INSTRUCTION MANUAL FOR LE-70 LEVEL TRANSMITTER

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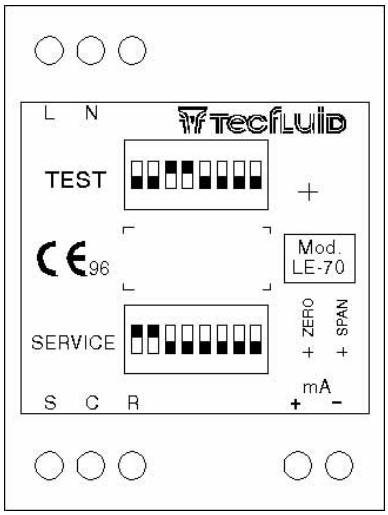


1. THEORY OF OPERATION

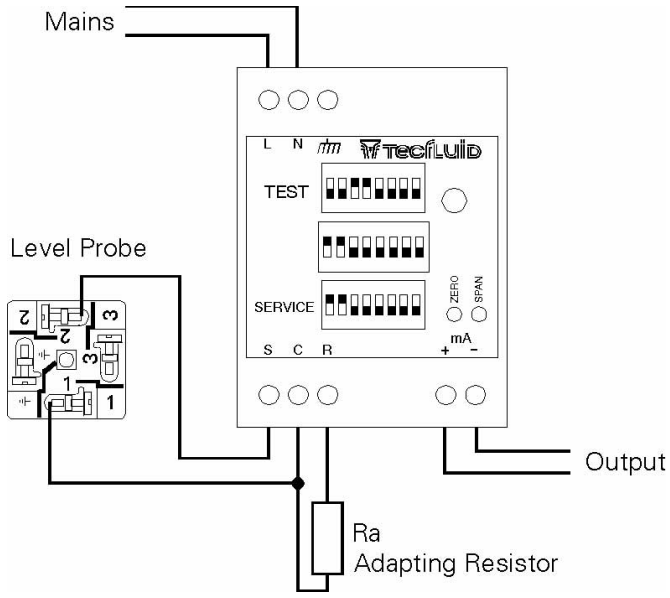
The LE-70 level transmitters use the variation of resistance of the level probe, which depends on the float position, to generate the output voltage or current. In all the output modes the output signal is active, and therefor the receivers should be passive.

The level probes have a resistance of 1000 ohms per meter of effective length. The variation of the resistance is 10 ohms per centimetre of the float movement, thus a 2.5 meter probe will vary its resistance from 2500 ohms (with zero level) to 10 ohms at maximum level.

To adapt the level probe to the transmitter a fixed resistance is used. This fixed resistance can be mounted in the probe head or in the transmitter. In the case of mounting the adapting resistor in the probe head one must use three wires between the probe and the transmitter. If the adapting resistor is mounted in the transmitter then the connection can be made with two wires.

The value of the adapting resistor should be 10,000 ohms per meter of probe, for example a 2.5 meter probe will have a 25 kÙ adapting resistor.

2. INSTALLATION



The LE-70 is housed in an IP40 plastic case for mounting on a panel inside an electric control panel. The plastic case has two holes for mounting with screws to DIN 46 121 and DIN 43 660, and also it has a snap fastener for fitting to DIN 46 277 and DIN EN 50 022 assembly rails.

Screw terminals are provided for external wiring. The terminals are protected against accidental contact in accordance with VDE 0100 Part 750, VDE 0160 Part 100 and VBG 4.

IMPORTANT : In order to comply with the electrical safety requirements as per IEC 1010-1, the installation of the equipment must take into account the following:

- The equipment must be installed inside an electrical mounting cabinet to avoid the possibility that the operator may touch a connection terminal.
- A mains switch must be provided to disconnect the equipment. This switch must be marked as the disconnecting device for the equipment and be within easy reach of the operator.

The power supply to the transmitter must be connected to terminals "L" and "N" of the

transmitter. In the case of 24 volts DC power supply, the polarity is not of importance since the transmitter will have a bridge rectifier on the power input and in this case one can use 24 volt AC or DC power input.

The probe and the transmitter must be inter-connected using two or three wires, depending on the position of the adapting resistor. The probe variable resistance is connected to terminals 1 & 2 of the probe connector and must be connected to terminals "S" and "C" of the transmitter. The adapting resistor "Ra" is connected to terminals "C" and "R" of the transmitter. If the resistor is placed at the transmitter, wire as shown in the drawing. If the resistor is placed in the probe take the third wire from terminal "R" of the transmitter to terminal "3" of the probe and connect the resistor between terminals 1 and 3 of the probe connector.

The maximum recommended load impedance for the mA output is 350 Ù.

3. TESTS AND ADJUSTMENT

3.1 Testing

Open the transparent top using a screwdriver. Inside there is an eight contact DIP switch. Move switches Nº 1 & 2 to the "OFF" position and switches Nº 3 & 4 to the "ON" position (TEST positions) and the LED lamp will light up, indicating TEST mode. Use the four switches Nº 5, 6, 7 & 8 to select the different output levels. With all four switches in the "OFF" position it will give an output for 0% level and with all four switches in the "ON" position we will have an output for a 100% level.

Nº in ON	**Level**	**Output**
None	0 %	4 mA
5	25 %	8 mA
5 y 6	50 %	12 mA
5, 6 y 7	75 %	16 mA
5, 6, 7 y 8	100 %	20 mA

To visualise the output one can use the level indicator or a multimeter in the mA range.

When finished with testing move the switches Nº 1, 2, 3 & 4 to the normal service position and the LED lamp will turn off.

3.2 Adjustment

The transmitters are provided with two potentiometers for adjusting them to the individual probes installed. The potentiometer P01 (marked ZERO) is used to adjust the 0 or 4 mA output for minimum level and potentiometer P02 (marked SPAN) is used to adjust the full scale output at maximum level. Adjustment must be made with the switches in the "SERVICE" position.

To reach the potentiometers one must use a fairly long fine screwdriver since the screw heads of the potentiometers are situated at about 25 mm below the face plate.

To adjust the output first of all the float must be situated at the minimum level position and then adjust P01 for a 4 mA output (or minimum output in the event of using other output modes).

Situate the float at the maximum level position and adjust P02 for a 20 mA output.

4. SELECTION OF OUTPUT MODES

The level transmitter is designed to have 6 possible output modes to adapt to different indicating instruments. All output modes are **active** outputs, which means that the transmitter supplies the current or voltage to the indicator.
(NOTE : **Passive** transmitters exist. These use the current supplied by the indicator)

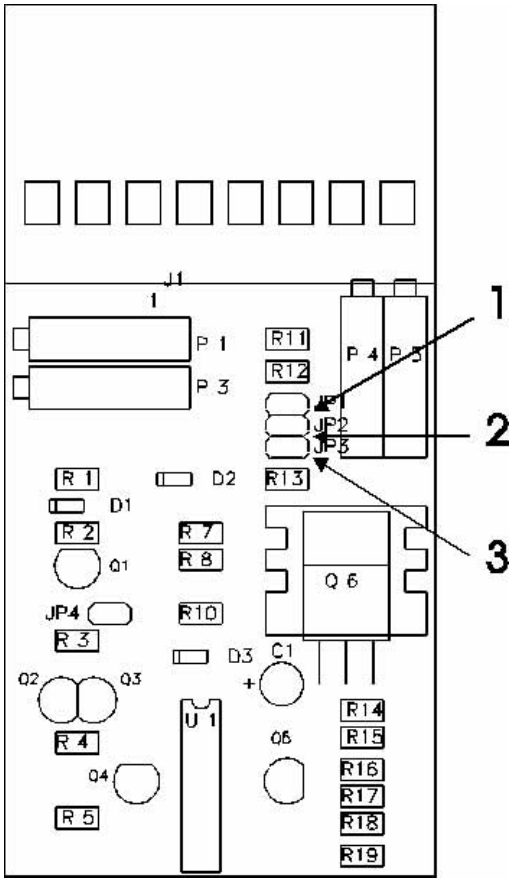
The six output modes are the following:

1. 4 - 20 mA output
2. 0 - 20 mA output
3. 1 - 5 V output
4. 0 - 5 V output
5. 2 - 10 V output
6. 0 - 10 V output

The different output modes are selected by means of jumpers on headers inside the transmitter.

Before opening the transmitter the power supply must be disconnected.

To open the transmitter to change the output mode, first remove the transparent top, then pressure outwards the sides of the plastic case to free the clips in the sides of the terminal blocks and slide the terminal blocks out together with the printed circuits. It is not necessary to slide the printed circuits completely out of the case, as the jumpers are just below the terminal block.



The positions for the jumpers is as following:

	JP1	JP2	JP3
4 - 20 mA			X
0 - 20 mA			
1 - 5 V	X	X	X
0 - 5 V	X	X	
2 - 10 V	X		X
0 - 10 V	X		

A fourth jumper exists lower down on the printed circuit, and must not be removed as it is only used for factory adjustments.

5. TECHNICAL CHARACTERISTICS

5.1 Power supply

The standard supply voltage is 220 Vac 50/60 Hz. Other supply voltages are available on demand ; 240 V, 110 V y 24 V 50/60 Hz and 24 Vdc.

The power consumption is less than 1 W.

5.2 Outputs

The analog outputs are active. This means that the LE-70 supplies the electric current to the output. The loads that can be applied to the output are the following:

0-20 mA & 4-20 mA = Maximum resistive load - 350 ohms

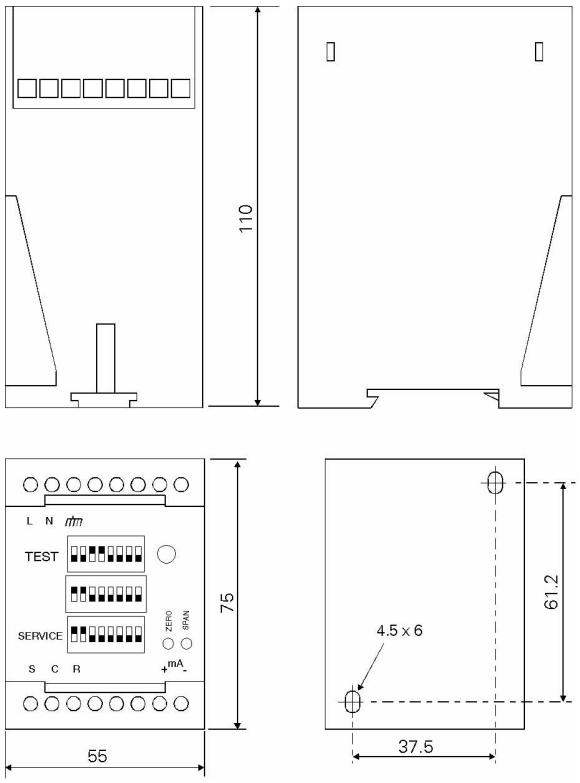
0-5 V y 1-5 V = Minimum resistive load - 100 kÙ

0-10 V y 2-10 V = Minimum resistive load - 200 kÙ

5.3 Level probe input

The LE-70 is designed to work with a probe with 1000 ohms per meter of length. To adapt the probe to the LE-70 a fixed resistor of 10,000 ohms per meter of probe length is used, this means that the adapting resistor will have ten times the maximum resistance of the probe. The adapting resistor must be a metal film type with a thermal coefficient of 50 ppm.

5.4 Dimensions



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This warranty is limited to cover the repair or replacement defective parts which have not been damaged by misuse.

This warranty is limited to the repair of the equipment and all further and eventually following damages are not covered by this warranty.

In the event of consignment of equipment to our factory, this should be done with the equipment well packed and prepaid transport. Tecfluid S.A. will not accept any responsibility for damage done during transport. Together with the equipment, a note should be enclosed indicating the failure observed, the name, address and telephone number of the sender.

TECFLUID S.A.
Narcís Monturiol, 33
08960 SANT JUST DESVERN (Barcelona):
Tel. (93) 372 45 11 , Fax (93) 473 08 54
Fax (INT.) (34 - 3) 473 08 54