

## Capacitive Level Sensor

### E7B

### Compact, High Sensitivity Level Sensor Uses Capacitance to Detect Product

Submersible oil resistant construction for use in aggressive environments.

Low mutual interference enables close mounting of multiple units.

Installation with E7U controller provides dual sensor control for dependable high–low level control.



## Ordering Information

Function type	Probe type	Detectable material	Controller unit	Sensing probe
General purpose	Polyacetal covered stainless steel	See chart	E7U	E7B-311M
High sensitivity type	Stainless steel			E7B-111

## Specifications

Item	Type	
	E7B-111	E7B-311M
Supply voltage	24 VDC (ripple: 10% max.)	
Operating voltage range	±15% of rated voltage	
Current consumption	21 mA max.	
Oscillation frequency	Approx. 600 kHz	
Operating sensitivity	0 to 20 pF	0 to 100 pF
Stable operating sensitivity	1.5 pF max.	5.0 pF max.
Control Output	Solid-state output: 24 VDC 100 mA max. (output resistance: 6.8 kΩ)	
Variation due to temperature fluctuation	0.8 pF max.	1.5 pF max. (within ambient operating temperature range)
Variation due to voltage fluctuation	0.2 pF max.	1.0 pF max. (within operating voltage range)
Min. permissible resistance by material adhering to electrode	100 kΩ min.	30 kΩ min.
Insulation resistance	Data are excluded because case is grounded	
Dielectric strength		
Vibration (mechanical durability)	10 to 25 Hz, 1.5 mm double amplitude	
Shock (mechanical durability)	200 m/s <sup>2</sup> (approx. 20 G's)	
Pressure resistance of electrode	16 kg/cm <sup>2</sup> max.	
Ambient temperature	Operating: –10° to 70°C	
Ambient humidity	Operating: 35% to 95% RH	
Degree of protection	Submersible construction (JIS C0920), IP67 (IEC 144)	
Weight (circuit section)	Approx. 600 g (E7B-111)	

## ■ Accessories – Order Separately

<b>Order number</b>	<b>E7U (Controller Unit)</b>
<b>Supply voltage</b>	100/110/120/200/220/240 VAC ±10%, 50/60 Hz
<b>Power consumption</b>	4 VA max.
<b>Output voltage and current</b>	24 VDC 35 mA
<b>Control output</b>	220 VAC, 2A, p.f.=1, 100,000 operations (under max. load) 12 VDC, 10 mA, 10,000,000 operations (under min. load) Twin contact SPDT
<b>Insulation resistance</b>	5 MΩ min. (at 500 VDC)
<b>Vibration</b>	Mechanical durability: 10 to 25 Hz, 1.5 mm double amplitude
<b>Shock</b>	Mechanical durability: 50 m/s <sup>2</sup> (approx. 5 G)
<b>Ambient temperature</b>	Operating: -10° to 40°C
<b>Ambient humidity</b>	Operating: 45% to 85% RH

## Engineering Data

### ■ Detectable Materials Chart

#### E7B-311M

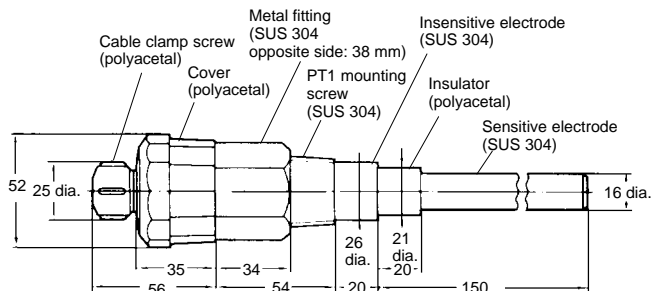
Water solutions
Watery grains
Watery sand
Metal powders

#### E7B-111

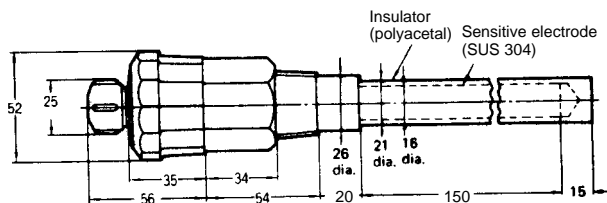
ABS	Cocoa bean cake	Melamine resin	Silicone resin (liquid)
Acetate	Coffee bean cake	Methanol	Silver chloride
Acrylic resin	Cottonseed oil	Mica	Sodium carbonate
Alcohol	Ebonite	Naphthalene	Sodium dichromate
Alkyd resin	Epoxy resin	Nylon	Soybean oil
Aluminous porcelain	Ethyl alcohol	Paints	Soybean cake
Amino alkyd resin	Feed (soybean meal, etc.)	Palm cake	Sulphur (liquid)
Asbestos	Flux	Phenol	Sugar
Asphalt	Formalin	Phosphate rock	Steatite
Barium nitrate	Glass-beads	Polyacetal resin	Thinner*
Barley (grain)	Glycerin	Polycarbonate	Turpentine oil*
Calcium	Grape sugar	Polyester resin	Urea resin
Calcium phosphate	Graphite	Polyurethane	Urethane
Carbide powder	Gravel	Quartz	Vanadium sulfide
Carbide dioxide	Gum arabic	Quartz sand	Vinyl chloride (powdered)
Carbolic acid	Gypsum	Rice flour	Vinyl chloride (granulous)
Celluloid	Linseed oil	Salt	Wheat (grain)
Cellulose	Corn cake	Sand	Wheat flour
Chloroform	Margarine (crude)	Silicone varnish	Xylene

# Dimensions

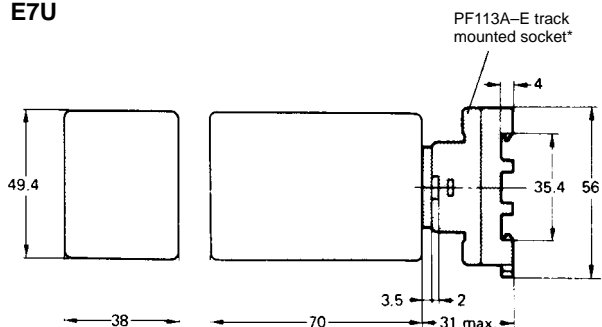
E7B-111



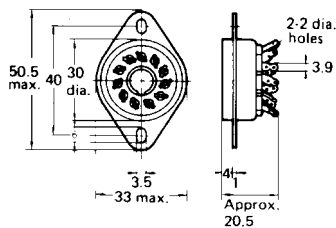
E7B-311M



E7U



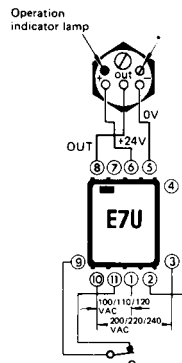
PL11 Back mount socket (order separately)



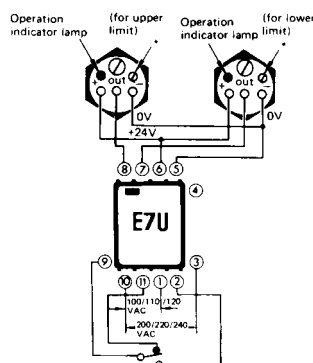
Note: \*PF113A-E track mounted socket is supplied with the E7U controller unit as an accessory (PF113A-E can be used as a front connecting socket)

# Connections

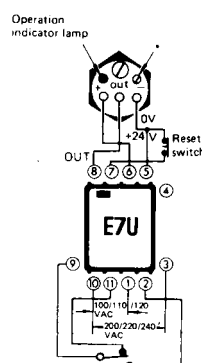
Single unit control



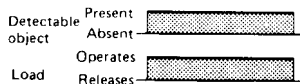
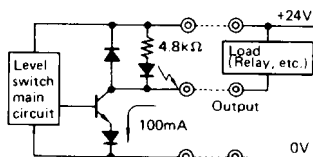
2 unit control



Self-holding control



Output stage circuit diagram



Residual voltage when operated: 2 V max. (under max. load between output and 0 V)