DESCRIPTION • INSTALLATION

INSTRUCTIONS

LIQUID LEVEL INDICATORS

Magnetic Type

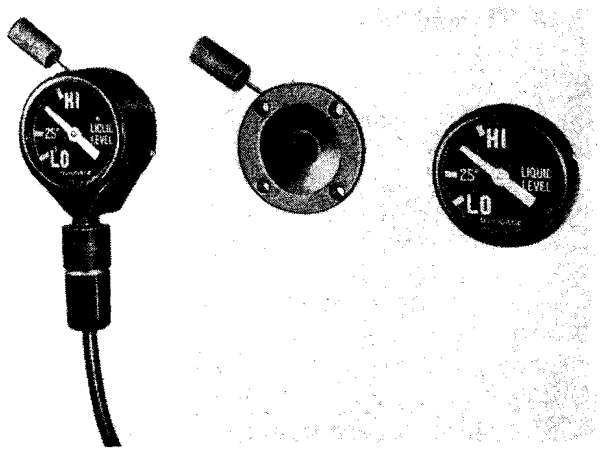

FIG. 1. Bezel with Alarm (left); Body with Float and Rod at Back (center); Bezel without Alarm Contacts.

MAGNETIC TYPE LIQUID LEVEL INDICATORS, designed for application on Westinghouse transformers or related apparatus, are self-contained, indicating, weatherproof, submersible, shockproof, float operated instruments suitable for use with oil or Inerteen.

Liquid level indicators with alarm contacts are available in either of two sizes. These contacts will operate a bell circuit, light, or small relay system. Liquid level indicators are usually shipped mounted on the transformer case, or equipment, and require no maintenance.

DESCRIPTION

These indicators are precision instruments composed of two main parts, the bezel and the body. See Figure 1. The bezel or outer assembly, includes the calibrated dial and indicating needle. It is hermetically sealed and should not be subjected to a vacuum since the internal pressure might break the glass. The dial is black with yellow markings for high visibility. The yellow indicating needle is directly mounted on the forward end of a shaft, the other end of which carries a powerful actuating magnet. The bezel-when in place, covers and protects the mounting screws with which the body is attached to the flange or boss on the transformer tank or equipment.

The body is sealed against oil leakage and encloses a second powerful magnet opposite the magnet in the bezel. The magnet in the body is mounted on a shaft coupled to the float arm. See Figure 2. In operation the motion of the float arm rotates the body magnet which in turn positively displaces the bezel magnet to which the indicating needle is attached.

In indicators having alarm contacts, a microswitch enclosed in the bezel is actuated at a predetermined position by the motion of the needle shaft. Microswitch ratings are given in Table 1.

Important: When checking circuits through this instrument, it is necessary to follow Table 1. This means that a low voltage bell ringer cannot be used unless switched through a high impedance relay. An indicating light type device is generally recognized as best for checking circuits through instruments containing microswitches with ratings similar to those of these devices.

While complete instruments with or without alarm contacts are interchangeable for a given size device, a bezel with alarm contacts should not be used on a body which was intended for use with a bezel having no alarm contacts. A larger and stronger magnet

TABLE NO. 1

VOLTAGE	NON-INDUCTIVE LOAD—AMPS.	INDUCTIVE LOAD AMPS.*
125 AC	10	10
250 AC	5	5
125 DC	0.5	0.05
250 DC	0.25	0.025

* L/R equal to or less than .026".
L = Inductive in henrys
R = Resistance in ohms

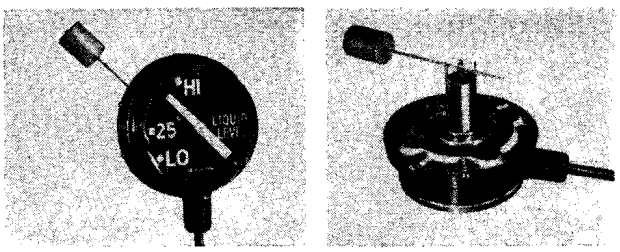

FIG. 2. Front and Rear of Medium Size Gauge with Float

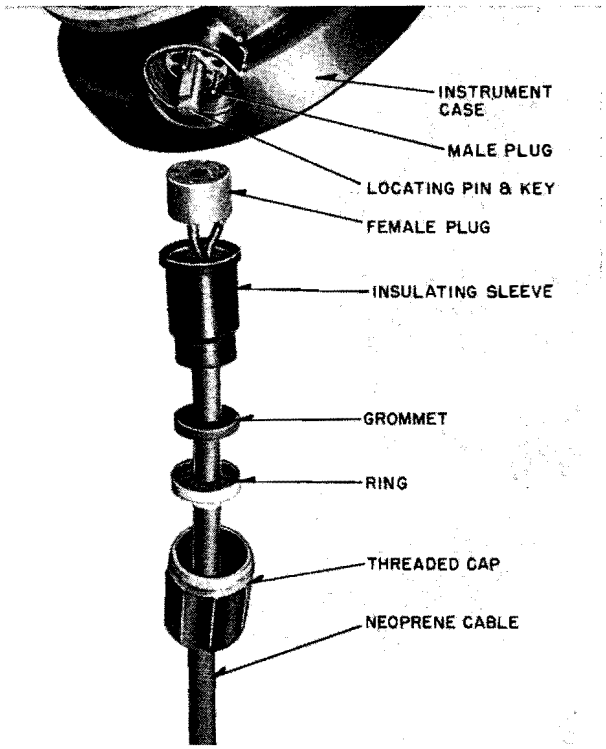

FIG. 3. Triple Seal Connector

must be used in the body of an instrument when alarm contacts are used in the bezel.

Alarm leads are brought through the under side of the bezel by means of a triple seal connector, Figure 3, which consists of the following:

1. The male terminals are moulded into the case together with a keyed locating pin which prevents making incorrect connections.

2. The rubber female plug has terminals to mate with the terminals in the case and a keyed hole to match the locating pin. The ends of the leads are tinned and crimped into the terminals of the female plug.

3. An insulating sleeve to press the female plug against the male plug.

4. A grommet to make a seal between the rubber cable and the bushing.

5. A ring to compress the grommet against the cable.

6. A threaded cap to hold the component parts of the connector tight in the case.

The connection diagram for this liquid level indicator is shown in Figure 4.

For indicators installed at the factory the tank is filled to the level which corresponds to a liquid temperature of 25°C which is considered the normal level.

Should the tank be filled at some temperature other than 25°C, use the Table No. 2 to determine the variation above or below the normal level. If these allowances are not made, excessive pressure may be built up in sealed tanks or excessive breathing may be produced in Inertaire units causing a high rate of loss of nitrogen, or the low level alarm may be caused to operate unnecessarily due to the incorrect amount of liquid in the tank. If any part of the instrument is damaged, the bezel may be replaced without disturbing the rest of the instrument and without loss of oil.

INSTALLATION

Instruments are usually shipped in place. If shipped separately or if the body is replaced check operation of the float over its entire range to see that it is free and that the needle follows movement of the float.

Coat the gasket on both sides and edges with red gasket cement (S# 1150419, black can or S# 471880, white can). Allow to dry for 15 minutes. Apply a second coat of cement, wipe off excess from the edges and put gasket in place. Mount the instrument body and tighten the bolts securely to insure against oil leaks. Put the bezel in place and tighten the holding screws on the sides. If alarm contacts are used make proper connections to the conduit box.

Important: When checking circuits through this instrument it is necessary to follow Table No. 1.

RENEWAL PARTS

If repairs to the instrument are necessary, contact the nearest Westinghouse Office.

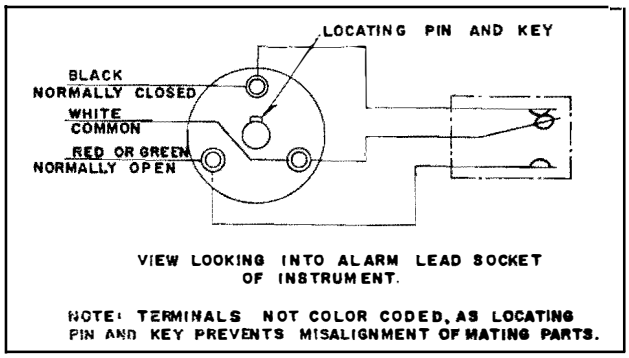

FIG. 4. Connection Diagram for Alarm Leads

TABLE NO. 2

AVERAGE LIQUID TEMP. (°C)	CORRECT FILLING LEVEL (PERCENT OF SCALE ABOVE OR BELOW 25° C LEVEL)
85 (High)	100
70	75
55	50
40	25
25 (Normal)	0
10	–33
–5	–67
–20 (Low)	–100

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DESCRIPTION • INSTALLATION • MAINTENANCE

INSTRUCTIONS

OIL FLOW INDICATOR

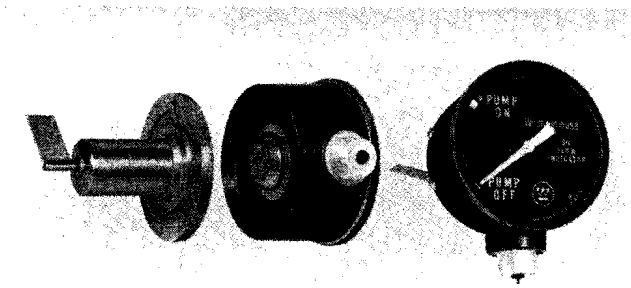

FIG. 1. Oil Flow Indicator.

THE OIL FLOW INDICATOR is a vane operated device for use on the suction or discharge pipes of transformer oil pumps with a minimum linear velocity of 4.5 ft./sec. The flow indicator is designed to indicate by dial and electrical alarm contacts that either sufficient oil is flowing or is not flowing. The case is weatherproof, submersible and shockproof.

DESCRIPTION

This indicator, see Figure 1, consists of two parts, the case and the drive mechanism. The case or outer assembly contains the dial, indicating needle and alarm contacts. The dial has a black background with yellow markings. The needle, also painted yellow, is mounted on the forward end of the shaft, the other end of which carries the drive magnet.

The drive mechanism is sealed against oil leakage. It houses a mating drive magnet and shaft, a torsion spring, travel limit stops and a vane. In operation the vane is positioned in the oil stream. The torsion spring holds the vane against one stop in the "Pump Off" position for conditions of (1) pump off (2) reverse pump rotation (3) restricted oil flow, or (4) closed oil circuit. Correct pump rotation will produce sufficient oil velocity to lock the vane against the second stop for "Pump On" and unrestricted oil flow.

The normally closed contacts of the microswitch are open for the "Pump On" position and close a minimum of 40° from the "Pump Off" position. The microswitch contacts are suitable for 600 volt-amperes at 125, 250 or 460 volts A-C, or 60 watts at 125 or 250 volts D-C lamp load or 6 watts at 125 or 250 volts D-C relay load.

INSTALLATION AND MAINTENANCE

Installation is usually made at the factory. If the indicator is shipped separate, check the operation of the vane over its entire range to see that it operates freely and that the needle follows the movement

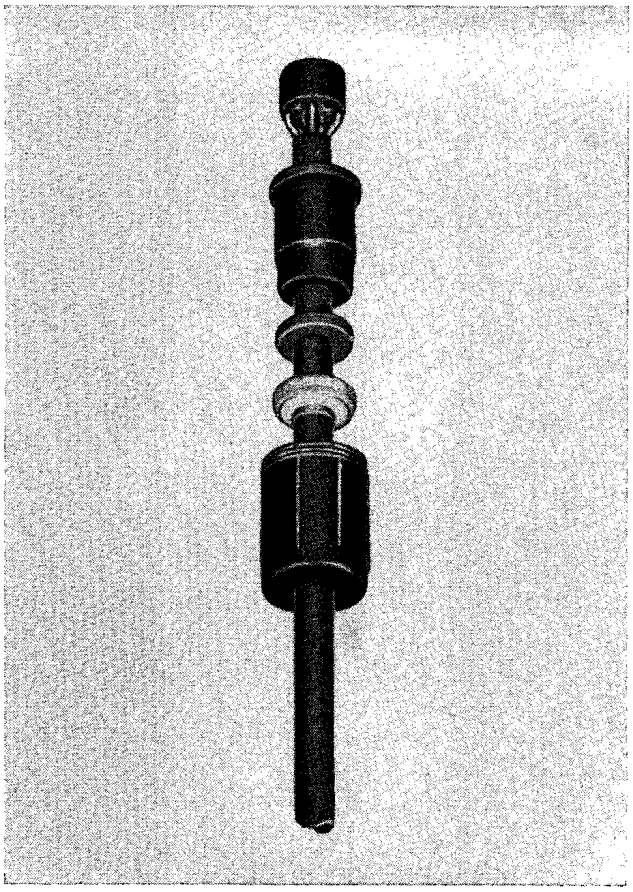

FIG. 2. Exploded View of Connector

of the vane. Coat the gasket on both sides and edges with gasket cement supplied with the transformer. Mount the drive mechanism and tighten the bolts. Put the case in place and tighten the mounting screws. Connect the alarm circuit according to Figure 3 and the wiring diagram for the particular job.

Important: When checking circuits through this instrument it is essential that the current ratings of the contacts are not exceeded. An indicating light type device is generally recognized as best for checking circuits through instruments containing microswitches of similar capacities.

RENEWAL PARTS

If the case is damaged, it may be removed without loss of oil. The case is carried as a stock item and identified by 446C858H01.

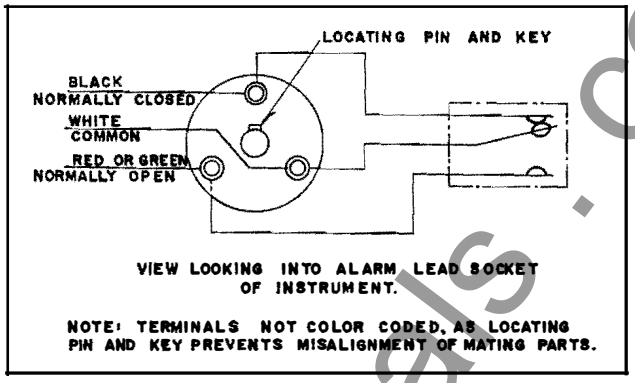

FIG. 3. Connection Diagram for Alarm Loads

If repair of the instrument is necessary, contact the nearest Westinghouse Office.

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DESCRIPTION • INSTALLATION

INSTRUCTIONS

LIQUID LEVEL INDICATORS

Magnetic Type

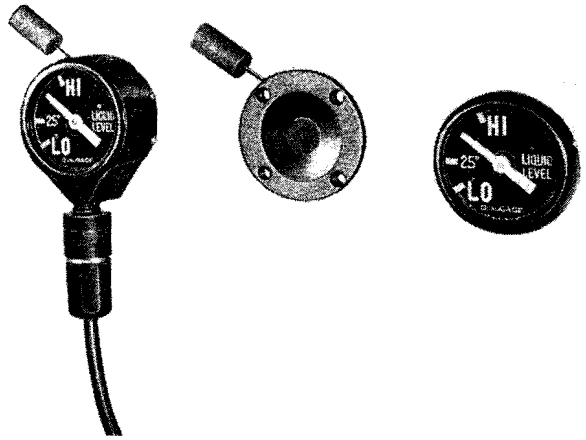

FIG. 1. Bezel with Alarm (left); Body with Float and Rod at Back (center); Bezel without Alarm Contacts.

MAGNETIC TYPE LIQUID LEVEL INDICATORS, designed for application on Westinghouse transformers or related apparatus, are self-contained, indicating, weatherproof, submersible, shockproof, float operated instruments suitable for use with oil or Inerteen.

Liquid level indicators with alarm contacts are available in either of two sizes. These contacts will operate a bell circuit, light, or small relay system. Liquid level indicators are usually shipped mounted on the transformer case, or equipment, and require no maintenance.

DESCRIPTION

These indicators are precision instruments composed of two main parts, the bezel and the body. See Figure 1. The bezel or outer assembly, includes the calibrated dial and indicating needle. It is hermetically sealed and should not be subjected to a vacuum since the internal pressure might break the glass. The dial is black with yellow markings for high visibility. The yellow indicating needle is directly mounted on the forward end of a shaft, the other end of which carries a powerful actuating magnet. The bezel-when in place, covers and protects the mounting screws with which the body is attached to the flange or boss on the transformer tank or equipment.

The body is sealed against oil leakage and encloses a second powerful magnet opposite the magnet in the bezel. The magnet in the body is mounted on a shaft coupled to the float arm. See Figure 2. In operation the motion of the float arm rotates the body magnet which in turn positively displaces the bezel magnet to which the indicating needle is attached.

In indicators having alarm contacts, a microswitch enclosed in the bezel is actuated at a predetermined position by the motion of the needle shaft. Microswitch ratings are given in Table 1.

Important: When checking circuits through this instrument, it is necessary to follow Table 1. This means that a low voltage bell ringer cannot be used unless switched through a high impedance relay. An indicating light type device is generally recognized as best for checking circuits through instruments containing microswitches with ratings similar to those of these devices.

While complete instruments with or without alarm contacts are interchangeable for a given size device, a bezel with alarm contacts should not be used on a body which was intended for use with a bezel having no alarm contacts. A larger and stronger magnet

TABLE NO. 1

VOLTAGE	NON-INDUCTIVE LOAD—AMPS.	INDUCTIVE LOAD AMPS.*
125 AC	10	10
250 AC	5	5
125 DC	0.5	0.05
250 DC	0.25	0.025

* L/R equal to or less than .026".
L = Inductive in henrys
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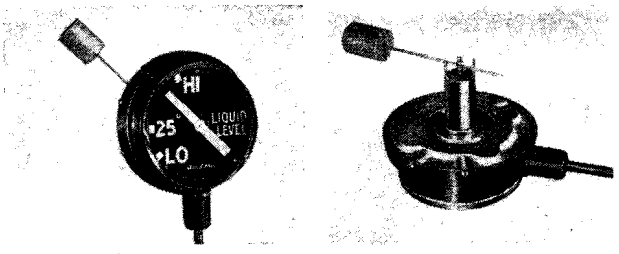

FIG. 2. Front and Rear of Medium Size Gauge with Float

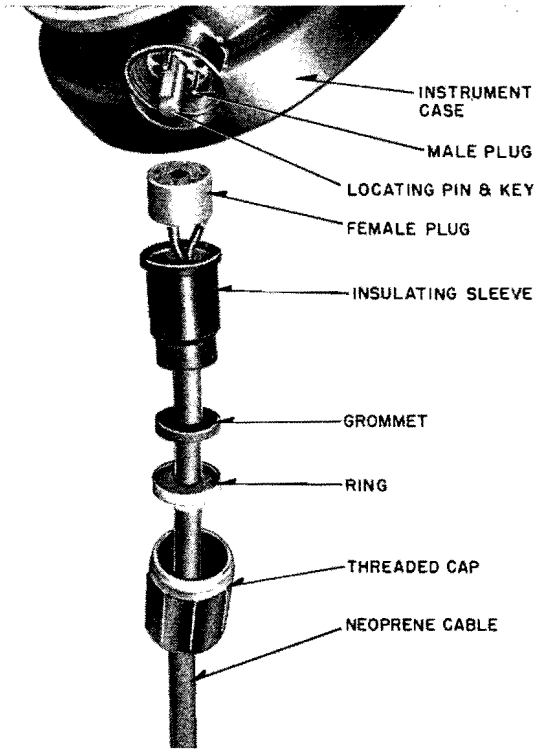

FIG. 3. Triple Seal Connector

must be used in the body of an instrument when alarm contacts are used in the bezel.

Alarm leads are brought through the under side of the bezel by means of a triple seal connector, Figure 3, which consists of the following:

1. The male terminals are moulded into the case together with a keyed locating pin which prevents making incorrect connections.

2. The rubber female plug has terminals to mate with the terminals in the case and a keyed hole to match the locating pin. The ends of the leads are tinned and crimped into the terminals of the female plug.

3. An insulating sleeve to press the female plug against the male plug.

4. A grommet to make a seal between the rubber cable and the bushing.

5. A ring to compress the grommet against the cable.

6. A threaded cap to hold the component parts of the connector tight in the case.

The connection diagram for this liquid level indicator is shown in Figure 4.

For indicators installed at the factory the tank is filled to the level which corresponds to a liquid temperature of 25°C which is considered the normal level.

Should the tank be filled at some temperature other than 25°C, use the Table No. 2 to determine the variation above or below the normal level. If these allowances are not made, excessive pressure may be built up in sealed tanks or excessive breathing may be produced in Inertaire units causing a high rate of loss of nitrogen, or the low level alarm may be caused to operate unnecessarily due to the incorrect amount of liquid in the tank. If any part of the instrument is damaged, the bezel may be replaced without disturbing the rest of the instrument and without loss of oil.

INSTALLATION

Instruments are usually shipped in place. If shipped separately or if the body is replaced check operation of the float over its entire range to see that it is free and that the needle follows movement of the float.

Coat the gasket on both sides and edges with red gasket cement (S# 1150419, black can or S# 471880, white can). Allow to dry for 15 minutes. Apply a second coat of cement, wipe off excess from the edges and put gasket in place. Mount the instrument body and tighten the bolts securely to insure against oil leaks. Put the bezel in place and tighten the holding screws on the sides. If alarm contacts are used make proper connections to the conduit box.

Important: When checking circuits through this instrument it is necessary to follow Table No. 1.

RENEWAL PARTS

If repairs to the instrument are necessary, contact the nearest Westinghouse Office.

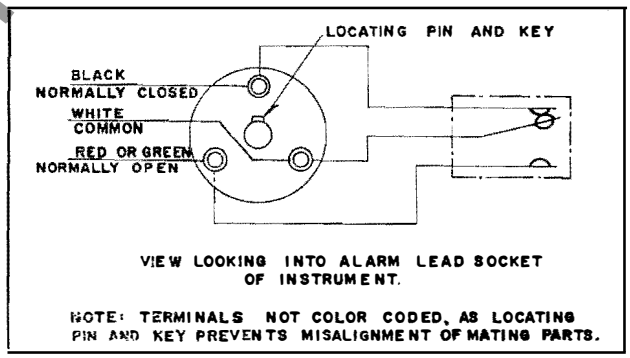

FIG. 4. Connection Diagram for Alarm Leads

TABLE NO. 2

AVERAGE LIQUID TEMP. (°C)	CORRECT FILLING LEVEL (PERCENT OF SCALE ABOVE OR BELOW 25° C LEVEL)
85 (High)	100
70	75
55	50
40	25
25 (Normal)	0
10	–33
–5	–67
–20 (Low)	–100

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DESCRIPTION • INSTALLATION

INSTRUCTIONS

LIQUID LEVEL INDICATORS

Magnetic Type

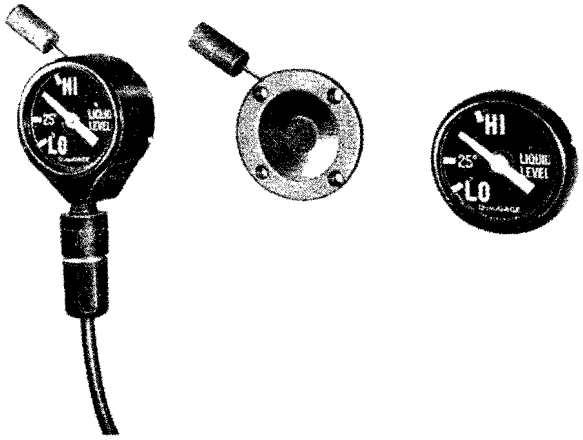

FIG. 1. Bezel with Alarm (left); Body with Float and Rod at Back (center); Bezel without Alarm Contacts.

MAGNETIC TYPE LIQUID LEVEL INDICATORS, designed for application on Westinghouse transformers or related apparatus, are self-contained, indicating, weatherproof, submersible, shockproof, float operated instruments suitable for use with oil or Inerteen.

Liquid level indicators with alarm contacts are available in either of two sizes. These contacts will operate a bell circuit, light, or small relay system. Liquid level indicators are usually shipped mounted on the transformer case, or equipment, and require no maintenance.

DESCRIPTION

These indicators are precision instruments composed of two main parts, the bezel and the body. See Figure 1. The bezel or outer assembly, includes the calibrated dial and indicating needle. It is hermetically sealed and should not be subjected to a vacuum since the internal pressure might break the glass. The dial is black with yellow markings for high visibility. The yellow indicating needle is directly mounted on the forward end of a shaft, the other end of which carries a powerful actuating magnet. The bezel-when in place, covers and protects the mounting screws with which the body is attached to the flange or boss on the transformer tank or equipment.

The body is sealed against oil leakage and encloses a second powerful magnet opposite the magnet in the bezel. The magnet in the body is mounted on a shaft coupled to the float arm. See Figure 2. In operation the motion of the float arm rotates the body magnet which in turn positively displaces the bezel magnet to which the indicating needle is attached.

In indicators having alarm contacts, a microswitch enclosed in the bezel is actuated at a predetermined position by the motion of the needle shaft. Microswitch ratings are given in Table 1.

Important: When checking circuits through this instrument, it is necessary to follow Table 1. This means that a low voltage bell ringer cannot be used unless switched through a high impedance relay. An indicating light type device is generally recognized as best for checking circuits through instruments containing microswitches with ratings similar to those of these devices.

While complete instruments with or without alarm contacts are interchangeable for a given size device, a bezel with alarm contacts should not be used on a body which was intended for use with a bezel having no alarm contacts. A larger and stronger magnet

TABLE NO. 1

VOLTAGE	NON-INDUCTIVE LOAD—AMPS.	INDUCTIVE LOAD AMPS.*
125 AC	10	10
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* L/R equal to or less than .026".
L = Inductive in henrys
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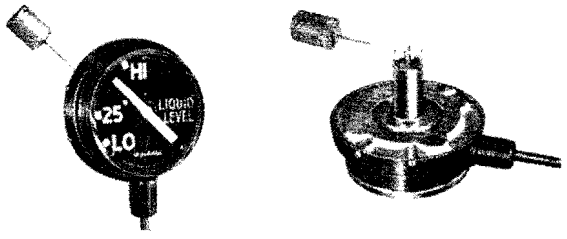

FIG. 2. Front and Rear of Medium Size Gauge with Float

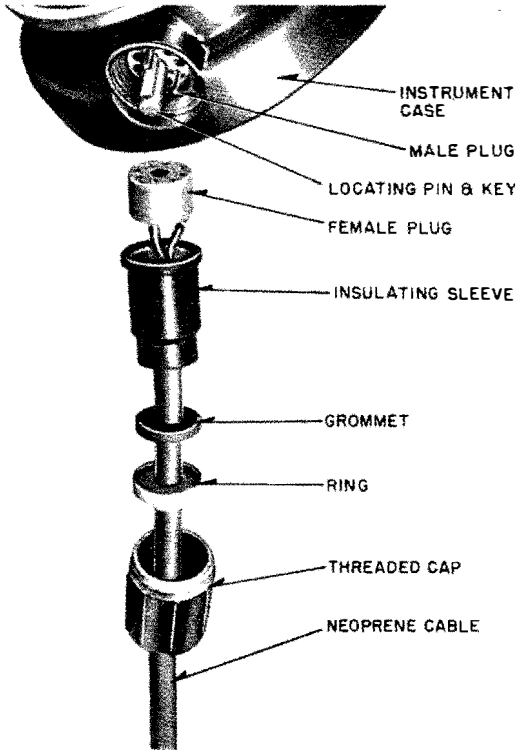

FIG. 3. Triple Seal Connector

must be used in the body of an instrument when alarm contacts are used in the bezel.

Alarm leads are brought through the under side of the bezel by means of a triple seal connector, Figure 3, which consists of the following:

1. The male terminals are moulded into the case together with a keyed locating pin which prevents making incorrect connections.

2. The rubber female plug has terminals to mate with the terminals in the case and a keyed hole to match the locating pin. The ends of the leads are tinned and crimped into the terminals of the female plug.

3. An insulating sleeve to press the female plug against the male plug.

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The connection diagram for this liquid level indicator is shown in Figure 4.

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RENEWAL PARTS

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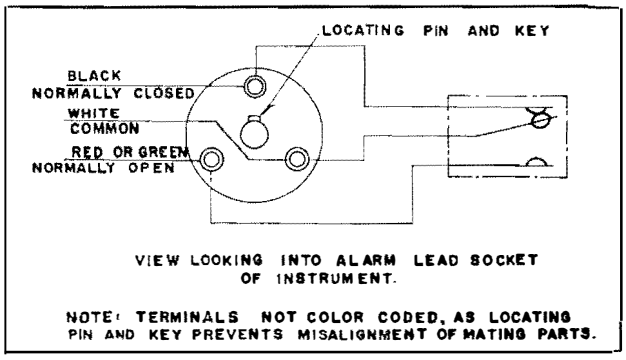

FIG. 4. Connection Diagram for Alarm Leads

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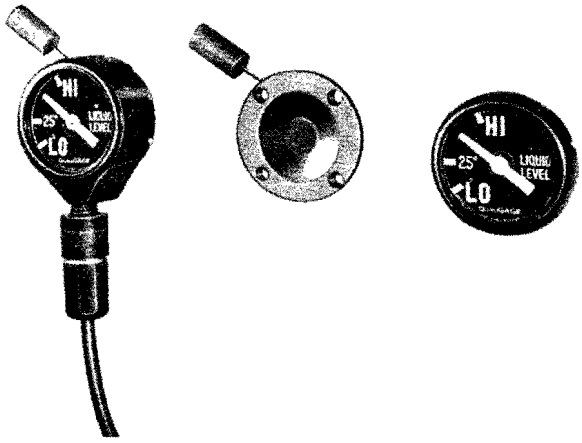
DESCRIPTION • INSTALLATION

INSTRUCTIONS

LIQUID LEVEL INDICATORS

Magnetic Type



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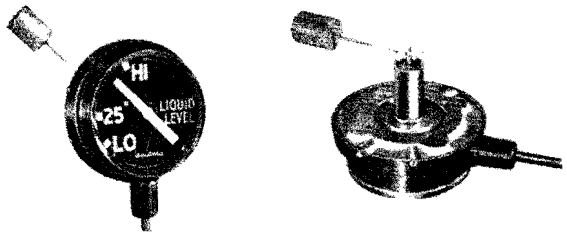

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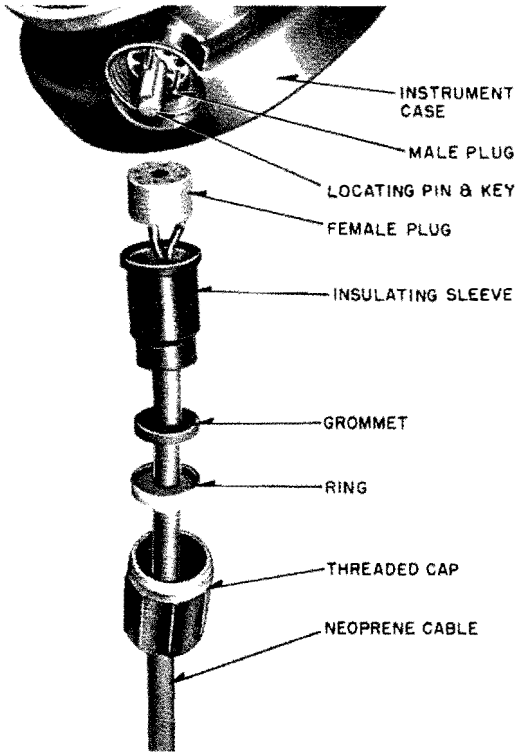

FIG. 3. Triple Seal Connector

must be used in the body of an instrument when alarm contacts are used in the bezel.

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4. A grommet to make a seal between the rubber cable and the bushing.

5. A ring to compress the grommet against the cable.

6. A threaded cap to hold the component parts of the connector tight in the case.

The connection diagram for this liquid level indicator is shown in Figure 4.

For indicators installed at the factory the tank is filled to the level which corresponds to a liquid temperature of 25°C which is considered the normal level.

Should the tank be filled at some temperature other than 25°C, use the Table No. 2 to determine the variation above or below the normal level. If these allowances are not made, excessive pressure may be built up in sealed tanks or excessive breathing may be produced in Inertaire units causing a high rate of loss of nitrogen, or the low level alarm may be caused to operate unnecessarily due to the incorrect amount of liquid in the tank. If any part of the instrument is damaged, the bezel may be replaced without disturbing the rest of the instrument and without loss of oil.

INSTALLATION

Instruments are usually shipped in place. If shipped separately or if the body is replaced check operation of the float over its entire range to see that it is free and that the needle follows movement of the float.

Coat the gasket on both sides and edges with red gasket cement (S# 1150419, black can or S# 471880, white can). Allow to dry for 15 minutes. Apply a second coat of cement, wipe off excess from the edges and put gasket in place. Mount the instrument body and tighten the bolts securely to insure against oil leaks. Put the bezel in place and tighten the holding screws on the sides. If alarm contacts are used make proper connections to the conduit box.

Important: When checking circuits through this instrument it is necessary to follow Table No. 1.

RENEWAL PARTS

If repairs to the instrument are necessary, contact the nearest Westinghouse Office.

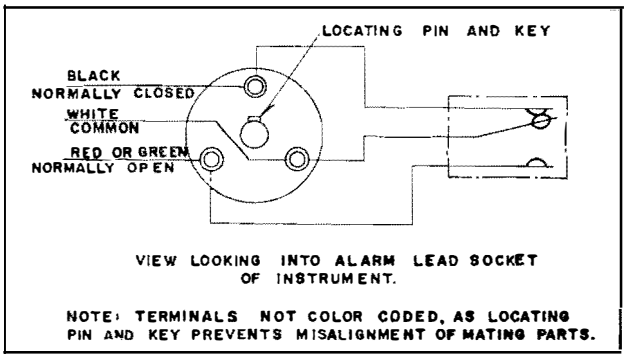

FIG. 4. Connection Diagram for Alarm Leads

TABLE NO. 2

AVERAGE LIQUID TEMP. (°C)	CORRECT FILLING LEVEL (PERCENT OF SCALE ABOVE OR BELOW 25° C LEVEL)
85 (High)	100
70	75
55	50
40	25
25 (Normal)	0
10	-33
-5	-67
-20 (Low)	-100