INSTRUCTIONS

HCL DETECTOR

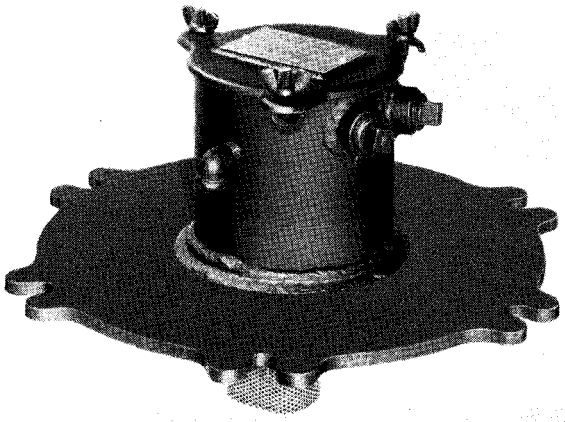

FIG. 1. HCL Gas Detector Ready for Mounting on a Cover Handhole.

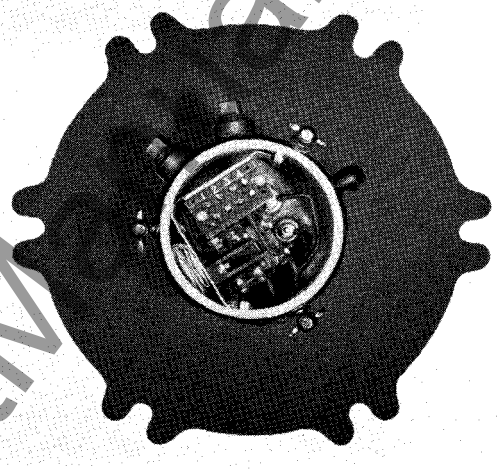

FIG. 2. HCL Gas Detector with Lid Removed, Showing Parts in Place.

THE HCL GAS DETECTOR is a protective device developed for application on Inerteen transformers. When Inerteen is decomposed by an electric arc hydrogen chloride gas is liberated. The detector will operate whenever a very small amount of HCL gas comes in contact with the detector coil which is located in the gas compartment of the tank, terminal or switch chamber. The relay for making contact in an external alarm circuit is mounted in a small case sealed from the main gas compartment. It is only necessary to check the condition of the coil every six months or replace it when it has been operated by the presence of HCL gas.

CONSTRUCTION

Fig. 1 shows the HCL detector as it appears when ready for mounting on the transformer. All Westinghouse Inerteen transformers equipped with HCL detectors are especially designed to incorporate this device.

The HCL detector is designed to fit an opening in the tank, terminal or switch chamber gas space. In most cases a handhole, of standard size, is used for this mounting.

The HCL detector has the following components.

Detector Coil. The detector coil is made up of two bare electrodes wound on an insulated spool and separated from each other by an insulating material that is sensitive to hydrogen chloride gas. This material produces a resistance of over 100,000 ohms between the electrodes. When hydrogen chloride gas comes in contact with this particular insulating material it is absorbed and due to the chemical reaction the resistance is greatly reduced allowing current to flow between the electrodes and through the relay coil, closing the relay contacts.

Relay. The relay is a Westinghouse Type "SG". This relay has two contacts, which are normally open, one contact being used to close the alarm circuit when the relay operates and the other contact holds the relay closed after operation until the supply voltage is interrupted. The relay can be altered so that the contacts are normally closed.

The standard HCL detector is designed to operate on 50 or 60 cycles, 400 to 480 volts. Different applications may require some additions or alterations to make the standard unit applicable. The most common of these are: with a supply voltage

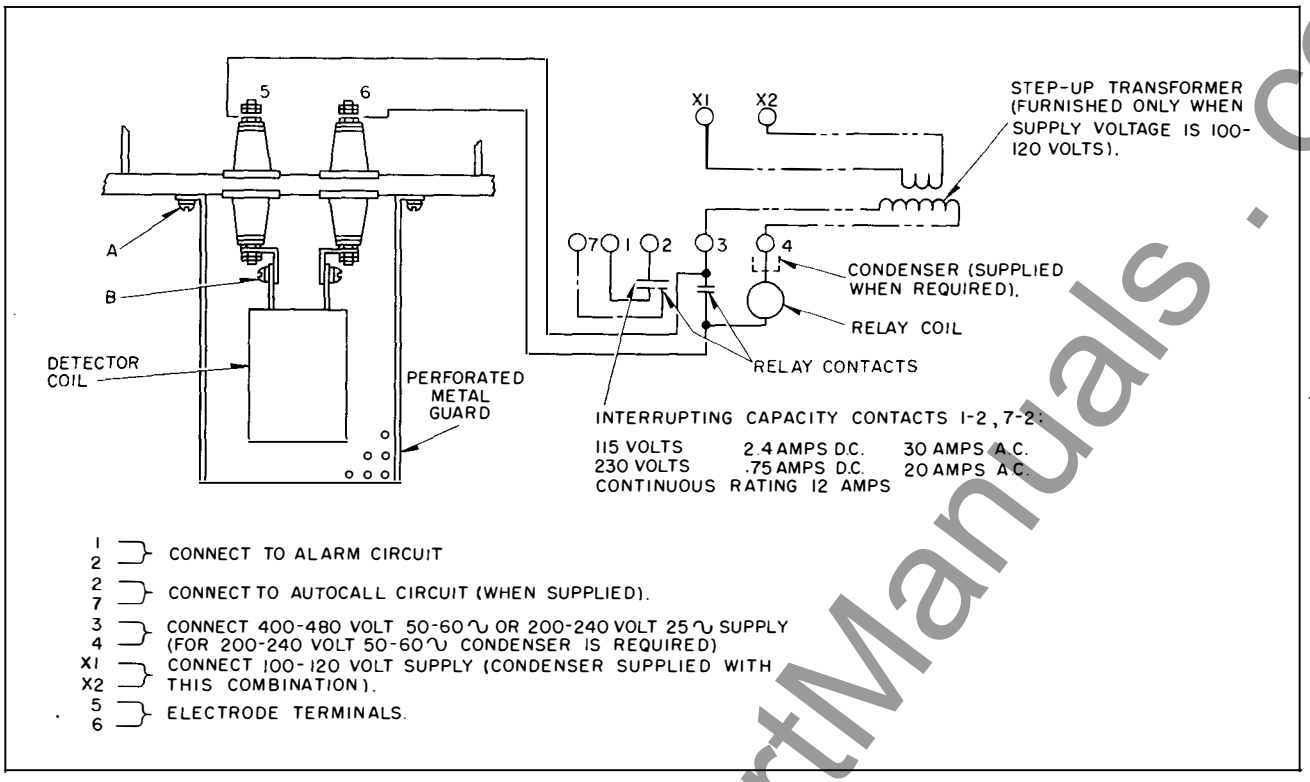

FIG. 3. Wiring Diagram of Standard HCL Gas Detector (Variable in Dotted Line).

of 50-60 cycles, 199 to 240 volts a condenser, placed in series with the supply, is used to offset the relay coil reactance; with a supply voltage of 50-60 cycles, 100-120 volts a step-up transformer is supplied in addition to the capacitor. For adaptation to an autocall system a lead and a special terminal board is added. For a supply voltage of 25 cycles, 199-240 volts no capacitor is necessary.

The fittings located on the HCL detector housing consist of an instruction plate on the cover, two three-quarter inch conduit connections, a vent pipe to prevent condensation within the housing, and an easily removable weather tight cover to make the relay easily accessible for testing.

The HCL gas detector can be installed on most existing transformers. The factory should be consulted however, giving complete transformer identification, before ordering.

When ordering an HCL detector for an existing transformer the following information should accompany the order: (1) complete transformer identification (2) Supply voltage available (3) is autocall feature required (4) any other special feature required.

The HCL gas detector can be modified for use on submersible transformers.

SHIPMENT

The HCL gas detector, when supplied with the transformer, is shipped completely assembled in its proper place on the transformer. The HCL gas detector, supplied for an existing transformer, will be shipped crated.

UNPACKING

No unpacking operation is necessary on HCL detectors supplied with transformers as they are shipped properly installed on the transformer. When shipped to be placed on an existing transformer it will appear as shown in Fig. 1 after the crating is removed.

When removing the crating and bracing, care must be taken not to damage the coil on the underside of the flange.

INSTALLATION

The relay is blocked to prevent damage during shipment. This blocking must be removed before the relay will operate.

Of the two conduit connections supplied one may be used for the supply circuit and one for the alarm circuit. All leads should be connected to the proper studs on the terminal board provided in the relay housing. See Fig. 3.

Before placing the transformer in operation, Test No. 3 (see "Maintenance") should be performed to check the relay and signal circuit operation.

When replacing the HCL gas detector assembly extreme care should be taken to see that all gasketed joints are made properly and that there are no leaks. See Instruction Leaflet "Gaskets".

MAINTENANCE

The only routine maintenance required on the HCL gas detector is to check the condition of the coil every six months. This is done by the following tests.

Test No. 1. (Made with power supply and signal circuits disconnected from the terminal board). Dielectric test to ground. Short circuit and ground terminals 1 and 2 to case. Short circuit and connect terminals 3 and 4 to a 2000-volt, 60-cycle test circuit for one minute.

Test No. 2. (Made with power supply and signal circuits disconnected from the terminal board). With terminals 3 and 4 open circuited connect a 1000-volt megger across terminals 5 and 6 and measure the resistance. If the resistance is below 100,000 ohms the coil should be replaced.

Test No. 3. Relay operation Test. (With the power supply and signal circuits connected and normal voltage applied). Short circuit terminals 5 and 6, and note relay operation. Relay should close both contacts.

Whenever the relay has operated in service or should the resistance of the coil fall below 100,000 ohms it will be necessary to replace the detector coil.

Replacing Coil. Disconnect and remove the complete unit from the transformer. Unfasten the perforated metal guard from the underside by removing machine screws marked "A" (See Fig. 3). To release the coil, remove machine screws marked "B". Before installing the new coil it should be dried for two hours at a temperature of 105°-115°C. (221°-239°F.) Then fasten the new coil to its guard and assemble the complete unit on the transformer. Take precautions to see that the shake-proof washers are replaced on the machine screws and that gaskets are properly installed to prevent leaks; see Instruction Leaflet "Gaskets". Reconnect all leads to the proper terminals and test relay operation as per test No. 3.

RENEWAL PARTS

Replacement detector coils, ready for installation, are obtainable from the Westinghouse Electric Corporation, Sharon, Pennsylvania. When ordering specify style number 1309 425 and mounting gasket. The transformers serial number, found on the instruction plate, should also be specified. Further information and service may be obtained by contacting the nearest Westinghouse Office.