MP101

- Only one gas detection sensor is shown on the drawings near existing boiler, are others needed for new boilers? New or existing? No CO2 sensors shown. Also, Propane is heavier than air so we would expect propane sensors down low.

  Refer to MI102 sequence item 17.

- (2) O2 analyzers are shown on the plan. They are not associated with the boiler. What are they for, new or existing? O2 analyzers shall be reused and tied into the boiler master control panel points 138 thru 140.

  Reuse boiler 3 oxygen analyzer to perform functions defined in 23 09 11 for flue gas oxygen analyzer. Provide new oxygen analyzer per 23 09 11 and points list for boilers 1 and 2.

- Boiler master panel will be much smaller than unit shown. However, each new boiler will have two panels not one. Because of the VA requirements in is not possible to fit both panels on the boiler. Once can be located on the boiler and the other will be shipped loosed for installation near the boiler.

  This is acceptable.

- No boiler platforms are shown.

  boiler platforms are shown on structural plans. boiler spec 23 52 39 requires platforms to be extended on boiler as required to access all valves associated with the boiler.

MP 104

- (2) gas sensors shown by existing boilers but none by new boilers. Are any needed?

  Refer to MI102 item 17.

- Note 3 says to provide 2 valves for boiler isolation, however, other drawings do not show two valves. Which is correct. Also, a spool piece (min 5 diameter of steam nozzle size in length) is required upstream of NRV.
  2 valves are required. Specification 23 21 11 paragraph 3.11 details piping from nozzle to main header.

- No boiler platforms are shown

  boiler platforms are shown on structural plans. boiler spec 23 52 39 requires platforms to be extended on boiler as required to access all valves associated with the boiler.

MP304

- Elevation of boiler does not show any valves in steam piping. Note, vertical NRV have long lead times and are expensive. Angled NRV or horizontal straight valves are preferred. Boiler spool pieces are also not identified, and limits of boiler external piping is not identified.
  Refer to details for all required valves.

2 valves are required. Specification 23 21 11 paragraph 3.11 details piping from nozzle to main header. Vertical is preferred as horizontal piping runs high in the plant and will be difficult to access valves in the horizontal sections. Provide globe-valved bypass to for warm up of piping.

MP502

- **Detail 2:** This detail shows a NRV on top of the boiler outlet (Not recommended) and in the vertical position. It does not show a header valve. Further the detail does not show an economizer or a platform to the economizer.
  2 valves are required. Specification 23 21 11 paragraph 3.11 details piping from nozzle to main header. Vertical is preferred as horizontal piping runs high in the plant and will be difficult to access valves in the horizontal sections.
  boiler platforms are shown on structural plans. boiler spec 23 52 39 requires platforms to be extended on boiler as required to access all valves associated with the boiler.

- **Detail 4:** 3 element feed water controls are shown. They are also specified. We have never seen 3 element feedwater controls on a 350 HP boiler for VA projects. In fact, we have never bid a job with any size firetube with 2 element feedwater controls. It is very expensive and offers no value on such a small boiler. Normally used on large IWT. Typical VA project uses single element control. Specification section 23 09 11 states single element control.

  Single element control is required per the contract documents.

MP601

- Boiler Schedule: A CB 350 HP boiler is listed as basis of design, but the schedule calls out 367 HP and the Boiler Sq Ft. is based on 367 HP. Which size is required?

  The design intent is to provide 12,000 lbs/hr of 110 PSIG steam from 212F feedwater at 3700 ft elevation. Boiler size will be determined by this requirement.
  Revise note 7 to say: BASIS OF DESIGN OR APPROVED EQUAL: CLEAVER BROOKS 4WI OR SUPERIOR SUPER SEMINAL OR UINILUX FORCE POWER MODEL TCS.

- The gas meter schedule lists the gas pressure as 10 psig, but the propane mixer schedule calls out for 12 psig. Pressures need to be the same at the boiler. Which pressure should we use for sizing the gas train?

  Pressure at the outlet of the vaporizer is 12 PSIG. Assuming 2 PSIG loss to furthest boiler. Pressure at boiler will then be reduced to 5 PSIG into furnace.

MP602

- Schematic shows two control valves in the feedwater recirculation line. What is the purpose. There will be orifices provided with the new pumps to limit recirculation flow. These valves are not typically provided on pumps this small and are not standardly seen on VA projects. Are they required?

  The design intent is to control and limit the feedwater recirculation to the deaerator. They are required.

- ¾" valves are shown in the economizer recirculation lines. Valves on specified to be open below a certain temperature. These are not recommended. The economizer always needs minimum flow such as when the boiler is on hot standby or warming up. These valves may be closed if this occurs when the outside air temperature is above setpoint. Recommend valves be removed and replaced with Orifice or balancing valves. We have not seen this done at any other VA's including those in northern climates.

  Provide balance valve set at economizer manufacturer recommended minimum required setting in lieu of valves shown. Replace valve at boiler 3.

MP603

- Like other drawings the NRV is shown on top of the boiler. This is not recommended. There needs to be a spool piece between the boiler and the NRV. In addition, the limits of the external boiler piping is the second stop valve. In this case that valve is at the steam distribution header. That means that all the piping up to the valve needs to be tested in accordance with the ASME code for Boiler Pressure Vessels in the field. Normally the boiler manufacturer provides a second stop valve after the NRV. All piping up to the valve is tested in the factory. Our recommendation is a second valve should be provided.

  2 valves are required. Specification 23 21 11 paragraph 3.11 details piping from nozzle to main header. Vertical is preferred as horizontal piping runs high in the plant and will be difficult to access valves in the horizontal sections.

- There is an 8" steam vent valve shown on the header. Type of valve is not in sections 23 09 11 or 23 21 11 and there is no mention of how it can be controlled. Addendum calls out for it to be manually controlled. Does it still need the electric actuator?
  Addendum mis understood the valve location. The 8" steam vent valve shall be electric actuated globe valve with controls compatible actuator. Isolation valve is required upstream of valve per MP603 and specification section 23 21 11.

MP604

- Emergency gas shut off valve. This is specified in section 23 21 11 paragraph 2.24 but is not shown on schematic for this drawing. The addendum states it is shown on Drawing MP604, MP601 and MI103. A valve is shown on 103 (not other drawings) but it appears to be existing. Please confirm if it is new and if one is needed in propane piping. Note, the emergency valve is called out on the points list (MI101) as existing.

  Agreed, provide emergency shut off valve accessible at entrance to building and tied into emergency shut off buttons.

MI101

- **Points List:**
  - CB utilizes a PLC for the DA & Surge, A PLC for each boiler and a Master Panel to monitor the DA and Boiler(s) PLC as well as pick up additional points. Is this acceptable?

    This seems to meet the requirements of 23 09 11 and 23 52 39. All equipment must either be submitted showing compliance with specifications or submitted with variation from specification requesting VHA COR approval.

  - The Points Lists indicates Digital or Analog points but does not provide additional description of existing points. For instance, for digital points what is the standard status of the point (NO or NC). For Analog, is it 4-20 ma or 0-10 Vdc, pulsed, or something else? This information is needed to properly price the input output cards and programing.

    See referenced Hays Cleveland controls for existing system. This information has not been verified and all information is for reference only.

  - The Vaporizer monitoring points are not listed at all on the points list. What is required and what type of points?

    5 alarms are listed in the sequence. This is the extent of the points required from the vaporizer.
    Shut off to vaporizer is shown in points list and be provided to allow shut off of vaporizer/mixer if plant emergency shut off buttons are pressed.

  - The Master Panel, boiler and DA PLCs are all provided by the boiler manufacturer as well as the SCADA system. Any metering for the boilers is also by the Points List has the control contractor listed for these points. On other VA projects the control contractor is responsible for the MUA units or other environmental controls. All boiler controls are by the boiler manufacturer. Please update chart.

    In this chart, CC refers to control's contractor, however, this is to signify the boiler plant controls contractor. This is intended to be the same contractor as the boiler controls. The only DDC requirements are to provide a bridge from the boiler plant master control panel or PC to the existing Trane DDC system to allow for trending and alarms.

  - DA:
    - The DA lists a normal and emergency make up water valve. However, these are not labeled on the schematics. Assume one of them is the transfer valve from the condensate line and one is actual make up water.

      No, SW is the softened water and is the primary make up.
      CW is city cold water that is an emergency make up.
      CTPD is from the condensate transfer pump

    - Steam valve is called out as a point but on the schematic, it is shown as a self-contained valve. What type of valve is it?

Hays Cleveland drawings indicate it is an analog positioner and position transmitter control valve. The intent is to modulate to control temperature at the scrubbing section of the deaerator.

- There does not appear to be any low water pump cut outs shown. Normally these are digital safeties. Please confirm they are not needed or if needed are they existing or new?

  Not needed. Controls shall open emergency valve when da level is 4" below low level alarm and add 8" of water.

- Condensate Storage Tank:
  - There are 4 valves listed but only two shown on the schematic. Please clarify.

    City water plant valve and city water softener valves are not controlled by surge tank. These are flow meters and are described on MI 102 sequence numbers 9 and 10. These report to the master panel.

  - There does not appear to be any low water pump cut outs shown. Normally these are digital safeties. Please confirm they are not needed or if needed are they existing or new?

    Not needed. Controls shall open emergency valve when DA level is 4" below low level alarm and add 8" of water.

- Condensate Receiver Pumps
  - Pump Demand, Pump fail, and Pump status are shown as digital input. Are these just contacts. 120V is shown. What is that for. Normally it is not wise to bring 120v to a control cabinet.

    Existing panel uses 120V. each duplex pump is served by one panel. The three points are for monitoring.

  - CB would wire points to ADAC panel not master panel. Is that, ok?

    The intent is to be able to monitor the points at the main panel.

- Additional Plant Controls
  - Existing gas valve closed switch is shown as existing. Is this for the emergency gas valves which are new? Nothing is shown on the drawings. Also further down there is Existing Shutdown to main NG. What is this?

    Gas valve closed switch is existing for the main gas line as it enters the building. These are listed as existing equipment with new control low voltage wire/ conduit to be controlled by new plant control panel.

  - The low- and high-pressure steam switches are show as new by the control contractor. Normally they are sensors (not switches) provided by the boiler company. Please clarify what is desired.

In this chart, CC refers to control's contractor, however, this is to signify the boiler plant controls contractor. This is intended to be the same contractor as the boiler controls. The only DDC requirements are to provide a bridge from the boiler plant master control panel or PC to the existing Trane DDC system to allow for trending and alarms.

- Boiler O2 monitoring and alarms are part of the boiler panel not Master Panel.

  Correct. O2 monitoring is covered under the boiler plant control paragraph of 23 09 11. It is also shown this way on the boiler panel points list. Plant list shows O2 alarms to the boiler plant main control panel.

- Co and Combustible gas sensors are listed but no quantities are provided. Are they connected to a control panel with a Modbus or similar connection to the Master panel or is each sensor wired to the Master Panel?

  MI 102 Sequence 17 shows 4 total for each, with approximate locations. Referenced Hays Cleveland controls shows this as 120V inputs.

- **MI102**
  - Condensate Receiver Tank re-used, but same vague statement as Deaerator and Surge Tanks, "existing condensate tank controls shall be reused/replaced/upgraded to allow for integration into BAS". Pumps CP-1 and CP-2 are the designations in MI-602 and in E-602

    Not a question

  - Drawing MI103. Not enough details provided

    Not a question

  - Not in specifications

    Not a question

  - MI-602 shows two condensate tank receivers, with two pumps each. Contradicts E-602 drawing, and contradicts MI103, which only shows one condensate receiver and no pumps.

    Two condensate tank receiver with two pumps each is correct. The power is fed to the condensate pump panels. Power then runs to the individual pumps.
    MI103 show one panel, but two panels are the correct configuration.

  - Drawing E-602 only shows power feed to two pumps total, not to two sets of duplex pumps as per MI-602

    Power is fed to the panel then from the panel each pump is powered.

  - Drawing MI102, paragraph B states that CP-1 and CP-2 are to be controlled by existing PLC. However, it is not clear if existing PLC is to remain.

Existing PLC can remain.

- **MI103**
  - The propane/air mixer skid is shown with connection to master panel. However, the control points are not defined, as well as the dashed line shown. It is not defined as hardwired points nor as Modbus communication points.

    5 alarms are shown in MI102 sequence K. Also provide hard wired shut off to vaporizer from emergency shut off buttons in plant. 23 09 11

Other Items:

- Condensate Receiver Tank re-used, but same vague statement as Deaerator and Surge Tanks, "existing condensate tank controls shall be reused/replaced/upgraded to allow for integration into BAS". Pumps CP-1 and CP-2 are the designations in MI-602 and in E-602
  - Drawing MI103. Not enough details provided
  - Not in specifications
  - MI-602 shows two condensate tank receivers, with two pumps each. Contradicts E-602 drawing, and contradicts MI103, which only shows one condensate receiver and no pumps.
  - Drawing E-602 only shows power feed to two pumps total, not to two sets of duplex pumps as per MI-602
  - Drawing MI102, paragraph B states that CP-1 and CP-2 are to be controlled by existing PLC. However, it is not clear if existing PLC is to remain.
  - Recommendation, rather than try to upgrade the pumps replace each system completely and have self-contained control. Specify a general alarm to be monitored by Master Panel.

    Duplicate questions to the above. This is an acceptable solution however, the three monitoring points are required.
- SCADA Computer and Software and Monitor. Re-use existing or supply new. There are contradictions.
  - 23 09 11, paragraph 2.5.A and 2.5.B indicates that a new computer with new software and new monitor are to be provided
  - Drawing EP102, Keynote 3 indicates that the existing computer and monitor are to be re-used.

    New computer shall be provided per specifications.
- Boiler #3, Existing Superior Boiler (25,000 lb./hr.) is to remain. Specifications and drawings are not clear as to the level of conversions required. Some examples of possibilities are:
  - Only provide new control panel
  - Provide new burner and/or control panel
  - Provide new level controls and instrumentation
  - Provide new gas train? Has the engineer verified that this boiler would operate on Propane air mixture?
  - Do water level controls remain?
  - Does the boiler have O2 trim, and does it remain?
  - Does the boiler get a VFD to match new boilers?

    Provide new control panel, burner management (flame guard). Level controls and instrumentation shall be controlled by the new panels. Gas train to remain, but will be controlled by new panel. Water level shall be single element control. O2 trim to

remain and be controlled by new panels. VFD shall remain.

- VA's normally have NEMA 4 control panels and rigid and seal tight conduit and boxes. The addendum indicates this is not necessary. Please confirm.

  Reference specification 23 09 11 for NEMA 4 rating for control panels. refer to 26 05 33 for conduit requirements.

- Crosby Relief valves are specified. Please confirm. There are not equivalent to these valves, and they are expensive with long lead times. All previous VA's have used Kunkle valves.\

  Kunkel valves fail after testing several times because they are un-adjustable. Crosby can be adjusted; therefore, they do not need replaced. The Sheridan VA prefers Crosby Safety valves.

- The metering systems specified are outdated. Typically, we provide Vortex Shedding meters for the Steam, Mag meters for feed water and make up and thermal mass for NG. Please confirm these are acceptable. The accuracy and turn down exceed what is specified. Also please confirm that all existing meters will provide a 4-20 readout. If not, they will need to be replaced.

  All equipment must either be submitted showing compliance with specifications or submitted with variation from specification requesting VHA COR approval.

- Detroit Style switches called for in the addendum do not meet the VA spec for gas switches on the boiler. Please identify if these take precedent over the VA spec and where they should be used.
  Detroit switches are basis of design on steam side of the boiler. Follow VA spec for switches on natural gas system.
- No loads are shown for the steam nozzle. Typically, the engineer has performed a pipe stress analysis and specified loads and moments at the nozzle so the boiler manufacture can determine the level of reinforcement necessary. Has this been done and can the loads be added to the documents?
  Mechanical support system will be calculated and designed per 23 21 11. Boiler nozzle and shell assembly shall be designed to withstand moments imposed by connecting piping per specification 23 52 39.

Below is a quick list per item of the kind of information we would like to confidently get the conversions configured.

Documents provided are for reference only shop drawings from previous construction project.

Superior Boiler #3 – 25,000 lb/hr

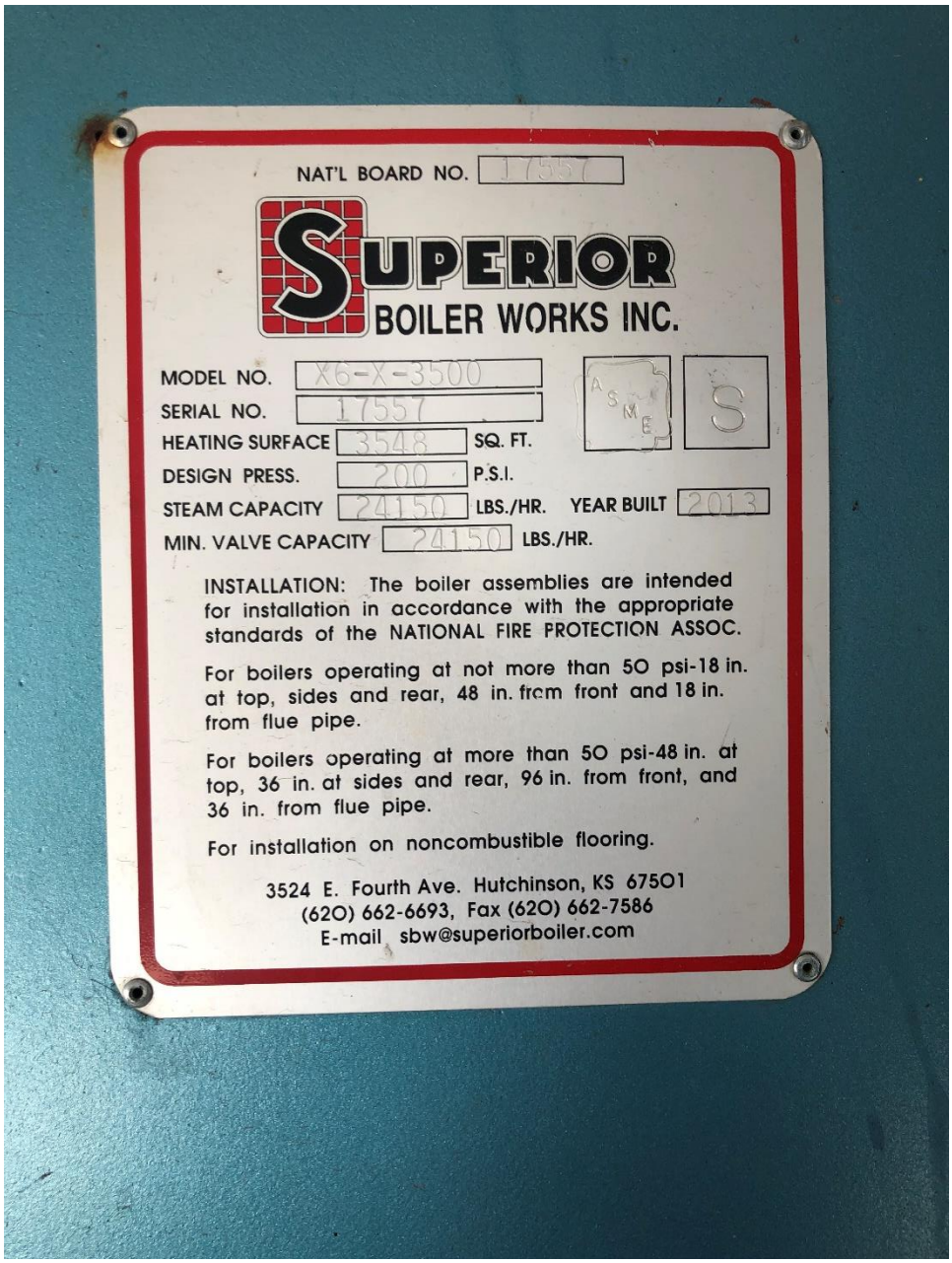

Hay's boiler 3 mechanical.pdf


B3 water level warrick dwg.pdf


Final B3 fire eye loops.pdf


Submittal #36 B-3.Burner.2.23.13.p

- Nameplate picture



- Burner nameplate picture

- Safety Relief Valve setting
  125, 130, 135 PSIG
- Existing level controller

- Existing feedwater valve (open/close vs modulating) MODULATING

- Pressure Vessel MAWP if not on the nameplate
- Any dimensional or factory provided documentation
    - Specifically furnace dimensions for burner conversion configuration. Mounting ring dimensions, furnace pressure, shape and depth. This may be information we can find based on model knowledge.

Existing Surge Tank

- Tank Nameplate

- Vessel Gallonage – or Vessel Diameter and Length
- Any dimensional or factory provided documentation (dimensional, P&IDs, Wiring diagrams)
- Pressure Vessel MAWP if not on the nameplate – or stated if atmospheric

- Pump nameplates and motor hp if available

- Tank stand height

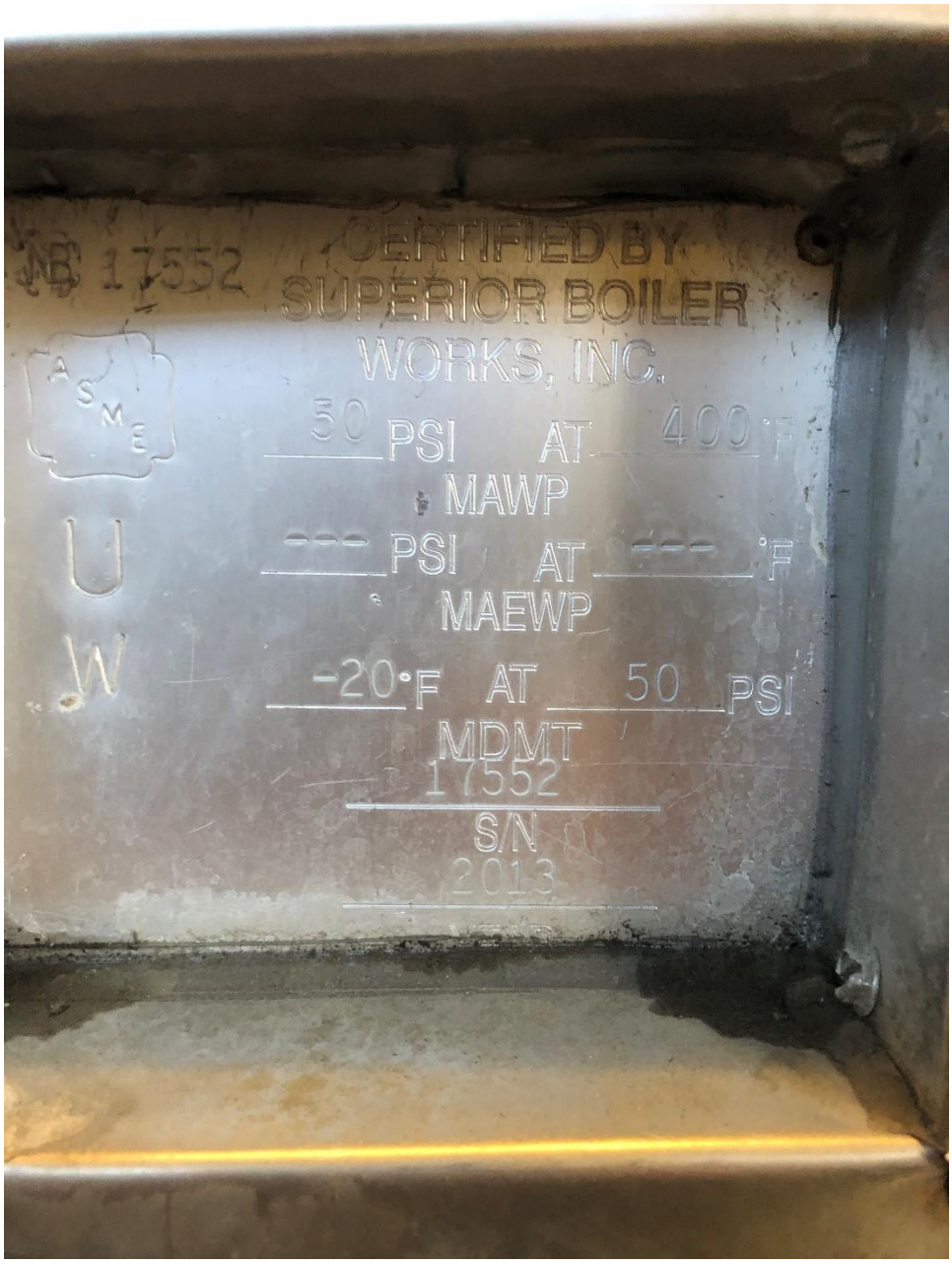
- Unit photos showing level controls if dimensional information is not available.

Condensate Tank.pdf

Condensate tank specs.pdf

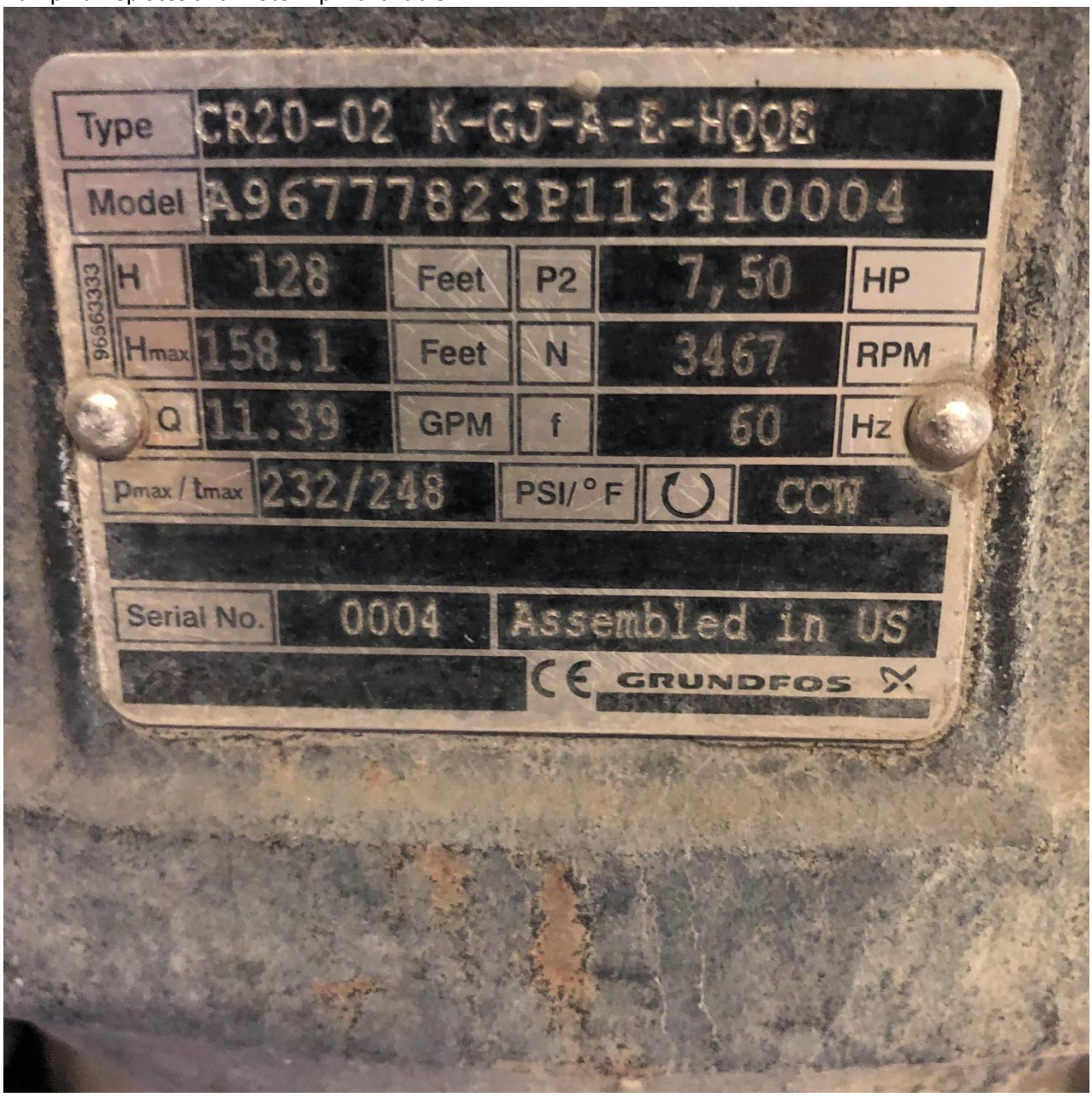
Existing Deaerator Tank

- Tank Nameplate



- Vessel Gallonage – or Vessel Diameter and Length
- Any dimensional or factory provided documentation (dimensional, P&IDs, Wiring diagrams)
- Pressure Vessel MAWP if not on the nameplate

- Pump nameplates and motor hp if available



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- Tank stand height
- Unit photos showing level controls if dimensional information is not available.

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Deaerator tank.pdf

Deaerator specs.pdf