

Cargo Tank Measuring System

PURPOSE

The Fixed gas sampling system is dedicated to the Gas Control in all Tanks, Void Spaces, Pump room or Houses adjacent to Cargo Storage Tanks and Handling Systems. In order to detect any Gas Concentration level over programmable limits and to monitor visible and audible alarms consequently, these areas are controlled by the suction process sampling on one or more common sensor(s) as well as by individual local sensors.

This system complies with ISGOTT regulation chap. 7.8 and 8.2.

SYSTEM DESCRIPTION

The Fixed gas sampling System is composed of :

ANALYSING UNIT

A cabinet named Analyzing Unit includes suction process sampling gas sensor(s) and pneumatic components for up to 48 channels (pumps, solenoid valves, water trap filter, pressure sensor, ...).

A modular arrangement of solenoid valves allows easy sizing of channels number, easy extension as well as easy maintenance.

An electronic module manages above parts, monitors up to 7 gas sensors dispatched either in suction process or as local sensor, performs all gas measurements from above sensors, and monitors the alarms on dry contact outputs. It comprises 4 digital RS485 communication ports Unit(s) as described hereunder, and/or an external Monitoring System using MODBUS RTU protocol. The Unit is powered equally by 220 or 110 VAC.

CONTROL UNIT

One or more panel(s) named Control Unit include an electronic module managing a LCD screen for measurement and alarms display, status lamps, buzzer/dry contact output for alarms monitoring and keyboard for System operation and configuration.

The large LCD screen increases the data availability and the man-machine interface is simplified for easy access to functions and configuration using spread menus.

One Control Unit can be incorporated in the Analyzing Unit or located in a remote box, another one can be located in another place. The Control Unit is powered by 24VDC from the Analyzing Unit, and communicates with it by RS485 link.

ANALYZING UNIT WITH CONTROL UNIT



SUCTION SAMPLING ACCESSORIES

A set of suction sampling accessories is composed of safety chamber, non-return valves, flame-arrestors, shut-off valves. On each channel, a flow regulating valve allows to get an identical flow whatever is the length of the line, for best efficiency of the system.

LOCAL GAS SENSORS

When required, a set of local gas sensors of infra-red, catalytic, electro-chemical or any other type, 4-20mA output, can be connected to the Analyzing Unit.

SAFETY CHAMBER



Local gas sensors

- Conn. Size : 5K 25A FF
- Material : SUS316
- Signal line : PT 3/8 "
- Protection device is used for avoiding water suction.

NON-RETURN CHECK VALVE



Local gas sensors

- Conn. Size : O.D 8mm
- Material : SUS316

SPECIFICATIONS

- Suction channels number : up to 48, connections for O.D. 8 mm copper pipes
- Suction capacity : up to 500 meters w/ O.D. 8 mm pipes
- Sampling exhaust output : connection for O.D. 8 mm copper pipe to safe area
- circulation exhaust output : connection for O.D. 8 mm copper pipe to safe area
- Drain water trap output : connection for O.D. 8 mm copper pipe to safe area
- Calibration gas input : connection for O.D. 8 mm plastic pipe
- 4-20mA Analog calibrated inputs for sampling or local sensors : up to 7
- Gas concentration alarm levels : 2 adjustable, Pre-Alarm and Main alarm
- Alarm form Analyzing Unit, dry contact outputs : 1 for Gas alarm
 - 1 for System alarm
 - 1 for remote Horn / Rotating Lamp
 - 1 for Power Supply failure
- Alarm from Control Unit : 1 internal buzzer + 1 dry contact output
- Communication ports : 4 RS485, 1 RS232 (Analyzing Unit)
 - 1 RS232 or RS485 (Control Unit)
- Output power supply for sensors : 24 VDC
- Instrument air supply for purge : 7 / 10 bars, connection for O.D. 8 mm copper pipe
- Sensors : miscellaneous type according to gas type Safety class according to their location
- Operating temperature for : 0 °C to + 70 °C
 - Analyzing and Control Units
- Location for Analyzing and Control Units : Safe area in enclosed space (Control Room, accommodation, bridge, ...)
- Power Supply : 110/220 VAC and Other voltages on request

GENERAL DIAGRAM FOR FIXED GAS SAMPLING SYSTEM

