



# LIQUID LEVEL SENSORS

The Gentech range of horizontal, vertical and right angle mounting liquid sensors offers the Design Engineer a combination of versatility and reed switch reliability. Available in UL listed glass filled Polypropylene and Nylon 6.6 materials to provide for use in most chemical and temperature environments, the design

allows for sensing high or low liquid level simply by rotating some models through 180°. There is a choice of switch options and fitting methods to satisfy the majority of signalling and control applications in the automotive, chemical, petroleum and food processing industries.

## DESIGN FEATURES

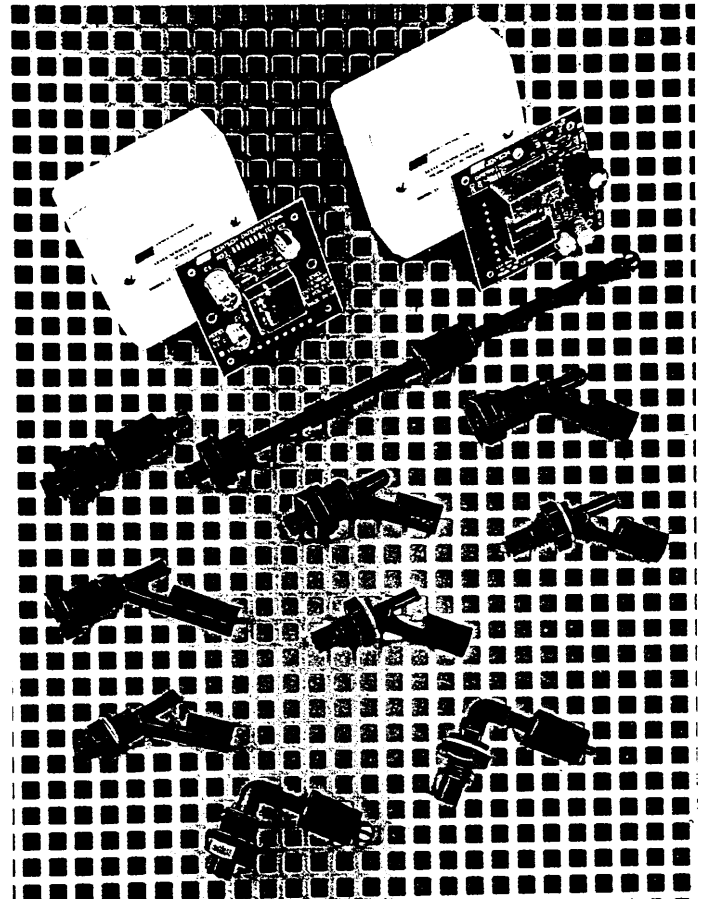
- High or low level sensing
- Normally open, normally closed or change over contact action
- Reed switch reliability, ratings up to 100va
- Glass filled Polypropylene or Nylon 6.6 material
- Horizontal models U.K. Water Research Council Approved for hot and cold water, Certificate No. 9209026. (See page 8, Environmental Specifications Note 3)
- Vertical models U.K. Water Research Council Approved for cold water, Certificate No. 9209026
- U.S. Underwriters Laboratories listed models, File No. E98428
- Operates in liquid down to S.G. of 0.65
- Internal or external fitting
- Internal 1/4" N.P.T., or external 1/2" N.P.T. fitting (horizontal models only). 1/2" N.P.T. version available with diecast metal body (fitted with nylon 6.6 float as standard).
- All models (except 1/4" and 1/2" N.P.T.) are available with universal kit suitable for choice of either internal or external fitting
- Extended models to suit most tank depths (details available on request)
- Interface control systems (See pages 11 & 12)
- Easy to install
- Cost effective

## APPLICATIONS

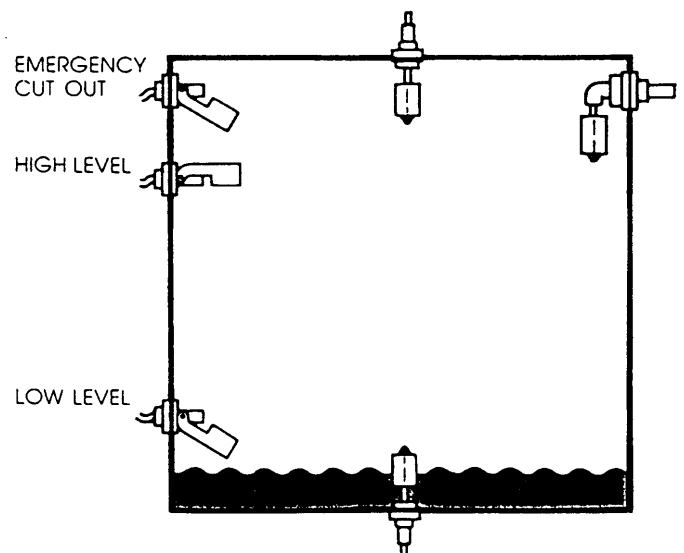
- Low coolant level sensing
- Fuel or oil level sensing
- Boiler level warning
- Solution monitoring
- Flood control
- Reservoir high or low level sensing

## INDUSTRIES

- Automobile
- Automobile, plant and equipment
- Catering, vending machines
- Petroleum, chemical, plating, process engineering
- Domestic appliances
- Automobile, medical equipment

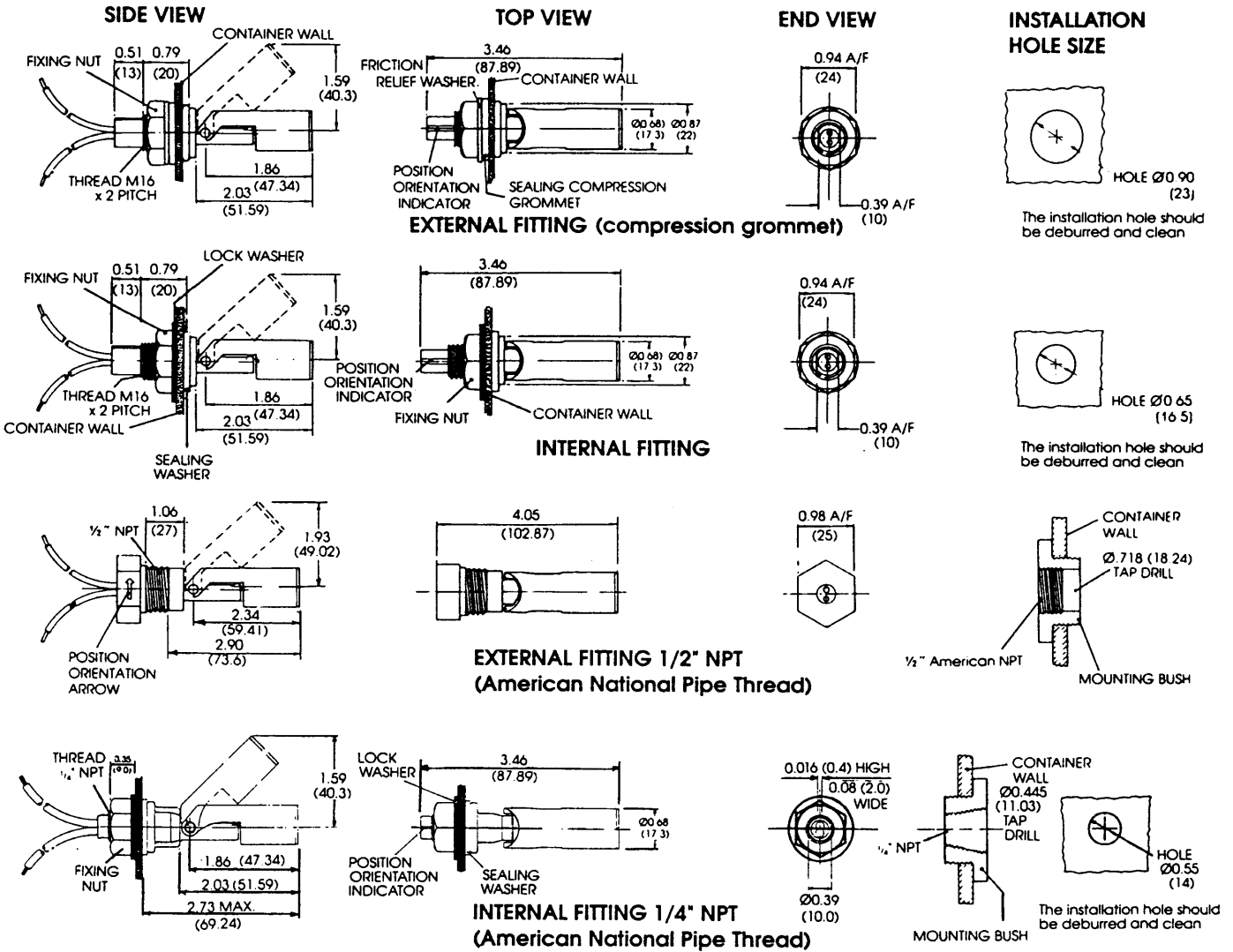


## TYPICAL APPLICATION

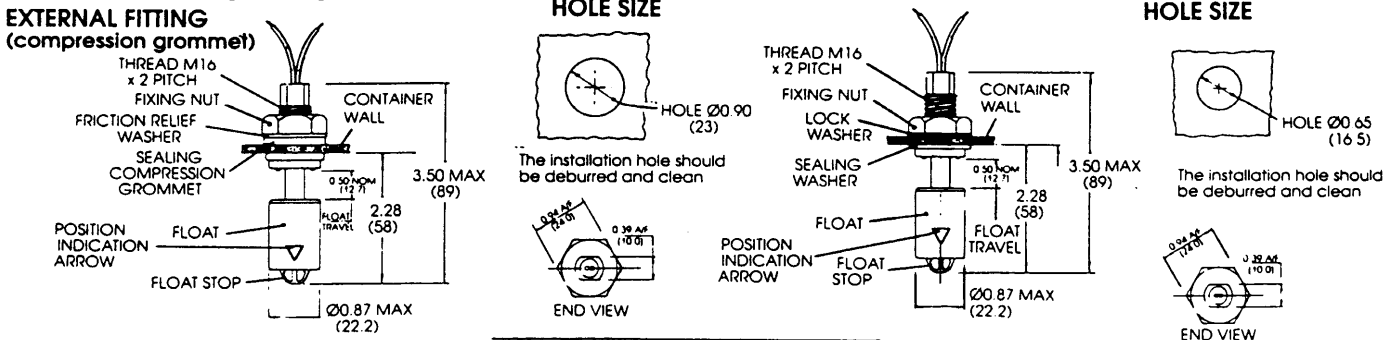


# DIMENSIONAL CHARACTERISTICS

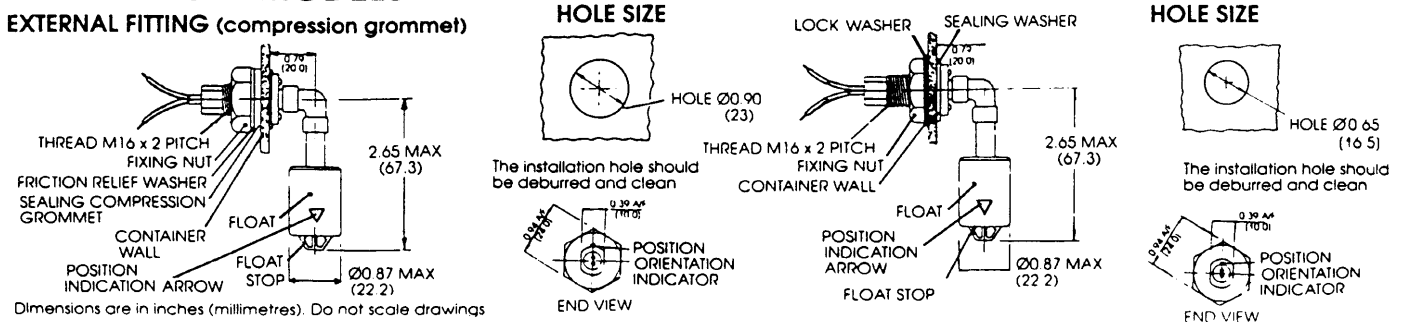
## HORIZONTAL MODELS



## VERTICAL MODELS



## RIGHT ANGLE MODELS





# SPECIFICATIONS

## SWITCHING OPTIONS

	01	03	04	06	07	08
<b>Switch Action</b> (Reed Switch)	SPST	SPST	SPDT	SPST	SPST (solid state triac)	SPST
<b>Maximum Switching Voltage</b> (VDC) (VRMS)	100 120	100 250	100 70	100 120	- 250	- 250
<b>Maximum Switching Current</b> (Amps)	1.0	1.0	0.50	3.0	3.0	1.0
<b>DC Contact Rating</b> (Watts)	†15	†15	†3	†100	-	-
<b>Minimum Breakdown Voltage</b> (VDC)	300	800	200	400	600	400
<b>Initial Contact Resistance</b> (Ohms)	0.25	0.25	0.25	0.75	-	-
<b>Fitting Option</b>	All	All	All	All	1/2" NPT ONLY	All

† The switching performance can be drastically affected if switch ratings are exceeded. For inductive, capacitive and tungsten filament lamp loads, derate by 50%. Contact circuit protection information is available (see page 19). All switch ratings are at DC resistive loads.

## MECHANICAL SPECIFICATION

<b>Mounting Position</b> (vertical & right angle models)	Stem position must be vertical $\pm 15^\circ$
<b>Mounting Position</b> (horizontal models)	$\pm 30^\circ$ from horizontal
<b>Minimum operate angle</b> (horizontal models)	5° from mounting angle
<b>Maximum release angle</b> (horizontal models)	40° from mounting angle
<b>Operate window</b> (vertical & right angle models)	within 5mm (0.196") from float stop
<b>Shock *</b>	50g for 11 milliseconds duration
<b>Vibration *</b>	35g up to 500Hz
<b>Nominal Cable Length</b>	0.5 metre

\* Reed Switch Only

## ENVIRONMENTAL SPECIFICATIONS

	Float and Housing Materials Nylon 6.6	Glass filled Polypropylene
<b>Operating Temperature Range</b>	-30°C to +130°C (See Note 2)	-30°C to +110°C (See Note 3)
<b>Minimum SG of Liquid</b>	0.85	0.65
<b>Minimum Viscosity of Liquid</b> (centipoise)	100	100
<b>Plastic Housing Water absorption of equilibrium</b> at 20°C and 100% RH at 100°C and 100% RH	5.6% 5.6%	<0.09% <0.09%
<b>Heat distortion temperature</b> 4.5Kg/cm <sup>2</sup> (67.6 psig)	245°C	154°C

### Notes:

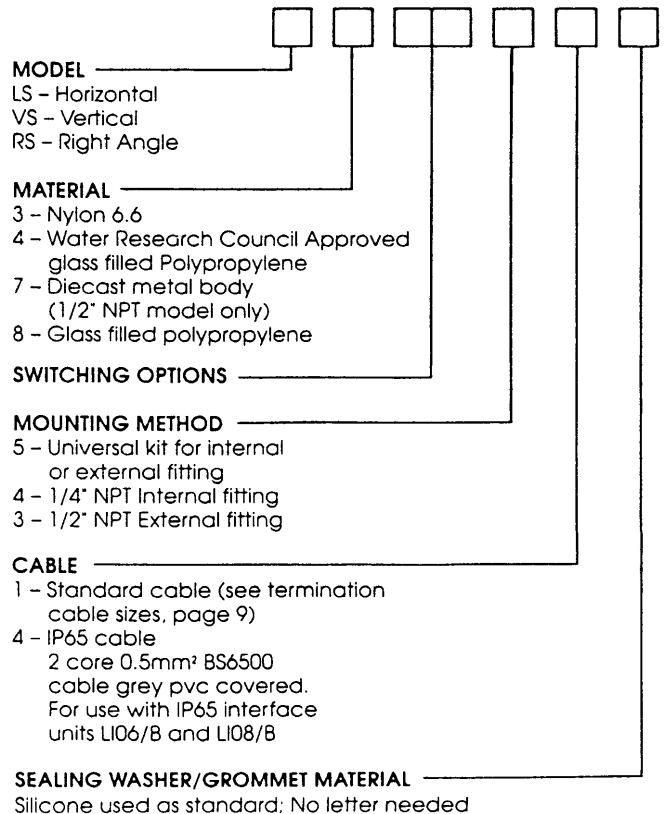
1. Diecast metal model is fitted with Nylon 6.6 float as standard.
2. Higher temperature range units available.
3. For boiling water applications the maximum operating temperature limits are:-  
Continuous boiling water 80°C  
Non continuous boiling water 100°C

Detailed chemical resistance information for specific liquids is available on request.

### SEALING WASHER/GROMMET MATERIALS:

<b>Operating Temperature Range</b>	<b>Silicone</b> -54°C to +150°C	<b>Nitrile</b> -55°C to +107°C
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## ORDERING INFORMATION





# IMPORTANT INSTALLATION AND APPLICATION NOTES

1 Care must be taken to ensure that the product is not damaged due to excessive tightening of the fixing nut or threaded bush. The torque must not exceed the maximum limits shown below.

Model	Torque Limit	Maximum Container Wall Thickness
<b>External Fitting</b> (compression grommet) See Note 1.1	2.0 lb ft (2.67Nm)	0.16ins (4mm)
<b>External Fitting</b> (1/2" NPT) See Note 1.2	5.0 lb ft (6.75Nm)	1.00ins (25mm)
<b>Internal Fitting</b>	3.0 lb ft (4.0Nm)	0.394ins (10mm)
<b>Internal Fitting</b> (1/4" NPT) into tapered bush	5.0 lb ft (6.75Nm)	0.50ins (12.7mm)
through tank wall with nut & washer See Note 1.3	3.0 lb ft (4.0Nm)	0.12ins (3mm)

## Notes

- 1.1 The **compression grommet** is suitable for a seal pressure of 70 p.s.i. There is a choice of silicone rubber and nitrile materials, suitable for a wide range of applications and chemicals.
- 1.2 When using a **1/2" NPT** (American National Pipe Thread) **Adaptor** fitting, the container wall thickness must not exceed the length of the male thread section of the adaptor. (See dimensional characteristics). The 1/2" NPT model float assembly is designed to pass through 1/2" NPT tap drill 0.718" diameter. A number of pipe fittings have a smaller diameter outside the thread area which will restrict entry. Because the 1/2" NPT tapered mounting bush is usually metal and the Gentech liquid level sensor is usually moulded plastic, it is essential that due care is taken not to overtighten which will cause damage to the sensor. A sealant such as P.T.F.E. tape should always be used on the threaded section of the sensor. Care must be taken to ensure that the position orientation arrow is vertical.
- 1.3 The **1/4" NPT** (American National Pipe Thread) is also suitable for mounting into a tapered bush (see dimensional characteristics). Because the 1/4" N.P.T. tapered mounting bush is usually metal and the Gentech liquid level sensor is moulded plastic, it is essential that due care is taken not to overtighten which will cause damage to the sensor. A sealant such as P.T.F.E. tape should always be used on the threaded section of the sensor.
- 2 Under no circumstances should the **float assembly** on horizontal models be removed for ease of installation as the operation characteristics can be impaired.
- 3 To reverse **switching action** on **horizontal models** simply rotate through 180° observing orientation indicator (arrow on 1/2" NPT model, bar on all other models).
- 4 On **vertical and right angle models** the **switch function** can be changed from normally open to normally closed contact by simply compressing the float stop arms, removing and reversing the float and reassembling. (Movement in the direction of the position indication arrow on the float closes the switch contacts at the end of float travel).

## 5 Termination Cable Sizes

Sensor Type	Switch Option	Cable Size AWG	Stranding	Insulation	Approvals
LS	01, 03, 06 & 07	18	32/0.2mm	P.V.C.	UL/CSA/BS6231
LS	04	24	7/0.2mm	P.V.C.	—
VS & RS	01, 03, 06 & 08	22	16/0.2mm	P.V.C.	UL/CSA/B6231
VS & RS	04	24	7/0.2mm	P.V.C.	—



# VERTICAL COMPACT LIQUID LEVEL SENSOR

The Gentech VCS-01 offers the Design Engineer a compact, cost effective Vertical Level Sensor with proven reed switch reliability.

The design, with a Polypropylene housing and a Polypropylene float, provides for sensing high or low liquid levels, simply by reversing the float.

## DESIGN FEATURES

- High or low level sensing
- Normally open or normally closed contact action
- Reed switch reliability up to 15 watt rating (US Underwriters Laboratories File No. E153493)
- Polypropylene housing and Polypropylene float
- Operates in liquid down to S.G. of 0.70
- 1/8" N.P.Taper thread fitting
- An overall length less than 2.5 inches (60mm)
- Interface control systems available

## SWITCHING SPECIFICATION

Switch Action(see Note 1)	SPST
Maximum Switching Voltage	100 vdc 250 vrms
Maximum Switching Current	1.0 amps
Maximum DC Contact Rating (see Note 2)	15 watts
Minimum Breakdown Voltage	800 vdc
Initial Contact Resistance	0.25 ohms

### NOTES:

1. When the non magnet end of the float is positioned against the float stop (as shown in drawing) the switch contacts are closed. The switch function can be changed from contacts closed to contacts open by simply compressing the float stop arms, removing and reversing the float and reassembling.
2. The switching performance can be drastically affected if switch ratings are exceeded. For inductive, capacitance and tungsten filament loads, derate by 50%. Contact circuit protection information is available on page 19. All switch ratings are at DC resistive loads.

## MECHANICAL SPECIFICATION

Mounting Position	Stem position must be vertical $\pm 15^\circ$
Operate Window	Within 0.196" (5mm) from float stop
Shock (see Note 3)	50g for 11 milliseconds duration
Vibration (see Note 3)	35g up to 500Hz
Nominal Cable Length	0.10 metre

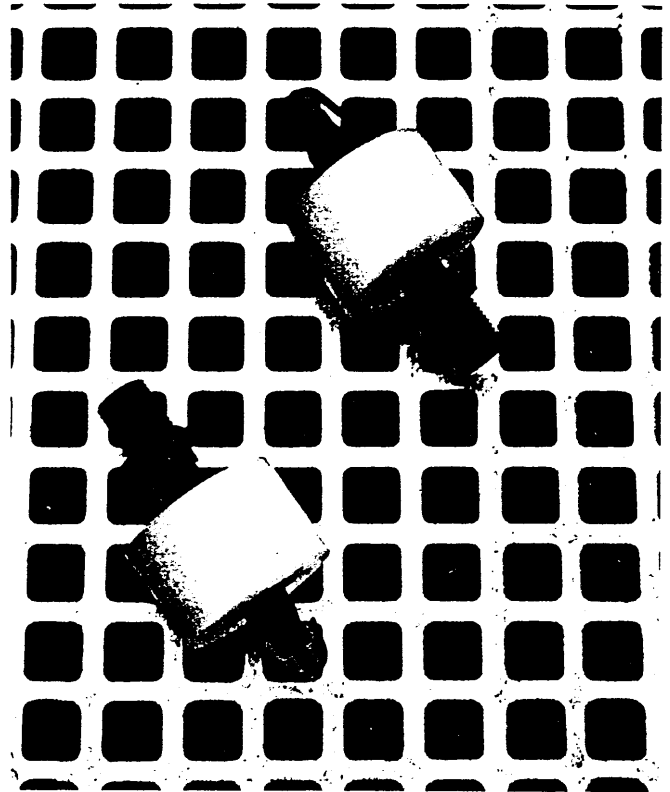
Note 3. Reed Switch only.

## IMPORTANT INSTALLATION AND APPLICATION NOTES

- 1 Care must be taken to ensure that the product is not damaged due to excessive tightening of the fixing bush. The torque must not exceed the maximum limit shown below.

Model	Torque Limit	Maximum Container Wall Thickness
VCS - 01 Internal fitting	1.0lb ft	0.394 ins
1/8 N.P.Taper into threaded bush	(1.33 Nm)	(10mm)

- 2 The 1/8" NPT (American National Pipe Taper) is intended for mounting into a tapered bush. Because the 1/8" N.P.T. tapered mounting bush is usually metal and the Gentech liquid level sensor is moulded plastic, it is essential that due care is taken not to overtighten which will cause damage to the sensor. A sealant such as P.T.F.E. tape should always be used on the threaded section of the sensor.
- 3 The VCS is also available as standard with M8 x 1.25mm thread fitting (details available on request).
- 4 Other float sizes can be provided (details on request).

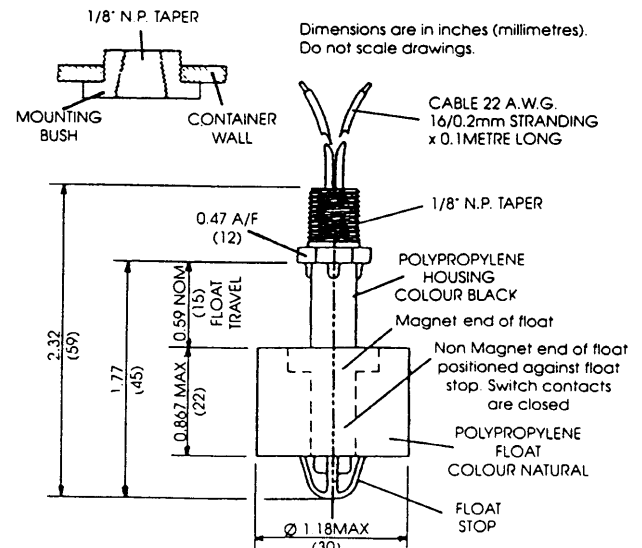


## ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range	-30°C to +60°C
Minimum SG of Liquid	0.70
Minimum Viscosity of Liquid	100 centipoise
Plastic Housing & Float Water Absorption Equilibrium at 20°C and 100% RH	0.03%
at 100°C and 100% RH	<0.05%
Heat Distortion Temperature	105°C

Note: Detailed chemical resistance information for specific liquids is available on request.

## DIMENSIONAL CHARACTERISTICS



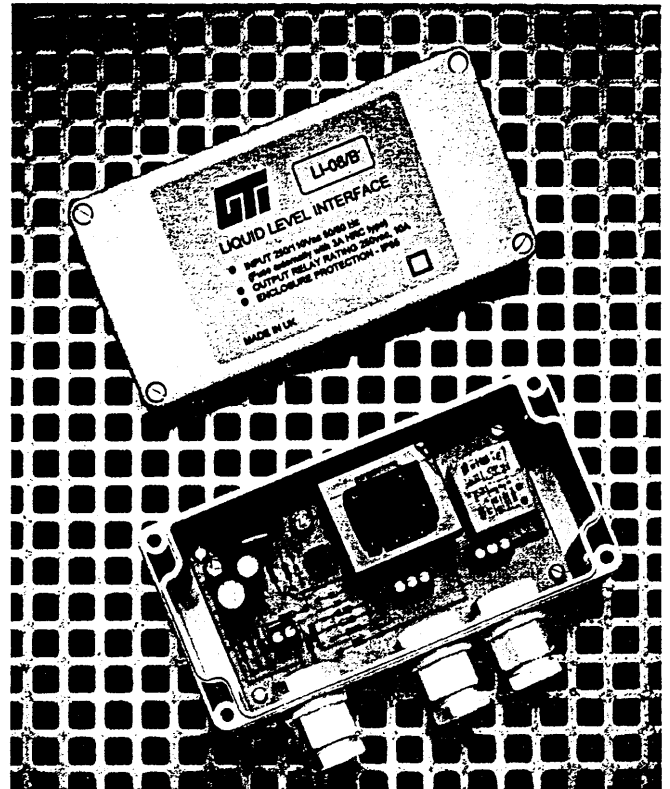


# LEVEL SENSOR INTERFACE CONTROL SYSTEMS

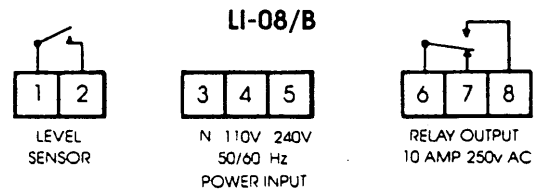
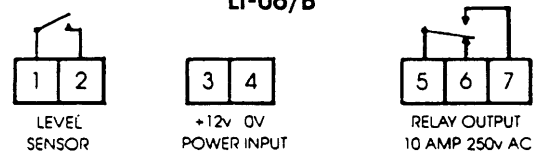
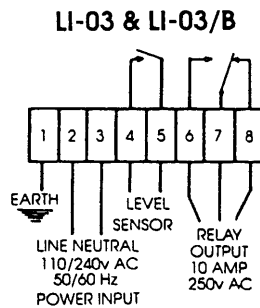
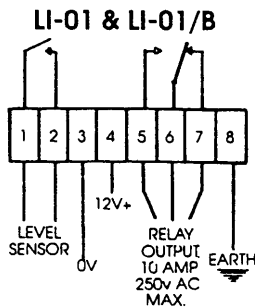
The Gentech LI range of level sensor interface control systems is designed specifically for use with the LS, VS and RS series of liquid level sensors. The control circuit is printed circuit board mounted complete with connection terminal block. Control systems are available in two versions, 12v dc or 110/240v ac 50/60Hz power input, both providing a 10A, 250v ac relay output contact. An electronic time delay circuit is provided to cope with applications where liquid turbulence is a factor, thereby minimising the risk of spurious control signals.

**LI-01/B** and **LI-03/B** models are supplied enclosed in a quality white plastic housing with an easily removable front cover. Knockouts are provided in the base and sides making cable entry simple. The printed circuit boards can be supplied separately to satisfy specific internal installation requirements.

**LI-06/B** and **LI-08/B** models are supplied in a light grey polycarbonate housing, fitted with cable glands, with IP65 (BS5420/IEC 144) rating and have printed circuit boards designed to meet BS3955 (electrical controls specification). Full IP65 (BS5420/IEC 144) rating can be achieved by using 2 core 0.5mm<sup>2</sup> BS6500 pvc covered cable (see Level Sensor ordering information on page 8).



## WIRING DIAGRAMS



## TECHNICAL SPECIFICATION

Ordering Code	LI-01	LI-01/B	LI-03	LI-03/B	LI-06/B	LI-08/B
Power Input	12vdc	12vdc	110/240vac 50/60Hz	110/240vac 50/60Hz	12vdc	110/240vac 50/60 Hz
Power Consumption	400mW max	400mW max	20W max	20W max	400mW max	20W max
Relay Output Contacts	1 Pole SPDT	1 Pole SPDT	1 Pole SPDT	1 Pole SPDT	1 Pole SPDT	1 Pole SPDT
Relay Contact Rating	10A/250vac	10A/250vac	10A/250vac	10A/250vac	10A/250vac	10A/250vac
Time Delay	10 secs typ	10 secs typ	10 secs typ	10 secs typ	10 secs typ	10 secs typ
Construction	P.C.B.	Enclosed	P.C.B.	Enclosed	Enclosed	Enclosed
Enclosure Housing	-	White Moulded ABS	-	White Moulded ABS	Polycarbonate	Polycarbonate
Enclosure Rating	-	Complies with IP10 (BS5420/IEC144)	-	Complies with IP10 (BS5420/IEC144)	IP65 (BS5420/IEC 144)	IP65 (BS5420/IEC 144)
Ambient Temperature Range	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C
Weight	46.3gms	164.4gms	57.2gms	175.3gms	315gms	494gms



# LEVEL SENSOR INTERFACE CONTROL SYSTEMS *continued*

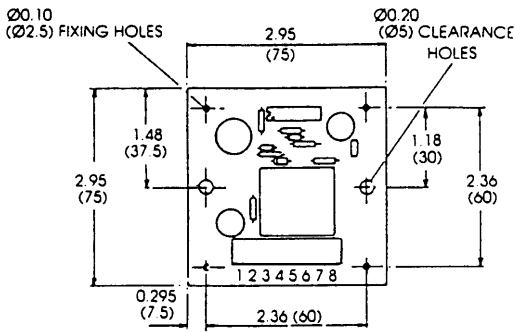
## ORDERING INFORMATION

Item	Construction	Power Input	Relay Output Contact	Relay Output Ratings
LI-01	P.C.B.	12v dc	1 Pole SPDT	10A/250v ac
LI-01/B	Enclosed	12v dc	1 Pole SPDT	10A/250v ac
LI-03	P.C.B.	110/240v ac 50/60Hz	1 Pole SPDT	10A/250v ac
LI-03/B	Enclosed	110/240v ac 50/60Hz	1 Pole SPDT	10A/250v ac
LI-06/B	Enclosed	12v dc	1 Pole SPDT	10A/250v ac
LI-08/B	Enclosed	110/240v ac 50/60Hz	1 Pole SPDT	10A/250v ac

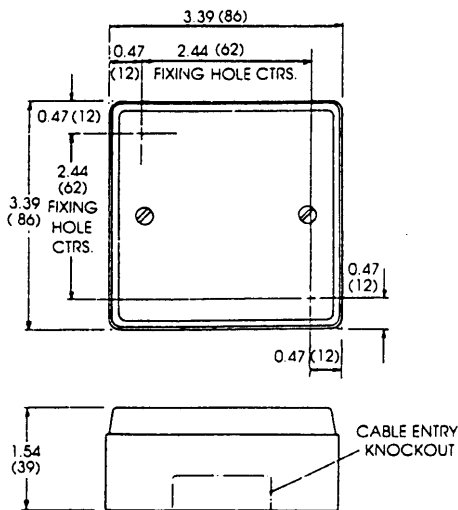
NOTE: Level Sensor Latching Interface Control Systems are also available: Information on request

## MECHANICAL SPECIFICATIONS

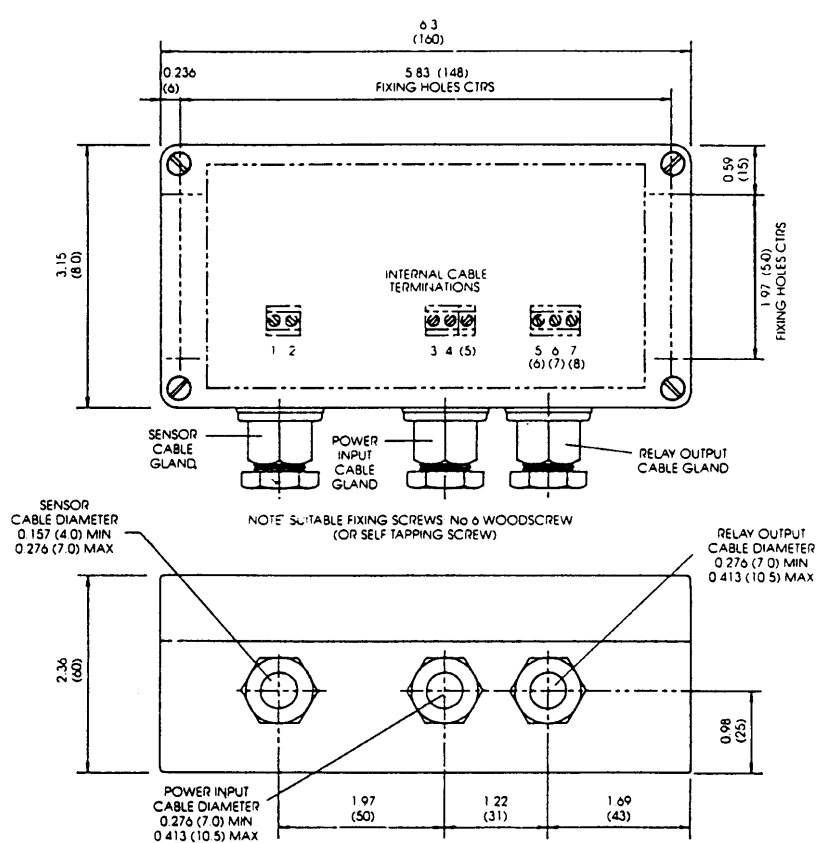
**LI-01 & LI-03  
P.C.B. Version**



**LI-01/B & LI-03/B  
Enclosed Version**



**LI-06/B & LI-08/B**



Dimensions are in inches (millimeters)  
Do not scale drawings