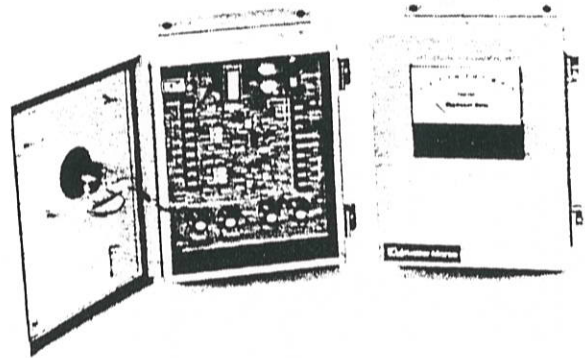


THE MODEL 920

The 920 is a single vessel electronics with all components hardwired on a single printed circuit board. The standard unit consists of an amplifier with span and zero adjustments, a 4–20 mA current output and a power supply capable of powering up to 24 individual sensors.

The Model 920 electronics provides an analog weight or level display for a vessel instrumented with any type of KISTLER-MORSE sensor.



GLOSSARY

AMPLIFIER

The input amplifier conditions the signal so correct weight or level is displayed. To accommodate differences in individual applications, amplifier gain and offset can be adjusted using the zero and span controls. Both controls are high quality, ten turn potentiometers with numeric dials.

DISPLAY

The weight display is a 4½"×4½" analog meter mounted on the enclosure door. The standard meter scaling is 0–100%, but scaling in pounds, tons, kilograms, etc., is available.

FIELD CONNECTION

All field connections are made to terminal strips on the printed circuit board. The preferred termination is a spade lug, per Figure 1.

SENSORS

All the sensors for a vessel are wired in parallel and connected to the Model 920 with a shielded three conductor cable. The red and black wires provide 12 VDC excitation for up to 48 sensors. The white wire carries the sensor signal back to the amplifier.

SETPOINTS

Optional HI and LO setpoints are adjustable over the entire weight range. The controls are high quality, ten turn potentiometers with numeric dials. Both setpoints have NO, NC and C relay outputs with contacts rated for 2 amps at 120 VAC into a resistive load.

TRANSMITTER

A non-isolated 4–20 mA transmitter is standard. It has separate span and zero controls and optional 1–5 mA or 10–50 mA ranges. The 4–20 mA version can drive a 500 ohm load.

ZERO AND SPAN CONTROLS

It is important to have an understanding of the zero and span controls before starting the calibration procedure. The zero control is adjusted to indicate the correct material weight. This is best done when the vessel is empty and the weight is zero (hence the name). However, if you have a vessel that won't empty for some time, you can adjust the zero control to indicate an approximate material weight and the zero can be adjusted more accurately when the vessel is empty.

The span control is only adjusted when a known weight of material has been added to or removed from the vessel. The span control is properly adjusted when a weight change on the readout meter is equal to the actual weight of material added or removed.

920 INSTALLATION —START-UP

ELECTRONICS INSTALLATION

All electronics have standard mounting flanges at the top and bottom of the enclosure. Use any common mounting methods and hardware to attach the equipment. To assure trouble-free operation, the electronic enclosure should be wall-mounted, indoors, free from vibrations, in a dry and dust-free environment.

The enclosure should be placed in a location that maintains normal room temperature (62°- 80° F, 17°- 27° C). It should be sealed against water entry or extreme humidity. The door should be kept closed and clamped at all times.

The sensor(s) and AC line power must be connected to the electronics as shown in the wiring diagram, Figure 1. The line voltage selector switch must be set to the appropriate position.

If setpoints or current outputs are used, they must also be connected at this time. Refer to the wiring diagram, Figure 1.

START-UP PROCEDURE

- 1** Re-check all field wiring. Make sure the wires connecting the sensor assemblies to each other and to the electronics are all wired red to red, white to white, black to black.
- 2** Make sure the enclosure is grounded to earth ground.
- 3** Make sure the AC power input cable to the electronics is properly connected and that the line voltage switch is in the appropriate position for the voltage wired to the electronics.
- 4** Electronics will require energizing the 115VAC power.
- 5** **IMPORTANT:** Allow 20 minutes warm-up before proceeding with CALIBRATION.

The electronics package is a precision instrument. Caution should be taken when handling the enclosure.

920 CALIBRATION

The system start-up and calibration procedures provided in this chapter are important to obtain optimum accuracy. All the procedures can be performed by inexperienced personnel with commonly available tools. Two controls, zero and span, are adjusted to provide the desired output. If the recommended procedure is used, these controls do not interact and may be set with a single setting of each one. Tools required for calibrating the electronics will be a small screwdriver, an ohmmeter and a digital VOM.

IMPORTANT

Allow 20 minutes for warm-up.

SETPOINT CALIBRATION

NOTE

This is preferably done before Zero & Span Calibration, but can be done at any time using the following procedure:

- 1** Record the meter reading and/or the zero control numeric dial indication.
- 2** Adjust the zero control until the weight/level meter indicates the point at which you desire a setpoint/ alarm operation.
- 3** Adjust the "HI (or LO) Setpoint Adjust" control very slowly until the relay and associated LED indicator *just* turn on.
- 4** Repeat steps 2 and 3 for the other setpoint.
- 5** Re-adjust the zero control to the reading recorded in step 1.

CURRENT TRANSMITTER CALIBRATION

NOTE

This is preferably done before Zero & Span Calibration, but can be done at any time using the following procedures:

- 1** Record the meter reading and/or the zero control numeric dial indication.
- 2** Adjust the zero control to exactly 0%.
- 3** Adjust the 4mA adjust for 4.00 mA at TB-1, pins 2 and 3.
- 4** Adjust the zero control to exactly 100%.
- 5** Adjust the 20 mA adjust for exactly 20.0 mA at TB-1, pins 2 and 3.
- 6** Adjust the zero control to the reading recorded in Step 1.

B

ZERO AND SPAN CALIBRATION PROCEDURE

It is important to have an understanding of the zero and span controls before starting the calibration procedure. The zero control is adjusted to indicate the correct material weight. This is best done when the vessel is empty and the weight is zero (hence the name). However, if you have a vessel that won't empty for some time, you can adjust the zero control to indicate an approximate material weight and the zero can be adjusted more accurately when the vessel is empty.

The span control is only adjusted when a known weight of material has been added to or removed from the vessel. The span control is properly adjusted when a weight change on the readout meter is equal to the actual weight of material added or removed. This system has been adjusted at the factory so final calibration should be minimal. If the recommended procedures are used, the zero and span controls will not interact. Calibrate the system using one of the following methods:

Calibration by filling an empty vessel.

- 1 Turn the span control fully clockwise.
- 2 With the vessel empty, adjust the zero control for a zero indication on the meter.
- 3 Fill the vessel with a known weight (at least 20% of capacity).
- 4 Adjust the span control until the meter displays the correct weight added.

Calibration by removing material.

- 1 Reverse the 0-1mA meter connections at TB-1.
- 2 Turn the span control fully clockwise.
- 3 Adjust the zero control for a zero indication on the meter.
- 4 Remove a known weight from the vessel (at least 20% of full vessel weight).

- 5 Adjust the span control until the meter indicates the correct weight removed.
- 6 Connect the 0-1mA meter wires as they were originally.
- 7 Estimate the total material weight, and adjust the zero control until the estimated weight is displayed on the meter.

Calibration by adding material to a partially full vessel.

- 1 Turn the span control fully clockwise.
- 2 Adjust the zero control for a zero indication on the meter.
- 3 Fill the vessel with a known weight (at least 20% of full vessel weight).
- 4 Adjust the span control until the meter indicates the correct weight added.
- 5 Estimate the total material weight, and adjust the zero control until the meter indicates the estimated weight.
- 6 When the vessel is empty, adjust the zero control for a zero indication on the meter.

Calibration Refinement.

The zero and span calibration should be checked after the system has been in operation and the vessel has been emptied and filled a few times.

B

920 TROUBLE- SHOOTING

FLOW CHART

If diagnosis is required for the following symptoms, refer to the appropriate flow chart on the following pages:

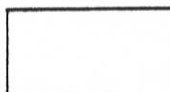
- No response to calibration control adjustments, refer to Figure 2 or
- No response to weight/level change, refer to Figure 2.

- Readout meter indicates drifting, refer to Figure 3 or
- Readout meter displays incorrect weight, refer to Figure 3.

TROUBLESHOOTING FLOW CHART SYMBOLS



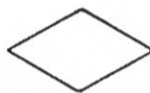
Interconnects flow chart symbols and indicates the direction of procedure flow.



Instruction or procedural step.



A terminal point—used to indicate a start, stop or interrupt of procedure flow.



Decision required—always ask a question—the flow from the symbol is dependent upon the decision made—usually yes (go) or no (no go), but may have three possibilities (e.g. high, low, normal).

920

SYSTEM DEAD
(No response to zero control or vessel level change)

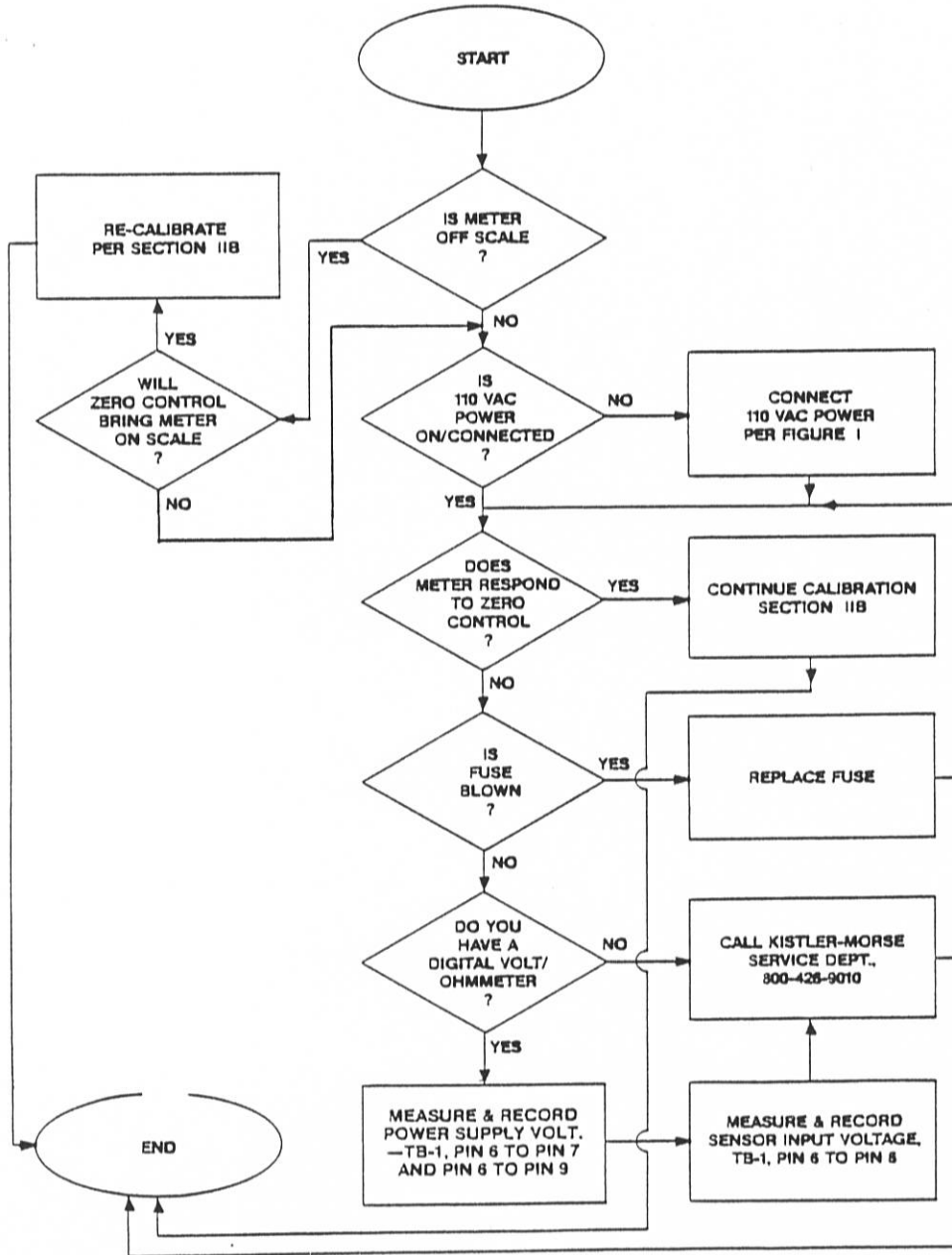


FIGURE 2

C

SYSTEM DRIFTS OR IS INACCURATE

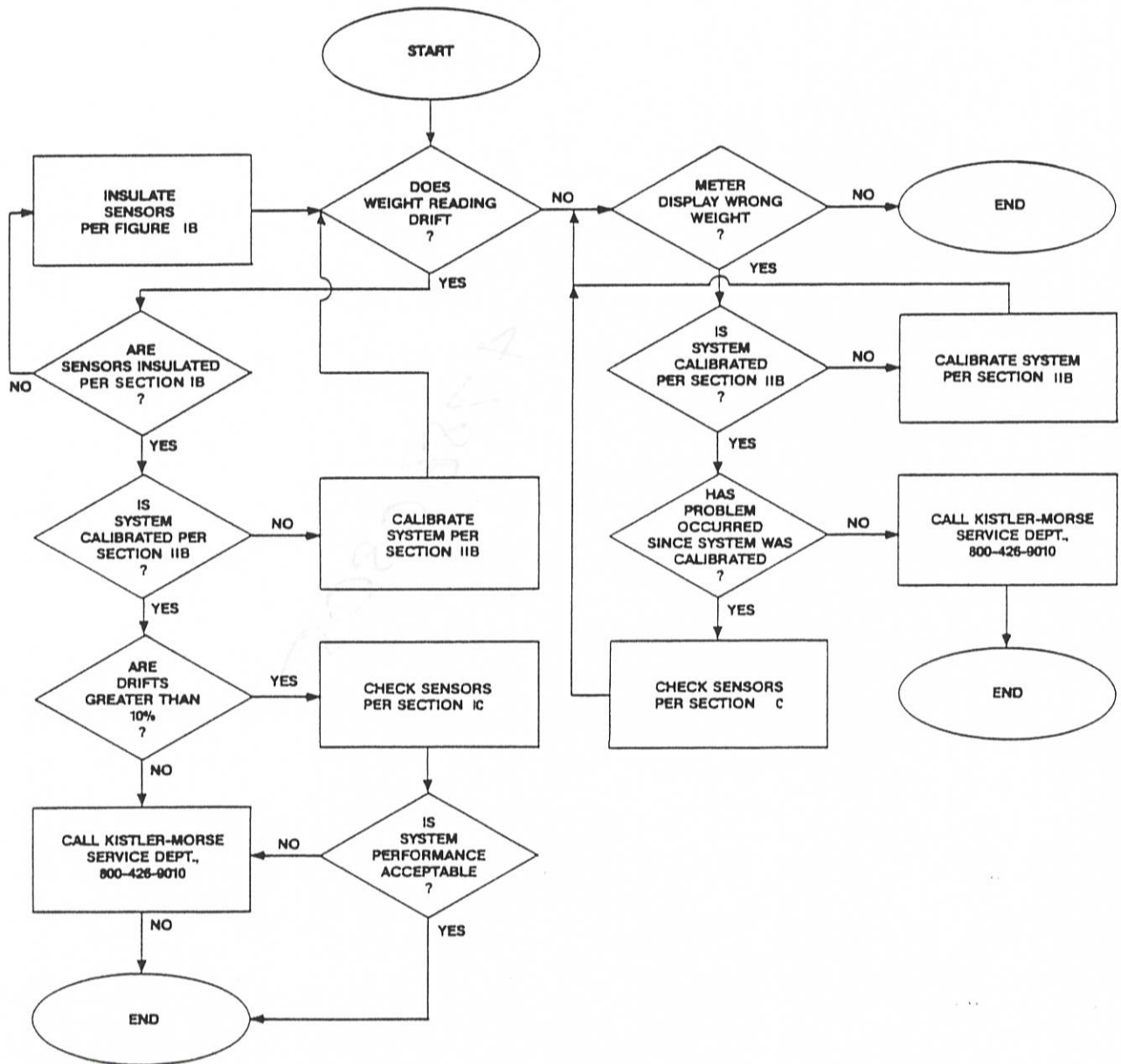


FIGURE 3