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Ansul 200 bar inergen manual

Introduction This manual provides instructions for designing, installing, recharging, and maintaining the 200 Bar InerGen system, a fire suppression system designed to protect sensitive equipment and hazardous materials. **System Components and Limitations** The system consists of various components, including electronic control panels, releasing devices, selector valves, and actuators. However, there are limitations to consider when designing and installing the system, such as flow calculation limitations and design constraints. **Planning and Design** Before installation, a thorough analysis of the facility's hazard information is required, including identifying potential hazards, InerGen supply requirements, actuation and alarm requirements, piping and wiring details, and ventilation concerns. The application method and distribution manifold and piping installation procedures are also outlined in this section. **Testing and Placement in Service** Once installed, the system must be tested to ensure its functionality and accuracy. This includes testing the electric detection system with Autopulse control, releasing devices, and selector valves. **Maintenance and Recharge** The system requires regular maintenance and recharge to ensure it remains effective and compliant with regulations. Specifically, the user should use a flexible discharge bend when attaching a valve to the supply pipe or manifold. **Safety Precautions and Trademarks** Throughout this manual, safety precautions are emphasized, and users are advised to refer to other Ansul documentation for detailed information on specific systems. **ANSUL InerGen System Specifications** The system meets various specifications, including those outlined in the data sheet and Material Safety Data Sheet (MSDS). **Overview** Ansul Incorporated provides various products for fire suppression systems, including selector valves and pull boxes. **Selector Valves** * Selector valves direct the flow of INERGEN into a single hazard in multiple hazard systems. * 1 1/8 - 18 UNEF selector valves are used in this application. * For pneumatic actuation on smaller valves (1" and 2"), a Stackable Actuator Assembly is required. **Product Details** * Pages 12-15 list various product numbers, including: + 006036: 1/4 inch pressure port + 006037: 1 1/8 - 18 UNEF selector valve + E91021: UL approval for the INERGEN system * Page 15 lists dimensions for a pull box (depth: 3 7/8 inches, height when lever is in straight up position: 5.25 inches) **Pull Boxes** * The pull box on an INERGEN system provides mechanical release of the system from a remote station. * Two types of pull boxes are available. * Components include: + Brass body + Hammer and chain secured to the box (painted red) + Copper gasket adaptor + End view (8.2 cm diameter) **Approvals and Trademarks** * Ansul Incorporated and INERGEN are trademarks of Ansul Incorporated or its affiliates. * The company is located at One Stanton Street, Marinette, WI 54143-2542, and can be reached at 715-735-7411. Note: I condensed the text to focus on the main points, while trying to preserve the original content. **Product Approvals** * The Bleeder Plug Brass 1/4 in. NPT Male (EX-4510) has been approved by UL. * Ansul and Inergen are registered trademarks of Ansul Incorporated. **System Components** * A male coupling is used to connect the manifold/end valve end. * Check valves with different sizes (1/2, 3/4, 1, and 1.25 inches) control the flow of Inergen agent between the main system and reserve system. * Male tees and straight connectors are available for connection. **Orifice Requirements** * The orifice diameter must be specified when ordering a nozzle or pressure reducer assembly. * Refer to the "Nozzle/Pressure Reducer Range Chart" in the Design Section for detailed information on orifice ranges. **Component Materials and Approvals** * Flanged pressure reducer assemblies are required to restrict the flow of Inergen agent, reducing downstream pressure. * The flange is made from forged steel (UL Listed), while the gasket is stainless steel. * Other components, such as weld necks and threaded slip-on fittings, are also available. **Design Information** * Detailed orifice range information can be found in the Design Section. * Notes on component specifications and ordering requirements are provided throughout the text. The document appears to be a technical manual or instruction guide for a fire suppression system. It includes information on the following topics: * The company that produces the system, Ansul Incorporated, and their trademarks (ANSUL and INERGEN). * A description of the cylinder bracketing, which is designed to support and rigidly attach cylinders to the back frame assembly. * Notes on the installation process for the brackets, including the option to bolt or weld them together. * Information on the compatibility of the system with hazardous locations (Class I, Division I, Groups C, D, and Class II, Division I, Groups E, F, G). * A section labeled "A" that appears to be a drawing or diagram of some sort. * Details about a pressure test assembly, including its components and how it is used to read the pressure in the system. * Information on various parts, including holes with specific diameters. The text also includes copyright information, trademark notices, and contact information for Ansul Incorporated. STREET, MARINETTE, WI 54143-2542 715-735-7411 Form No. F-2001285 © 2001 Ansul Incorporated Litho in U.S.A. Page 44 Shipping Assembly hazard area to warn personnel that the space is protected by an INERGEN ™ system and no one should enter after discharge without proper protection. Warning Plate – outside... Page 45 When auxiliary shutdown or functions are discharged, or when alarm systems based on INERGEN agent are triggered, inputs from fire detection devices introduce a proper mixture of gases that charges prepaid. INERGEN/Detection and Control System pressure reducer available in nine sizes: and must approve the cost of INERGEN gas 1/2 in., 3/4 in., 1 in., 1 1/4 in., 1 1/2 in., 2 in., and recharge service in advance. Class C fires occurring within an enclosure by lowering oxygen content below level that supports combustion. INERGEN agent is a mixture of three naturally occurring gases: nitrogen, argon, and carbon dioxide. ANSUL ANSUL INCORPORATED INERGEN MATERIAL SAFETY DATA SHEET MARINETTE, WI 54143-2542 ® ACCORDING TO 93/112/EEC Identification of the Substance/Preparation and of the Company Trade Name: INERGEN Manufacturer/Supplier: ANSUL INCORPORATED Address: One Stanton Street, Marinette, WI 54143-2542 Prepared by: Safety and Health Department... Page 49 Exposure Controls/Personal Protection Respiratory: Normal discharge of INERGEN at designed concentration between 34 and 70 % V/V in fixed enclosure does not present hazard. Exposure at concentrations above limits requires self-contained breathing apparatus. THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. ANSUL SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. Avoid Exposure to Vapors, Fumes, which have no impact on the ozone or environment in general. INERGEN agent is a mixture of three inerting (oxy- AND PRODUCTS OF COMBUSTION. gen diluting) gases: 52% nitrogen, 40% argon, and 8% carbon dioxide (see MSDS in Section II). INERGEN FLOW The flow of INERGEN in system discharge piping is a compressible flow. The agent is a compressed gas, temperature and density changes with pipe pressure. • Maximum allowed split % of INERGEN agent through tee is 95%:5%. • For unbalanced systems, contact Ansul Designer 5.0.1... Page 54 100 ft. (30.5 m). See Figure 1. 8 SCH 40 32487 194922 In determining the design of an INERGEN system, it is necessary to calculate the volume of each area to be protected, as well as the required quantity of INERGEN agent for that area. This calculation can be made using the "Flooding Factor Chart" on Example Page 5-18 or by referring to UL-listed concentrations for Class A, B (contact Ansul for types), and C hazards. The minimum ambient temperature is also important in determining the correct flooding factor. To determine the number of cylinders required, divide the total quantity of INERGEN agent by the system minimum agent quantity and then round up to the nearest whole number. This step helps verify that the "worst case" design concentration will not exceed limits for fire suppression on the low end and life safety on the high end. Additionally, it is necessary to estimate the pressure reducer size based on the discharge time chart on Page 5-21. For multiple level hazards, nozzles must be positioned at the top of each intermediate level, with those mounted at the ceiling. An isometric sketch of the piping should also be created for inputting information into the INERGEN Designer program. Finally, if the enclosures' wall strength cannot be determined, Ansul recommends a maximum wall strength of 5 lbs./ft unless the architect or owner specifies otherwise. The final step in designing an INERGEN system is to create installation drawings for submission to the appropriate authority and customer. These drawings should include information on the pilot cylinder requirement table, which lists various components such as valves, actuators, and reducers. The design should also take into account factors such as the flooding factor chart, atmospheric corrections factors chart, discharge time chart, pipe size estimation chart, and maximum pipe pressure chart. The latter provides acceptable pressure capability for threaded and welded steel pipe used with INERGEN agent systems. It is essential to determine if an autopulse control system is required and to select a suitable style of AUTOPULSE panels. Additionally, the number of pulley elbows that may be used should not exceed 100 feet, and the maximum length of piping from the manifold to all accessories should not exceed 30.5 meters. The INERGEN agent requires atmospheric correction factors based on the National Fire Protection Association (NFPA) 2001 standards. Page 81 - Maximum Pipe Pressure Chart PIPE PRESSURE (Continued) Schedule 80 Threaded Pipe – Maximum Pressure (psi) Grade A-106C, A-53B, and A-106B for different diameters. Page 82 - Maximum Pipe Pressure Chart (continued) Page 83 - Equivalent Length Chart Page 84 - Nozzle/Pressure Reduce Range Chart Nozzle range chart based on actual drill sizes and min/max allowable vs. ability to machine. Page 85 - Cylinder/Bracket Assembly standards INERGEN cylinders must comply with local, state, and federal authority having jurisdiction. They should be installed outside of the protected space and not exposed to fire or explosion hazard. Page 86-87 - Installation MOUNTING COMPONENTS Bracketing installation for INERGEN cylinder assembly without uprights and with uprights (back-to-back). Page 88-89 - INSTALLING ACTUATION PIPING Actuation piping design must be determined before installing. Install 1/4 in. tee in actuation piping and vent plug. Installation instructions for distribution piping continue from page 91. Key points include: All black iron or galvanized fittings must be used before the pressure reducer in the manifold construction. Nozzles should be positioned at the top of hazard areas, aimed downwards. For Ansul flanged components, flange gasket material must be 304 stainless steel Flextite Super Style CG 304. Installation of supply pipes and headers is also specified, with specific dimensions for different configurations. Important notes include: * The actuation manifold should start from the pilot manifold as far away from the distribution pressure reducer as possible. * A maximum number of cylinders can be connected in back-to-back piping arrangements. * Discharge nozzles must be installed according to specifications on the computer design output sheet. Other components, such as fuel shut-off valves and blower motors, are also discussed in relation to system installation and ratings. Installation and setup procedures for various actuators and accessories are detailed throughout these sections. Given article text here 1. Orifice plate in place, size should be checked as per instructions on tab page 112. 2. Test each detector individually and recock release Thermal Detection/Electric mechanism after each test, referring to page 113. 3. Ensure ring pin is fixed in ANSUL AUTOMAN NOTICE II-C release mechanism as shown in Figure 1. 4. Perform system annual maintenance by following instructions in AUTOPULSE Control System Installation, Operation, and Maintenance Manual on page 114. 5. To calculate INERGEN flow, perform Computer room/subfloor protection calculation and print out Flow Report on page 115. 6. Typical applications include piping layouts of 10-20 feet with 1-2 nozzles, as shown in pages 116-117. 7. The system design is UL listed EX4510 and ULC listed CEx1151 version 5.0.1, with a total agent capacity of 1144 cubic feet in each cylinder. 8. Calculation based on 70 degree Fahrenheit pre-discharge pipeline temperature and maximum pressure downstream of manifold orifice at 1715 psia. 9. The ANSUL INERGEN DESIGNER software has a version number 5.0.1 job number manual example, with pipe data input as shown in pages 119-120. 10. Concentrations are based on an altitude of 4000 ft above mean sea level and pipe schedule selected for pipe sizes downstream of the manifold orifice is based on Grade A-53B, A-106B Seamless. 11. ANSUL Incorporated is located at One Stanton Street, Marquette, WI 54143-2542. 12. The person responsible for finances in a company or organization is referred to as the Chief Financial Officer (CFO). The role of a chief financial officer (CFO) has undergone significant changes over time. Traditionally, the CFO was seen as a financial gatekeeper, but now they are viewed as an advisor and strategic partner to the CEO. The position requires big-picture thinking, collaboration, and making decisions that emphasize results rather than process. CFOs are expected to play a critical role in shaping their company's strategies, particularly in uncertain macroeconomic environments where managing financial volatilities is key. In many countries, the appointment of a CFO or finance director (FD) is mandated by law, and they typically report directly to the CEO and board of directors. The duties of a modern CFO have expanded beyond traditional financial stewardship to include areas of strategic leadership and business operations. Many CFOs now hold the "CEO-in-Waiting" status, as CEOs expect them to be active participants in shaping the organization's strategy. The rise of digital technologies and data analytics has placed more pressure on CFOs to meet the expectations of their C-Suite colleagues. They are expected to set the financial agenda for the organization, support the CEO directly, and provide timely advice to the board of directors. In this role, they play a fundamental part in governance and oversight, developing and critiquing strategic choices. The role of a Chief Financial Officer (CFO) has undergone significant changes in recent years, shifting from solely focusing on accounting tasks to becoming a strategic business leader. A finance function based on four pillars supports this shift, including an FP&A organization, increased insight into KPIs, and a focus on leadership and performance improvement expertise. CFOs are now expected to provide valuable insights and support to the organization through their ownership of financial information and data. They must ensure the integrity of data, model transparency, and accountability, and prioritize financial reporting. However, CFOs have traditionally spent significant time on traditional accounting tasks, such as transaction reporting. Research suggests that a more effective approach is for CFOs to work closely with procurement organizations, appointing a chief procurement officer when necessary, and increasing their involvement in the procurement function. CFOs often hold professional accounting qualifications, such as the CPA or CA, and may also hold additional postgraduate qualifications in business administration or finance. These qualifications complement their accounting expertise with strategic, leadership, and financial market considerations. A chief financial officer (CFO) is responsible for more than just finance, focusing on strategic planning and decision-making. According to Entrepreneur, a CFO's role extends beyond financial management to include leadership and vision. A Forbes article by Jeff Thomson emphasizes the importance of being a "Chief Future Officer," highlighting the need for CFOs to think ahead and make informed decisions. The McKinsey on Finance report from 2008 underscores the significance of strategic thinking in finance.