

SpectraSensors™



SC403 HEATED REGULATOR Instructions



Introduction

The SC403 Heated Regulator Assembly is designed for extracting natural gas samples from a pipeline when a probe regulator cannot be used. Ideally, the input to the SC403 will come from a sample tube whose inlet end is in the center 1/3 of the pipeline. If gas samples are taken from a fitting on the wall of the pipe rather than from a sample tube, there is a good possibility of collecting a sample that is not representative of the bulk of the gas flowing through the pipeline. See the American Petroleum Institute's Manual of Petroleum Measurement Standards Chapter 14, Section 1-Collecting and Handling Natural Gas Samples for recommendations on proper sampling techniques.

The SC403 can accept inlet pressure up to 3600 psig (at 175 F) and reduce it to a few psig, suitable for use with SpectraSensors analyzers. Whenever gas pressure is reduced, the gas expands and the temperature of the gas drops unless heat is added. This Joule-Thomson effect can cool the gas by as much as 7 F per 100 psi pressure drop. In some cases this temperature drop can cause water or hydrocarbon vapors to condense into liquids and affect the composition of the gas phase. The SC403 Heated Regulator Assembly is designed to add heat to the gas at the regulator orifice and prevent the condensation of liquids. To prevent overheating, the heater is thermostatically controlled to a maximum temperature of 85 F. In addition, the insulation on the stainless steel tubing coming out of the regulator will help to maintain some of the heat of the gas even when the ambient temperatures are low.

The SC403 is designed to be powered from 120 VAC and draws about 0.33 amps (40 Watts). It uses a standard three prong grounded power plug. For portable applications, a small inverter (rated > 40 Watts) operating from a vehicle battery is required to power the SC403.

The SC403 assembly is CSA certified for use in a Class I, Division 1 hazardous classified area. A fifty-foot (standard) power cord is provided between the Regulator Assemble and the electrical plug. The electrical power connection must be made in a non-hazardous classified area (because of the potential of a spark when the connection is made). A warning to this effect is attached to the power plug.

Installation

Gas Line Connection

The SC403 has a 1/4" male quick-connect fitting on the bottom. The female quick-connect fitting with 1/4" MNPT threads is supplied. The customer will have to adapt those 1/4" MNPT threads to whatever connection he has on the pipeline sample port. All pipe thread connections should be made using an approved thread sealant or Teflon tape.

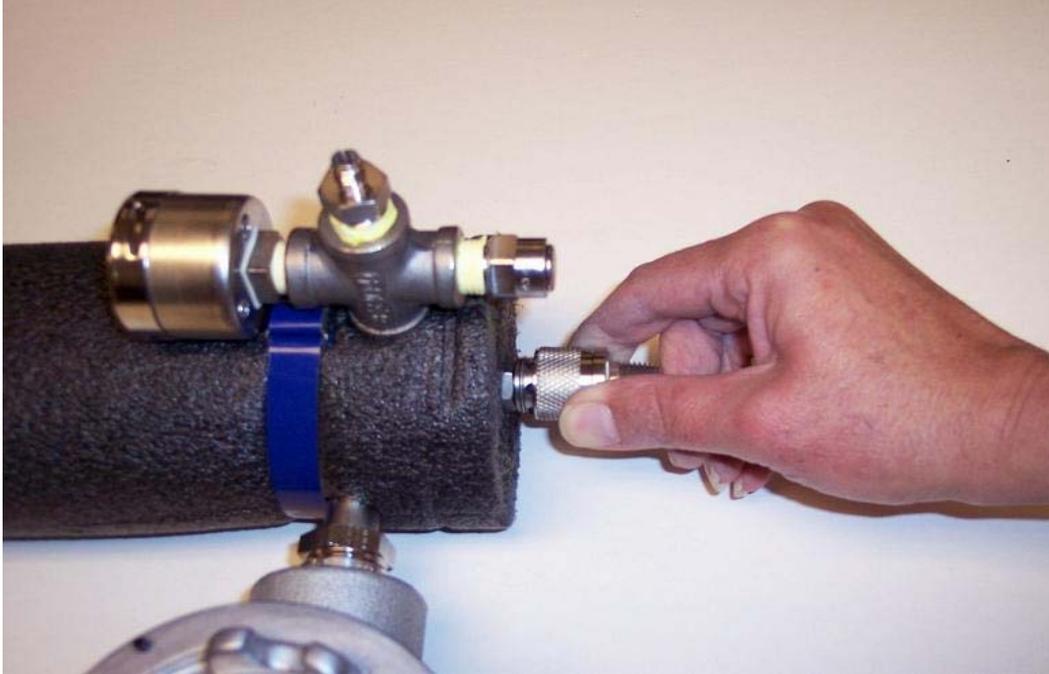


Figure 1 – Quick-connect release ring

Once the female quick-connect is tightened, the regulator can be inserted into it by pulling down on the quick-connect release ring. The SC403 Heated Regulator Assembly is heavy so it should be supported to prevent damage to the quick-connect fittings.

Sample Line Connection

Connect the supplied insulated sample line to the 1/8" swage fitting on the outlet of the pressure regulator. The fitting on the sample line has been pre-swaged so it is only necessary to snug the nut rather than turning it the usual $\frac{3}{4}$ turns. Connect the other end of the insulated sample line to the quick connect fitting supplied with the SpectraSensors Model 1000 Gas Analyzer. Again, it is only necessary to snug the fitting nut.

Electrical Connection

Plug the electrical cord into a 120 VAC power source located in a non-hazardous classified area.



CAUTION! – The electrical power connection must be made in a non-hazardous classified area. Sparks that can occur when the connector is plugged in can ignite flammable gas mixtures if they are present.

The heater will start heating as soon as the power cord is plugged in. Allow five minutes for the internal temperature of the regulator to reach setpoint.

Operation

Once the regulator has had time to warm up, you can open the gas flow to the SC403 and into the Model 1000 Gas Analyzer. Note that the regulator body may not feel warm to the touch; the heat is concentrated at the regulator orifice. Follow the gas analyzer instructions to take a reading. The SC403 Heated Regulator Assembly is factory set to a temperature of 85 F and an output pressure of about 2.5 psig. In most cases this should produce good results when used with the SpectraSensors Model 1000 Portable Gas Analyzer.

When the measurement is complete, turn off the gas flow and remove the sample line from the Gas Analyzer and from the regulator assembly. Then, uncouple the quick-connect fittings to remove the Heated Regulator Assembly from the pipeline.

When not connected to a gas pipeline, the SC403 can be left plugged in to minimize the heat-up time when it is installed.