

WATER SUPPLIES DEPARTMENT
STANDARD SPECIFICATION EM-02-04
CHLORINE GAS DETECTION SYSTEM

1. GENERAL

The chlorine gas detection system including sensors and control unit shall be suitable for chlorine leak detection and alarm applications. All materials used shall be corrosion resistant to chlorine gas environment.

The control unit shall be able to monitor one or a number of chlorine leak detectors as specified in the particular specification at a time and to indicate the current status of each individual detector which it is connected to. The system shall be designed on a 'fail safe' basis such that any fault alarm can still be initiated in case of mains failure. The system shall also give indication and alarm in case of equipment fault. Provision for relaying the alarm signal of the system fault for remote monitoring and control shall be available.

A 4-20mA analog signal output per gas detector shall be provided.

2. SENSOR

The sensor of the detector shall be of electrochemical type. The service life of the sensor shall be at least 1 year. It shall be suitable for at least two hours duration of exposure to concentrated chlorine gas of minimum 20 ppm. The 90% pick up response shall not exceed 150 seconds. The detectors shall be suitable for monitoring chlorine concentrations between 1 ppm and 10 ppm by volume.

For detectors to be used in air sampling of ventilation ducts, the response time of the sensor shall be not more than 12 seconds. The detector unit shall be suitable for duct sizes between 300 and 1500 mm wide, inside which the air velocity is greater than 5 m/s.

3. DETECTOR ASSEMBLY

The detector shall be of wall-mounted type and the chlorine gas sensor shall be of modular "plug-in" type without any wiring work to facilitate easy replacement. Minimum two adjustable detection levels shall be provided. The adjustable low level and high level alarm settings shall be at 1 ppm and 3 ppm respectively. Provision for relaying the alarm signal of each detection level for remote monitoring and control shall be available.

The chlorine leak detector shall be powered by d.c. supply from its own control panel.

4. CONTROL UNIT

The degree of protection of the enclosure of the control unit shall be of at least IP54 to IEC 60529 and shall have the following alarms/indications on the front of the enclosure :-

- (a) Power supply on
- (b) Fault alarm(s)
- (c) High chlorine leak alarm
- (d) Low chlorine leak alarm
- (e) Gas concentration display (ppm)

The control unit shall be of wall-mounted type. Audible and visible alarms shall also be provided on the control unit under alarm conditions.

The power supply of chlorine leak control panel or unit shall be 220V 50Hz with a local battery back-up sufficient for operation under alarm condition for not less than 5 hours. The local back-up battery shall be of sealed type with charger provided. The function for detecting and indicating the battery fault condition shall also be provided.

5. ACCESSORIES

A set of gas generator shall be supplied, when specified, for calibration verification.

For air sampling applications in ventilation ducts, the detector shall be provided with accessories such as dust filter, fan, hoses, inlet and vent connections, etc.

6. CALIBRATION

The calibration shall be carried out by direct chlorine gas at 1, 3 and 10 ppm. Pre-calibration shall be carried out at factory with calibration certificate issued by the manufacturer. The gas generator shall be used for calibration.

7. PRODUCT APPROVAL OF FIRE SERVICE INSTALLATION AND EQUIPMENT

Chlorine gas detection system shall be approved by Fire Services Department (FSD) or one of the "Listed Equipments" listed by the Product Certified Bodies (PCBs) in accordance with FSD Circular Letter 1/2007 and the latest FSD requirements. A copy of the approval document issued by Fire Services Department or the relevant documentary proof such as product listing certificates/ records/ letters issued by the respective PCBs should be submitted for information if requested.