



## INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

### MARINE GAUGE WITH TUBULAR SIGHT GLASS

#### GENERAL DESCRIPTION

The Seetru Marine Gauge consists of a transparent sight tube fixed to the outside of a tank and isolated from it by Seetru push-button self closing valve(s). Valves control the flow of liquid to the sight tube when they are depressed (the correct level is shown only when both valves are opened).

The sight tubes (1) (2) are protected against breakage by the guard tubes (7) (8), the guard tube completely surrounds the sight tube, apart from the windows through which the liquid level can be seen.

Anti-rattle rings (9) are fitted over the sight tubes and fit the inside diameter of the guard tubes. The maximum length of glass sight tube is 1 metre, therefore longer gauges will have two or more sight tubes and guard tubes joined together with intermediate support brackets which will be equally spaced between the two valves.

Gauge collars are fitted to top and bottom ends of the sight tube. The sight tubes are sealed into both collars and intermediate support brackets by 'O' rings (4 & 5), which are compressed by the P.T.F.E. bushes (3) when the gland nuts (6) are tightened.

The valve units (12) or blind nipple assembly (13) slide into the collars (10) with 'O' rings (11) in the groove either side of the collar units (10). Valve / blind units (12) (13) screw into the tank boss (17) and are sealed in the tank boss bore by 'O' ring (18).

SEE RELATED INFORMATION ON:

- **SEETRU MARINE GAUGE HYDRAULIC ACTUATION.**
- **SEETRU MARINE GAUGES WITH UNION CONNECTIONS.**
- **SEETRU SEEFLEX MARINE GAUGE WITH FLAT GLASS TO 'SOLAS' REQUIREMENTS.**



# INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

## MARINE GAUGE WITH TUBULAR SIGHT GLASS

### INSTALLATION INSTRUCTIONS

#### **READ ALL INSTALLATION INSTRUCTIONS BEFORE COMMENCING WORK**

#### **IMPORTANT NOTES**

Due consideration should be taken of climatic, process or other conditions which might affect the performance of the gauge. Installation must be undertaken by qualified technicians to good engineering practice. If fitted in marine applications, ensure no classification rules are contravened. In addition, user's attention is drawn to our joint responsibility to ensure that the Health and Safety at Work Act (or other relevant safety standard) are not contravened by incorrect installation, commissioning or servicing.

Gauges should be stored preferably between 5°C and 25°C and a relative humidity of less than 75%. Very moist or very dry conditions should be avoided.

Before dismantling any pressurised components, the system must be effectively isolated from all sources of pressure and completely vented to atmosphere.

Any discharge of the tank content should terminate in a location which will not cause a hazard, particular attention being given to hazardous fluids or particales.

The Tubular Marine Gauge is designed to be securely fitted to the side of a tank. Before the gauge is mounted on the tank, the glass tube is fragile, therefore the gauge should be handled with care. Do not pick the gauge up from one end, when lifting support the gauge along its entire length. If working on a bench the gauge must be rigidly supported.

Any condition that could prevent free movement of the push button valves should be avoided.

#### **TANK PREPARATION**

Choose a position on the tank which is flat and unobstructed vertically to mount the gauge.

Mark out two holes on the tank wall at the same centre distance as the gauge centres, these holes will locate the tank bosses for the gauge and so must be positioned vertically.

The bottom hole must be above any known or suspected sludge levels.

Drill a 42 mm diameter hole at each marked position.

Remove the Tank Bosses (17) from isolation valves (12) / blind nipple assembly (13).

Insert the bosses into the hole in the tank up to the shoulder and weld into position.

Ensure that weld spatter does not enter boss bores.

All welding must be to the satisfaction of the classification surveyor.



## INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

### MARINE GAUGE WITH TUBULAR SIGHT GLASS

#### INSTALLATION INSTRUCTIONS CONTINUED

#### **READ ALL INSTALLATION INSTRUCTIONS BEFORE COMMENCING WORK**

#### **GAUGE**

Remove retaining nuts (20 or 30) and 'O' rings (11) from isolating valves (12) / blind nipple assembly (13).

Screw the isolating valves / blind nipple assembly into tank bosses after first checking that the bosses are cold.

If the gauge is fitted with intermediate supports, these require packing plates to be welded to the tank.

Support the gauge vertically, slide the gauge collars over the isolation valves / blind nipple now protruding from the tank, tack weld the packing pads (16) to the tank remove screws (15) which retain gauge to packing pad, and remove gauge from tank.

Complete the welding of the packing pad to the tank.

Fit inner collar 'O' ring, support gauge vertically, slide collars over the valves / blind nipple, make sure inner 'O' ring fits into groove in collars, fit outer 'O' rings into groove in collars, screw on retaining nuts and tighten.

If gauges have intermediate support brackets fitted, fit these to pads previously welded to tank with screws provided.

The gauge assembly can be adjusted by +/- 2.0 mm on nominal centre distance. To carry out this adjustment when necessary, slacken gland nuts (6) slide collars on sight tube to obtain correct distance retighten gland nuts.

#### **IMPORTANT**

Centre distance must not exceed nominal distance by more than + 2.0 mm.

Check for leaks.



# INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

## MARINE GAUGE WITH TUBULAR SIGHT GLASS

### OPERATING INSTRUCTIONS TO READ LEVEL IN TANK

1. Depress top valve if fitted and hold open.
2. Depress bottom valve and hold open.  
The level inside the tank should now register in the sight tube.
3. When liquid finds its own level in the gauge release valves to seal off gauge from tank.

It should be noted that on gauges fitted with valves in top and bottom connections, the tank level shown may be incorrect if the bottom valve alone is operated. This is due to the trapping of air between the liquid and the upper valve. This will not occur in gauges fitted with a blind nipple assembly in the upper connection, as with this connection the top of the sight tube is always open to the tank.

Long gauges with valves top and bottom are usually fitted with hydraulic actuation so that both valves are operated simultaneously from a single point.

Note:- Once a reading is taken, the level shown in the sight tube will remain the same until the Valves are opened again. When new reading is required operations above to be repeated.

If the sight tube is broken its contents will be lost, but the tank will remain sealed, by design the volume of liquid in the sight tube ( 0.1 litres/metre ) is isolated from the tank and remains so unless a reading is actually being taken.

### OPERATING FAULTS

Faults	Probable Cause	Rectification	Maintenance Paragraph
Gauge not filling	Empty tank Obstruction in gauge Obstruction in valve body	Fill Clear Clear	B E
Filling to incorrect level	Incorrect use of gauge	See operation instruction	
Broken sight tube	Misuse Misalignment	Replace Replace - check tank face flat	B
Valves not sealing	'O' ring damage Broken spring	Replace Replace	E
<u>Leaks From:-</u>			
Collar seal	Loose nut 'O' ring damaged	Tighten Replace	A A
Sight tube gland	Loose nut 'O' ring damaged	Tighten Replace	B B
Tank boss	'O' ring damaged	Replace	D
Push rod	'O' ring damaged	Replace	C



## INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

### MARINE GAUGE WITH TUBULAR SIGHT GLASS

#### MAINTENANCE

NOTE: When carrying out any of the following operations A to B, the contents of the gauge sight tube, will be released but the tank contents will be held by the gauge valves.

#### **(A) To remove gauge from tank**

Remove screws (15) when fitted.  
Remove gauge retaining nuts (20) or (20 & 30).  
Remove gauge from tank complete with 'O' rings (11).  
Check and replace seals (11).  
Re-assemble in reverse order.

#### **(B) To remove or replace gauge sight tube (1 or 2)**

Remove gauge from tank, as section 'A' above.  
Unscrew top gland nut (6) from top gauge collar (10).  
Remove top gauge collar (10).  
Remove guard tube (8).  
Unscrew lower gland nut (6) in (top section) from intermediate support bracket (31).  
Remove top section sight tube (1) complete with gland nuts (6) 'O' rings (4) and (5) and P.T.F.E. bushes (3) together with anti-rattle rings (9) from intermediate support (31).  
Unscrew top gland nut (6) on lower sight tube from intermediate support, remove intermediate support bracket.  
Remove guard tube (7).  
Unscrew lower gland nut (6) from lower collar (10), remove lower sight tube (2) complete with gland nuts (6) 'O' rings (4) and (5) and P.T.F.E. bushes (3) together with anti-rattle rings (9) from lower collar.  
Clean or replace sight tube, inspect all seals and replace if required.  
Internal passages of collars and intermediate support bracket should be cleared of any obstruction.  
Re-assemble in reverse order, push anti-rattle rings (9) behind bridges in the windows of the guard tubes.

**Instructions B above refer to gauge with two sight tubes. For single sight tube ignore reference to intermediate support bracket. If more than two sight tubes repeat for each bracket.**



## MARINE GAUGE WITH TUBULAR SIGHT GLASS

### MAINTENANCE CONTINUED

NOTE: When carrying out operations C to E, the tank must be drained below level of connection

#### **(C) To replace push rod 'O' ring (24)**

Drain tank to below level of connection.

Remove gauge retaining nuts (20).

Remove retaining clip (26).

Remove push rod (21).

Inspect or replace 'O' ring (24).

Check for obstructions.

Re-assemble in reverse order.

#### **(D) To inspect or replace tank boss 'O' ring (18)**

Drain tank to below level of connection.

Remove gauge from tank, as section 'A'.

Unscrew and remove valve unit (12) or (13) from tank boss (17).

Inspect 'O' ring (18) replace if necessary.

Check bore in tank boss is smooth and clean.

Re-assemble in reverse order.

#### **(E) To inspect or replace main shut-off valves seal (25) or spring (23)**

Drain tank to below level of connection.

Remove gauge from tank, as section 'A'.

Unscrew and remove valve unit (12) from tank boss (17).

Remove circlip (27) from rear of unit.

Remove washer (28).

Remove spring (23).

Remove plunger (22).

Inspect or replace 'O' ring (25).

Check internal passage of body (19) to be free of obstructions.

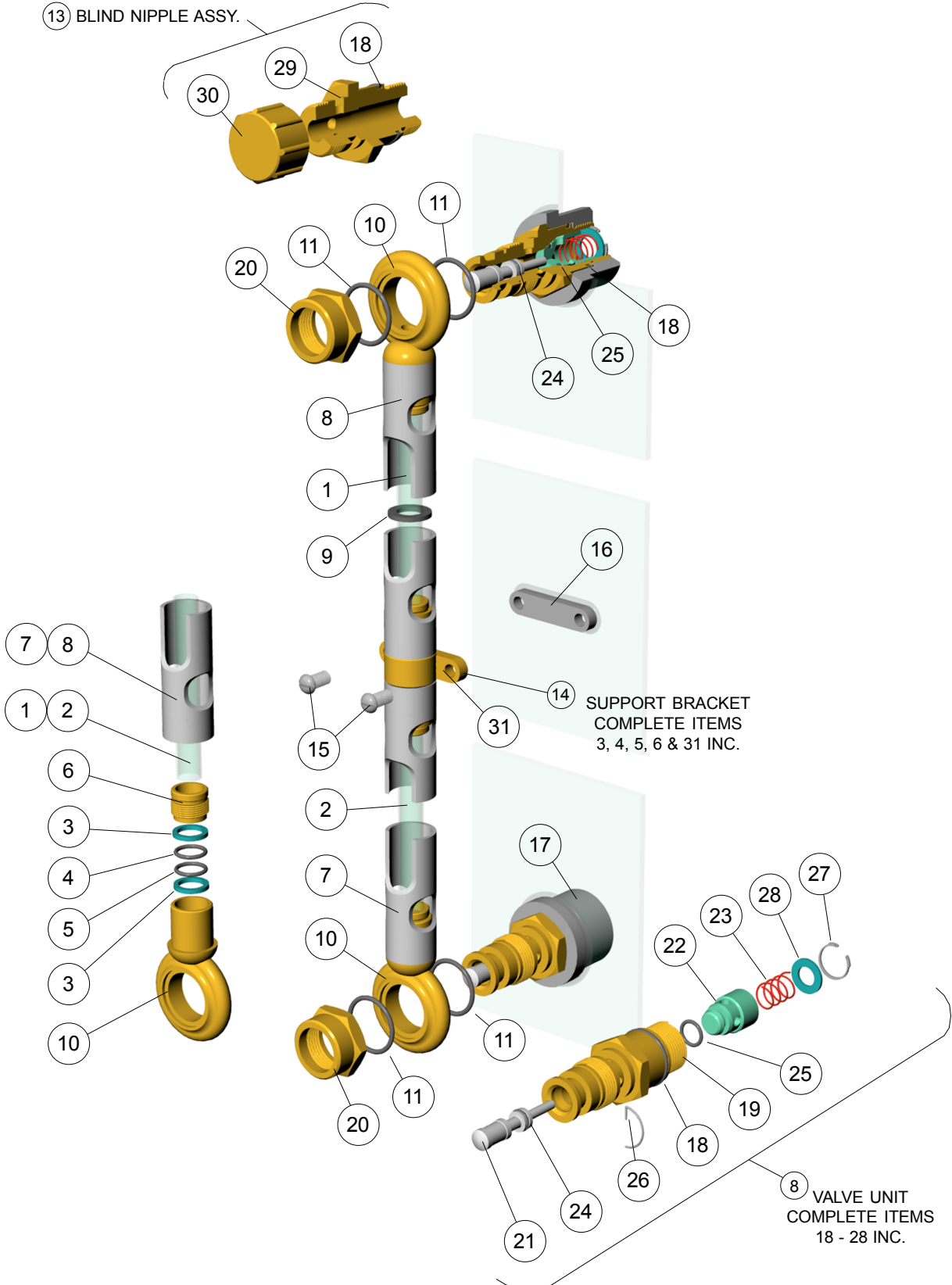
Inspect and wipe clean bore and valve seating.

Check bore in tank boss (17) to be smooth and clean.

Inspect 'O' ring (18) replace if necessary.

Re-assemble in reverse order.

## MARINE GAUGE WITH TUBULAR SIGHT GLASS





## INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

### MARINE GAUGE WITH TUBULAR SIGHT GLASS

#### SEETRU MARINE GAUGE PARTS LIST

Item No.	Description	Item No.	Description
1	Sight tube - top.	15	Intermediate support bracket screws.
	Sight tube - intermediate.	16	Intermediate support packing pad.
2	Sight tube - bottom.	17	Tank boss.
3	Bush.	18	Tank boss 'O' ring.
4	'O' ring.	19	Push button valve body.
5	'O' ring.	20	Retaining nut.
6	Gland nut.	21	Push rod.
7	Guard tube - bottom.	22	Shut off valve plunger.
	Guard tube - intermediate.	23	Shut off valve spring.
8	Guard tube - top.	24	Push rod 'O' ring.
9	Anti-rattle ring.	25	Plunger 'O' ring.
10	Gauge collar.	26	Retaining clip.
11	Collar seal.	27	Circlip.
12	<b>VALVE UNIT COMPLETE .</b>	28	Washer.
13	<b>BLIND NIPPLE ASSEMBLY .</b>	29	Blind nipple body.
14	<b>INTERMEDIATE SUPPORT BRACKET ASSEMBLY.</b>	30	Blind retaining nut.
		31	Support Bracket.

#### Spares Kits Available For Above

**Note:** 'O' rings can be made in Nitrile, Viton, Ethylene Propylene or Neoprene, depending on required duty.

For spares please specify sealing material required when order is placed.

Specify material and length when ordering sight tube or guard tube.

Specify gauge type and material of construction, bronze or stainless steel when ordering other spares.



**MARINE GAUGE WITH TUBULAR SIGHT GLASS**

**INSTALLATION DIMENSIONS**

