FLOAT OPERATED GUIDED LEVEL SWITCH "FGS"

FGS is a single or multiple point switch for detection of liquid level in open/ pressurized tanks. It offers trouble free service in conductive, non-conductive and corrosive liquids.

SALIENT FEATURES

- Hermetically sealed glass encapsulated reed switch
- Liquid level or liquid/liquid interface detection
- Type approval by IRS for marine applications
- Option of switch integral with control unit
- Option of zener barrier for intrinsic safety

CONSTRUCTION AND WORKING

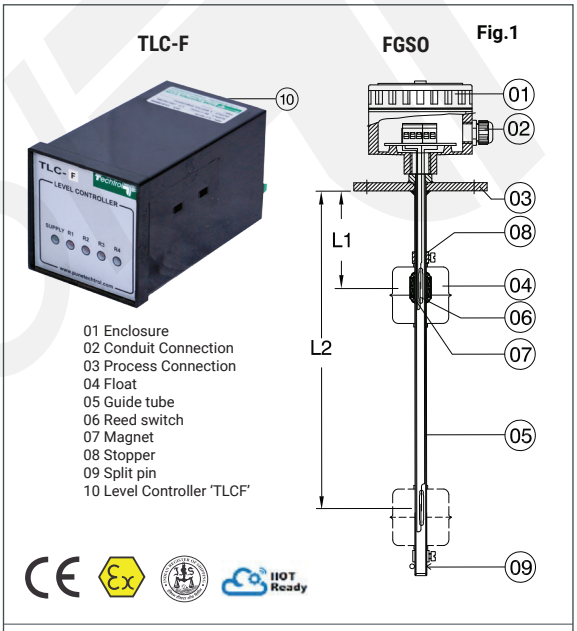
It consists of magnetic float moving on guide tube, which houses hermetically sealed reed switches at preset levels.The float follows liquid level and magnetically actuates reed switches at preset levels to change over contacts.

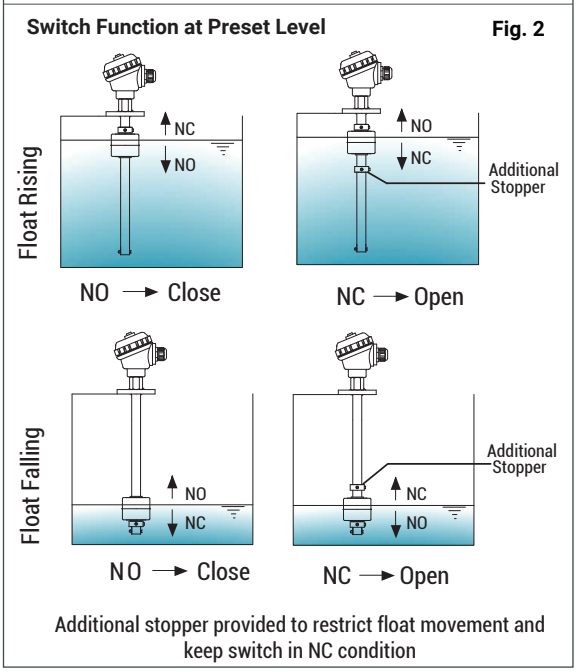
Single or multiple switching is effected through single or multiple floats as required by applications.

FGSO is fitted with weather proof enclosure or flameproof enclosure. FGSI is fitted with plug-in connector or epoxy potted cable. These switches can be provided with 'Zener Barrier' for intrinsic safety.

The low power potential free reed contacts can be directly connected to PLC, DCS or SCADA. However, their contact rating can be amplified to 5A, 250VAC through use of controller (TLC-F) for driving higher load devices.

Important: Preset levels & switching function are factory set and should be specified in PO to initiate production





SPECIFICATIONS

Model	FGSO	FGSI
Installation	Outdoor	Indoor
Mounting	Top	
Terminal Enclosure	Cast Al. IP66 or Exd Gr. IIB or IIC, T6 IP66 (CCOE Certified) or ATEX Exd Gr. IIC T6, IP66	Plug- in connector / Epoxy Potted Cable Extension (500mm)
Conduit Connection	PG11 Cable Gland, Nylon (IP66) or ½" NPT Double Compression Cable Gland, Brass (Ex-proof)	PG11 (Nylon) / NA
No. of Preset Levels	1 to 4	1 to 4 with cable extn. Max 2 with plug connector
No. of Floats	Single / Multiple (Max. 4)	Single / Multiple (Max 4)
Float MOC x Size	SS316 x Ø 25, 28, Ø 40, 42, 60 mm PP x Ø25, 50mm, PVDF x Ø63 mm	SS316 x Ø 25, 28, Ø 40, 42 mm PP x Ø25 mm
Liquid Specific Gravity (SG)	0.65 to 1.2 depending on float size (Refer float selection chart on page 3)	
Interface Detection	Min 0.2 difference between SG of upper & lower liquid (with 60 dia. float)	
Process Connection	Flanged, Screwed or Tri- cover Ferrule	
Switch Type	Glass encapsulated hermetically sealed reed switch	
Reed Switch Rating & Type	40 VA or 120 VA-NO (SPST) contacts ; 5 VA or 60 VA-1C/O (SPDT) contacts. Refer table for reed switch contact details	
Differential	Fixed 10 ± 5 mm	Fixed 3 to 5 mm
Accuracy/ Repeatability	± 2 mm/ ±1mm	
Load	Resistive or Inductive	
Insulation	100 M Ohms at 500 VDC	
Max. Temperature	70 °C (PP), 100 °C (PVDF) 125 °C (SS) 150 °C (Optional)	70 °C (PP), 125 °C (SS) Refer Float Selection Table
Max. Test Pressure	3 kg/cm² (PP/PVDF), 10 Kg/cm² (SS) upto 25 kg/cm² (optional)	3 kg/cm² (PP), 10 kg/cm² (SS) Refer Float Selection Table
CE Certification	As per 2014/35/EU, available with weather proof enclosure/ plug connector/ cable extension	
Intrinsic Safety Approval	Ex ib Gr. IIB T6 ; Provided with Zener Barrier and Techrol Controller TLC-F	
Zener Barrier	Used in Conjunction with Realy contacts viz Techtrol Controller (TLC-F)	
Input Supply	24 VDC	
Output	24 VDC/ 110 mA	
Enclosure MOC & Size	ABS, 40 x 115 x 90 mm, DIN rail mounted	

Reed Switch Contact Details

Switch Rating	5 VA	40 VA	60 VA	120 VA
Contact Type	1C/O (SPDT)	NO (SPST)	1C/O (SPDT)	NO (SPST)
Max. Sw. Current	0.25 A	1 A	1 A	1 A
Max. Sw. Voltage	120 VAC/175 VDC	230 VAC/ DC	220 VAC/ 250 VDC	250 V AC/DC

Level Control and Automation System using Wireless Technology for IIOT Applications is available on Demand

FLOAT SELECTION

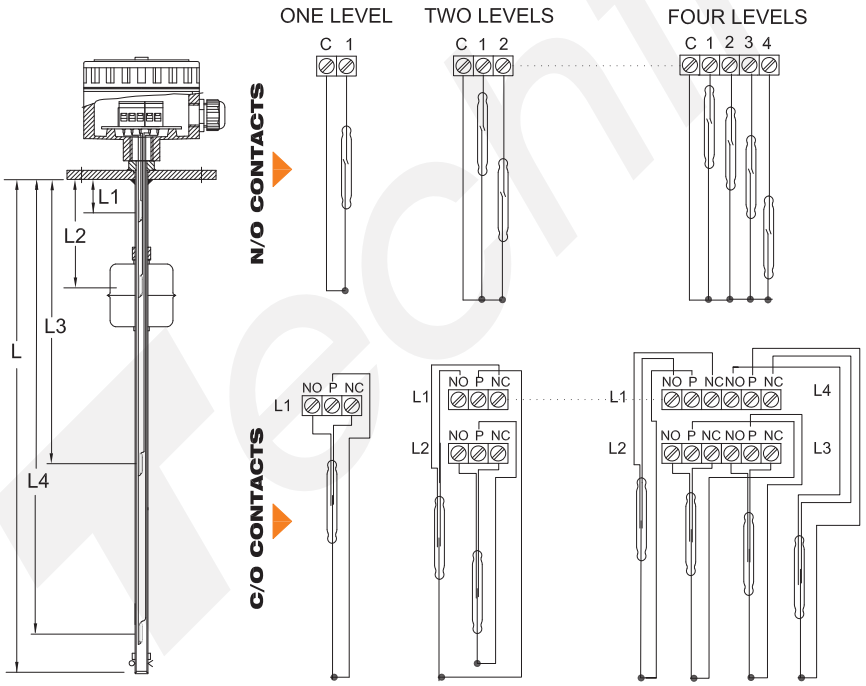
Float selection is based on type of liquid, its specific gravity, max temp, pressure and tank nozzle ID.

Float Size Ø X L mm	Float MOC	Nominal Bore (NB)	Type	Min. Liquid SG	Max Test Pressure Kg/cm²	Max Temp °C	Reed Switch Rating				Max GTL mtr
							5VA 1 C/O	40VA NO	60VA 1 C/O	120VA NO	
Ø25 x 25	PP	25	B	≥0.8	1	70	1	3	--	--	1
Ø25 x 25	SS316	25	J	≥1	8	125	1	3	--	--	1
Ø28 x 28	SS316	32	C	≥0.8	10	125	1	3	--	--	1
Ø 40 x 50	SS316	40	D	≥0.8	10	100	4	4	4	4	3
Ø42 x 50	SS316	40	H	≥0.65	15	125	4	4	4	4	3
Ø50 x 60	PP	50	E	≥0.8	2	70	4	4	4	4	3
Ø60 x 130	SS316	65	F	≥0.8	15	150	4	4	4	4	3
Ø63 x 120	PVDF	80	V	≥0.8	2	100	4	4	4	4	3

NB : Option of Floats for higher temp and SS316L MOC available optionally

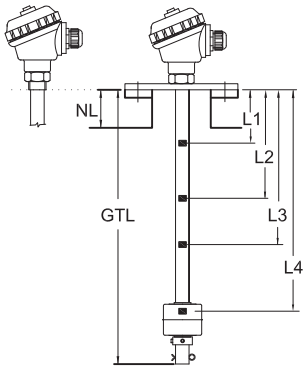
GTL- Guide Tube Length

Internal Circuit Diagram Illustrating Reed Switch Contacts and Terminations — Fig. 3



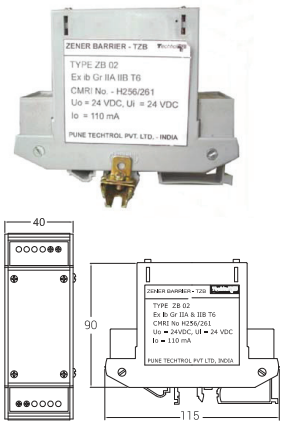
L1,L2,L3 & L4 = Preset Level
L = Guide Tube Length

Positioning of Preset Levels — Fig. 4



Preset levels L1, L2...L4 from bottom of process flange/ threaded length

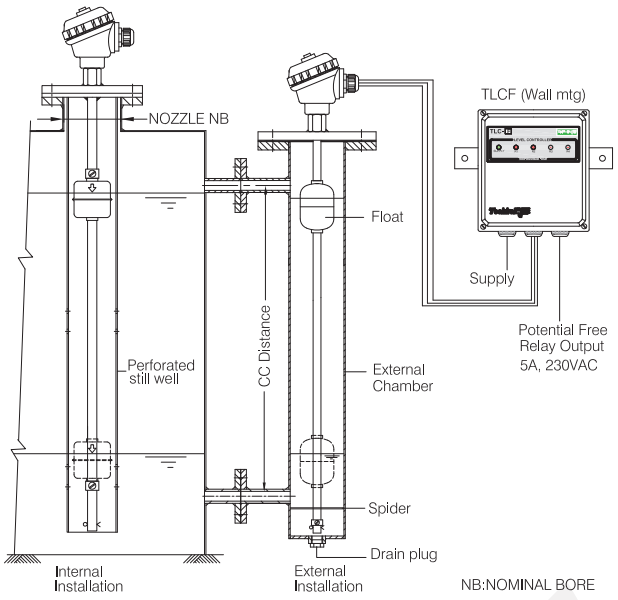
Schematic Diagram of Zener Barrier — Fig. 5



Level Control and Automation System using Wireless Technology for IIOT Applications is available on Demand

TYPICAL INSTALLATION

Fig. 6



It can be mounted internally or externally through a chamber as shown in figure 6.

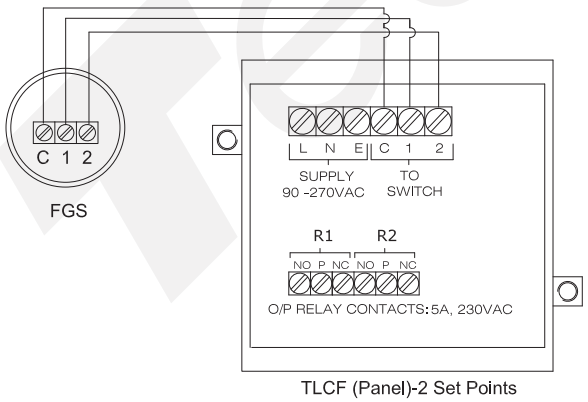
1) Internal Mounting
Perforated stillwell is recommended for liquids under turbulence. For fitment of stillwell, ensure that nominal bore (NB) of tank nozzle is greater than its diameter.

2) External Mounting
Is adopted, where mechanical devices like stirrers operate within the tank or to overcome space limitation.

3) Ensure that ID of mounting nozzle is grater than float diameter. In case, float diameter is greater than nominal bore, remove float from guide tube & reinsert the float from bottom of guide tube, after installation

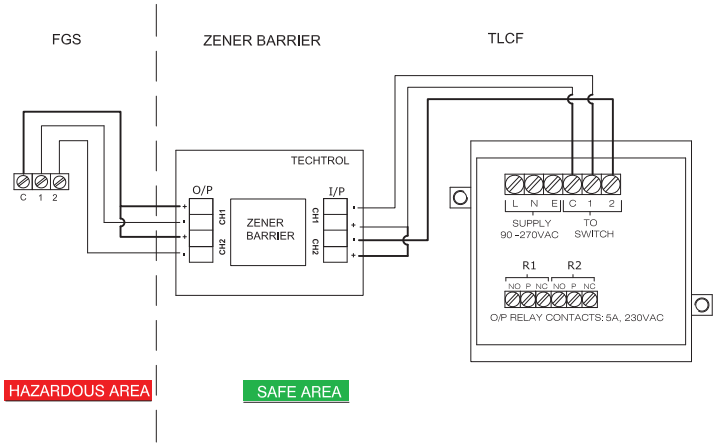
TERMINATION & WIRING

1. Switch with Controller Fig. 7



TLCF (Panel)-2 Set Points

2. Switch with Zener Barrier and Techtrol Level Controller Fig. 8



APPLICATIONS

- Oil/Water Separators
- Diesel Tanks
- Fuel/Oil Tank and Transfer Systems
- Fuel Tanks Management
- Dosing Tanks in ETP
- STP & WTP
- Chemical Processing Storage Tanks
- Lubrication Equipment
- Heating Ventilation & Air Conditioning
- Food Processing Equipment and Marine Services

FGSO

SS MOC

PP MOC

PVDF MOC

Triclover Ferrule Connection

With Multiple Floats

FGSI

Epoxy Potted Cable Extension

Plug in Connector

FGSO with External Chamber

Integral Electronics Weather Proof Enclosure

MODEL IDENTIFICATION

FGS											
Outdoor Installation	O										
Indoor Installation	I										
1. Enclosure x Conduit Connection											
Cast Al. IP66 x PG11 Cable Gland		J									
Cast Al. IP66 x 1/2" NPT DC Cable Gland		K									
Cast Al. Ex d Gr. IIB T6, IP66 x 1/2" NPT DC Cable Gland		E									
Cast Al. Ex d Gr. IIC T6, IP66 x 1/2" NPT DC Cable Gland		F									
Cast Al. ATEX Ex d Gr. IIC T6, IP66 x 1/2" NPT DC Cable Gland		G									
Cast Al. IP65 with Integral Electronics x PG 11 Cable Gland		I									
Cast Al. IP66 x Plug & Socket		T									
Epoxy Potted Cable Extension (Indoor Installation)		P									
Plug-in Connector (Indoor Installation, max 2 levels)		C									
Others		O									
2. Reed Switch Rating x Form											
40 VA x NO (SPST)			1								
60 VA x 1 C/O (SPDT)			2								
5 VA x 1 C/O (SPDT)			3								
120 VA x NO (SPST)			4								
3. No. of Levels											
1, 2, 3, 4				1..4							
4. Float MOC x Size (mm)											
PP x Ø25 (SS Guide Tube with CS/SS Pr. Conn)					B						
SS316 x Ø25					J						
SS316 x Ø28					C						
SS316 x Ø 40					D						
SS316 x Ø42					H						
PP x Ø50					E						
SS316 x Ø60					F						
PVDF X Ø63					V						
Others					0						
5. Process Connection MOC											
CS						M					
SS304						N					
SS316						S					
SS316L						L					
PVDF						V					
PP cladding on CS (with Ø50 PP Float)						P					
Others						O					

6. Process Connection Size & Type				
52 Sq. 54 PCD, 4H x 4 mm Dia, 10 mm Th Flange	A			
1" NB ASME 150 # Flange	B			
1-1/2" NB ASME 150# Flange	C			
2" NB ASME 150 # Flange	D			
2-1/2" NB ASME 150 # Flange	E			
3" NB ASME 150 # Flange	F			
2" Triclover Ferrule	H			
3" Triclover Ferrule	I			
1" BSP (M) Screwed	J			
1-1/2" BSP (M) Screwed	K			
2" BSP (M) Screwed	L			
Others	O			
7. No. of Floats				
1,2,3,4		1..4		
8. Accessories				
Without			W	
External Chamber (Refer ECT Catalog)			C	
Counter Flange with Nuts, Bolts & Gasket			F	
Perforated Stillwell			S	
Others			O	
9. Level Controller				
Without				W
With Remote controller				P
With Integral controller				I

ORDERING INFORMATION

Model No x Liquid & its SG x Operating Temperature & Pressure, Number & Positioning Of Preset Levels and Desired Switching Function at Every Preset Level

Techtrol Level Controller for FGS

'FGS Level Controller' is provided separately for remote level indication & control. It amplifies the power ratings of reed switches to 5A @250VAC through its relay outputs. Integral level controller is also provided on switch head.

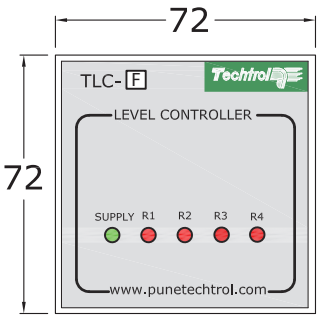
SPECIFICATIONS

Model	**TLC-F**	
	Remote	**Integral to Float Guided Switch**
Input	Potential free contacts of FGS	
Input Signal Voltage	24 VDC	
Power Supply	90 – 270 VAC or 24 VDC, ± 10 %	90-270 VAC or 24 VDC, ± 10 %
No. of set points x Relay output	2 nos. x SPDT; 4 nos. x SPDT; 2 nos. x DPDT (2 SPDT); 4 nos. x DPDT (2 SPDT) with two remote controllers. Potential free contacts rated for 5A, 250 VAC	
Relay Latching	Field settable through DIP switch between L1 & L2, L3 & L4	
LED Indications	Green- Supply, Red – Alarm (Relay On status)	
Delay Time	2 sec	
Power	< 3 VA (90-270 VAC); 8 VA (24 VDC)	
Terminals	Suitable for 1.5 mm^2 conductor size	
Enclosure x Conduit Connection	1. ABS Panel Mounted WP IP41 (Size: 72 x 72 x 130 D mm) 2. Cast Al. Wall Mounted, Powder Coated, WP IP66 x PG11 Cable Gland, Nylon (Size: 147 x 132 x 80 H mm) 3. Cast Al. Wall Mounted, Powder Coated. Ex d Gr. IIB, T6, IP66 x ½"NPT DC Cable Gland, Brass(Size: 150 x 150 x 122 H mm)	1. Cast Al. Powder Coated, WP IP66 x PG11 Cable Gland, Nylon (Size: 147 x 132 x 80 H mm)
Ambient Temp	0 to 55 °C	
Humidity	90 % Rh (Non condensing)	
CE Certification	For Panel Mounted	

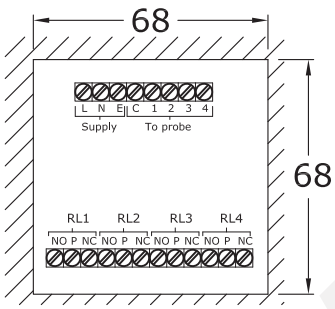
Note : Control panels with customized logic for pump/ solenoid valve auto/manual operation and hooter with reset function are available on demand.

DIMENSIONS AND MOUNTING DETAILS

Panel Mounted

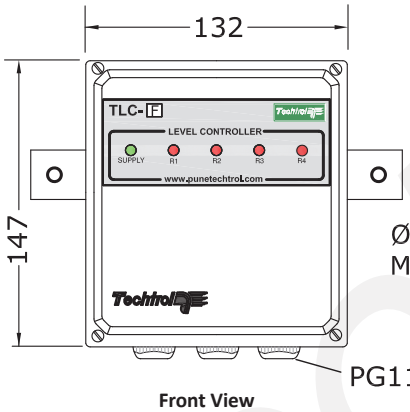


Front View

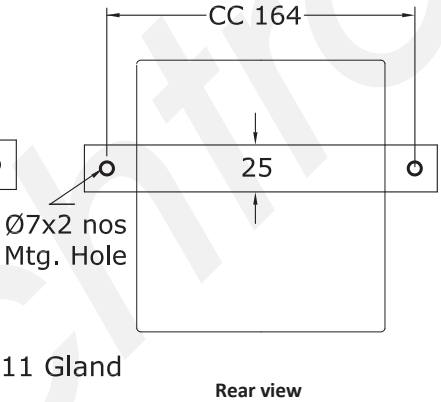


Rear view (cutout)

Wall Mounted (WP IP66)

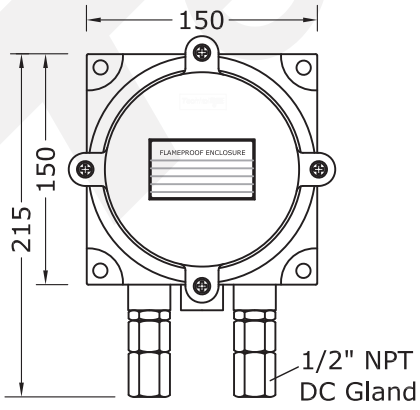


Front View

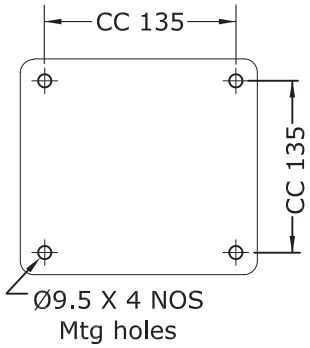


Rear view

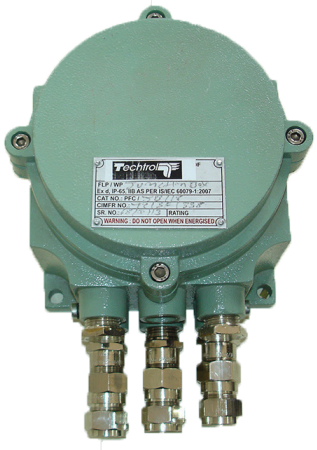
Wall Mounted (Exd Gr. IIB)



Front View



Rear view



MODEL IDENTIFICATION

TLC-					
For Float Guided Switch - FGS	F				
1. Enclosure x Conduit Connection					
ABS Panel Mounted IP41		P			
Cast Al. IP66 x PG 11 Cable Gland		J			
Cast Al. Exd Gr. IIB T6, IP66 x 1/2" NPT DC Cable Gland		E			
Integral (as specified in FGS model)		I			
Others		O			
2. Power Supply					
90 to 270 VAC			1		
24 VDC			2		
3. No. of Set Point x Relay Output					
Two x SPDT				2	
Four x SPDT				4	
Two x DPDT				6	
Four x DPDT (with 2 control units; remote controller option only)				8	
Others				O	
4. Relay Latching					
No					N
Yes					Y

*All dimensions in mm except specified