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Ametek 880-nsl user manual

Ametek 880-nsl user manual pdf. Ametek 880 nsl manual.

The AMETEK Process Instruments Model 880-NSL is a compact, rugged analyzer that directly mounts on your process pipe. This transmitter-style photometer combines an exceptionally long lamp life (estimated 5 years) with innovative features for reduced maintenance and enhanced reliability. The device continuously monitors itself and has built-in alarm features. It does not require an external sample line, simplifying the analysis process. The Model 880-NSL features a stainless steel construction, fast response time, and provisions for instrument air and hot water backflush. It is suitable for US and European Hazardous Area classifications and includes no moving parts, electronic zero and span check, and microprocessor-based electronics with self-diagnostic capabilities. To ensure proper installation: 1. Verify easy access to the detector box for adjustments. 2. Ensure the analyzer stands horizontally on a process pipe run. 3. Check if the analyzer requires a sun shade. 4. Test the sample tap area heat by rubbing sulfur on flanges or steam-jacketed components. 5. Measure and adjust the probe length as needed. Installation guidelines for AMETEK Model 888 Tail Gas Analyzer Swage probe tube to 1/2" compression fitting on valve bottom. Rotate tube to oppose process gas flow. Check all removed parts are re-installed, fittings are tight after probe installation. Looking forward to discussing the installation procedures for the Model 888 Analyzer in Class I, Division 2 locations, which involves ensuring safety for personnel and the analyzer. Key considerations include verifying ground continuity of all equipment before applying power and operating from a grounded power source with a securely connected protective ground contact. Additionally, note that humidity may damage installed Optical filters, and it's recommended to arrange product recycling at the end of its life cycle. ****CAUTION:**** The Model 888 Analyzer should not be used in configurations that produce or are susceptible to electromagnetic disturbances as specified in the European Union's EMC Directive. Strict compliance is required for safe installation techniques and wiring practices. ****CLASSIFIED HAZARDOUS AREA PROTECTION:**** This version of the Model 888 is designed for use in Class I, Division 2 classified hazardous areas and complies with electrical equipment requirements. The analyzer features redundant heater control and enclosure designs to prevent ignition of surrounding gases. ****SAFETY PRECAUTIONS:**** When working with the electronics enclosure in an open position, safety conditions must be met per company policy, and the analyzer may only be energized with permission from the works manager or his proxy. Additionally, exposure to some chemicals may degrade sealing properties of materials used in devices. The AMETEK Model 888 Tail Gas Analyzer is a photometric analysis system designed to continuously monitor hydrogen sulfide (H2S) and sulfur dioxide (SO2) in the tail gas stream of a Claus plant. The analyzer's electronics enclosure houses the source and detector assemblies, while the sample conditioning enclosure contains the light tube, mirror-block, and sample cell assemblies. The xenon lamp assembly is powered by a high-quality 3mm arc xenon flash lamp, accompanied by a close-coupled capacitor and trigger electronics with a 50Hz flash rate. The sample cell is secured to the light tube via two stainless steel (SST) plates and a thumb screw, ensuring optical stability. The aspirator pressure regulator and proportional solenoid valve control the flow of instrument air or nitrogen through the aspirator, which is pre-heated by an aluminum heat exchanger. The aspirator gas supply is heated before contacting the aluminum aspirator and pipe flange that must remain at oven temperature. All customer power and signal connections are made within the customer connection enclosure located below the electronics enclosure. Signal connections include Ethernet, Modbus, Alarm Relays, Analog Outputs, and Remote Inputs, supporting FTP and Telnet functions over an Ethernet connection. The analyzer's timing and control chart outlines normal cycles and special periods, indicating valve states and default timing. When steam is turned on, it is injected by the steam valve into the top of the demister. The model 888 tail gas analyzer supports specifications such as temperature range, pressure range, and sample flow rate. Standard Range: 0-2% H S and 0-1% SO; High Range: 0-4% H S and 0-2% SO; Other ranges available upon request. All performance specifications are based on normal operation that includes periodic zero and photo span calibration. The analyzer must be shaded from direct sunlight, with electronics and oven enclosures made of 316 stainless steel. The customer connection enclosure is fiber-reinforced polyester. Power Consumption: 120 VAC (105-132 VAC), 47-63Hz, 500W; or 240 VAC (209-264 VAC), 47-63Hz, 500W. Instrument Air Utility Pressure: 379-517 kPa (55 to 75 psig / 3.8-5.2 barg) Requirements include Air Quality as per ANSI/ISA standard 7.0.01-1996) and Steam Ball Valve Jacket Pressure: 517-690 kPa (75 to 100 psig / 5.2-6.9 barg). The analyzer is approved for installation in hazardous areas classified as Class I, Division 2, and must be installed on a horizontal run of the tail gas pipe. Site preparation should include a plan defining the system mounting location and provisions for power/data interconnect wiring. Installation and Start Up... The Model 888 returns the sample to process through the annular space around the O.D. of the probe tube, preventing plugging the sample tap with solid sulfur. A heated ball valve with a raised face flange should be installed on the nozzle to ensure safe removal of the fresh-air apparatus after installation. The analyzer back plate must be parallel with the tail gas pipe, and the sample inlet flange and main sample valve flange bolt patterns must line up during installation. Slide the probe tube down into the flange fitting, potentially requiring removal of the sample oven cover plate and lowering the probe/valve assembly through the top for tubes longer than 16 inches. For pressure transducers, refer to Table 1 for parts legend. The demister is a white insulated assembly that condenses sulfur droplets from the sample stream at a lower temperature than the rest of the oven. Ensure the steam-jacketed main sample ball valve handle is removed and secured nearby, as it cannot be closed with the probe in place. The AC source must be single-phase, grounded-neutral type for the 888 Analyzer. If necessary, a separate junction box may be required for signal cables that are too large for cable glands. Before power application, ensure no leaks are present in the sample system through leak checking after any maintenance or modifications. The analyzer will start in Period 1, Special Flush, and step to Period 2, Flush &... Set the aspirator regulator pressure gauge to approximately 10 PSI above process pressure. Make sure the Aspirator Override is in the NO position and flow setpoint is set to 1.5. The Model 888 Tail Gas Analyzer has a unique timing sequence that is divided into 14 periods. These periods are programmable and can be run for a specified length of time in seconds. The normal timing sequence starts at Period 1 and cycles through to Period 4, which is the Sample Tracking period. This cycle continues indefinitely until one of several events occurs, such as the Zero Timer times out or a Steam Blow Back Cycle is started. The analyzer has an optional calibration span adjustment that can be performed manually using cylinders of known concentrations. This adjustment involves validating and/or adjusting the calibration of the analyzer by navigating to the "Continuous Hold" option and pressing the ENTER key to activate it. The gold side of the slider will move to the right to indicate that the hold is activated. The Model 888 also features a Hazardous Area warning, stating that hazardous voltages are present inside the analyzer when covers or doors are open. This warning advises users to monitor the area for flammable gases and proceed only when it is safe to do so. Additionally, there are four alarm relays maintained by the analyzer, which are failsafe and indicate a problem if an open contact occurs. These alarms include System Alarm, Data Valid Alarm, and two user-configurable alarms. Set up programmable relays, specifically the Model 888 Class I, Division 2 Tail Gas Analyzer on Page 65. This involves configuring Level 1 Alarms which utilize an internal 1 second clock to track machine periods and can be disabled via the service menu. If the alarm persists after the timer is enabled, it may indicate that the cell temperature has dropped below its lower limit, potentially causing sulfur mist to condense on optical surfaces. On Page 66, Flange Temperature Alarm can also occur if there's a cold spot at the flange that might lead to plugging conditions. The Model 888 varies flash counts for each detector to ensure adequate light levels but high flash counts often suggest dirty optical surfaces. Diagnostic Functions include testing analog outputs, relay operation, and other components through menus described in the User Interface manual (883056904). Trouble can be identified by checking active alarms for a RTD failure alarm which is displayed as 999 °C on the Config-ure Status menu. Low Light Conditions may indicate issues with the Xenon Flash Lamp or optical pathway obstructions, possibly due to deposits on surfaces or mechanical misalignment in the oven enclosure. Always ensure the area is free of hazardous gases before opening the enclosure door and only qualified technicians should work on the analyzer while it's powered. Parts Replacement involves programming units for Bypass to power electronics, being cautious of hazardous voltages inside the electronics enclosure and hot surfaces present in the oven enclosure. The cell assembly, conax gland seal, sample cell, mirror block, electronics enclosure interior, ameivision electronic assembly, and 8000-122 SE circuit assembly are key components that need to be considered for replacement or maintenance according to specific instructions. The Model 888 is a Class I, Division 2 compliant tail gas analyzer that comes with various parts and components, including LCD displays, keypad, sensor boards, detector boards, DC/DC converters, lamps, sample oven enclosures, manifold blocks, flanges, fuses, and wiring diagrams. The device has multiple models and configurations, with different ranges and capabilities. The manual includes pages detailing the different components, their parts numbers, and replacement procedures. The model 888 is designed to measure concentrations of sulfur dioxide (SO2) and hydrogen sulfide (H2S) in the air, using four detectors and bandpass filters. It provides an analog output that can be used to regulate air flow into a reaction furnace to produce the correct ratio of H2S to SO2. The manual also includes wiring diagrams for various configurations of the model 888, including standard, high-range, and custom connections. The device is designed to meet specific safety standards and regulations, such as Class I, Division 2 compliance. Additionally, the manual explains a calculation method called S + SO + 2H, which allows the Model 888 to provide an analog output that can be used to regulate air flow into a reaction furnace. This calculation is based on the plant factor, process ratio, and excess air. The Model 888 Tail Gas Analyzer, a Class I, Division 2 device, utilizes a state machine with 14 periods to control its operation. Timers trigger many state transitions. Once Period 8 elapses, the analyzer may revert to Period 3 or advance to Period 9, but only if equipped with steam blowback capabilities. The analyzer features several operation sequences, including Zero Calibration, Photo-Span Calibration, and Special Periods for troubleshooting. During these periods, the sample system is flushed by instrument air, and analog outputs are held at their last valid values. The device also has three special periods (12, 13, and 14) used for troubleshooting, where data validity contacts are held at their last valid values. These periods allow for continuous flushing of the sample system. Additionally, the analyzer features a range of alarms, including Level 1 Alarms for hardware failures or system errors that prevent accurate concentration measurements. There are also programmable Level 4 Alarms that can be mapped to specific parameters and selected to operate normally open or closed. The device automatically adjusts light intensity by changing lamp flashes per second. If the light intensity drops too low, a Low Light Alarm is triggered. As sample flow rates become unstable, adjustments are made by increasing flashes per second on detectors to maintain light intensity. Page 118 Potential causes include faulty solid-state relays or excessive air cooling, which will clear once temperature reaches normal range. Cell Flow Alarm [7] occurs when sample flow rate deviates from ideal 1.5 SLPm due to proportional valve hitting maximum or minimum control range. Page 120 When heater's two redundant sensors detect an issue, user intervention is required to resolve the problem, possibly due to a faulty RTD or disconnected wires. Manifold Pressure Alarm [15] triggers if pressure drops below operating threshold for pneumatic valves, resolved by heating flange and ensuring proper insulation around external ball valve on Page 122