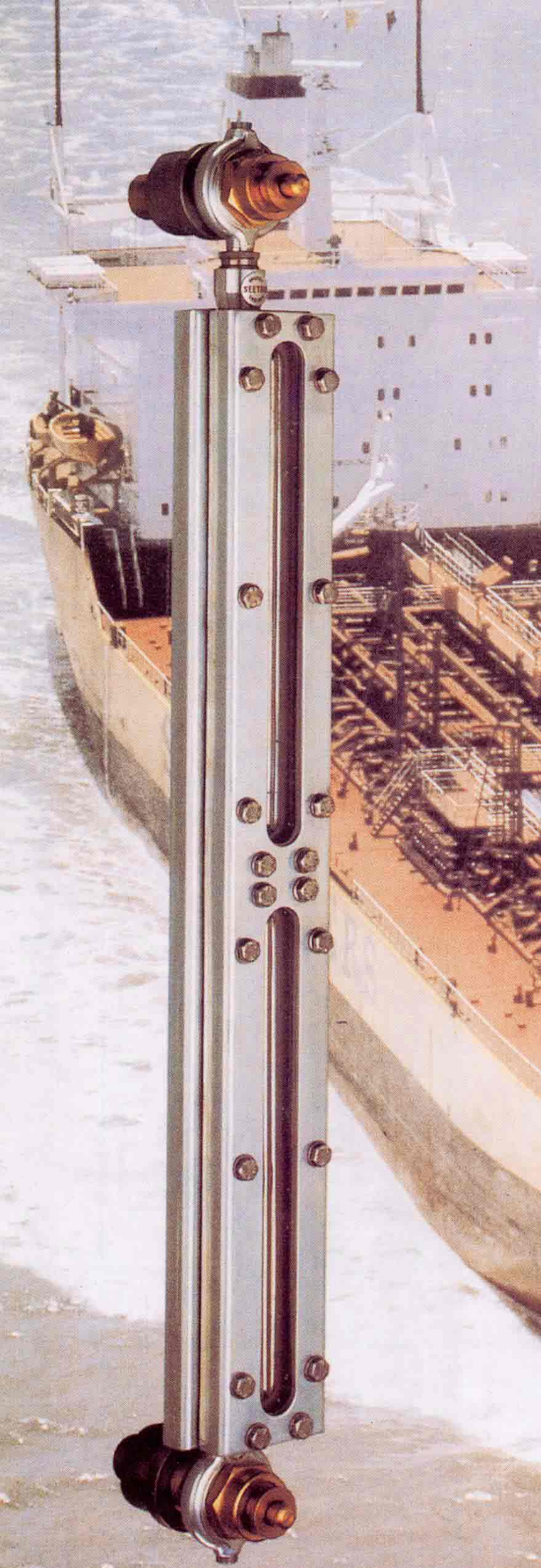
Liquid Level Gauges

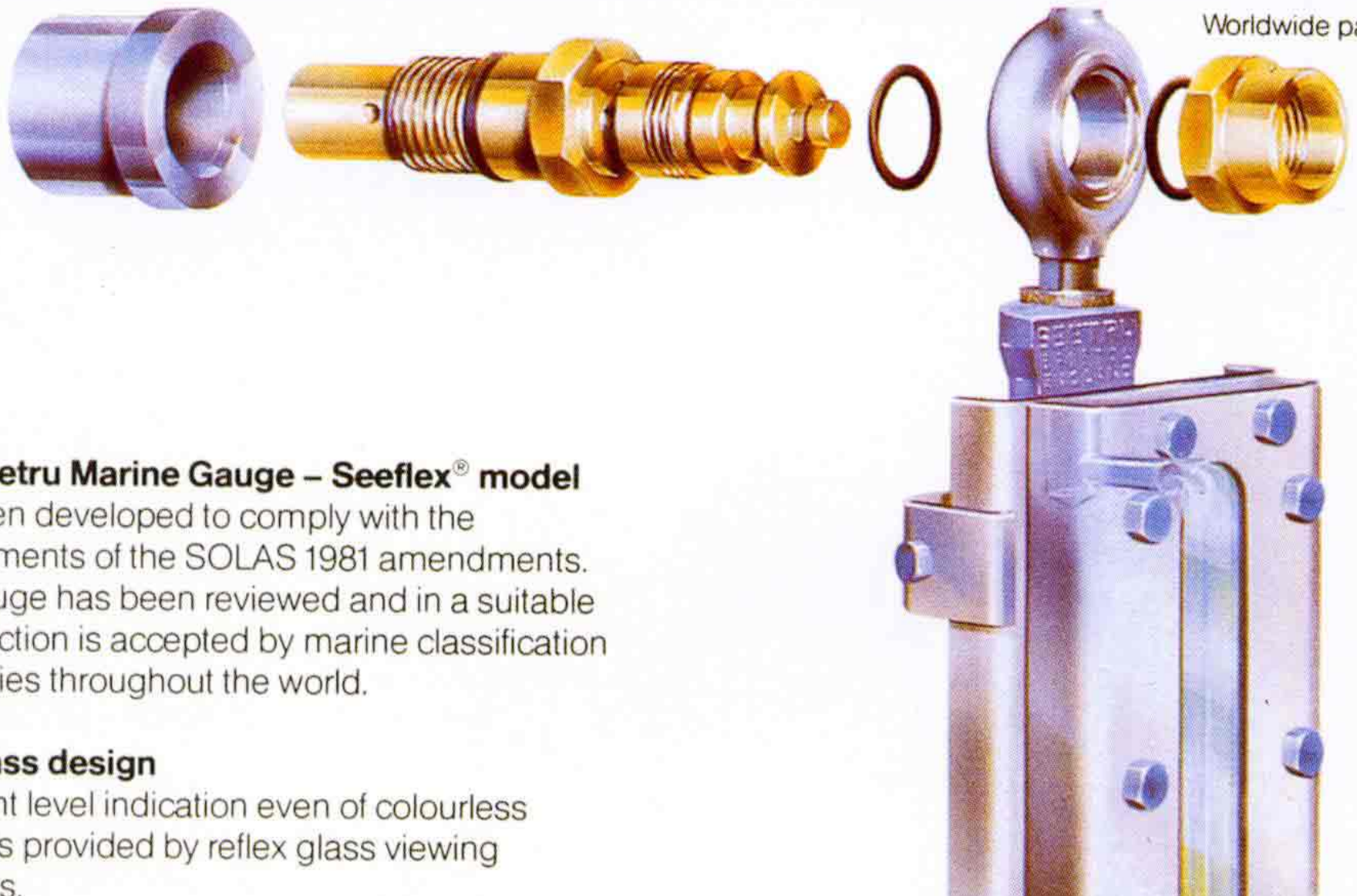
Seetru Marine Gauge
Seeflex® model
with flat glass



SEETRU

for flammable tank contents in cargo ships

SEE®



Worldwide patents pending.

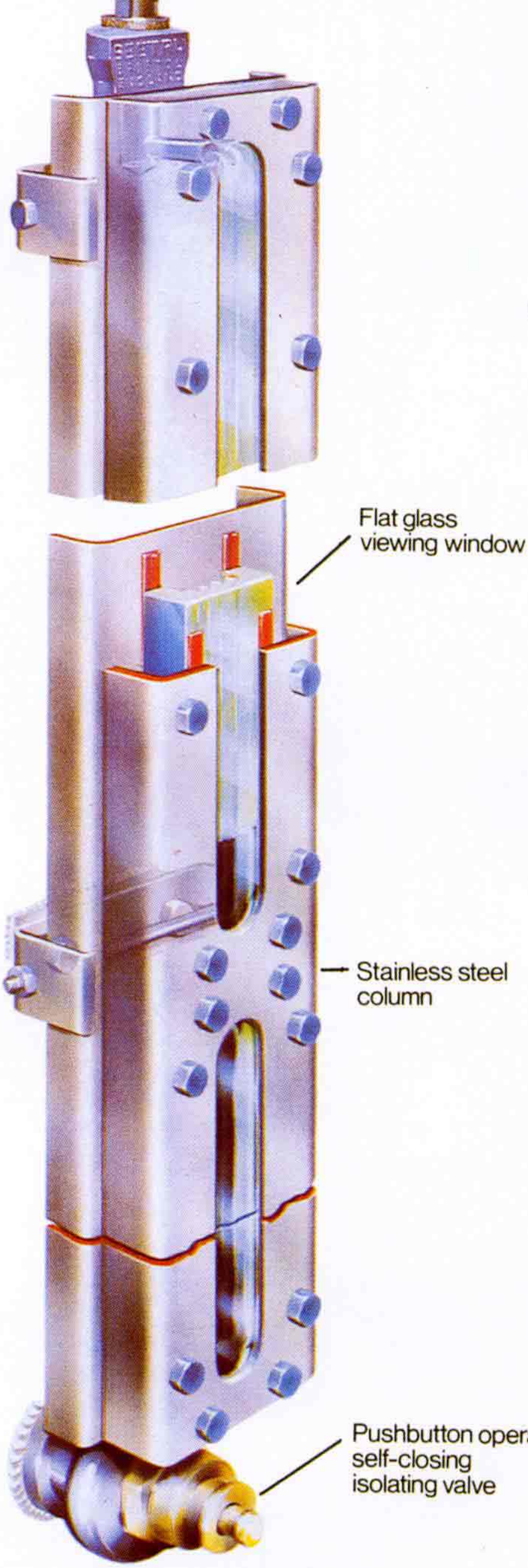
The Seetru Marine Gauge – Seeflex® model has been developed to comply with the requirements of the SOLAS 1981 amendments. The gauge has been reviewed and in a suitable construction is accepted by marine classification authorities throughout the world.

Flat glass design
Excellent level indication even of colourless liquids is provided by reflex glass viewing windows.
The toughened borosilicate glass window is housed and protected in a robust stainless steel column.
The construction provides a modern gauge which fits close to the tank wall and is aesthetically pleasing.

Self Closing Isolating Valves
Seetru pushbutton operated, self-closing isolating valves have been used on marine installations for many years. The Seeflex® gauge incorporates this well-proven design, which provides full safety in preventing liquid loss from the tank. The tank will remain sealed by the self-closing valve even if the gauge column is totally destroyed.
A tank boss is supplied with each isolating valve. The standard boss is suitable for welding to the tank, but bosses for non-weld installation are available.
Certain classification authorities require that the pushbutton valves are always fitted with the approved Seetru Hydraulic actuating system – Seetru will advise when this applies.

Easily maintained
When required, the liquid chambers can be cleaned with the gauge on the tank, alternatively the isolating valves will allow column removal without need to drain the tank.

Tank calibration
For precise measurement of the liquid content, a graduated scaleplate can be supplied. The scaleplate is attached to the column, providing a direct observation of the liquid level against the units of graduation.



liquid level gauge

meets SOLAS requirements

Tank connections
Information on the gauge connections accepted by individual Marine Classification Authorities is shown on the back cover of this leaflet.
The self-closing, pushbutton-operated valve is always fitted at the lower connection of the gauge. Subject to acceptance by the Marine Authority, a closed circuit or open circuit pattern may be selected for the gauge top connection.

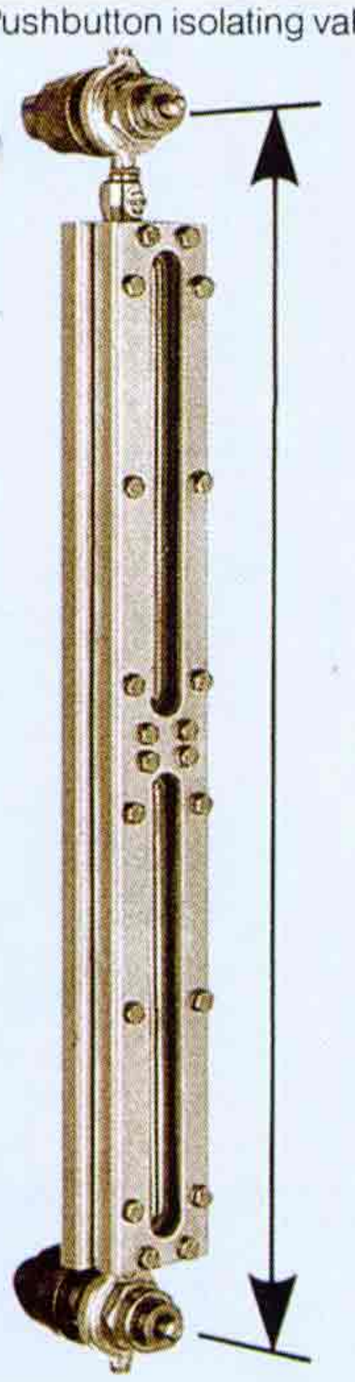
Standard manufactured lengths
Two sizes of viewing window are combined to provide a wide range of manufactured lengths. A standard manufactured length must be selected to suit each tank.

Refitting of ships to comply with SOLAS 1981 amendments
Seetru gauges with cylindrical glass sight tube can be replaced by the Seeflex® model fitting onto the existing tank bosses.
Where a Standard Manufactured Length is not suitable, an open circuit pattern gauge can be supplied complete with a plug to seal the existing top tank boss.

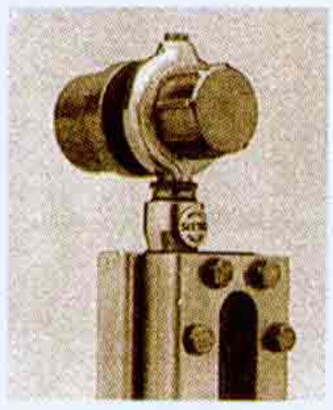
Closed circuit pattern
Direct connection from the top of the gauge to the tank can be made with a pushbutton operated self-closing valve or, alternatively, a valveless unit.
When two pushbutton-operated self-closing valves are fitted, it is essential that both valves are open to obtain the correct liquid level reading. An approved hydraulic actuating system is available to operate both valves from a single actuator.
NOTE: The valveless tank return unit must not be installed below the highest level of a flammable liquid.

Open circuit pattern
When it is possible for the gauge column to extend above the top of the tank, by a minimum of 160mm or maximum 250mm, a gauge requiring connection into the tank at the lower end only can be selected. The upper end of the gauge can be supplied with an automatic safety vent valve or, alternatively, a pipe union connection. The automatic safety vent valve will allow air to pass, but will seal against a liquid level. In the case of the pipe union connection design, a 10mm o/d steel vent pipe is returned to the tank or into the tank vent pipe.

Pushbutton isolating valves top and bottom.



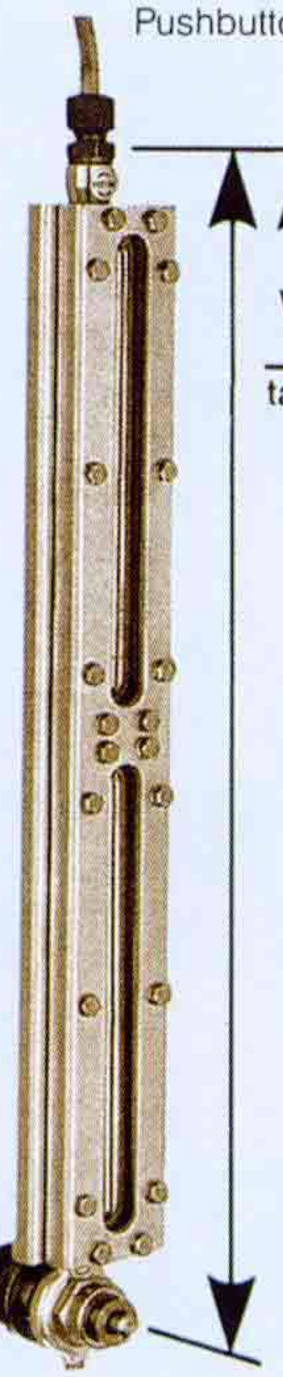
Standard Manufactured Lengths



Valveless tank return top.

CLOSED CIRCUIT DESIGN *(dimensions in millimetres)*
Length between centres of top and bottom valves.
(Adjustment of ± 5mm available)

360	1070	2040	3015	4000	
450	1160	2130	3105	4080	
620	1240	2220	3200	4170	Manufactured
710	1330	2305	3290	4260	Lengths
800	1420	2395	3370	4350	for
885	1515	2490	3460	4435	longer
975	1595	2580	3550	4525	column
	1685	2660	3640	4615	on request
	1780	2750	3725	4710	
	1870	2840	3815	4790	
	1950	2930	3910	4880	
				4970	
				5060	Max length 9m



s with flat glass

Hydraulic Actuation – one lever operates up to 4 isolating valves simultaneously.

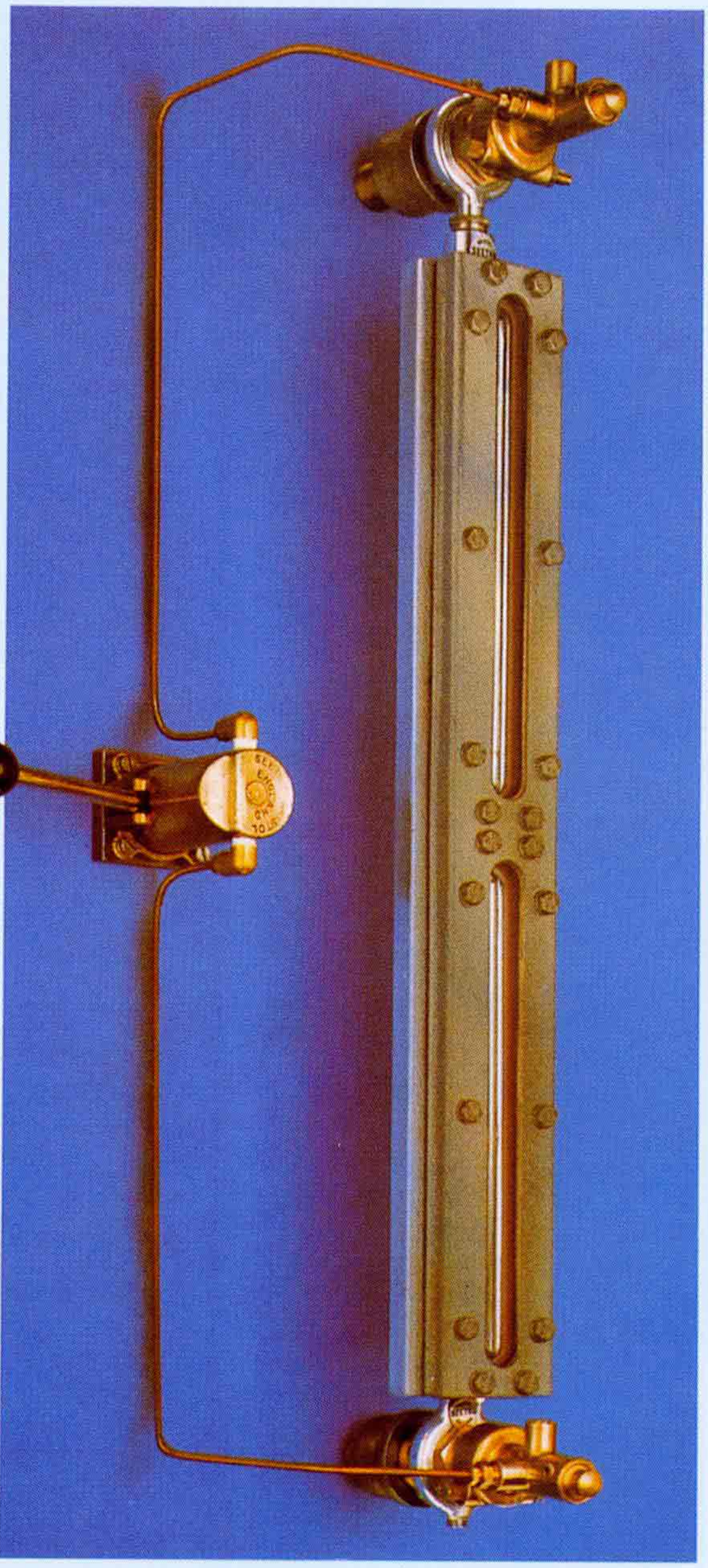
The Seetru Marine Gauge – Seeflex® model can be opened from a remote position by an operator using hydraulic actuation.
May be used when pushbutton valves are installed at the top and lower end of the gauge, as both must be open to obtain correct liquid level.
Certain classification societies require that the hydraulic actuation is always fitted to the isolating valves. Seetru will advise when this is applicable.

Seetru pushbutton isolating valves require no modification to convert them to hydraulic actuation. Hydraulic heads are attached to the valve units by cotter-pins, providing instant installation or dismantling.
Direct operation of the pushbutton valve is still possible when an hydraulic head is fitted.

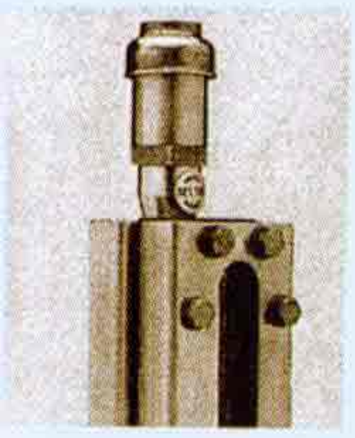
The hand pump can be placed in any convenient position and connected to the hydraulic head on the isolating valves by 1/8 inch diameter half hard copper tube.

Thermal expansion of the oil caused by normal increases in temperatures are accommodated in the pump unit. A fusible plug protects the system in the event of excessive temperature.

Number of isolating valves operated by single hand pump	Total allowable length of piping
1	60 metres
2	30 metres
3	20 metres
4	15 metres



valve bottom and pipe union connection top.



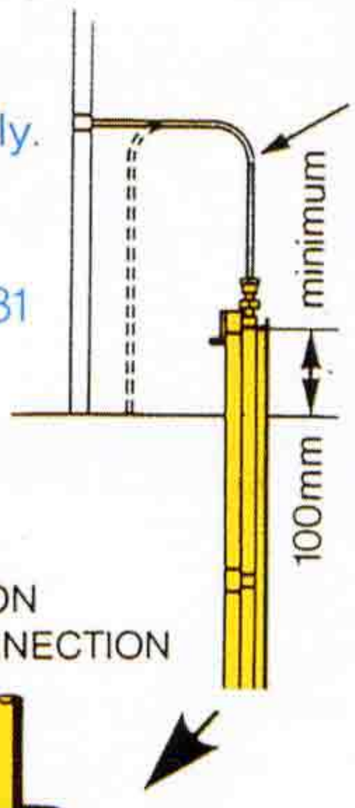
Automatic safety vent valve top.

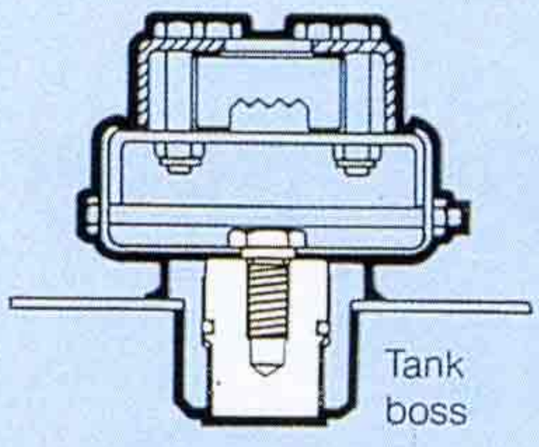
OPEN CIRCUIT DESIGN *(dimensions in millimetres)*
Overall gauge column length.
Add 60mm for total height when automatic safety vent valve is fitted.

315	1025	2000	3065	4040	
405	1115	2090	3155	4130	
580	1200	2180	3245	4220	Manufactured
670	1290	2265	3330	4310	Lengths
760	1380	2355	3420	4395	for
845	1470	2445	3510	4485	longer
935	1555	2535	3600	4575	column
	1645	2620	3685	4665	on request
	1735	2710	3775	4750	
	1825	2800	3865	4840	
	1910	2890	3955	4930	
		2975		5020	

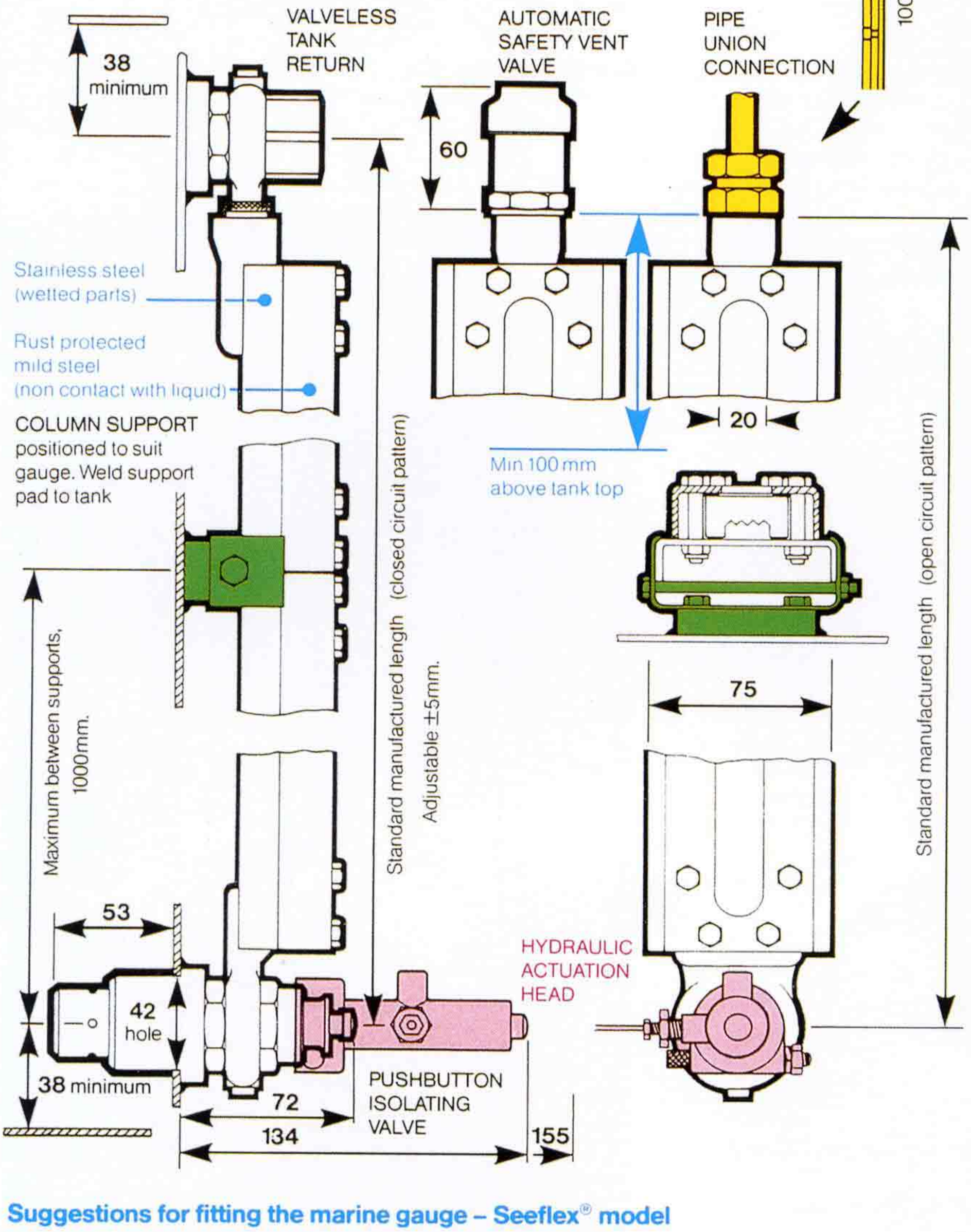
Installation dimensions

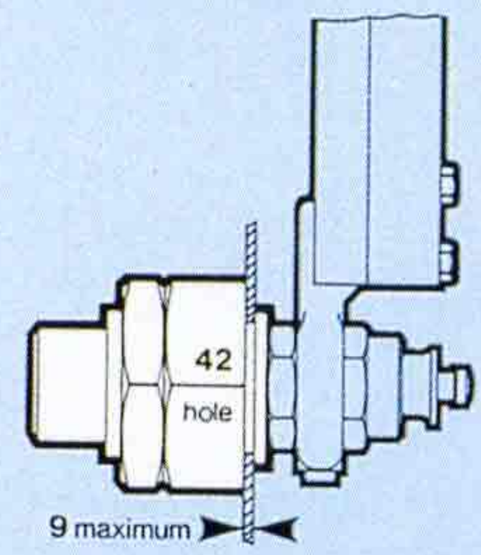
Maximum operating pressure 2.67 barg Normal supply 2 barg only.
Maximum liquid temperature 80 C
Construction Materials
Viewing window: Toughened borosilicate reflex glass, DIN 7080/7081
Column: Stainless steel Rust protected mild steel
Isolating valves: Bronze with nitrile seals
(Stainless steel and viton seals are available)



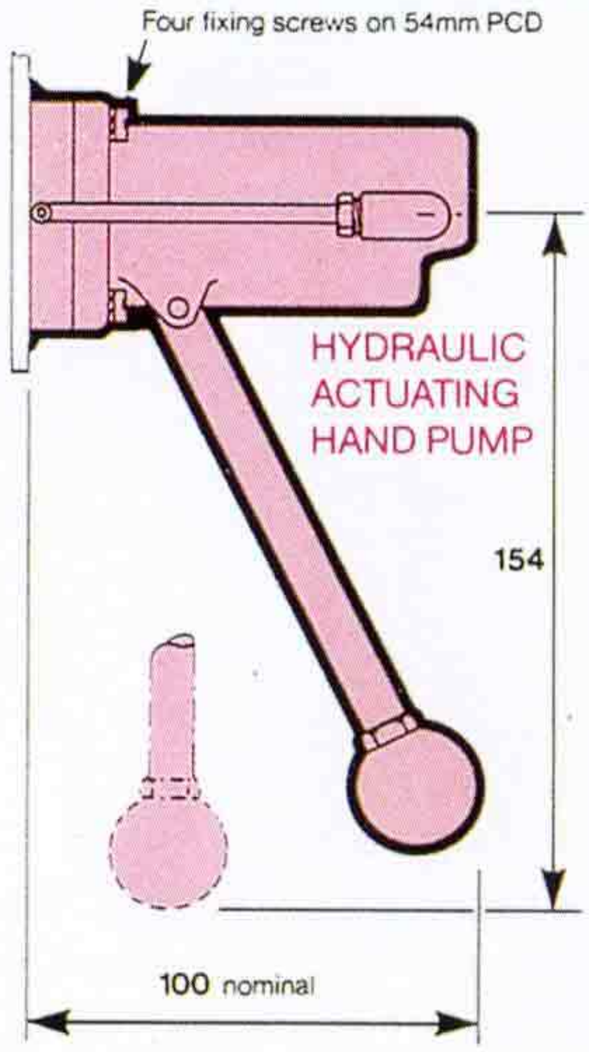


COLUMN SUPPORT
with tank boss plug,
for refitting of ships' tanks.





Alternative tank boss secured to tank by sealed retaining nut. Requires no welding.



Suggestions for fitting the marine gauge – Seeflex® model

The gauge is supplied complete with tank bosses either for welding in position of fitting by means of special sealed internal nuts without welding. Both require 42mm diameter holes.

Where welded type bosses are used –

1 Assemble gauge complete with tank bosses.
2 Position assembly on to tank and tack weld the bosses.
3 Tack weld column support pad(s) to tank.
4 Remove gauge assembly leaving tank bosses and column support(s) in position.
5 Protect inside of tank boss with graphite grease.
6 Weld tank boss and pads.

NOTE: On mild steel tanks use Electrode Arosta 316L-150 or equivalent welding rod.

7 Remove protective grease and reassemble gauge to tank.

Length adjustment on closed circuit gauges

1 Slacken gland nut at the top of column.
2 Move top connection for adjustment ±5mm.
3 Re-tighten gland nut.

Marine Authorities that have reviewed and advised product acceptance for cargo ships' tanks containing lubricating or other flammable oils (subject to installation to the ships surveyors' satisfaction).

Lower Connection	CLOSED CIRCUIT Pushbutton		Pushbutton		OPEN CIRCUIT Pushbutton		Pushbutton	
Upper Connection	Pushbutton		Valveless [1]		Pipe union		Auto safety vent	
Hydraulic Actuation	Fitted	None	Fitted	None	Fitted	None	Fitted	None
Lloyd's Register of Shipping *(UK)*	✓	✓	✓	✓	✓	✓	✓	✓
Department of Transport *(UK)*	✓ [2]	✓ [2]	X	X	X	X	X	X
Department of Transport *(Hong Kong)*	✓ [2]	✓ [2]	X	X	X	X	X	X
Germanischer Lloyd *(W Germany)*	✓	✓	✓	✓	✓	✓	✓	✓
RINA *(Italy)*	✓	✓	X	X	✓	✓	✓	✓
American Bureau of Shipping *(USA)*	✓	✓	X	X	X	X	✓	✓
US Coastguard *(USA)*	☆	☆	X	X	X	X	☆	☆
Bureau Veritas *(France)*	✓	✓	✓	✓	✓	✓	✓	✓
Det Norske Veritas *(Norway)*	✓	✓	✓	✓	✓	✓	✓	✓
Direktoratet for Statens Skibstilsyn *(Denmark)*	✓	X	X	X	✓	✓	X	X
Siglingamalastofnun Rikisins *(Iceland)*	✓	✓	✓	✓	✓	✓	✓	✓
Ministerie Van Verkeer Waterstaat *(Holland)* (NSI)	✓	✓	✓	✓	✓	✓	✓	✓
Canadian Coastguard *(Canada)*	✓	✓	X	X	✓	✓	✓	✓
NKK *(Japan)*	✓	✓	✓	✓	✓	✓	✓	✓
Register of Shipping *(Russia)*	✓	✓	✓	✓	✓	✓	✓	✓

✓ Approved X Not acceptable ☆ Accepted and supplied on a ship by ship basis.

NOTES

[1] The valveless tank return must be installed above the highest possible level of a flammable liquid.

[2] Department of Transport-approved for lubricating and other flammable oils, except fuel oil. Fitting of Hydraulic Actuation is optional on small tanks requiring gauge up to, and including, 1330mm centres.

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