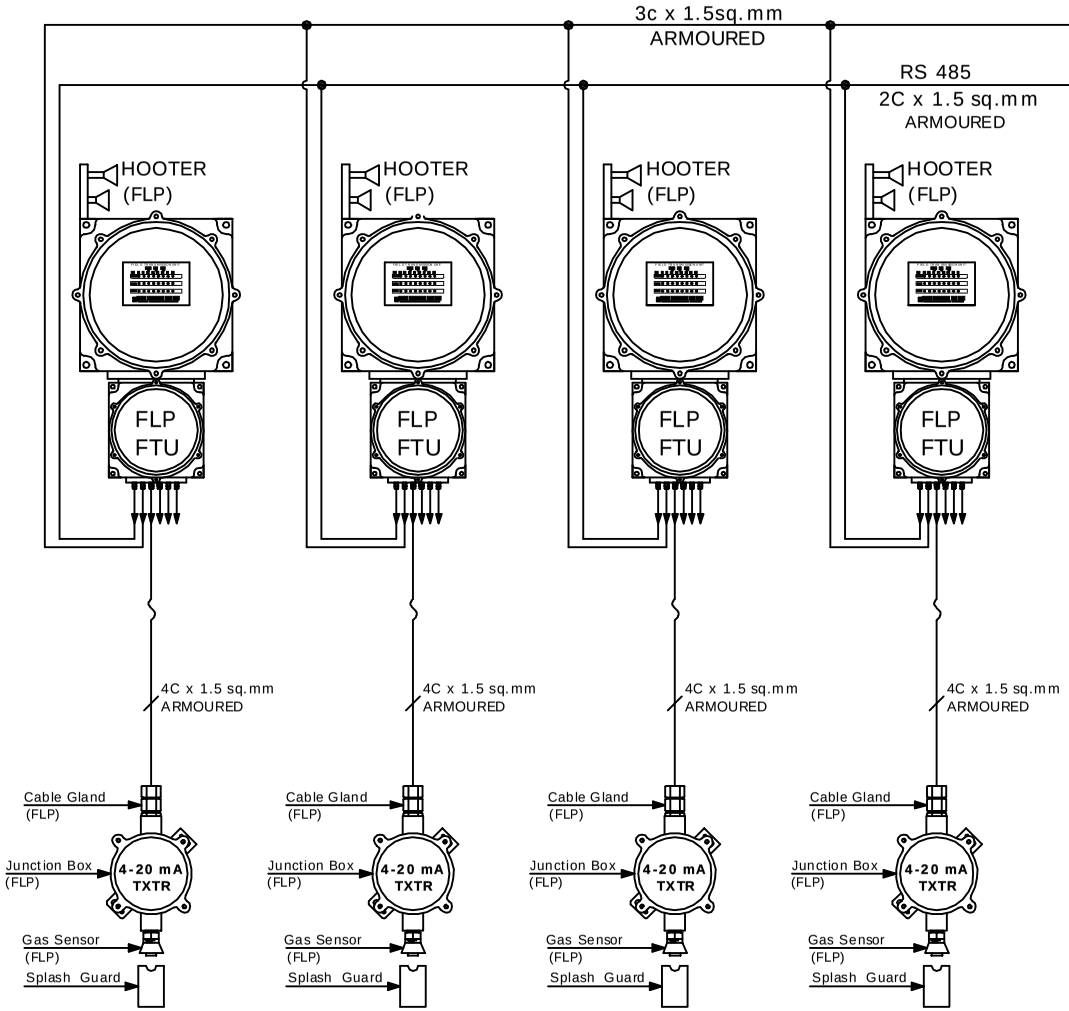
DIMENSIONS ARE IN MM. | DO NOT SCALE | IF IN DOUBT, ASK.

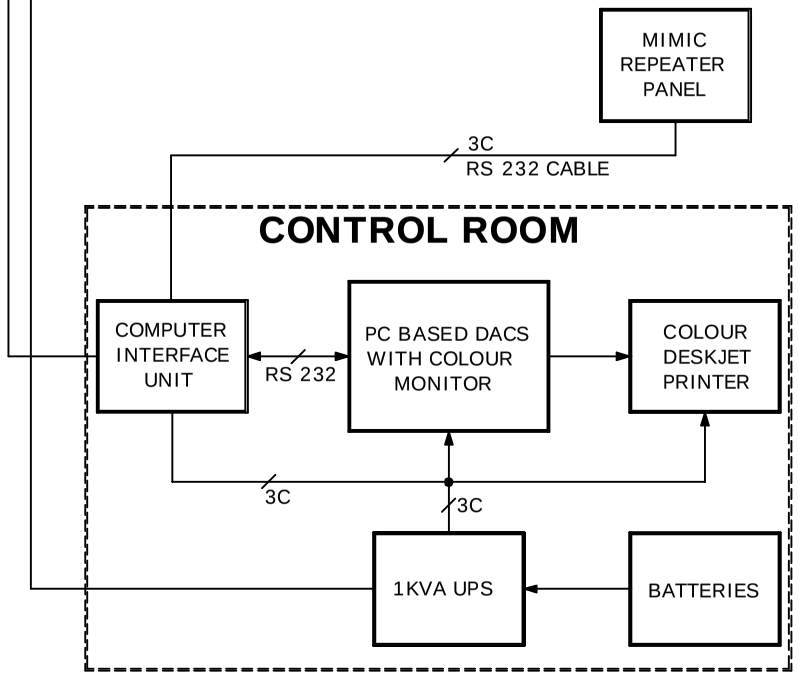
DRAWING NO. 3C-1430-5N(18)

RIV. No.	LOCATION	REVISIONS	DATE	DRN.	APPD.

HAZARDOUS AREA



SAFE AREA



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Pentax Engineering Pvt. Ltd. MUMBAI - 400 072.

MATERIAL	SURFACE TREATMENT	TITLE :- G. A. DRG. FOR PC BASED GMS-4000
---------	---------	CLIENT :-

UNLESS OTHERWISE SPECIFIED GENERAL TOLERANCES ON DIMENSIONS
X.X ± X.XX ± X.XXX ± ANGULAR ±

ROUGH FINISH
SMOOTH FINISH
GROUND FINISH

SCALE NTS

USED ON

	NAME	DATE
DRN.	SHEKHAR	29.01.2010
CHD.	JDK	29.01.2010
APPD.	JDK	29.01.2010

DRAWING No. 3C-1430-5N(18)

RIV. No. 0 | SIZE A3

GAS MONITORING SYSTEM INTRODUCTION

Pentax Gas Monitoring System is a PC based safety Monitoring Annunciation System. It monitors gas concentration in % LEL units at various sensor location points. Each Channel (corresponding to each sensor) has two settable alarm limits. The system automatically generates these two alarms when any limit is exceeded. Each channel is also monitored for any fault condition like open/short circuit etc. Fault is announced and faulty channel is suspended from monitoring.

The System has UPS backup of two hours and can work without any permanent observation or attention. Only interaction required normally is to acknowledge or reset any alarm state.

System has elaborate data storage scheme and all abnormal situations are logged permanently. System stores all events (alarm, fault) all program changes, all system control commands, channel peak data along with the date and time of occurrence.

In the computer hard disc, these data are stored in easy to manage files. These files then become permanent record which can be stored in separate CD etc. for subsequent safety management/audit.

Personnel Computer PC along with high resolution colour monitor and printer permits system control, program control, data storage and processing functions. The computer also shows the plant status with sensor location, gas concentration, alarm status etc. in a colour bar chart form or in a colour mimic layout form. The computer is used as an on-line device to update records, to see the plant status on real time basis, to change program settings and to process alarm/fault signals.

System has extensive self-monitoring. All critical circuits, components, sub assemblies are automatically and regularly monitored and any abnormal situation is announced as a fault.

GAS MONITORIING SYSTEM COMPOSISTION

1) Catalytic Combustion based Pellistor Type Gas Sensor

2) Sensor Accessories set comprising of:

   a) FLP Junction Box with Gland
   b) Mounting Stand with canopy
   c) Weather Protection Guard
   d) Foam Filter

3) 4-20mA Transmitter for above sensors

4) Analogue Field Transmission Unit (Analogue FTU) suitable for 8 CH

5) Computer Interface & Controller Unit (CIU)

6) PC with Colour Monitor and DeskJet Printer

7) UPS (Uninterruptible Power Supply) with Batteries for 2 Hrs Back-up

8) Mimic Repeater Panel for Security Cabin

9) Calibration Kit

HYDROCARBON GAS SENSORS

The gas sensor will be based on Catalytic combustion principle. It shall be able to withstand extremes of environmental conditions. Sensitivity shall not be affected by Variations in the atmosphere temperature and humidity. The sensor shall meet all the statutory requirements like CCOE India' approval of positioning the same in Hazardous atmospheres. It shall have approval for use Hazardous atmospheres in the country of origin.

All Gas Sensors shall be supplied with accessories like FLP Junction Box, Double Compression Cable Glands, Weather Protection Guard, Foam Filter, Sensor Mounting Stand.

4-20mA TRANSMITTERS

Pentax 4-20mA Transmitter is the interface between Gas Sensor in the field and Monitor/Controller (Analogue FU).

It is designed to convert 0-100% LEL gas concentration equivalent to 4-20mA current o/p signal. As the o/p from transmitter is loop current, there is no problem of cross talk or interference.

This current output is converted into milivolts by putting a termination resistor in the loop and then, the signal is utilized by the controllers to generate % LEL indication and all the Alarm Signals for that particular channel.

INTELLIGENT FIELD TERMINAL UNIT

The Field Terminal Unit (FTU) will be an intelligent remote unit which will make available the digital values of the analog signals received by it from gas sensors connected to it in the field to the Computer located in the control room. This shall be done through a Computer Interface Unit (CIU) located next to the Computer in the control room. The FTU will also provide power to each Gas Sensor connected to it. A single FTU will have facility to connect up to 8 Gas Sensors.

The FTU will accept 4-20mA analog signal from gas sensors, convert it into the respective digital values and store them in its RAM. It will make available these values to the Computer on receiving an appropriate command from it. The Computer will be able to scan all FTU's and receive gas sensor readings for all sensors within 15 seconds.

The FTU will be equipped with a Power Supply Block of SMPS type to provide the different DC voltages required for operation of various components of the FTU.

Data communication between the FTU's and the CIU will be through RS 485 communication protocol.

COMPUTER INTERFACE CONTROLLER UNIT

The Computer Interface Unit (CIU) is provided for the interface between the Computer and Field Terminal Units (FTUs), External Alarms and Mimic Repeater Panel.

The Gas Sensors are to be connected to the CIU through FTUs. Based on a command from the Computer, the CIU shall receive signals corresponding to gas concentration from the Sensors in Digitized form through the FTUs.

The CIU will display the % LEL information received from all detectors continuously on its Intelligent Alphanumeric LCD Display.

The CIU will be provided with sufficient keys to program the Gas Detectors for Alarm Settings, SKIP, INHIBIT etc.

The CIU also transmits commands received from the Computer to the FTUs for setting of the local WARN and ALARM limits in the FTUs. Based on this, the FTU can generate Local Warn and Alarms signals through switching of relay contacts for activation of external alarms locally.

The CIU also has provision for connection of upto 16 External Alarms. The CIU is therefore, equipped with 16 relay contacts. These are to be used for activation of external alarms in the central areas such as Control Room, Security Cabin, etc.

In the absence of PC, it will be possible to take ALARM, LOG and HISTORY Printouts directly from CIU.

The communication between the CIU and the FTUs is through RS-485 protocol. The CIU is connected to the Computer through one of the serial ports on the Computer and will use RS-232 protocol for communication with the Computer.

The CIU is operated on 230V AC/110V AC Power Supply.

CIU is provided with an Audio Alarm Facility and there are sufficient Indications to confirm the status of various communication links.

The CIU is supplied with all Interconnection Cables.

INTELLIGENT MIMIC REPEATER PANEL

This will be connected to the control system through RS232/485 Interface and the signal strength shall be enough for a distance of 500 mtrs.

These shall be a large mimic diagram with LED Display Panel showing sensor locations, channel status, etc. Summary status indicators shall show plant and control system status. A local buzzer shall give audio annunciations. This shall have local Accept switches for local audio-visual annunciations. A remote Accept switch and remote Reset switch for remote control of main control system. Remote commands shall be maskable by the main system. A test command shall test all audio-visual annunciation elements.

GAS MONITORING SOFTWARE

The Gas Monitoring Software resides on the Computer and controls the functioning of the entire Gas Monitoring System.

The PENTAX Gas Monitoring system uses the latest GUI Software on Microsoft windows Operating System for acquiring and displaying Read Time Data from the field sensors located around the plant. A fully graphical, user-friendly interface using mouse and keyboard gives the user full operational flexibility and control. All channel parameters and system parameters are programmable through PC. Overall software design uses the concept of Visual Display Interface to the users. PC is connected to the GMS Controller through Rs-232 interface.

The GMS Software will have following features.

- Sensors may be in any combination of FTUs.
- Upto 2 Alarm set points may be specified for each sensor, anywhere in the sensor range.
- Conversion of Sensor signal into engineering Unit and display of the Gas concentration reading in % LEL for each Detector.
- Complete flexibility of configuring external Alarms whether by individual sensor or by Zones.
- Automatic logging of Data on computer's hard disk.
- Data logging at regular intervals for Gas Concentration readings, efficient data Logging scheme is employed to minimise use of hard disk space.
- Ability to Bypass a sensor from processing of reading, alarms and Data logging in the event of sensors having become Faulty or for any other reasons.
- Supports automatic sensor calibration, External alarms are deactivated for a Sensor under calibration, Maintains the record of calibration done.
- Menu driven and screen printed and therefore easy to use.
- Password protection for system configuration features.
- The % LEL data of all CH is available continuously in any of the following 4 Modes when PC is On- Line with GMS Controller (i.e. Real Time Mode)

1) TABULAR 2) BARGRAPH 3) PLANT MIMIC 4) SLGWAL TREND.

- In Off-line Mode, the User can access the following and can take selected printouts.

PROGRAM HISTORY PEAK LOG RECORDS ALARM EVENT HISTORY