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |
| *F* | *CONTROLS INSTALLATION* |
| 1 | Controller secured per manufacturer and specification requirements. | YES | NO |
| 2 | Pressure sensor line properly terminated within controller. | YES | NO |
| 3 | Pressure switches adjusted per NFPA 20. | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |
| *G* | *FIRE PROTECTION STARTUP* |
| 1 | Unit checked, aligned, and certified prior to startup and report submitted. | YES | NO |
| 2 | Angular mis-alignment of motor and unit shafts does not exceed 0.02 in per diameter of coupling hub. | YES | NO |
| 3 | Unit and motor lubricated before startup. | YES | NO |
| 4 | Pump rotates in correct direction. | YES | NO |
| 5 | Pump shaft rotates easily with power turned off. | YES | NO |
| 6 | System starts and runs free from any unusual noise or vibration. | YES | NO |
| 7 | Manufacturer's startup checklist completed and attached. | YES | NO |
| 8 | Acceptance testing accomplished according to NFPA-20 and results acceptable. | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Negative Responses**

| **Group/****Item** | **Date****Found** | **Found****By** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |