

**SUMMARY REPORT
SVE AND HYBRID SSDS INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796**

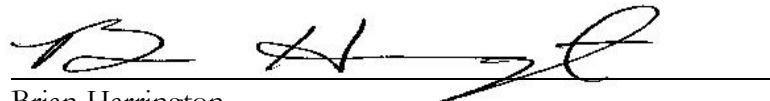
Submitted to: **INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**
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August 18, 2021

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1.0 BACKGROUND AND INTRODUCTION

KERAMIDA Inc. (KERAMIDA) has prepared this Summary Report of the Soil Vapor Extraction (SVE) and Hybrid Sub-Slab Depressurization System (SSDS) Installation at the Former Norge Laundry & Cleaning Village property (Property), on behalf of D&E Enterprises, Incorporated (D&E). The report documents field work performed between April and June 2021.

The Property (or Site) is located at 2915 S. Meridian Street on the south side of Indianapolis, Marion County, Indiana. Historically, the Property was used by former owners and operators as a coin-operated laundry and dry cleaning facility. The Property comprises approximately 0.5 acres and includes one, single story building of approximately 3,600 square feet. The building was once occupied by Norge Laundry & Cleaning Village (Norge Laundry), thereafter a church, and later a vintage and hand-made consumer goods retailer. The building was vacant between January 2018 and January 2021, when ownership changed and the new owner renovated the Property into a softball training facility. A Site Vicinity map is included as Figure 1, and a Site map is provided as Figure 2.

The 2016 Sub-Slab Supplemental Site Investigation (SSI) [KERAMIDA, 2016] identified vadose soils under the former Norge Laundry building with elevated concentrations of chlorinated volatile organic compounds (cVOCs) especially in the area of the former dry-cleaning machines and associated piping/utilities. The cVOCs in the sub-slab materials and shallow soils under the former Norge Laundry building are believed to be the primary source of elevated concentrations of cVOCs reported in sub-slab vapors (i.e., soil gas) based on vapor intrusion sampling between 2013 and 2017. The sub-slab sampling results are summarized in Table 4 of the Semi-Annual Status Report (July-December 2020) [KERAMIDA, 2021].

In 2018 KERAMIDA conducted treatment of sub-slab vapors using ozone within the former Norge Laundry building between June and July. Although the one-month of ozone treatment achieved significant concentration reductions and achieved the remediation goal in areas around two sub-slab sampling locations (Sub-Slab 2 and 4), the post-remediation sampling results indicated the other two sub-slab sampling locations (Sub-Slab 1 and 3) still had tetrachloroethene (PCE) and/or trichloroethene (TCE) concentrations above the Indiana Department Environmental Management (IDEM) Remediation Closure Guide (RCG) Commercial/Industrial (C/I) Screening Levels (SLs).

Additional details of the sub-slab ozone treatment are available in the Interim Remediation Summary Report – Sub-Slab Ozone Treatment [KERAMIDA, 2019].

In the summer of 2020, an SVE pilot test was conducted at the Site with installation of two SVE wells (SVE-1 and SVE-2). The pilot test demonstrated SVE as a feasible remediation technology; however, testing indicated SVE around the building northern edge exhibited limited connectivity to shallow soil below the building. SVE is anticipated to reduce vadose zone cVOCs over time by volatilization and diffusion and limited connectivity within the tight soils below the building. Pilot testing using the ozone injection points (OIP) inside the former Norge Laundry building indicated SSDS as a feasible option to control vapor migration from the sub-surface into the building. Additional details of the SVE pilot test are available in the SVE Pilot Test Summary Report [KERAMIDA, 2020].

Full-scale SVE was proposed to remediate cVOCs in soil gas proximate to the former Norge Laundry building and the source contributing to vapor intrusion (VI). The addition of SSDS was proposed to mitigate the migration of sub-slab vapors into the former Norge Laundry building while the SVE remediation was occurring. The SSDS utilizes the blower of the SVE system as the vacuum source, and hence the ‘hybrid’ SSDS designation. A standard SSDS typically utilizes a low pressure, high flow in-line fan as the vacuum source to collect and vent soil gas from below a building slab and prevent VI. The installed hybrid SSDS will be convertible to a stand-alone system with the addition of standard in-line fans. A Letter Work Plan was prepared and submitted to IDEM on February 18, 2021. The IDEM Project Manager, Mr. Jeff Kavanaugh, indicated via email on March 18, 2021 that KERAMIDA could move forward with remediation plans.

Pressure field extension (PFE) testing inside the former Norge Laundry was conducted on April 13, 2021. Installation of two additional SVE wells (SVE-3 and SVE-4) was performed on April 15, 2021. Construction of the SVE system was completed between April 22 and April 26, 2021. SVE system optimization and baseline sampling were conducted on April 27, 2021. Operation maintenance and monitoring (OM&M) of the SVE started immediately following baseline sampling. Installation of the hybrid SSDS was performed between May 6, and May 10, 2021. Baseline sampling of the SSDS was conducted on May 13, 2021. Sampling of indoor air (post-SSDS install) was conducted on May 17, 2021. In accordance with the scope of work, this report has been prepared to summarize installation of the SVE system and hybrid SSDS, the baseline sampling results, and the first two months’ OM&M.

2.0 PRESSURE FIELD EXTENSION TEST

2.1 GEOPHYSICAL SITE SURVEY

Prior to initiation of field activities, KERAMIDA called in a public utility locate through the Indiana 811 public utilities protection service, and contracted Ground Penetrating Radar Systems, LLC (GPRS) to perform a geophysical survey. The geophysical survey of the design locations of the SVE extraction wells and the SSDS vapor extraction points for PFE testing was performed using electromagnetic (EM) and ground-penetrating radar (GPR) sensors. The purpose of the geophysical

survey is to mark all underground utility lines in and near the work locations. Oversight and guidance were provided by KERAMIDA during performance of the survey.

2.2 CREATION OF SUB-SLAB EXTRACTION POINTS

At the time of PFE testing, renovation of the building into a softball training facility was generally complete. Inspection of the renovated facility and communication with the owners' representative, concluded the PFE test plan required modification. One change was drilling in the front portion (west end) of the building (meeting room and office) was limited to one location due to difficulty to repair the newly installed wood floor. In the building center, the softball training room, core drilling using a water bath was prohibited since the floor covering was artificial turf over a layer of cork (indicated not water resistant). Based on the restrictions of the PFE test locations, the plan was reduced, and the conceptual SSDS design revised. The sub-slab extraction point (SSEP) planned within the new softball training room (SSEP-1) was relocated to the front meeting room. Locations of the three other SSEPs (SSEP-2 through SSEP-3) were also modified slightly to accommodate drilling limitations and facility future use.

For each of the revised SSEP locations, a five-inch diameter core bit and water bath were utilized to core through any flooring and the concrete floor slab. Using a shop vacuum and small diameter auger mounted to an electric drill, approximately five gallons of soil were removed to a depth of 12 to 18-inches within each SSEP. Due to drilling limitations inside the building, the pressure test points were eliminated and the existing ozone injection points (OIPs) utilized to determine PFE. The locations of the SSEPs and OIPs are depicted on Figure 3.

2.3 FAN TEST

Fan testing was conducted on April 13, 2021 by three KERAMIDA staff. At each of the SSEPs, testing was conducted using a RadonAway Model GX-4 radon fan (maximum vacuum of 4.3 inches water column [in wc]) and/or a RadonAway Model RP-145 radon fan (maximum vacuum of 2.0 in wc). The radon fan was connected to the SSEP using a U-stop rubber bushing, a polyvinyl chloride (PVC) reducer bushing, and a section of three-inch PVC pipe equipped with a pressure port. A magnehelic gauge was used to measure vacuum through the pressure port. Using a digital manometer pressure was measured using the surrounding OIPs. Field notes are included in Attachment 1 and test data are summarized in Table 1. Specifications of the GX-4 and RP-145 radon fans are provided in Attachment 2.

2.4 FAN TEST SUMMARY AND SSDS DESIGN

Based on data summarized in Table 1, SSEP-1 and SSEP-3 both achieved a radius of influence (ROI) greater than 40 feet with the GX-4 radon fan; far greater than the design ROI of approximately 24 feet based on building floor size. Operating pressure for both locations were near the center of the fan curve. It was concluded that GX-4 radon fan to be a good fit for SSEP-1 and SSEP-3 in the event the hybrid SSDS was converted to a stand-alone SSDS.

At SSEP-2 the GX-4 radon fan operated at a vacuum of approximately four in wc (near the maximum vacuum of the GX-4 fan). A ROI of approximately ten feet was observed during the fan test. The reduced PFE at SSEP-2 is attributed to the tight and wet soil observed during excavation of the extraction point. Theoretically, a radon fan with a higher vacuum is needed to achieve the design ROI at this location; however, since the GX-4 unit offers the highest vacuum for an in-line fan, the GX-4 unit is recommended at SSEP-2 if the hybrid SSDS were to be converted to a stand-alone SSDS. The fan unit is believed capable to achieve the mitigation goal in the area based on the following: 1) vacuum is anticipated to drop as moisture in sub-surface soil is reduced from system operation; and 2) SSEP-1 and SSEP-2 have extended ROIs using the GX-4 unit which can overcome ROI loss at SSEP-2.

At SSEP-4 during extraction point installation a subsurface void was encountered below the slab. Additionally, sub slab material around SSEP-4 was extremely permeable and granular. Based on these conditions, the GX-4 unit is not a good fit at this location. Testing confirmed minimal vacuum observed using the GX-4 unit at SSEP-4. A fan offering less vacuum and higher flow (e.g. RP-145 radon fan) is recommended at SSEP-4 in the event the hybrid SSDS is converted to a stand-alone SSDS in the future.

With vacuum and flow concurrently applied to all four SSEP locations, it is anticipated the entire building footprint will be depressurized, and achieve the design goal of the mitigation system and capture vapors which potentially may migrate from the subsurface into the building. For the hybrid SSDS, gate valves and ball valves will be utilized to adjust pressures and flows at each SSEP to achieve design flows.

3.0 SVE SYSTEM INSTALLATION

3.1 DRILLING AND SOIL SAMPLING

KERAMIDA advanced two soil borings (SVE-3 and SVE-4) for the SVE system using a Geoprobe® 7822DT percussive drill rig. The borings were completed by KERAMIDA under the supervision of Ms. Chelsea McCammack, LPG on April 15, 2021. Soil borings were completed in accordance with KERAMIDA's SOPs, Attachment 3. The locations of the SVE wells are depicted on Figure 3.

The SVE-3 and SVE-4 soil borings were advanced to depths of ten and 15 feet below ground surface (ft-bgs), respectively. Soil cores were collected via direct-push technology and extracted at five-foot intervals from each boring to obtain soil samples for soil texture identification, field screening, and laboratory analysis. Samples were subject to screening with a photoionization detector (PID) with accompanying visual and olfactory inspection. Soil boring logs, field screening results and lithology are provided in Attachment 4. One soil sample was collected from each soil boring based on field inspection and PID readings. The soil samples were collected directly into laboratory-supplied sample containers and immediately placed on ice. Soil samples were submitted through proper chain-of-

custody procedures to Pace Analytical Services, Inc. (PACE) in Indianapolis, Indiana for analysis of volatile organic compounds (VOCs) using United States (U.S.) Environmental Protection Agency (EPA) SW-846 Method 8260B with sample collection and handling according to Method 5035A.

The soil analytical results are summarized in Table 2. Minimal detected compounds were reported, and all were below IDEM RCG Direct Contact SLs. However, PCE was reported above the IDEM RCG Migration to Groundwater (MTG) SLs in the sample collected from boring SVE-4 from 11 to 12 ft-bgs. The minor exceedance of PCE in the sample close to the elevation of groundwater is believed attributed to smear zone impacts by PCE from the groundwater plume and water table fluctuations.

3.2 DRILLING AND WELL CONSTRUCTION

In addition to the two SVE wells and three nested soil vapor points (SVPs) constructed during the SVE pilot test, one additional shallow SVE well (SVE-3) and one additional deep SVE well (SVE-4) were constructed for the full-scale SVE system on April 15, 2021. The SVE wells were constructed using a Geoprobe® 7822DT percussive drill rig equipped with a rotary head to turn hollow-stem augers. The locations of the SVE wells are depicted on Figure 3. SVE-3 and SVE-4 are located near the northeast corner of the building, and about 30 feet east of the pilot test wells (SVE-1 and SVE-2).

The two SVE wells were constructed using two-inch diameter Schedule (SCH) 40 PVC pipe within an eight-inch hollow-stem auger borehole. SVE-3 was constructed to a total depth of eight feet with slotted well screen from three to eight ft-bgs. SVE-4 was constructed to a total depth of 13 feet and screened from eight to 13 ft-bgs. A number two (#2) sand pack was placed around the well screen and extended approximately six inches above the top of the screen. A one-foot granular bentonite seal was placed above the sand pack, and a cement bentonite grout was placed above the bentonite seal to approximately one ft-bgs. The SVE wells were completed approximately 0.5 ft-bgs within a flush mount protective cover set in concrete. Each SVE well was completed with a PVC threaded female adapter fitting and threaded plug for connection to the SVE pilot system.

3.3 WASTE CHARACTERIZATION AND DISPOSAL

Soil generated during soil sampling and well installation was containerized in two 55-gallon steel drums, and properly labeled pending disposal approval. As part of waste characterization during the SVE pilot test, a “Contained-In” determination request was submitted to IDEM on July 7, 2020. The request was approved on July 8, 2020, including pre-approval of all future investigation derived waste (IDW) at the Property through July 8, 2022 that meets the 2019 Federal Industrial/Commercial Soil Direct Contact Soil Exposure Screening Levels, and is not characteristic hazardous waste. The approval is included in Attachment 5.

With the “Contained-In” determination, all waste soil was managed as non-hazardous waste through Liquid Waste Removal, Inc. (LWR) of Greenwood, Indiana. The soils were disposed at Waste Management’s Twin Bridges Landfill in Danville, Indiana.

3.4 SVE SYSTEM INSTALLATION

Construction of the SVE system was completed over a two day period between April 22 and 26, 2021. Operation of the SVE system (SVE System) was started on April 26, 2021. The SVE System, Stock # 1500 as manufactured by Enviro-Equipment, Inc., of Pineville, NC, was procured and shipped to Indianapolis, IN, and transported to the Site by KERAMIDA personnel. The SVE system is contained within a vandalism resistant metal structure, equipped with a heater for freeze protection and an exhaust fan for equipment cooling. The SVE system includes four inlet connections mounted on the structure exterior. Inside the SVE structure, the inlets are connected to a common manifold, condensate knock-out, inlet filter, vacuum relief valve and the vacuum blower. Each inlet to the manifold has a flow control valve and vacuum gauge. The condensate tank is equipped with a high-level shut-off and manual drain. On the exterior of the SVE structure, each inlet connection is piped to an SVE extraction well. Details of the system are provided in the System Manual in Attachment 6.

The SVE System is located on the east side of the former Norge Laundry building, on an existing concrete pad near the northeast building corner. A licensed electrician was contacted to wire the control panel on the SVE structure to the existing electrical service within the former Norge building. A small hole was created in the eastern building wall close to the SVE System to pass through the electrical conduit. Rigid conduit was run within the building and flexible conduit utilized for the exterior connection.

At each SVE well a two-inch PVC tee, ball valve and threaded plug were installed at the well head. The ball valve connects to two-inch SCH 40 PVC pipe which extends to the SVE System inlet connection. A diagram of the piping is depicted on Figure 4. The ball valve at the well head is used for flow control/shut-off at each SVE well. A sample port was installed on each of the SVE lines close to the SVE System structure and used for flow and vacuum measurement and sample collection. The sample ports are plugged when not in use. For freeze protection, self-regulating heat tape, closed cell insulation, and PVC jacketing, or similar, will be installed on all exposed piping outside the SVE system cabinet prior to onset of freezing weather.

3.5 SYSTEM OPTIMIZATION

Optimization of SVE system operation was conducted on April 27, 2021. Operations were initiated with application of 100% vacuum to maximize flow from the four SVE wells. System parameters including flow rate and vacuum were monitored following start-up. Data indicated SVE-1 and SVE-3 yield higher air flow compared to SVE-2 and SVE-4. To balance flow and vacuum in each line and meet the design operation parameters, ball valves for SVE-1 and SVE-3 in the SVE system structure were partially closed until the air flow rate from each SVE well were similar. Pressures were measured

at the three pilot-installed SVPs to verify the SVE System ROI. Field notes are included in Attachment 7.

3.6 SVE BASELINE SAMPLING AND RESULTS

Baseline SVE sampling was conducted immediately after the system optimization on April 27, 2021. The vapor sample of the influent from the SVE system was collected using a one-liter Summa canister in accordance with KERAMIDA's SOPs, Attachment 3. The sample was submitted to PACE in Minneapolis, Minnesota and analyzed for cVOCs according to US EPA Method TO-15. The sampling log is included in Attachment 8. The laboratory report is included in Attachment 9, and the sample results summarized in Table 3.

Since two SVE wells are screened from three to eight ft-bgs, and two SVE wells screened from eight to 13 ft-bgs, SVE influence on subsurface soil is a combination of shallow and deep soil gas. The IDEM Technical Guidance (2016) defines shallow soil gas as from a depth less than five ft-bgs, and deep soil gas as greater than five ft-bgs. It is assumed 40% of system flow is from SVE-1 and SVE-3 as shallow soil gas and 60% as deep soil gas based on screen location, and therefore shallow soil gas accounts for 25% to 30% of SVE System influent. Details on flow data are discussed in Section 5.1.2.

The SVE sampling results compared to both the Shallow Soil Gas C/I SLs and the Deep Soil Gas C/I SLs are presented in Table 3. The Shallow Soil Gas C/I SLs were calculated by dividing the IDEM RCG indoor air C/I SLs by an attenuation factor of 0.1 per IDEM Technical Guidance dated September 29, 2016; and the Deep Soil Gas C/I SLs (same as Sub-Slab Soil Gas C/I SLs) were calculated by dividing the IDEM RCG indoor air C/I SLs by an attenuation factor of 0.03 per IDEM Technical Guidance dated September 29, 2016. As shown in Table 3, PCE and TCE were reported at concentrations of 27,300 and 1,540 microgram per cubic meter ($\mu\text{g}/\text{m}^3$) respectively, well above their corresponding Deep Soil Gas C/I SLs of 6,000 and 293 $\mu\text{g}/\text{m}^3$. Vinyl chloride (VC) was reported in the SVE baseline sample at a concentration of 603 $\mu\text{g}/\text{m}^3$, exceeding its Shallow Soil Gas C/I SL of 280 $\mu\text{g}/\text{m}^3$, but below its Deep Soil Gas C/I SLs of 933 $\mu\text{g}/\text{m}^3$. No other cVOCs were reported above the Shallow Soil Gas C/I SLs.

4.0 HYBRID SSDS INSTALLATION

4.1 HYBRID SSDS INSTALLATION

At each SSEP a three-inch diameter SCH 40 PVC vertical riser pipe was installed, sealed at the slab interface and extended into the space above the existing suspended ceiling. Each of the riser pipes was equipped with a flow control gate valve, U-tube manometer, and piped for connection to the SVE system. Parallel to the east wall and extending into the rear furnace room a single four-inch diameter PVC manifold pipe was connected to each SSEP and to the SVE system. An approximate five-inch hole was created through the eastern building wall for connection of the hybrid SSDS to the inlet manifold valve of the SVE system. The hybrid SSDS was constructed such that it can be converted to stand-alone SSDS operation with the addition of standard radon-style fan units and minor

modifications to the vapor piping. For freeze protection, self-regulating heat tape, closed cell insulation, and PVC jacketing, or similar, will be installed on the exterior piping outside the SVE system cabinet prior to onset of freezing weather.

Operation of the hybrid SSDS was started immediately after installation completed on May 10, 2021. The hybrid SSDS piping is illustrated on Figure 4.

4.2 HYBRID SSDS BASELINE SAMPLING AND RESULTS

Baseline sampling of the SSDS was conducted on May 13, 2021. The SSDS influent vapor sample was collected using a one-liter Summa canister in accordance with KERAMIDA's SOPs, Attachment 3. The sample was submitted to PACE in Minneapolis, Minnesota and analyzed for cVOCs according to US EPA Method TO-15. The sampling log is included in Attachment 10. The laboratory report is included in Attachment 11, and the results summarized in Table 3.

The hybrid SSDS baseline sampling results compared to the Sub-Slab Soil Gas C/I SLs are presented in Table 3. As discussed in Section 3.6, the Deep Soil Gas C/I SLs and the Sub-Slab Soil Gas C/I SLs were calculated by dividing the IDEM RCG indoor air C/I SLs by an attenuation factor of 0.03 per IDEM Technical Guidance dated September 29, 2016. As shown in Table 3, PCE and TCE were detected in the sample at concentrations of 356 and 4.9 $\mu\text{g}/\text{m}^3$, respectively, well below their corresponding Sub-Slab Soil Gas C/I SLs of 6,000 and 293 $\mu\text{g}/\text{m}^3$. No other cVOCs were detected in the hybrid SSDS baseline sample.

4.3 POST HYBRID SSDS INDOOR AIR SAMPLING AND RESULTS

Post mitigation PFE testing and indoor air sampling were conducted to evaluate effectiveness of the hybrid SSDS. Post mitigation PFE test data is discussed in Section 5.1.1 of this report.

Post hybrid SSDS installation, indoor air sampling was conducted in the former Norge Laundry building on May 21, 2021. The indoor air sample was collected using a six-liter Summa canister over an eight-hour sample period in accordance with KERAMIDA's SOPs, Attachment 3. The sample was submitted to PACE in Minneapolis, Minnesota and analyzed for cVOCs according to US EPA Method TO-15. The sampling log is included in Attachment 12. The laboratory report included in Attachment 13, and the results of post hybrid SSDS indoor air sampling along with historical indoor air sampling results summarized in Table 4.

Sample data compared to the IDEM RCG indoor air C/I SLs are presented in Table 4. PCE was the only cVOC detected in the post hybrid SSDS indoor air sample. PCE was detected at a concentration of 34.6 $\mu\text{g}/\text{m}^3$, well below corresponding IDEM RCG indoor air C/I SL of 180 $\mu\text{g}/\text{m}^3$ (below the residential level of 42 $\mu\text{g}/\text{m}^3$). The most recent sample within the building (pre-SSDS) reported a PCE concentration of 321 $\mu\text{g}/\text{m}^3$ in 2020. These results indicate the hybrid SSDS design connected to the SVE system is meeting the goal of vapor intrusion mitigation and use of the building for

commercial usage.

5.0 OPERATION MAINTENANCE AND MONITORING

5.1 INITIAL TWO MONTHS OM&M

Operations maintenance and monitoring (OM&M) were initiated immediately following start-up of the system. Daily inspections were performed for the initial week and then weekly inspections were performed till the end of the second month. During each inspection, a data log was filled out detailing the field observations and measurements collected. All data logs are included in Attachment 14 and summarized in Attachment 15.

5.1.1 System Vacuum and PFE

System vacuum data are summarized in Table 5, and the data curves presented as Figure 5. Prior to startup of the hybrid SSDS's on May 10, 2021, system vacuum stabilized around 81 in wc, which is close to the blower's maximum suction of 85 in wc; blower specification provided in Attachment 6. System vacuum dropped immediately after start-up of the hybrid SSDS, and stabilized around 65 in wc, which is close to the center of the blower performance curve. Per the blower performance chart (Attachment 6), the system yields approximately 110 cubic feet per minute (CFM) of air flow at suction of 65 in wc. Measurement of system flow rate is discussed in the following section.

The deep SVE wells (SVE-2 and SVE-4) are each operating at approximately 45 in wc, which is higher than the shallow SVE wells (SVE-1 and SVE-3) which generally operate between 15 and 25 in wc. These differing operational pressures are due to the subsurface stratigraphy and corrected using the flow control valves to SVE-1 and SVE-3 which are partially closed to limit vacuum and balance system flow. Details of flow balancing are discussed in Section 3.5. In general, the fill soil below the building slab is significantly less permeable than the subsurface soil around the building exterior. The hybrid SSDS inlet control valve and the individual SSEP valves are each partially closed to limit flow from the SSDS. The vacuum pressures observed at each of the SSEPs are subsequently minimal, especially at SSEP-4 where vacuum is less than 0.1 in wc. Details of the hybrid SSDS are discussed in Sections 2.4 and 4.1.

Vacuum readings at the SVPs, interior OIPs and Sub-Slab testing locations (SS-1 through SS-4) were periodically monitored to evaluate PFE of the SVE and the hybrid SSDS system. The monitoring data are summarized in Attachment 14. A minimum vacuum of 0.1 in wc was used as the criteria to indicate significant vacuum to extract air into the SVE well. A pressure of 0.004 in wc is the lower limit commonly used to indicate PFE for an SSDS. Vacuum readings at all SVP wells were above the criteria of 0.1 in wc except for the intermediate zones of SVP-2 and SVP-3. It is believed that the low vacuum observed at SVP-2 intermediate is due to tighter soils in this vertical zone. This was further confirmed when the SVE system vacuum was reduced due to start-up of the hybrid SSDS, and almost no effect on vacuum was exhibited at these wells. SVE system vacuum can be increased to target the intermediate zone, if determined necessary in the future. The low vacuum observed at SVP-3

intermediate is believed due to non-connectivity of the discontinuous sand layers, as observed in the soil borings.

Vacuum readings measured at all OIPs were above the design minimum of 0.004 in wc with the exception of OIP-19 and SS-1, both located in the northeast corner of the building. The lower readings at these locations are attributed to tight and wet soils observed at SSEP-2, as discussed in Section 2.4. Even with low PFE at two locations, the vapor mitigation goal was still achieved as discussed in Section 4.3.

5.1.2 Flow Rate

Measured flow rate data are summarized in Table 6, and the data curves presented as Figure 6. System flow stabilized around 100 CFM, with approximately 50% from the SVE system and 50% from the SSDS. As discussed in Section 5.1.1, the blower performance curve predicts a system flow rate of approximately 110 CFM. The approximately 10% relative percentage difference (RPD) between measured and predicted system flow rate is attributed to accuracy limitations of the measuring device – a pitot tube and digital manometer. The approximate 10% RPD is considered an acceptable level of RPD.

At SVE-4 measured flow is minimal as compared to the other SVE wells and may reduce to little or no flow following a significant rain event. SVE-4 is screened between eight ft-bgs and 13 ft-bgs, and from the boring log material the screen is mostly moist clay (eight ft-bgs to 11 ft-bgs), over a sand layer (11 ft to 13 ft). When the more permeable sand layer around the screen becomes submerged by groundwater, there is almost no air flow yield from SVE-4. This is further illustrated by groundwater elevation data included in Attachment 14.

5.1.3 PID Readings

PID reading data are summarized in Table 7, and the data curves presented as Figure 7. PID readings of system discharge fluctuated between 3,300 parts per billion (ppb) and 6,700 ppb through most of the monitoring period. No trends (increase or decrease) have been observed in the discharge following startup and stable operation of the system. Note, the 10,700 ppb reported at system discharge on May 7, 2021 is believed partially attributable to PVC glue used during hybrid system installation.

PID readings at the deep SVE wells (SVE-2 and SVE-4) are higher than the shallow SVE wells (SVE-1 and SVE-3). This is attributed to the following: 1) the deep SVE wells are closer to cVOC impacted groundwater migrating from below the building; 2) cVOC impacts in the smear zone and vadose soil; and 3) the deep SVE wells have lower flow rates than the shallow SVE wells.

PID readings at the hybrid SSDS inlet are lower than the SVE wells most of the time. This result is expected as the SSDS creates a negative pressure field directly under the building slab to prevent vapor intrusion into the building. Performance of the hybrid SSDS has been evaluated based on PFE,

discussed in Section 5.1.6, and post-mitigation indoor air sampling discussed in Section 4.3. PID data for the hybrid SSDS is included as an OM&M task for assessment of VOC contribution to system discharge. It is not a parameter used to evaluate functionality of the hybrid SSDS.

5.1.4 Vapor Sampling

In addition to the SVE baseline sampling, SVE monthly sampling events were conducted on May 28, and June 25, 2021. The ball valve to the hybrid SSDS inlet was closed prior to collection of the SVE system samples and after sample collection returned to normal conditions. The vapor samples were collected using a one-liter Summa canister in accordance with KERAMIDA's SOPs, Attachment 3. The samples were submitted to PACE in Minneapolis, Minnesota and analyzed for cVOCs according to US EPA Method TO-15. Sampling logs for both sampling events are included in Attachment 16. The laboratory report for the May and June sampling events are included in Attachment 13 and Attachment 17, respectively. The sampling results are summarized in Table 3.

The May 28, 2021 sampling (Month 1) reported PCE and TCE at concentrations of 34,200 and 1,390 $\mu\text{g}/\text{m}^3$, respectively, well above their corresponding Deep Soil Gas C/I SLs. All other cVOCs were below C/I SLs. The June 25, 2021 sampling results (Month 2) reported PCE and TCE at concentrations of 61,100 and 2,010 $\mu\text{g}/\text{m}^3$, respectively, well above their corresponding Deep Soil Gas C/I SLs. All other cVOCs were below C/I SLs. The Month 2 concentrations of PCE and TCE increased by factors of 79 and 45 percent, respectively, as compared to the Month 1 results.

5.1.5 Mass Removal

The data in Table 3 was used to calculate cumulative mass removal of cVOCs. Calculations are presented in Table 8 and the cumulative curve as Figure 8. The concentration of cVOCs is the sum of concentrations of PCE, TCE, cis-1,2-dichloroethene (cis-1,2 DCE), trans-1,2-dichloroethene (trans-1,2 DCE), 1,1-dichloroethene (1,1-DCE) and VC. Half of the detection limit was used for non-detects. The concentration of cVOCs for the first month (Weeks 1 through 4) is assumed as the average of the SVE baseline results (4/27/21) and the SVE first month results (5/28/21). The concentration of cVOCs for the second month (Weeks 5 through 8) is assumed as the average of the SVE first month results (5/28/21) and SVE second month results (6/25/21). Weekly flow rate is the sum of flow rates for SVE-1 through SVE-4 measured each week.

Based on the limited data and averaging of concentrations, mass removal of cVOCs after 8 weeks of operation is approximately five kilograms, and inlet concentrations increased over the period. KERAMIDA will continue to evaluate on a monthly basis SVE system operation, rate of mass removal, and if any operation conditions should be modified.

5.2 OM&M PLAN

Monthly inspections are planned to continue for up to a two-year duration (total of 22 site visits). During each inspection, a data log will be filled out detailing field observations and measurements

collected. It is assumed the collection and review of operational data over the initial two months support that inspections occur on a monthly basis.

Routine system monitoring will include measurements of vacuum, pressure, air flow and PID readings. Vacuum will be measured at various points throughout the system with fixed gauges, digital manometers and/or magnehelic gauges. Pressure and temperature at the blower discharge will be measured with fixed gauges. Air flow is measured at sample ports through dynamic pressure measurement using a pitot tube and digital manometer. PID screening is conducted at sample ports and the blower discharge. In addition to the PID screening, samples of the SVE system influent will be collected monthly for measurement of cVOCs. The valve to the SSDS inlet will be closed prior to collection of the SVE System sample. An example data log form is included in Attachment 13. Following each monthly inspections a brief summary letter or Field Summary Form will be prepared to document remediation operations.

As part of OM&M in July or August, installation of additional equipment to the SVE system will be performed. The additional equipment includes a WIFI-connected remote monitoring system (SensaPhone Pro) for notification of alarm conditions or system shut-down, a heat-trace system for freeze protection of the exterior piping, and two fixed pitot tube flow measurement devices on the system effluent and the SSDS influent. Routine operations will continue to monitor blower operation, and build-up of condensate in the knock-out tank. The buildup of condensate in the knock-out tank and system shut-down generally occurs following heavy precipitation events. The remote monitoring system is anticipated to help further understand the environmental factors contributing to system shut down. Sampling of condensate is planned to evaluate characteristics of this waste stream; these fluids are presently managed with the monitoring well purge wastes.

6.0 SVE AND HYBRID SSDS DISCHARGE PERMIT EVALUATION

According to IDEM air permitting requirements ¹, a source with potential to emit (PTE) less than the minimum registration thresholds is typically exempt from permit regulations. For this project, the chemical of concern is VOCs, which has a minimum registration threshold of ten tons per year.

Hypothesis scenario:

Concentration of VOCs in the system discharge remain at the SVE baseline concentration during the first year of system operation from April 27, 2021 to April 27, 2022.

Note, the hypothesis scenario is estimated to be conservative with regards to PTE based on the following: 1) System discharge is a combination of SVE and the hybrid SSDS, and 2) Concentration of VOC in the system discharge is anticipated to decrease gradually over time. Based on the data presented in Section 5, the VOC concentration in the hybrid SSDS is significantly lower than the SVE

¹ <https://www.in.gov/idem/airpermit/information-about/potential-to-emit-and-source-category/emissions-applicability-thresholds/>

concentration. As such, the combined discharge of the system is actually a lower VOC concentration, and therefore conservative to assume VOC loading remains at the baseline level.

The PTE for the hypothesis scenario is calculated as follows:

$$\begin{aligned} C_{\text{discharge}} &= C_{1,1\text{DCE}} + C_{\text{cis}1,2\text{DCE}} + C_{\text{trans}1,2\text{DCE}} + C_{\text{PCE}} + C_{\text{TCE}} + C_{\text{VC}} \\ &= 38 \mu\text{g}/\text{m}^3 + 1,390 \mu\text{g}/\text{m}^3 + 122 \mu\text{g}/\text{m}^3 + 27,300 \mu\text{g}/\text{m}^3 + 1,540 \mu\text{g}/\text{m}^3 + 603 \mu\text{g}/\text{m}^3 \\ &= 30,993 \mu\text{g}/\text{m}^3 \end{aligned}$$

Where:

- $C_{\text{discharge}}$ = VOC concentration in system discharge
- $C_{1,1\text{DCE}}$ = 1,1-Dichloroethene concentration in SVE baseline sample
- $C_{\text{cis}1,2\text{DCE}}$ = cis-1,2-dichloroethene concentration in SVE baseline sample
- $C_{\text{trans}1,2\text{DCE}}$ = trans-1,2-dichloroethene concentration in SVE baseline sample
- C_{PCE} = Tetrachloroethene concentration in SVE baseline sample
- C_{TCE} = Trichloroethene concentration in SVE baseline sample
- C_{VC} = Vinyl Chloride concentration in SVE baseline sample

$$\begin{aligned} \text{PTE} &= C_{\text{discharge}} \times Q_{\text{discharge}} \times D_{\text{year}} \\ &= 30,993 \mu\text{g}/\text{m}^3 \times 110 \text{ ft}^3/\text{min} \times 365 \text{ days}/\text{yr} \\ &= 30,993 \mu\text{g}/\text{m}^3 \times 110 \text{ ft}^3/\text{min} \times (0.3048 \text{ meter}/\text{ft})^3 \times 365 \text{ days}/\text{yr} \times 24 \text{ hrs}/\text{day} \times 60 \text{ mins}/\text{hr} \\ &= 5.07 \times 10^{10} \mu\text{g}/\text{yr} \times 10^{-9} \text{ kg}/\mu\text{g} \times 2.2 \text{ lb}/\text{kg} \div 2000 \text{ lb}/\text{ton} \\ &= 0.056 \text{ ton}/\text{yr} \end{aligned}$$

Where:

- $Q_{\text{discharge}}$ = Discharge flow rate
- D_{year} = Duration of a year

As illustrated in the calculation above, the PTE for the conservative hypothesis scenario is 0.056 ton per year (ton/yr.), which is well below the minimum registration threshold of ten tons per year. Inlet concentrations following startup have increased some since baseline sampling, however, concentrations would need to be greater than 5.55 grams/m³ to exceed the ten tons per year limit. It is therefore determined that no air permit or treatment with activated carbon is required for system direct discharge into the atmosphere.

7.0 SUMMARY

Installation of the full-scale SVE and Hybrid SSDS system at the former Norge building is operational and achieving the remediation objectives. The SVE system is removing cVOC impacted soil gas from below the building and the footprint of the former dry cleaner machines. The hybrid SSDS, as demonstrated through indoor air sampling and levels of PCE below IDEM RCG SLs, is mitigating the migration of sub-slab vapors into the building. Ownership of the former Norge building changed in early 2021 and redevelopment converted usage to a private girls softball training facility.

Redevelopment was complete prior to installation of the remediation systems which did require modification of the design plans to accommodate the new use of the building.

Per the work plan the design flows of the remediation system was targeted at 125 CFM with 100 cfm from the SVE system and 25 cfm from the SSDS. Measured flows post-system installation are a total flow of 100 to 110 cfm with flows from the SVE of 50 to 60 cfm and the SSDS at 50 cfm. The slightly lower total flow is attributed to tighter subsurface conditions near the northeast building corner and elevated pressure losses in the SVE piping and equipment. Reduction of the SSDS flow slightly and closer to the design flow (25 CFM) will occur following installation of the additional flow measurement devices. The SSDS installation was completed such that it is readily convertible to a stand-alone system with the addition of in-line radon style fan(s).

Optimization and monitoring performed as part of installation and start-up activities verified PFE across the building sub-slab, and data collected from the soil vapor points verified SVE System ROI. OM&M occurred weekly for the initial two months of operation and then reverted to monthly moving forward. To date shut-down of the system only occurs when the knock-out tank becomes full which occurs generally following periods of heavy precipitation. Installation of the remote monitoring system will provide further understanding of these operational characteristics. An analysis of system discharge concentrations determined that no treatment or air permitting is required.

Based on limited sampling to date and averaging of concentrations the SVE system is estimated to removed 5 kg of cVOCs over the initial 2 months of operation. SVE system inlet concentrations have increased up to 79% (PCE) over the two-month period of operations. Monitoring and sampling will continue to monitor and track remediation operations and removal of cVOCs from subsurface soil gas.

8.0 REFERENCES

- KERAMIDA, 2021. *Letter Work Plan – Soil Vapor Extraction and Hybrid Sub-Slab Depressurization System*, KERAMIDA, Inc., February 18, 2021.
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- KERAMIDA, 2019. *Interim Remediation Summary Report – Sub-Slab Ozone Treatment*, KERAMIDA, Inc., February 20, 2019.
- KERAMIDA, 2016. *Sub-Slab Supplementary Site Investigation* Former Norge Laundry and Cleaning Village, by KERAMIDA, date December 7, 2016.

**SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796**

TABLES

Table 1
Fan Test Data Summary
Former Norge Laundry Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796

Date	Suction Test Point	Test Fan Model	Vacuum Reading (in w.c.)	Estimated Flow (CFM)	Pressure Test Point	Pressure Reading (in w.c.)	Distance (feet)
4/13/2021	SSEP-1	GX-4	3.3	50	SS-3	-0.095	29.05
					OIP-11	-0.005	39.7
					OIP-12	-0.008	48.36
					OIP-7	-0.086	26.65
4/13/2021	SSEP-2	GX-4	4.0	19	SS-3	0	35.6
					OIP-11	0.002	22.36
					OIP-12	0	14.76
					OIP-17	0	16.8
					SS-2	-0.032	2.81
					OIP-18	-0.005	8.89
					OIP-19	-0.007	4.56
					OIP-3	-0.002	27.7
4/13/2021	SSEP-3	GX-4	1.8	85	OIP-7	-0.021	38.51
					OIP-3	0.001	43.01
					SS-3	-0.024	28.13
					OIP-11	-0.008	37.26
					OIP-12	-0.005	43.22
					SS-4	-0.026	39.36
4/13/2021	SSEP-4	GX-4	0.7	105	OIP-7	0	41.74
					OIP-3	0.001	43.28
					SS-3	0	33.26
					OIP-11	0	31.19
					OIP-12	0.002	30.74
					OIP-15	-0.005	12.91
4/13/2021	SSEP-4	RP-145	0.5	126	OIP-12	0	30.74
					OIP-15	-0.008	12.91
					OIP-17	0	29.49

Notes:

GX-4 radon fan from Radon Away, maximum vacuum of approximately 4.3 in w.c.

RP-145 radon fan from Radon Away, maximum vacuum of approximately 2.0 in w.c.

SSEP = Sub-Slab Extraction Point

in w.c. = inch of water column

SS = Sub-Slab

OIP = Ozone Injection Point

CFM = Cubic Feet Per Minute

Table 2
Soil VOC Analytical Results (mg/kg)
Former Norge Laundry Cleaning Village
2915 S. Meridian Street
Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796

Sample No.	RCG Soil Migration to Groundwater ⁽¹⁾	RCG Soil Exposure Direct Contact - Residential ⁽¹⁾	RCG Soil Exposure Direct Contact - Commercial / Industrial ⁽¹⁾	RCG Soil Exposure Direct Contact - Excavation ⁽¹⁾	U.S. EPA RSL - Soil Saturation (C _{sat}) ⁽²⁾	SVE-3	SVE-4	Trip Blank
Sample Depth (feet)						5-6	11-12	NA
Date Sampled						4/15/2021	4/15/2021	4/15/2021
Lab Sample No.						50285043001	50285043002	50285043003
Acetone	57	85,000	100,000	100,000	114,000	<0.10	<0.088	<0.10
Acrolein	0.00017	0.2	0.6	3.4	22,700	<0.10	<0.088	<0.10
Acrylonitrile	0.0023	3.5	11	370	11,300	<0.10	<0.088	<0.10
Benzene	0.051	17	51	1,800	1,820	<0.0052	<0.0044	<0.0050
Bromobenzene	0.84	410	680	680	679	<0.0052	<0.0044	<0.0050
Bromochloromethane	0.41	210	630	3,500	4,040	<0.0052	<0.0044	<0.0050
Bromodichloromethane	0.43	4.1	13	930	930	<0.0052	<0.0044	<0.0050
Bromoform	0.42	270	860	920	915	<0.0052	<0.0044	<0.0050
Bromomethane (Methyl Bromide)	0.038	9.5	30	160	3,590	<0.0052	<0.0044	<0.0050
n-Butylbenzene	64	110	110	110	108	<0.0052	<0.0044	<0.0050
sec-Butylbenzene	120	150	150	150	145	<0.0052	<0.0044	<0.0050
tert-Butylbenzene	31	180	180	180	183	<0.0052	<0.0044	<0.0050
Carbon disulfide	4.8	740	740	740	738	<0.010	<0.0088	<0.010
Carbon tetrachloride	0.039	9.1	29	460	458	<0.0052	<0.0044	<0.0050
Chlorobenzene	1.4	390	760	760	761	<0.0052	<0.0044	<0.0050
Chlorodibromomethane	0.43	120	390	800	802	<0.0052	<0.0044	<0.0050
Chloroethane (Ethyl Chloride)	120	2,100	2,100	2,100	2,120	<0.0052	<0.0044	<0.0050
Chloroform	0.44	4.5	14	1,900	2,540	<0.0052	<0.0044	<0.0050
Chloromethane (Methyl Chloride)	0.98	150	460	1,300	1,320	<0.0052	<0.0044	<0.0050
2-Chlorotoluene (o-)	4.7	910	910	910	907	<0.0052	<0.0044	<0.0050
4-Chlorotoluene (p-)	4.8	250	250	250	253	<0.0052	<0.0044	<0.0050
1,2-Dibromo-3- Chloropropane	0.0017	0.074	0.64	86	979	<0.010	<0.0088	<0.010
1,2-Dibromoethane	0.00028	0.5	1.6	180	1,340	<0.0052	<0.0044	<0.0050
Dibromomethane (Methylene Bromide)	0.041	34	99	550	2,820	<0.0052	<0.0044	<0.0050
1,2-Dichlorobenzene	12	380	380	380	376	<0.0052	<0.0044	<0.0050
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	<0.0052	<0.0044	<0.0050
1,4-Dichlorobenzene	1.4	36	110	16,000	NA	<0.0052	<0.0044	<0.0050
Dichlorodifluoromethane	6	120	370	850	845	<0.0052	<0.0044	<0.0050
trans-1,4-Dichloro- 2-butene	0.00012	0.1	0.32	44	760	<0.10	<0.088	<0.10
1,1-Dichloroethane	0.16	50	160	1,700	1,690	<0.0052	<0.0044	<0.0050
1,2-Dichloroethane	0.028	6.4	20	730	2,980	<0.0052	<0.0044	<0.0050
1,1-Dichloroethene	0.05	320	1,000	1,200	1,190	<0.0052	<0.0044	<0.0050
cis-1,2-Dichloroethene	0.41	220	2,300	2,400	2,370	0.2	<0.0044	<0.0050
trans-1,2-Dichloroethene	0.62	98	300	1,600	1,900	<0.0052	<0.0044	<0.0050
1,2-Dichloropropane	0.033	22	66	360	1,360	<0.0052	<0.0044	<0.0050
1,3-Dichloropropane	2.6	1,500	1,500	1,500	1,490	<0.0052	<0.0044	<0.0050
2,2-Dichloropropane	NA	NA	NA	NA	NA	<0.0052	<0.0044	<0.0050
1,1-Dichloropropene	NA	NA	NA	NA	NA	<0.0052	<0.0044	<0.0050
1,3-Dichloropropene	0.034	25	82	1,600	1,570			
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	<0.0052	<0.0044	<0.0050
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	<0.0052	<0.0044	<0.0050
Ethylbenzene	16	81	250	480	480	<0.0052	<0.0044	<0.0050
Ethyl methacrylate	3	1,100	1,100	1,100	1,100	<0.10	<0.088	<0.10
2-Hexanone	0.18	280	1,300	3,300	3,280	<0.10	<0.088	<0.10
Hexachlorobutadiene	0.054	17	17	17	16.8	<0.0052	<0.0044	<0.0050
n-Hexane	210	140	140	140	141	<0.0052	<0.0044	<0.0050
Iodomethane	NA	NA	NA	NA	NA	<0.10	<0.088	<0.10
Isopropylbenzene (Cumene)	15	270	270	270	268	<0.0052	<0.0044	<0.0050
p-Isopropyltoluene	NA	NA	NA	NA	NA	<0.0052	<0.0044	<0.0050
Methylene chloride	0.025	490	3,200	3,300	3,320	<0.021	<0.018	<0.020
Methyl Ethyl Ketone (2-Butanone)	23	28,000	28,000	28,000	28,400	<0.026	<0.022	<0.025
Methyl tert-butyl ether (MTBE)	0.63	660	2,100	8,900	8,870	<0.0052	<0.0044	<0.0050
4-Methyl-2-pentanone (MIBK)	28	3,400	3,400	3,400	3,360	<0.026	<0.022	<0.025
1-Methylnaphthalene	1.2	250	390	390	NA	<0.010	<0.0088	<0.010
2-Methylnaphthalene	3.7	340	3,000	6,800	NA	<0.010	<0.0088	<0.010
Naphthalene	0.079	28	86	3,100	NA	<0.0052	<0.0044	<0.0050
n-Propylbenzene	25	260	260	260	264	<0.0052	<0.0044	<0.0050
Styrene	2.2	870	870	870	867	<0.0052	<0.0044	<0.0050
1,1,1,2-Tetrachloroethane	0.043	28	88	680	680	<0.0052	<0.0044	<0.0050
1,1,2,2-Tetrachloroethane	0.0059	8.4	27	1,900	1,900	<0.0052	<0.0044	<0.0050
Tetrachloroethene	0.045	110	170	170	166	<0.0052	0.68	<0.0050
Toluene	14	820	820	820	818	<0.0052	<0.0044	<0.0050
1,2,3-Trichlorobenzene	0.42	88	930	1,600	NA	<0.0052	<0.0044	<0.0050
1,2,4-Trichlorobenzene	4.1	81	260	400	404	<0.0052	<0.0044	<0.0050
1,1,1-Trichloroethane	1.4	640	640	640	640	<0.0052	<0.0044	<0.0050
1,1,2-Trichloroethane	0.032	2.1	6.3	35	2,160	<0.0052	<0.0044	<0.0050
Trichloroethene	0.036	5.7	19	95	692	0.016	0.0071	<0.0050
Trichlorofluoromethane	66	1,200	1,200	1,200	1,230	<0.0052	<0.0044	<0.0050
1,2,3-Trichloropropane	0.000065	0.071	1.1	46	1,400	<0.0052	<0.0044	<0.0050
1,2,4-Trimethylbenzene	1.6	220	220	220	219	<0.0052	<0.0044	<0.0050
1,3,5-Trimethylbenzene	1.7	180	180	180	182	<0.0052	<0.0044	<0.0050
Vinyl acetate	1.7	1,300	2,800	2,800	2,750	<0.10	<0.088	<0.10
Vinyl chloride	0.014	0.83	17	1,300	3,920	<0.0052	<0.0044	<0.0050
Xylenes, Total	200	260	260	260	260	<0.010	<0.0088	<0.010

Samples analyzed using EPA SW-846 Method 8260B / Sample Preparation Method 5035A
mg/kg = milligrams per kilogram
NA = Not Available
VOCs = Volatile Organic Compounds
(1) Indiana Department of Environmental Management Remediation Closure Guide, Appendix A, Table A-6, Final, March 22, 2012, with updates through March 2021.
(2) U.S. EPA, Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=1), Soil Saturation Concentration (C_{sat}), November 2020.

BOLD = Indicates Detection
Exceeds RCG Soil Migration to Groundwater-Residential Screening Levels
Exceeds RCG Soil Exposure Direct Contact-Residential Screening Levels
Exceeds RCG Soil Exposure Direct Contact-Commercial/Industrial Screening Levels
Exceeds RCG Soil Exposure Direct Contact-Excavation Worker Screening Levels

Table 3
Soil Gas and Sub-Slab cVOCs Analytical Results (ug/m³)
Norge Laundry Site
2915 S. Meridian Street
Indianapolis, Indiana
KERAMIDA Project No. 19796

Sample	Sample Type	Date Sampled	1,1-Dichloroethene	cis-1,2-dichloroethene	trans-1,2-dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl Chloride	Total cVOCs
SVE_Baseline	Soil Gas	4/27/2021	38.0	1,390	122	27,300	1,540	603	30,993
SVE_1st Month	Soil Gas	5/28/2021	<47.9	872	<47.9	34,200	1,390	45.1	36,507
SVE_2nd Month	Soil Gas	6/25/2021	<1.9	1,030	31.6	61,100	2,010	21.3	64,193
RCG Sub-Slab/Deep Soil Gas Vapor Exposure - Commercial / Industrial ^{(1),(2)}			29,333	NA	6,000	6,000	293	933	NA
RCG Shallow Soil Gas Vapor Exposure - Commercial / Industrial ^{(1),(3)}			8,800	NA	1,800	1,800	88	280	NA
SSDS_Baseline	Soil Gas	5/13/2021	<1.7	<1.7	<1.7	356	4.9	<0.55	361
RCG Sub-Slab/Deep Soil Gas Vapor Exposure - Commercial / Industrial ^{(1),(2)}			29,333	NA	6,000	6,000	293	933	NA

Notes:

Samples analyzed using USEPA Method TO-15

Data presented in micrograms per cubic meter (ug/m³)

cVOC =Chlorinated Volatile Organic Compounds

NA = Not available in screening level table A-6

AF = Attenuation Factor

(1) Indiana Department of Environmental Management Remediation Closure Guide, Appendix A, Table A-6, Final, March 22, 2012, with updates through March 2021.

(2) Sub-Slab and Deep Soil Gas (Depth >5 feet) screening levels calculated by dividing the indoor air screening levels by an attenuation factor of 0.03 (per IDEM Technical Guidance dated 9/29/2016).

(3) Shallow Soil Gas (Depth < 5 feet) screening levels calculated by dividing the indoor air screening levels by an attenuation factor of 0.1 (per IDEM Technical Guidance dated 9/29/2016).

Bold - Indicates Detection
Exceeds RCG Vapor Exposure - Sub-Slab/Deep Soil Gas -Commercial/Industrial Screening Levels (AF=0.03)
Exceeds RCG Vapor Exposure - Shallow Soil Gas -Commercial/Industrial Screening Levels (AF=0.1)

SVE system operation started on 4/26/21

Table 4
Indoor Air cVOCs Analytical Results (ug/m³)
Norge Laundry Site
2915 S. Meridian Street
Indianapolis, Indiana
KERAMIDA Project No. 19796

Sample	Sample Type	Date Sampled	cis-1,2-dichloroethene	trans-1,2-dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl Chloride
2915 S. Meridian (Former Norge Laundry - Site building)	Indoor Air	08/20/08	<0.91	<0.91	<1.40	<1.10	<0.51
		02/22/13	0.30	<0.61	350*	4	<0.40
		04/12/13	<0.54	<0.54	62	0.76	<0.35
		09/17/15	<0.99	<0.99	110	3.2	<0.64
		02/21/17	<1.2	<1.2	325*	3.8	<0.39
		03/29/17	<1.1	<1.1	148**	2.0	<0.36
		09/12/17	<1.98	<1.98	198	6.99	<1.28
		09/12/17	<1.4	<1.4	255**	3.1	<0.46
		11/08/17	<1.982	<1.982	357**	5.1	<1.278
		05/30/18	<1.2	<1.2	263	3.6	<0.38
		07/05/18	<1.2	<1.2	681	6.7	<0.38
		12/05/19	<1.2	<1.2	273	3.1	<0.37
		09/28/20	<1.2	<1.2	321	3.5	<0.40
		05/21/21	<1.2	<1.2	34.6	<0.85	<0.40
IDEM Remediation Closure Guide Screening Level - Commercial/Industrial ⁽¹⁾			NL	180	180	8.8	28

Notes:

Samples analyzed using USEPA Method TO-15

Data presented in micrograms per cubic meter (µg/m³)

cVOC = Chlorinated Volatile Organic Compound

NL = Not listed in screening level table A-6

(1) Indiana Department of Environmental Management Remediation Closure Guide, Appendix A, Table A-6, Final, March 22, 2012, with updates through March 2021.

* = Due to painting of the building interior

** = Sampling done during recent tenant occupancy with refinished furniture and other household items

Bold - Indicates Detection

Exceeds RCG Indoor Air Vapor Exposure - Commercial / Industrial Screening Levels

Table 5
OM&M Vacuum Data Summary
Former Norge Laundry & Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796

Date	System Vacuum (in w.c.)	SVE-1 Total Vacuum (in w.c.)	SVE-2 Total Vacuum (in w.c.)	SVE-3 Total Vacuum (in w.c.)	SVE-4 Total Vacuum (in w.c.)	SSEP-1 Total Vacuum (in w.c.)	SSEP-2 Total Vacuum (in w.c.)	SSEP-3 Total Vacuum (in w.c.)	SSEP-4 Total Vacuum (in w.c.)
4/27/2021	78	20	60	23	60	-	-	-	-
4/28/2021	78	-	-	-	-	-	-	-	-
4/29/2021	81	21	65	30	66	-	-	-	-
4/30/2021	81	24	66	40	67	-	-	-	-
5/3/2021	81	18	65	34	66	-	-	-	-
5/7/2021	82	23	66	35	67	-	-	-	-
5/10/2021	65	21	48	22	50	0.446	0.515	0.105	0.006
5/13/2021	65	14	46	25	46	0.6	0.6	0.1	0.2
5/21/2021	64	12.5	46	19.5	48	0.7	0.6	0.2	<0.1
5/28/2021	65	13.5	47.5	19.5	49	0.6	0.6	0.2	<0.1
6/4/2021	65	16	50	26	50	0.6	0.6	0.2	<0.1
6/11/2021	64	11.5	45	20	46	0.6	0.6	0.2	<0.1

Notes:

in w.c. = inch of water column

< = less than

- = not measured or not available

Table 6
OM&M Flow Rate Data Summary
Former Norge Laundry & Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796

Date	SVE-1 Flow Rate (CFM)	SVE-2 Flow Rate (CFM)	SVE-3 Flow Rate (CFM)	SVE-4 Flow Rate (CFM)	SSEP-1 Flow Rate (CFM)	SSEP-2 Flow Rate (CFM)	SSEP-3 Flow Rate (CFM)	SSEP-4 Flow Rate (CFM)	Total SVE (CFM)	Total SSEP (CFM)	Total (CFM)
4/27/2021	17.30	20.66	17.30	14.99	-	-	-	-	70.25	-	70.25
4/28/2021	-	-	-	-	-	-	-	-	-	-	-
4/29/2021	21.19	20.84	18.56	7.24	-	-	-	-	67.82	-	67.82
4/30/2021	19.54	13.95	12.83	5.47	-	-	-	-	51.79	-	51.79
5/3/2021	20.29	15.72	17.94	4.74	-	-	-	-	58.69	-	58.69
5/7/2021	20.47	13.95	16.42	4.74	-	-	-	-	55.58	-	55.58
5/10/2021	15.72	13.12	15.72	4.74	13.77	6.16	13.77	12.31	49.29	46.00	95.29
5/13/2021	18.15	13.68	15.72	0.00	15.08	8.71	10.66	10.66	47.55	45.11	92.65
5/21/2021	17.52	14.22	15.95	4.74	13.77	6.16	13.77	10.66	52.43	44.35	96.78
5/28/2021	16.87	14.22	16.19	2.74	15.08	6.16	12.31	12.31	50.00	45.86	95.86
6/4/2021	16.42	11.61	14.99	4.74	15.08	6.16	15.08	12.31	47.75	48.63	96.37
6/11/2021	16.87	14.48	15.95	2.74	12.31	6.16	13.77	12.31	50.03	44.54	94.58

Notes:

CFM = Cubic Feet Per Minute

- = not measured or not available

Table 7
OM&M PID Reading Data Summary
Former Norge Laundry & Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796

Date	Discharge PID Reading (ppb)	SVE-1 PID Reading (ppb)	SVE-2 PID Reading (ppb)	SVE-3 PID Reading (ppb)	SVE-4 PID Reading (ppb)	SSEP-1 PID (ppb)	SSEP-2 PID (ppb)	SSEP-3 PID (ppb)	SSEP-4 PID (ppb)
4/27/2021	4,000	-	-	-	-	-	-	-	-
4/28/2021	-	-	-	-	-	-	-	-	-
4/29/2021	3,299	1,886	5,380	2,467	2,708	-	-	-	-
4/30/2021	4,150	6,897	9,521	3,323	4,769	-	-	-	-
5/3/2021	-	-	-	-	-	-	-	-	-
5/7/2021	10,700	600	25,500	11,200	15,900	-	-	-	-
5/10/2021	-	-	-	-	-	36,012	58,400	2,553	2,504
5/13/2021	4,969	300	21,000	7,500	21,000	1,380	1,122	739	636
5/21/2021	6,764	407	32,710	10,010	35,160	2,051	1,191	1,208	1,090
5/28/2021	3,493	674	11,710	5,907	13,410	2,962	21,660	6,423	678
6/4/2021	5,123	236	21,360	3,261	24,190	650	380	400	223
6/11/2021	5,219	2,764	17,590	6,285	23,620	1,480	442	480	260

Notes:

PID = photoionization detector

ppb = parts per billion

- = not measured or not available

Table 8
SVE Mass Removal Estimation
Former Norge Laundry & Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796

Week #	Flow Rate (CFM)	cVOC Concentration ($\mu\text{g}/\text{m}^3$)	Weekly Mass Removal (kg)	Cumulative Mass Removal (kg)
1	63	33,774	0.61	0.61
2	57	33,774	0.54	1.15
3	50	33,774	0.48	1.64
4	48	33,774	0.47	2.10
5	53	50,374	0.77	2.87
6	51	50,374	0.73	3.60
7	49	50,374	0.70	4.30
8	51	50,374	0.73	5.03

Notes

CFM = Cubic Feet Per Minute

cVOC =Chlorinated Volatile Organic Compounds

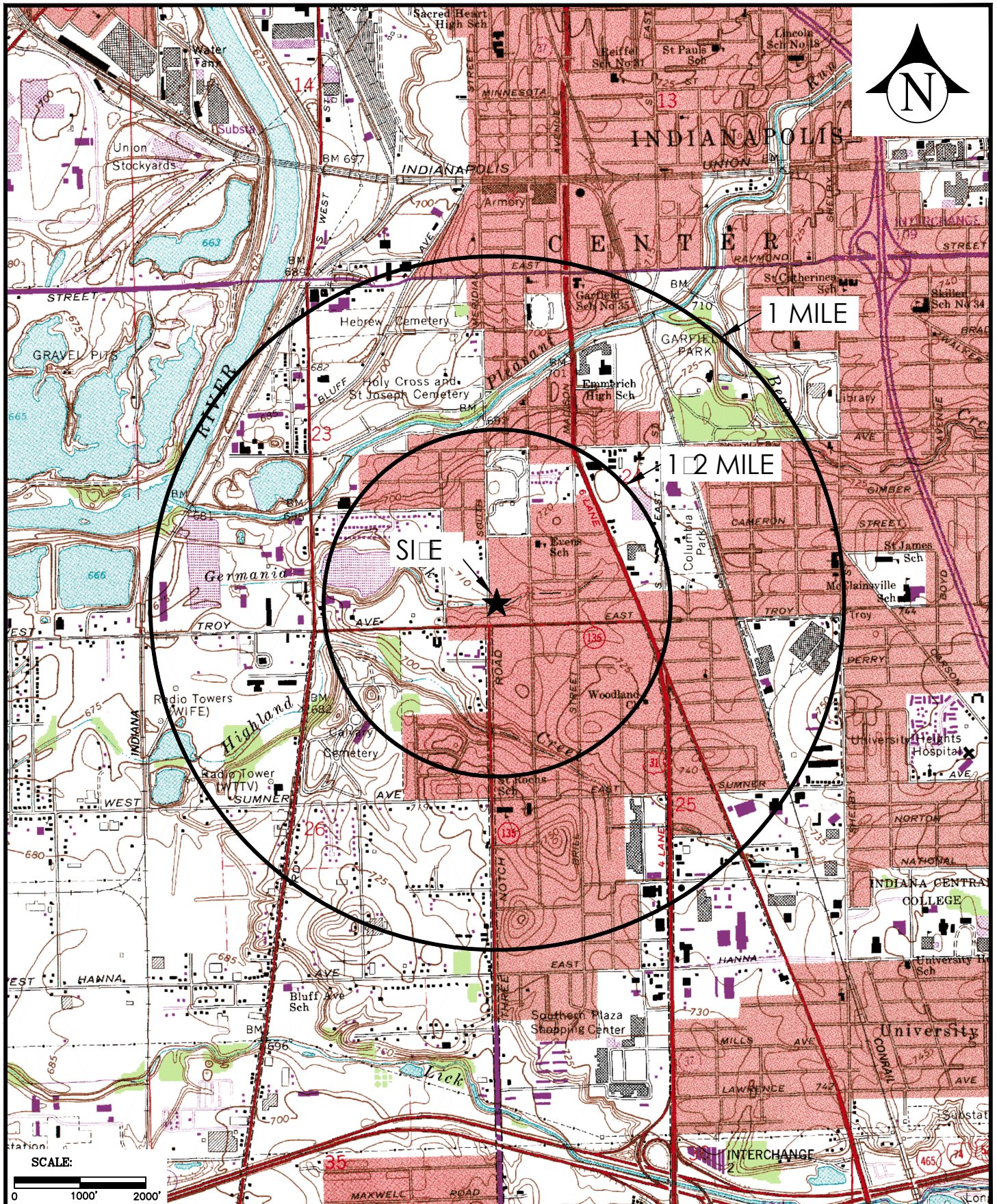
$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

kg = kilogram

SVE system operation started on 4/26/21

**SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796**

FIGURES









Project: Former Norge Laundry & Cleaning Village
2915 S. Meridian Street
Indianapolis, Indiana

Figure 1

Site Vicinity Map



Project Number: 15953	Drawn By: S. Grady
Date: January 15, 2018	Approved By: M.D.
	File No. 15953_Ph2

	SOIL BORING		SANITARY SEWER LINES
	MONITORING WELL		STORM SEWER LINES
	PROPERTY BOUNDARY		WATER LINES
	GARAGE		COMMUNICATION LINES
	GREENHOUSE		ELECTRICAL LINES
	RESIDENCE		GAS LINES

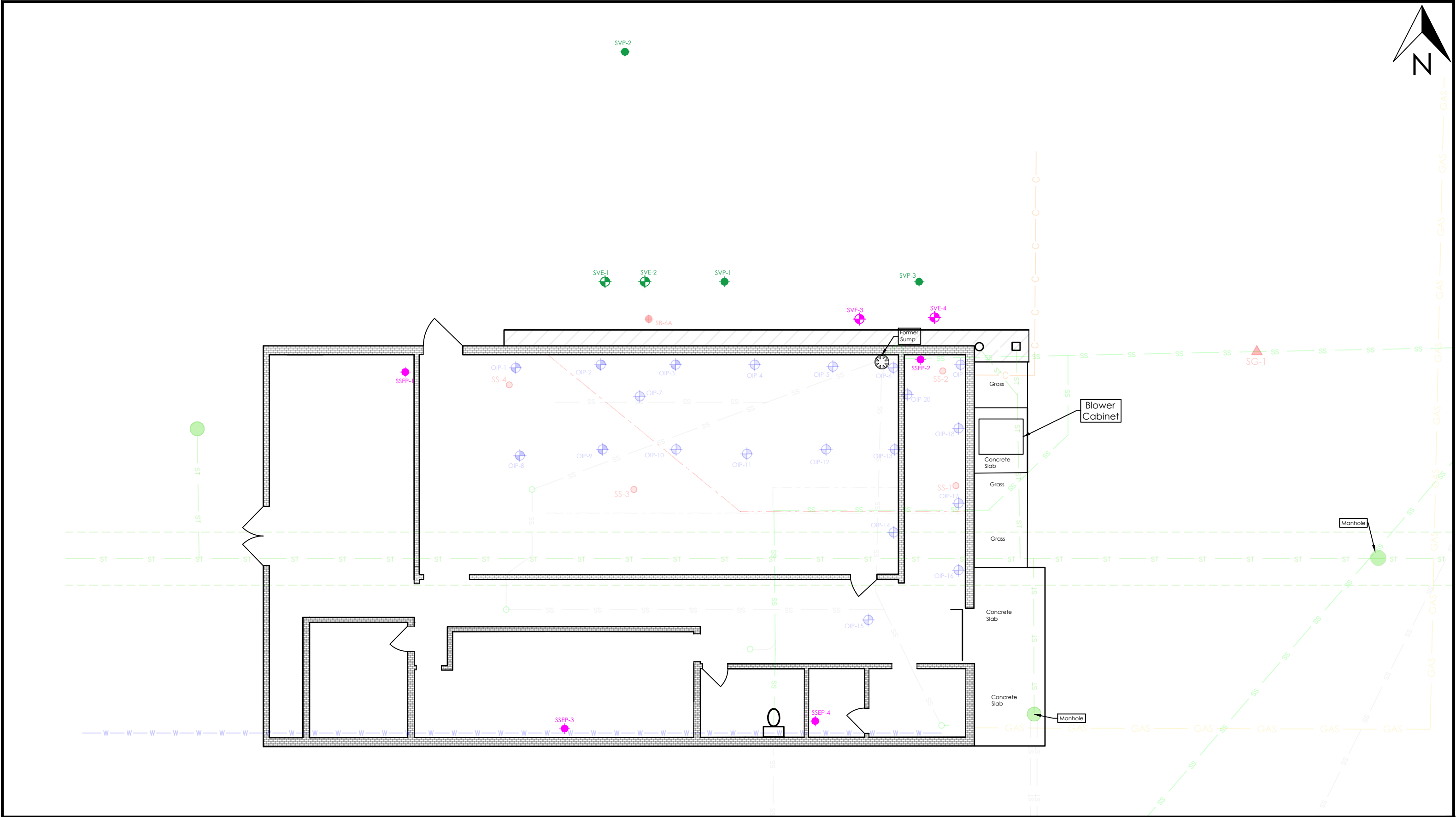
Note:
Base Map by SESCO Group



	Drawn By: S. Grady
Project Number: 15953	Approved By: M.D.
Date: January 27, 2020	File No. 15953 Ph2-2019

Site Map

G:\AUTOCAD\1_CLIENTS\K\Katz Korin Cunningham\19796-Norge Site -SVE



LEGEND

Former Soil Boring (2003-2016)

Soil Gas Location (2016)

Ozone Injection Point (2018)

SVE Well Location

SVP Well Location

Sub-Slab Sampling Location

Communication Line

Electric Utility

Storm Sewers

Sanitary Sewers

Property Wall

Water Line

Storm Sewer Edge

Gas Utility Line

Gray indicates inactive sewer

Full-scale SVE Well Location

Sub-Slab Depressurization System
Extraction Point Location

SCALE:

0

5

10'

KERAMIDA

GLOBAL EHS & SUSTAINABILITY SERVICES

Note:

The SESCO 2003 Sample Locations
Were Resampled in 2004 to Obtain
Additional Samples from Multiple
Depths (SESCO, 2005)

Project: Former Norge Laundry & Cleaning Village
2915 S. Meridian St.
Indianapolis, Indiana

Project Number: 19796

Date: June 8, 2021

Drawn By: M. Thiel

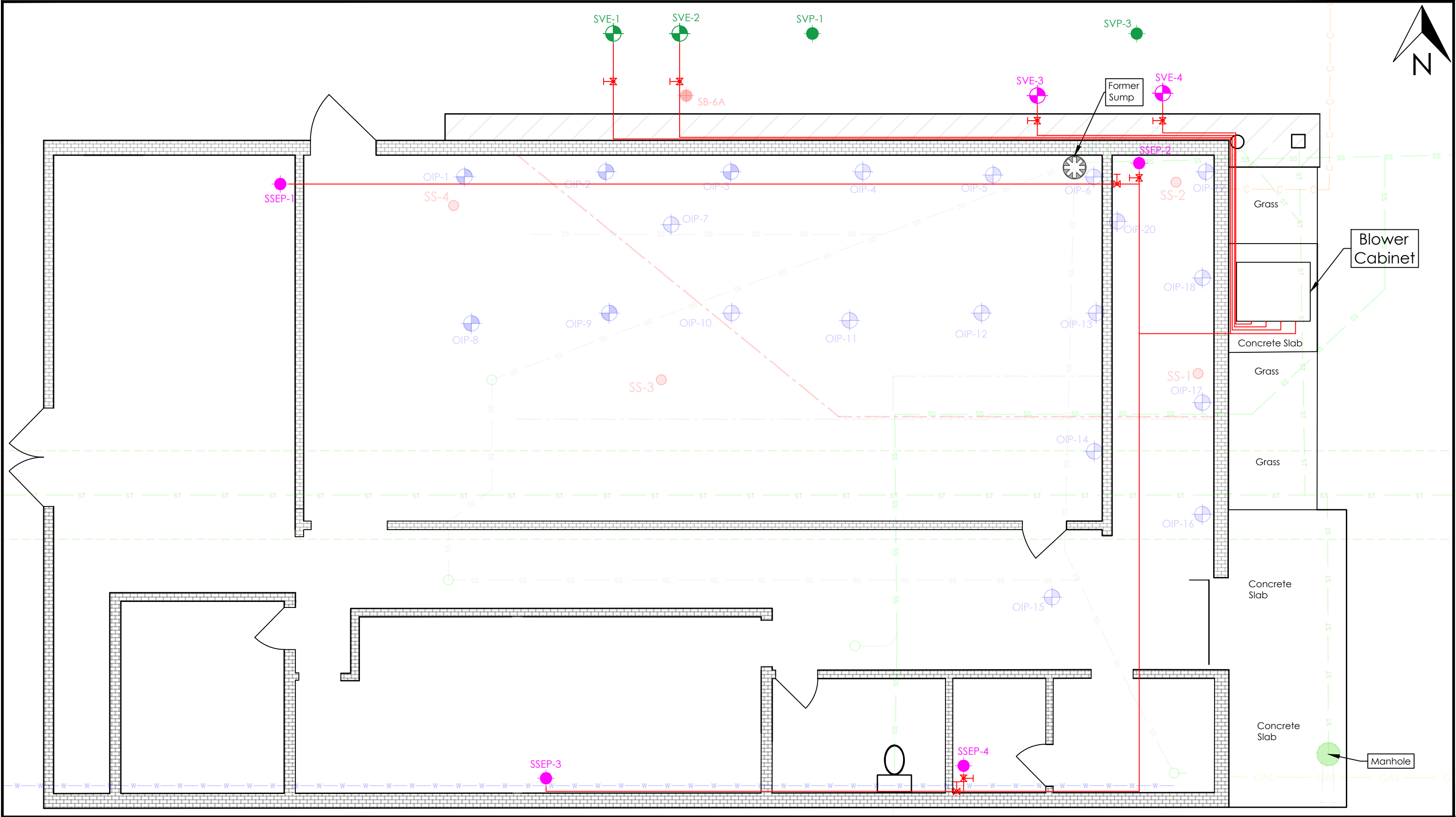
Approved By: M.D.

File No. 19796-Fig

Figure 3

SVE Well and
SSDS Locations

G:\AUTOCAD\1_CLIENTS\Katz Korin Cunningham\19796-Norge Site -SVE



LEGEND

<ul style="list-style-type: none"> Former Soil Boring (2003-2016) Soil Gas Location (2016) Ozone Injection Point (2018) SVE Well Location SVP Well Location 	<ul style="list-style-type: none"> Sub-Slab Sampling Location Communication Line Electric Utility Storm Sewers Sanitary Sewers 	<ul style="list-style-type: none"> Property Wall Water Line Storm Sewer Edge Gas Utility Line Gray indicates inactive sewer 	<ul style="list-style-type: none"> Full-scale SVE Well Location Sub-Slab Depressurization System Extraction Point Location Piping Ball Valve
--	---	--	--

SCALE:

0 3' 6'

KERAMIDA
GLOBAL EHS & SUSTAINABILITY SERVICES

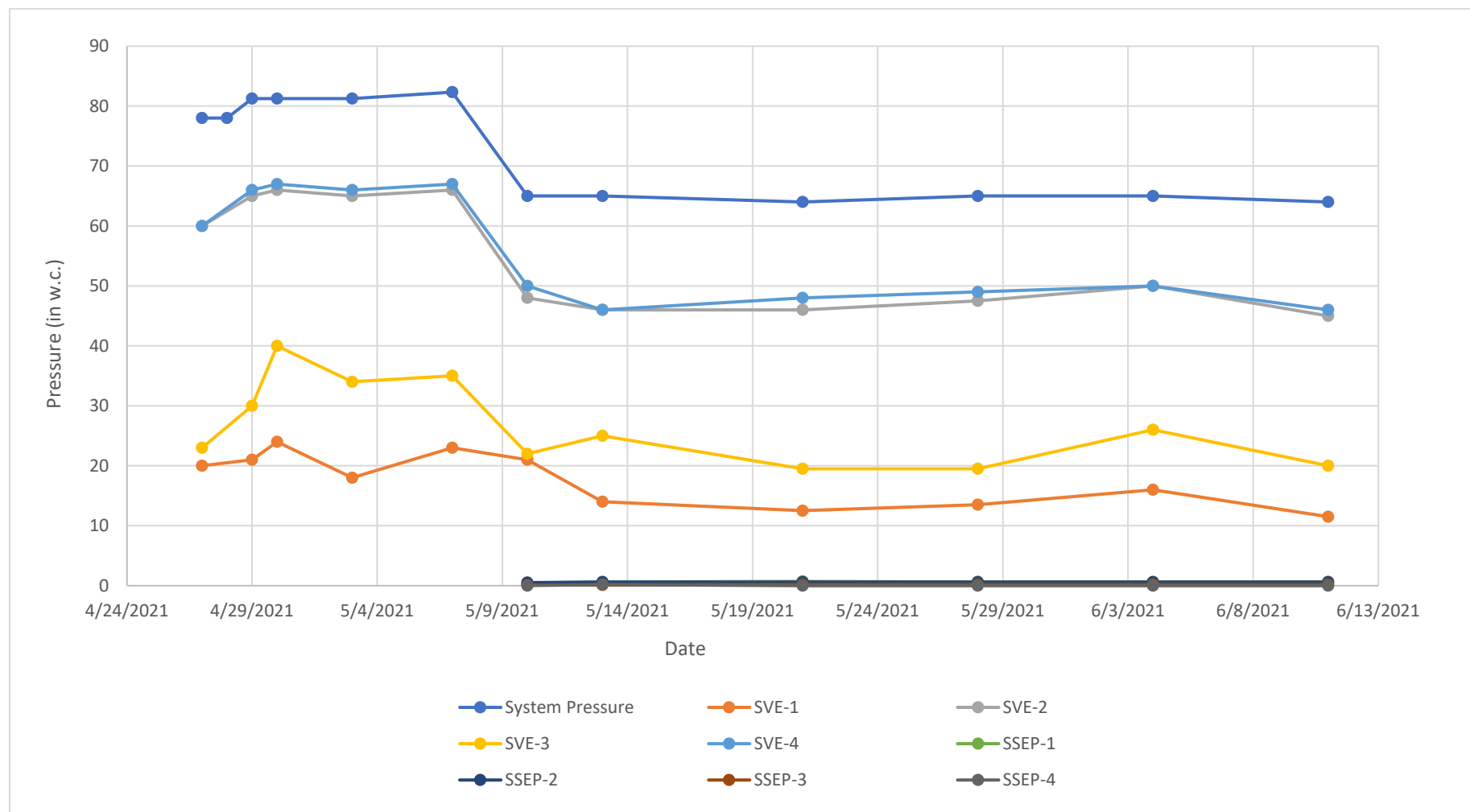
Note:
The SESCO 2003 Sample Locations Were Resampled in 2004 to Obtain Additional Samples from Multiple Depths (SESCO, 2005)

Project: Former Norge Laundry & Cleaning Village 2915 S. Meridian St. Indianapolis, Indiana	
Project Number: 19796	Drawn By: M. Thiel
Date: June 10, 2021	Approved By: M.D.
	File No. 19796-Fig

Figure 4

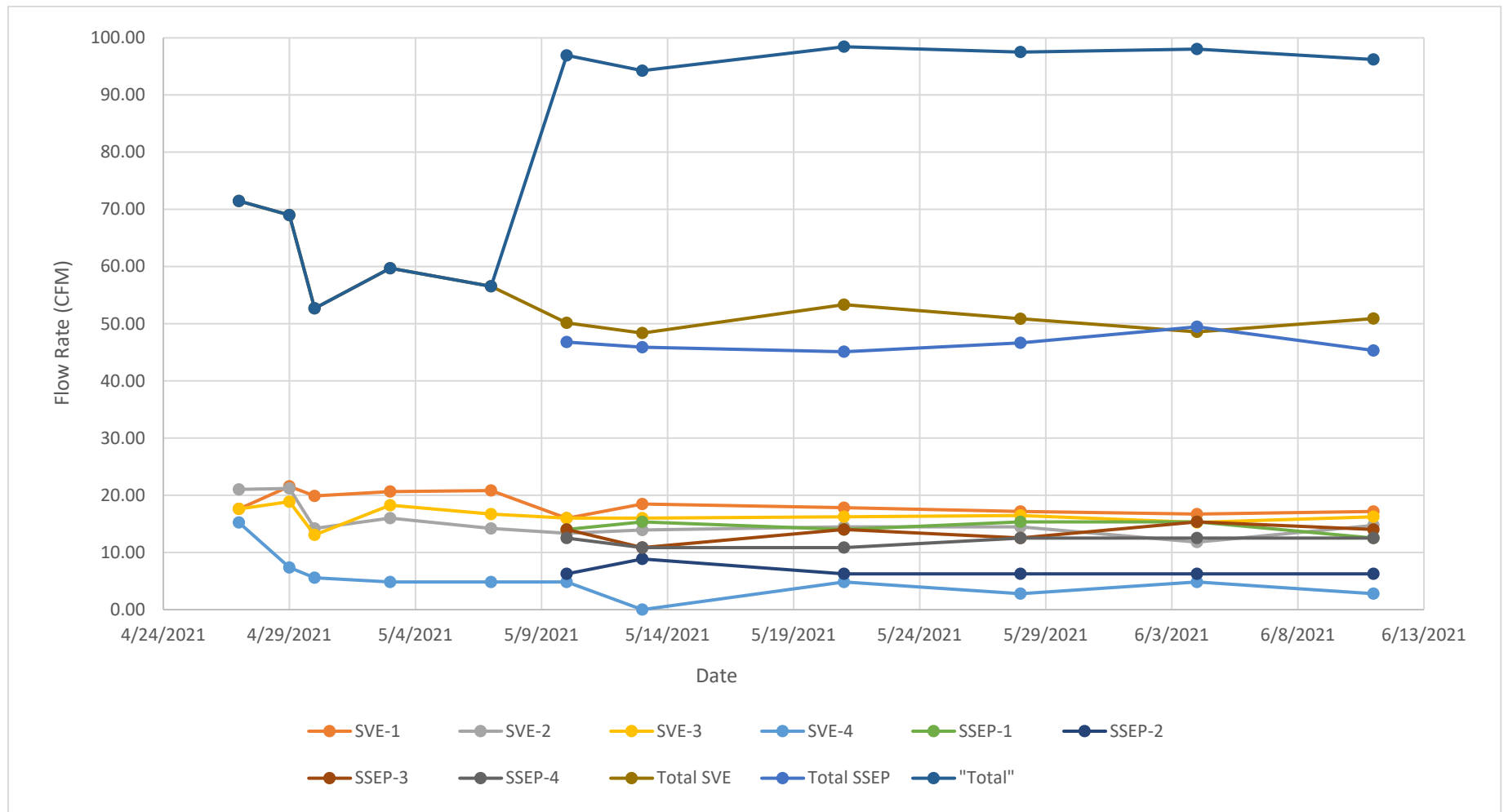
SVE and Hybrid
SSDS Piping Diagram

**Figure 5: OM&M Vacuum Data Summary
Former Norge Laundry & Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796**



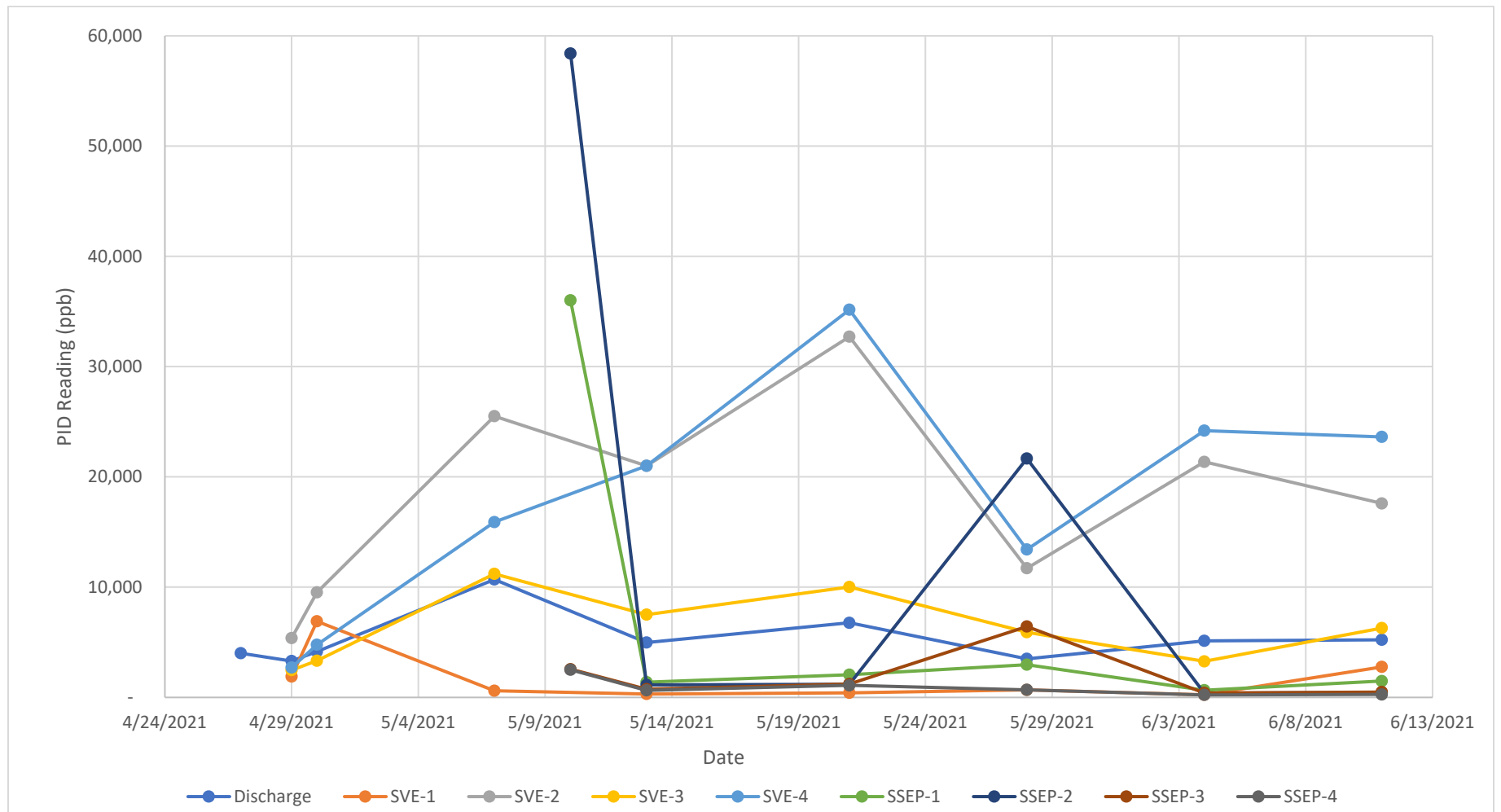
Note: SVE System Operation Started on 4/26/21, and Hybrid SSDS Operation Started on 5/10/21

**Figure 6: OM&M Flow Rate Data Summary
Former Norge Laundry & Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796**



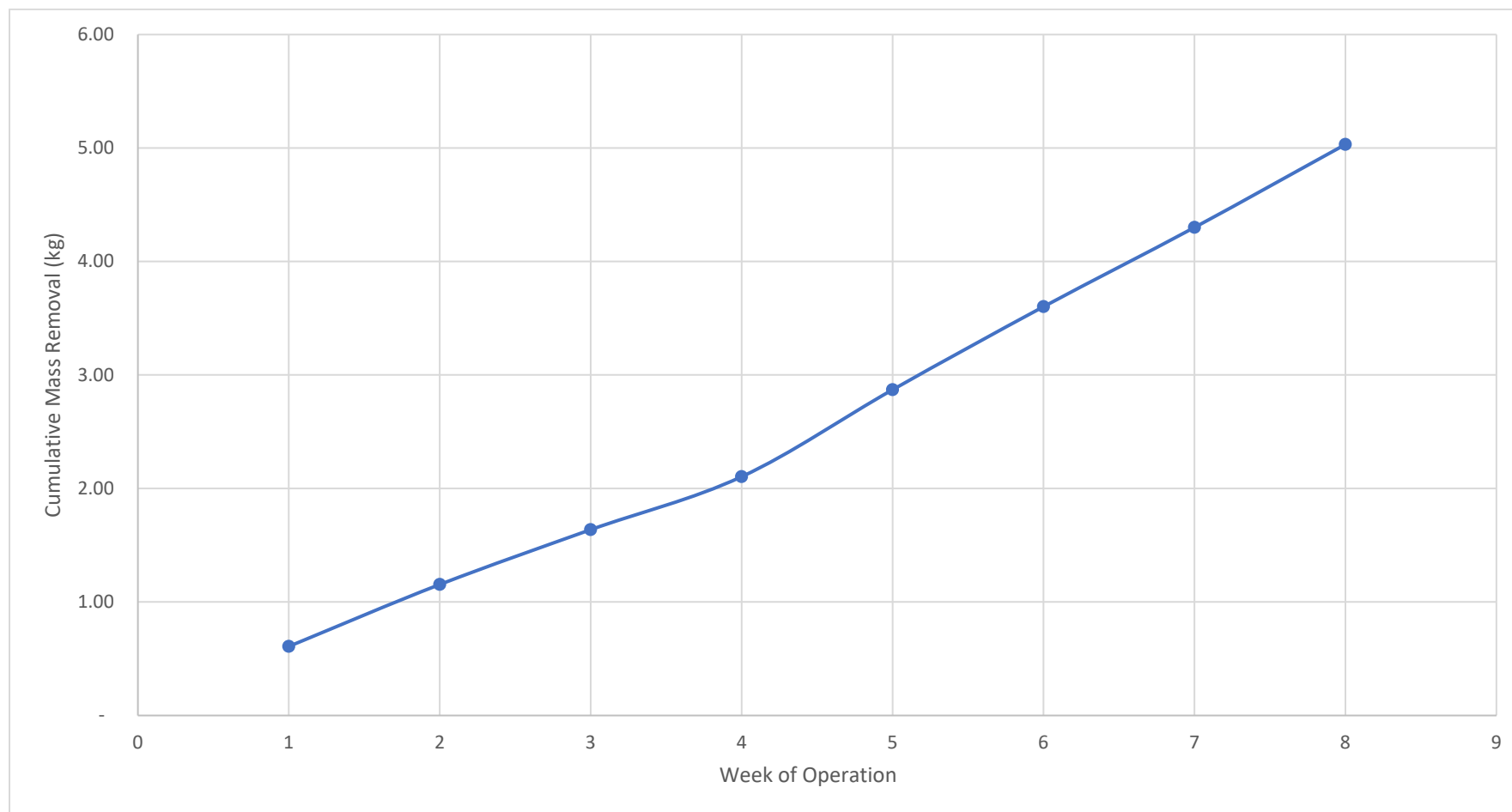
Note: SVE System Operation Started on 4/26/21, and Hybrid SSDS Operation Started on 5/10/21

Figure 7: OM&M PID Reading Data Summary
Former Norge Laundry & Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796



Note: SVE System Operation Started on 4/26/21, and Hybrid SSDS Operation Started on 5/10/21

Figure 8: Cumulative Mass Removal
Former Norge Laundry & Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796



Note: SVE System Operation Started on 4/26/21, and Hybrid SSDS Operation Started on 5/10/21

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 1
PFE Field Notes

DIAGNOSTICS REPORT



Project Name:	Former Norge	Technician: <i>Xugang Xiong</i> Supervisor: M. Devir
Address:	2915 S Meridian St	
City, State, Zip:	Indianapolis, IN	
Project No:	19796	

Diagnostics Information

Diagnostics Date:	4/13/2021	Testing Location ID	P (w.c.)	P (w.c.)
Weather Conditions	Sunny	Fan/Vac Setup	NA Sx0	
Location:	SS EP-1	VP- SS-3	-0.085	
Core Specifications	4"	VP- 01P-11	-0.005	
Foundation Type:	Concrete slab	VP- 01P-12	-0.008	
Sub-Slab Conditions:		Target ≤ -0.004 w.c.		

Diagnostics Analysis & Notes

Gx-4 3.3" H2O *01P-7* *-0.086*

Sketch of Diagnostic Testing Area

X = Suction Pt for Testing
O - PFE Test Pt Location

Note: Image not to scale

DIAGNOSTICS REPORT



Project Name:	Former Norge	Technician: <i>Xuging Xing</i> Supervisor: M. Devir
Address:	2915 S Meridian St	
City, State, Zip:	Indianapolis, IN	
Project No:	19796	

Diagnostics Information

Diagnostics Date:	<i>6/12/2021</i>	Testing Location ID	P (w.c.)	P (w.c.)
Weather Conditions	<i>Sunny</i>	Fan/Vac Setup	<i>Yes</i>	
Location:	<i>SSEP-2</i>	<i>SS-3</i>	<i>0</i>	
Core Specifications	<i>4"</i>	<i>VP-01P-11</i>	<i>0.002</i>	
Foundation Type:	<i>concrete slab</i>	<i>VP-01P-12</i>	<i>0</i>	
Sub-Slab Conditions:		Target ≤ -0.004 w.c.		

Diagnostics Analysis & Notes

<i>GX-4 4" H₂O</i>	<i>01P-17</i>	<i>0</i>
	<i>SS-2</i>	<i>-0.032</i>
	<i>01P-18</i>	<i>-0.005</i>
	<i>01P-19</i>	<i>-0.007</i>
	<i>01P-3</i>	<i>-0.002</i>

Sketch of Diagnostic Testing Area

X = Suction Pt for Testing
0 - PFE Test Pt Location

Note: Image not to scale

DIAGNOSTICS REPORT



Project Name:	Former Norge	Technician:	<i>Xugap Xop</i>
Address:	2915 S Meridian St	Supervisor:	M. Devir
City, State, Zip:	Indianapolis, IN		
Project No:	19796		

Diagnostics Information

Diagnostics Date:	<i>4/12/2021</i>	Testing Location ID	P (w.c.)	P (w.c.)
Weather Conditions	<i>Sunny</i>	Fan/Vac Setup	<i>NA SW</i>	
Location:	<i>SSEP-3</i>	<i>VP OIP-7</i>	<i>-0.021</i>	
Core Specifications	<i>411</i>	<i>VP OIP-3</i>	<i>0.031</i>	
Foundation Type:	<i>Concrete Slab</i>	<i>VP SS-3</i>	<i>-0.020</i>	
Sub-Slab Conditions:		Target ≤ -0.004 w.c.		

Diagnostics Analysis & Notes

<i>Gx-4 1.8" H₂O</i>	<i>OIP-11</i>	<i>-0.008</i>
	<i>OIP-12</i>	<i>-0.025</i>
	<i>SS-4</i>	<i>-0.026</i>

Sketch of Diagnostic Testing Area

X = Suction Pt for Testing
O - PFE Test Pt Location

Note: Image not to scale

DIAGNOSTICS REPORT



Project Name:	Former Norge	Technician:	<i>Supriy Singh</i>
Address:	2915 S Meridian St	Supervisor:	M. Devir
City, State, Zip:	Indianapolis, IN		
Project No:	19796		

Diagnostics Information

Diagnostics Date:	4/13/2021	Testing Location ID	P (w.c.)	P (w.c.)
Weather Conditions	Cloudy	Fan/Vac Setup	5 NA	RP145
Location:	SSPD-4	VP- 01P-7	0	
Core Specifications	4"	VP- 01P-3	0.001	
Foundation Type:	Concrete slab	VP- SS-3	0	
Sub-Slab Conditions:		Target <= -0.004 w.c.		

Diagnostics Analysis & Notes

6x4 fan 0.7" H ₂ O	01P-11	0	
RP145 0.5" H ₂ O	01P-12	0.002	0
	01P-15	-0.005	-0.008
	01P-17		0

Sketch of Diagnostic Testing Area

X = Suction Pt for Testing
 O - PFE Test Pt Location

Note: Image not to scale

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 2

Radon Fan Specifications

GX PRO SERIES



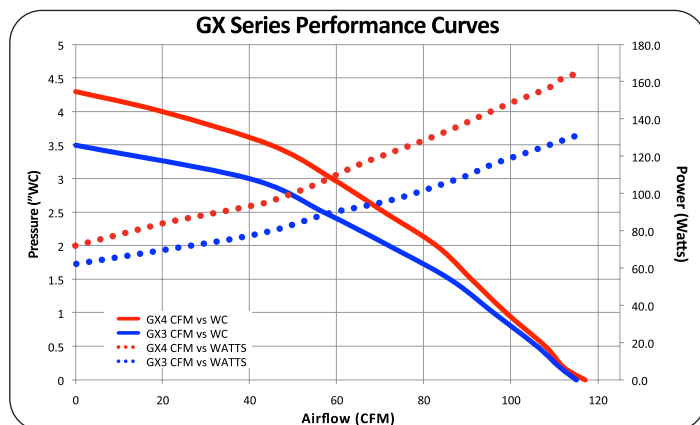
GX3/GX4



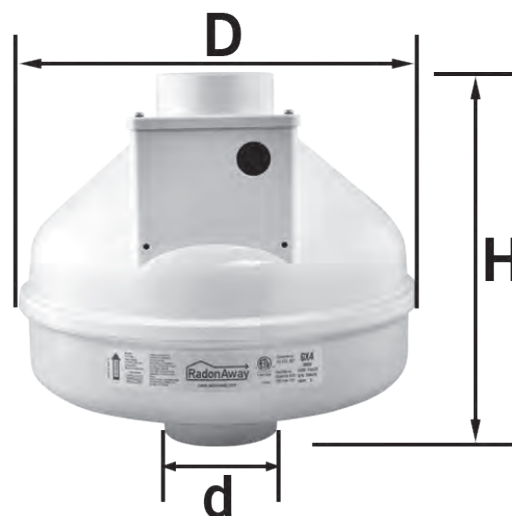
Features

- Revolutionary patent pending design
- Eternalast™ polycarbonate plastic housing
- Water-hardened thermally-protected motor
- Optimal for moderate to tight soils
- Quiet operation
- Rated for indoor and outdoor use
- Rated for commercial or residential use
- Vapor Tite™ technology to inhibit radon and soil gas leakage
- ETL listed by Intertek to UL507 and CSA C22.2 Standards

MODEL	P/N	FAN DUCT DIAMETER	WATTS	RECOM. MAX. OP. PRESSURE "WC	TYPICAL CFM vs. STATIC PRESSURE WC					
					0"	1.0"	2.0"	3.0"	4.0"	5.0"
GX3	28584	3"	60-135	3.3"	115	96	72	40	-	-
GX4	28585	3"	70-170	4.0"	117	99	83	59	20	-



MODEL	DUCT SIZE - OD (d)	DIAMETER (D)	HEIGHT (H)
GX3	3.5"	11.9"	10.9"
GX4	3.5"	11.9"	10.9"



with U.S. and imported parts.



ETL Listed



RadonAway® Pro Series inline radon fans are covered by a 5-year, limited warranty.

For more information
(800) 767-3703
RadonAway.com



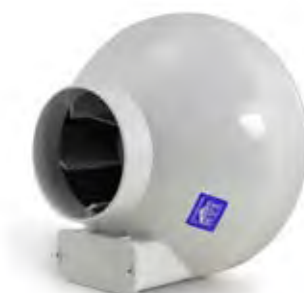
INSTALLS WHITE, STAYS WHITE

Radon Mitigation Fan

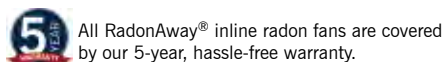
All RadonAway® fans are specifically designed for radon mitigation. RP Series Fans provide superb performance, run ultra-quiet and are attractive. They are ideal for most sub-slab radon mitigation systems.

Features

- NEW Stay-White™ housing
- Energy efficient
- RP140 - ENERGY STAR Most Efficient 2020
- Ultra-quiet operation
- Meets all electrical code requirements
- Water-hardened motorized impeller
- Seams sealed to inhibit radon leakage (RP140 & RP145 double snap sealed)
- ETL Listed - for indoor or outdoor use
- Thermally protected motor
- Rated for commercial and residential use



MODEL	P/N	FAN DUCT DIAMETER	WATTS	RECOM. MAX. OP. PRESSURE "WC	TYPICAL CFM vs. STATIC PRESSURE WC				
					0"	.5"	1.0"	1.5"	2.0"
RP140	28460	4"	15-21	0.7	135	70	-	-	-
RP145	28461	4"	41-72	1.7	166	126	82	41	3
RP260	28462	6"	47-65	1.3	251	157	90	-	-
RP265	28463	6"	95-139	2.3	375	282	204	140	70
RP380	28464	8"	96-138	2.0	531	415	268	139	41



Model	A	B	C
RP140	4.5"	9.7"	8.5"
RP145	4.5"	9.7"	8.5"
RP260	6"	11.75"	8.6"
RP265	6"	11.75"	8.6"
RP380	8"	13.41"	10.53"

For Further Information, Contact Your Radon Professional:

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796



ATTACHMENT 3
KERAMIDA Standard Operation Procedures

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 4



Boring Logs



PROJECT INFORMATION		DRILLING INFORMATION	Reviewed By: Mike Devir
PROJECT: Former Norge Laundry		DRILLING CO.: KEI	GROUND ELEVATION: NA
ADDRESS: 2915 S. Median St		DRILLER: A. Smith	TOC ELEVATION: NA
CITY, ST: Indianapolis, Indiana		RIG TYPE: Geoprobe 7822 DT	NORTHING: NA
JOB NO.: 19796		TOOLING: 4-1/4" Hollow stem auger	EASTING: NA
LOGGED BY: Chelsea McCammack		SAMPLER TYPE: Dual Tube	 OBSERVED GROUNDWATER
DATES DRILLED: 04/15/2021		TOTAL DEPTH 10.0'	 STATIC WATER LEVEL

DEPTH	SOIL DESCRIPTION: texture, moisture, plasticity Munsell color, concretions or mottles, odor	SAMPLE	REC. (feet)	PID (ppm)	BORING COMPLETION	WELL DESCRIPTION
0	ASPHALT					Well Lid
	GRAVEL - Well sorted: Asphalt subbase					Concrete
	CLAY: Moist, soft, high plasticity, 10YR 3/3 (dark brown)					Expandable Cap
2	SAND - Poorly sorted: Moist, loose to medium dense, 10YR 5/6 (yellowish brown)					Manhole Cover
	CLAY: Moist, with silt, some fine to coarse sand, soft to medium stiff, medium plasticity, 7.5YR 3/3 (dark brown) with 7.5YR 4/4 (brown)					Cement Bentonite Seal
			1.1			PVC Riser
						Granular Benonite Seal
		SVE-3 (5.0 - 6.0)		0.361		Sand Pack
				0.241		10 Slot PVC Screen
			3.4			
8	No Recovery					Bottom Cap
10						



PROJECT INFORMATION		DRILLING INFORMATION	Reviewed By: Mike Devir
PROJECT: Former Norge Laundry		DRILLING CO.: KEI	GROUND ELEVATION: NA
ADDRESS: 2915 S. Median St		DRILLER: A. Smith	TOC ELEVATION: NA
CITY, ST: Indianapolis, Indiana		RIG TYPE: Geoprobe 7822 DT	NORTHING: NA
JOB NO.: 19796		TOOLING: 4-1/4" Hollow stem auger	EASTING: NA
LOGGED BY: Chelsea McCammack		SAMPLER TYPE: Dual Tube	 OBSERVED GROUNDWATER
DATES DRILLED: 04/15/2021		TOTAL DEPTH 15.0'	 STATIC WATER LEVEL

DEPTH	SOIL DESCRIPTION: texture, moisture, plasticity Munsell color, concretions or mottles, odor	SAMPLE	REC. (feet)	PID (ppm)	BORING COMPLETION	WELL DESCRIPTION
0	ASPHALT					Well Lid
	GRAVEL - Well sorted: Asphalt subbase					Expandable Cap
	CLAY: Moist, soft, high plasticity, 10YR 3/3 (dark brown)					Concrete
2	SAND AND GRAVEL: Moist, loose to medium dense, 10YR 5/6 (yellowish brown)		2.7	0.104		Manhole Cover
	CLAYEY SAND: Moist, fine grained, 7.5YR 3/3 (dark brown)					
4	SAND AND GRAVEL: Moist, medium dense, 7.5YR 5/6 (strong brown)					
6	CLAY: Moist, with silt, some fine to coarse sand, soft to medium stiff, medium plasticity, 7.5YR 3/3 (dark brown) with 7.5YR 4/4 (brown)			0.000		Cement Bentonite Seal
				0.000		PVC Riser
8			1.9			
10						
12	SAND - Well sorted: Moist, some medium to coarse sand, some silt, medium dense, fine grained, 10YR 5/6 (yellowish brown)	SVE-4 (11.0 - 12.0)		0.675		Granular Benonite Seal
	No Recovery		2.4	0.000		Sand Pack
14						10 Slot PVC Screen
						Bottom Cap

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 5
“Contained-in” Determination Approvals



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Eric J. Holcomb
Governor

Bruno L. Pigott
Commissioner

July 8, 2020

Ms. Xuqing Xiong
KERAMIDA, Inc.
401 North College Avenue
Indianapolis, Indiana 46202

Re: Norge Laundry & Cleaning Village
“Contained-in” Determination for Contaminated Soil
VRP Site: #6130102
EPA ID No.: INR000110973
Indianapolis, Marion County

Dear Ms. Xiong:

This letter is in response to your July 7, 2020, request for a “contained-in” determination for 4 55-gallon containers of investigative derived waste (IDW) contaminated soil generated at the Norge Laundry & Cleaning Village site.

The site is located at 2915 South Meridian Street, Indianapolis, Marion County, Indiana. The site was previously occupied by Markey’s Audio Visual and D&E Enterprises.

Your current request is for management options available based on the contaminant concentrations in the IDW contaminated soil meeting applicable industrial exit levels. It is understood that you are also asking for options for contaminated IDW contaminated soil generated in the future.

IDEM specifies the applicable exit levels in the “Contained-in” policy. Enclosed are copies of the “Contained-in” policy and the screening levels from the IDEM Remediation Closure Guidance for your reference.

For purposes of this determination, the RCRA “contained-in” policy is applicable only to IDW contaminated soil generated at the aforementioned site.

For efficiency reasons, it is our policy that due to the relatively low volumes of IDW contaminated soil usually generated, we grant on-going site specific approvals for IDW contaminated soil. This is done only after an evaluation and approval of the first request. As such, we are pre-approving all likely management options for the IDW contaminated soil.

Pre-approvals are conditioned upon the IDW contaminated soil to be generated in the future meeting applicable exit criteria levels. Representative sampling documentation must be available to show that applicable values are met.

In the “contained-in” request, it has been described that the basis for managing the IDW contaminated soil as listed hazardous waste would be historic releases of F002 and U079 cleaning solvents from on-site dry cleaning operations.

The constituents of concern for the F-listed hazardous waste codes specified above as described in 40 CFR 261.31 and/or 40 CFR 261 Appendix VII are as follows:

F002: The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

U079: 1,2-Dichloroethylene.

Additionally, the following are breakdown products of F002/U079 constituents and/or additional contaminants that were detected in the soil samples: benzene, cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride (VC).

Based on the information provided by the requestor, compared with the established policy criteria, the following determination applies:

Current IDW Soil

There are 4 55-gallon containers of F002/U079 contaminated soil. The containers of IDW contaminated soil were identified as being generated during the installation of 2 soil vapor extraction wells and 3 soil vapor probe wells. The waste is located on-site pending disposal.

The generator supplied analytical data for samples collected at the time of generation from the wells/borings. The soils generated from the wells/borings were collected and comingled in the 55-gallon containers.

A review of the soil sample analytical results indicated that the contaminant concentrations in the IDW contaminated soil appear to meet (not exceed) the 2019 Federal Industrial/ Commercial Soil Direct Contact Soil Exposure Screening Levels (see partial list below) and do not appear to exhibit a hazardous waste characteristic.

*The IDW contaminated soil appears to meet the aforementioned screening levels, does not exhibit a hazardous waste characteristic, and **may** be disposed in a permitted municipal solid waste landfill.*

Constituent	2019 Federal Industrial/Commercial Soil Direct Contact Soil Exposure Screening Levels (mg/kg)	TCLP Maximum Concentration of Contaminants for the Toxicity Characteristic
cis-1,2-DCE	2300	N/A
trans-1,2-DCE	1900	N/A
PCE	170	0.7 ppm
TCE	19	0.5 ppm
Vinyl Chloride	17	0.2 ppm

Future IDW Soil

If future IDW contaminated soil is generated at this site, meets the 2019 Federal Industrial/Commercial Soil Direct Contact Soil Exposure Screening Levels (see partial list above), and is not characteristic hazardous waste, it may be disposed in a permitted municipal solid waste landfill.

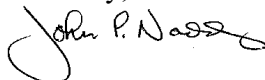
Representative sampling and analysis must be conducted on all future IDW soil generated at this site to confirm applicable default levels are met. Sampling must be done at the point of generation and before soils are mixed or comingled.

Media which does not meet applicable default levels or exhibits any characteristic of a hazardous waste must be managed as a hazardous waste under 329 IAC 3.1, as applicable.

This on-going site-specific approval is for IDW contaminated soil only and expires two (2) years from the date of this letter

If you have any questions, please call me at 317-233-0404.

Sincerely,



John P. Naddy
Compliance and Response Branch
Office of Land Quality

Enclosures

cc: Mr. Jeff Kavanaugh, OLQ, Voluntary Remediation Program

EMANUEL, DONNA

From: Xuqing Xiong <xxiong@keramida.com>
Sent: Tuesday, July 07, 2020 4:52 PM
To: NADDY, JOHN
Cc: Michael J. Devir
Subject: Contained-In Request
Attachments: Contained-In_Request_Norge SVE_FINAL.pdf

**** This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. ****

Good Afternoon Mr. Naddy,

Please find attached contained-in request for soil boring and well installation generated waste soil at the former Norge Laundry & Cleaning Village at 2915 South Meridian Street, Indianapolis, Indiana. Please let us know if you have any questions.

Thanks,

Xuqing Xiong
Project Engineer
KERAMIDA Inc.
401 North College Avenue
Indianapolis, IN 46202
t: (317) 685-6621 m: (626) 327-6975
www.keramida.com

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July 7, 2020

Mr. John Naddy
Senior Environmental Manager
Indiana Department of Environmental Management
Office of Land Quality – Compliance and Response Branch
100 North Senate Avenue – Mail Code 65-45
Indianapolis, Indiana 46204-2251

Re: Request for Contained-In Determination
Former Norge Laundry & Cleaning Village
2915 South Meridian Street, Indianapolis, Indiana
VRP No. 6130102
KERAMIDA Project # 19302

Dear Mr. Naddy:

On behalf of D&E Enterprises, Inc. (Owner), KERAMIDA Inc. (KERAMIDA) is pleased to submit this request for a “Contained-In” Determination for soil boring and well installation generated waste soil at the above-referenced Site.

The Site was used by former owners and operators as a coin-operated laundry and dry cleaning facility from approximately the early 1960s to the late 1970s. The Site comprises approximately 0.5 acre and includes one vacant building of approximately 3,600 square feet, once occupied by Norge Laundry & Cleaning Village, most recently occupied by a hand-made consumer goods retailer. The building has been vacant since January 2018. The Site is depicted on Figure 1.

The annual vapor sampling in the fall 2019 at the north adjoining property (2909 S. Meridian Street) indicated sub-slab vapors with impacts by PCE. A soil vapor extraction (SVE) pilot test was proposed to evaluate additional remediation of sub-slab vapor impacts at the former Norge Laundry property and potentially the property adjoining to the north.

The SVE pilot test included installation of two SVE wells and three soil vapor probe (SVP) wells. KERAMIDA conducted drilling and well installation activities on June 23 through 25, 2020. Figure 2 depicts the approximate locations of the installed wells. A total of **four** 55-gallon drums of waste soil were generated. Two soil samples were collected from each soil boring, with the exception of the shallow SVE well (SVE-1), which is in close approximate to the deep SVE well (SVE-2). All samples were sent to Pace Analytical in Indianapolis, Indiana for analysis of volatile organic compounds (VOCs).

The Contained-In request is for all waste soil generated during the soil boring and well installation activities. The soil analytical results are summarized in Table 1, and all

laboratory results are included in Appendix 1. All soil sample results presented in Table 1 are below 20X the Toxicity Characteristic Leaching Procedure (TCLP) Maximum Concentrations for Toxicity Characteristic (see table below). Therefore, all of the waste soil is determined **not** to contain concentrations at hazardous waste characteristic levels, which fulfills IDEM's Contained-In determination.

Compound	TCLP Max. Conc. of Contaminant for Toxicity Characteristic	20X TCLP Max. Conc. of Contaminant for Toxicity Characteristic
Tetrachloroethene (PCE)	0.7 ppm	14 ppm
Trichloroethene (TCE)	0.5 ppm	10 ppm
Cis-1,2-Dichloroethene (Cis-1,2-DCE)	NA	NA
Trans-1,2Dichloroethene (Trans-1,2-DCE)	NA	NA
Vinyl Chloride	0.2 ppm	4 ppm

Note:


ppm = parts per million NA = Not Available


Based on this information, KERAMIDA requests approval of the Contained-In determination in order to manage the **waste soil generated during the drilling and well installation activities (four 55-gallon drums)** as non-hazardous. The non-hazardous waste soils are planned to be managed by Liquid Waste Removal, Inc., in Greenwood, Indiana.

Additional information required for the Contained-In determination submittal is provided in the attached information checklist. If you have any questions or require additional information, please contact me at 317-363-5972 or via email at mdevir@keramida.com.

Sincerely,

KERAMIDA Inc.


Xuqing Xiong
Project Engineer


Michael J. Devir
Senior Engineer

Enclosures

Information Checklist for Contained-In Request

1. Name of responsible party.

*D&E Enterprises, Inc.
Owner Contact: Mr. Charles Markey*

2. Site description (Name, Address, Size of Site, Number of Areas Involved). Please provide any site ID# such as EPA ID#, VRP number, etc.

*Former Norge Laundry & Cleaning Village
2915 South Meridian Street
Indianapolis, Indiana
VRP No. 6130102
The Site has a total area of 0.5 acre and is currently vacant.*

3. Is the site subject to RCRA corrective action, enforcement orders?

The Site is not subject to RCRA corrective action or enforcement orders.

4. Is the site being remediated under state or federal oversight? Identify Agency and Agency contacts.

The Site is being remediated under the Indiana Department of Environmental Management (IDEM) VRP. The IDEM project manager is Mr. Jeffery Kavanaugh.

5. How was the site contaminated? (Spill of hazardous waste, product release, process waste release, other)

The Site was contaminated by Tetrachloroethene (PCE) from historic dry cleaning operations.

6. When was the site contaminated?

Contamination was first identified at the Site during a site investigation in 2005. Further site investigation between 2005 and 2014 identified the presence of a plume of dissolved phase chlorinated volatile organic compounds (cVOCs), including PCE and various degradation “daughter” products, in groundwater below and downgradient from the property. The date of the Site being contaminated is unknown. The Site was operated as a laundry and dry cleaning facility from approximately the early 1960s to the late 1970s. The Site could have been impacted anytime between the early 1960s and the late 1970s.

7. What EPA waste codes apply and why? Indicate all listed and characteristics codes applicable to the material which contaminated the site.

The code applicable to PCE and trichloroethene (TCE), include F002-listed, which is the EPA coding used for spent halogenated solvents. PCE, TCE, 1,2-Dichloroethylene, and vinyl chloride are D039, D040, U079, and D043 characteristic, respectively.

8. Does the media exhibit any characteristics of hazardous waste, in addition to being contaminated with a listed waste? If it does, the media would be subject to hazardous waste rules regardless of listed waste concentration. Media cannot exit hazardous waste system unless treated to remove the characteristics.

No, the media that is the focus of the Contained-In determination does not exhibit any characteristics of hazardous waste.

9. Which specific hazardous substances/constituents are present based on analytical results? Be sure to include breakdown products of the listed waste.

PCE is the primary hazardous substance. Only minor detections of TCE, cis-1,2-dichloroethene, trans-1,2-Dichloroethylene, and vinyl chloride have been detected at the Site.

10. What is the volume/quantity of media involved? An estimate of the volume/quantity will provide some idea of what size project we are dealing with.

One-time soil boring and well installation derived waste soil. KERAMIDA requests Contained-In approval for a total of four 55-gallon drums of waste.

11. Will the media in question be generated one time only, as a batch or in a continuous manner?

The media was generated one time as a batch.

12. Is treatment of the media involved or necessary?

Treatment of the media is not necessary.

13. Analytical results and test methods. Results must be based upon representative sampling.

Soil samples were analyzed for full list of VOCs by EPA SW-846 Method 8260B, using preparation method EPA Method 5035A.

14. A description of the sampling plan and methods used to assure representative sampling.

Two soil samples were collected from each boring, with the exception of the shallow soil vapor extraction well (SVE-1) due to its close approximate to the deep soil vapor extraction well (SVE-2). The collection of soil samples was based on field observations and the readings of the Photo Ionization Detector (PID). The soil samples were collected directly into laboratory-supplied sample containers and immediately placed on ice.

Samples were submitted through proper chain-of-custody procedures to Pace Analytical for analysis of VOCs.

15. QA/QC documentation should be provided. For most industrial default level determinations, we only need a statement that QA/QC procedures were followed and are available if requested. For residential default determinations complete QA/QC documentation must be provided with the request.

A QA/QC process was applied consistent with the IDEM RCG, which included one duplicate sample for every 20 samples collected, along with one matrix spike (MS) and one matrix spike duplicate (MSD). A trip blank for VOC analysis was also included. The data quality objectives (DQO) are Level II.

16. How will the material be managed at the generation site, intermediate sites, and final destination? What time periods are involved?

Waste soil at the site has been placed in properly labeled 55-gallon drums. Waste soil will be properly disposed upon contained-in approval and transportation arrangements made with the licensed disposal contractor and permitted disposal facility.

17. What is the final destination of the contaminated media and how is it to be managed at the final destination site?

The soil will be transported by Liquid Waste Removal, Inc. (LWR) and go to a permitted landfill. LWR works with Twin Bridges RDF, located in Danville, Indiana, or Caldwell Landfill, located in Shelby County, which are Subtitle D Landfills and will be the final destination site for the non-hazardous soil (pending contained-in approval).

18. How will the company assure contained-in threshold levels are attained for media that will be generated on an ongoing basis?

The media was generated as a batch, one time soil boring and well installation event.

**Contained-In Policy Determination Request
Former Norge Laundry & Cleaning Village
2195 South Meridian Street, Indianapolis, IN
VRP No. 6130102
KERAMIDA Project No. 19302**

TABLE

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INDIANAPOLIS, IN • GRANGER, IN • CHICAGO, IL • PITTSBURGH, PA • NEW YORK, NY • LOS ANGELES, CA • SACRAMENTO, CA

Table 1 Soil VOC Analytical Results (mg/kg) Former Norge Laundry & Cleaning Village 2915 S. Merdian Street, Indianapolis, Indiana VRP NO. 6130102 KERAMIDA Project No. 19302															
Sample No.	RCG Soil Migration to Groundwater ⁽¹⁾	RCG Soil Exposure Direct Contact - Residential ⁽¹⁾	RCG Soil Exposure Direct Contact - Commercial / Industrial ⁽¹⁾	RCG Soil Exposure Direct Contact - Excavation ⁽¹⁾	U.S. EPA RSL - Soil Saturation (C _{sat}) ⁽²⁾	SVE-2	SVE-2	SVE-2 Dup (Dup-01)	SVP-1	SVP-1	SVP-2	SVP-2	SVP-3	SVP-3	Trip Blank
Sample Depth (feet)						1-2	10-11	10-11	1.6-2.6	11-12	1.6-2.6	11-12	5-6	11-12	NA
Date Sampled						06/23/2020	06/23/2020	06/23/2020	06/23/2020	06/23/2020	06/23/2020	06/23/2020	06/23/2020	06/23/2020	06/23/2020
Lab Sample No.						5026061800	5026061800	5026061800	5026061800	5026061800	5026061800	5026061800	5026061800	5026061800	5026061801
Acetone	57	85,000	100,000	100,000	114,000	<0.076	<0.096	<0.088	<0.089	<0.10	<0.086	<0.094	<0.11	<0.082	<0.10
Acrolein	0.00017	0.2	0.6	3.4	22,700	<0.076	<0.096	<0.088	<0.089	<0.10	<0.086	<0.094	<0.11	<0.082	<0.10
Acrylonitrile	0.0023	3.5	11	370	11,300	<0.076	<0.096	<0.088	<0.089	<0.10	<0.086	<0.094	<0.11	<0.082	<0.10
Benzene	0.051	17	51	1,800	1,820	0.0068	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Bromobenzene	0.84	410	680	680	679	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Bromochloromethane	0.41	210	630	3,500	4,040	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Bromodichloromethane	0.43	4.1	13	930	931	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Bromoform	0.42	270	860	920	915	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Bromomethane (Methyl Bromide)	0.038	9.5	30	160	3,590	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
n-Butylbenzene	64	110	110	110	108	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
sec-Butylbenzene	120	150	150	150	145	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
tert-Butylbenzene	31	180	180	180	183	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Carbon disulfide	4.8	740	740	740	738	<0.0076	<0.0096	<0.0088	<0.0089	<0.010	<0.0086	<0.0094	<0.011	<0.0082	<0.010
Carbon tetrachloride	0.039	9.1	29	460	458	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Chlorobenzene	1.4	390	760	760	761	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Chlorodibromomethane	0.43	120	390	800	802	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Chloroethane (Ethyl Chloride)	120	2,100	2,100	2,100	2,120	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Chloroform	0.44	4.5	14	1,900	2,540	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Chloromethane (Methyl Chloride)	0.98	150	460	1,300	1,320	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
2-Chlorotoluene (o-)	4.7	910	910	910	907	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
4-Chlorotoluene (p-)	4.8	250	250	250	253	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
1,2-Dibromo-3- Chloropropane	0.0017	0.074	0.64	86	979	<0.0076	<0.0096	<0.0088	<0.0089	<0.010	<0.0086	<0.0094	<0.011	<0.0082	<0.010
1,2-Dibromoethane	0.00028	0.5	1.6	180	1,340	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Dibromomethane (Methylene Bromide)	0.041	34	99	550	2,820	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
1,2-Dichlorobenzene	12	380	380	380	376	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
1,4-Dichlorobenzene	1.4	36	110	16,000	NA	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Dichlorodifluoromethane	6	120	370	850	845	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
trans-1,4-Dichloro- 2-butene	0.00012	0.1	0.32	44	760	<0.076	<0.096	<0.088	<0.089	<0.10	<0.086	<0.094	<0.11	<0.082	<0.10
1,1-Dichloroethane	0.16	50	160	1,700	1,690	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
1,2-Dichloroethane	0.028	6.4	20	730	2,980	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
1,1-Dichloroethene	0.05	320	1,000	1,200	1,190	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
cis-1,2-Dichloroethene	0.41	220	2,300	2,400	2,370	0.018	0.033	0.031	0.023	0.017	0.0070	0.16	0.026	0.029	<0.0050
trans-1,2-Dichloroethene	0.62	1,900	1,900	1,900	1,860	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	0.027	<0.0057	<0.0041	<0.0050
1,2-Dichloropropane	0.033	22	66	360	1,360	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
1,3-Dichloropropane	2.6	1,500	1,500	1,500	1,490	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
2,2-Dichloropropane	NA	NA	NA	NA	NA	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
1,1-Dichloropropene	NA	NA	NA	NA	NA	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
cis-1,3-Dichloropropene	0.034	25	82	1,600	1,570	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
trans-1,3- Dichloropropene	0.034	25	82	1,600	1,570	<0.0038	<0.0048	<0.0044	<0.0044	<0.0051	<0.0043	<0.0047	<0.0057	<0.0041	<0.0050
Ethylbenzene	16	81	250												

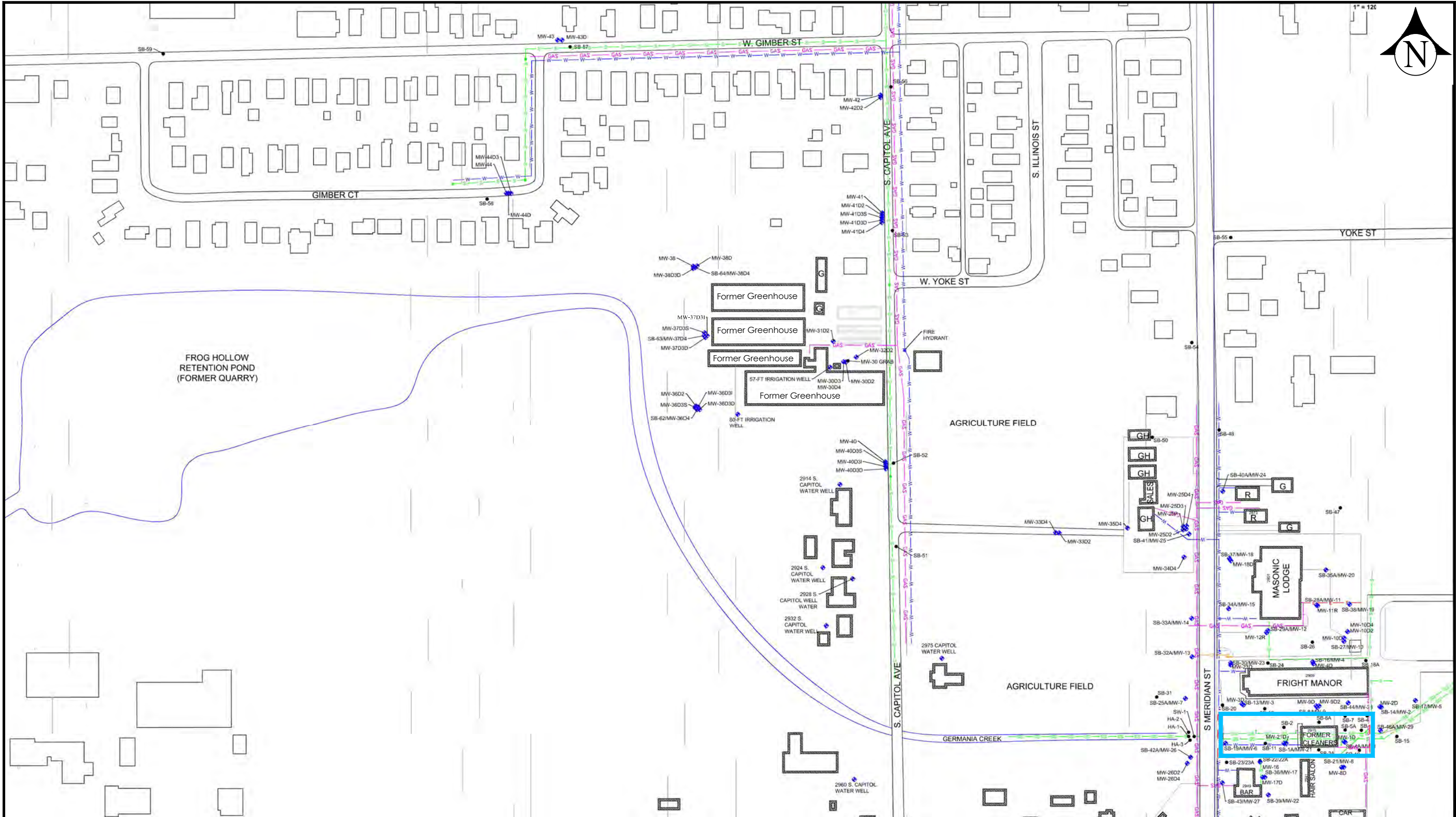
Contained-In Policy Determination Request
Former Norge Laundry & Cleaning Village
2195 South Meridian Street, Indianapolis, IN
VRP No. 6130102
KERAMIDA Project No. 19302

FIGURES

INCREASING OUR CLIENTS' PROFITABILITY THROUGH SMART CONSULTING™

ENGINEERS • GEOLOGISTS • SCIENTISTS • SAFETY PROFESSIONALS • INDUSTRIAL HYGIENISTS • TOXICOLOGISTS • MODELING EXPERTS
INDIANAPOLIS, IN • GRANGER, IN • CHICAGO, IL • PITTSBURGH, PA • NEW YORK, NY • LOS ANGELES, CA • SACRAMENTO, CA

G:\AUTOCAD\1_CLIENTS\Cantrell Strenski and Mehlinger\Former Norge\15953 Former Norge Laundry



LEGEND

- SOIL BORING
- MONITORING WELL
- PROPERTY BOUNDARY
- G GARAGE
- GH GREENHOUSE
- R RESIDENCE
- SANITARY SEWER LINES
- STORM SEWER LINES
- WATER LINES
- COMMUNICATION LINES
- ELECTRICAL LINES
- GAS LINES

Approximate Boundary of Former Norge Laundry

Note □
Base Map by Sesco Group



Project: Former Norge Laundry & Cleaning Village
2915 S. Meridian Street
Indianapolis, Indiana

Project Number: 15953	Drawn By: S. Grady
Date: February 20, 2018	Approved By: M.D.
	File No. 15953_Ph2-2018

Figure 1

Site Map

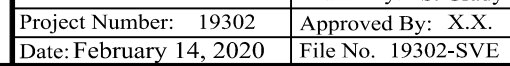
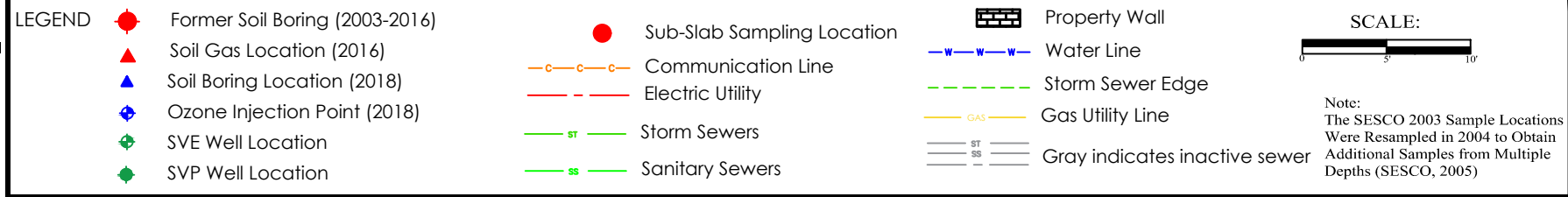


Figure 2

SVE and SVP
Well Locations

Contained-In Policy Determination Request
Former Norge Laundry & Cleaning Village
2195 South Meridian Street, Indianapolis, IN
VRP No. 6130102
KERAMIDA Project No. 19302

APPENDIX

INCREASING OUR CLIENTS' PROFITABILITY THROUGH SMART CONSULTING™

ENGINEERS • GEOLOGISTS • SCIENTISTS • SAFETY PROFESSIONALS • INDUSTRIAL HYGIENISTS • TOXICOLOGISTS • MODELING EXPERTS
INDIANAPOLIS, IN • GRANGER, IN • CHICAGO, IL • PITTSBURGH, PA • NEW YORK, NY • LOS ANGELES, CA • SACRAMENTO, CA

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 6

SVE System Manual

ENVIRO-EQUIPMENT, INC.

10120 Industrial Drive
PINEVILLE, NC 28134
704-556-7723 - Phone
704-556-7228 - Fax
www.enviroequipment.com

SYSTEM MANUAL

1500 SVE System

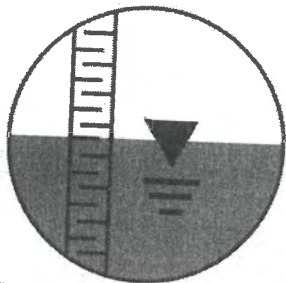


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Table of Contents



Enviro-Equipment, Inc.

1500
SVE System

1	ELECTRICAL
2	ROTRON BLOWER / MOISTURE SEP.
3	ROTRON FILTERS
4	PRESSURE & TEMP. SWITCHES
5	THERMOSTAT
6	XP HEATER
7	XP EXHAUST FAN
8	

1

2

3

4

5

6

7

8



Enviro-Equipment, Inc.
Remediation Division

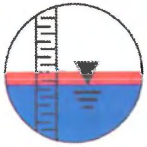
Stock # 1500 Enclosed SVE System

Dimensions: 59" L x 48" W x 77" H Weight: 1438 Pounds

SVE System inside of Enclosure Including:

- Rotron EN6F5L 5HP 1PH 230V XP Blower – 225 CFM Max, 85" WC Max Vacuum
- 2" Solberg Inlet Vacuum Filter
- 2" Solberg Exhaust Silencer
- 2" Solberg Filter Silencer with 2" Brass Gate Valve (Dilution Valve)
- Vacuum Gauges
- Rotron MS200PS Moisture Separator with XP High Level Float and manual drain
- 4 Zone Inlet Manifold Each Leg Includes Ball Valve and 2" FNPT Connection
- Dwyer 1950 XP Low Vacuum Switch with adjustable 4-20" WC Range
- 4' W x 4' L x 6' H Enclosure Including
 - o XP Exhaust Fan with Thermostat
 - o XP Heater with Thermostat
 - o 1" Thick Sound Foam
 - o Interior Wired for Class 1 Div 2 Hazardous Location
- UL 508/698 Weatherproof Relay Logic Control Panel mounted on exterior. 230V 1PH 33 Full Load Amps.





Enviro-Equipment, Inc.
Remediation Division





Enviro-Equipment, Inc.
Remediation Division



ROTRON® Regenerative Blowers

EN 6 & CP 6

Sealed Regenerative Blower w/ Explosion-Proof Motor

FEATURES

- Manufactured in the USA – ISO 9001 compliant
- Maximum flow: 225 SCFM
- Maximum pressure: 104 IWG
- Maximum vacuum: 85 IWG
- Standard motor: 5.0 HP, explosion-proof
- Cast aluminum blower housing, cover, impeller & manifold; cast iron flanges (threaded); teflon lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

MOTOR OPTIONS

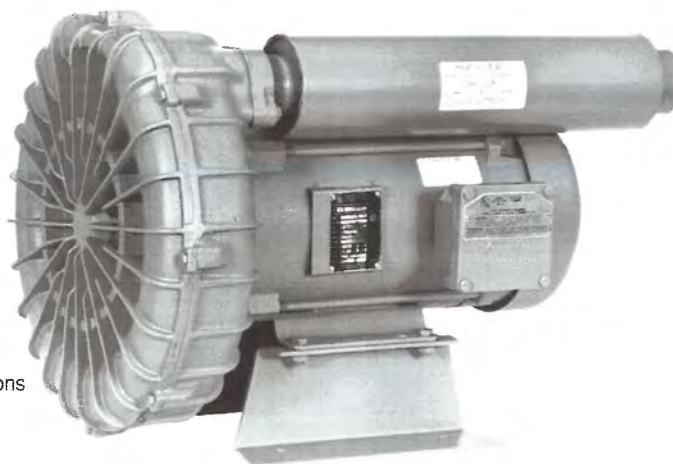
- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepower for application-specific needs

BLOWER OPTIONS

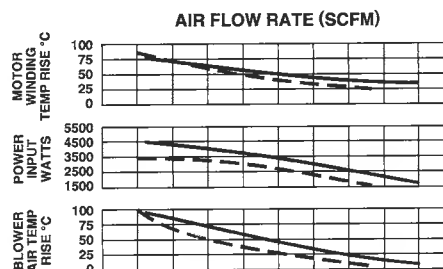
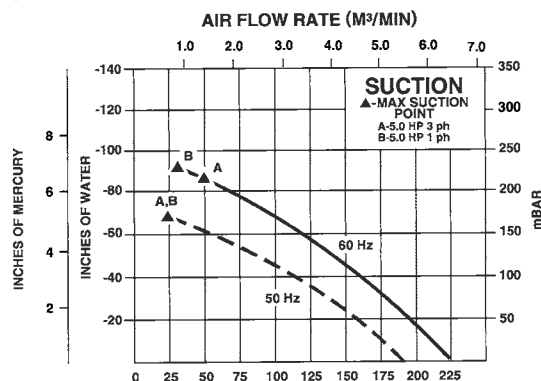
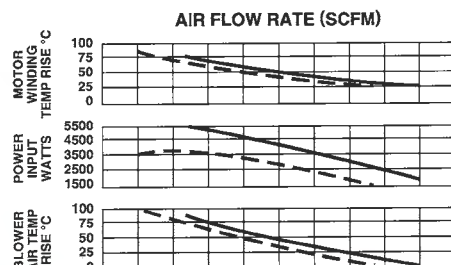
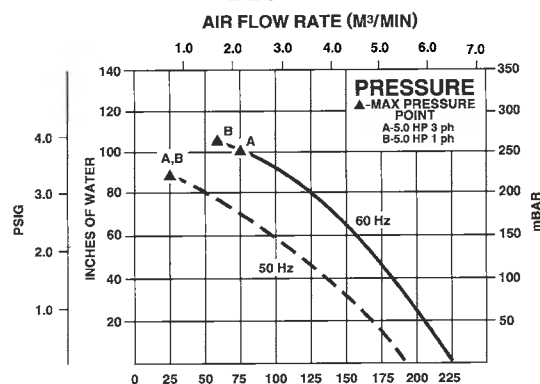
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

ACCESSORIES (See Catalog Accessory Section)

- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges & relief valves
- Switches – air flow, pressure, vacuum or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package



BLOWER PERFORMANCE AT STANDARD CONDITIONS



Rev. 2/04

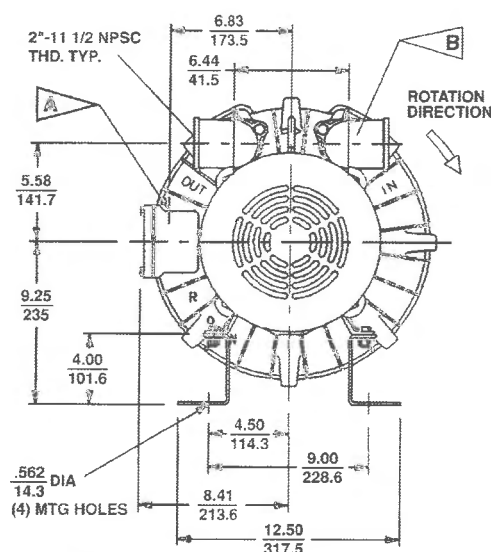
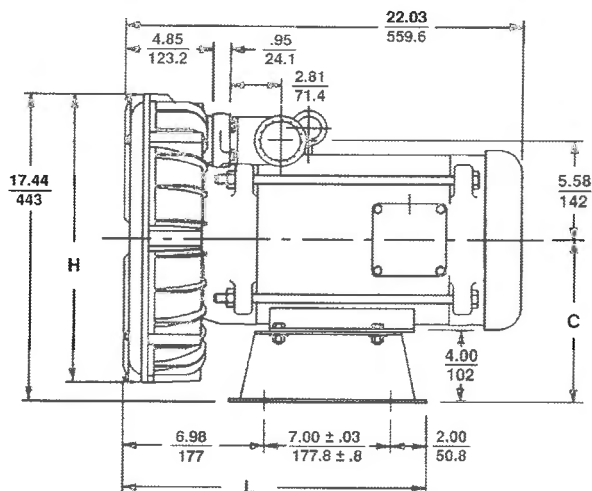
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AMETEK Technical and Industrial Products, Kent, OH 44240 • e mail: rotronindustrial@ametek.com • internet: www.ametekind.com

ROTRON® Regenerative Blowers

EN 6 & CP 6 Sealed Regenerative Blower w/Explosion-Proof Motor

Scale CAD drawing available upon request.



DIMENSIONS: IN
MM
TOLERANCES: .XX ± .12
9
(UNLESS OTHERWISE NOTED)

MODEL	L (IN/MM)	C (IN/MM)	H (IN/MM)
EN/CP6F72L	20.37/517	8.5/216	16.7/424
EN/CP6F5L	22.0/560	10.21/259	17.5/443

A 0.75" NPT CONDUIT CONNECTION AT 12 O'CLOCK POSITION

B 90° ELBOW SUPPLIED ON 1 PHASE MODEL ONLY

SPECIFICATIONS

ALL PRODUCTS LISTED INCLUDE MUFFLER PN 522948

MODEL	EN6F5L	EN6F72L	EN6F86L	CP6FW5LR	CP6FW72LR
Part No.	038361	038180	038438	—	038978
Motor Enclosure – Shaft Material	Explosion-proof – CS	Explosion-proof – CS	Explosion-proof – CS	Chem XP – SS	Chem XP – SS
Horsepower	5.0	5.0	5.0	Same as EN6F5L – 038361 except add Chemical Processing (CP) features from catalog inside front cover	Same as EN6F72L – 038180 except add Chemical Processing (CP) features from catalog inside front cover
Phase – Frequency ¹	Single – 60 Hz	Three – 60 Hz	Three – 60 Hz		
Voltage ¹	230	230 460	575		
Motor Nameplate Amps	19.5	14 7	5.7		
Max. Blower Amps ³	23	15.8 7.9	6.3		
Inrush Amps	175	152 76	38		
Starter Size	2	1 0	0		
Service Factor	1.0	1.0	1.0		
Thermal Protection ²	Class B – Pilot Duty	Class B – Pilot Duty	Class B – Pilot Duty		
XP Motor Class – Group	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G		
Shipping Weight	232 lb (105 kg)	160 lb (73 kg)	160 lb (73 kg)		

¹ Rotron motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

² Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

³ Maximum blower amps corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

Specifications subject to change without notice. Please consult your Local Field Sales Engineer for specification updates.

Rev. 2/04

AMETEK Technical and Industrial Products, Kent, OH 44240 • e mail: rotronindustrial@ametek.com • internet: www.ametekind.com

C-16

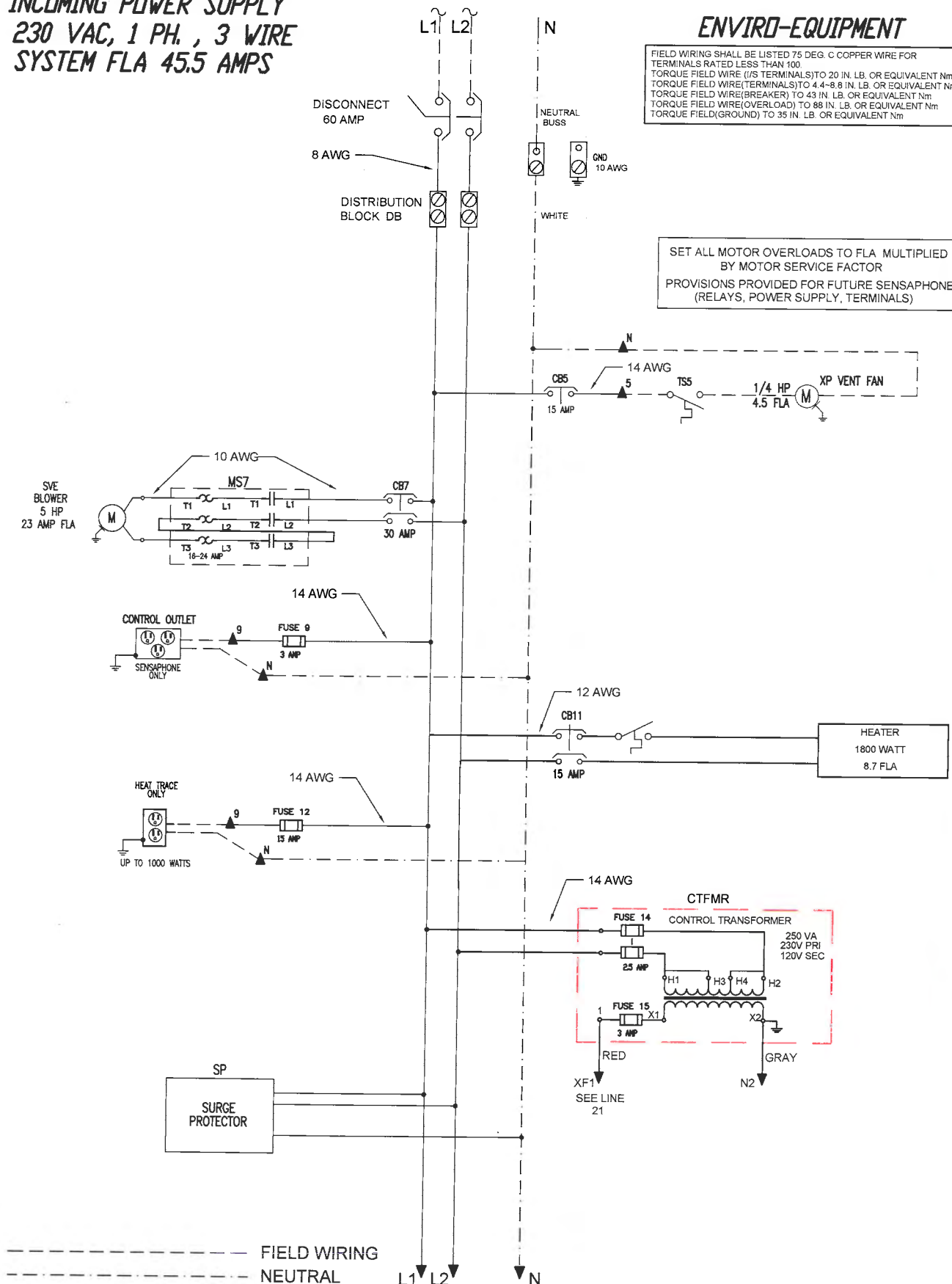
Section 1

INCOMING POWER SUPPLY
230 VAC, 1 PH., 3 WIRE
SYSTEM FLA 45.5 AMPS

ENVIRO-EQUIPMENT

FIELD WIRING SHALL BE LISTED 75 DEG. C COPPER WIRE FOR
 TERMINALS RATED LESS THAN 100
 TORQUE FIELD WIRE (1/8" TERMINALS) TO 20 IN. LB. OR EQUIVALENT Nm
 TORQUE FIELD WIRE (TERMINALS) TO 4.4-8.8 IN. LB. OR EQUIVALENT Nm
 TORQUE FIELD WIRE (BREAKER) TO 43 IN. LB. OR EQUIVALENT Nm
 TORQUE FIELD WIRE (OVERLOAD) TO 88 IN. LB. OR EQUIVALENT Nm
 TORQUE FIELD (GROUND) TO 35 IN. LB. OR EQUIVALENT Nm

SET ALL MOTOR OVERLOADS TO FLA MULTIPLIED
 BY MOTOR SERVICE FACTOR
 PROVISIONS PROVIDED FOR FUTURE SENSAPHONE
 (RELAYS, POWER SUPPLY, TERMINALS)



DATE

NAME

ENVIRO-EQUIPMENT

PAGE DESCRIPTION

08-19-20

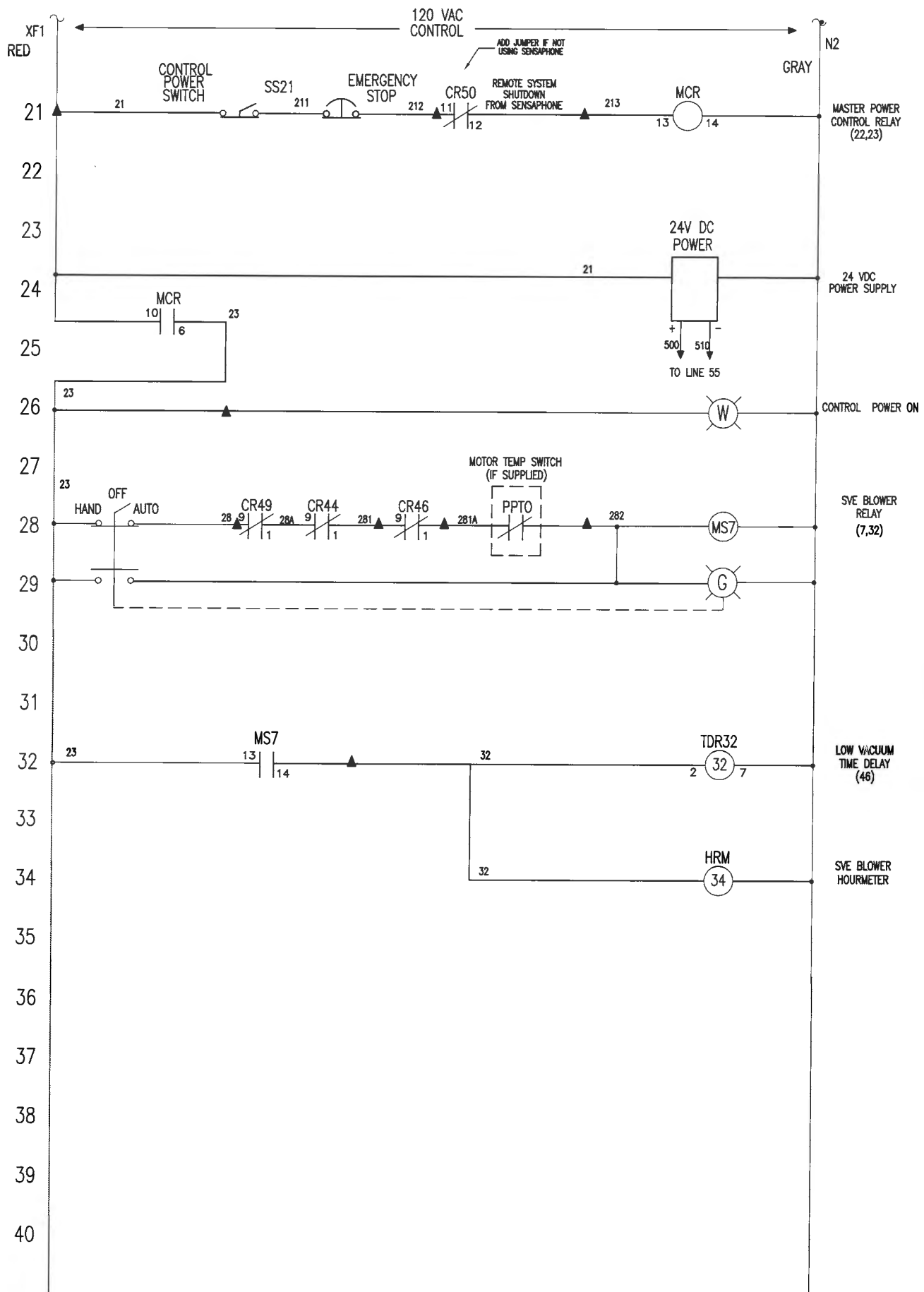
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10120 Industrial Drive
 Pineville, NC 28134
 704-556-7723

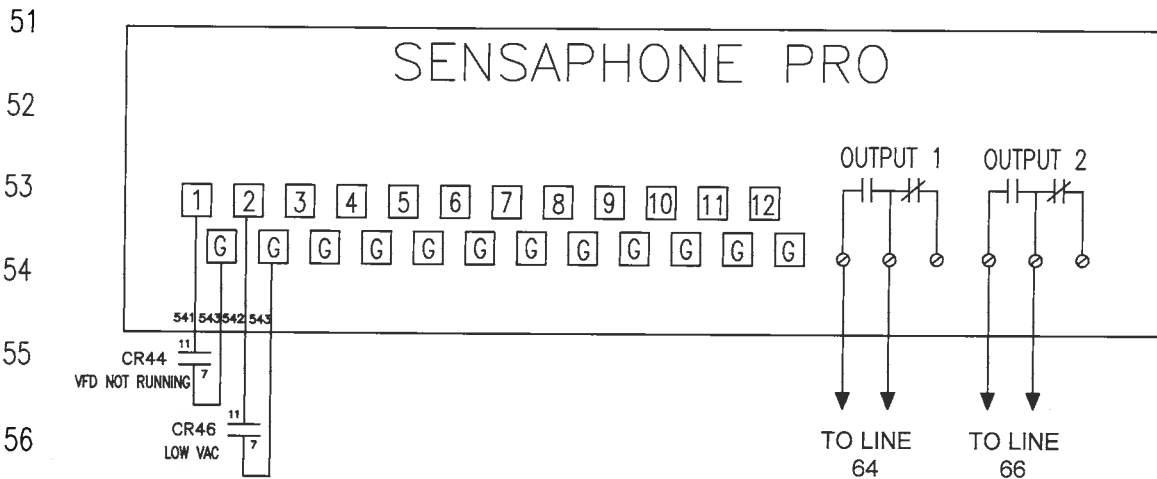
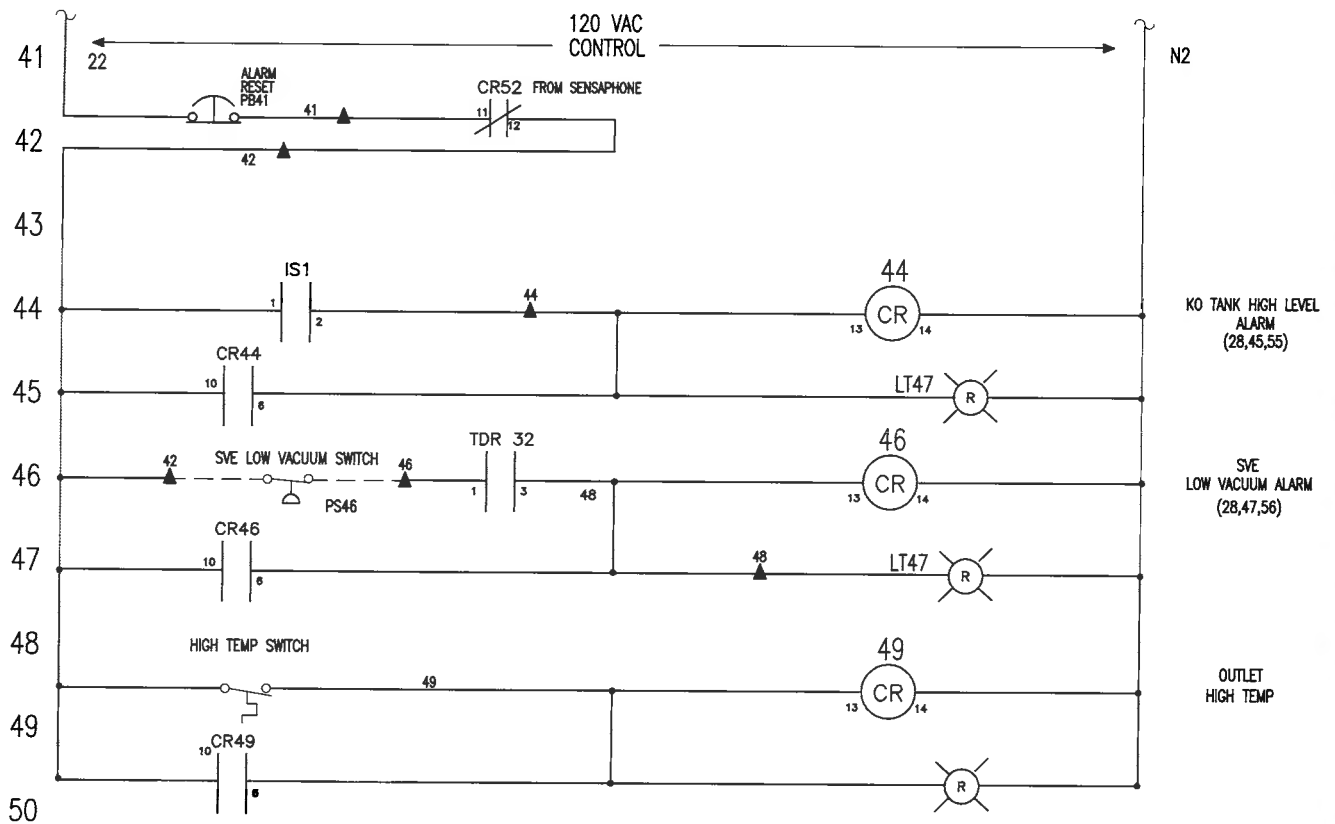
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DRAWING-NO: EEI-1500

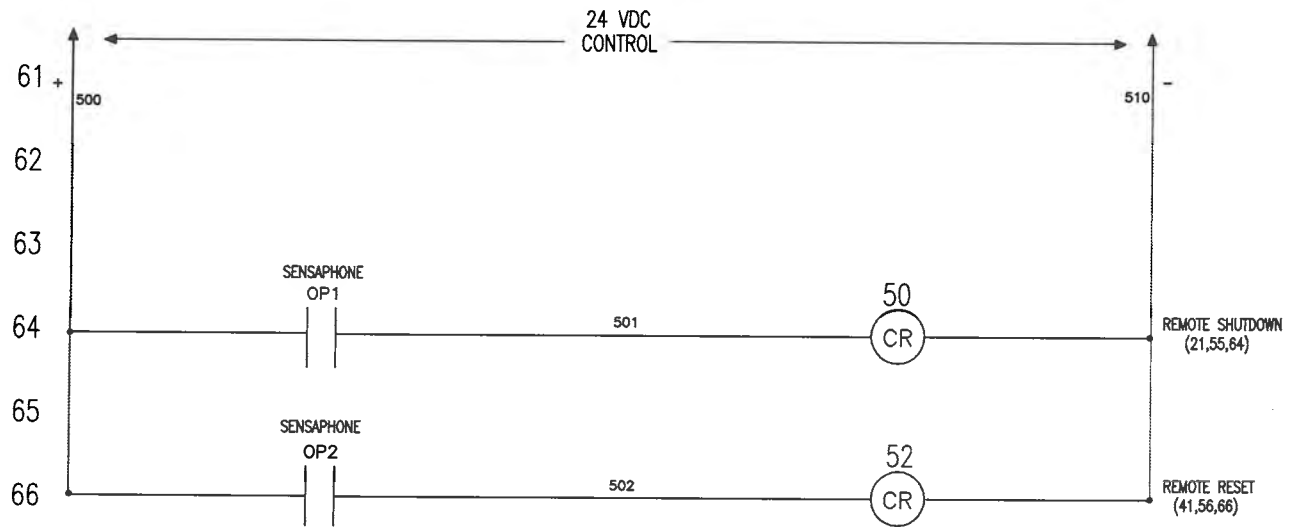
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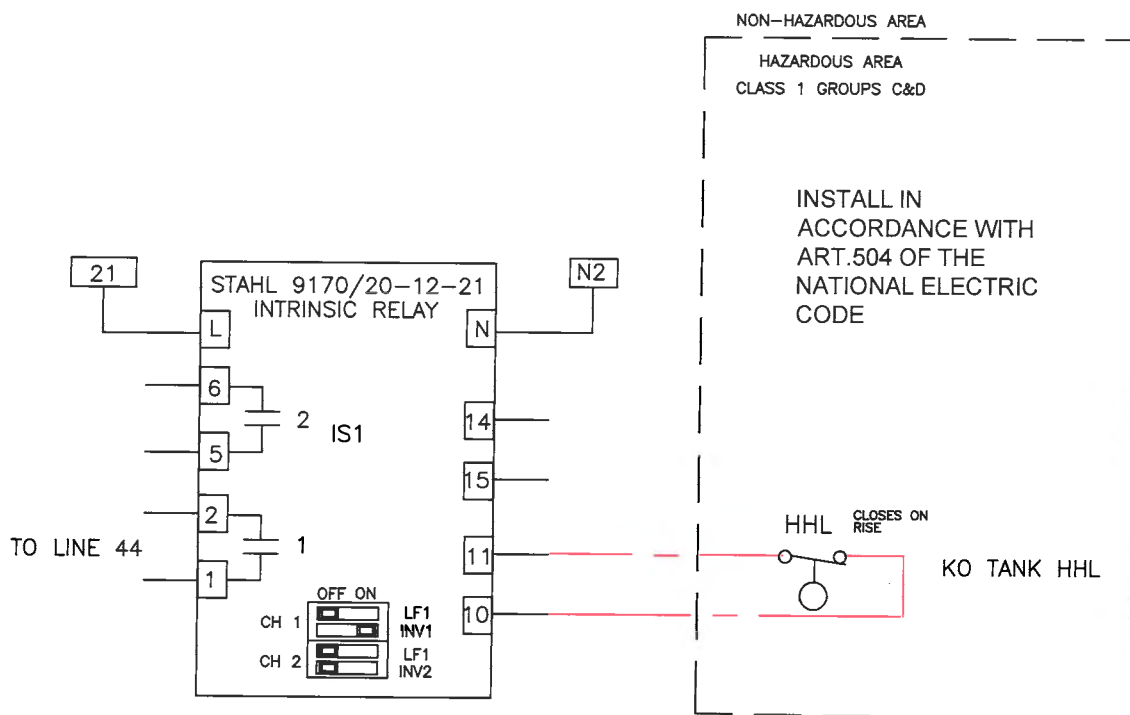


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DATE	NAME	ENVIRO-EQUIPMENT 10120 Industrial Drive Pineville, NC 28134 704-556-7723	PAGE DESCRIPTION		
08-19-20	DRAWN BY BAH		PROJECT: 1500	DRAWING-NO: EEI-1500	PAGE: 4 OF 5

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DATE	NAME	ENVIRO-EQUIPMENT 10120 Industrial Drive Pineville, NC 28134 704-556-7723	PAGE DESCRIPTION		
08-19-20	DRAWN BY BAH		PROJECT: 1500	DRAWING-NO: EEI-1500	PAGE: 5 of 5

Section 2

ROTRON[®] Regenerative Blowers

EN 6 & CP 6

Sealed Regenerative Blower w/ Explosion-Proof Motor

FEATURES

- Manufactured in the USA – ISO 9001 compliant
- Maximum flow: 225 SCFM
- Maximum pressure: 104 IWG
- Maximum vacuum: 85 IWG
- Standard motor: 5.0 HP, explosion-proof
- Cast aluminum blower housing, cover, impeller & manifold; cast iron flanges (threaded); teflon lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

MOTOR OPTIONS

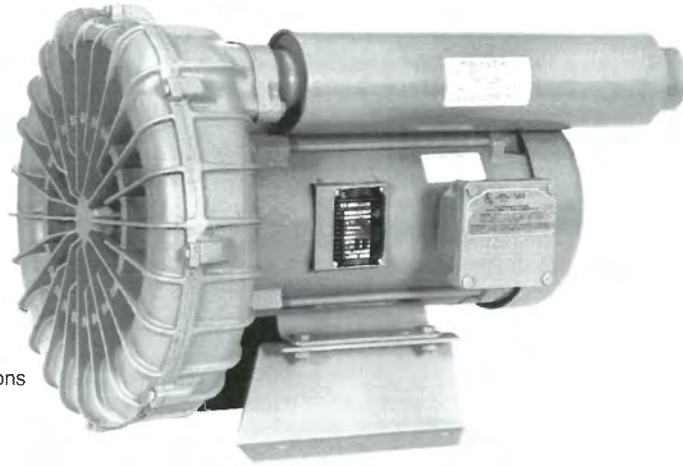
- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepower for application-specific needs

BLOWER OPTIONS

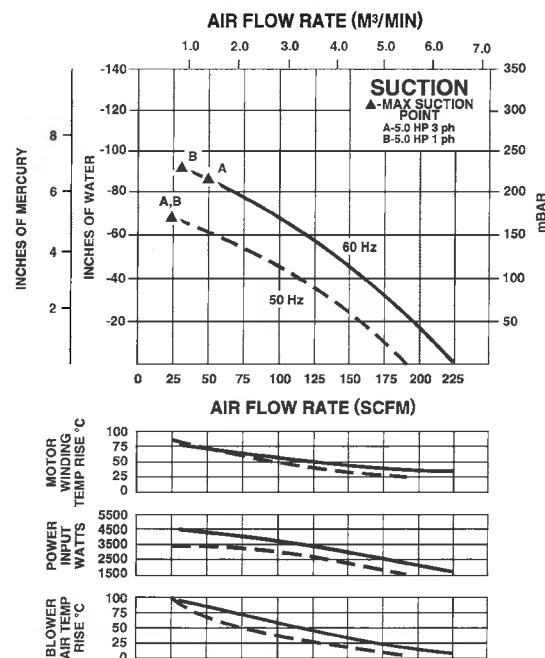
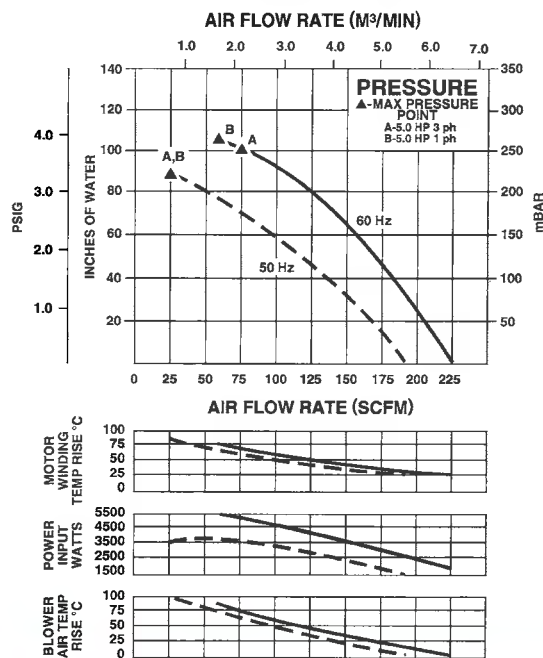
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- Remote drive (motorless) models
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ACCESSORIES (See Catalog Accessory Section)

- Flowmeters reading in SCFM
- Filters & moisture separators
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- Switches – air flow, pressure, vacuum or temperature
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- Air knives (used on blow-off applications)
- Variable frequency drive package



BLOWER PERFORMANCE AT STANDARD CONDITIONS

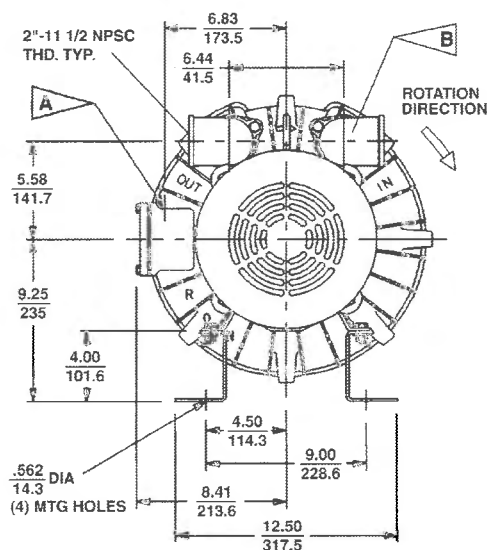
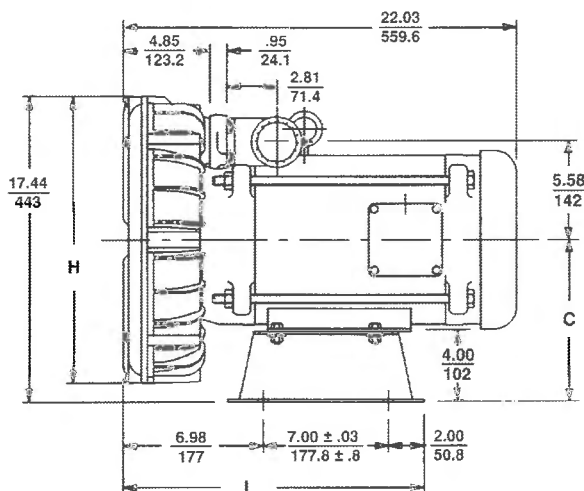


Rev. 2/04

ROTRON® Regenerative Blowers

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Horsepower	5.0	5.0	5.0	Same as EN6F5L – 038361	Same as EN6F72L – 038180
Phase – Frequency ¹	Single - 60 Hz	Three - 60 Hz	Three - 60 Hz	except add Chemical Processing (CP) features from catalog inside front cover	except add Chemical Processing (CP) features from catalog inside front cover
Voltage ¹	230	230 460	575		
Motor Nameplate Amps	19.5	14 7	5.7		
Max. Blower Amps ³	23	15.8 7.9	6.3		
Inrush Amps	175	152 76	38		
Starter Size	2	1 0	0		
Service Factor	1.0	1.0	1.0		
Thermal Protection ²	Class B - Pilot Duty	Class B - Pilot Duty	Class B - Pilot Duty		
XP Motor Class – Group	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G		
Shipping Weight	232 lb (105 kg)	160 lb (73 kg)	160 lb (73 kg)		

¹ Rotron motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

² Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

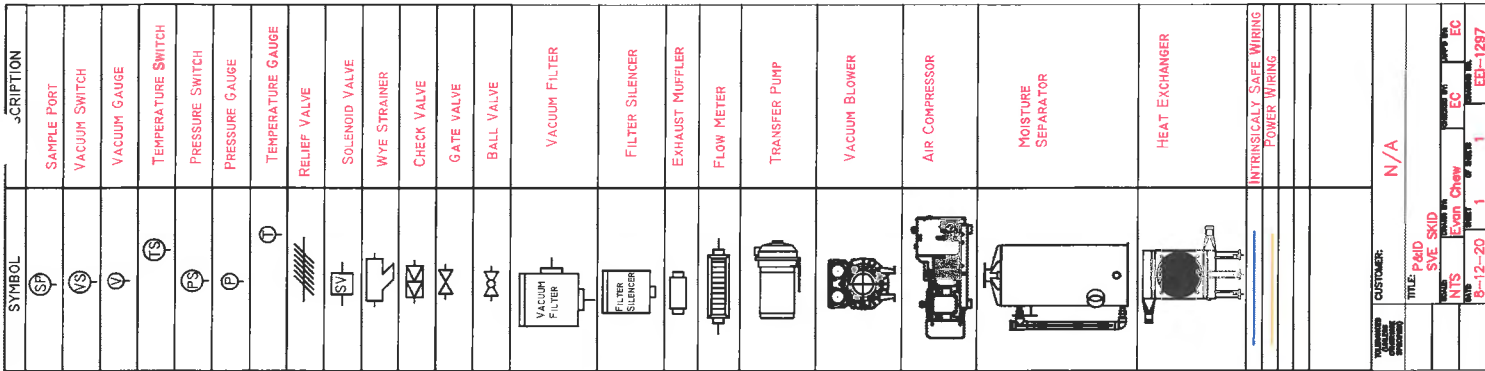
³ Maximum blower amps corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

Specifications subject to change without notice. Please consult your Local Field Sales Engineer for specification updates.

Rev. 2/04

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C-16



Filtration Accessories

ROTRON® Regenerative Blowers

Blower Connection Key

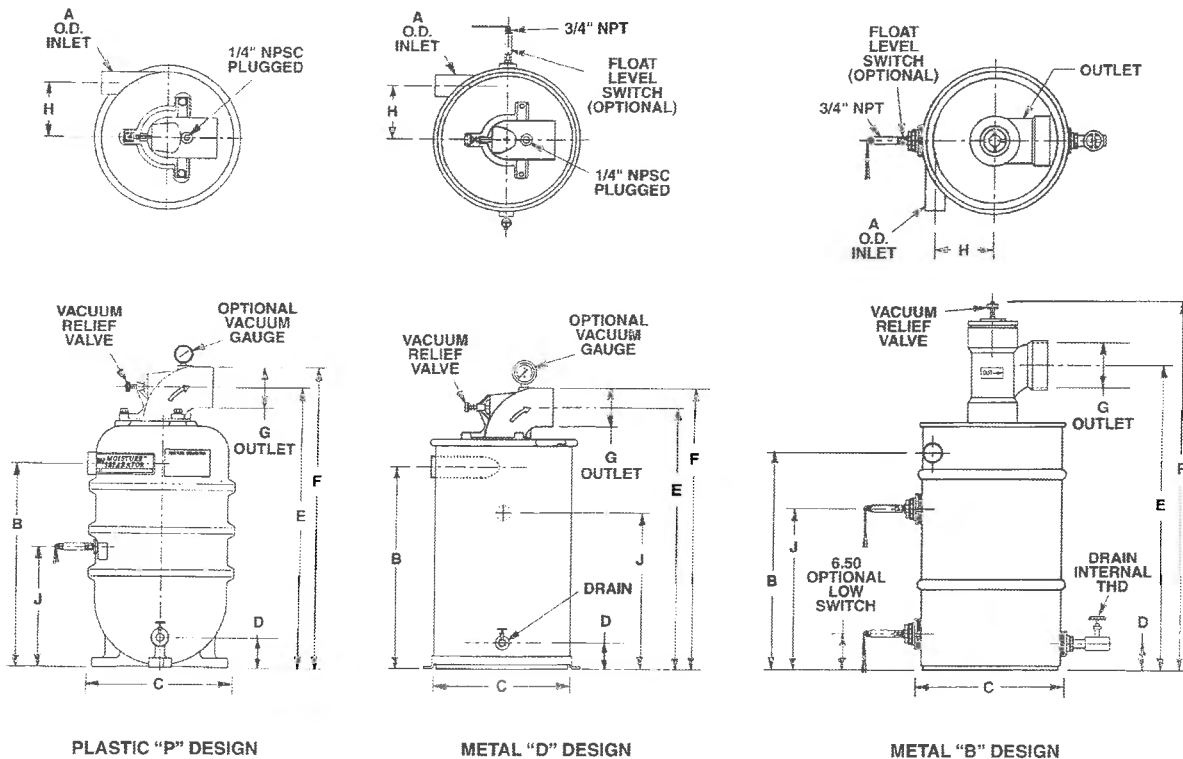
NPT – American National Standard Taper Pipe Thread (Male)
NPSC – American National Standard Straight Pipe Thread for Coupling (Female)
SO – Slip On (Smooth – No Threads)

Moisture Separator™

By separating and containing entrained liquids, Rotron's moisture separator helps protect our regenerative blowers and the end treatment system from corrosion and mineralization damage. Recommended for all soil vacuum extraction applications.

SPECIFICATIONS:

SEPARATION METHOD – High Efficiency Cyclonic
RELIEF VALVE MATERIAL – Brass & Stainless Steel
FLOAT MATERIAL – Copper
FLOAT SWITCH – SPDT, Explosion-proof
NEMA 7&9, 5 Amp max.



Model	Part No.	CFM Max.	A Dia.	B	C Dia.	D	E	F	G Dia.	H	J Switch	Drain Internal THD	Shipping Weight
MS200PS	038519	200	2.38	22.46	16.00	3.25	31.05	33.30	4.50 OD	6.00	13.25	3/4" NPT	42 lb.
MS300PS	038520	300	2.88										
MS200DS	080086	200	2.00	22.12	16.75	2.75	27.92	30.17		6.56	12.62		
MS300DS	080087	300	2.50							6.81			
MS350BS	038357	350	3.25	28.00	23.00	4.00	37.25	39.50	6.63 ID	9.75	17.50	1" NPT	82 lb.
MS500BS	080660	500					37.37	54.50		9.25	95 lb.		
MS600BS	080659	600	4.00	27.00			96 lb.						
MS1000BS	038914	1000	6.00	31.00	27.00		47.32	51.70	8.62 OD	10.00	19.88		150 lb.

Models without float switch available. Metal MS200/300DS models are not the standard stocked, but are available.

Rev. 2/04

ROTRON® Regenerative Blowers

Blower Model Reference Key	
A = SPIRAL	E = DR/EN/CP 656, 6, 623, S7
B = DR/EN/CP 068, 083, 101, 202	F = DR/EN/CP 707, 808, 858, S9, P9 (Inlet Only)
C = DR/EN/CP 303, 312, 313, 353	G = DR/EN/CP 823, S13, P13 (Inlet Only)
D = DR/EN/CP 404, 454, 513, 505, 555, 523	H = DR/EN/CP 909, 979, 1223, 14, S15, P15 (Inlet Only)

Filtration Accessories

2.0 Moisture Separator™ Specifications

2.1 DUTY

The moisture separator shall be designed for use in a soil vapor extraction system capable of continuous operation with a pressure drop of less than six inches of water at the rated flow of _____ SCFM. The separator shall be capable of operation under various inlet conditions ranging from a fine mist to slugs of water with high efficiency.

2.2 PRINCIPLE OF OPERATION

The moisture separator shall incorporate cyclonic separation to remove entrained water. The separator must protect against an overflow by fail safe mechanical means. An electrical switch or contact(s) alone is not an acceptable means of protection against overflow, but is a good backup.

2.3 CONSTRUCTION

The body of the moisture separator shall be constructed of heavy wall plastic or heavy gauge cold rolled steel. The steel interior and exterior shall be epoxy (powder) coated to resist abrasion, corrosion, and chipping that might expose the surface. The inlet shall be tangentially located and welded to the body. The outlet port shall be constructed of PVC or cast aluminum alloy, flanged and sealed to the center of the top of the separator. The separator shall incorporate a non-sparking copper

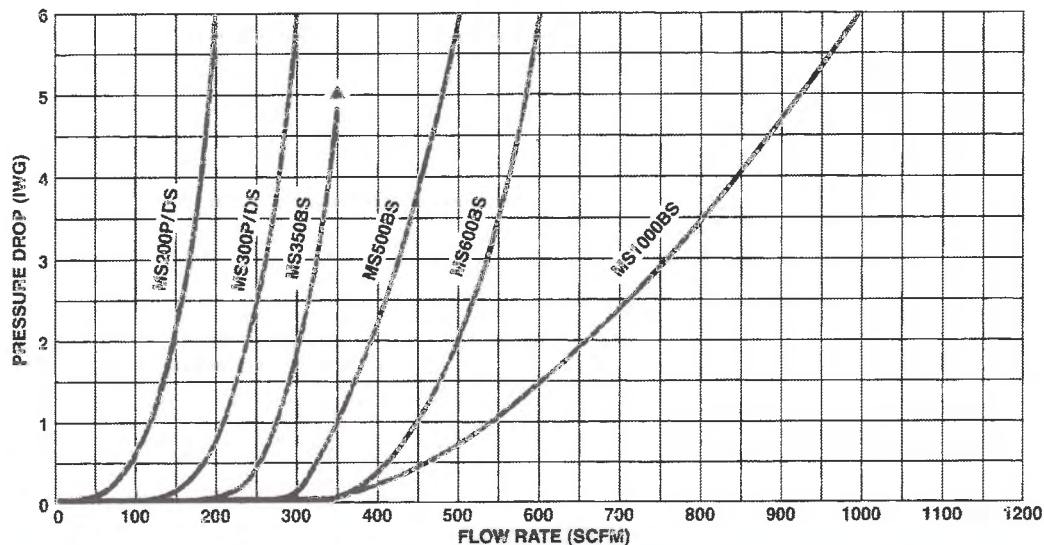
float ball and an adjustable relief valve to protect against overflow and overheating the blower.

2.4 CAPACITY AND DIMENSIONS

The moisture separator must have a liquid capacity of _____ gallons. The inlet shall be _____ inch OD slip-on type. The outlet shall be _____ inch OD slip-on type.

For DR/EN/CP Blower Model	Selector Moisture Separator Model	Liquid-holding Capacity (gallons)	Inlet (OD)	Outlet	Max Vacuum Allowed (IHg)
404 454 505 513 523 555 623 823	MS200PS	7	2.38	4.5" OD	12
	MS200DS	10	2.0		22
656 6 707	MS300PS	7	2.88	6.63" ID	12
	MS300DS	10	2.5		22
808	MS350BS	40	3.25		
858 1223	MS500BS		4.0"		
909 979 14	MS600BS		6.0"	8.62" OD	
	MS1000BS	65			

2.5 PRESSURE DROP

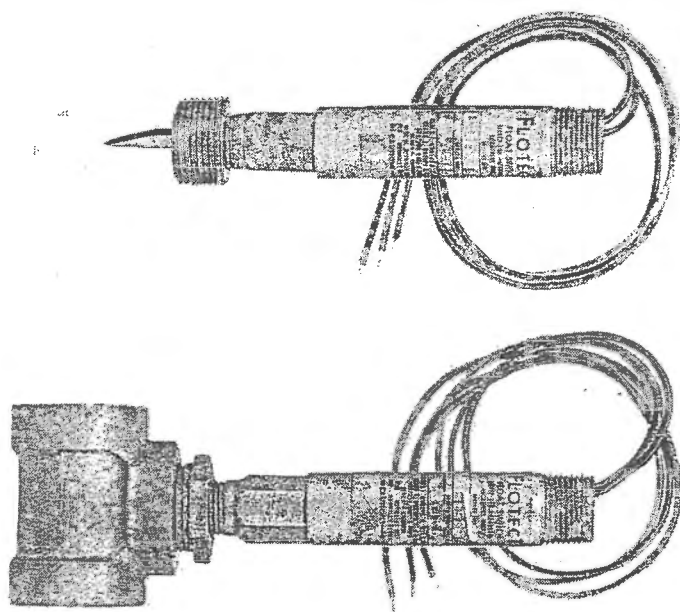


Rev. 2/04



FLOTECH™ MODEL L-6 FLOAT SWITCH

Installation and Operating Instructions



Explosion-Proof; U.L. and C.S.A. Listed -
Class I, Groups *A, B, C & D
Class II, Groups E, F & G
CENELEC: EExd IIC T6 (T amb=75°C)
 *(Group A, stainless steel body only)

PHYSICAL DATA

Temperature Limit: 220°F (105°C) maximum

Maximum Pressure: See chart below

Switches: One or two SPDT snap switches

Electrical Rating: U.L.: 5A @ 125/250 VAC.

C.S.A. and CENELEC: 5A @ 125/250 VAC, 5A resistive, 3A inductive @ 30 VDC.

Optional ratings: MV option—Gold contacts for dry circuits.

Rated 0.1A @ 125 VAC MT option: 400°F

(205°C) 5A @ 125/250 VAC (not listed).

Wiring Connections: 3-18" (460mm) wire leads, 18 ga.

CENELEC models only: push-in type terminal blocks

Black = common, blue = N.O., red = N.C.

Minimum Specific Gravity:

Polypropylene float - 0.9

Round SS float - 0.7

Cylindrical SS float - 0.5

Switch Body: Brass 3/4" NPT conduit connection.

For SS switch body, change model no. to L6EPS.

Piping/Mounting Connection: 1" NPT

Installation: Horizontal, index arrow pointing down.

Weight: 1 lb. (.5 KG); w/external chamber 1-3/4 lb. (.8 KG)

WETTED MATERIALS CHART

Model	Brass	Bronze	Ceramic	Polypropylene	301SS	303SS	304SS
B-S-3-A	X		X		X		X
B-S-3-B	X	X	X	X	X		
B-S-3-C	X		X		X		X
B-S-3-H	X	X	X		X		X
B-S-3-O	X		X	X	X		
S-S-3-A			X	X	X		X
S-S-3-C			X		X	X	X
S-S-3-L			X		X	X	X
S-S-3-O			X	X	X	X	
S-S-3-S			X	X	X	X	

INSTALLATION:

Unpack switch and remove any packing material found inside lower housing or float chamber.

Switch must be installed with body in a horizontal plane and arrow on side pointing down.

If switch has an external float chamber (tee), connect it to vertical sections of 1" NPT pipe installed outside vessel walls at appropriate levels. If unit has no external float chamber, it must be mounted in a 1" NPT half coupling welded to the vessel wall. The coupling must extend through the wall.

Inspect and clean wetted parts at regular intervals.

ELECTRICAL CONNECTIONS:

Connect wire leads in accordance with local electrical codes and switch action required. N.O. contacts will close and N.C. contacts will open when liquid level causes float to rise. They will return to "normal" condition on decreasing liquid level. Black = common, Blue = N.O. and Red = N.C.

For units supplied with both internal and external grounds, the ground screw inside the housing must be used to ground the control. The

MAXIMUM PRESSURE CHART

Model Number	Float	Pressure Rating PSIG (KG/CM²)
L6EPB-B-S-3-A	Cylindrical SS	200 (14)
L6EPB-B-S-3-B	Polypropylene	250 (18)
L6EPB-B-S-3-C	Round SS	350 (25)
L6EPB-B-S-3-H	Round SS	250 (18)
L6EPB-B-S-3-O	Polypropylene	1000 (70)
L6EPB-S-S-3-A	Cylindrical SS	200 (14)
L6EPB-S-S-3-C	Round SS	350 (25)
L6EPB-S-S-3-L	Round SS	350 (25)
L6EPB-S-S-3-O	Polypropylene	2000 (140)
L6EPB-S-S-3-S	Polypropylene	2000 (140)

external ground screw is for supplementary bonding when allowed or required by local code. Some CSA listed models are furnished with a separate green ground wire. Such units must be equipped with a junction box, not supplied but available on special order.

CENELEC certified models include a junction box. Cable should enter enclosure through an approved EX cable gland, not supplied. Push stripped and tinned leads into appropriate openings in terminal block(s). To connect fine stranded leads or to remove any wire, depress spring release with small screwdriver first.

All wiring, conduit and enclosures must meet applicable codes for hazardous areas. Conduits and enclosures must be properly sealed. For outdoor or other locations where temperatures vary widely, precautions should be taken to prevent condensation inside switch or enclosure. Electrical components must be kept dry at all times. **CAUTION:** To prevent ignition of hazardous atmospheres, disconnect the device from the supply circuit before opening. Keep assembly tightly closed when in use.

Dimensions on reverse

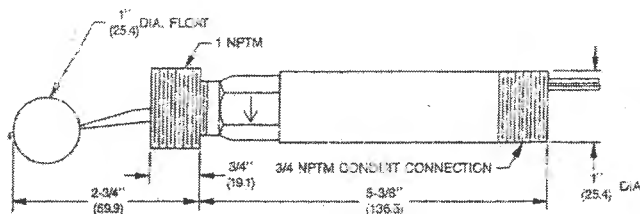
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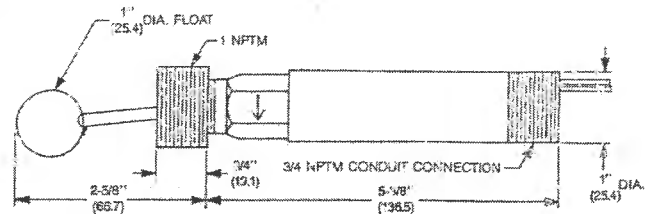
Telephone 219/879-8000

Fax 219/872-9057

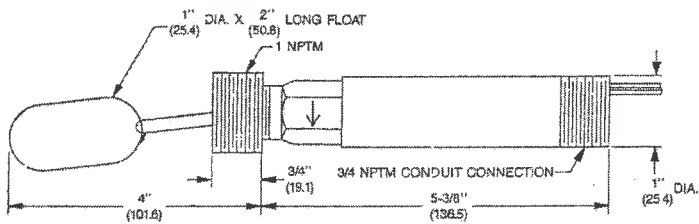
FLOTECH MODEL L-6 FLOAT SWITCH — DIMENSION DRAWINGS



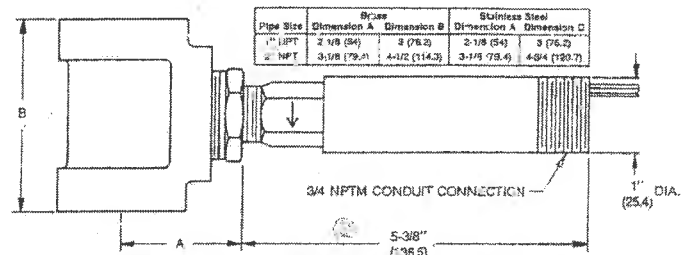
Polypropylene Float



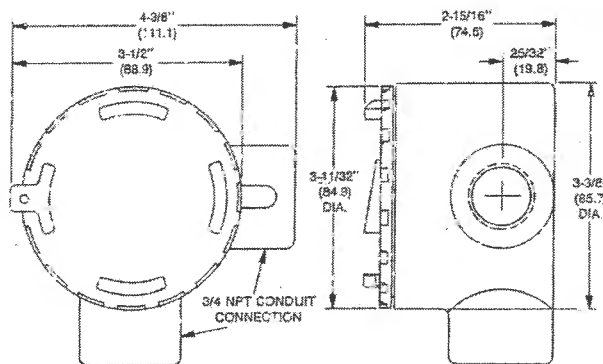
Round Stainless Steel Float



Cylindrical Stainless Steel Float



With External Float Chamber (Tee)



CSA, CENELEC Conduit Enclosure

Limited Warranty: The Seller warrants all Dwyer instruments and equipment to be free from defects in workmanship or material under normal use and service for a period of one year from date of shipment. Liability under this warranty is limited to repair or replacement F.O.B. factory of any parts which prove to be defective within that time or repayment of the purchase price at the Seller's option provided the instruments have been returned, transportation prepaid, within one year from the date of purchase. All technical advice, recommendations and services are based on technical data and information which the Seller believes to be reliable and are intended for use by persons having skill and knowledge of the business, at their own discretion. In no case is Seller liable beyond replacement of equipment F.O.B. factory or the full purchase price. This warranty does not apply if the maximum ratings label is removed or if the instrument or equipment is abused, altered, used at ratings above the maximum specified, or otherwise misused in any way.

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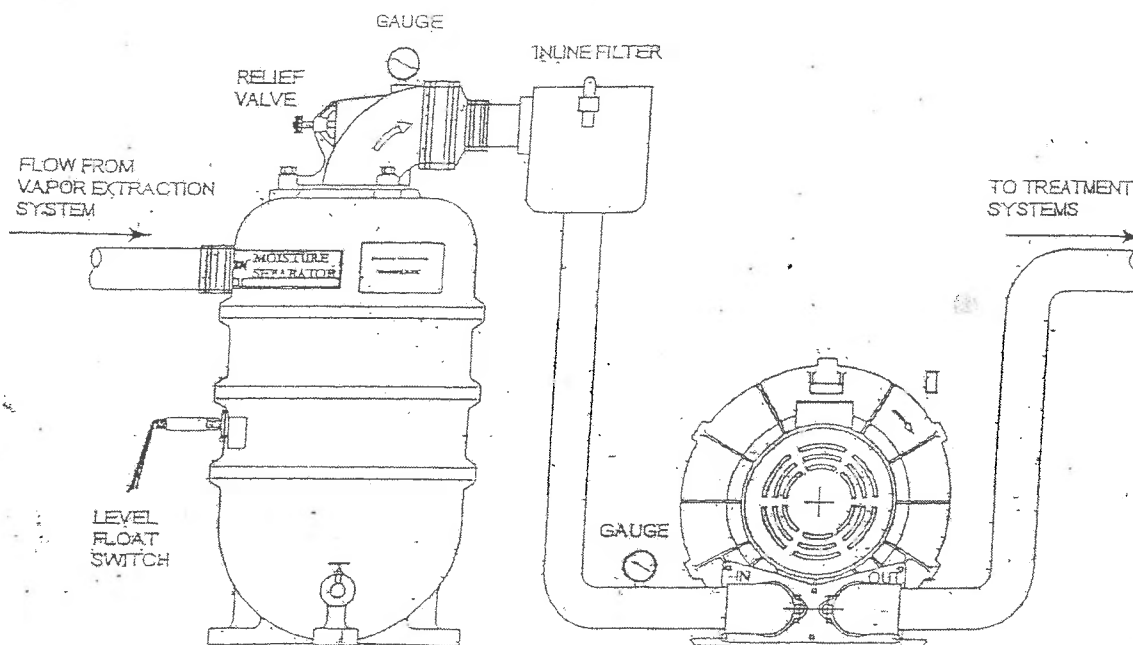


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Note: A moisture separator is not a substitute for an inline air filter. A Rotron inline filter should be used to remove particles that pass through the separator.

Typical Vapor Extraction System



Operation

Moisture-laden air enters the separator through the tangential inlet. Cyclonic action removes free moisture from the air stream and allows the air to discharge through the top of the separator. When the separator is full, the float valve shuts off the air flow through the separator, and the relief valve opens to limit the vacuum of the blower.

To drain the separator, turn off the blower and open the drain valve at the bottom of the separator. Caution: The liquid contained in the separator should be analyzed before it is released back into the environment. It may be considered hazardous waste in certain geographical areas and require special treatment/disposal. Once the liquid is drained, the unit can be reset by turning the blower back on.

Automatic draining options are at the discretion of the customer.

Maintenance

This MS series moisture separator has been designed to require minimal maintenance. During normal operation a layer of sludge may build up on the bottom of the separator. As necessary, the top assembly of the moisture separator should be removed and the inside cleaned out with water. Keeping the inside clean will prevent the valve from becoming clogged with sediment. The relief valve should be inspected upon emptying the separator and readjusted (per installation instruction 5) upon restart.

If you have any questions regarding this product, contact your local sales representative or our Application Engineering Department at the factory.

Section 3

Accessories

Filtration - Inlet Filter (Single Connection)

ROTRON®

Inlet Filters protect the blower and the air distribution system from dust, and other airborne particles and contaminants. Normally used in pressure systems.

SPECIFICATIONS:

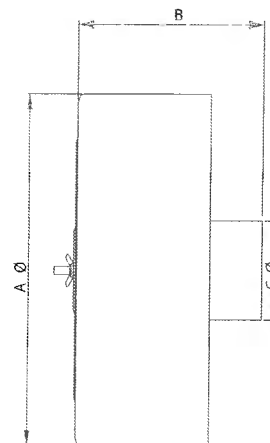
HOUSING – Steel

MEDIA – Polyester

EFFICIENCY – 97-98% (8 to 10 micron particle size)

FILTER ELEMENT – Replaceable (see Filter elements)

NOTE: "Z" MEDIA (1 to 3 micron particle size) available



		Part/Model Number								
Specification	Units	477411	516466	515122	515123	515124	515125	515145	515151	516511
Filter Element	-	A	B	C, D	E	E	F	G	H	H
Ref Blower Model	-	271078	515132	515132	515133	515134	515134	515134	515135	516515
Outlet Connection	-	2.00 SO	1.00 NPT	1.50 NPT	2.00 NPT	2.00 NPT	2.50 NPT	3.00 NPT	4.00 NPT	6.00 NPT
Dimension A	Inches	4.56	6.00	6.00	7.75	10.00	10.00	10.00	10.00	16.00
	mm	115.8	152.4	152.4	196.9	254	254	254	254	406.4
Dimension B	Inches	6.12	6.50	6.50	7.25	12.25	12.50	13.00	14.00	15.00
	mm	155.4	165.1	165.1	184.2	311.2	317.5	330.2	355.6	381
Dimension C	Inches	2.00	1.00	1.5	2.00	2.00	2.50	3.00	4.00	6.00
	mm	50.8	25.4	38.1	50.8	50.8	63.5	76.2	101.6	152.4
Z Media Filter PN	-		517865	517866	517867	517868	517869	517870	517871	517872

Blower Model Reference Key

A = SPIRAL	E = DR/EN/CP 656, 6, 633, S7
B = DR/EN/CP 068, 083, 101, 202	F = DR/EN/CP 757, 808, 858, S9, P9 (Inlet Only)
C = DR/EN/CP 303, 312, 313, 353	G = DR/EN/CP 833, S13, P13 (Inlet Only)
D = DR/EN/CP 404, 454, 513, 505, 555, 523	H = DR/EN/CP 909, 979, 1233, 14, S15, P15 (Inlet Only)

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AMETEK TECHNICAL & INDUSTRIAL PRODUCTS

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 Customer Service Fax: +1 215.256.1338
www.ametektip.com

Accessories

Filtration - Inline Filter (Dual Connection)

ROTRON®

Inline Filters protect the blower from harmful dust and other particles that may be drawn into the blower through the air distribution system. Normally used in vacuum systems.

SPECIFICATIONS:

HOUSING – Steel

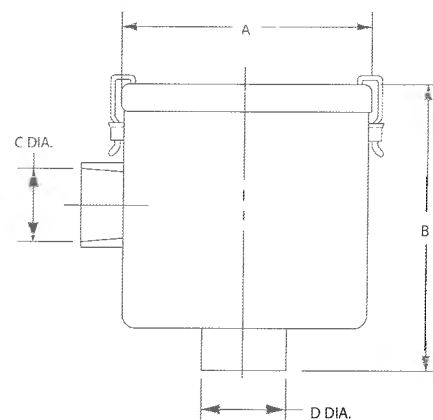
MEDIA – Polyester

EFFICIENCY – 97-98% (8 to 10 micron particle size)

FILTER ELEMENT – Replaceable (see filter elements)

NOTE: "Z" MEDIA (1 to 3 micron particle size) available

Inline filter PN 271200 is a straight through design
inlet is directly opposite of outlet



* Feature 1/4" threaded tap for gauge connection on inlet and outlet

		Part/Model Number							
Specification	Units	271200	516461	515254	515255	515256	516463*	516465*	517611*
Filter Element	-	271078	516434	516434	516435	516435	515135	515135	516515
Ref Blower Model	-	A	B	C, D	E	F	G	H	H
Inlet Connection	-	1.75 SO	1.00 NPSC-F	1.50 NPSC-F	2.00 NPSC-F	2.50 NPSC-F	3.00 NPT-M	4.00 NPT-M	6.00 NPT-M
Outlet Connection	-	2.00 SO	1.00 NPSC-F	1.50 NPSC-F	2.00 NPSC-F	2.50 NPSC-F	3.00 NPT-M	4.00 NPT-M	6.00 NPT-M
Dimension A	Inches	5.25	7.25	7.00	8.00	8.00	14.00	14.00	18.00
	mm	133.4	184.2	177.8	203.2	203.2	355.6	355.6	457.2
Dimension B	Inches	8.31	6.50	6.50	10.25	10.25	26.50	27.00	28.00
	mm	211.1	165.1	165.1	260.4	260.4	673.1	685.8	711.2
Dimension C	Inches	2.00	1.00	1.50	2.00	2.50	3.00	4.00	6.00
	mm	50.8	25.4	38.1	50.8	63.5	76.2	101.6	152.4
Dimension D	Inches	1.75	1.00	1.50	2.00	2.50	3.00	4.00	6.00
	mm	44.5	25.4	38.1	50.8	63.5	76.2	101.6	152.4
Z Media Filter PN	-		517886	517887	517888	517889	517890	517891	517892

Blower Model Reference Key

A = SPIRAL	E = DR/EN/CP 656, 6, 633, S7
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Accessories

Filtration - Filter Silencers (Single Connection)

ROTRON®

Filter/ Silencers reduce noise levels while ensuring clean air is provided to the blower and the air distribution system. Normally used in pressure applications.

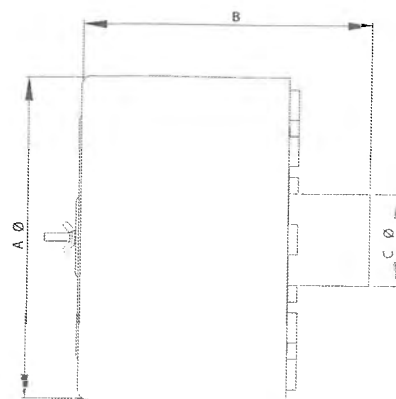
SPECIFICATIONS:

HOUSING – Steel

MEDIA – Polyester

EFFICIENCY – 97-98% (8 to 10 micron particle size)

FILTER ELEMENT – Replaceable (see Filter elements)



		Part/Model Number							
Specification	Units	516487	516489	516491	516493	516495	516497	516499	516513
Filter Element	-	B	C, D	E	E	F	G	H	H
Ref Blower Model	-	515132	515132	515133	515134	515134	515134	515135	516515
Outlet Connection	-	1.00 NPT	1.50 NPT	2.00 NPT	2.00 NPT	2.50 NPT	3.00 NPT	4.00 NPT	6.00 NPT
Dimension A	Inches	6.00	6.00	10.00	10.00	10.00	10.00	16.00	16.00
	mm	152.4	152.4	254	254	254	254	406.4	406.4
Dimension B	Inches	6.50	6.50	7.25	12.25	12.50	12.50	14.00	15.00
	mm	165.1	165.1	184.2	311.2	317.5	317.5	355.6	381
Z Media Filter PN	-	1.00	1.50	2.00	2.00	2.50	3.00	4.00	6.00
Dimension C	Inches	517878	517879	517880	517881	517882	517883	517884	517885
	mm	13154101.2	13154126.6	13154152	13154177.4	13154202.8	13154228.2	13154253.6	13154279

Blower Model Reference Key

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C = DR/EN/CP 303, 312, 313, 353	G = DR/EN/CP 833, S13, P13 (Inlet Only)
D = DR/EN/CP 404, 454, 513, 505, 555, 523	H = DR/EN/CP 909, 979, 1233, 14, S15, P15 (Inlet Only)

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AMETEK TECHNICAL & INDUSTRIAL PRODUCTS

75 North Street, Saugerties, NY 12477

USA: +1 215-256-6601 - Europe: +44 (0) 845 366 9664 - Asia: +86 21 5763 1258

Customer Service Fax: +1 215.256.1338

www.ametektip.com

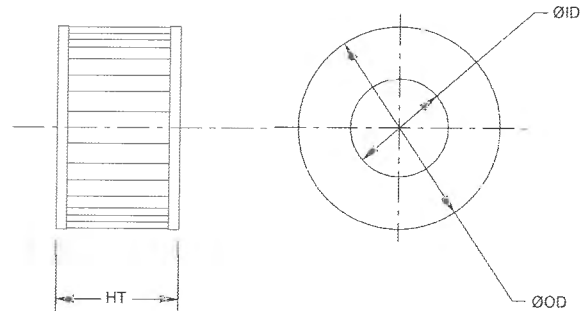
Accessories

Filtration - Filter Element

ROTRON®

All ROTRON Air Filters and Filter/ Silencers have replaceable filter elements. The filter media is polyester designed for high efficiency over a wide spectrum of industrial applications. See filter element cross reference table. Filter elements supplied with foam pre-filter.

Standard Replacement Filter Element Cross Reference Table					
Filter	Element	Filter	Element	Filter	Element
271200	271078	515158	515134	516489	515132
477411	271078	515254	516434	516491	515133
515122	515132	515255	516435	516493	515134
515123	515133	515256	516435	516495	515134
515124	515134	516461	516434	516497	515134
515125	515134	516463	515135	516499	515135
515145	515134	516465	515135	516511	516515
515151	515135	516466	515132	516513	516515
515157	515133	516487	515132	517611	516515



For DR Blower Models

Specification	Units	Part/Model Number						
		515132	515133	515134	515135	516434	516435	516515
Z Media Filter PN	-	517873	517874	517875	517876	517893	517894	517877
Dimension ID	Inches	3.00	3.63	3.5	4.75	2.56	3.50	8.00
	mm	76.2	92.2	88.9	120.7	65	88.9	203.2
Dimension OD	Inches	4.38	5.88	5.88	7.88	5.00	5.88	11.75
	mm	111.3	149.4	149.4	200.2	127	149.4	298.5
Area	Sq/Ft	4.75	4.75	9.50	9.63	4.75	8.75	9.63
	Sq/M	0	0	1	1	0	1	1
Dimension HT	Inches	1.5	2.3	4.5	8.3	2.0	4.5	19.0
	mm	38.1	58.4	114.3	210.8	50.8	114.3	482.6

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G 4

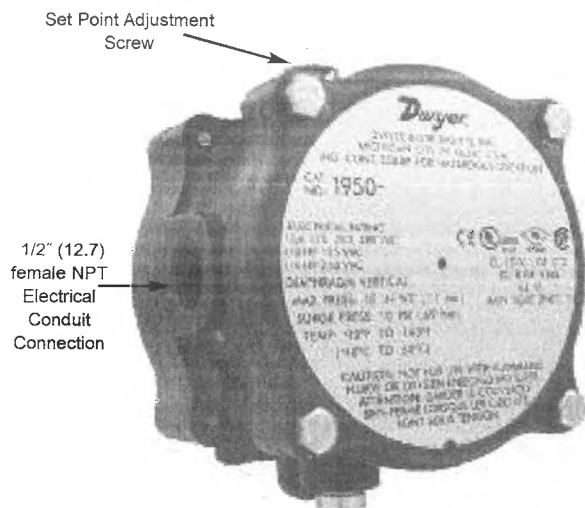
AMETEK®
TECHNICAL & INDUSTRIAL PRODUCTS

Section 4



Series 1950 Explosion-Proof Differential Pressure Switches

Specifications - Installation and Operating Instructions



Series 1950 Explosion-Proof Differential Pressure Switches combine the best features of the Series 1900 Pressure Switch with an integral explosion-proof and weather-proof housing. Each unit is UL & CSA listed; FM approved for use in Class I, Groups C & D; Class II, Groups E, F, & G; and Class III atmospheres (NEMA 7 & 9). They are totally rain-tight for outdoor installations. Twelve models allow set-points from .03 to 20 inches w.c. and from .5 to 50 psi (3.4 to 345 kPa).

Easy access to the SPDT switch for electrical hook-up is provided by removing the top plate of the three-part aluminum housing. Adjustment to the set point of the switch can be made without disassembling the housing. The unit is very compact, about half the weight and bulk of equivalent conventional explosion-proof switches.

CAUTION

For use only with air or compatible gases. Use of the Model 1950 switch with explosive media connected to the Low pressure port (including differential pressure applications in such media) is not recommended. Switch contact arcing can cause an explosion inside the switch housing which, while contained, may render the switch inoperative. If switch is being used to sense a single positive pressure relative to atmosphere, run a line from the low pressure port to a non-hazardous area free of combustible gases. This may increase response time on -0 and -00 models.

Note: The last number-letter combination in the model number identifies the switch's electrical rating (number) and diaphragm material (letter). The 2F combination is standard as described in the physical data above. In case of special models, a number 1 rating is the same as 2; a number 3 or 4 rating is 10A 125, 250, 480 VAC; 1/8 H.P. 125 VAC; 1/4 H.P. 250 VAC; a number 5 or 6 rating is 1A 125 VAC. Letter B indicates a Buna-N diaphragm; N = Neoprene; S = Silicone; and V = Viton®.

UL and CSA Listed, FM Approved For
CL. I GR. C, D - CL. II GR. E, F, G - CL. III

Series 1950 Switches

Operating ranges and deadbands

To order specify Model Number	Operating Range: Inches, W.C.	Approximate Dead Band	
		At Min. Set Point	At Max. Set Point
1950-02-2S	0.03 to 0.10	0.025	0.05
1950-00-2F	0.07 to 0.15	0.04	0.05
1950-0-2F	0.15 to 0.5	0.10	0.15
1950-1-2F	0.4 to 1.6	0.15	0.20
1950-5-2F	1.4 to 5.5	0.3	0.4
1950-10-2F	3.0 to 11.0	0.4	0.5
1950-20-2F	4.0 to 20.0	0.4	0.6

Model Number	Operating Range: PSI	Approximate Dead Band	
		Min. Set Point	Max. Set Point
1950P-2-2F	0.5 to 2.0	0.3 psi	0.3 psi
1950P-8-2F	1.5 to 8.0	1.0 psi	1.0 psi
1950P-15-2F	3.0 to 15.0	0.9 psi	0.9 psi
1950P-25-2F	4.0 to 25.0	0.7 psi	0.7 psi
1950P-50-2F	15.0 to 50	1.0 psi	1.5 psi

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.

Wetted Materials: Consult factory.

Temperature Limits: -40 to 140°F (-40 to 60°C); 0 to 140°F (-17.8 to 60°C) for 1950P-8, 15, 25, and 50. -30 to 130°F (-34.4 to 54.4°C) for 1950-02.

Pressure Limits:

Continuous: 1950's - 45" w.c. (0.11 bar);

1950P's - 35 psi (2.41 bar); 1950P-50 only - 70 psi (4.83 bar).

Surge: 1950's - 10 psi (0.69 bar), 1950P's - 50 psi (3.45 bar), 1950P-50 only - 90 psi (6.21 bar).

Enclosure Rating: IP54, NEMA 3, 7 and 9.

Switch Type: Single-pole double-throw (SPDT).

Electrical Rating: 15 A @, 125, 250, 480 VAC, 60 Hz. Resistive 1/8 HP @ 125 VAC, 1/4 HP @ 250 VAC, 60 Hz.

Electrical Connections: 3 screw type, common, normally open and normally closed.

Process Connections: 1/8" female NPT.

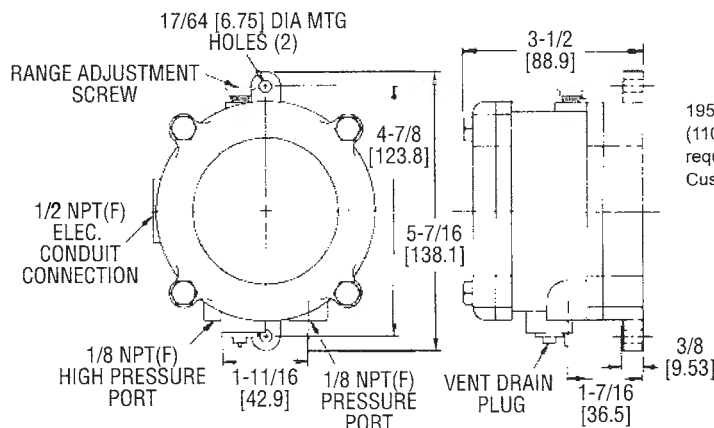
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.

Set Point Adjustment: Screw type on top of housing.

Weight: 3.25 lb (1.5 kg); 1950-02 model, 4.4 lb (2 kg).

Agency Approvals: CE, UL, CSA, FM.

RESPONSE TIME: Because of restrictive effect of flame arrestors, switch response time may be as much as 10-25 seconds where applied pressures are near set point.



1950-02: 7-3/4" (196.9) dia. x 4-11/32" (110.3) depth. For complete dimensions request drawing 28-700175-00 from our Customer Service Department

1950 Switch Outline Dimensions

INSTALLATION

1. Select a location free from excess vibration and corrosive atmospheres where temperatures will be within the limits noted under Specifications on reverse. Switch may be installed outdoors or in areas where the hazard of explosion exists. See reverse for specific types of hazardous service.

2. Mount standard switches with the diaphragm in a vertical plane and with switch lettering and nameplate in an upright position. Some switches are position sensitive and may not reset properly unless they are mounted with the diaphragm vertical.

3. Connect switch to source of pressure, vacuum or differential pressure. Metal tubing with 1/4" O.D. is recommended, but any tubing which will not restrict the air flow can be used. Connect to the two 1/8" female NPT pressure ports as noted below:

A. Differential pressures - connect pipes or tubes from source of greater pressure to high pressure port marked HIGH PRESS, and from source of lower pressure to low pressure port marked LOW PRESS.

B. Pressure only (above atmospheric pressure) - connect tube from source of pressure to high pressure port. The low pressure port is left open to atmosphere.

C. Vacuum only (below atmospheric pressure) - connect tube from source of vacuum to low pressure port. The high pressure port is left open to atmosphere.

4. To make electrical connections, remove the three hex head screws from the cover and after loosening the fourth captive screw, swing the cover aside. Electrical connections to the standard single pole, double throw snap switch are provided by means of terminals marked "COM" (common), "NO" (norm open), "NC" (norm closed). The normally open contacts close and the normally closed contacts open when pressure increases beyond the set point. Switch loads for standard models should not exceed the maximum specified current rating of 15 amps resistive. Switch capabilities decrease with an increase in ambient temperature, load inductance, or cycling rate. Whenever an application involves one or more of these factors, the user may find it desirable to limit the switched current to 10 amps or less in the interest of prolonging switch life.

ADJUSTMENT: To Change the Set point

1. Remove the plastic cap and turn the slotted Adjust-ment Screw at the top of the housing clockwise to raise the set point pressure and counter-clockwise to lower the set point. After calibration, replace the plastic cap and re-check the set point.

2. The recommended procedure for calibrating or checking calibration is to use a "T" assembly with three rubber tubing leads, all as short as possible and the entire assembly offering minimum flow restriction. Run one lead to the pressure switch, another to a manometer of known accuracy and appropriate range, and apply pressure through the third tube. Make final approach to the set point very slowly. Note that manometer and pressure switch will have different response times due to different internal volumes, lengths of tubing, fluid drainage, etc. Be certain the switch is checked in the position it will assume in use, i.e. with diaphragm in a vertical plane and switch lettering and Dwyer nameplate in an upright position.

3. For highly critical applications check the set point adjustment and if necessary, reset it as noted in step A.

MAINTENANCE

The moving parts of these switches need no maintenance or lubrication. The only adjustment is that of the set point. Care should be taken to keep the switch reasonably clean. Periodically the vent drain plug should be rotated, then returned to its original position. This will dislodge deposits which could accumulate in applications where there is excessive condensation within the switch. The Series 1950 Explosion-Proof Differential Pressure Switch is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.

Series
1950

Explosion-proof Differential Pressure Switches

Compact, Low Cost, Explosion-proof and Weatherproof



SPECIFICATIONS

Service: Air and non-combustible, compatible gases.

Wetted Materials: Consult factory.

Temperature Limits: -40 to 140°F (-40 to 60°C); 0 to 140°F (-17.8 to 60°C) for 1950P-8, 15, 25, and 50; -30 to 130°F (-34.4 to 54.4°C) for 1950-02.

Pressure Limits:

Continuous: 1950's - 45" w.c. (0.11 bar); 1950P's - 35 psi (2.41 bar); 1950P-50 only - 70 psi (4.83 bar).

Surge: 1950's - 10 psi (0.69 bar); 1950P's - 50 psi (3.45 bar); 1950P-50 only - 90 psi (6.21 bar).

Enclosure Rating: NEMA 3 (IP54), NEMA 7 & 9.

Switch Type: Single-pole double-throw (SPDT).

Electrical Rating: 15 A @ 125, 250, 480 VAC, 60 Hz. Resistive 1/8 HP @ 125 VAC, 1/4 HP @ 250 VAC, 60 Hz.

Electrical Connections: 3 screw type, common, normally open and normally closed.

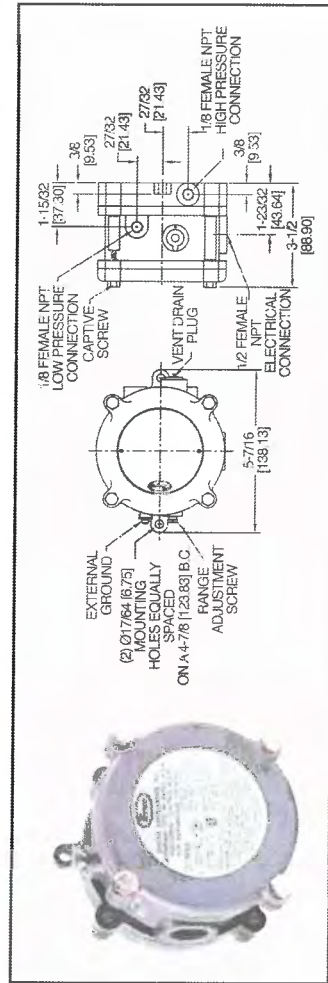
Process Connections: 1/8" female NPT.

Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.

Set Point Adjustment: Screw type on top of housing.

Weight: 3.25 lb (1.5 kg); 1950-02 model, 4.4 lb (2 kg).

Agency Approvals: CE, UL, CSA, FM.



Model 1950 Explosion-Proof Differential Pressure Switch combines the best features of the popular Dwyer® Series 1900 Pressure Switch with an integral explosion-proof and weatherproof housing, making it an exceptional value for either application. It is CE, UL and CSA listed, FM approved for use in Class I, Div 1, Groups C and D, Class II Groups E, F, and G and Class III hazardous atmospheres (NEMA 7 & 9), Raintight NEMA 3 (IP54). Weatherproof features include a drain plug and O-ring seal in cover. Electrical connections are easily made by removing front cover. For convenience the set point adjustment screw is located on the outside of the housing. Twelve models offer set points from .03 to 20" w.c. (7.5 to 5 kPa) and from .5 to 50 psi (0.035 to 3.5 bar). The unit is very light and compact — about half the weight and bulk of other explosion-proof or weather-proof switches with separate enclosures.

SERIES 1950 SWITCHES - OPERATING RANGES AND DEAD BANDS

Model Number	Range, Inches W.C.	Approximate Dead Band at	
		Min. Set Point	Max. Set Point
1950-02-2S	0.3 to 1.0	0.25	0.5
1950-00-2F	0.7 to 1.5	.04	.05
1950-0-2F	.15 to .50	.10	.15
1950-1-2F	.4 to 1.6	.15	.20
1950-5-2F	1.4 to 5.5	.30	.40
1950-10-2F	3 to 11	.40	.50
1950-20-2F	4 to 20	.40	.60

Model* Number	Range, PSID	Approximate Dead Band at	
		Min. Set Point	Max. Set Point
1950P-2-2F	0.5 to 2	.3	.3
1950P-8-2F	1.5 to 8	1.0	1.0
1950P-15-2F	3 to 15	.9	.9
1950P-25-2F	4 to 25	.7	.7
1950P-50-2F	15 to 50	1.0	1.5

CAUTION: For use only with air or compatible gases. Applications with hazardous atmospheres and a single positive pressure may require special venting.

*P=PSID range models

Instructions for Installation and Maintenance

For all 2 in. (51 mm) and 2-1/2 in. (64 mm) Dial Temperature Murphygage® and Swichgage® Instruments

00-02-0168
Revised 01-07
Section 10



Please read the following information before installing. A visual inspection of this product for damage during shipping is recommended before mounting. General information and these installation instructions are intended for all 20T, 25T, A20T, and A25T series models.

GENERAL INFORMATION

WARNING

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT

- ✓ Disconnect all electrical power to the machine.
- ✓ Make sure the machine cannot operate during installation.
- ✓ Follow all safety warnings of the machine manufacturer.
- ✓ Read and follow all installation instructions.



Description

Murphy 2 in. (51 mm) and 2-1/2 in. (64 mm) Murphygage and Swichgage instruments have a remote sensing bulb connected to the gauge head by a sealed capillary system. **DO NOT CUT THIS CAPILLARY OR BEND AT A SHARP ANGLE.** The sensing bulb and capillary are filled with a liquid. When heat is applied to the sensing bulb the liquid turns to vapor which exerts pressure against the diaphragm movement of the gauge. This movement is read on the dial face as temperature.

Models having face adjustable contact(s) are rated for 2 A @ 30 V (pilot duty). If the case is steel (models 20T, 20SD, 25T, etc.), the ground path for the contact circuit is through the case. Therefore, the case must be installed in the ground plane of the electrical power supply.

If the case is polycarbonate (models A20T, A25T), the ground path is isolated and is made through the "C" or "P" terminal on the back of the case.

Models 20TE, A20TE, 25TE and A25TE have a snap-acting switch instead of the face adjusted pointer type contact. Electrical rating is 3 A @ 30 VDC, 4 A @ 125 VAC. Reset differential for the switch is approximately 10% of the scale below the trip point. Trip point is factory set and must be special ordered for field adjustable.

Swichgage models with Alarm Before Shut-down

The 20TABS, A20TABS, 25TABS and A25TABS feature a front limit contact for high temperature equipment shut-down and an internal SPDT snap switch for Alarm Before Shut-Down (see Wiring Diagram, page 3). When the high side (preset high temperature point) of the snap switch trips, the N.O. terminal completes a circuit to activate an alarm. A continued increase in temperature will complete the shutdown circuit. A decrease in temperature of approximately 10% of scale is necessary before the snap-switch (alarm) will RESET and open the circuit.

NOTE: The front contact shut-down limit setting (adjustable) and snap switch high point are preset at the factory; if settings other than standard are necessary, then specify when ordering.

Typical Tattletale® Magnetic Switch

Murphy manufactures several, patented Magnetic Switches for protection of the light duty Swichgage contacts and to ensure positive shut-down of equipment. There are Magnetic Switches for Capacitor Discharge ignition, Magneto, or Battery systems, and models for electric motor driven equipment. Tattletale annunciators are indicators that show the cause of shut-down. Tattletale annunciators are used in conjunction with several different Swichgage instruments. Selected Tattletale models can be wired so that the first one to trip will lockout all other Tattletale instruments. Be sure the type of Magnetic Switch matches the power source used to trip it.

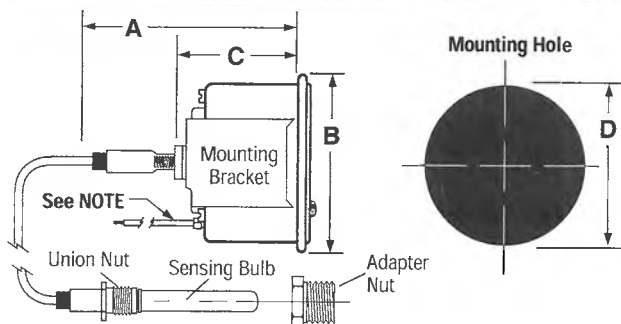
NOTE: At equipment start-up, the Magnetic Switch reset button must be held in until normal operation occurs, or an external time delay may be used. See examples of typical wiring and instructions packed with each Magnetic Switch.



CAUTION: Certain dangers to human safety and to equipment may occur if some equipment is stopped without pre-warning. It is recommended that monitored functions be limited to alarm-only or to alarm before shutdown.

IMPORTANT: Swichgage instruments, Magnetic Switches and shutdown or alarm devices, properly used, are effective tools in any preventive maintenance program. For optimum performance, check these tools periodically: look for frozen pointers, kinked/worn tubing, broken wiring or loose connections; operate the contacts and watch for expected results. Replace damaged/worn parts; clean/repair as necessary. Check for correct/complete wiring, unbroken insulation and no accidental grounds. **DO NOT run shut-down wires with ignition wiring.** Check all tubing and connections for leaks. Mount Magnetic Switches and valves upright, to prevent moisture collection.

MOUNTING DIMENSIONS



NOTE: 20 and 25 Series have 18 AWG pigtails. A20 series has #4 screws. A25 series has #6 screws.

For All 20, 25, A20, and A25 Series Temperature Murphygage and Swichgage Instruments

	20 Series	A20 Series	25 Series	A25 Series
A	2-7/32 (56)	2-9/64 (54)	2-1/8 (54)	1-51/64 (46)
B	2-15/64 (57)	2-1/4 (57)	3-1/8 (79)	2-29/32 (74)
C	1-5/16 (33)	1-27/64 (36)	1-3/8 (35)	1-27/64 (36)
D	2-1/16 (53)	2-1/16 (53)	2-11/16 (68)	2-11/16 (68)

NOTE: The dimensions above are in inches and (millimeters).

* Products covered by this literature comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility except as noted.

INSTALLATION



WARNING: DISCONNECT THE BATTERY OR POWER SOURCE BEFORE BEGINNING THE INSTALLATION. DO NOT OPEN RADIATOR CAP OR FITTINGS ON A HOT ENGINE. DANGEROUS BURNS CAN OCCUR.

Panel Mounting

The 20, 25, A20 and A25 series models can be installed in a panel from 0.032 in. (1 mm) to 0.250 in. (6 mm) thick. See Mounting Dimensions, page 1. Remove the mounting bracket completely and insert the Murphygage/Swichgage instrument from the front side of the panel. Replace the bracket and secure it in place. **IMPORTANT: Do NOT overtighten the mounting bracket. Shockmount the panel as necessary.**

LIQUID COOLED ENGINES:

1. Drain engine coolant to a level below the temperature sensing connection/plug. This connection is on the engine side of the thermostat generally near thermostat housing. *Consult your engine manual.*
2. Remove adapter nut from temperature sensing bulb and union nut.
3. Apply a non-hardening thread sealant to the adapter nut and screw securely into the water jacket opening in the engine.
4. Route the temperature capillary **AWAY** from hot surfaces such as exhaust manifolds.
5. Place the sensing bulb into the adapter nut and observe that the sensing bulb does not "bottom" in the water jacket nor are there other obstructions in the water jacket opening. Secure sensing bulb into the adapter nut with the 5/8-18 union nut. *See Figure 2.*



CAUTION: Do **NOT** cut or bend the temperature capillary at a sharp angle. The minimum bending radius should not be less than 1 inch at any point on the capillary. Excess capillary must be carefully coiled and secured. The temperature sensing bulb must be immersed directly into the water jacket flow to sense coolant temperature. Do **NOT** install into a tee or other fitting. Use only Murphy adapter nuts.

6. Coil excess temperature capillary into a 2 in. (51 mm) diameter minimum coil. Tie the coil to prevent excessive movement.
7. Allow the engine to warm up and the thermostat to open. Slightly loosen the 5/8-18 union nut on the temperature sensing bulb to allow trapped air to escape from the cooling system. Retighten the nut.



WARNING: Perform this operation using appropriate protection. Trapped air and coolant may cause burns.

AIR COOLED ENGINES:

Temperature for air cooled engine can be measured in the cylinder head or in the lubricating oil. Oil temperature will give a more uniform reading than cylinder head since the oil circulates throughout the engine. Refer to specific instructions supplied, if any, for your specific application.

1. **Oil Temperature**
 - a. The SWICHGAGE® sensing probe must be fully immersed in the oil pan, oil filter housing, oil cooler, etc. depending on engine model and configuration.
 - b. Observe all precautions for liquid cooled engines.
2. **Cylinder Head Temperature**
 - a. Generally the cylinder head must already have a hole drilled and tapped for insertion of the temperature sensing probe.
 - b. If a hole is not provided in the cylinder head and no provision is made to drill and tap one, it may be possible to install an external bolt on heat sink such as the Murphy HS7.
 - c. Coat the temperature sensing probe with a high temperature grease. A mixture of silicone and graphite flakes is recommended although grease alone can be used.



CAUTION: Do **NOT** apply too much grease. If grease is pushed out of the hole when temperature probe is inserted, remove some grease.

- d. Observe all precautions for liquid cooled engines.

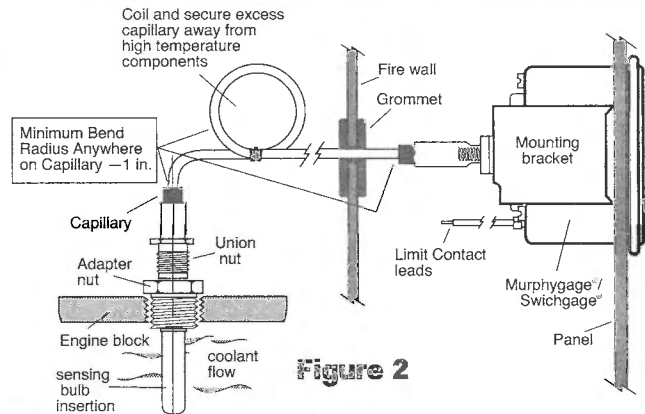


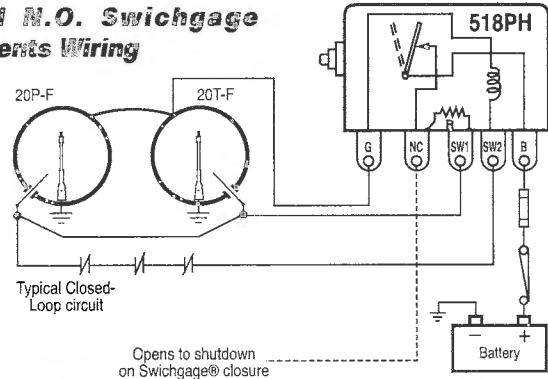
Figure 2

Connecting the Tattletale Annunciator/Magnetic Switch

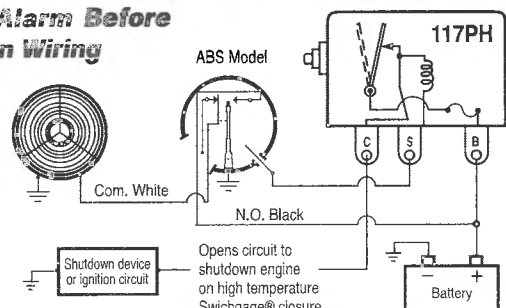
1. Mount with electrical lugs down. If necessary, drill the case and pilot-stud holes (template provided).
2. Clean away burrs and filings. Position the Magnetic Switch in the panel, making sure the pilot stud is in place.
3. Add decal, then washer, then nut and tighten.

NOTE: Murphy components are easily wired and maintained. Use good quality wire and terminals. The type of Magnetic Switch differs for various applications. See examples of typical wiring (below). Wiring and instructions are packed with each Magnetic Switch.

Typical N.O. Swichgage Instruments Wiring



Typical Alarm Before Shutdown Wiring



IMPORTANT INFORMATION: Do **NOT** clean Murphygage, Swichgage and Magnetic Switch with steam or high pressure washes. Many solvents and cleaners can haze and permanently damage the clear, polycarbonate. Clean your devices with: mild soap and water, mineral spirits, methyl/isopropyl/isobutyl alcohols, or 1 & 3 denatured alcohols.

WARNING: Do not clean the Murphygage, Swichgage or Magnetic Switch when equipment is running or very hot.

INSTALLATION Continued

Setting the Switchgauge contacts



IMPORTANT: For 20TE, 25TE, A20TE and A25TE models the switch trip point CANNOT be set at either the lowest or the highest extremes of the scale. Trip point MUST allow for the switch reset differential. For adjustable switch versions, the switch point is adjustable ONLY over the upper half of the scale.

1. All contacts are set using a 1/16 in. hex wrench (Figure 3).
2. Some models such as A20TE, A25TE, etc. may not have field adjustment. Consult the factory if in doubt.
3. Observe the "normal operating" temperature readings. Set the contact slightly above maximum reading observed or slightly below maximum temperature recommended by equipment manufacturer.

Testing the Contacts

1. With equipment running; use a 1/16 in. hex wrench to rotate contact until it touches the pointer. **Do NOT force contact against the gage pointer.** Equipment should shut down and/or alarm should operate.

Reset the contact (Figure 3).

2. **VERY IMPORTANT** Each time you start the machine, observe that the Switchgauge instrument is indicating temperature. Visual inspection and regular testing should be normal procedure to ensure proper operation and to achieve maximum results from your Switchgauge instrument.

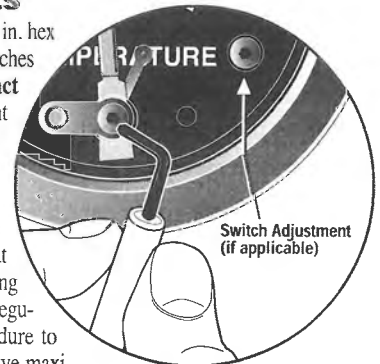


Figure 3

TYPICAL WIRING DIAGRAMS



WARNING: DISCONNECT ALL ELECTRICAL POWER BEFORE BEGINNING THE WIRING INSTALLATION

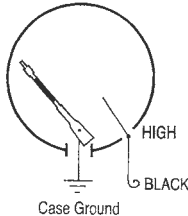
20 and 25 Series models

These diagrams are shown with the pointer in the at rest (shelf) position.

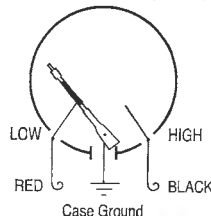
Pointer contact rating: pilot duty 2 A @ 30 VAC/DC.

Snap-switch rating: 3 A @ 30 VDC, 4 A @ 125 VAC.

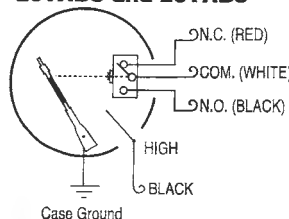
20T and 25T



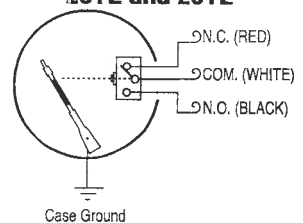
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20TABS and 25TABS



20TE and 25TE



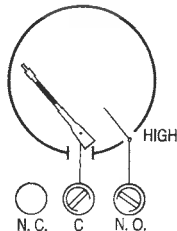
A20 Series models

These diagrams are shown with the pointer in the at rest (shelf) position.

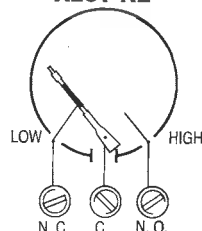
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Snap-switch rating: 3 A @ 30 VDC, 4 A @ 125 VAC.

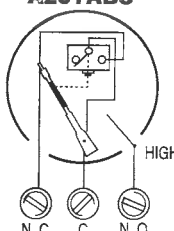
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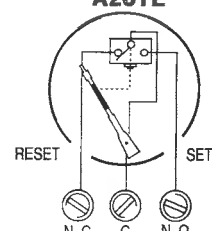
A20T-HL



A20TABS*



A20TE



* **CAUTION** Pointer contact and ABS switch share the same "Common." Voltage source **MUST** be the same. Maximum voltage is 30 V. Consult factory for 120 VAC applications.

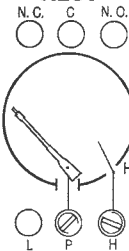
A25 Series models

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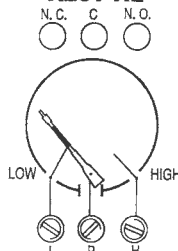
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Snap-switch rating: 3 A @ 30 VDC, 4 A @ 125 VAC.

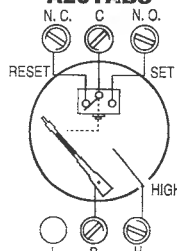
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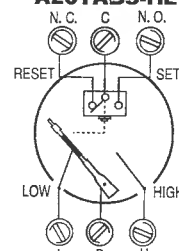
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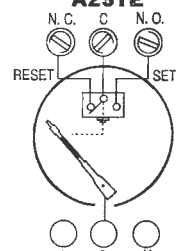
A25TABS



A25TABS-HL



A25TE



TROUBLESHOOTING TIPS

DO THIS FIRST:

- Verify that the Switchgauge instrument has not been damaged (hit or dropped).
- Look for broken wiring, frozen pointer, dirty contacts (will not make).
- Check for kinked or broken/worn capillary tubing.
- Verify that the sensing bulb is immersed in coolant flow.
- Verify that there is coolant or water flowing inside the engine.
- Reset Magnetic Switch and verify that it stays latched.

The following information will assist in the correction of most problems which you may encounter with the unit. If any problems persist after you have made these checks, consult your nearest Murphy facility.

SYMPTOM	CAUSE	TEST/REMEDY
Engine will not start.	<ol style="list-style-type: none"> 1. Short or Open circuit, be sure that the Magnetic Switch latches and either puts out power to run device or removes ground (magneto or CD ignition). Check for power or ground at run device. 2. Control circuit overloaded by accessories (blown fuse in Magnetic Switch). 3. False ground in control circuit. 	<ol style="list-style-type: none"> 1. Reset Magnetic Switch and make sure it stays latched. For 518PH check battery voltage and place a jumper between SW1 and SW2. If switch latches, check Switchgauge wiring circuit and repair. If switch does not latch, repair or replace Magnetic Switch. 2. Find the cause of the blown fuse and replace it (use a 14 A fuse). Reroute the accessories. 3. Repair.
False shutdown.	<ol style="list-style-type: none"> 1. Switchgauge circuit has intermittent open or short. 2. Vibration causes the Magnetic Switch to trip. 	<ol style="list-style-type: none"> 1. Check all wiring and replace as necessary. 2. Repair and relocate the switch as needed.
SWICHGAGE® closes but does not trip the magnetic switch or kill the engine.	<ol style="list-style-type: none"> 1. Incomplete shutdown circuit. 2. Dirty Switchgauge contacts. 3. Magneto not providing power to primary terminal post. 4. Switchgauge case may not be grounded. 5. Incorrect Magnetic Switch for type of power. 	<ol style="list-style-type: none"> 1. Locate open circuit and repair. 2. Clean and check that contacts make. 3. Repair magneto. 4. Ground case. 5. Replace with correct Magnetic Switch.
TATTLETALE® tripped but engine is still running (magneto or CD ignition)	<ol style="list-style-type: none"> 1. Open circuit between the Tattletale annunciator and the shut down device. 2. Lost ground to kill the engine. 	<ol style="list-style-type: none"> 1. Check wiring from Tattletale annunciator to shut down device, repair or replace. 2. Check all wiring and connections and repair.
Pointer will not operate properly. Inaccurate reading.	<ol style="list-style-type: none"> 1. Frozen pointer 2. Loose pointer spring (caused by hitting or dropping gauge). 3. Bulb not inserted to full length or low coolant level. 4. Kinked/crimped/broken capillary. 5. Height difference between gage and bulb not taken in consideration. 6. Over temperature. 	<ol style="list-style-type: none"> 1. Return for repair or replace. 2. Return for repair or replace. 3. Correct. 4. Correct. 5. Specify height difference (over 5 feet) when ordering gage. 6. Return for repair or replace.
Pointer or contact burned-in-two.	<ol style="list-style-type: none"> 1. Without exception this condition is caused by incorrect wiring or a short circuit. 	<ol style="list-style-type: none"> 1. Refer to wiring diagram and recheck wiring; replace Switchgauge instrument or return for repair. Observe voltage and current ratings.

Warranty

A limited warranty on materials and workmanship is given with this FW Murphy product.
A copy of the warranty may be viewed or printed by going to www.fwmurphy.com/support/warranty.htm

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+1 918 317 4100 Fax: +1 918 317 4266
E-mail: sales@fwmurphy.com

INDUSTRIAL PANEL DIVISION
Fax: +1 918 317 4124
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MURPHY POWER IGNITION
Web site: www.murphy-pi.com

www.fwmurphy.com

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Hangzhou, Zhejiang 310018 China
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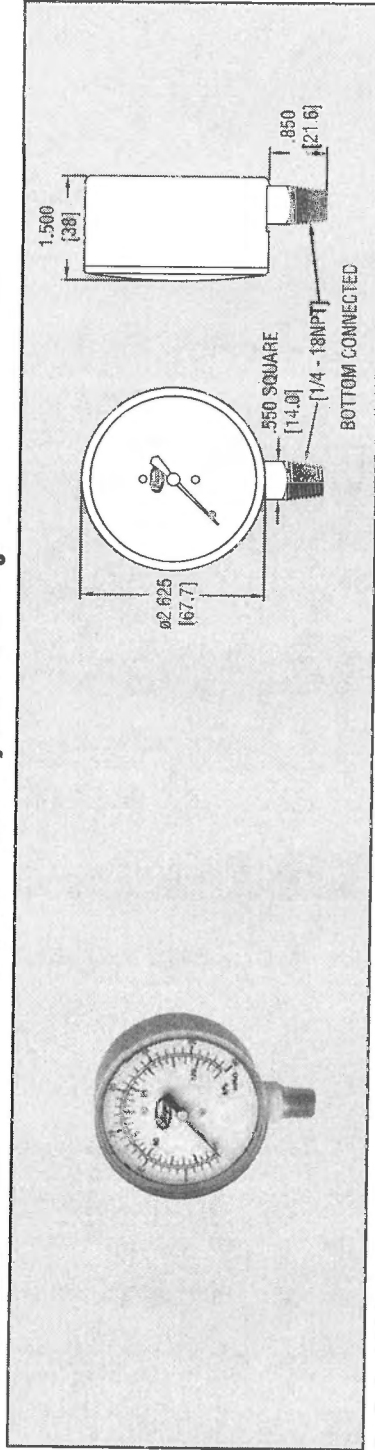
Printed in U.S.A.



Series
LPG4

2.5" Low Pressure Gage

1.5% Full Scale Accuracy in a 2-1/2" Gage



Our Series LPG4 gages offer top of the line performance and accuracy for pressure and vacuum applications up to and including 160 in. w.c. The LPG4 is constructed from a single beryllium-copper diaphragm affixed to a precision-machined brass plate. This innovative design, together with a high-precision, milled-teeth brass movement and nickel-silver pinion and bearing surface, provide the user with a top of the line low pressure instrument.

SPECIFICATIONS

Service: Compatible gases & liquids.
Wetted Materials: Brass and beryllium copper.
Housing: Drawn steel, black finish.
Lens: Polycarbonate (removable).
Accuracy: $\pm 1.5\%$ full scale.
Pressure Limit: 100% of range scale.

Temperature Limits:
 Process: -40 to 160°F (-40 to 70°C);
 Ambient: -40 to 140°F (-40 to 60°C).
Size: 2.5" (63 mm).
Process Connections: 1/4" male NPT.
Enclosure Rating: NEMA 3 (IP55).
Weight: 7.3 oz (0.21 kg).

Model	Range	Model	Range
LPG4-D7122N	-10-0 in. w.c. (-2.5-0 kPa)	LPG4-D8322N	0-40 in. w.c. (0-10 kPa)
LPG4-D7222N	-16-0 in. w.c. (-4-0 kPa)	LPG4-D8422N	0-60 in. w.c. (0-15 kPa)
LPG4-D7322N	-25-0 in. w.c. (-6-0 kPa)	LPG4-D8522N	0-80 in. w.c. (0-20 kPa)
LPG4-D7422N	-40-0 in. w.c. (-10-0 kPa)	LPG4-D8622N	0-100 in. w.c. (0-25 kPa)
LPG4-D7522N	-60-0 in. w.c. (-15-0 kPa)	LPG4-D8722N	0-160 in. w.c. (0-40 kPa)
LPG4-D7622N	-80-0 in. w.c. (-20-0 kPa)	LPG4-D8922N	-4-0-6 in. w.c. (-1-0-1.5 kPa)
LPG4-D7722N	-100-0 in. w.c. (-25-0 kPa)	LPG4-D9022N	-6-0-10 in. w.c. (-1.5-0-2.5 kPa)
LPG4-D7822N	-160-0 in. w.c. (-40-0 kPa)	LPG4-D9122N	-8-0-16 in. w.c. (-2-0-4 kPa)
LPG4-D7922N	-235-0 in. w.c. (-60-0 kPa)	LPG4-D9222N	-16-0-24 in. w.c. (-4-0-6 kPa)
LPG4-D8022N	0-10 in. w.c. (0-2.5 kPa)	LPG4-D9322N	-24-0-40 in. w.c. (-6-0-10 kPa)
LPG4-D8122N	0-15 in. w.c. (0-3.75 kPa)	LPG4-D9422N	-30-0-50 in. w.c. (-7.5-0-14.5 kPa)
LPG4-D8222N	0-25 in. w.c. (0-6 kPa)	LPG4-D9522N	-40-0-60 in. w.c. (-10-0-15 kPa)

Section 5



No.
4PU50

Columbus Electric

Hazardous Location Thermostats

• DPDT

• 24 to 277V

Ideal for heating or cooling. No. 6GVX9 has remote capillary bulb. UL Listed for Class I Groups C and D and Class II Groups E, F, and G locations.

Thermostat Control			Inductive		Contact Rating		Mfr. Model	Item No.
Range	H	W	Amps @ 120V	Amps @ 240V	Resistive @ 120V	Resistive @ 240V		
50° to 90°F 5W	6W	—	4.0A	4.0A	22A	22A	EP1D8DJ	4PU50
30° to 110°F 5W	6W	4W	4.0A	4.0A	22A	22A	HT-2-G	6GVX9

COLUMBUS ELECTRIC

INSTALLATION & INSTRUCTION SHEET LINE VOLTAGE THERMOSTAT - ET SERIES

DESCRIPTION

THE COLUMBUS ELECTRIC WALL LINE VOLTAGE THERMOSTAT IS SUITABLE FOR DIRECT CONNECTION WITH ANY RESISTANCE HEATING ELEMENTS AND UNIT HEATERS.

THIS THERMOSTAT HAS A SNAP ACTION SWITCH OPERATED BY A BIMETAL ACTUATOR AND IS AVAILABLE IN SINGLE POLE, DOUBLE POLE WITH POSITIVE OFF, TWO STAGE HEAT, COOLING ONLY AND HEAT OR COOL MODELS. OTHER OPTIONS INCLUDE FACTORY OR FIELD INSTALLED LOCKING KITS FOR TOP AND FOR BOTTOM SETTING AND 6" WIRE LEADS.

WARNING

IF THIS PRODUCT IS USED TO REPLACE A DEVICE CONTAINING MERCURY, THE PURCHASER OR CONSUMER MUST ENSURE THAT THE MERCURY IS PROPERLY MANAGED TO COMPLY WITH STATE OR FEDERAL REGULATIONS. THE MERCURY MUST NOT BECOME PART OF SOLID WASTE OR WASTE WATER. ADDITIONAL GUIDANCE MAY BE OBTAINED FROM THE MANUFACTURER OF THE PRODUCT BEING REMOVED, OR BY CALLING COLUMBUS ELECTRIC MANUFACTURING COMPANY MATERIALS MANAGER.

1-800-251-7828

SPECIFICATIONS

ELECTRICAL RATING

22 AMPS @ 125/277 VAC

3/4 HP @ 125 VAC

1 1/2 HP @ 250/277 VAC

DIFFERENTIAL

HEAT APPROXIMATELY.....2°F

COOLING APPROXIMATELY....4°F

HEAT ANTICIPATOR MODEL...1/2°F

TEMPERATURE RANGE

(STANDARD MODELS)

SETTING RANGE.....50°F TO 90°F

HEATING OR COOLING...50°F TO 90°F

ATTIC FAN CONTROL...90°F TO 135°F

APPROVALS

U.L. APPROVED

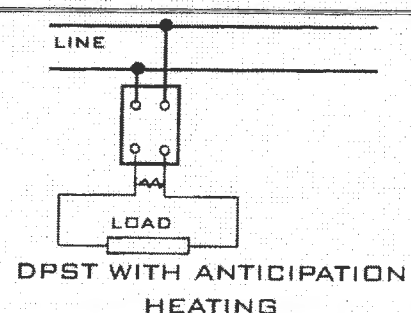
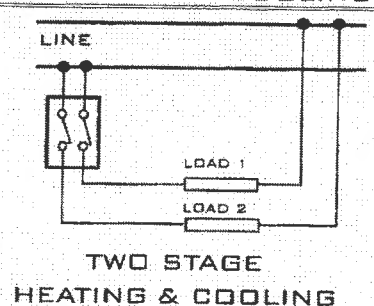
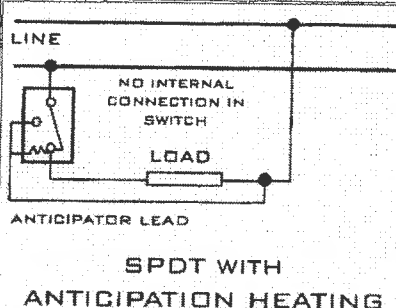
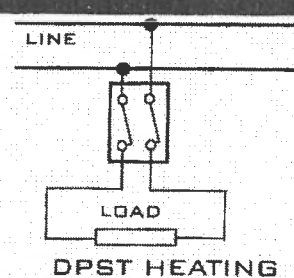
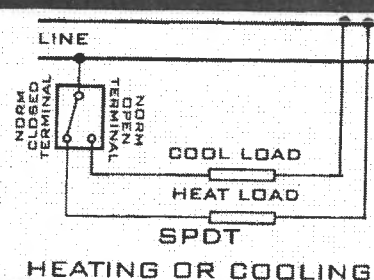
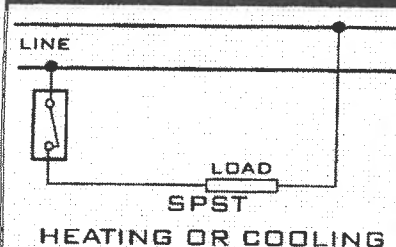
C.S.A. CERTIFIED

DIMENSIONS

4 3/4 X 2 3/4 X 2 3/4

H W D

INSTALLATION / OPERATION



P.O. BOX 4973

JOHNSON CITY, TN. 37602-4973

423-477-4131

8001
REV. G

COLUMBUS ELECTRIC MANUFACTURING

OPERATION & INSTALLATION MANUAL

EP-ETD-8D
EP-ETD-8S

DPDT HEAT/COOL
SPDT HEAT/COOL

EXPLOSION PROOF THERMOSTAT

The Columbus Electric Explosion Proof Thermostat is designed to control heating only, cooling only, heating and cool or ventilation systems in oil refineries, grain elevators, munition plants, hospital operating rooms and other hazardous locations.

The switch mechanism is enclosed in a 1/2" thick cast aluminum case which is dust proof and dust resistant. A reliable sensing element provides accurate response to temperature change and does not require leveling during installation.

The casing is tapped top and bottom for 3/4" conduit, a 1/2" adaptor is provided.

SPECIFICATIONS

Electrical Rating: 22 Amp 125-277 VAC
3/4 HP at 125 VAC
1 1/2 HP 250/277 VAC

Dimensions: 5.62" x 6.37" x 4.43"
Approvals: U.L. AND C.S.A.
Class I Groups C & D
Class II Groups E, F, & G

Differential: Heat: 2°F/Cool: 4°F

Temp Set Range: 50°F to 90°F

INSTALLATION

ALL WIRING MUST COMPLY WITH NFPA-70(NEC), LOCAL CODES AND ORDINANCES:

Locate the thermostat approximately five feet (5') above the floor in a location that will sense the average temperature of the area to be controlled. Do not mount the thermostat adjacent to water pipes, in drafty areas, or other locations that would adversely affect the operation of the thermostat.

- 1) Remove the cover of the thermostat and set it aside. Exercise care not to mar the mating surface or damage the temperature sensing/operating components. CAUTION: Marring of the mating surfaces of the enclosure could destroy the integrity of the seal causing an unsafe condition during operation of the thermostat.
- 2) Mount the thermostat base on the surface selected. See Fig. 1 for dimensions.
- 3) The base is tapped for 3/4" conduit; a 1/2" conduit adaptor and a 3/4" plug is provided. Two openings are provided. Unused openings must be properly plugged, with plugs provided, prior to applying power to the unit.
- 4) Connect the conduit to the mounted base and place the required wire into the base.
- 5) Connections are to be made to the switch terminals on the cover, see Fig. 2. The cover can then be installed to the base and securely fastened utilizing the four (4) mounting screws. Immediately prior to assembly, inspect the mating surfaces of the cover and enclosure. Do not connect if surfaces are uneven or gaps exist between the cover and enclosure. Install the four (4) cover screws to enclosure and TIGHTEN TO A MINIMUM OF 40 INCH POUNDS.
- 6) The installer must seal each conduit run within 18" of the thermostat enclosure. This seal must be a suitable listed hazardous location fitting.

DIAGRAMS

FIG 1

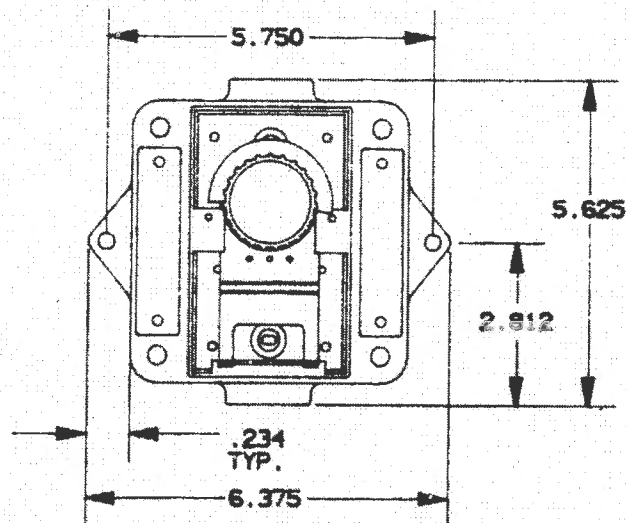
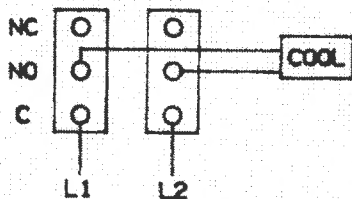
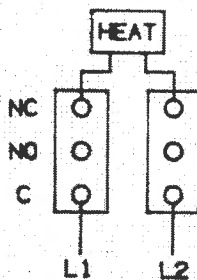
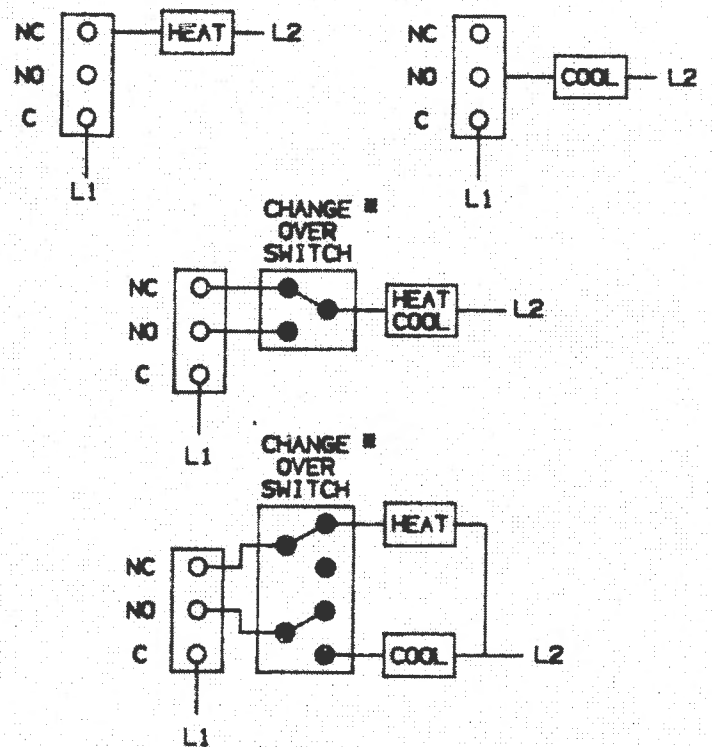


FIG 2 TYPICAL WIRING DIAGRAMS

EP-ETD-8D



EP-ETD-8S



* TO BE PROVIDED BY INSTALLER

P.O. BOX 4973, JOHNSON CITY, TENNESSEE 37602

Section 6

WARNING! Read all important information notices on page 3. Please adhere to instruction published in this manual. Failure to do so may be dangerous and may void certain provisions of your warranty.

Electric Convection Air Heaters for Hazardous Locations

CX1 ProVector® Series

Installation, Operation, & Maintenance Instructions



Model Coding

CX1	-	120	1	60	-	012	-	T2A	IIB	-	T
Model Series		Heater Voltage 120 V, 208 V, 240 V, 277 V, 380 V, 400 V, 415 V, 480 V, 600 V	Phase 1, 3	Hertz 50, 60				T-Code T2A - 536°F (280°C) T3 - 392°F (200°C)	Hazardous Location IIB, IIC		T - Built-in room thermostat. Add 'T' for T-stat. A - Stainless steel cabinet

1st Generation

Heater Kilowatts				
0075 - 0.75 kW	0135 - 1.35 kW	0313 - 3.13 kW	048 - 4.8 kW	0747 - 7.47 kW
0083 - 0.83 kW	018 - 1.8 kW	0333 - 3.33 kW	050 - 5.0 kW	076 - 7.6 kW
009 - 0.90 kW	0226 - 2.26 kW	0347 - 3.47 kW	0528 - 5.28 kW	100 - 10.0 kW
0113 - 1.13 kW	025 - 2.5 kW	0359 - 3.59 kW	0568 - 5.68 kW	
012 - 1.2 kW	0269 - 2.69 kW	036 - 3.6 kW	0626 - 6.26 kW	
0125 - 1.25 kW	0301 - 3.01 kW	0476 - 4.76 kW	0694 - 6.94 kW	

Reminder: This nomenclature illustration is intended primarily to explain how a product part number is defined. Not all voltages and/or wattage combinations are available. Please consult the Performance Data chart(s) for product availability.

Approved Locations

Electric convection air heaters are cULUS listed for the following hazardous locations:

(without built-in thermostat)

Class I, Div. 1 & 2, Groups A, B, C & D
Class I, Zones 1 & 2, Groups IIA, IIB, IIC
Temperature Code T2A 536°F (280°C),
T3 392°F (200°C)

(with built-in thermostat)

Class I, Div. 1 & 2, Groups A, B, C & D
Class I, Zones 1 & 2, Groups IIA, IIB, IIC
Temperature Code T2A 536°F (280°C), T3 392°F (200°C)

For details of hazardous locations with potential for explosion, refer to the Canadian Electrical Code, Part 1, Section 18 or National Electrical Code Articles 500 - 516.



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A. HEATER MAINTENANCE CHECKLIST

Photocopy
this page
for reuse.



WARNING. Disconnect heater from the power supply before opening enclosures or servicing heater.

Lock the switch in the **"OFF"** (open) position and/or tag the switch to prevent unexpected power application. For heaters marked "IIC", ensure to loosen the setscrew before removing the cover.

This heater should only be serviced by personnel with heating and hazardous location equipment experience.

Heater Model _____ Date of Maintenance _____

Serial Number _____ Maintenance Done By _____

Comments _____

A.1 Periodic (before and as required during heating season)

- Clean
 - ☐ Finned Tubes
 - ☐ Cabinet top and below unit
 - ☐ Remove dust using compressed air. Do not spray with water or solvents. Do not immerse in water or solvents
- Check
 - ☐ All explosion-proof covers for tightness.

A.2 Annual (before heating season)

- Mechanical Check
 - ☐ Check all enclosures. Inside of enclosures must be clean, dry, and free of foreign materials. Enclosure joints are metal to metal. Do not use gasket material or sealant in joints.
 - ☐ Check the tightness of all hardware. All nuts and bolts must be tight.
 - ☐ Turn heater on for a minimum of five minutes. Check for warm air exiting heater through top vents.
- Electrical Check
 - ☐ Check all terminal connections and conductors. Tighten loose connections. Conductors with damaged insulation must be replaced.
 - ☐ Check all explosion-proof conduits. Replace damaged conduits, unions, and plugs. Ensure 5 turns of engagement on all threaded connections.

Ruffneck™

Heaters for the Harshest Environments

For assistance, please call
Toll Free: 1-800-661-8529 (24 hrs)
U.S. & Canada

B. IMPORTANT NOTICES



WARNING. Read and adhere to the following installation instructions. FAILURE TO DO SO MAY RESULT IN SEVERE OR FATAL INJURY AND/OR POSSIBLE VOIDING OF THE WARRANTY.

1. Read and follow all instructions in this manual.
2. Heater is to be used only in atmospheres having an ignition temperature higher than the heater's maximum rated operating temperature, as shown on the heater data plate. Refer to applicable electrical codes for additional information.
3. Heater to be used only in the hazardous locations indicated on the heater data plate.
4. Heater is for dry, indoor use only. Do not immerse in water. Do not store or use in areas exposed to rain or snow.
5. Maximum ambient operating temperature 104°F (40°C).
6. Heater is to be connected and serviced only by a qualified electrician experienced with hazardous location equipment.
7. Installation and wiring of the heater must adhere to all applicable codes.
8. Before opening any enclosures, disconnect the heater from the power supply. Lock the switch in the "OFF" (open) position and/or tag the switch to prevent unexpected power application.
9. External surfaces get hot and can cause burns with prolonged contact.
10. Operate the heater only while it is permanently mounted in an upright position. Refer to the C.1 Mechanical, page 4 for details.
11. Heater must be kept clean. When operating in a dirty environment, regularly clean the finned tubes, top vents, and keep bottom opening free of obstructions. Follow the recommended maintenance procedures. Refer Section A. Heater Maintenance Checklist, page 3 for details.
12. Do not operate the heater in atmosphere corrosive to steel or aluminum.
13. Use factory approved replacement parts only.
14. Conduit seals are not required in the heater's factory installed conduits.
15. A conduit seal is required within 6" (153 mm) of field entries.
16. If there are any questions or concerns regarding the heater, contact the factory. Refer to the last page of this manual for details.

C. INSTALLATION

All applicable codes must be adhered to. For optimum heating, the heater should be installed **as** follows:

C.1 Mechanical

1. Location
 - 1.1 The air discharge is not directed at a thermostat.
 - 1.2 The air discharge is across areas of heat loss, such as windows.
 - 1.3 If equipment freeze protection is of importance, locate heater as close to equipment as possible.
2. Mounting
 - 2.1 Heater must be mounted level on a vertical surface using the factory supplied mounting brackets such that there are no obstructions to impede air inlet or discharge.
 - 2.2 The mounting surface must be strong enough to:
 - Support the heater's weight, refer to Section D. Specifications, page 8.
 - Withstand abusive situations such as transportable installations of the heater.
 - 2.3 Secure mounting brackets to vertical surface with the top mounting hole 1.5" (38 mm) below the desired top surface height (Figure 1, page 4). Refer to Figure 3, page 5, Figure 4 and Figure 5, page 4 for physical dimensions and Figure 5, page 6 for required installation clearances. Mounting brackets are to be spaced to match the slots in the rear panel of heater cabinet.

- 2.4 After mounting brackets are secured, tilt the heater and lower it onto the top tabs of the mounting bracket such that the tabs go into the mounting slots on the rear panel of the heater cabinet (Figure 2, page 5).

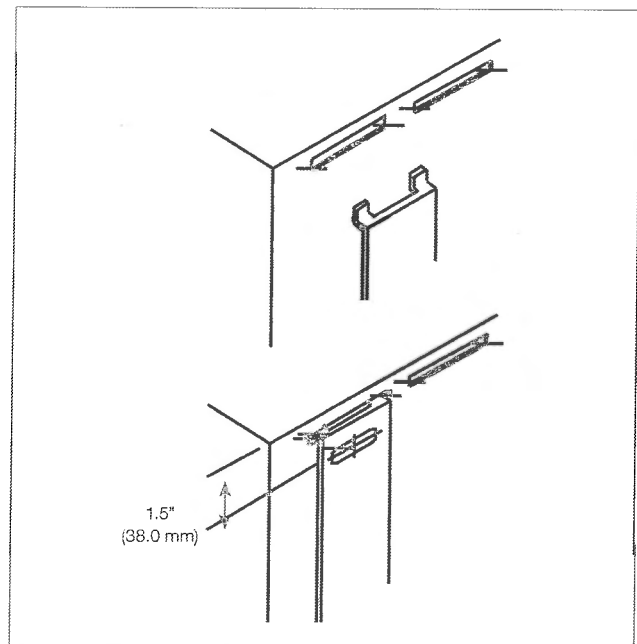


Figure 1

- 2.5 Carefully swing the bottom of the heater into the mounting brackets so that it is resting on the bottom tab (Figure 2, page 5).
- 2.6 Insert the securing screw through the bottom mounting bracket tab and into the cabinet to keep the heater from dislodging from the mounting bracket (Figure 2, page 5).
- 2.7 CAUTION: Use fasteners with yield stress greater than or equal to 58 ksi (400 MPa).

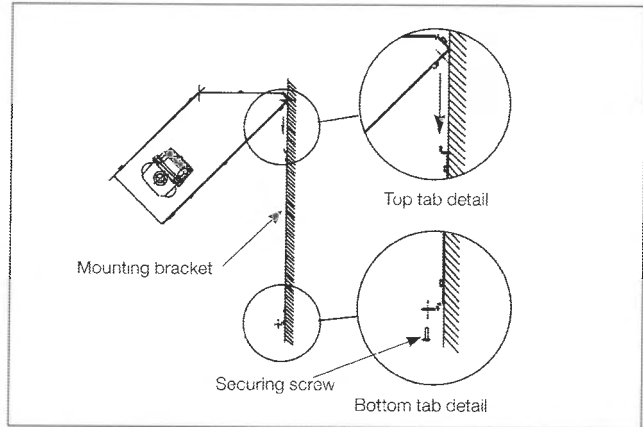
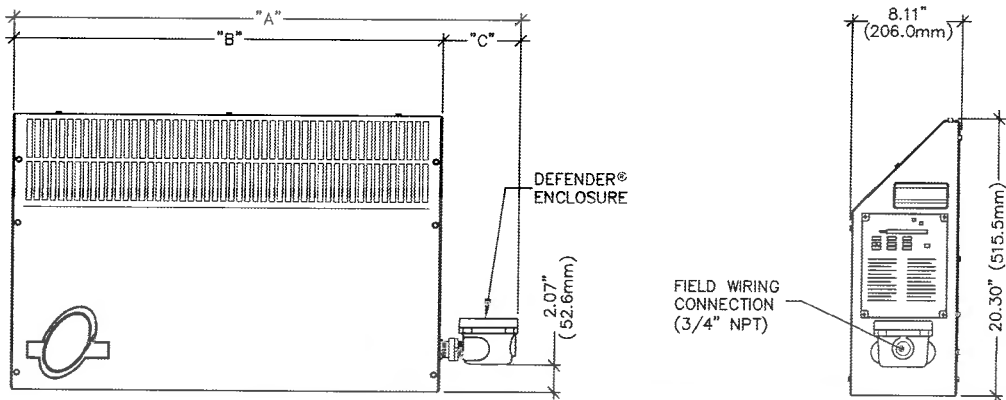


Figure 2

Group B, C, D, Heaters with Defender® Housing



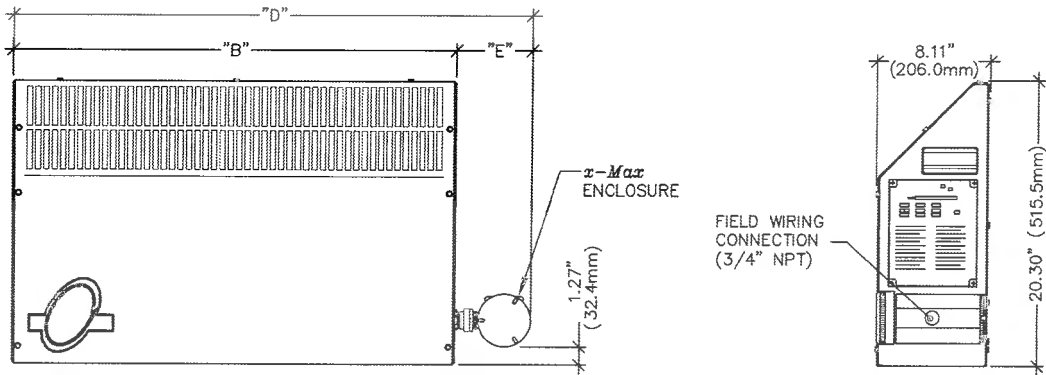
Heater kW Rating	'A' Dimension				'B' Dimension		'C' Dimension			
	w/o Extension		w/ Extension				w/o Extension		w/ Extension	
	in	mm	in	mm	in	mm	in	mm	in	mm
0.75 to 2.69 & 3.6 (T2A)	36.9	938	39.0	991	31.34	796	5.6	142	7.7	195
3.01 to 3.59, 3.6 (T3) & 4.8	55.0	1398	57.1	1451	49.45	1256				
4.76, 5.28 to 7.6*	65.1	1653	67.2	1706	59.49	1511				
3.13, 3.47, 3.74, 5.0, 6.26, 6.94, 7.47 & 10.0	77.4	1965	79.4	2018	71.78	1823				

* Except 7.6 kW, 208, 3Ø and 10 kW, 208V, & 277V, 3Ø units

** 1Ø Thermostat units require extension

Figure 3 – Physical Dimensions

Group A,B,C,D Heater with **x-Max**® Housing



Heater kW Rating	'D' Dimension						'B' Dimension	'E' Dimension						
	1Ø w/o Extension		1Ø* w/ Extension		3Ø Units			w/o Extension		w/ Extension		3Ø Units		
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
0.75 to 2.69 & 3.6 (T2A)	37.6	954	39.6	1007	38.3	973	31.34	796	6.2	158	8.3	211	7.0	177
3.01 to 3.59, 3.6 (T3) & 4.8	55.7	1414	57.8	1467	56.4	1433	49.45	1256						
4.76, 5.28 to 7.6*	65.7	1669	67.8	1722	66.5	1688	59.49	1511						
3.13, 3.47, 3.74, 5.0, 6.26, 6.94, 7.47 & 10.0	78.0	1981	80.1	2034	78.7	2000	71.78	1823						

* 1Ø Thermostat units require extension

Figure 4 – Physical Dimensions

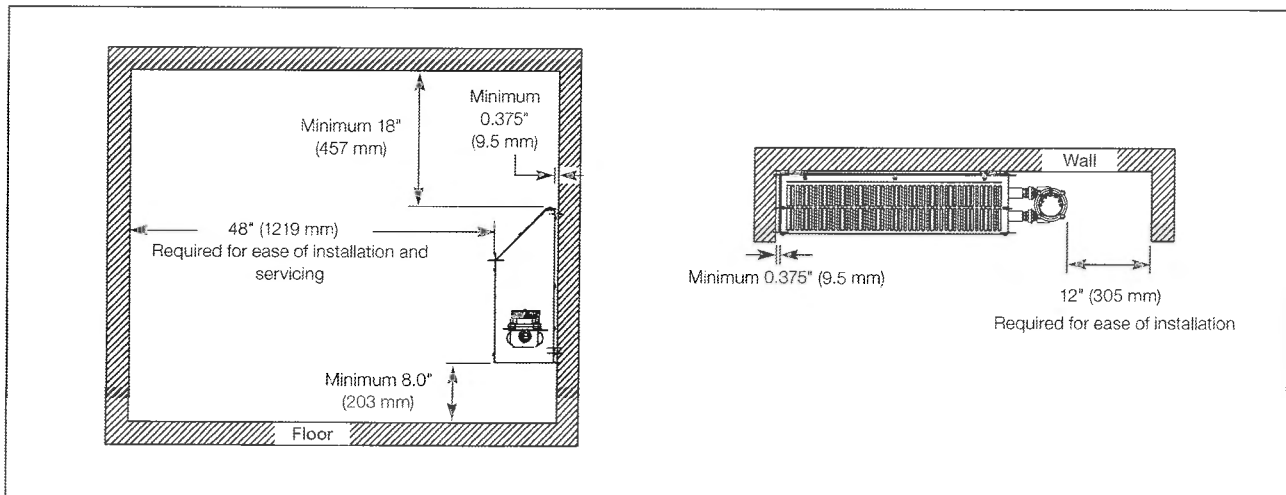


Figure 5 – Installation Clearances

C.2 Electrical



WARNING. Disconnect the power supply before installation of the heater.

Lock the switch in the “OFF” (open) position and/or tag the switch to prevent unexpected power application.

For heaters marked “IIC”, insure to loosen the setscrew before removing the cover. Installation and wiring of the heater must adhere to all applicable codes.

1. General

1.1 Use only copper conductors and approved explosion-proof wiring methods during installation. Refer to the Section H.1 1-Phase, page 12 and Section H.2 3-Phase, page 14, or heater data plate for the voltage, amperage and wattage ratings when sizing for the appropriate conductors. All supply conductors should be rated for operating at temperatures up to 194°F (90°C).

1.2 Supply voltage must be within 10% of the data plate rating. External over-current protection is required and must meet data plate ratings for voltage, amperage and frequency.

2. Field Wiring

Heater has been supplied with an enclosure that has a 3/4" NPT or 1" NPT threaded opening to accommodate the line conductors (see Figure 3, page 5 to for connection details). Use wire connectors rated for minimum 194°F (90°C).

NOTE: If remote thermostats other than the factory supplied are used, ensure that they will not allow the room temperature to exceed ambient temperature limitations of the heater (104°F/40°C) and are suitable for the area's hazardous atmosphere classification. When using any control devices, ensure that the voltage and amperage ratings match the heater's electrical ratings. If not, a contactor may be required.

3. Final Inspection

3.1 Before application of electrical power:

- Check that all connections are secured and comply with the wiring diagram (see Figure 6 and Figure 7, page 7 and applicable code requirements,
- Confirm that the supply voltage and phase is compatible with the data plate specifications,
- Remove any foreign objects from the heater, and
- Ensure all external fittings and enclosure covers are secured.

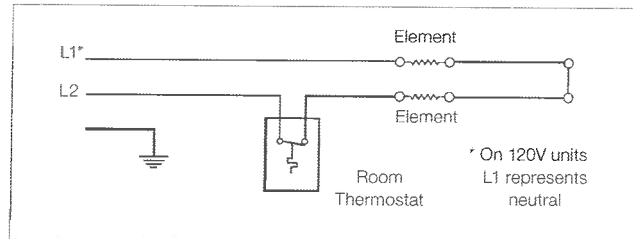


Figure 6 – Wiring Diagram for remote mount and built-in room thermostats (1Ø units)

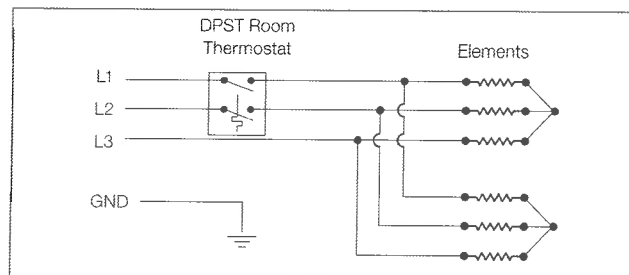


Figure 7 – Wiring Diagram for remote mount and built-in room thermostats (3Ø units)

D. SPECIFICATIONS

		Nominal kW			
		0.75 - 2.69 & 3.6 (T2A)	3.01, 3.33, 3.59, 3.6 (T3), 4.8	4.76, 5.28, 5.68, 7.6	3.13, 3.47, 3.74, 5.0, 6.26, 6.94, 7.47, 10.0
Cabinet Length	in	31.3	49.4	59.5	71.8
	mm	796	1256	1511	1823
Net Weight	lbs	55.3	80.7	92.8	117
	kg	25.1	36.6	42.1	53.2
Shipping Weight	lbs	65	95	105	142
	kg	30	44	47.6	65.5

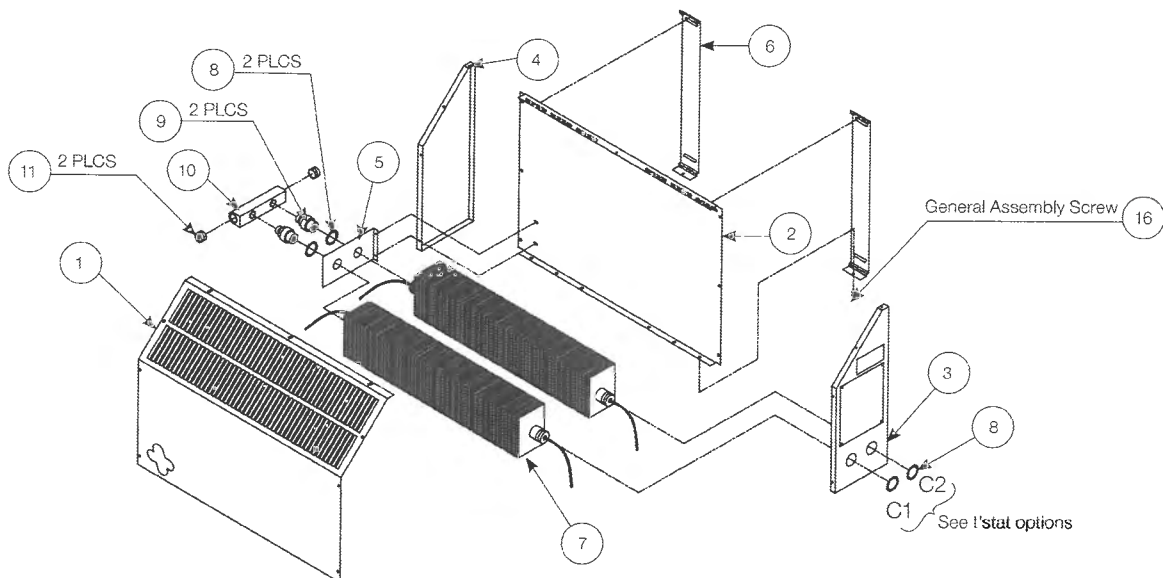
Specifications for Models

- Hazardous Locations**
Without Built-in T'Stat*
 Class I, Div. 1 & 2, Groups B, C, & D; Zones 1 & 2, Groups IIA, IIB + H2 (Defender® Housing)
 or, Class I, Div. 1 & 2, Groups A, B, C, & D, Groups IIA, IIB, IIC (**x-Max**®)
With Built-in T'Stat*
 Class I, Div. 1 & 2, Groups C, & D, Zones 1 & 2, Groups IIA, IIB (Defender® Housing)
 or, Class I, Div. 1 & 2, Groups A, B, C, D, Zones 1 & 2, Groups IIA, IIB, IIC (**x-Max**® housing)
- Enclosures**
 Defender® housing is cast aluminum with bolt on cover, Groups IIB. **x-Max**® housing is extruded aluminum with two screwed on covers. The **x-Max**® housing offers IP55 moisture ingress protection, Groups IIC.
 For dry indoor use only.
 Do not immerse in water. Do not store or use in areas exposed to rain or snow.
- Mounting Brackets**
 Two 14 Ga. (0.075 in) (1.90 mm) galvanized steel.
- Heating Elements**
 Incoloy® sheathed elements.
- Cabinet Material**
 14 Ga. steel. Rear panel is galvanized. Front and side panels are baked green-grey epoxy powder coated with five-stage pretreatment, including iron phosphate.
- Temperature Code Rating**
 T2A 536°F (280°C), T3 392°F (200°C)
- Temperature Limitations**
 Operational: -49°F to 104°F
 Storage: -49°F to 176°F

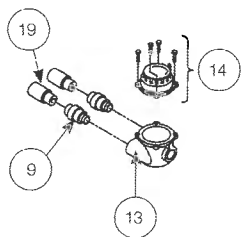
*Hazardous location ratings are dependant on the junction box used.

Please consult a customer service representative or the unit data plate for actual location ratings.

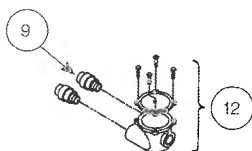
E. PARTS DIAGRAM



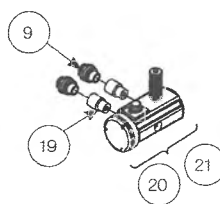
IIB, Built-in T'stat Option



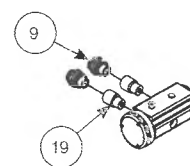
IIB + H₂ Without T'stat Option



IIC, Built-in T'stat Option

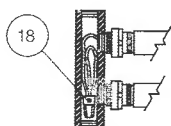


IIC, Without Built-in T'stat Option

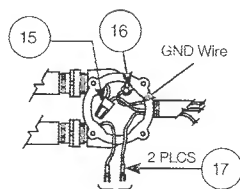


1-Phase Wiring

Conduit Detail

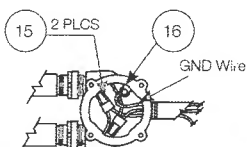


IIB Built-in Wiring

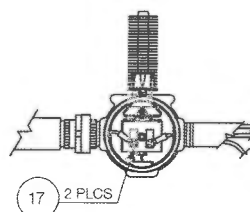


Connect to "common" and "norm closed" terminals of built-in T'stat.

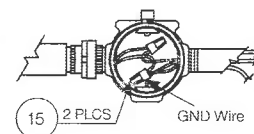
IIB+H₂ Without T'stat Wiring



IIC Built-in T'stat Wiring

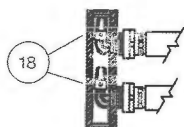


IIC Without T'stat Wiring

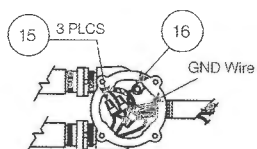


3-Phase Wiring

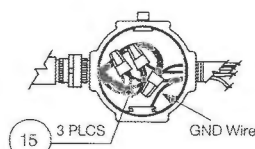
Conduit Detail



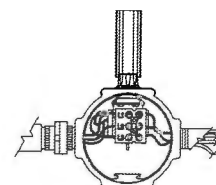
IIB+H₂ Without T'stat Wiring



IIC Without T'stat Wiring



IIC Built-in T'stat Wiring



F. PARTS LIST

Please have model and serial number available before calling.

Item No.	Description	Cabinet Length							
		31.5" (796 mm)		49.4" (1256 mm)		59.5" (1511 mm)		71.78" (1823 mm)	
		Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.
1	Panel, Front	6488	1	6493	1	6490	1	12305	1
2	Panel, Back	6487	1	6494	1	6489	1	12306	1
3	Panel, Right - 1Ø units	6491	1	6491	1	6491	1	6491	1
	Panel, Right - 3Ø units	12304	1	12304	1	12304	1	12304	1
4	Panel, Left	6492	1	6492	1	6492	1	6492	1
5	Bracket, Finned Tube - 1Ø units	6485	1	6485	1	6485	1	6485	1
	Bracket, Finned Tube - 3Ø units	12303	1	12303	1	12303	1	12303	1
6	Kit, Wall Mounting	6602	1	6602	1	6602	1	6602	1
7	Finned Tube Assy c/w Element	*	2	*	2	*	2	*	2
8	Nut, 3/4 Alum. Lock - 1Ø units	6449	4	6449	4	6449	4	6449	4
	Nut, 1" NPT Lock - 3Ø units	12676	4	12676	4	12676	4	12676	4
	Union, 3/4 NPT Male/Female - 1Ø units	6506	4	6506	4	6506	4	6506	4
	Union, 1" NPT Female/Female - 3Ø units	12677	2	12677	2	12677	2	12677	2
9	Union, 1" NPT Male/Female - 3Ø units	12787	2	12787	2	12787	2	12787	2
	Union, 1" NPT Male/Female - 3Ø units	12787	2	12787	2	12787	2	12787	2
10	Conduit, Element	6497	1	6497	1	6497	1	6497	1
11	Plug, 3/4 Ex-Proof	1443	2	1443	2	1443	2	1443	2
12	Kit, Group B, (IIb -H ₂) Enclosure	6604	1	6604	1	6604	1	6604	1
13	Enclosure, Convecter	6211	1	6211	1	6211	1	6211	1
14	Kit, Built-in XCT T'Stat - 1Ø units	6603	1	6603	1	6603	1	6603	1
15	Wire Connector, 302°F (150°C)	**							
16	Screw, 10-24 x 1/2 in. Thd Ct	4972	20	4972	21	4972	22	4972	24
17	Fork Connector, 12-10GA #10	2088	2	2088	2	2088	2	2088	2
18	Wire Connector, 572°F (300°C)	6529	÷	6529	+	6529	+	6529	+
19	Tube Extension - 1Ø units	7202	2	7202	2	7202	2	7202	2
20	Kit, Built-in XT T'Stat - 1Ø units	11773	1	11773	1	11773	1	11773	1
21	Kit, Built-in XT T'Stat - 3Ø units	13728	1	13728	1	13728	1	13728	1
22	Reducer Bushing - 3Ø units	12679	2	12679	2	12679	2	12679	2
23	Nipple - 3Ø units	12678	2	12678	2	12678	2	12678	2
24	Reducer, 3/4 x 1" Male/Female	12867	2	12867	2	12867	2	12867	2

Notes

* Contact factory for replacement finned tube kits.

** Customer supplied. Quantity varies: 1 for built-in T'stat option; 2 for remote T'stat option.

*** 7.6 kW, 208V, 3Ø and 10 kW, 208V, 240V & 277V, 3Ø only

+ Quantity varies: 1 for 1Ø, 2 for 3Ø

G. REPAIR & REPLACEMENT



WARNING. Disconnect the power supply before installation of the heater. Lock the switch in the “OFF” (open) position and/or tag the switch to prevent unexpected power application. Heater surfaces may be hot.

G.1 Finned Tube/Element Assembly

A complete finned tube assembly is available from the factory. Refer to Section E. Parts Diagram, page 9 for item numbers.

1. Remove the front cabinet panel (Item #1).
2. Remove convector enclosure's cover and disconnect wires.
3. De-couple two unions (Item #9) connecting convector enclosure and finned tube extrusion (Item #7).
4. Remove the front 3/4" NPT plug (Item #11) from element conduit (Item #10) and then pull out wire connector and disconnect the wires.
5. De-couple remaining two unions and remove element conduit.
6. Remove union halves and lock-nut (Item #8) from ends of each finned tube requiring replacement and set aside for re-use on new factory supplied finned/element assemblies.
7. Remove bolts from lower tabs of wall mount brackets (Item #6), remove heater from wall mount brackets, and loosen the bolts from the finned tube bracket (Item #5).
8. Remove the damaged finned tube/element assemblies and install replacements.
9. Re-assemble heater using the reverse order of the preceding instructions.

IMPORTANT: All threaded connections must be wrench tight with a minimum of 5 turns engagement.

G.2 Cabinet Panels and Brackets

Replacement cabinet panels and brackets are available from the factory.

NOTE: For purposes of safety and convenience, all repairs and maintenance must be done with factory authorized parts and materials.

H. CX1 TECHNICAL DATA

H.1 1-Phase

Model	kW (Btu/hr)	Unit Voltage	Gas Group				Supply Wire Size ***	Unit Current	Max. Circuit Fuse*	Cabinet Length	Temperature Code
			IIB + H2	IIB	IIC						
		V	w/o T'stat	w/ T'stat	w/o T'stat	w/ T'stat	AWG	A	A	in (mm)	
CX1-120160-012-T3	1.2 (4095)	120	✓	✓	✓	✓	12	10.0	15	31.3 (796)	T3 (200)
CX1-120160-018-T3	1.8 (6142)	120		✓		✓	12	15.0	20	31.3 (796)	T3 (200)
CX1-208160-012-T3	1.2 (4095)	208		✓		✓	12	5.8	15	31.3 (796)	T3 (200)
CX1-208160-018-T3	1.8 (6142)	208		✓		✓	12	8.7	15	31.3 (796)	T3 (200)
CX1-208160-036-T3**	3.6 (12284)	208		✓		✓	12	17.3	25	49.5 (1256)	T3 (200)
CX1-208160-048-T2A	4.8 (16378)	208		N/A		✓	8	23.1	30	49.5 (1256)	T2A (280)
CX1-208160-050-T3	5.0 (17060)	208		N/A		✓	8	24.0	30	71.8 (1823)	T3 (200)
CX1-208160-076-T2A	7.6 (25932)	208		N/A		N/A	8	36.5	50	59.5 (1511)	T2A (280)
CX1-240160-012-T3	1.2 (4095)	240		✓		✓	12	5.0	15	31.3 (796)	T3 (200)
CX1-240160-018-T3	1.8 (6142)	240		✓		✓	12	7.5	15	31.3 (796)	T3 (200)
CX1-240160-036-T3**	3.6 (12284)	240		✓		✓	12	15.0	20	49.5 (1256)	T3 (200)
CX1-240160-048-T2A	4.8 (16378)	240		✓		✓	10	20.0	25	49.5 (1256)	T2A (280)
CX1-240160-050-T3	5.0 (17060)	240		✓		✓	8	20.8	30	71.8 (1823)	T3 (200)
CX1-240160-076-T2A	7.6 (25932)	240		N/A		N/A	8	31.7	40	59.5 (1511)	T2A (280)
CX1-277160-012-T3	1.2 (4095)	277		✓		✓	12	4.3	15	31.3 (796)	T3 (200)
CX1-277160-018-T3	1.8 (6142)	277		✓		✓	12	6.5	15	31.3 (796)	T3 (200)
CX1-277160-036-T3**	3.6 (12284)	277	✓	✓	12	13.0	20	49.5 (1256)	T3 (200)		
CX1-277160-048-T2A	4.8 (16378)	277	✓	✓	12	17.3	25	49.5 (1256)	T2A (280)		
CX1-277160-050-T3	5.0 (17060)	277	✓	✓	8	18.1	25	71.8 (1823)	T3 (200)		
CX1-277160-076-T2A	7.6 (25932)	277	N/A	N/A	8	27.4	35	59.5 (1511)	T2A (280)		
CX1-380160-0075-T3	0.75 (2560)	380	✓	✓	12	2.0	15	31.3 (796)	T3 (200)		
CX1-380160-0113-T3	1.13 (3856)	380	✓	✓	12	3.0	15	31.3 (796)	T3 (200)		
CX1-380160-012-T3	1.2 (4095)	380	✓	✓	12	3.2	15	31.3 (796)	T3 (200)		
CX1-380160-018-T3	1.8 (6142)	380	✓	✓	12	4.7	15	31.3 (796)	T3 (200)		
CX1-380160-0226-T2A	2.26 (7711)	380	✓	✓	12	5.9	15	31.3 (796)	T2A (280)		
CX1-380160-0301-T3	3.01 (10271)	380	✓	✓	12	7.9	15	49.5 (1256)	T3 (200)		
CX1-380160-0313-T3	3.13 (10680)	380	✓	✓	12	8.2	15	71.8 (1823)	T3 (200)		
CX1-380160-036-T3**	3.6 (12284)	380	✓	✓	12	9.5	15	49.5 (1256)	T3 (200)		
CX1-380160-0476-T2A	4.76 (16241)	380	✓	✓	10	12.5	20	59.5 (1511)	T2A (280)		
CX1-380160-048-T2A	4.8 (16378)	380	✓	✓	10	12.6	20	49.5 (1256)	T2A (280)		
CX1-380160-050-T3	5.0 (17060)	380	✓	✓	10	13.2	20	71.8 (1823)	T3 (200)		
CX1-380160-0626-T2A	6.26 (21360)	380	✓	N/A	8	16.5	25	71.8 (1823)	T2A (280)		
CX1-380160-076-T2A	7.6 (25932)	380	✓	N/A	8	20.0	25	59.5 (1511)	T2A (280)		
CX1-380160-100-T2A	10.0 (34121)	380	N/A	N/A	8	26.3	35	71.8 (1823)	T2A (280)		
CX1-400160-0083-T3	0.83 (2832)	400	✓	✓	12	2.1	15	31.3 (796)	T3 (200)		
CX1-400160-012-T3	1.2 (4095)	400	✓	✓	12	3.0	15	31.3 (796)	T3 (200)		

Notes

* Or equivalent breaker as per local electrical inspection authority requirements.

** For 3.6 kW heaters rated T3 cabinet length is 49.5" (1256 mm), 3.6 kW heaters rated T2A cabinet length is 31.3" (796 mm).

*** Ensure supply wire size adheres to applicable local and national electrical codes.

1. Heater is functioning normally if, at rated voltage, the current draw is within 10% of the value in this table.

2. Operation at lower voltages than rated will result in reduced output and current draw.

Actual Output (kW) = [(Supply Voltage)² ÷ (Rated Voltage)²] × Rated Unit Wattage (kW)

3. Add suffix "T" for optional built-in thermostat. Thermostat not available on IIB+H2 models.

4. Add suffix "H" for high-temperature ambient storage option. High temperature storage option is not available with thermostat option. Not available on IIB models.

Model	kW (Btu/hr)	Unit Voltage	Gas Group				Supply Wire Size ***	Unit Current	Max. Circuit Fuse*	Cabinet Length	Temperature Code
			IIB + H2	IIB	IIC						
		V	w/o T'stat	w/ T'stat	w/o T'stat	w/ T'stat	AWG	A	A	in (mm)	
CX1-400160-0125-T3	1.25 (4565)	400	✓	✓	✓	✓	12	3.1	15	31.3 (796)	T3 (200)
CX1-400160-018-T3	1.8 (6142)	400		✓		✓	12	4.5	15	31.3 (796)	T3 (200)
CX1-400160-025-T2A	2.5 (8530)	400		✓		✓	12	6.3	15	31.3 (796)	T2A (280)
CX1-400160-0333-T3	3.33 (11362)	400		✓		✓	12	8.3	15	49.5 (1256)	T3 (200)
CX1-400160-0347-T3	3.47 (11840)	400		✓		✓	12	8.7	15	71.8 (1823)	T3 (200)
CX1-400160-036-T3**	3.6 (12284)	400		✓		✓	12	9.0	15	49.5 (1256)	T3 (200)
CX1-400160-048-T2A	4.8 (16378)	400		✓		✓	10	12.0	15	49.5 (1256)	T2A (280)
CX1-400160-050-T3	5.0 (17060)	400		✓		✓	10	12.5	20	71.8 (1823)	T3 (200)
CX1-400160-0528-T2A	5.28 (18016)	400		✓		✓	10	13.2	20	59.5 (1511)	T2A (280)
CX1-400160-0604-T3	6.04 (20680)	400		✓		N/A	8	17.4	25	71.8 (1823)	T3 (200)
CX1-400160-076-T2A	7.6 (25932)	400		✓		N/A	8	19.0	30	59.5 (1511)	T2A (280)
CX1-400160-100-T2A	10.0 (34121)	400		N/A		N/A	8	25.0	35	71.8 (1823)	T2A (280)
CX1-415160-009-T3	0.9 (3071)	415		✓		✓	12	2.2	15	31.3 (796)	T3 (200)
CX1-415160-012-T3	1.2 (4095)	415		✓		✓	12	2.9	15	31.3 (796)	T3 (200)
CX1-415160-0135-T3	1.35 (4606)	415		✓		✓	12	3.3	15	31.3 (796)	T3 (200)
CX1-415160-018-T3	1.8 (6142)	415		✓		✓	12	4.3	15	31.3 (796)	T3 (200)
CX1-415160-0269-T2A	2.69 (9179)	415		✓		✓	12	6.5	15	31.3 (796)	T2A (280)
CX1-415160-0359-T3	3.59 (12250)	415		✓		✓	12	8.7	15	49.5 (1256)	T3 (200)
CX1-415160-036-T3**	3.6 (12284)	415		✓		✓	12	8.7	15	49.5 (1256)	T3 (200)
CX1-415160-0374-T3	3.74 (12761)	415		✓		✓	12	9.0	15	71.8 (1823)	T3 (200)
CX1-415160-048-T2A	4.8 (16378)	415	✓	✓	10	11.6	15	49.5 (1256)	T2A (280)		
CX1-415160-050-T3	5.0 (17060)	415	✓	✓	10	12.0	15	71.8 (1823)	T3 (200)		
CX1-415160-0568-T2A	5.68 (19381)	415	✓	✓	10	13.7	20	59.5 (1511)	T2A (280)		
CX1-415160-0747-T2A	7.47 (25488)	415	✓	N/A	8	18.0	25	71.8 (1823)	T2A (280)		
CX1-415160-076-T2A	7.6 (25932)	415	✓	N/A	8	18.3	25	59.5 (1511)	T2A (280)		
CX1-415160-100-T2A	10.0 (34121)	415	N/A	N/A	8	24.1	35	71.8 (1823)	T2A (280)		
CX1-480160-012-T3	1.2 (4095)	480	✓	✓	12	2.5	15	31.3 (796)	T3 (200)		
CX1-480160-018-T3	1.8 (6142)	480	✓	✓	12	3.8	15	31.3 (796)	T3 (200)		
CX1-480160-036-T3**	3.6 (12284)	480	✓	✓	12	7.5	15	49.5 (1256)	T3 (200)		
CX1-480160-048-T2A	4.8 (16378)	480	✓	✓	12	10.0	15	49.5 (1256)	T2A (280)		
CX1-480160-050-T3	5.0 (17060)	480	✓	✓	12	10.4	15	71.8 (1823)	T3 (200)		
CX1-480160-076-T2A	7.6 (25932)	480	✓	N/A	10	15.8	20	59.5 (1511)	T2A (280)		
CX1-480160-100-T2A	10.0 (34121)	480	✓	N/A	8	20.8	30	71.8 (1823)	T2A (280)		
CX1-600160-012-T3	1.2 (4095)	600	N/A	✓	12	2.0	15	31.3 (796)	T3 (200)		
CX1-600160-018-T3	1.8 (6142)	600	N/A	✓	12	3.0	15	31.3 (796)	T3 (200)		
CX1-600160-036-T3**	3.6 (12284)	600	N/A	✓	12	6.0	15	49.5 (1256)	T3 (200)		
CX1-600160-048-T2A	4.8 (16378)	600	N/A	✓	12	8.0	15	49.5 (1256)	T2A (280)		
CX1-600160-050-T3	5.0 (17060)	600	N/A	✓	12	8.3	15	71.8 (1823)	T3 (200)		
CX1-600160-076-T2A	7.6 (25932)	600	N/A	✓	12	12.7	20	59.5 (1511)	T2A (280)		
CX1-600160-100-T2A	10.0 (34121)	600	N/A	N/A	10	16.7	25	71.8 (1823)	T2A (280)		

- For IIB model with Defender® built-in thermostat - Class I, Div. 1 & 2, Groups C & D; Zones 1 & 2, Groups IIA and IIB.
- For IIC model with XT built-in thermostat - Class I, Div. 1 & 2, Groups A,B,C & D; Zones 1 & 2, Groups IIA, IIB, IIC.
- IIC Grouping units come with x-Max® housing.
- Remote mounted, Defender, explosion-proof room thermostats are not suitable for Group B & IIC applications.

- Remote contactors are required on all 600V heaters, and heaters with a current draw greater than 22 amps (supplied & installed by others), when utilizing XT-311 remote thermostat.
- Temperature code ratings: T2A - 280°C (536°F), T3 - 200°C (392°F)

H.2 3-Phase

Model	kW (Btu/hr)	Unit Voltage	Gas Group				Supply Wire Size ***	Unit Current	Max. Circuit Fuse*	Cabinet Length	Temperature Code	
			IIB + H2	IIB	IIC							
		V	w/o T'stat	w/ T'stat	w/o T'stat	w/ T'stat						AWG
CX1-208360-012-T3	1.2 (4095)	208	✓					12	3.3	15	31.3 (796)	T3 (200)
CX1-208360-018-T3	1.8 (6142)	208	✓					12	5.0	15	31.3 (796)	T3 (200)
CX1-208360-036-T3**	3.6 (12284)	208	✓					12	10.0	15	49.5 (1256)	T3 (200) 10
CX1-208360-048-T2A	4.8 (16378)	208	✓					10	13.3	20	49.5 (1256)	T2A (280)
CX1-208360-050-T3	5.0 (17060)	208	✓					10	13.9	20	71.8 (1823)	T3 (200)
CX1-208360-076-T2A	7.6 (25932)	208	N/A					8	21.1	30	59.5 (1511)	T2A (280)
CX1-208360-100-T2A	10.0 (34121)	208	N/A					8	27.8	35	71.8 (1823)	T2A (280)
CX1-240360-012-T3	1.2 (4095)	240	✓					12	2.9	15	31.3 (796)	T3 (200)
CX1-240360-018-T3	1.8 (6142)	240	✓					12	4.3	15	31.3 (796)	T3 (200)
CX1-240360-036-T3*1	3.6 (12284)	240	✓					12	5.7	15	49.5 (1256)	T3 (200) 12
CX1-240360-048-T2A	4.8 (16378)	240	✓	12	11.5	20	49.5 (1256)	T2A (280)				
CX1-240360-050-T3	5.0 (17060)	240	✓	12	12.0	15	71.8 (1823)	T3 (200)				
CX1-240360-076-T2A	7.6 (25932)	240	✓	10	18.3	25	59.5 (1511)	T2A (280)				
CX1-240360-100-T2A	10.0 (34121)	240	N/A	8	24.1	35	71.8 (1823)	T2A (280)				
CX1-277360-012-T3	1.2 (4095)	277	✓	N/A	✓	✓	12	2.5	15	31.3 (796)	T3 (200)	
CX1-277360-018-T3	1.8 (6142)	277	✓				12	3.8	15	31.3 (796)	T3 (200)	
CX1-277360-036-T3**	3.6 (12284)	277	✓				12	7.5	15	49.5 (1256)	T3 (200) 10	
CX1-277360-048-T2A	4.8 (16378)	277	✓				12	10.0	15	49.5 (1256)	T2A (280)	
CX1-277360-050-T3	5.0 (17060)	277	✓				12	10.4	15	71.8 (1823)	T3 (200)	
CX1-277360-076-T2A	7.6 (25932)	277	✓				10	15.8	20	59.5 (1511)	T2A (280)	
CX1-277360-100-T2A	10.0 (34121)	277	N/A				8	20.8	30	71.8 (1823)	T2A (280)	
CX1-380360-0113-T3	1.13 (3856)	380	✓				12	1.7	15	31.3 (796)	T3 (200)	
CX1-380360-0226-T2A	2.26 (7711)	380	✓				12	3.4	15	31.3 (796)	T2A (280)	
CX1-380360-0301-T3	3.01 (10271)	380	✓				12	4.6	15	49.5 (1256)	T3 (200)	
CX1-380360-0313-T3	3.13 (10680)	380	✓				12	4.8	15	71.8 (1823)	T3 (200)	
CX1-380360-0476-T2A	4.76 (16241)	380	✓				12	7.2	15	59.5 (1511)	T2A (280)	
CX1-380360-050-T3	5.0 (17060)	380	✓				12	7.6	15	71.8 (1823)	T3 (200)	
CX1-380360-0626-T2A	6.26 (21360)	380	✓				12	9.5	15	71.8 (1823)	T2A (280)	
CX1-380360-100-T2A	10.0 (34121)	380	✓				10	15.2	20	71.8 (1823)	T2A (280)	
CX1-400360-0125-T3	1.25 (4565)	400	✓				12	1.8	15	31.3 (796)	T3 (200)	

Notes

* Or equivalent breaker as per local electrical inspection authority requirements.

** For 3.6 kW heaters rated T3 cabinet length is 49.5" (1256 mm). 3.6 kW heaters rated T2A cabinet length is 31.3" (796 mm).

*** Ensure supply wire size adheres to applicable local and national electrical codes.

- Available for IIB only.

1. Heater is functioning normally if, at rated voltage, the current draw is within 10% of the value in this table.
2. Operation at lower voltages than rated will result in reduced output and current draw.
3. Actual Output (kW) = [(Supply Voltage)² ÷ (Rated Voltage)²] × Rated Unit Wattage (kW)
4. Add suffix "T" for optional built-in thermostat. Thermostat not available on IIB+H2 models.
5. Add suffix "H" for high-temperature ambient storage option. High temperature storage option is not available with thermostat option. Not available on IIB models.

Model	kW (Btu/hr)	Unit Voltage	Gas Group				Supply Wire Size ***	Unit Current	Max. Circuit Fuse*	Cabinet Length	Temperature Code
			IIB + H2	IIB	IIC						
		V	w/o T'stat	w/ T'stat	w/o T'stat	w/ T'stat	AWG	A	A	in (mm)	
CX1-400360-025-T2A	2.5 (8530)	400	✓✓				12	3.6	15	31.3 (796)	T2A (280)
CX1-400360-0333-T3	3.33 (11362)	400	✓				12	4.8	15	49.5 (1256)	T3 (200)
CX1-400360-0347-T3	3.47 (11840)	400	✓				12	5.0	15	71.8 (1823)	T3 (200)
CX1-400360-050-T3	5.0 (17060)	400	✓				12	7.2	15	71.8 (1823)	T3 (200)
CX1-400360-0528-T2A	5.28 (18016)	400	✓				12	7.6	15	59.5 (1511)	T2A (280)
CX1-400360-0694-T2A	6.94 (23680)	400	✓				12	10.0	15	71.8 (1823)	T3 (200)
CX1-400360-100-T2A	10.0 (34121)	400	✓				10	14.4	20	71.8 (1823)	T2A (280)
CX1-415360-0135-T3	1.35 (4606)	415	✓				12	1.9	15	31.3 (796)	T3 (200)
CX1-415360-0269-T2A	2.69 (9179)	415	✓				12	3.7	15	31.3 (796)	T2A (280)
CX1-415360-0359-T3	3.59 (12250)	415	✓				12	5.0	15	49.5 (1256)	T3 (200)
CX1-415360-0374-T3	3.74 (12761)	415	✓				12	5.2	15	71.8 (1823)	T3 (200)
CX1-415360-050-T3	5.0 (17060)	415	✓				12	7.0	15	71.8 (1823)	T3 (200)
CX1-415360-0568-T2A	5.68 (19381)	415	✓				12	7.9	15	59.5 (1511)	T2A (280)
CX1-415360-0747-T2A	7.47 (25488)	415	✓	N/A	✓	✓	12	10.4	15	71.8 (1823)	T2A (280)
CX1-415360-100-T2A	10.0 (34121)	415	✓				10	13.9	20	71.8 (1823)	T2A (280)
CX1-480360-018-T3	1.8 (6142)	480	✓				12	2.2	15	31.3 (796)	T3 (200)
CX1-480360-036-T3**	3.6 (12284)	480	✓				12	4.3	15	49.5 (1256)	T3 (200) T2A (280)
CX1-480360-048-T2A	4.8 (16378)	480	✓				12	5.8	15	49.5 (1256)	T2A (280)
CX1-480360-050-T3	5.0 (17060)	480	✓				12	6.0	15	71.8 (1823)	T3 (200)
CX1-480360-076-T2A	7.6 (25932)	480	✓				12	9.1	15	59.5 (1511)	T2A (280)
CX1-480360-100-T2A	10.0 (34121)	480	✓				12	12.0	15	71.8 (1823)	T2A (280)
CX1-600360-036-T3**	3.6 (12284)	600	✓				12	3.5	15	49.5 (1256)	T3 (200) T2A (280)
CX1-600360-048-T2A	4.8 (16378)	600	✓				12	4.6	15	49.5 (1256)	T2A (280)
CX1-600360-050-T3	5.0 (17060)	600	✓				12	4.8	15	71.8 (1823)	T3 (200)
CX1-600360-076-T2A	7.6 (25932)	600	✓				12	7.3	15	59.5 (1511)	T2A (280)
CX1-600360-100-T2A	10.0 (34121)	600	✓				12	9.6	15	71.8 (1823)	T2A (280)

6. For IIB model with Defender® built-in thermostat - Class I, Div. 1 & 2, Groups C & D; Zones 1 & 2, Groups IIA and IIB.
7. For IIC model with XT built-in thermostat - Class I, Div. 1 & 2, Groups A,B,C & D; Zones 1 & 2, Groups IIA, IIB, IIC.
8. IIC Grouping units come with **x-Max®** housing.

9. Remote mounted, Defender®, explosion-proof room thermostats are not suitable for Group B & IIC applications.
10. Remote contactors are required on all 600V heaters, and heaters with a current draw greater than 22 amps (supplied & installed by others), when utilizing XT-311 remote thermostat.
11. Temperature code ratings: T2A - 280°C (536°F), T3 - 200°C (392°F)

For further assistance, please call 24hr hotline: 1-800-661-8529 (U.S.A. and Canada)

Please have model and serial numbers available before calling.

WARRANTY: Under normal use the Company warrants to the purchaser that defects in material or workmanship will be repaired or replaced without charge for a period of 18 months from date of shipment, or 12 months from the start date of operation, whichever expires first. Any claim for warranty must be reported to the sales office where the product was purchased for authorized repair or replacement within the terms of this warranty.

Subject to State or Provincial law to the contrary, the Company will not be responsible for any expense for installation, removal from service, transportation, or damages of any type whatsoever, including damages arising from lack of use, business interruptions, or incidental or consequential damages.

The Company cannot anticipate or control the conditions of product usage and therefore accepts no responsibility for the safe application and suitability of its products when used alone or in combination with other products. Tests for the safe application and suitability of the products are the sole responsibility of the user.

This warranty will be void if, in the judgment of the Company, the damage, failure or defect is the result of:

- Vibration, radiation, erosion, corrosion, process contamination, abnormal process conditions, temperature and pressures, unusual surges or pulsation, fouling, ordinary wear and tear, lack of maintenance, incorrectly applied utilities such as voltage, air, gas, water, and others or any combination of the aforementioned causes not specifically allowed for in the design conditions or,
- Any act or omission by the Purchaser, its agents, servants or independent contractors which for greater certainty, but not so as to limit the generality of the foregoing, includes physical, chemical or mechanical abuse, accident, improper installation of the product, improper storage and handling of the product, improper application or the misalignment of parts.

No warranty applies to paint finishes except for manufacturing defects apparent within 30 days from the date of installation.

The Company neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the product(s).

The Purchaser agrees that all warranty work required after the initial commissioning of the product will be provided only if the Company has been paid by the Purchaser in full accordance with the terms and conditions of the contract.

The Purchaser agrees that the Company makes no warranty or guarantee, express, implied or statutory, (including any warranty of merchantability or warranty of fitness for a particular purpose) written or oral, of the Article or incidental labour, except as is expressed or contained in the agreement herein.

LIABILITY: Technical data contained in the catalog or on the website is subject to change without notice. The Company reserves the right to make dimensional and other design changes as required. The Purchaser acknowledges the Company shall not be obligated to modify those articles manufactured before the formulation of the changes in design or improvements of the products by the Company.

The Company shall not be liable to compensate or indemnify the Purchaser, end user or any other party against any actions, claims, liabilities, injury, loss, loss of use, loss of business, damages, indirect or consequential damages, demands, penalties, fines, expenses (including legal expenses), costs, obligations and causes of action of any kind arising wholly or partly from negligence or omission of the user or the misuse, incorrect application, unsafe application, incorrect storage and handling, incorrect installation, lack of maintenance, improper maintenance or improper operation of products furnished by the Company.



**HEATING
SYSTEMS**

Edmonton

1-780-466-3178

F 780-468-5904

5918 Roper Road

Alberta, Canada T6B 3E1

Oakville

1-800-410-3131

1-905-829-4422

F 905-829-4430

Orillia

1-877-325-3473

1-705-325-3473

F 705-325-2106

Houston

1-855-219-2101

1-281-506-2310

F 281-506-2316

Denver

1-855-244-3128

1-303-979-7339

F 303-979-7350

Section 7

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton® Hazardous Location Direct-Drive Exhaust Fans

Description

Dayton hazardous location exhaust fans are designed for ventilating spaces containing flammable or explosive vapors, gases, or dusts as defined under Article 500 of the National Electrical Code (NEC). Mount in vertical or horizontal position. Construction includes galvanized steel frame, pre-punched mounting holes, hazardous location ball bearings, and spark-resistant aluminum propeller. Motor is explosion-proof, fan-cooled enclosure with Class B insulation (if marked on motor). All fans have a maximum ambient temperature of 104°F (if marked on motor) and are UL/cUL Listed Standard 1203, NEC Class I, Groups C and D; NEC Class II, Groups F and G (Model 10E020 Groups E, F and G).

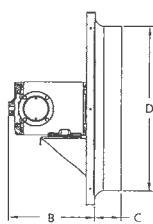


Figure 1 — Panel Fan Dimensions

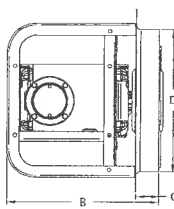
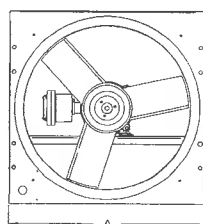
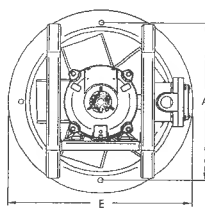


Figure 2 — Ring Fan Dimensions



Dayton Electric Mfg. Co. certifies that the fans shown herein are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.



Unpacking

1. Inspect for any damage that may have occurred during transit.
2. Shipping damage claim must be filed with carrier.
3. Check all bolts, screws, set-screws, etc. for looseness that may have occurred during transit. Retighten as required. Rotate propeller by hand to be sure it turns freely.

Dimensions and Specifications

Model	Prop. Dia.	Shaft Dia.	A	B	C	D	E	Blades	Recommended Wall Opening	
									Direct to Wall	Wall Collar, Wall Collar & Guard, or Wall Housing
PANEL FANS (See Figure 1)										
10D995, 10D996	12"	5/8"	16"	9½"	3"	12¼"	—	5	14½ x 14½"	17¼ x 17¼"
10D997, 10D998	16	5/8	20	9½	3¼	16½	—	3	18½ x 18½	21¼ x 21¼
10D999	18	5/8	22	9½	3⅛	18½	—	3	20½ x 20½	23¼ x 23¼
10E001	18	5/8	22	11	3⅞	18½	—	3	20½ x 20½	23¼ x 23¼
10E002, 10E003	20	5/8	24	11½	3¾	20½	—	3	22½ x 22½	25⅝ x 25⅝
10E004, 10E005, 10E006	24	5/8	28	11½	3⅞	24½	—	3	26½ x 26½	29⅝ x 29⅝
10E007	24	5/8	28	12	3⅞	24½	—	3	26½ x 26½	29⅝ x 29⅝
RING FANS (See Figure 2)										
10E008, 10E009	12"	5/8	14⅞"	13½"	2"	12½"	16¼"	5	13½" Dia.	—
10E010, 10E011	16	5/8	18⅞	13½	2	16½	20¼	3	17½	—
10E012, 10E013	18	5/8	20⅞	13½	2	18½	22¼	3	19½	—
10E014, 10E015	20	5/8	23	13½	2	20½	24¼	3	21½	—
10E016, 10E017, 10E018, 10E019	24	5/8	26⅞	13½	2	24½	28¼	3	25½	—
10E020	30	5/8	32	17½	2	30½	34¼	3	31½	—

Dayton® Hazardous Location Direct-Drive Exhaust Fans

Performance

Model		Prop. Dia.	HP	Motor RPM	Sones @ 0.000" SP @ 5Ft.	CFM Air Delivery @ Static Pressure Shown				
1-PHASE 115/208-230	3-PHASE 208-230/460					0.000"	0.125"	0.250"	0.375"	0.500"
PANEL FANS										
10D995	10D996	12"	1/4	1750	13.4	1347	1262	1142	947	604
10D997	10D998	16	1/4	1750	14.1	2476	2288	2061	1769	1350
10D999	10E001	18	1/3	1750	19.1	3168	2912	2612	2219	1599
10E002	10E003	20	1/2	1750	23	4557	4254	3919	3542	3101
10E004	10E006	24	1/2	1750	26	5669	4946	4010	2963	1906
10E005	10E007	24	3/4	1750	28	6317	5851	5314	4729	4117
RING FANS										
10E008	10E009	12"	1/4	1725	13.6	1147	999	803	682	—
10E010	10E011	16	1/4	1750	17.0	2153	1943	1713	1366	1125
10E012	10E013	18	1/4	1750	21	2371	2089	1756	1423	1088
10E014	10E015	20	1/4	1750	23	2429	2074	1744	1341	1098
10E016	10E018	24	1/3	1750	30	3837	3305	2637	1970	—
10E017	10E019	24	1/2	1750	26	5669	4946	4010	2963	1906
10E020	—	30	3/4	1140	28	8153	7515	6804	5957	4956

Performance certified is for installation type A: Free inlet, Free outlet. Performance ratings do not include the effects of appurtenances (accessories). Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are loudness values in fan sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: Free inlet hemispherical sone levels.

General Safety Information

⚠ DANGER Do not depend on any switch as the sole means of disconnecting power when installing or servicing the fan. Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury. Units with thermally protected motors, motor will restart without warning after thermal protector trips. Do not touch operating motor, it may be hot enough to cause injury.

⚠ DANGER Do not place any body parts or objects in fan, motor openings or drives while motor is connected to power source.

1. Read and follow all instructions and cautionary markings. Make sure electrical power source conforms to

requirements of equipment and local codes.

2. Fans should be assembled, installed and serviced by a qualified technician. Have all electrical work performed by a qualified electrician.
3. Follow all local electrical and safety codes in the United States and Canada, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA) in the United States. Ground motor in accordance with NEC Article 250 (grounding). Follow the Canadian Electric Code (CEC) in Canada.

4. All moving parts should be guarded.

⚠ CAUTION To reduce the risk of injury to persons, observe the following:

OSHA requires OSHA complying guards when fan is installed within 7 feet of floor or working level.

UL/cUL Standards require OSHA complying guards when fan is installed within 8 feet of floor or working level.

5. Make certain that the power source conforms to the requirements for the equipment.

Installation

⚠ WARNING Installation, troubleshooting and parts replacement is to be performed only by qualified personnel.

⚠ CAUTION If gases, other than clean air, are to be exhausted using the fan, then the user bears the responsibility of determining that the fan is appropriate and safe for the application.

Models 10D995 thru 10D999, 10E001 thru 10E020

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Installation (Continued)

⚠ WARNING *Not for use where paint residue can accumulate on motor.*

⚠ CAUTION *To reduce the risk of ignition of hazardous atmospheres, disconnect the fan from the supply circuit before opening. Keep the motor tightly closed with in operation.*

WALL MOUNTING

1. Move fan to the desired location and determine the method by which the fan is to be mounted.

NOTE: Wall opening size and propeller-to-shutter distance are two important dimensions for fan installation.

2. Cut an appropriate sized hole in the wall using the Dimensions table on page 1.

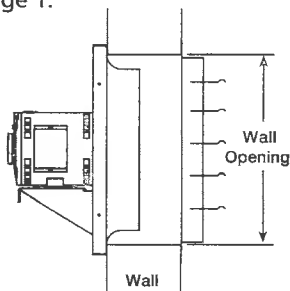


Figure 3 — Direct to Wall Installation

NOTE: Panel fans mounted to the wall require a different opening size than those mounted in collars or housings.

3. The fan should be securely mounted within a rigid framework to prevent flexing or movement of the fan frame during operation. The fan frame should be equally supported on all sides within the framework and caution should be taken to avoid twisting of the fan frame during installation.

NOTE: Allowing the fan frame to flex or move during operation will create harmful vibrations which may damage the unit.

4. Fans should be mounted in opening with 1/4" clearance around perimeter. Framing should be secured to building structure utilizing corrosion resistant fasteners (by others). Fasteners should be used in all pre-punched mounting holes.
5. Install remaining components (shutter, intake guard, etc.).
6. Check all fasteners and set screws for tightness.
7. Rotation direction of the propeller should be checked by momentarily turning the unit on. Rotation should be in the same direction as the rotation decal affixed to the unit. For 3-phase installations, fan rotation can be reversed by interchanging any two of the three electrical leads. For single phase installations follow the wiring diagram located on the motor.

ELECTRICAL CONNECTION

NOTE: Refer to motor nameplate for wiring procedures. Refer to switch manufacturer for installation and wiring procedures.

1. Motor and fan must be securely grounded (bare metal) to a suitable electric ground, such as a grounded water pipe or ground wire system.

⚠ WARNING *Comply with all local and national safety codes including the National Electrical Code (NEC) and National Fire Protection Act (NFPA).*

NOTE: Motor and switch must be classified as hazardous for fan to

be suitable for use in hazardous environments. Installation must be performed by a qualified personnel with suitable motor and disconnect for application.

2. Wire motor for desired voltage per wiring diagram on motor.
3. Wire control switches at ground level.
4. Before activating fan, inspect to be sure that there are no obstructions or debris that would interfere with the propeller.

Operation

1. Before starting up or operating your new Dayton fan, check all fasteners for tightness. In particular, check set screws in propeller hub.

While in the OFF position, or before connecting the fan to power, turn the fan propeller by hand to be sure it is not striking the orifice or any obstacle.

2. Start the fan up and shut it off immediately to check rotation of the propeller with directional arrow in the motor compartment.
3. When the fan is started, observe the operation and check for any unusual noises.
4. Motor amperage should be checked to avoid overloading of the motor. With the system in full operation measure current input to the motor and compare with the nameplate rating to determine if the BHP is operating under safe load conditions. See performance on page 2.
5. Keep inlets and approaches to fan clean and free from obstruction.

Dayton® Hazardous Location Direct-Drive Exhaust Fans

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Maintenance

⚠ WARNING Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

⚠ CAUTION Uneven cleaning of the propeller will

produce an out of balance condition that will cause vibration in the fan.

1. Depending on the usage and severity of the contaminated air, a regularly scheduled inspection for cleaning the fan propeller, housing and surrounding areas should be established.

2. Check for unusual noises when fan is running.

3. Periodically inspect and tighten set-screws.

4. Follow motor manufacturer's instructions for motor lubrication.

Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action
Fan inoperative	1. Blown fuse or breaker 2. Incorrectly wired 3. Electricity turned off	1. Replace or repair 2. Shut power OFF and check wiring for proper connections 3. Contact local power company
Airflow - Reversed air Airflow - Too much air	1. Propeller rotation reversed 2. Insufficient static pressure	1. Reverse motor rotation, rewire motor 2. Check static pressure calculation
Excessive noise or vibration	1. Foreign material inside bearing 2. Loose propeller 3. Fan not securely anchored	1. Replace bearing 2. Tighten set screws or taper bushing screws 3. Secure properly
Motor overloads or overheats	1. Incorrect propeller rotation 2. Over/Under line voltage	1. Check motor wiring 2. Contact Power Company

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. DAYTON® HAZARDOUS LOCATION DIRECT-DRIVE EXHAUST FANS, MODELS COVERED IN THIS MANUAL, ARE WARRANTED BY DAYTON ELECTRIC MFG. CO. (DAYTON) TO THE ORIGINAL USER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE YEAR AFTER DATE OF PURCHASE. ANY PART WHICH IS DETERMINED TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO AN AUTHORIZED SERVICE LOCATION, AS DAYTON DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT DAYTON'S OPTION. FOR LIMITED WARRANTY CLAIM PROCEDURES, SEE "PROMPT DISPOSITION" BELOW. THIS LIMITED WARRANTY GIVES PURCHASERS SPECIFIC LEGAL RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION.

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Product Suitability. Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While attempts are made to assure that Dayton products comply with such codes, Dayton cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, review the product applications, and all applicable national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

Prompt Disposition. A good faith effort will be made for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co.



Por favor lea y guarde estas instrucciones. Léalas cuidadosamente antes de tratar de montar, instalar, operar o dar mantenimiento al producto aquí descrito. Protéjase usted mismo y a los demás observando toda la información de seguridad. ¡El no cumplir con las instrucciones puede ocasionar daños, tanto personales como a la propiedad! Guarde estas instrucciones para referencia en el futuro.

Dayton® Ventiladores Aspirantes de Transmisión Directa para Lugares Peligrosos

Descripción

Los ventiladores aspirantes para lugares peligrosos de Dayton están diseñados para ventilar espacios que contengan vapores, gases o polvos inflamables o explosivos, según se define en el Artículo 500 de National Electrical Code (NEC). El equipo se monta en posición vertical u horizontal. La fabricación incluye un marco de acero galvanizado, orificios de montaje preperforados, rodamientos de bolas para lugares peligrosos y una hélice de aluminio resistente a las chispas. El motor es resistente a las explosiones, con caja enfriada con ventilador con aislamiento Clase B (si está marcado en el motor). Todos los ventiladores tienen una temperatura ambiente máxima de 40 °C (104 °F) (si está marcado en el motor) y cuentan con clasificación UL/cUL norma 1203, NEC Clase I, Grupos C y D; NEC Clase II, Grupos F y G (para el modelo 10E020, Grupos E, F y G).



Dayton Electric Mfg. Co. certifica que los ventiladores que aquí se muestran tienen licencia para llevar el sello AMCA. Los niveles que se muestran se basan en pruebas y procedimientos realizados según la Publicación 211 y 311 de AMCA y cumplen los requisitos del Programa Certified Ratings de AMCA.



Desembalaje

1. Revise si existen daños que se hayan producido durante el transporte.
2. Se debe presentar una queja por daños de transporte a la empresa de transporte.
3. Compruebe que ninguno de los pernos, tornillos, tornillos de fijación, etc. se haya soltado durante el transporte. Vuelva a apretarlos, según sea necesario. Gire la hélice manualmente para asegurarse de que gire libremente.

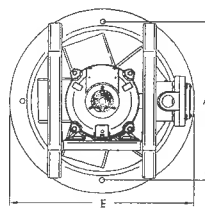
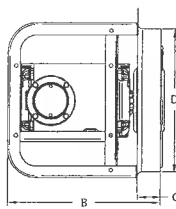
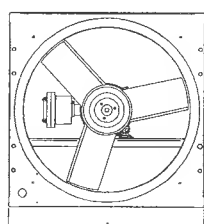
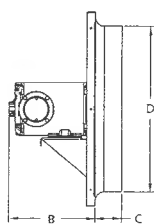


Figura 1 — Dimensiones del Ventilador de Panel Figura 2 — Dimensiones del Ventilador de Anillo

Dimensiones y Especificaciones

Modelo	Diá. de la Hélice	Diá. del Eje	A	B	C	D	E	Paletas	— Abertura Recomendada en la Pared —		
									Directo en la Pared	Collar de Pared, Collar de Pared y Protección o Carcasa de Pared	
VENTILADORES DE PANEL (Consulte la Figura 1)											
10D995, 10D996	30,5 cm	1,6 cm	40,6 cm	24,1 cm	7,6 cm	31,1 cm	—	5	36,8 x 36,8 cm	43,8 x 43,8 cm	
10D997, 10D998	40,6	1,6	50,8	24,1	8,3	41,9	—	3	47,0 x 47,0	54,0 x 54,0	
10D999	45,7	1,6	55,9	24,1	7,9	47,0	—	3	52,1 x 52,1	59,1 x 59,1	
10E001	45,7	1,6	55,9	27,9	7,9	47,0	—	3	52,1 x 52,1	59,1 x 59,1	
10E002, 10E003	50,8	1,6	61,0	29,2	9,5	52,1	—	3	57,2 x 57,2	65,1 x 65,1	
10E004, 10E005, 10E006	61,0	1,6	71,1	29,2	9,8	62,2	—	3	67,3 x 67,3	75,2 x 75,2	
10E007	61,0	1,6	71,1	30,5	9,8	62,2	—	3	67,3 x 67,3	75,2 x 75,2	
VENTILADORES DE ANILLO (Consulte la Figura 2)											
10E008, 10E009	30,5 cm	1,6 cm	37,8 cm	34,3 cm	5,1 cm	31,8 cm	41,3 cm	5	34,3 cm de diá.	—	
10E010, 10E011	40,6	1,6	47,9	34,3	5,1	41,9	51,4	3	44,5	—	
10E012, 10E013	45,7	1,6	53,0	34,3	5,1	47,0	56,5	3	49,5	—	
10E014, 10E015	50,8	1,6	58,4	34,3	5,1	52,1	61,6	3	54,6	—	
10E016, 10E017, 10E018, 10E019	61,0	1,6	68,3	34,3	5,1	62,2	71,8	3	64,8	—	
10E020	76,2	1,6	81,3	44,5	5,1	77,5	87,0	3	80,0	—	

Dayton® Ventiladores Aspirantes de Transmisión Directa para Lugares Peligrosos

Rendimiento

Modelo		Hélice Diá.	HP	RPM del Motor	Sonios @ 0,000" SP a 5 pies	Suministro de Aire en CFM a la Presión Estática que se Muestra				
Monofásico 115/208-230	Trifásicos 208-230/460					0,000"	0,125"	0,250"	0,375"	0,500"
VENTILADORES DE PANEL										
10D995	10D996	30,5 cm	1/4	1750	13,4	1347	1262	1142	947	604
10D997	10D998	40,6	1/4	1750	14,1	2476	2288	2061	1769	1350
10D999	10E001	45,7	1/3	1750	19,1	3168	2912	2612	2219	1599
10E002	10E003	50,8	1/2	1750	23	4557	4254	3919	3542	3101
10E004	10E006	61,0	1/2	1750	26	5669	4946	4010	2963	1906
10E005	10E007	61,0	3/4	1750	28	6317	5851	5314	4729	4117
VENTILADORES DE ANILLO										
10E008	10E009	30,5 cm	1/4	1725	13,6	1147	999	803	682	—
10E010	10E011	40,6	1/4	1750	17,0	2153	1943	1713	1366	1125
10E012	10E013	45,7	1/4	1750	21	2371	2089	1756	1423	1088
10E014	10E015	50,8	1/4	1750	23	2429	2074	1744	1341	1098
10E016	10E018	61,0	1/3	1750	30	3837	3305	2637	1970	—
10E017	10E019	61,0	1/2	1750	26	5669	4946	4010	2963	1906
10E020	—	76,2	3/4	1140	28	8153	7515	6804	5957	4956

El rendimiento certificado es para instalaciones de tipo A: Entrada y salida libre. El rendimiento efectivo no incluye los efectos de aditamentos (accesorios). La velocidad (RPM) que se muestra es nominal. El rendimiento se basa en la velocidad real de la prueba. El nivel de ruido que se muestra corresponde a valores de intensidad sonora en sonios del ventilador a 1,5 m (5 pies) de distancia en un campo hemisférico libre según la norma 301 de AMCA. Los valores que se muestran son para instalaciones de tipo A: Niveles de sonios hemisféricos de entrada libre.

Información de Seguridad General

⚠ PELIGRO No dependa de ningún interruptor como el único medio para desconectar la energía al momento de instalar o de realizar mantenimiento al ventilador. Siempre desconecte, bloquee y etiquete la fuente de energía antes de instalar o realizar mantenimiento. Si no se desconecta la fuente de energía, se puede provocar un incendio, descargas eléctricas o lesiones graves. En las unidades con motores con protección térmica, el motor volverá a arrancar sin advertencia después de que se active el protector térmico. No toque el motor mientras esté en funcionamiento, podría estar lo suficientemente caliente como para provocar lesiones.

⚠ PELIGRO No coloque partes del cuerpo ni objetos en el ventilador, o en los orificios o las transmisiones del motor mientras éste se encuentre conectado a la fuente de energía.

1. Lea y siga todas las instrucciones y marcas de precaución. Asegúrese de que la fuente de energía eléctrica cumpla los requisitos del equipo y los códigos locales.
2. Un técnico calificado debe realizar el montaje, la instalación y el mantenimiento de los ventiladores. Un electricista calificado debe realizar todo el trabajo eléctrico.
3. Respete todos los códigos eléctricos y de seguridad locales de los Estados Unidos y Canadá, así como también, el National Electrical Code (NEC) y la Ley de Seguridad y Salud Ocupacionales (OSHA, por sus siglas en inglés) de los Estados Unidos. Conecte el motor a tierra de acuerdo con el Artículo 250 de NEC (conexión a tierra). Respete el Código Eléctrico Canadiense (CEC, por sus siglas en inglés) en Canadá.
4. Se debe proteger todas las partes móviles.

⚠ PRECAUCION

Para reducir el riesgo de lesiones a las personas, respete lo siguiente:

OSHA exige protectores que cumplan la norma de OSHA cuando el ventilador se instale a 2,1 m (7 pies) del piso o al nivel de trabajo.

Las normas UL/cUL exigen protectores que cumplan la norma de OSHA cuando el ventilador se instale a 2,4 m (8 pies) del piso o al nivel de trabajo.

5. Asegúrese de que la fuente de energía esté en conformidad con los requisitos del equipo.

Instalación

⚠ ADVERTENCIA

Sólo personal calificado debe realizar la instalación, la solución de problemas y el reemplazo de partes.

⚠ PRECAUCION

Si se aspirarán otros gases que no sean aire limpio con el ventilador, entonces el usuario tendrá la responsabilidad de determinar y el ventilador es adecuado y seguro para la aplicación.

Modelos 10D995 a 10D999, 10E001 a 10E020

Instalación (Continuación)

⚠ ADVERTENCIA No usar donde los residuos de pintura se puedan acumular en el motor.

⚠ PRECAUCIÓN Para reducir el riesgo de encendido de atmósferas peligrosas, desconecte el ventilador del circuito de suministro antes de abrirlo. Mantenga el motor firmemente cerrado cuando esté en funcionamiento.

MONTAJE DE PARED

1. Mueva el ventilador a la ubicación deseada y determine el método mediante el cual se montará el ventilador.

NOTA: El tamaño de la abertura en la pared y la distancia de la hélice a la persiana son dos dimensiones importantes para la instalación del ventilador.

2. Perfore un orificio del tamaño adecuado en la pared con la tabla de dimensiones de la página 1.

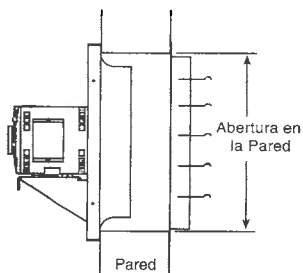


Figura 3 — Instalación Directa en la Pared

NOTA: Los ventiladores de panel que se montan en la pared requieren un tamaño diferente de abertura de aquellos que se montan en collares o carcasas.

3. El ventilador se debe montar con firmeza dentro de un armazón rígido a fin de evitar la flexión o el movimiento del bastidor del ventilador durante su funcionamiento. El bastidor del ventilador se debe apoyar de forma uniforme en todos los lados del armazón y se debe tener cuidado de evitar girar el bastidor del ventilador durante la instalación.

NOTA: Si se permite que el bastidor del ventilador se flexione o mueva durante el funcionamiento, se crearán vibraciones dañinas que pueden dañar la unidad.

4. Los ventiladores se deben montar en aberturas con una holgura de 6,5 mm (1/4 pulg.) alrededor del perímetro. El bastidor se debe fijar a la estructura del edificio con sujetadores resistentes a la corrosión (proporcionados por terceros). Se deben usar sujetadores en todos los orificios de montaje preperforados.
5. Instale los componentes restantes (persiana, protector de entrada, etc.).
6. Compruebe que todos los sujetadores y tornillos de fijación estén apretados.
7. Se debe comprobar la dirección de giro de la hélice encendiendo momentáneamente la unidad. El giro de la hélice debe ser en la misma dirección que indica la calcomanía de giro adherida a la unidad. Para instalaciones trifásicas, el giro del ventilador se puede invertir intercambiando dos de los tres conductores eléctricos. Para instalaciones monofásicas siga el diagrama del cableado que se encuentra en el motor.

CONEXIÓN ELÉCTRICA

NOTA: Consulte la placa de identificación del motor para conocer los procedimientos de cableado. Consulte al fabricante del interruptor para obtener los procedimientos de instalación y cableado.

1. El motor y el ventilador deben estar conectados a tierra de manera segura (en metal desnudo) en una conexión eléctrica a tierra adecuada, como una tubería de agua subterránea o un sistema de cable de conexión a tierra.

⚠ ADVERTENCIA Respete todos los códigos de seguridad locales y nacionales, entre los que se encuentran el National Electrical Code (NEC) y la Ley Nacional de Protección Contra Incendios (NFPA, por sus siglas en inglés).

NOTA: El motor y el interruptor se deben clasificar como peligrosos para su uso con ventiladores en ambientes peligrosos. La instalación la debe realizar personal calificado con un motor y desconexión correctos para la aplicación.

2. Conecte el motor en el voltaje deseado según el diagrama de cableado del motor.
3. Conecte los interruptores de control al nivel del suelo.
4. Antes de activar el ventilador, inspeccione para asegurarse de que no existan obstrucciones ni suciedad que pudiese interferir con la hélice.

Funcionamiento

1. Antes de arrancar u operar el nuevo ventilador Dayton, revise que estén apretados todos los sujetadores. En particular, revise los tornillos de fijación en el cubo de la hélice.
Mientras se encuentre en la posición OFF (Apagado) o antes de conectar el ventilador a la energía, gire la hélice del ventilador con la mano para asegurarse de que no entre en contacto con el orificio o cualquier obstáculo.
2. Encienda el ventilador y apáguelo inmediatamente para revisar el giro de la hélice con la flecha direccional en el compartimiento del motor.
3. Al arrancar el ventilador, observe el funcionamiento y la presencia de cualquier ruido anormal.
4. Se debe verificar el amperaje del motor para evitar sobrecargarlo. Con el sistema a pleno funcionamiento, mida la entrada de corriente hacia el motor y compárela con la de la placa de identificación para determinar si el BHP funciona en condiciones de carga seguras. Consulte el rendimiento de la página 2.
5. Mantenga las entradas y las vías de acceso al ventilador limpias y libres de obstrucciones.

Dayton® Ventiladores Aspirantes de Transmisión Directa para Lugares Peligrosos

Mantenimiento

ADVERTENCIA Siempre desconecte, bloquee y etiquete la fuente de energía antes de instalar o realizar mantenimiento. Si no se desconecta la fuente de energía, se puede provocar un incendio, descargas eléctricas o lesiones graves.

PRECAUCIÓN

La limpieza desigual de la hélice producirá una condición fuera de equilibrio que provocará vibraciones en el ventilador.

1. Dependiendo del uso y la densidad del aire contaminado, se debe establecer un programa de inspección regular para limpiar la hélice del ventilador, la carcasa y las áreas circundantes.

2. Cuando esté funcionando el ventilador, revise si existen ruidos anormales.
3. Inspeccione de manera periódica y apriete los tornillos de fijación.
4. Siga las instrucciones del fabricante del motor para su lubricación.

Tabla de Solución de Problemas

Síntoma	Causas Posibles	Medida Correctiva
No funciona el ventilador	<ol style="list-style-type: none"> 1. Se quemó un fusible o cortacircuitos 2. Se conectó incorrectamente 3. Se cortó la electricidad 	<ol style="list-style-type: none"> 1. Reemplácelo o repárelo 2. Corte la energía y revise que el cableado esté conectado correctamente 3. Comuníquese con la compañía local de electricidad
Flujo de aire está invertido Flujo de aire es demasiado	<ol style="list-style-type: none"> 1. El giro de la hélice está invertido 2. Presión estática insuficiente 	<ol style="list-style-type: none"> 1. Invierta el giro del motor y vuelva a conectar el motor 2. Compruebe el cálculo de la presión estática
Ruido o vibración excesiva	<ol style="list-style-type: none"> 1. Materiales extraños dentro del rodamiento 2. La hélice está suelta 3. El ventilador no anclado con firmeza 	<ol style="list-style-type: none"> 1. Reemplace el rodamiento 2. Apriete los tornillos de fijación o los tornillos de los bujes cónicos 3. Fíjelo bien
Sobrecarga o sobrecalentamiento del motor	<ol style="list-style-type: none"> 1. Giro incorrecto de la hélice 2. Voltaje de línea excesivo o deficiente 	<ol style="list-style-type: none"> 1. Revise el cableado del motor 2. Comuníquese con la compañía de electricidad

GARANTÍA LIMITADA

GARANTÍA LIMITADA DE UN AÑO DAYTON. DAYTON® VENTILADORES ASPIRANTES DE TRANSMISIÓN DIRECTA PARA LUGARES PELIGROSOS, LOS MODELOS INCLUIDOS EN ESTE MANUAL, TIENEN GARANTÍA DE DAYTON ELECTRIC MFG. CO. (DAYTON) POR DEFECTOS DE FABRICACIÓN O MATERIALES DURANTE SU USO NORMAL DURANTE UN AÑO A PARTIR DE LA FECHA DE COMPRA. TODA PIEZA QUE SE DEMUESTRE QUE TENGA DEFECTOS DE MATERIAL O DE MANO DE OBRA Y SE DEVUELVA A UN LUGAR DE SERVICIO TÉCNICO AUTORIZADO, DESIGNADO POR DAYTON, COSTOS DE TRANSPORTE PREPAGADOS, SERÁ COMO RECURSO EXCLUSIVO, REPARADA O REEMPLAZADA SEGÚN EL CRITERIO DE DAYTON. POR DEMANDA DE GARANTÍA LIMITADA, VER DISPOSICIÓN INMEDIATA A CONTINUACIÓN. ESTA GARANTÍA LIMITADA LE DA AL COMPRADOR DERECHOS LEGALES ESPECÍFICOS QUE VARIAN DE UNA JURISDICCIÓN A OTRA.

RESTRICCIÓN DE RESPONSABILIDAD. HASTA DONDE LO PERMITA LA LEGISLACIÓN PERTINENTE, DAYTON NIEGA EXPRESAMENTE SU RESPONSABILIDAD EN DAÑOS DE INDIRECTOS O EMERGENTES. LA RESPONSABILIDAD DE DAYTON EN TODOS LOS CASOS SE LIMITA AL PRECIO DE COMPRA Y NO DEBE EXCEDER ÉSTE.

DENEGACIÓN DE GARANTÍA. SE HA HECHO UN GRAN ESFUERZO POR PROPORCIONAR INFORMACIÓN SOBRE EL PRODUCTO E ILUSTRAR LOS PRODUCTOS DE MANERA PRECISA EN ESTE DOCUMENTO; SIN EMBARGO, TAL INFORMACIÓN E ILUSTRACIONES TIENEN EL ÚNICO PROPÓSITO DE IDENTIFICACIÓN, Y NO EXPRESA NI IMPLICA UNA GARANTÍA DE QUE LOS PRODUCTOS SEAN DE BUENA CALIDAD, O QUE SE ADAPTEN A UN PROPÓSITO EN ESPECIAL, NI QUE LOS PRODUCTOS ESTÉN NECESARIAMENTE DE ACUERDO CON LAS ILUSTRACIONES O DESCRIPCIONES. CON EXCEPCIÓN DE LO QUE SE DETALLA A CONTINUACIÓN, NINGUNA GARANTÍA NI AFIRMACIÓN DE HECHO, EXPRESA O IMPLÍCITA, APARTE DE LO QUE SE INCLUYE EN LA "GARANTÍA LIMITADA" ESTÁ HECHA O AUTORIZADA POR DAYTON.

Asesoría Técnica y Recomendaciones, Exención de Responsabilidad. No obstante las prácticas, tratos o costumbre del oficio anteriores, las ventas no incluirán asesoría o asistencia técnica, o el diseño del sistema. Dayton no asume obligaciones ni responsabilidades debido a recomendaciones, opiniones o asesorías no autorizadas en cuanto a la elección, la instalación o el uso de productos.

Aptitud del Producto. Muchas jurisdicciones tienen códigos y ordenanzas que regulan las ventas, la construcción, la instalación, y/o el uso de productos para ciertos propósitos, que pueden variar con respecto a los de las áreas vecinas. Si bien se hacen intentos para garantizar que los productos Dayton cumplan tales códigos, Dayton no garantiza su cumplimiento y no puede ser responsable por la manera en que se instalen o usen los productos. Antes de la compra y del uso de un producto, revise sus aplicaciones y todos los códigos, y reglamentos nacionales y locales pertinentes, y asegúrese de que el producto, su instalación y su uso estén en conformidad con ellos.

Ciertos aspectos de la denegación no se aplican a productos del consumidor; por ej., (a) algunas jurisdicciones no permiten la exclusión o la limitación de daños accidentales o resultantes, por lo que la limitación o exclusión mencionadas anteriormente, pueden no aplicarse a usted; (b) además, algunas jurisdicciones no permiten una limitación sobre la duración de una garantía implícita, en consecuencia, la limitación mencionada anteriormente puede no aplicarse a usted; y (c) por ley, durante el periodo de esta Garantía Limitada, cualquier garantía implícita de comerciabilidad o aptitud para un propósito en particular que se aplique a productos del consumidor adquiridos por consumidores, no puede ser excluida ni rechazada.

Disposición Inmediata. Se realizará un esfuerzo de buena fe para corregir o realizar otros ajustes de manera oportuna con respecto a cualquier producto que se demuestra que tenga defectos dentro de la garantía limitada. En caso de existir un producto con fallas dentro de la garantía limitada, escriba o llame al distribuidor a quien le compró el producto. Este le indicará qué hacer. Si el problema no se resuelve de manera satisfactoria, escriba a Dayton a la dirección que figura a continuación, indicando nombre del distribuidor, dirección, fecha y número de la factura del distribuidor, y describa la naturaleza de la falla. Título y riesgo de pérdida pasan al comprador en la entrega a la compañía de transporte. Si el producto se dañó durante el transporte, presente el reclamo al transportista.

Fabricado para Dayton Electric Mfg. Co.

Dayton®

Veuillez lire et conserver ces instructions. Lisez avec attention avant d'essayer d'assembler, d'installer, d'utiliser ou d'entretenir le produit décrit. Pour votre protection et celle des autres, respectez toutes les informations de sécurité. Toute infraction à ces instructions peut provoquer des blessures corporelles et des dommages matériels ! Conservez ces instructions pour consultation ultérieure.

Ventilateurs d'extraction à entraînement direct pour zone dangereuse Dayton®

Description

Les ventilateurs d'extraction à entraînement direct pour zone dangereuse Dayton sont conçus pour la ventilation d'espaces contenant des vapeurs, gaz ou poussières inflammables ou explosifs en vertu de l'Article 500 du National Electrical Code (NEC). Ils se posent en position verticale ou horizontale. Ils comportent un bâti en acier galvanisé, des trous de fixation préperforés, des roulements à billes pour zones dangereuses et une hélice en aluminium anti-étincelles. Le moteur est dans une enceinte antidéflagrante refroidie par ventilateur avec isolation de Classe B (si cela est marqué sur le moteur). Tous les ventilateurs sont conçus pour une température ambiante maximale de 40 °C (104 °F) (si cela est marqué sur le moteur) et sont homologués UL/cUL, norme 1203, NEC Classe I, Groupes C et D; NEC Classe II, Groupes F et G (modèle 10E020 Groupes E, F et G).

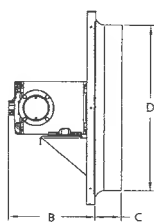


Figure 1 — Dimensions du ventilateur sur panneau

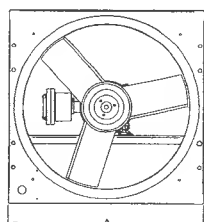


Figure 2 — Dimensions du ventilateur sur couronne



Dayton Electric Mfg. Co. certifie que les ventilateurs décrits aux présentes sont autorisés à porter le sceau de l'AMCA. Les caractéristiques indiquées ici reposent sur des essais et procédures effectués conformément à la Publication 211 et

à la Publication 311 de l'AMCA et répondent aux exigences du programme de certification des caractéristiques de l'AMCA.



Déballage

1. Vérifier l'absence de tout dommage éventuellement causé par le transport.
2. Les réclamations pour dommages dus au transport sont à adresser au transporteur.
3. Vérifier que les boulons, vis, vis de calage, etc. ne se sont pas desserrés durant le transport. Resserrer le cas échéant. Actionner l'hélice à la main pour s'assurer qu'elle tourne librement.

Dimensions et caractéristiques

Modèle	Dia. pales	Dia. arbre	A	B	C	D	E	Pales	— Ouverture murale conseillée — Manchon mural, manchon mural et grille ou caisson mural		
									Direct sur mur		
VENTILATEURS SUR PANNEAU (voir Figure 1)											
10D995, 10D996	30,5 cm	1,6 cm	40,6 cm	24,1 cm	7,6 cm	31,1 cm	—	5	36,8 x 36,8 cm	43,8 x 43,8 cm	
10D997, 10D998	40,6	1,6	50,8	24,1	8,3	41,9	—	3	47,0 x 47,0	54,0 x 54,0	
10D999	45,7	1,6	55,9	24,1	7,9	47,0	—	3	52,1 x 52,1	59,1 x 59,1	
10E001	45,7	1,6	55,9	27,9	7,9	47,0	—	3	52,1 x 52,1	59,1 x 59,1	
10E002, 10E003	50,8	1,6	61,0	29,2	9,5	52,1	—	3	57,2 x 57,2	65,1 x 65,1	
10E004, 10E005, 10E006	61,0	1,6	71,1	29,2	9,8	62,2	—	3	67,3 x 67,3	75,2 x 75,2	
10E007	61,0	1,6	71,1	30,5	9,8	62,2	—	3	67,3 x 67,3	75,2 x 75,2	
VENTILATEURS SUR COURONNE (voir Figure 2)											
10E008, 10E009	30,5 cm	1,6 cm	37,8 cm	34,3 cm	5,1 cm	31,8 cm	41,3 cm	5	34,3 cm de dia.	—	
10E010, 10E011	40,6	1,6	47,9	34,3	5,1	41,9	51,4	3	44,5	—	
10E012, 10E013	45,7	1,6	53,0	34,3	5,1	47,0	56,5	3	49,5	—	
10E014, 10E015	50,8	1,6	58,4	34,3	5,1	52,1	61,6	3	54,6	—	
10E016, 10E017, 10E018, 10E019	61,0	1,6	68,3	34,3	5,1	62,2	71,8	3	64,8	—	
10E020	76,2	1,6	81,3	44,5	5,1	77,5	87,0	3	80,0	—	

Ventilateurs d'extraction à entraînement direct pour zone dangereuse Dayton®

Performances

Modèle		Dia. pales	HP	Moteur tr/min	Sones à 0,000"	Débit d'air (pi³/min) à la pression statique indiquée				
MONOPHASE 115/208-230 V	TRIPHASE 208-230/460 V				SP à 5 pi	0,000"	0,125"	0,250"	0,375"	0,500"
VENTILATEURS SUR PANNEAU										
10D995	10D996	12"	1/4	1750	13,4	1347	1262	1142	947	604
10D997	10D998	16	1/4	1750	14,1	2476	2288	2061	1769	1350
10D999	10E001	18	1/3	1750	19,1	3168	2912	2612	2219	1599
10E002	10E003	20	1/2	1750	23	4557	4254	3919	3542	3101
10E004	10E006	24	1/2	1750	26	5669	4946	4010	2963	1906
10E005	10E007	24	3/4	1750	28	6317	5851	5314	4729	4117
VENTILATEURS SUR COURONNE										
10E008	10E009	12"	1/4	1725	13,6	1147	999	803	682	—
10E010	10E011	16	1/4	1750	17,0	2153	1943	1713	1366	1125
10E012	10E013	18	1/4	1750	21	2371	2089	1756	1423	1088
10E014	10E015	20	1/4	1750	23	2429	2074	1744	1341	1098
10E016	10E018	24	1/3	1750	30	3837	3305	2637	1970	—
10E017	10E019	24	1/2	1750	26	5669	4946	4010	2963	1906
10E020	—	30	3/4	1140	28	8153	7515	6804	5957	4956

Valeurs certifiées pour une installation de type A : admission libre, refoulement libre. Les valeurs indiquées ne tiennent pas compte des effets des équipements connexes (accessoires). La vitesse (tr/min) indiquée est nominale. Valeurs basées sur la vitesse effective lors de l'essai. Les données acoustiques indiquées sont des valeurs de sonie exprimées en sonies ventilateur à 1,5 m (5 pieds) en champ libre hémisphérique calculés selon la norme AMCA 301. Valeurs indiquées pour une installation de type A : niveaux de sonie hémisphérique à l'admission libre.

Informations générales sur la sécurité

⚠ DANGER Ne pas dépendre d'un interrupteur comme unique moyen de coupure de l'alimentation lors de l'installation ou de l'entretien de l'appareil. Pour écarter les risques d'incendie, de choc électrique ou de blessure grave, veiller à toujours débrancher, verrouiller et étiqueter la source de courant avant l'installation ou l'entretien. Sur les modèles équipés d'un moteur à protection thermique, le moteur redémarre sans avertir après le déclenchement de la protection thermique. Ne pas toucher le moteur en marche, il peut être assez chaud pour causer des lésions.

⚠ DANGER Ne pas placer de parties du corps ni d'objets dans le ventilateur, les ouvertures du moteur ou l'entraînement si l'appareil est raccordé à une source de courant.

1. Lire et respecter toutes les instructions et marques de mise en garde. S'assurer que la source d'alimentation est conforme aux exigences pour le matériel et à la réglementation en vigueur.
2. Les ventilateurs doivent être assemblés, posés et entretenus par un technicien qualifié. Confier tous les travaux d'électricité à un électricien qualifié.
3. Respecter tous les codes d'électricité et de sécurité en vigueur aux États-Unis et au Canada, ainsi que le National Electrical Code (NEC) et l'Occupational Safety and Health Act (OSHA) aux États-Unis. Mettre le moteur à la terre conformément à l'Article 250 (mise à la terre) du NEC. Au Canada, respecter le Code canadien de l'électricité.
4. Toutes les pièces en mouvement doivent être protégées.

⚠ ATTENTION Pour réduire le risque de blessure corporelle, respecter ce qui suit :

L'OSHA exige des protections agréées OSHA lorsque l'appareil est posé à moins de 2,1 m (7 pi) du niveau du sol ou de travail.

Les normes UL/UL exigent des protections agréées OSHA lorsque l'appareil est posé à moins de 2,4 m (8 pi) du niveau du sol ou de travail.

5. S'assurer que la source d'alimentation est conforme aux exigences pour le matériel.

Pose

⚠ AVERTISSEMENT La pose, le dépannage et le remplacement de pièces doivent être effectués exclusivement par du personnel qualifié.

⚠ ATTENTION Si des gaz autres que de l'air propre doivent être évacués au moyen de ce ventilateur, alors l'utilisateur a pour responsabilité de déterminer si le ventilateur est adapté et sûr pour l'application considérée.

Modèles 10D995 à 10D999, 10E001 à 10E020

Pose (suite)

⚠ AVERTISSEMENT

Ne pas utiliser aux endroits où des résidus de peinture peuvent s'accumuler sur le moteur.

⚠ ATTENTION

Pour réduire le risque d'inflammation dans les atmosphères dangereuses, débrancher le ventilateur du circuit d'alimentation avant de l'ouvrir. Garder le moteur hermétiquement fermé lorsqu'il est en marche.

POSE MURALE

1. Amener le ventilateur à l'emplacement souhaité et déterminer par quelle méthode il doit être monté.

REMARQUE : La taille de l'ouverture murale et la distance hélice-persiennes sont deux dimensions importantes pour la pose du ventilateur.

2. Découper une ouverture de taille adaptée dans le mur en se basant sur la table Dimensions à la page 1.

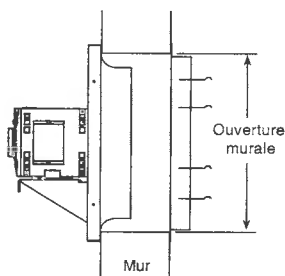


Figure 3 — Pose murale directe

REMARQUE : Les ventilateurs sur panneau posés au mur nécessitent une ouverture de taille différente que ceux posés dans des manchons ou caissons.

3. Le ventilateur doit être solidement fixé à l'intérieur d'une ossature pour éviter tout mouvement ou flexion du cadre de ventilateur durant la marche. Le cadre de ventilateur doit être soutenu de façon uniforme sur tous les côtés à l'intérieur de l'ossature. Par ailleurs, prendre garde à éviter toute torsion du cadre de ventilateur durant la pose.

REMARQUE : La flexion ou le déplacement du cadre de ventilateur durant la marche produit des vibrations dommageables pour l'appareil.

4. Le ventilateur doit être posé dans l'ouverture avec un espacement de 6,5 mm (1/4 po) sur le périmètre. L'encadrement doit être fixé à la structure du bâtiment à l'aide de vis anticorrosion (non fournies). Les vis doivent être posées à travers tous les trous de fixation prépoçonnés.
5. Poser le reste des éléments (persiennes, grille d'admission, etc.).
6. Vérifier le bon serrage de toute la visserie.
7. Vérifier le sens de rotation de l'hélice en mettant brièvement l'appareil en marche. Le sens de rotation doit être celui indiqué sur l'autocollant apposé sur l'appareil. Sur les installations triphasées, le sens de rotation peut être inversé par l'inversion de deux quelconques des trois fils électriques. Pour les installations monophasées, suivre le schéma de câblage figurant sur le moteur.

RACCORDEMENT ÉLECTRIQUE

REMARQUE : Voir le câblage sur la plaque signalétique du moteur. Se reporter aux procédures de pose et de câblage du fabricant de commutateur.

1. Le moteur et le ventilateur doivent être solidement reliés à la terre (métal nu) via une masse électrique adaptée, telle qu'une conduite d'eau reliée à la terre ou un circuit de terre.

⚠ AVERTISSEMENT

Respecter tous les codes de sécurité en vigueur, notamment le National Electrical Code (NEC) et le National Fire Protection Act (NFPA).

REMARQUE : Le moteur et le commutateur doivent être classés « milieux dangereux » pour que le ventilateur soit utilisable dans des milieux dangereux. La pose doit être effectuée par du personnel qualifié, avec un moteur et un sectionneur adaptés pour l'application considérée.

2. Câbler le moteur pour la tension souhaitée conformément au schéma de câblage sur le moteur.
3. Câbler les commutateurs de commande au niveau du sol.
4. Avant d'activer le ventilateur, vérifier qu'il n'y a aucune obstruction ni débris susceptibles d'entraver l'hélice.

Fonctionnement

1. Avant de démarrer et d'utiliser le nouveau ventilateur Dayton, vérifier le bon serrage de toute la visserie. En particulier, contrôler les vis de calage du moyeu d'hélice.

En position Arrêt, ou avant de brancher l'alimentation du ventilateur, tourner l'hélice à la main pour s'assurer qu'elle ne heurte pas l'orifice ni aucun autre obstacle.

2. Démarrer le ventilateur et l'arrêter immédiatement pour vérifier que le sens de rotation de l'hélice correspond à la flèche dans le compartiment du moteur.
3. Lorsque le ventilateur est en marche, observer son fonctionnement et vérifier l'absence de bruits inhabituels.
4. Vérifier l'intensité consommée par le moteur pour éviter sa surcharge. Le système étant pleinement en marche, mesurer l'intensité de courant vers le moteur et la comparer à l'intensité nominale figurant sur la plaque signalétique pour vérifier s'il fonctionne dans des conditions de charge admissibles. Voir les performances à la page 2.
5. Garder les ouvertures d'admission et les approches du ventilateur propres et non obstruées.

Ventilateurs d'extraction à entraînement direct pour zone dangereuse Dayton®

Entretien

⚠ AVERTISSEMENT

Pour écarter les risques d'incendie, de choc électrique ou de blessure grave, veiller à toujours débrancher, verrouiller et étiqueter la source de courant avant l'installation ou l'entretien.

⚠ AVERTISSEMENT

Un nettoyage irrégulier de l'hélice produit un déséquilibre qui provoque des vibrations du ventilateur.

1. En fonction de l'utilisation et du degré de saleté de l'air, il convient d'établir un contrôle à intervalles réguliers pour le nettoyage de l'hélice, du caisson et des surfaces avoisinantes.

2. Vérifier l'absence de bruits inhabituels durant la marche du ventilateur.
3. Contrôler et resserrer régulièrement toute la visserie.
4. Suivre les instructions du fabricant du moteur concernant sa lubrification.

Dépannage

Symptôme	Cause(s) possible(s)	Action corrective
Le ventilateur ne fonctionne pas	1. Fusible grillé ou disjoncteur ouvert 2. Mauvais câblage 3. Électricité coupée	1. Changer ou réparer 2. Couper l'alimentation et contrôler le bon raccordement des câbles 3. Communiquer avec la compagnie d'électricité
Écoulement d'air inversé	1. L'hélice tourne à l'envers	1. Inverser la rotation du moteur, recâbler le moteur
Débit d'air excessif	2. Pression statique insuffisante	2. Vérifier les calculs de pression statique
Bruit ou vibration excessifs	1. Matières étrangères dans un palier 2. Hélice desserrée 3. Ventilateur pas solidement ancré	1. Changer le palier 2. Serrer les vis de calage ou les vis de bague conique 3. Fixer correctement
Surcharge ou surchauffe du moteur	1. Rotation incorrecte de l'hélice 2. Sur- ou sous-tension secteur	1. Contrôler le câblage du moteur 2. Communiquer avec la compagnie d'électricité

GARANTIE LIMITÉE

GARANTIE LIMITÉE DE UN AN DE DAYTON. LES MODÈLES VENTILATEURS D'EXTRACTION À ENTRAÎNEMENT DIRECT POUR ZONE DANGEREUSE DAYTON® COUVERTS DANS CE MANUEL SONT GARANTIS À L'UTILISATEUR D'ORIGINE PAR DAYTON ELECTRIC MFG. CO. (DAYTON), CONTRE TOUT DÉFAUT DE FABRICATION OU DE MATÉRIAUX, LORS D'UNE UTILISATION NORMALE, ET CELA PENDANT UN AN APRÈS LA DATE D'ACHAT. TOUTE PIÈCE, DONT LES MATÉRIAUX OU LA MAIN D'ŒUVRE SERONT JUGÉS DÉFECTUEUX, ET QUI SERA RENVOYÉE PORT PAYÉ, À UN CENTRE DE RÉPARATION AUTORISÉ PAR DAYTON, SERA, À TITRE DE SOLUTION EXCLUSIVE, SOIT RÉPARÉE, SOIT REMPLACÉE PAR DAYTON. POUR LE PROCÉDÉ DE RÉCLAMATION SOUS GARANTIE LIMITÉE, REPOSEZ-VOUS À LA CLAUSE DE « DISPOSITION PROMPTE » CI-DESSOUS. CETTE GARANTIE LIMITÉE DONNE AUX ACHETEURS DES DROITS LÉGAUX SPÉCIFIQUES QUI VARIENT DE JURIDICTION À JURIDICTION.

LIMITES DE RESPONSABILITÉ. LA RESPONSABILITÉ DE DAYTON, DANS LES LIMITES PERMISES PAR LA LOI, POUR LES DOMMAGES INDIRECTS OU FORTUITS EST EXPRESSEMENT DÉNIÉE. DANS TOUS LES CAS LA RESPONSABILITÉ DE DAYTON EST LIMITÉE ET NE DÉPASSERA PAS LA VALEUR DU PRIX D'ACHAT PAYÉ.

DÉSISTEMENT DE GARANTIE. DE DILIGENTS EFFORTS SONT FAITS POUR FOURNIR AVEC PRÉCISION LES INFORMATIONS ET ILLUSTRATIONS DES PRODUITS DÉCRITS DANS CETTE BROCHURE ; CEPENDANT, DE TELLES INFORMATIONS ET ILLUSTRATIONS SONT POUR LA SEULE RAISON D'IDENTIFICATION, ET N'EXPRIMENT NI N'IMPLIQUENT QUE LES PRODUITS SONT COMMERCIALISABLES, OU ADAPTABLES À UN BESOIN PARTICULIER, NI QUE CES PRODUITS SONT NÉCESSAIREMENT CONFORMES AUX ILLUSTRATIONS OU DESCRIPTIONS. SAUF POUR CE QUI SUIT, AUCUNE GARANTIE OU AFFIRMATION DE FAIT, ÉNONCÉE OU IMPLICITE, AUTRE QUE CE QUI EST ÉNONCÉ DANS LA « GARANTIE LIMITÉE » CI-DESSUS N'EST FAITE OU AUTORISÉE PAR DAYTON.

Désistement sur les conseils techniques et les recommandations. Peu importe les pratiques ou négociations antérieures ou les usages commerciaux, les ventes n'incluent pas l'offre de conseils techniques ou d'assistance ou encore de conception de système. Dayton n'a aucune obligation ou responsabilité quant aux recommandations non autorisées, aux opinions et aux suggestions relatives au choix, à l'installation ou à l'utilisation des produits.

Conformité du produit. De nombreuses juridictions ont des codes et règlements qui gouvernent les ventes, constructions, installations et/ou utilisations de produits pour certains usages qui peuvent varier par rapport à ceux d'une zone voisine. Bien que Dayton essaie de s'assurer que ses produits s'accordent avec ces codes, Dayton ne peut garantir cet accord, et ne peut être jugée responsable pour la façon dont le produit est installé ou utilisé. Avant l'achat et l'usage d'un produit, revoir les applications de ce produit, ainsi que tous les codes et règlements nationaux et locaux applicables, et s'assurer que le produit, son installation et son usage sont en accord avec eux.

Certains aspects de désistement ne sont pas applicables aux produits pour consommateur ; ex : (a) certaines juridictions ne permettent pas l'exclusion ou la limitation des dommages indirects ou fortuits et donc la limitation ou exclusion ci-dessus peut ne pas s'appliquer dans le cas présent ; (b) également, certaines juridictions n'autorisent pas de limitations de durée de la garantie implicite, en conséquence, la limitation ci-dessus peut ne pas s'appliquer dans le cas présent ; et (c) par force de loi, pendant la période de cette Garantie Limitée, toutes garanties implicites de commerciabilité ou d'adaptabilité à un besoin particulier applicables aux produits de consommateurs achetés par des consommateurs, peuvent ne pas être exclues ni autrement désistées.

Disposition prompt. Un effort de bonne foi sera fait pour corriger ou ajuster rapidement tout produit prouvé défectueux pendant la période de la garantie limitée. Pour tout produit considéré défectueux pendant la période de garantie limitée, contacter tout d'abord le concessionnaire où l'appareil a été acheté. Le concessionnaire doit donner des instructions supplémentaires. S'il est impossible de résoudre le problème de façon satisfaisante, écrire à Dayton à l'adresse ci-dessous, en indiquant le nom et l'adresse du concessionnaire, la date et le numéro de la facture du concessionnaire, et en décrivant la nature du défaut. Le titre et le risque de perte passent à l'acheteur au moment de la livraison par le transporteur. Si le produit a été endommagé pendant le transport, une réclamation doit être faite auprès du transporteur.

Fabriqués pour Dayton Electric Mfg. Co.

Dayton®

BACKDRAFT DAMPERS

This model is a non-flanged horizontal mount exhaust backdraft damper. The frame is galvanized steel with aluminum blades. The blades have a felt seal on the leading edge for quiet closing and better protection from the weather. Spring assisted to allow blades to open quickly. Ideal for use in roof curbs, duct work, or wall collars when using a fan or power roof ventilator. Recommended for horizontal mount exhaust applications but it is also available for vertical mount.

Sizes available:

– 8" W x 8" H to 48" W x 60" H.

Multiple panels for sizes over 48" x 60".

Maximum free area velocity:

– 2000 FPM on sizes up to 19".

– 2250 FPM on sizes 20" and above.



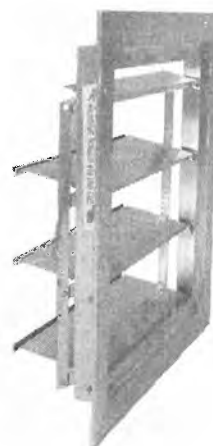
2FTW8

SUPPLY FAN WALL SHUTTER

This model is a rear flanged gravity supply (intake) wall shutter. The frame and blades are mill finish aluminum with a galvanized reinforcement strip on each blade for added strength and counter balancing efficiency. The blades have a felt seal on the leading edge for quiet closing and better protection from the weather. Ideal for use with belt-driven centrifugal wall ventilators. Recommended for vertical mount supply (intake) only. The blades will pivot at the bottom and fall with gravity to open. Spring-assist to close.

Sizes available – 8" W x 8" H to 50" W x 50" H.

Maximum free area velocity – 2250 FPM.



4HX74

ECONOMY WALL EXHAUST SHUTTERS

This model is a rear flanged low velocity gravity exhaust shutter. The frame is galvanized steel with mill finish aluminum blades. The blades have a felt seal on the leading edge for quiet closing and better protection from the weather. Ideal for use with direct-drive or belt-driven exhaust fans. Recommended for vertical mount exhaust applications only.

Sizes available – 8" W x 8" H to 24" W x 24" H.

Maximum free area velocity – 2000 FPM.



2C520

DAMPER SIZE (IN.)	OVERALL SIZE (IN.)	ITEM NO.
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NO FLANGE, EXHAUST BACKDRAFT DAMPERS

7 3/4 X 7 3/4	7 3/4 X 7 3/4	3HHL4
9 3/4 X 9 3/4	9 3/4 X 9 3/4	2FTW8
11 3/4 X 11 3/4	11 3/4 X 11 3/4	2FTX4
13 3/4 X 13 3/4	13 3/4 X 13 3/4	2FTX5
15 3/4 X 15 3/4	15 3/4 X 15 3/4	3HHL5
17 3/4 X 17 3/4	17 3/4 X 17 3/4	2FTU9
19 3/4 X 19 3/4	19 3/4 X 19 3/4	3HHL6
23 3/4 X 23 3/4	23 3/4 X 23 3/4	2FTV7
27 3/4 X 27 3/4	27 3/4 X 27 3/4	3HHL7
29 3/4 X 29 3/4	29 3/4 X 29 3/4	3HHL8
33 3/4 X 33 3/4	33 3/4 X 33 3/4	3HHL9
35 3/4 X 35 3/4	35 3/4 X 35 3/4	3HHL1
39 3/4 X 39 3/4	39 3/4 X 39 3/4	3HHL2
41 3/4 X 41 3/4	41 3/4 X 41 3/4	6WRK7
47 3/4 X 47 3/4	47 3/4 X 47 3/4	3HHL3
49 3/4 X 49 3/4	49 3/4 X 49 3/4	6WRK8
55 3/4 X 55 3/4	55 3/4 X 55 3/4	5NKN7
59 3/4 X 59 3/4	59 3/4 X 59 3/4	5NKN8
61 3/4 X 61 3/4	61 3/4 X 61 3/4	6WRK9
63 3/4 X 63 3/4	63 3/4 X 63 3/4	5NKN9

FLANGED, EXHAUST BACKDRAFT DAMPERS

9 1/2 X 9 1/2	11 1/2 X 11 1/2	3TZ50
12 X 12	14 X 14	4HX64
15 X 15	17 X 17	4HX65
19 X 19	21 X 21	4HX66
23 X 23	25 X 25	4HX67
27 X 27	29 X 29	4HX68
35 X 35	37 X 37	4HX69
39 X 39	41 X 41	4HX70
50 X 50	52 X 52	4HX71

WALL MOUNT, SUPPLY BACKDRAFT DAMPERS

8 X 8	10 3/4 X 10 3/4	4HX72
10 X 10	12 3/4 X 12 3/4	4HX73
11 X 11	13 3/4 X 13 3/4	4HX33
12 X 12	14 3/4 X 14 3/4	4HX74
13 X 13	15 3/4 X 15 3/4	4HX75
14 X 14	16 3/4 X 16 3/4	4HX76
15 X 15	17 3/4 X 17 3/4	4HX77
17 X 17	19 3/4 X 19 3/4	5NKN4
20 X 20	22 3/4 X 22 3/4	5NKN5
25 X 25	27 3/4 X 27 3/4	5NKN6

FITS FAN DIA. (IN.)	OPENING REQ. (IN.)	OVERALL SQUARE (IN.)	ITEM NO.
10	10 1/2 X 10 1/2	13	2C517
12	12 1/2 X 12 1/2	15	2C518
14	14 1/2 X 14 1/2	17	3HHL5
16	16 1/2 X 16 1/2	19	2C520
18	18 1/2 X 18 1/2	21	2C521
20	20 1/2 X 20 1/2	23	2C522
24	24 1/2 X 24 1/2	27	2C523

GALVANIZED STEEL FRAME WALL EXHAUST SHUTTER

This model is a rear flanged general purpose exhaust shutter. The frame is galvanized steel with mill finish aluminum blades. The blades have a galvanized steel reinforcement strip across the top of each blade for added strength and counter balancing efficiency. The blades have a felt seal on the leading edge for quiet closing and better protection from the weather. Ideal for use with direct-drive or belt-driven exhaust fans. Recommended for vertical mount exhaust applications only.

Sizes available – 10" W x 10" H to 60" W x 60" H.
Maximum free area velocity – 2500 FPM.



1C743

ALUMINUM WALL EXHAUST SHUTTER (REAR FLANGED)

This model is a rear flanged exhaust shutter for areas where corrosion may be a problem. The frame is mill finish aluminum. The blades have a white enamel finish and a galvanized reinforcement strip across the top of each blade for added strength and counter balancing efficiency. The blades have a felt seal on the leading edge for quiet closing and better protection from the weather. Ideal for use with direct-drive or belt-driven exhaust fans. Recommended for vertical mount exhaust applications only.

Sizes available – 10" W x 10" H to 60" W x 60" H.
Maximum free area velocity – 2500 FPM.



4C556

ALUMINUM WALL EXHAUST SHUTTER (FRONT FLANGED)

This model is a front flanged exhaust shutter for areas that require a flush mount. The frame and blades are mill finish aluminum. The blades have a galvanized reinforcement strip across the top of each blade for added strength and counter balancing efficiency. The blades have a felt seal on the leading edge for quiet closing and better protection from the weather. Ideal for use with cabinet fans and flush mount direct-drive or belt-driven exhaust fans. Recommended for vertical mount exhaust applications only.

Sizes available – 10" W x 10" H to 60" W x 60" H.
Maximum free area velocity – 2500 FPM.



3HHN6

FITS FAN DIA. (IN.)	OPENING REQ. (IN.) A	OVERALL SQ. (IN.) B	GALVANIZED STEEL ITEM NO.	ALUMINUM REAR FLANGE ITEM NO.	ALUMINUM FRONT FLANGE ITEM NO.
GRAVITY OPERATED, SINGLE PANEL					
10	10 1/2 X 10 1/2	13	2C526	4C555	3HHN4
12	12 1/2 X 12 1/2	15	1C742	4C556	3HHN5
16	16 1/2 X 16 1/2	19	1C743	4C557	3HHN6
18	18 1/2 X 18 1/2	21	1C744	4C558	3HHN7
20	20 1/2 X 20 1/2	23	1C745	4C559	3HHN8
24	24 1/2 X 24 1/2	27	1C746	3C308	2FTW6
30	30 1/2 X 30 1/2	33	1C055	3C309	2FTX1
36	36 1/2 X 36 1/2	39	4C521	3C310	2FTW7

FITS FAN DIA. (IN.)	OPENING REQ. (IN.) A	OVERALL SQ. (IN.) B	GALVANIZED STEEL ITEM NO.	ALUMINUM REAR FLANGE ITEM NO.	ALUMINUM FRONT FLANGE ITEM NO.
GRAVITY OPERATED, DOUBLE PANEL					
36	36 1/2 X 36 1/2	39	1C209	4C835	3HHN9
42	42 1/2 X 42 1/2	45	1C210	3C311	2FTW1
48	48 1/2 X 48 1/2	51	1C211	3C312	2FTX3
54	54 1/2 X 54 1/2	57	3C115	3C313	3HHP1
60	60 1/2 X 60 1/2	63	3C116	3C314	3HHP2

Call or visit your local branch or go to granger.com/dayton for complete product line information.

HIGH VELOCITY WALL EXHAUST SHUTTER

This model is a rear flanged exhaust shutter for applications that require higher velocities. The frame and blades are mill finish extruded aluminum with stainless steel tie rods. Ideal for use with direct-drive or belt-driven exhaust fans. Recommended for vertical mount exhaust applications only.

Sizes available – 12" W x 12" H to 60" W x 60" H.

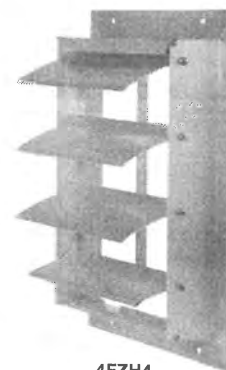
Maximum free area velocity – 3250 FPM.

FITS FAN DIA. (IN.)	OPENING REQ. (IN.) A	OVERALL SQ. (IN.) B	ITEM NO.
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GRAVITY OPERATED, SINGLE PANEL			
12	12 1/2 X 12 1/2	15	4FZH3
16	16 1/2 X 16 1/2	19	4FZH4
18	18 1/2 X 18 1/2	21	4FZH5
20	20 1/2 X 20 1/2	26	4FZH6
24	24 1/2 X 24 1/2	27	4FZH7
30	30 1/2 X 30 1/2	33	4FZH8
36	36 1/2 X 36 1/2	39	4FZH9

FITS FAN DIA. (IN.)	OPENING REQ. (IN.) A	OVERALL SQ. (IN.) B	ITEM NO.
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GRAVITY OPERATED, DOUBLE PANEL			
42	42 1/2 X 42 1/2	45	4FZJ1
48	48 1/2 X 48 1/2	51	4FZJ2
54	54 1/2 X 54 1/2	57	45C662
60	60 1/2 X 60 1/2	63	45C663



4FZH4



5C212

FIBERGLASS WALL EXHAUST SHUTTER

This model is a rear flanged exhaust shutter for areas where corrosion is a known problem. The frame and blades are a heavy duty fiberglass pultrusion with stainless steel tie rods. Ideal for use with direct-drive or belt-driven exhaust fans in chemical plants and poultry/swine confinement operations. Recommended for vertical mount exhaust applications only.

Sizes available - 10" W x 10" H to 60" W x 60" H.

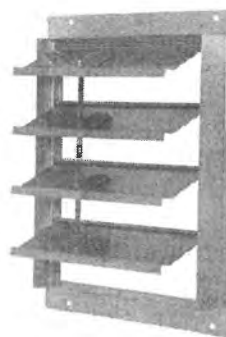
Maximum free area velocity – 2500 FPM.

STAINLESS STEEL WALL SHUTTER

This model is a rear flanged exhaust shutter for areas that require extreme corrosion resistance. The frame and blades are 304 stainless steel with stainless steel tie rods and hardware. Ideal for use with direct-drive or belt-driven exhaust fans in chemical plants and food processing operations. Recommended for vertical mount exhaust applications only.

Sizes available – 10" W x 10" H to 36" W x 36" H.

Maximum free area velocity – 2500 FPM.



4FZJ5

FITS FAN DIA. (IN.)	OPENING REQ. (IN.) A	OVERALL SQ. (IN.) B	FIBERGLASS ITEM NO.	STAINLESS STEEL ITEM NO.
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GRAVITY OPERATED, SINGLE PANEL				
10	10 1/2 X 10 1/2	13	5C210	4FZJ3
12	12 1/2 X 12 1/2	15	5C211	4FZJ4
16	16 1/2 X 16 1/2	19	5C212	4FZJ5
18	18 1/2 X 18 1/2	21	5C213	4FZJ6
20	20 1/2 X 20 1/2	23	5C214	4FZJ7
24	24 1/2 X 24 1/2	27	5C215	-
30	30 1/2 X 30 1/2	33	5C216	-
36	36 1/2 X 36 1/2	39	5C217	-

FITS FAN DIA. (IN.)	OPENING REQ. (IN.) A	OVERALL SQ. (IN.) B	FIBERGLASS ITEM NO.	STAINLESS STEEL ITEM NO.
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GRAVITY OPERATED, DOUBLE PANEL				
24	24 1/2 X 24 1/2	27	-	4FZJ8
30	30 1/2 X 30 1/2	33	-	4FZJ9
36	36 1/2 X 36 1/2	39	5C218	4FZK1
42	42 1/2 X 42 1/2	45	5C219	-
48	48 1/2 X 48 1/2	51	5C220	-
54	54 1/2 X 54 1/2	57	5C221	-
60	60 1/2 X 60 1/2	63	5C222	-

Call or visit your local branch or go to graininger.com/dayton for complete product line information.

AGRICULTURAL WALL EXHAUST SHUTTERS

ALUMINUM FRAME / PVC BLADES

This model is a rear flanged exhaust shutter for areas where corrosion is a known problem. The frame is painted extruded aluminum with UV stabilized PVC blades and yellow zinc dichromate rods running the full length of the blades. Ideal for direct-drive or belt-driven cone or slant-wall exhaust fans in poultry or swine confinement operations. Recommended for vertical mount exhaust applications only. Available in black or white.

Maximum free area velocity – 1500 FPM.



3HHP7

ALUMINUM FRAME / ALUMINUM BLADES

This model is a rear flanged exhaust shutter for areas where corrosion is a known problem. The frame is mill finish extruded aluminum with mill finish aluminum blades. The blades have an aluminum reinforcement strip across the top of each blade for added strength and counter balancing efficiency. The blades have a rubber seal on the leading edge for better protection from the weather. Ideal for direct-drive or belt-driven cone or slant-wall exhaust fans in poultry or swine confinement operations. Recommended for vertical mount exhaust applications only. Blades are available with a Polar White Finish.

Maximum free area velocity – 2500 FPM.

GALVANIZED FRAME / PVC BLADES

This model is a rear flanged exhaust shutter for areas where corrosion is a known problem. The frame is galvanized steel with UV stabilized PVC blades with stainless steel tie rods and fasteners. Ideal for direct-drive or belt-driven cone or slant-wall exhaust fans in poultry or swine confinement operations. Recommended for vertical mount exhaust applications only. Blades are available in black or white.

Maximum free area velocity – 1500 FPM.



4TM09

FITS FAN DIA. (IN.)	OPENING REQ. (IN.)	OVERALL SQUARE (IN.)	BLADE MATERIAL	NO. OF PANELS	ITEM NO.
G-90 GALVANIZED STEEL FRAME AND TIE RODS					
36	39 1/2 H X 39 1/2 W	42	MILL FINISH ALUMINUM	1	2FTX7
48	51 1/2 H X 51 1/2 W	54	MILL FINISH ALUMINUM	2	2FTX8
48	54 H X 54 1/2 W	57 1/4	MILL FINISH ALUMINUM	2	4GY95
G-90 GALVANIZED STEEL FRAME AND STAINLESS STEEL TIE RODS					
36	36 1/2 H X 36 1/2 W	39	BLACK PVC	1	3JA22
36	36 1/2 H X 36 1/2 W	39	WHITE PVC	1	4TM09
36	36 1/2 H X 36 1/2 W	39	WHITE PVC	2	4TM08
36	39 1/2 H X 39 1/2 W	42	WHITE PVC	1	2FTW9
48	48 1/2 H X 48 1/2 W	51	WHITE PVC	2	4TM10
48	51 1/2 H X 51 1/2 W	54	WHITE PVC	2	2FTV8
EXTRUDED ALUMINUM FRAME WITH YELLOW ZINC DICHROMATE RODS					
16	16 3/4 H X 16 3/4 W	19	BLACK PVC	1	3HHP6
16	16 3/4 H X 16 3/4 W	19	WHITE PVC	1	3HHP8
24	24 3/4 H X 24 3/4 W	27	BLACK PVC	1	3HHP7
24	24 3/4 H X 24 3/4 W	27	WHITE PVC	1	3HHP9
36	36 3/4 H X 36 3/4 W	39	BLACK PVC	2	4GY96
36	36 3/4 H X 36 3/4 W	39	WHITE PVC	2	4GY98
36	39 3/4 H X 39 3/4 W	42	BLACK PVC	2	2FTW5
36	39 3/4 H X 39 3/4 W	42	WHITE PVC	2	2FTV6
48	51 3/4 H X 51 3/4 W	54	BLACK PVC	3	2FTX9
48	51 3/4 H X 51 3/4 W	54	WHITE PVC	3	2FTW2
48	54 3/4 H X 54 3/4 W	57	BLACK PVC	3	4GY97
48	54 3/4 H X 54 3/4 W	57	WHITE PVC	3	4GY99
EXTRUDED ALUMINUM FRAME WITH ALUMINUM BLADES					
36	39 1/2 H X 39 1/2 W	42	MILL FINISH ALUMINUM	2	45C666
48	51 1/2 H X 51 1/2 W	54	MILL FINISH ALUMINUM	2	45C667
48	54 H X 54 1/2 W	57 1/4	MILL FINISH ALUMINUM	2	45C668

Find it at Grainger.

Call or visit your local branch or go to grainger.com/dayton for complete product line information.

Dayton®

Installation Instructions Instrucciones de instalación Instructions de montage

1C055C, 1C209C-1C211C, 1C742D-1C746D, 2C517C, 2C518C, 2C520C-2C523C, 2C526D, 3C116C, 4C521C, 4G9Y5, 2FTX7, 2FTX8, 3HHP5
3C309C-3C314C, 4C835C, 3C308B, 4C555B-4C559B
2FTW9, 2FTV8, 2FTW5, 2FTX9, 2FTV6, 2FTW2, 3HHP6-3HHP9, 4TM08A-4TM10A, 3JA22A, 4G9Y6-4G9Y9, 4YN20, 3HHR1
2FTW6, 2FTX1, 2FTW7, 2FTW1, 2FTX3, 3HHR4-3HHR9, 3HHP1, 3HHP2, 45C662, 45C663, 45C666-45C668
4FZ3, 4FZ4, 4FZH5, 4FZH6, 4FZH7, 4FZH8, 4FZH9, 4FZJ1, 4FZJ2, 4FZJ4, 4FZJ5, 4FZJ6, 4FZJ7, 4FZJ8, 4FZJ9, 4FZK1

Veillez lire ces instructions et les conserver. Lisez-les attentivement avant d'essayer d'assembler, d'installer, d'utiliser ou d'entretenir l'équipement décrit. Protégez-vous et protégez les autres en observant toutes les consignes de sécurité. Ne pas respecter ces instructions peut entraîner des blessures ou des dégâts matériels! Conservez les instructions pour pouvoir les consulter ultérieurement.

Volets Dayton® en aluminium galvanisés/en PVC pour murs et toitures

Employer les moteurs optionnels 24N064 pour 1 panneau de 25.4 - 91.4cm, 24N065 pour 2 panneaux de 91.4 - 121.9cm et 4C885B pour 2 panneaux de 137.2 - 152.4cm

Nous recommandons de ne pas monter le volet à moins de 1/3 du diamètre de la pale de ventilateur par rapport au ventilateur.

Ne forcez pas le volet dans l'ouverture!

N'ouvrez pas le volet en soulevant les pales individuelles!

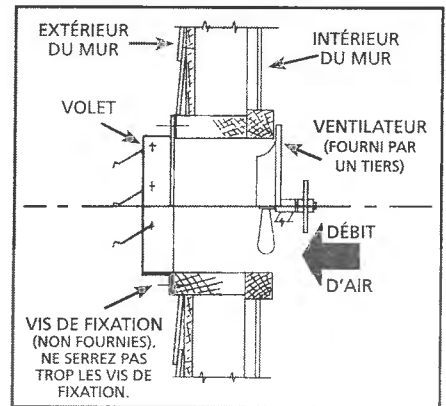
N'installez pas le volet penché!

Installation

1. Le cadre du volet doit être monté droit et être bien d'équerre sur le mur extérieur. Il faut faire attention

de ne pas tordre le cadre du volet. Ne recouvrez jamais le volet de parement ni de maçonnerie. Le volet doit être monté de manière à pouvoir être retiré à tout moment en cas de détérioration.

2. Le volet doit fonctionner aussi librement après installation qu'avant.
3. Il est recommandé d'appliquer du mastic entre les bords du cadre du volet et le mur.
4. Nettoyez et lubrifiez le volet en même temps que le ventilateur.



LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. DAYTON® ALUMINUM GALVANIZED PVC VALUABLE SHUTTERS MODELS COVERED IN THIS MANUAL, ARE WARRANTED BY DAYTON ELECTRIC MFG. CO. (DAYTON) TO THE ORIGINAL USER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE YEAR AFTER DATE OF PURCHASE. ANY PART WHICH IS DETERMINED TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO AN AUTHORIZED SERVICE LOCATION, AS DAYTON DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT DAYTON'S OPTION. FOR LIMITED WARRANTY CLAIM PROCEDURES, SEE "PROMPT DISPOSITION" BELOW. THIS LIMITED WARRANTY GIVES PURCHASERS SPECIFIC LEGAL RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION.

LIMITATION OF LIABILITY. TO THE EXTENT ALLOWABLE UNDER APPLICABLE LAW, DAYTON'S LIABILITY FOR CONSEQUENTIAL AND INCIDENTAL DAMAGES IS EXPRESSLY DISCLAIMED. DAYTON'S LIABILITY IN ALL EVENTS IS LIMITED TO AND SHALL NOT EXCEED THE PURCHASE PRICE PAID.

WARRANTY DISCLAIMER. A DILIGENT EFFORT HAS BEEN MADE TO PROVIDE PRODUCT INFORMATION AND ILLUSTRATE THE PRODUCTS IN THIS LITERATURE ACCURATELY. HOWEVER, SUCH INFORMATION AND ILLUSTRATIONS ARE FOR THE SOLE PURPOSE OF IDENTIFICATION, AND DO NOT EXPRESS OR IMPLY A WARRANTY THAT THE PRODUCTS ARE MERCHANTABILITY, OR FIT FOR A PARTICULAR PURPOSE, OR THAT THE PRODUCTS WILL NECESSARILY CONFORM TO THE ILLUSTRATIONS OR DESCRIPTIONS, EXCEPT AS PROVIDED BELOW, NO WARRANTY OR AFFIRMATION OF FACT, EXPRESSED OR IMPLIED, OTHER THAN AS STATED IN THE "LIMITED WARRANTY" ABOVE IS MADE OR AUTHORIZED BY DAYTON.

Technical Advice and Recommendations, Disclaimer. Notwithstanding any past practice or dealings or trade custom, sales shall not include the furnishing of technical advice or assistance or system design. Dayton assumes no obligations or liability on account of any unauthorized recommendations, opinions or advice as to the choice, installation or use of products.

Product Suitability. Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While attempts are made to assure that Dayton products comply with such codes, Dayton cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, review the product applications, and all applicable national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise diminished.

Prompt Disposition. A good faith effort will be made for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co., 100 Grainger Parkway, Lake Forest, IL 60045-5201 U.S.A.

GARANTÍA LIMITADA

LA GARANTÍA LIMITADA DAYTON POR UN AÑO. DAYTON ELECTRIC MFG. CO. (DAYTON) LE GARANTIZA AL USUARIO ORIGINAL QUE LOS MODELOS TRATADOS EN ESTE MANUAL DE PERSIANAS DE ALUMINIO GALVANIZADO O PVC VALUABLE SHUTTERS DE DAYTON ESTÁN LIBRES DE DEFECTOS EN LA MANO DE OBRA O EL MATERIAL, CUANDO SE LES SOMETE A USO NORMAL, POR UN AÑO A PARTIR DE LA FECHA DE COMPRA. CUALQUIER PARTE QUE SE HALLA DEFECTUOSA, YA SEA EN EL MATERIAL O EN LA MANO DE OBRA, Y SEA DEVUELTA CON LOS COSTOS DE ENVÍO PAGADOS POR ADELANTADO, A UN CENTRO DE SERVICIO AUTORIZADO DESIGNADO POR DAYTON, SERÁ REPARADA O REEMPLAZADA (NO EXISTE OTRA POSIBILIDAD) SEGUN LO DETERMINE DAYTON. PARA OBTENER INFORMACIÓN SOBRE LOS PROCEDIMIENTOS DE RECLAMO CUBIERTOS EN LA GARANTÍA LIMITADA, VEA LA SECCIÓN "ATENCIÓN OPORTUNA" QUE APARECE MÁS ADELANTE. ESTA GARANTÍA LIMITADA CONFIERE AL COMPRADOR DERECHOS LEGALES ESPECÍFICOS QUE VARIAN DE JURISDICCIÓN A JURISDICCIÓN.

LIMITES DE RESPONSABILIDAD. EN LA MEDIDA EN QUE LAS LEYES APLICABLES LO PERMITAN, LA RESPONSABILIDAD DE DAYTON POR LOS DAÑOS EMERGENTES O INCIDENTALES ESTÁ EXPRESAMENTE EXCLUIDA. LA RESPONSABILIDAD DE DAYTON EXPRESAMENTE ESTÁ LIMITADA Y NO PUEDE EXCEDER EL PRECIO DE COMPRA PAGADO POR EL ARTÍCULO.

EXCLUSIÓN DE RESPONSABILIDAD DE LA GARANTÍA. SE HAN HECHO ESFUERZOS DILIGENTES PARA PROPORCIONAR INFORMACIÓN E ILUSTRACIONES APROPIADAS SOBRE EL PRODUCTO EN ESTE MANUAL. SIN EMBARGO, ESTA INFORMACIÓN E ILUSTRACIONES TIENEN COMO ÚNICO PROPÓSITO LA IDENTIFICACIÓN DEL PRODUCTO Y NO EXPRESAN NI IMPLICAN GARANTÍA DE QUE LOS PRODUCTOS SEAN VENDIBLES O ADECUADOS PARA UN PROPÓSITO EN PARTICULAR NI QUE SE AJUSTAN NECESARIAMENTE A LAS ILUSTRACIONES O DESCRIPCIONES, CON EXCEPCIÓN DE LO QUE SE ESTABLECE A CONTINUACIÓN. DAYTON NO HACE NI AUTORIZA NINGUNA GARANTÍA O AFIRMACIÓN DE HECHO, EXPRESA O IMPLÍCITA, QUE NO SEA ESTIPULADA EN LA "GARANTÍA LIMITADA" ANTERIOR.

Consejo Técnico y Recomendaciones, Exclusiones de Responsabilidad. A pesar de las prácticas, negociaciones o usos comerciales realizados previamente, las ventas no deberán incluir el suministro de consejo técnico o asistencia o diseño de sistema. Dayton no asume ninguna obligación o responsabilidad por recomendaciones, opiniones o consejos no autorizados sobre la elección, instalación o uso de los productos.

Adaptación del Producto. Muchas jurisdicciones tienen códigos o regulaciones que rigen la venta, la construcción, la instalación y/o el uso de productos para ciertos propósitos que pueden variar con respecto a los aplicables a las zonas vecinas. Si bien se trata de que los productos Dayton cumplan con dichos códigos, no se puede garantizar su conformidad y no se puede hacer responsable por la forma en que se instale o use el producto. Antes de comprar y usar el producto, revise su aplicación y todos los códigos y regulaciones nacionales y locales aplicables y asegúrese de que el producto, la instalación y el uso los cumplan.

Ciertos aspectos de limitación de responsabilidad no se aplican a productos al consumidor, es decir: (a) algunas jurisdicciones no permiten la exclusión ni limitación de daños incidentales o consecuentes, de modo que las limitaciones o exclusiones anteriores quizás no apliquen en su caso; (b) asimismo, algunas jurisdicciones no permiten limitar el plazo de una garantía implícita, por lo tanto, la limitación anterior quizás no aplique en su caso; y (c) por ley, mientras la Garantía Limitada esté vigente no podrán excluirse ni limitarse en modo alguno ninguna garantía implícita de comerciabilidad o de idoneidad para un propósito en particular aplicables a los productos al consumidor adquiridos por éste.

Atención Oportuna. Se hará un esfuerzo de buena fe para corregir puntualmente, o hacer otros ajustes, con respecto a cualquier producto que resulte defectuoso dentro de los términos de esta garantía limitada. En el caso de que encuentre un producto defectuoso y que esté cubierto dentro de los límites de esta garantía haga el favor de escribir primero, o llame, al distribuidor a quien le compró el producto. El distribuidor le dará las instrucciones adicionales. Si no puede resolver el problema en forma satisfactoria, escriba a Dayton a la dirección « continuación, dando el nombre del distribuidor, su dirección, la fecha y el número de la factura del distribuidor y describa la naturaleza del defecto. La propiedad del artículo y el riesgo de pérdida pasan al comprador en el momento de la entrega del artículo a la compañía de transporte. Si el producto se daña durante el transporte, debe presentar su reclamo a la compañía transportista.

Fabricado para Dayton Electric Mfg. Co., 100 Grainger Parkway, Lake Forest, IL 60045-5201 EEUU.

GARANTIE LIMITÉE

GARANTIE LIMITÉE DE UN AN DE DAYTON. LES MODÈLES SEULS ET VOILETS DAYTON® EN ALUMINIUM GALVANISÉ EN PVC POUR MURS ET TOITURES DE DAYTON® COUVERTS DANS CE MANUEL SONT GARANTIS À L'UTILISATEUR D'ORIGINE PAR DAYTON ELECTRIC MFG. CO. (DAYTON), CONTRE TOUT DÉFAUT DE FABRICATION OU DE MATÉRIAU, LORS D'UNE UTILISATION NORMALE, ET CELA PENDANT UN AN APRÈS LA DATE D'ACHAT, TOUTE PIECE DONT LES MATÉRIAUX OU LA MAIN D'ŒUVRE SERONT JUGES DÉFECTUEUX, ET QUI SERA RENVOYÉE PORT PAYE, À UN CENTRE DE RÉPARATION AUTORISÉ PAR DAYTON, SERA, À TITRE DE SOLUTION EXCLUSIVE, SOIT RÉPARÉE, SOIT REMPLACÉE PAR DAYTON, POUR LE PROCÉDÉ DE RÉCLAMATION SOUS GARANTIE LIMITÉE. REPORTEZ-VOUS À LA CLAUSE DE "DISPOSITION PROMPTE" CI-DESSOUS. CETTE GARANTIE LIMITÉE DONNE AUX ACHETEURS DES DROITS LÉGAUX SPÉCIFIQUES QUI VARIENT DE JURISDICTION À JURISDICTION.

LIMITES DE RESPONSABILITÉ. LA RESPONSABILITÉ DE DAYTON, DANS LES LIMITES PERMISES PAR LA LOI, POUR LES DOMMAGES INDIRECTS OU FORTUITS EST EXPRESSÉMENT DÉNIÉE. DANS TOUS LES CAS LA RESPONSABILITÉ DE DAYTON EST LIMITÉE ET NE DÉPASSERA PAS LA VALEUR DU PRIX D'ACHAT PAYÉ.

DÉSISTEMENT DE GARANTIE. DE DILIGENTS EFFORTS SONT FAITS POUR FOURNIR AVEC PRÉCISION LES INFORMATIONS ET ILLUSTRATIONS DES PRODUITS DÉCRITS DANS CETTE BROCHURE. CÉPENDANT, DE TELLES INFORMATIONS ET ILLUSTRATIONS SONT POUR LA SEULE RAISON D'IDENTIFICATION, ET N'EXPRIMENT NI N'IMPLIQUENT QUE LES PRODUITS SONT COMMERCIALISABLES, OU ADAPTABLES À UN BESOIN PARTICULIER, NI QUE CES PRODUITS SONT NECESSAIREMENT CONFORMES AUX ILLUSTRATIONS OU DESCRIPTIONS, SAUF POUR CE QUI SUIT, AUCUNE GARANTIE OU AFFIRMATION DE FAIT, ENONCÉE OU IMPLICITE, AUTRE QUE CE QUI EST ENONCÉE DANS LA "GARANTIE LIMITÉE" CI-DESSUS N'EST FAITE OU AUTORISÉE PAR DAYTON.

Désistement sur les conseils techniques et les recommandations. Peu importe les pratiques ou négociations antérieures ou les usages commerciaux, les ventes n'incluent pas l'offre de conseils techniques ou d'assistance ou encore de conception de système. Dayton n'a aucune obligation ou responsabilité quant aux recommandations non autorisées, aux opinions et aux suggestions relatives au choix, à l'installation ou à l'utilisation des produits.

Conformité du produit. De nombreuses juridictions ont des codes et règlements qui gouvernent les ventes, constructions, installations et/ou utilisations de produits pour certains usages qui peuvent varier par rapport à ceux d'une zone voisine. Bien que Dayton essaie de s'assurer que ses produits s'accordent avec ces codes, Dayton ne peut garantir cet accord, et ne peut être jugée responsable pour la façon dont le produit est installé ou utilisé. Avant l'achat et l'usage d'un produit, revoyez les applications de ce produit, ainsi que tous les codes et règlements nationaux et locaux applicables, et s'assurer que le produit, son installation et son usage sont en accord avec eux.

Certains aspects de désistement ne sont pas applicables aux produits pour consommateur, ex: (a) certaines juridictions ne permettent pas l'exclusion ou la limitation des dommages indirects ou fortuits et donc la limitation ou exclusion ci-dessus peut ne pas s'appliquer dans le cas présent; (b) également, certaines juridictions n'autorisent pas de limitations de durée de la garantie implicite, en conséquence, la limitation ci-dessus peut ne pas s'appliquer dans le cas présent; et (c) par force de loi, pendant la période de cette Garantie Limitée, toutes garanties implicites de commerciabilité ou d'adaptabilité à un besoin particulier applicables aux produits de consommateurs achetés par des consommateurs, peuvent ne pas être exclues ni autrement désistées.

Disposition prompt. Un effort de bonne foi sera fait pour corriger ou ajuster rapidement tout produit prouvé défectueux pendant la période de la garantie limitée. Pour tout produit considéré défectueux pendant la période de garantie limitée, contactez tout d'abord le concessionnaire où l'appareil a été acheté. Le concessionnaire doit donner des instructions supplémentaires. S'il est impossible de résoudre le problème de façon satisfaisante, écrire à Dayton à l'adresse ci-dessous, en indiquant le nom et l'adresse du concessionnaire, la date et le numéro de la facture du concessionnaire, et en décrivant la nature du défaut. Le titre et le risque de perte passent à l'acheteur au moment de la livraison par le transporteur. Si le produit a été endommagé pendant le transport, une réclamation doit être faite auprès du transporteur.

Fabriqué pour Dayton Electric Mfg. Co., 100 Grainger Parkway, Lake Forest, IL 60045-5201 États-Unis

Manufactured for: Dayton Electric Mfg. Co.
Fabricado para: Lake Forest, IL 60045 U.S.A.
Fabriqué pour:

Dayton®

Installation Instructions
Instrucciones de instalación
Instructions de montage

1C055C, 1C209C-1C211C, 1C742D-1C746D, 2C517C, 2C518C, 2C520C-2C523C, 2C526D, 3C115C, 3C116C, 4C521C, 4GY95, 2FTX7, 2FTX8, 3HHP5
 3C309C-3C314C, 4C835C, 3C308B, 4C555B-4C559B
 2FTW9, 2FTV8, 2FTW5, 2FTX9, 2FTV6, 2FTW2, 3HHP6-3HHP9, 4TM08A-4TM10A, 3JA22A, 4GY96-4GY99, 4YN20, 3HHR1
 2FTW6, 2FTX1, 2FTW7, 2FTW1, 2FTX3, 3HHN4-3HHN9, 3HHP1, 3HHP2, 4SC662, 4SC663, 4SC666-4SC668
 4FZH3, 4FZH4, 4FZH5, 4FZH6, 4FZH7, 4FZH8, 4FZH9, 4FZJ1, 4FZJ2, 4FZJ3, 4FZJ4, 4FZJ5, 4FZJ6, 4FZJ7, 4FZJ8, 4FZJ9, 4FZK1

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton® Aluminum/Galvanized/ PVC Wall/Gable Shutters

**Use Optional Motors: 24NO64 on 10 - 36" Single Panel,
 24NO65 on 36 - 48" Double Panel, 4C885B on 54 - 60" Double Panel**

We recommend shutter not be mounted closer to the fan than 1/3 the diameter of fan blade.

Do not force shutter into opening!

Do not open shutter by lifting individual blades!

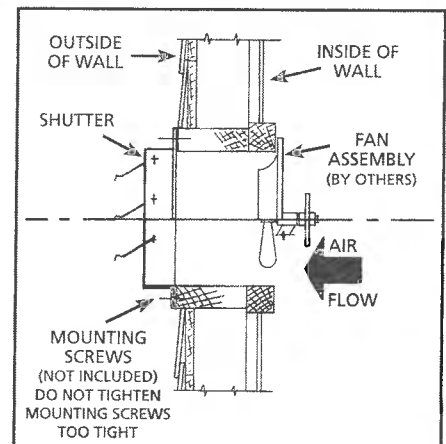
Do not install shutter leaning forward or backward!

Installation

1. Shutter frame should be mounted level and squarely on outside wall. Care should be taken not to twist

the shutter frame. Never cover shutter with siding or masonry work. Shutter should be mounted so it can be removed any time in case of damage.

2. Shutter should operate as freely after installation as it did before.
3. Caulking compound is recommended between shutter frame edges and the wall.
4. Clean and lubricate shutter at the same time that the fan is lubricated and cleaned.



Por favor lea y guarde estas instrucciones. Léelas cuidadosamente antes de intentar montar, instalar, operar o reparar el producto descrito. Para su propia protección y la de los demás cumpla con lo indicado en la información de seguridad. ¡El no hacerlo podría ocasionar lesiones personales, daños materiales o ambos! Guarde las instrucciones para referencia en el futuro.

Persianas de piñón/pared de PVC/ aluminio/galvanizado Dayton®

**Usar motores opcionales: 24NO64 en el panel simple de 25.4 - 91.4cm,
 24NO65 en panel doble de 91.4 - 121.9cm, 4C885B en panel doble de 137.2 - 152.4cm**

Recomendamos que no se instale a una distancia menor de 1/3 de diámetro de las hojas del ventilador.

¡No forzar la persiana para abrirla!

¡No abrir la persiana levantando las hojas individualmente!

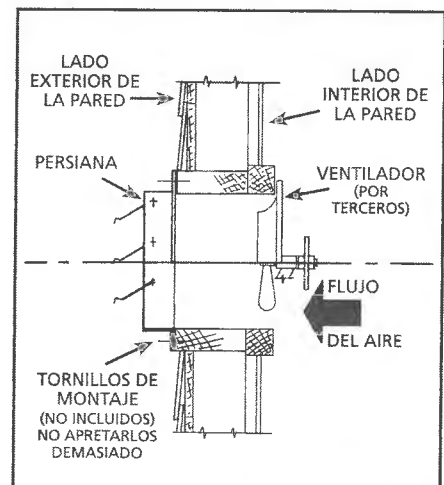
¡No instalar la persiana inclinada hacia adelante o hacia atrás!

Instalación

1. El marco de la persiana debe instalarse bien nivelado y recto en la pared exterior. Procurar no torcer el

marco. Nunca cubrir la persiana con las tablas de revestimiento material de albañilería. La persiana debe instalarse de modo que se puede extraer en cualquier momento en caso de dañarse.

2. La persiana debe funcionar tan libremente después de instalada como antes de instalarse.
3. Se recomienda calafatear el espacio entre el borde del marco de la persiana y la pared.
4. Limpiar y lubricar la persiana al mismo tiempo que el ventilador.



Form 556212
 Formulario 556212
 Brochure 556212

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Dayton®

ENGLISH

ESPAÑOL

FRANÇAIS

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 7

Field Notes of SVE System Optimization

Data Log

System pressure 58 "wc

Date and Time: 4/27/2021		
SVE-1	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	46 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.128 "wc
	Pitot Tube Air Velocity:	31.26 27.63 cfm
	Flow Rate:	→
SVE-2	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	46 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.044 "wc
	Pitot Tube Air Velocity:	18.33 cfm
	Flow Rate:	→
SVE-3	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	46 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.084 "wc
	Pitot Tube Air Velocity:	25.32 cfm
	Flow Rate:	→
SVE-4	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	47 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.027 "wc
	Pitot Tube Air Velocity:	14.36 cfm
	Flow Rate:	→
System Pressure:		58 "wc
Discharge PID Reading:		
Discharge Temperature:		

~~child 561, 2 563~~

Location	Pressure Reading
SVP-1_Shallow	
SVP-1_Intermediate	
SVP-1_Deep	
SVP-2_Shallow	
SVP-2_Intermediate	
SVP-2_Deep	
SVP-3_Shallow	
SVP-3_Intermediate	
SVP-3_Deep	
OIP-1	
OIP-2	
OIP-3	
OIP-8	
OIP-9	
PTP-1	
PTP-2	
PTP-3	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
Comments:	

Data Log

4/27/21

check SVE-1 & SVE-3

Date and Time:		
SVE-1	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.04 "WC
	Pitot Tube Air Velocity:	0.157 0.157
	Flow Rate:	
SVE-2	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.057 "WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-3	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.067 "WC - 0.07 "WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-4	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.026 "WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
System Pressure:		61 "WC
Discharge PID Reading:		
Discharge Temperature:		

Data Log

Location	Pressure Reading
SVP-1_Shallow	
SVP-1_Intermediate	
SVP-1_Deep	
SVP-2_Shallow	
SVP-2_Intermediate	
SVP-2_Deep	
SVP-3_Shallow	
SVP-3_Intermediate	
SVP-3_Deep	
OIP-1	
OIP-2	
OIP-3	
OIP-8	
OIP-9	
PTP-1	
PTP-2	
PTP-3	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
Comments:	

Data Log

4/27/21

Date and Time:		
SVE-1	PID Reading (ppb):	~300 ?
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	60 "H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.04 "H ₂ O
	Pitot Tube Air Velocity:	
	Flow Rate:	17.47 CFM
SVE-2	PID Reading (ppb):	~20 ?
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	50 20 "H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.05
	Pitot Tube Air Velocity:	20.86 CFM
	Flow Rate:	↓
SVE-3	PID Reading (ppb):	1832 ?
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	23 "H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.04
	Pitot Tube Air Velocity:	
	Flow Rate:	17.47 CFM
SVE-4	PID Reading (ppb):	642 ?
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	60 "H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.03
	Pitot Tube Air Velocity:	
	Flow Rate:	15 CFM
System Pressure:		72 "H ₂ O
Discharge PID Reading:		4 ppm
Discharge Temperature:		72 °C

PID funky, not reliable

Data Log

Location	Pressure Reading
SVP-1_Shallow	
SVP-1_Intermediate	
SVP-1_Deep	
SVP-2_Shallow	
SVP-2_Intermediate	
SVP-2_Deep	
SVP-3_Shallow	
SVP-3_Intermediate	
SVP-3_Deep	
OIP-1	
OIP-2	
OIP-3	
OIP-8	
OIP-9	
PTP-1	
PTP-2	
PTP-3	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
Comments:	

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 8
SVE Baseline Sampling Log

Site Name: ~~Norge~~
 Address: 2915 S Meridian St
 Weather: ~~cloudy~~ - rain precipitation ~~yes~~ low before sampling
 Barometric pressure: 28.98" Hg Speed/direction: SSW 17mph
 Laboratory: Pale
 Temperature: ~80°F
 Comments: From weather underground

Sample ID
~~DE-8~~
 Baseline

Location Description
 combined S/E inside cabinet
Type
 Soil gas
Can #
 2079
Flow Controller
 2807

Set Date
 4/27/2021

Time Set
~~0344~~ 1541

Initial Vacuum
 -29

Date collected
 4/27/2021

Time collected
 1546

Final Vacuum
 -9

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
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ATTACHMENT 9
SVE Baseline Sampling Laboratory Report

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
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IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 10
Hybrid SSDS Baseline Sampling Log

Comments: _____

[illegible]

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 11

Hybrid SSDS Baseline Sampling Laboratory Report

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 12
Post Hybrid SSDS Indoor Air Sampling Log

[illegible]

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
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ATTACHMENT 13

Post Hybrid SSDS Indoor Air Sampling and SVE First Monthly Sampling Laboratory Report

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
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ATTACHMENT 14
Operation Maintenance & Monitoring Field Data Logs

Location NORRG SITE Date 4/28/21

Project / Client 2915 S MERIDIAN

DATE 4-28-21

5:45 PM

KNOCKOUT 72 in H₂O

Blower 74 in H₂O

TEMP 180 F

Hour meter 31.2 HRS

WATER ON FLOOR OF CABINET
SUSPECT LEAK ON ROOF/WALL

- VISUAL / AUDIBLE INSPECTION
NO LEAKS OBSERVED



Data Log

Date and Time:		4/29/2021 10:17
SVE-1	PID Reading (ppb):	1886
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	21 "H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.060 "H ₂ O
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-2	PID Reading (ppb):	5380
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	65 "H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.058 "H ₂ O
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-3	PID Reading (ppb):	2467
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	30 "H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.046 "H ₂ O
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-4	PID Reading (ppb):	2708
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	66 "H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.007 "H ₂ O
	Pitot Tube Air Velocity:	
	Flow Rate:	
System Pressure:		75 "H ₂ O
Discharge PID Reading:		3299 before knock-out drum 5135 ppb
Discharge Temperature:		190°F 88°C

rainy

Came at site around 3:45 pm. found system stopped running due to full of knock-out drum. came back to office got tool to drain water. gauged SVE wells.

SVE-4 ~ 11.9' - 0.8" screen	screen 8-13	✗
SVE-3 ~ 58' - 0.8" screen	3-8	X
SVE-2 ~ 13.7' - 0.8" screen	8-13	
SVE-1 ~ 5.90' - 0.8" screen	3-8	X

Data Log

Location	Pressure Reading
SVP-1_Shallow	= 1.663 "WC
SVP-1_Intermediate	> -2.39 "WC
SVP-1_Deep	> range
SVP-2_Shallow	1.13 -1.176 "WC
SVP-2_Intermediate	0.46 -0.470 "WC
SVP-2_Deep	= 1.327 "WC
SVP-3_Shallow	> -2.2 "WC
SVP-3_Intermediate	-1.539
SVP-3_Deep	-1.539 "WC
OIP-1	
OIP-2	
OIP-3	
OIP-8	
OIP-9	
PTP-1	
PTP-2	
PTP-3	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
Comments:	

Data Log

Date and Time:		4/30/2021 10:30 am
SVE-1	PID Reading (ppb):	6897
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	24" H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.91" W.C.
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-2	PID Reading (ppb):	9521
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	66" H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.026" W.C.
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-3	PID Reading (ppb):	3323
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	40" H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.022" W.C.
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-4	PID Reading (ppb):	4769
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	67" H ₂ O
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.004" W.C.
	Pitot Tube Air Velocity:	
	Flow Rate:	
System Pressure: combined inflow 4150 ppb		75" H ₂ O
Discharge PID Reading: outlet 4045 ppb		
Discharge Temperature:		~188°F @ (86°C)

Data Log

4/30/21

Location	Pressure Reading
SVP-1_Shallow	-1.310 "WV
SVP-1_Intermediate	-1.742 "WV
SVP-1_Deep	-1.853 "WV
SVP-2_Shallow	-0.910 "WV
SVP-2_Intermediate	-0.074 "WV
SVP-2_Deep	-0.897 "WV
SVP-3_Shallow	-1.920 "WV
SVP-3_Intermediate	-0.015 "WV
SVP-3_Deep	-0.947 "WV
OIP-1	
OIP-2	
OIP-3	
OIP-8	
OIP-9	
PTP-1	
PTP-2	
PTP-3	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
Comments:	
can hear water flowing in SVE-3 & 4 not in SVE-1 & 2	
TDW:	
SVE-1 $\approx 4.52' - 0.8" = \cancel{4.0} 3.85'$	
SVE-2 $\approx 12.48' - 0.8" = \cancel{11.8} 11.81'$	
SVE-3 $\approx 5.93' - 0.8" = \cancel{5.3} 5.16'$	
SVE-4 $\approx 9.85' - 0.8" = \cancel{8.3} 9.18'$	

Data Log

5/3/21

Date and Time:		
SVE-1	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	18 "WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.055 "WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-2	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	65 at test port close to cabinet and wellhead
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.033 "WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-3	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	34 "WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.043 "WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-4	PID Reading (ppb):	
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	66 "WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.003 "WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
System Pressure:		75 "WC
Discharge PID Reading:		
Discharge Temperature:		85 °C

5/3/21

2 of 2

Data Log

Date and Time:		5/7/2021 11:00
SVE-1	PID Reading (ppb):	0.6 ppm
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	23"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.056"wc
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-2	PID Reading (ppb):	25.5 ppm
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	66"wc at both blower and well/4
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.026"wc
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-3	PID Reading (ppb):	11.2 ppm
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	35"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.036"wc
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-4	PID Reading (ppb):	15.9 ppm
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	67"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.003"wc
	Pitot Tube Air Velocity:	
	Flow Rate:	
System Pressure:		76"wc
Discharge PID Reading:		10.7 ppm inside cabinet 12.8 ppm discharge outside cabinet
Discharge Temperature:		~150°F ~88°C

Data Log

Location	Pressure Reading
SVP-1_Shallow	-0.875
SVP-1_Intermediate	-0.023
SVP-1_Deep	-0.838
SVP-2_Shallow	-1.207
SVP-2_Intermediate	-2.25
SVP-2_Deep	-1.855
SVP-3_Shallow	-1.756
SVP-3_Intermediate	0
SVP-3_Deep	-0.985
OIP-1	-0.004
OIP-2	
OIP-3	
OIP-8	
OIP-9	
PTP-1	
PTP-2	
PTP-3	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
U-Tube Manometer Reading at SSEP-1	
Comments: <div> <div> SVE-1 DTW $\{4.85' - 0.8'\}$ $\approx 4.18'$ </div> <div> SVE-2 DTW $\{11.04' - 0.8'\}$ $\approx 10.37'$ </div> <div> SVE-3 DTW $\sim (4.82' - 0.8')$ $\approx 4.15'$ </div> <div> SVE-4 DTW $\sim (9.90' - 0.8')$ $\approx 9.23'$ </div> </div>	

SS-4 pressure reading 0.001

OIP-7 -0.001

SS-2 -0.010

Data Log

Date and Time:		4/5/13/2024 1350
SVE-1	PID Reading (ppb):	0.3 ppm
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	14" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.044" WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-2	PID Reading (ppb):	21 ppm
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	46" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.075" WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-3	PID Reading (ppb):	7.5 ppm
	Pitot Tube Static Pressure Reading:	
	Pitot Tube Total Pressure Reading:	25" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.033" WC
	Pitot Tube Air Velocity:	
	Flow Rate:	
SVE-4	PID Reading (ppb):	21 ppm
	Pitot Tube Static Pressure Reading:	0
	Pitot Tube Total Pressure Reading:	46" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0
	Pitot Tube Air Velocity:	
	Flow Rate:	
System Pressure:		60" WC
Discharge PID Reading:		4.969 ppm outside of cabinet 5.2 ppm inside cabinet
Discharge Temperature:		~150°F

Data Log

5/13/2024

Location	Pressure Reading
SVP-1_Shallow	-1.366 -0.970
SVP-1_Intermediate	-1.920
SVP-1_Deep	-1.646
SVP-2_Shallow	-0.701
SVP-2_Intermediate	-0.004
SVP-2_Deep	-0.743
SVP-3_Shallow	-1.366
SVP-3_Intermediate	-0.004
SVP-3_Deep	-0.780
OIP-1 =	SS-1 = -0.002
OIP-2 =	SS-2 = -0.008
OIP-3 =	OIP-19 = -0.005
OIP-8 =	OIP-15 = -0.005
OIP-9 =	OIP-17 = -0.006
PTP-1 =	OIP-11 11 = -0.046
PTP-2 =	OIP-12 = -0.063
PTP-3 =	SS-3 = -0.027
U-Tube Manometer Reading at SSEP-1	SS $P_T = 0.6" \text{WC}$, $P_V = 0.006$ PZO = 1.380 ppm
U-Tube Manometer Reading at SSEP-2	$P_T = 0.6" \text{WC}$, $P_V = 0.002$ PZO = 1.122 1.122 ppm
U-Tube Manometer Reading at SSEP-3	$P_T = 0.1" \text{WC}$, $P_V = 0.005$ PZO = 0.739 ppm
U-Tube Manometer Reading at SSEP-4	$P_T = 0.2" \text{WC}$, $P_V = 0.003$ PZO = 0.636 ppm
Comments: back 1A PZO = 0.267 ppm Front 1A PZO = 0.455 ppm combined SSDS 1-123 ppm	

Data Log

Date and Time:		5/21/21 0415 PM Sunny	
Weather:		28°C	
System Pressure:		58"WC at knock out drum	64"WC at System
Discharge PID Reading:		6764 PPb outside of cabinet,	6712 inside cabinet
Discharge Temperature:			170°F
SVE-1	PID Reading:		407 PPb
	Pitot Tube Total Pressure Reading:		12.5"WC
	Pitot Tube Pressure Difference (Dynamic Pressure):		0.041"WC
SVE-2	PID Reading:		32710 PPb
	Pitot Tube Total Pressure Reading:		46"WC
	Pitot Tube Pressure Difference (Dynamic Pressure):		0.027"WC
SVE-3	PID Reading:		10,010 PPb
	Pitot Tube Total Pressure Reading:		19.5"WC
	Pitot Tube Pressure Difference (Dynamic Pressure):		0.034"WC
SVE-4	PID Reading:		10010 PPb 35160 PPb
	Pitot Tube Total Pressure Reading:		48"WC
	Pitot Tube Pressure Difference (Dynamic Pressure):		0.003"WC
SSEP-1	PID Reading:		2051 PPb
	U-Tube Manometer Reading:		0.7"WC
	Pitot Tube Pressure Difference (Dynamic Pressure):		0.005"WC
SSEP-2	PID Reading:		1191 PPb
	U-Tube Manometer Reading:		0.6"WC
	Pitot Tube Pressure Difference (Dynamic Pressure):		0.001"WC
SSEP-3	PID Reading:		1208 PPb
	U-Tube Manometer Reading:		0.2"WC
	Pitot Tube Pressure Difference (Dynamic Pressure):		0.005"WC
SSEP-4	PID Reading:		1090 PPb
	U-Tube Manometer Reading:		< 0.1"WC
	Pitot Tube Pressure Difference (Dynamic Pressure):		0.003"WC
Comments:			
combined SSOS 1322 PPb			
room center 900 PPb higher closer to ground			
back of building 842 PPb			
1014 PPb			

Data Log

~ 28°C Sunny

Date and Time:	5/21/21 ~ 4:00 pm
Location	Pressure Reading
SVP-1_Shallow	-1.478
SVP-1_Intermediate	-1.785 ↑
SVP-1_Deep	-1.629
SVP-2_Shallow	-0.607
SVP-2_Intermediate	-0.009
SVP-2_Deep	-0.764
SVP-3_Shallow	-1.409
SVP-3_Intermediate	0.004
SVP-3_Deep	-0.829
SS-1	-0.045 -0.006
SS-2	-0.001
SS-3	-0.032
SS-4	-0.045
OIP-7	-0.029
OIP-11	-0.050
OIP-12	-0.076
OIP-15	-0.005
OIP-19	-0.001
OIP-3	-0.004
OIP-	
OIP-	
OIP-	
OIP-	
OIP-	
OIP-	
Comments:	

Data Log

Date and Time:		5/28/21 1320 hrs
Weather:		cloudy / Rain p
System Pressure:		59 "wc above knock-out drum 65 "wc at system
Discharge PID Reading:		3493 ppb outside cabinet 3156 ppb inside cabinet
Discharge Temperature:		~64 °C
SVE-1	PID Reading:	674 ppb
	Pitot Tube Total Pressure Reading:	13.5 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.038 "wc
SVE-2	PID Reading:	11710 ppb
	Pitot Tube Total Pressure Reading:	47.5 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.027 "wc
SVE-3	PID Reading:	4710 ppb 5907 ppb
	Pitot Tube Total Pressure Reading:	47.5 19.5 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.035 "wc
SVE-4	PID Reading:	13410 ppb
	Pitot Tube Total Pressure Reading:	49 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.001 "wc
SSEP-1	PID Reading:	2962 ppb
	U-Tube Manometer Reading:	0.6 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.006 "wc
SSEP-2	PID Reading:	21660 ppb
	U-Tube Manometer Reading:	0.6 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.001 "wc
SSEP-3	PID Reading:	6423 ppb
	U-Tube Manometer Reading:	0.2 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.004 "wc
SSEP-4	PID Reading:	678 ppb
	U-Tube Manometer Reading:	< 0.1 "wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.004 "wc
Comments:		Indoor PID center room 440 ppb , front room 496 ppb , lighting room 515 ppb , back room 474 ppb

Data Log

Date and Time:	5/28/21 1525
Location	Pressure Reading
SVP-1_Shallow	-1.047 "wc
SVP-1_Intermediate	-1.195 "wc
SVP-1_Deep	-1.769 "wc
SVP-2_Shallow	-0.027 -0.806 "wc
SVP-2_Intermediate	-0.023 "wc
SVP-2_Deep	-0.850 "wc
SVP-3_Shallow	-1.840
SVP-3_Intermediate	-0.005
SVP-3_Deep	-1.027
SS-1	-0.002 "wc
SS-2	-0.004 "wc need black cover
SS-3	-0.029 "wc need rubber cover
SS-4	-0.041 "wc need black cover
OIP-7	-0.027 "wc need black cover
OIP-11	-0.056 "wc
OIP-12	-0.077 "wc
OIP-15	-0.004 "wc need black cover
OIP-19	-0.001 "wc
OIP-	
OIP-	
OIP-	
OIP-	
OIP-	
OIP-	
OIP-	
Comments:	

Data Log

Date and Time:		6/4/2021 1415
Weather:		Sunny 29°C
System Pressure:		2766 60" H ₂ O at knock-out drum 65" WC at system
Discharge PID Reading:		5275 - 5123 ppb outside cabinet 2500 ppb inside cabinet
Discharge Temperature:		80°C
SVE-1	PID Reading:	236 ppb
	Pitot Tube Total Pressure Reading:	16" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.036" WC
SVE-2	PID Reading:	21360 ppb
	Pitot Tube Total Pressure Reading:	50" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.018" WC
SVE-3	PID Reading:	3261 ppb
	Pitot Tube Total Pressure Reading:	26" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.030" WC
SVE-4	PID Reading:	24190 ppb
	Pitot Tube Total Pressure Reading:	50" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.003" WC
SSEP-1	PID Reading:	650 650 ppb
	U-Tube Manometer Reading:	0.6" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.006" WC
SSEP-2	PID Reading:	380 ppb
	U-Tube Manometer Reading:	0.6" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.001" WC
SSEP-3	PID Reading:	400 ppb
	U-Tube Manometer Reading:	0.2" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.006" WC
SSEP-4	PID Reading:	223 ppb
	U-Tube Manometer Reading:	0.1" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.004" WC
Comments: Front room 1A = 751 ppb back room 1A = 730 ppb lifting room 1A = 793 ppb		

Data Log

Date and Time:	6/4/2021
Location	Pressure Reading
SVP-1_Shallow	-1.045
SVP-1_Intermediate	-0.364
SVP-1_Deep	-1.000 -1.854
SVP-2_Shallow	-0.763
SVP-2_Intermediate	-0.007
SVP-2_Deep	-0.789
SVP-3_Shallow	-1.541
SVP-3_Intermediate	-0.003
SVP-3_Deep	-0.869
SS-1	-0.004
SS-2	-0.016
SS-3	-0.029
SS-4	-0.043
OIP-7	-0.027
OIP-11	-0.026
OIP-12	-0.047
OIP-15	-0.004
OIP-19	-0.001
OIP-18	-0.005
OIP-3	-0.004
OIP-	
OIP-	
OIP-	
OIP-	
OIP-	
Comments: <div> <div>SVE-1 4.83' - 8"</div> <div>SVE-2 DTW (14.12 - 2.08 - 0.5) ft 11.97' - 8"</div> <div>SVE-3 DTW 4.72' - 8"</div> <div>SVE-4 DTW 10.2' - 8"</div> </div>	

Data Log

Date and Time:		6/11/2021 1340
Weather:		Sunny 88°F
System Pressure:		57" WC at knock-out drum, 64" WC system
Discharge PID Reading:		5219 ppb outside cabinet 4590 inside cabinet
Discharge Temperature:		60°C
SVE-1	PID Reading:	2764 ppb 2764 ppb
	Pitot Tube Total Pressure Reading:	11.5" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.038" WC
SVE-2	PID Reading:	17590 ppb
	Pitot Tube Total Pressure Reading:	45" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.028" WC
SVE-3	PID Reading:	6285 ppb
	Pitot Tube Total Pressure Reading:	20" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.034" WC
SVE-4	PID Reading:	23620 ppb
	Pitot Tube Total Pressure Reading:	46" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.001 " WC
SSEP-1	PID Reading:	1480 ppb ↓
	U-Tube Manometer Reading:	0.6" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.004" WC
SSEP-2	PID Reading:	442 ppb ↓
	U-Tube Manometer Reading:	0.6" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.001" WC
SSEP-3	PID Reading:	480 ppb ↓
	U-Tube Manometer Reading:	0.2" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.005" WC
SSEP-4	PID Reading:	260 ppb
	U-Tube Manometer Reading:	< 0.1" WC
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.003" WC
Comments:		system was off when arrived on site. Front Room PID 640 ppb Lifting Room PID 668 ppb back Room PID 482 ppb Center Room PID 524 ppb

Data Log

Date and Time:	6/11/2021
Location	Pressure Reading
SVP-1_Shallow	-0.997
SVP-1_Intermediate	-1.959 ↑
SVP-1_Deep	-2.08
SVP-2_Shallow	-0.968
SVP-2_Intermediate	-0.055
SVP-2_Deep	-0.727
SVP-3_Shallow	-1.240
SVP-3_Intermediate	-0.027 ↑
SVP-3_Deep	-1.518
SS-1	-0.005
SS-2	-0.001 -0.009
SS-3	-0.028
SS-4	-0.039
OIP-7	-0.027
OIP-11	-0.063
OIP-12	-0.096
OIP-15	-0.004
OIP-19	-0.001
OIP-3	-0.004
OIP-18	-0.004
OIP-	
OIP-	
OIP-	
OIP-	
OIP-	
Comments:	

Data Log

Date and Time:		6/16/21 1110
Weather:		Sunny 23°C
System Pressure:		39"wc at knock-out drum 65"wc system
Discharge PID Reading:		outside cabinet 4109 ppb 2513 ppb inside cabinet
Discharge Temperature:		170°F
SVE-1	PID Reading:	448 ppb
	Pitot Tube Total Pressure Reading:	14"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.039"wc
SVE-2	PID Reading:	18230 ppb
	Pitot Tube Total Pressure Reading:	49"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.021"wc
SVE-3	PID Reading:	3784 ppb
	Pitot Tube Total Pressure Reading:	23"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.034"wc
SVE-4	PID Reading:	31570 ppb
	Pitot Tube Total Pressure Reading:	50"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.004"wc
SSEP-1	PID Reading:	1260 ppb
	U-Tube Manometer Reading:	0.6"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.004"wc
SSEP-2	PID Reading:	986 ppb
	U-Tube Manometer Reading:	0.6"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.002"wc
SSEP-3	PID Reading:	765 ppb
	U-Tube Manometer Reading:	0.2"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.006"wc
SSEP-4	PID Reading:	0
	U-Tube Manometer Reading:	<0.1"wc
	Pitot Tube Pressure Difference (Dynamic Pressure):	0.004"wc
Comments:		Front room PID 300 ppb Lifting room PID 350 ppb back room PID 295 ppb

Data Log

Date and Time:	
Location	Pressure Reading
SVP-1_Shallow	-0.850 "wc
SVP-1_Intermediate	-1.410 "wc
SVP-1_Deep	-1.439 "wc
SVP-2_Shallow	-0.637
SVP-2_Intermediate	0.004
SVP-2_Deep	-0.693
SVP-3_Shallow	-1.300 "wc
SVP-3_Intermediate	0.007 "wc
SVP-3_Deep	-0.756 "wc
SS-1	-0.002 "wc
SS-2	-0.006 "wc
SS-3	-0.029 "wc
SS-4	-0.042 "wc
OIP-7	-0.027 "wc
OIP-11	-0.036 "wc
OIP-12	-0.074 "wc
OIP-15	-0.004 "wc
OIP-19	-0.002 "wc
OIP-3	-0.004 "wc
OIP-18	-0.006 "wc
OIP-	
OIP-	
OIP-	
OIP-	
OIP-	
Comments:	

SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 15
Operation Maintenance & Monitoring Data Summary

Attachment 15

Operation Maintenance Monitoring Data Summary

Former Norge Laundry Cleaning Village

2915 S. Meridian Street, Indianapolis, Indiana

IDEM VRP #6130102

KERAMIDA Project No. 19796

Date	Pressure at Knock-out Drum (in w.c.)	System Pressure (in w.c.)	Discharge PID Reading (ppb)	Discharge Temperatue (°C)	SVE-1				SVE-2				SVE-3				SVE-4			
					PID Reading (ppb)	Total Pressure (in w.c.)	Dynamic Pressure (in w.c.)	Flow Rate (CFM)	PID Reading (ppb)	Total Pressure (in w.c.)	Dynamic Pressure (in w.c.)	Flow Rate (CFM)	PID Reading (ppb)	Total Pressure (in w.c.)	Dynamic Pressure (in w.c.)	Flow Rate (CFM)	PID Reading (ppb)	Total Pressure (in w.c.)	Dynamic Pressure (in w.c.)	Flow Rate (CFM)
4/27/2021	58	63	-	-	-	46	0.128	31.49	-	46	0.044	18.46	-	46	0.084	25.51	-	47	0.027	14.46
4/27/2021	61	66	-	-	-	-	0.040	17.60	-	-	0.057	21.01	-	-	0.075	24.10	-	-	0.026	14.19
4/27/2021	72	78	4,000	72	-	20	0.040	17.60	-	60	0.057	21.01	-	23	0.040	17.60	-	60	0.030	15.24
4/28/2021	72	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/29/2021	75	81	3,299	88	1886	21	0.060	21.56	5,380	65	0.058	21.19	2,467	30	0.046	18.87	2,708	66	0.007	7.36
4/30/2021	75	81	4,150	86	6897	24	0.051	19.87	9,521	66	0.026	14.19	3,323	40	0.022	13.05	4,769	67	0.004	5.57
5/3/2021	75	81	-	85	-	18	0.055	20.64	-	65	0.033	15.99	-	34	0.043	18.25	-	66	0.003	4.82
5/7/2021	76	82	10,700	88	600	23	0.056	20.83	25,500	66	0.026	14.19	11,200	35	0.036	16.70	15,900	67	0.003	4.82
5/10/2021	60	65	-	61	-	21	0.033	15.99	-	48	0.023	13.35	-	22	0.033	15.99	-	50	0.003	4.82
5/13/2021	60	65	4,969	66	300	14	0.044	18.46	21,000	46	0.025	13.91	7,500	25	0.033	15.99	21,000	46	0	0.00
5/21/2021	58	64	6,764	77	407	12.5	0.041	17.82	32,710	46	0.027	14.46	10,010	19.5	0.034	16.23	35,160	48	0.003	4.82
5/28/2021	59	65	3,493	64	674	13.5	0.038	17.16	11,710	47.5	0.027	14.46	5,907	19.5	0.035	16.46	13,410	49	0.001	2.78
6/4/2021	60	65	5,123	80	236	16	0.036	16.70	21,360	50	0.018	11.81	3,261	26	0.030	15.24	24,190	50	0.003	4.82
6/11/2021	55	64	5,219	88	2,764	11.5	0.038	17.16	17,590	45	0.028	14.73	6,285	20	0.034	16.23	23,620	46	0.001	2.78
6/16/2021	59	65	4,109	77	448	14	0.039	17.38	18,230	49	0.021	12.75	3,784	23	0.034	16.23	31,570	50	0.004	5.57

Notes:

in w.c. = inch of water column

PID = photoionization detector

ppb = parts per billion

°C = degree Celsius

CFM = Cubic Feet Per Minute

DTW = depth to water

ft = feet

- = not measured or not available

> = greater than

~ = approximately

Attachment 15
Operation Maintenance Monitoring Data Summary
Former Norge Laundry Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796

Date	Pressure Field Extension Test for SVE									
	SVP-1 Shallow (in w.c.)	SVP-1 Intermediate (in w.c.)	SVP-1 Deep (in w.c.)	SVP-2 Shallow (in w.c.)	SVP-2 Intermediate (in w.c.)	SVP-2 Deep (in w.c.)	SVP-3 Shallow (in w.c.)	SVP-3 Intermediate (in w.c.)	SVP-3 Deep (in w.c.)	Others
4/27/2021	-	-	-	-	-	-	-	-	-	-
4/27/2021	-	-	-	-	-	-	-	-	-	-
4/27/2021	-	-	-	-	-	-	-	-	-	-
4/28/2021	-	-	-	-	-	-	-	-	-	-
4/29/2021	-1.663	> -2.39	> -2.39	-1.176	-0.47	-1.327	> -2.2	0	-1.539	-
4/30/2021	-1.31	-1.742	-1.853	-0.91	-0.074	-0.897	-1.92	-0.015	-0.947	-
5/3/2021	-	-	-	-	-	-	-	-	-	-
5/7/2021	-1.207	-2.25	-1.855	-0.875	-0.023	-0.838	-1.756	0	-0.985	OIP-1: -0.004; SS-4: 0.001; OIP-7: -0.001; SS-2: -0.010
5/10/2021	-	-	-	-	-	-	-	-	-	-
5/13/2021	-0.97	-1.92	-1.646	-0.701	-0.004	-0.743	-1.366	-0.004	-0.78	SS-1: -0.002; SS-2: -0.008; OIP-19: -0.005; OIP-15: -0.005; OIP-7: -0.006; OIP-11: -0.046; OIP-12: -0.063; SS-3: -0.027; SS-3: -0.041
5/21/2021	-1.478	-1.785	-1.629	-0.607	-0.009	-0.764	-1.409	0.004	-0.829	SS-1: -0.006; SS-2: -0.011; SS-3: -0.032; SS-4: -0.045; OIP-3: -0.004; OIP-7: -0.029; OIP-11: -0.050; OIP-12: -0.076; OIP-19: -0.001; OIP-15: -0.005;
5/28/2021	-1.047	-1.195	-1.769	-0.806	-0.023	-0.850	-1.840	-0.003	-1.027	SS-1: -0.002; SS-2: -0.004; SS-3: -0.029; SS-4: -0.041; OIP-7: -0.027; OIP-11: -0.056; OIP-12: -0.077; OIP-19: -0.001;
6/4/2021	-1.045	-0.364	-1.854	-0.763	-0.007	-0.789	-1.541	-0.003	-0.869	SS-1: -0.004; SS-2: -0.016; SS-3: -0.029; SS-4: -0.043; OIP-3: -0.004; OIP-7: -0.027; OIP-11: -0.026; OIP-12: -0.047; OIP-18: -0.005; OIP-19: -0.001;
6/11/2021	-0.997	-1.959	-2.080	-0.968	-0.055	-0.727	-1.240	-0.027	-1.518	SS-1: -0.005; SS-2: -0.009; SS-3: -0.028; SS-4: -0.039; OIP-3: -0.004; OIP-7: -0.027; OIP-11: -0.063; OIP-12: -0.096; OIP-15: -0.004; OIP-18: -0.004; OIP-19: -0.001;
6/16/2021	-0.850	-1.410	-1.439	-0.637	0.004	-0.693	-1.300	0.007	-0.756	SS-1: -0.002; SS-2: -0.006; SS-3: -0.029; SS-4: -0.042; OIP-3: -0.004; OIP-7: -0.027; OIP-11: -0.036; OIP-12: -0.074; OIP-15: -0.004; OIP-18: -0.006; OIP-19: -0.002;

Notes:
in w.c. = inch of water column
PID = photoionization detector
ppb = parts per billion
°C = degree Celsius
CFM = Cubic Feet Per Minute
DTW = depth to water
ft = feet
- = not measured or not available
> = greater than
~ = approximately

Attachment 15
Operation Maintenance Monitoring Data Summary
Former Norge Laundry Cleaning Village
2915 S. Meridian Street, Indianapolis, Indiana
IDEM VRP #6130102
KERAMIDA Project No. 19796

Date	Pressure Field Extension Test for SSDS																Notes
	SSEP-1 Total Pressure (in w.c.)	SSEP-1 Dynamic Pressure (in w.c.)	SSEP-1 Flow Rate (CFM)	SSEP-1 PID (ppb)	SSEP-2 Total Pressure (in w.c.)	SSEP-2 Dynamic Pressure (in w.c.)	SSEP-2 Flow Rate (CFM)	SSEP-2 PID (ppb)	SSEP-3 Total Pressure (in w.c.)	SSEP-3 Dynamic Pressure (in w.c.)	SSEP-3 Flow Rate (CFM)	SSEP-3 PID (ppb)	SSEP-4 Total Pressure (in w.c.)	SSEP-4 Dynamic Pressure (in w.c.)	SSEP-4 Flow Rate (CFM)	SSEP-4 PID (ppb)	
4/27/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Full open
4/27/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Choked SVE-1 and SVE-3
4/27/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Final
4/28/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/29/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Raining, when on site around 3:45 pm. System was off due to full of water in knock-out drum. Drained knock-out drum and turned system on. SVE-1 DTW ~ 5.23 ft; SVE-2 DTW ~13.06 ft; SVE-3 DTW ~5.14 ft; SVE-4 DTW ~11.23 ft
4/30/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SVE-1 DTW ~3.85 ft; SVE-2 DTW ~11.81 ft; SVE-3 DTW ~5.16 ft; SVE-4 DTW ~9.18 ft
5/3/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/7/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SVE-1 DTW ~4.18 ft; SVE-2 DTW ~10.37 ft; SVE-3 DTW ~4.15 ft; SVE-4 DTW ~9.23 ft
5/10/2021	0.446	0.005	14.00	36,012	0.515	0.001	6.26	58,400	0.105	0.005	14.00	2,553	0.006	0.004	12.52	2,504	-
5/13/2021	0.6	0.006	15.34	1,380	0.6	0.002	8.86	1,122	0.1	0.003	10.85	739	0.2	0.003	10.85	636	Combined ssds 1123 ppb; back building IA PID 267 ppb; front building IA PID 455 ppb
5/21/2021	0.7	0.005	14.00	2,051	0.6	0.001	6.26	1,191	0.2	0.005	14.00	1,208	<0.1	0.003	10.85	1,090	Combined SSDS 1322 ppb; room center 910 ppb, higher closer to ground; back room 842 ppb; front room 1014 ppb
5/28/2021	0.6	0.006	15.34	2,962	0.6	0.001	6.26	21,660	0.2	0.004	12.52	6,423	<0.1	0.004	12.52	678	room center 440 ppb; front room 496 ppb; lifting room 515 ppb; back room 474 ppb
6/4/2021	0.6	0.006	15.34	650	0.6	0.001	6.26	380	0.2	0.006	15.34	400	<0.1	0.004	12.52	223	front room 751 ppb; back room 730 ppb; lifting room 793 ppb; SVE-1 DTW ~ 4.16 ft; SVE-2 DTW ~11.30 ft; SVE-3 DTW ~4.05 ft; SVE-4 DTW ~9.53 ft
6/11/2021	0.6	0.004	12.52	1,480	0.6	0.001	6.26	442	0.2	0.005	14.00	480	<0.1	0.004	12.52	260	front room 640 ppb; back room 482 ppb; lifting room 668 ppb; center room 524 ppb
6/16/2021	0.6	0.004	12.52	1,260	0.6	0.002	8.86	986	0.2	0.006	15.34	765	<0.1	0.004	12.52	-	front room 630 ppb; lifting room 350 ppb; back room 295 ppb

Notes:
in w.c. = inch of water column
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SUMMARY REPORT
SVE AND HYBRID SSDS SYSTEM INSTALLATION
FORMER NORGE LAUNDRY & CLEANING VILLAGE
2915 S. MERIDIAN STREET, INDIANAPOLIS, INDIANA
IDEM VRP #6130102
KERAMIDA PROJECT NO. 19796

ATTACHMENT 16
SVE First and Second Monthly Sampling Logs

Site Name Norge Project # 1996 Sampler X. Xiong

Address 2915 S meridian st Laboratory pac

Weather Conditions cloudy / rain Precipitation rain Temperature(s) 14°C
(e.g. cloudy, sunny) (e.g. snow, rain)

Barometric Pressure 29.79 "Hg Wind-
Speed/Direction ESE Data Source Apple

Comments: closed SSDS before sampling

[illegible]

Site Name	Norge	Project #	19796	Sampler	Xing Xiong
Address	2915 S meridian St	Laboratory	Pace		
Weather Conditions (e.g. cloudy, sunny)	cloudy	Precipitation (e.g. snow, rain)	rained prior to sampling	Temperature(s)	73°F
Barometric Pressure	29.99 "Hg	Wind-Speed/Direction	North/North west	Data Source	Apple
Comments:					

[illegible]

SUMMARY REPORT
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FORMER NORGE LAUNDRY & CLEANING VILLAGE
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KERAMIDA PROJECT NO. 19796

ATTACHMENT 17
SVE Second Monthly Sampling Laboratory Report