

Technical Information

Float Gauge LT5

Mechanical Tank Gauge for Accurate and Reliable Level Measurement



Application

LT5 float gauges have been developed for use in all areas of industry. Many years of operation of LT11/12/14/16 in a wide variety of applications has proven their reliability.

Typical applications include:

- Gauging containment levels in petroleum products such as crude oil; kerosene; light and heavy oil, vegetable oil, palm oil, seed oil and animal oil
- Highly viscous fluid such as liquid asphalt
- Certain chemicals (corrosive/toxic vapor can be sealed using a liquid seal pot)
- Liquid gases contained in spherical tanks

Benefits

- No electrical power is required to perform the measurements.
- Built-in repeatability check
- Direct tank side readings allows tank contents to be checked quickly and easily.
- Installation is possible on a wide variety of tanks, including fixed roof, floating roof, covered floating roof and spherical.
- Can be used in conjunction with analogue/digital transmitters to perform tank inventory management.





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Important Document Information

Notes on Safety Conventions and Symbols

Symbols for Safety Conventions

Symbol	Meaning
 <small>A0011189-EN</small>	DANGER! This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
 <small>A0011190-EN</small>	WARNING! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
 <small>A0011191-EN</small>	CAUTION! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
 <small>A0011192-EN</small>	NOTICE! This symbol contains information on procedures and other facts which do not result in personal injury.

Symbols for Certain Types of Information

Symbol	Meaning
 <small>A0011182</small>	Allowed Indicates procedures, processes or actions that are allowed.
 <small>A0011183</small>	Recommendation Indicates procedures, processes or actions that are recommended.
 <small>A0011184</small>	Forbidden Indicates procedures, processes or actions that are forbidden.
 <small>A0011193</small>	Tip Indicates additional information.

Function and System Design

Measuring Principle

The float gauge consists of float, measuring tape and the gauge head. When the float is immersed, it is balanced by its own buoyancy and by tension on the measuring tape. The measuring tape is wound on a drum, located inside the tank gauge head and is given tension by a spring motor.

As changes in liquid level occur, variances in float buoyancy are detected as the spring motor adjusts the measuring tape to maintain float position on the liquid surface. The measuring tape, having a series of holes set at precise intervals, rides on a rotating sprocket, activating the display indicator.

The position of the measuring tape holes on the sprocket compensates for the tape weight and prevents it from slipping. To accommodate analogue or digital outputs, a transmitter can be coupled directly to the sprocket wheel and attached to the rear of the gauge head.

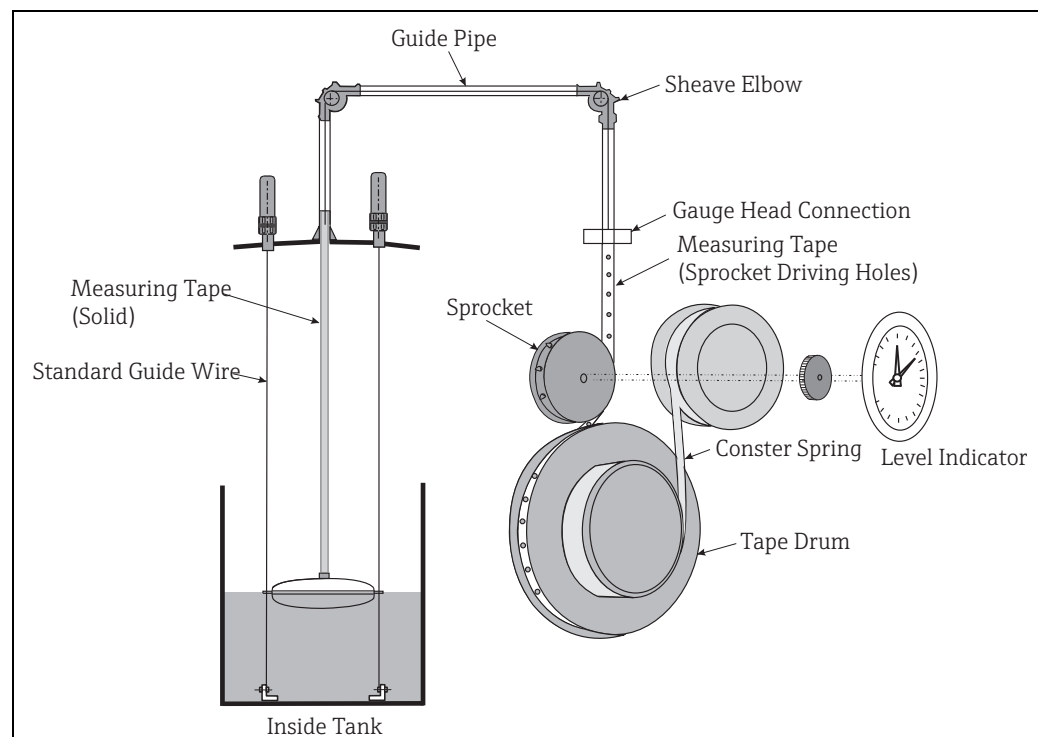


Figure 1: System Layout

Combine with Analog Transmitter

AT1

- 4 - 20mA current output
- Max. 6 points alarm signal output



Refer to AT1 technical information for details

Combine with Digital Transmitter

TMD1

- 2 wire bi-serial pulse (V1 protocol) output
- 4 - 20mA current output
- Max. 8 points alarm signal output



Refer to TMD1 technical information for details

Performance Characteristics

Measuring Ranges

Specifications	Measuring Range
LT5	0 to 2.5, 5, 10, 16, 20, 30m 0 to 60ft, 100ft

Accuracy

Specifications	Measuring Range
Ø400mm Float	±2mm (Under the condition of; specific gravity: 1g/cm ³ , measuring range; 10m)
Ø140mm Float	±30mm (Under the condition of; specific gravity: 1g/cm ³ , measuring range; 10m)

Maximum Operating Pressure

Specifications	Measuring Range
LT5-1	0...0.1961bar/0.01961MPa/2.84psi
LT5-4	0...0.9807bar/0.09807MPa/14.22psi
LT5-6	0...24.5bar/2.45MPa/355.25psi

NOTICE

Enabled pressure varies depending on the flange specifications.

Operating Temperature Limits

Specifications	Measuring Range
LT5-1	Wetted parts: -200 to +200°C Gauge head: -20 to +70°C
LT5-4/LT5-6	Wetted parts: -45 to +80°C Gauge head: -20 to +70°C

Operating Conditions: Installation

Cone Roof Tank (CRT)

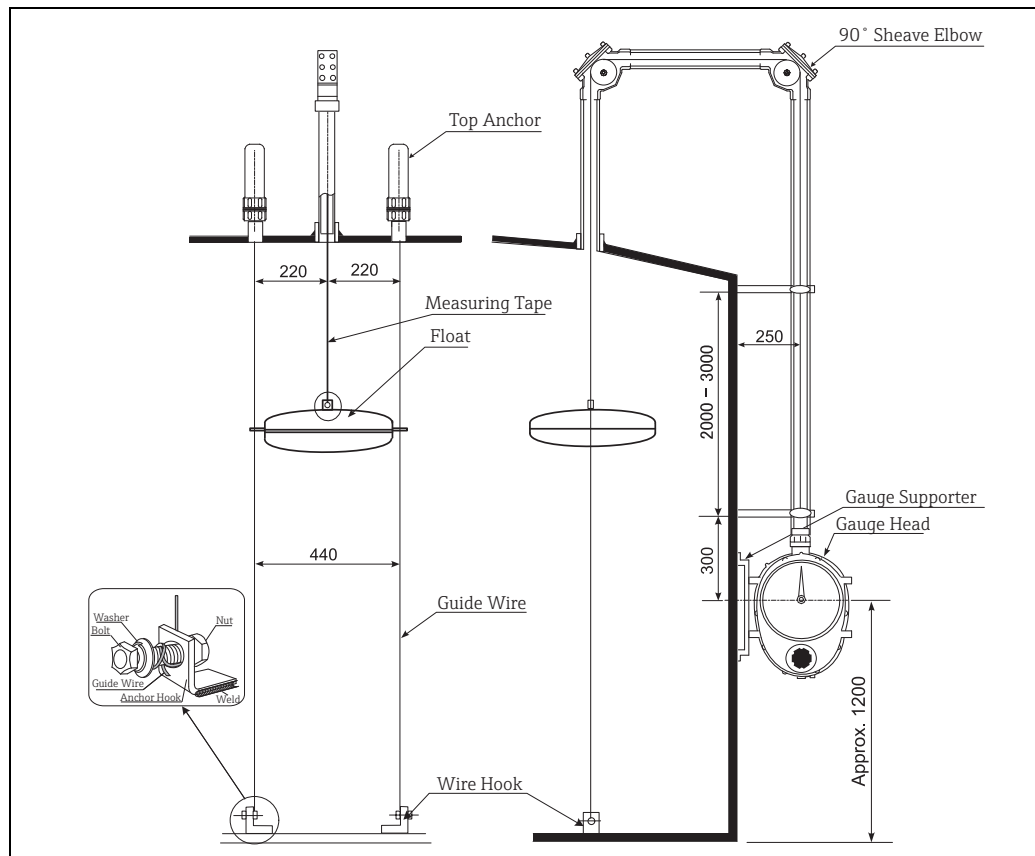


Figure 2: Coon Roof Tank (CRT)

Order Code (LT5-111A031B11A11120000+PA)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	1	0...0.1961bar/0.01961MPa/2.84psi, Alu (ADC12), Low pressure	1
030	Gauge Head Connection	11	Rc 1-1/2, union nut, SUS316, thread JIS B0203	
040	Display; Cover	A	Dial display; Acrylic	
050	Crank Unit	0	Not selected	
060	Measuring Range	3	10m	
070	Measuring Tape	1	Measuring tape, CRT	1
080	Float	B	D400mm SUS316 tape connection 5.0kg, density range $\geq 0.65... < 1.05$, rings	1
090	Top Anchor	11	2x R1, Alu (ADC6), thread JIS B0203	2
100	Guide Wire	A	Diameter 3mm solid wire	2
110	Bottom Anchor; Fixing Bolt	1	Iron; SUS316	2
120	90 Degree Sheave Elbow	112	2x Rp1-1/2, Alu (ADC6), thread JIS B0203	2
130	135 Degree Sheave Elbow	000	Not selected	0
140	Seal Pot	0	Not selected	0
150	Valve	0	Not selected	0
620	>>Accessory Enclosed	PA	Gauge supporter, Iron	1

**Tank Top Mount
(Underground Tank)**

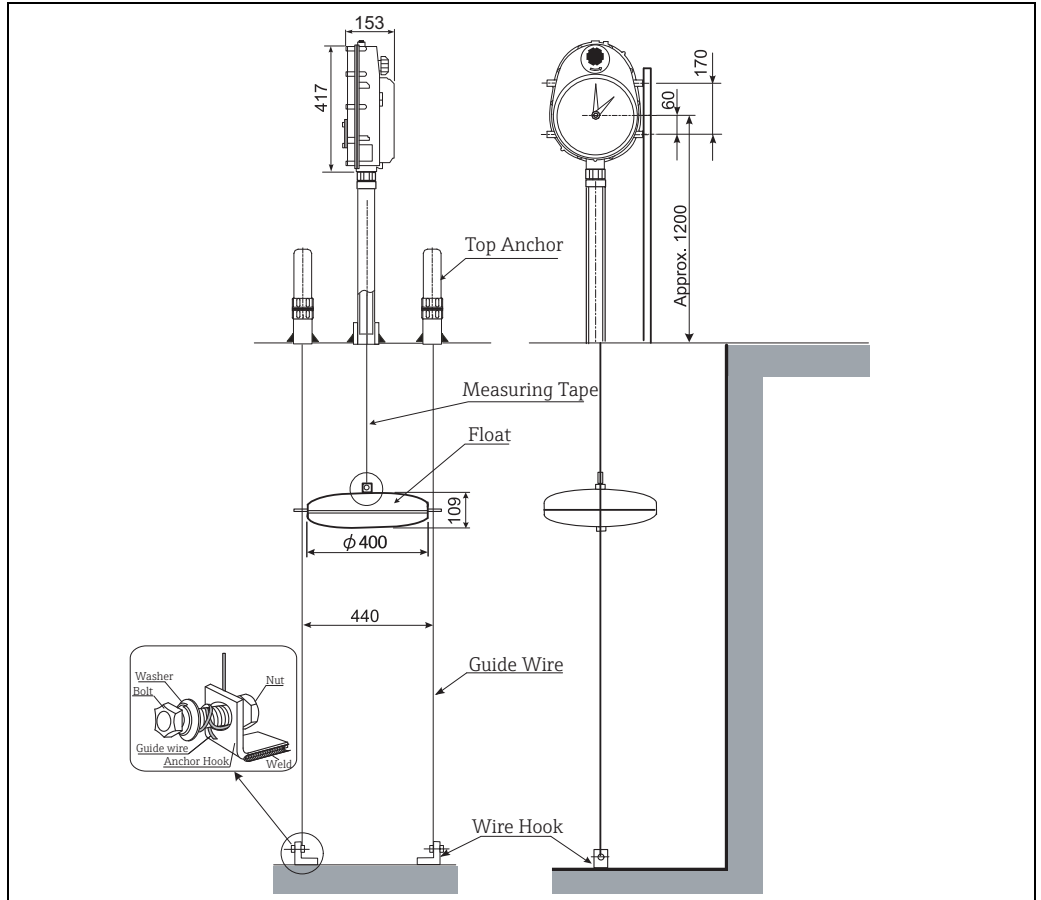


Figure 3: Tank Top Mount (Underground Tank)

Order Code (LT5-111C022B11A10000000)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	1	0...0.1961bar/0.01961MPa/2.84psi, Alu (ADC12), Low pressure	1
030	Gauge Head Connection	11	Rc 1-1/2, union nut, SUS316, thread JIS B0203	
040	Display; Cover	C	Dial display upside down; Glass + Iron	
050	Crank Unit	0	Not selected	
060	Measuring Range	2	5m	
070	Measuring Tape	2	Measuring tape, tank top installation	
080	Float	B	D400mm SUS316 tape connection 5.0kg, density range $\geq 0.65... < 1.05$, rings	1
090	Top Anchor	11	2x R1, Alu (ADC6), thread JIS B0203	2
100	Guide Wire	A	Diameter 3mm solid wire	2
110	Bottom Anchor; Fixing Bolt	1	Iron; SUS316	2
120	90 Degree Sheave Elbow	000	Not selected	0
130	135 Degree Sheave Elbow	000	Not selected	0
140	Seal Pot	0	Not selected	0
150	Valve	0	Not selected	0

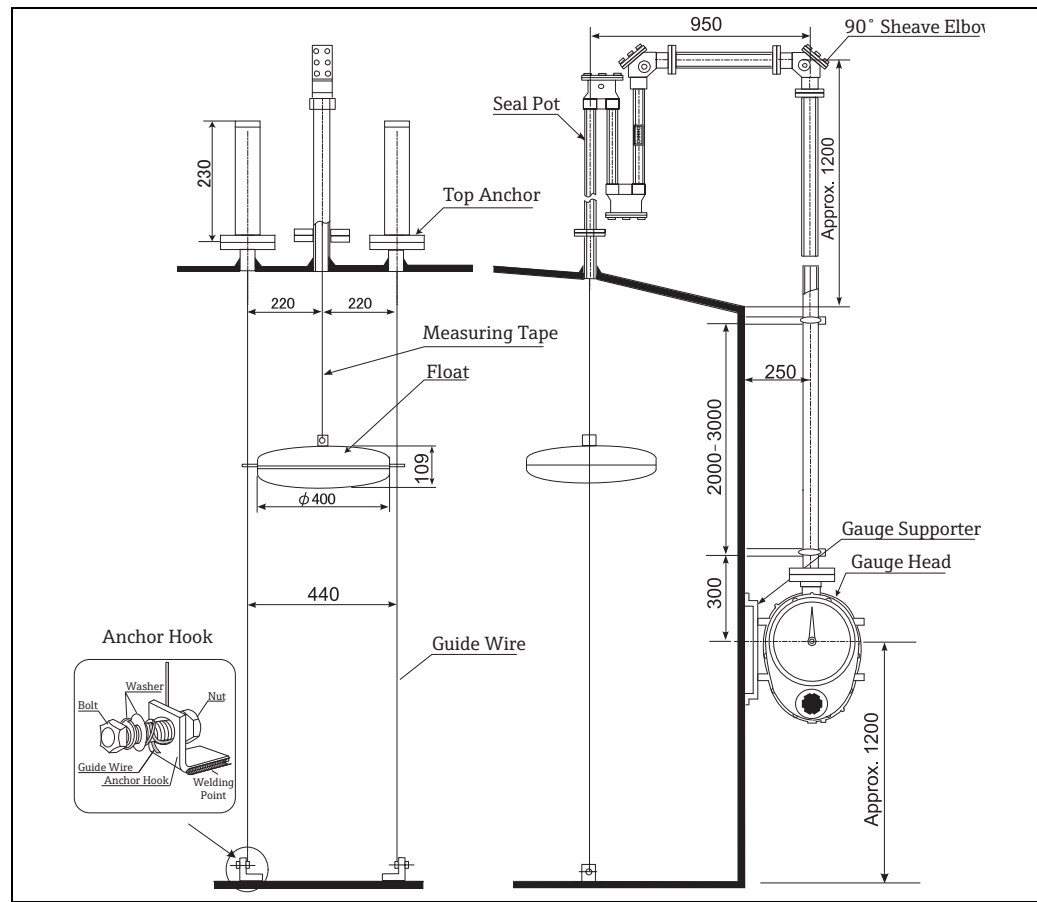
**Cone Roof Tank (CRT)
with Seal Pot**


Figure 4: Cone Roof Tank with Seal Pot

Order Code (LT5-11AA023B1BA21A1000F0+PA)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	1	0...0.1961bar/0.01961MPa/2.84psi, Alu (ADC12), Low pressure	1
030	Gauge Head Connection	1A	10K 40A RF, Alu (AC4A), flange JIS B2220	
040	Display; Cover	A	Dial display; Acrylic	
050	Crank Unit	0	Not selected	
060	Measuring Range	2	5m	
070	Measuring Tape	3	Measuring tape, seal pot/BT	1
080	Float	B	D400mm SUS316 tape connection 5.0kg, density range $\geq 0.65... < 1.05$, rings	1
090	Top Anchor	1B	2x 10K 40A RF, SUS316, flange JIS B2220	2
100	Guide Wire	A	Diameter 3mm solid wire	2
110	Bottom Anchor; Fixing Bolt	2	SUS316; SUS316	2
120	90 Degree Sheave Elbow	1A1	1x 10K 40A RF, Alu (ADC6+AC4A), flange JIS B2220	1
130	135 Degree Sheave Elbow	000	Not selected	0
140	Seal Pot	F	10K 40A RF, SUS316, flange JIS B2220	1
150	Valve	0	Not selected	0
620	>>Accessory Enclosed	PA	Gauge supporter, Iron	1

**Cone Roof Tank (CRT)
with Seal Pot PVC**

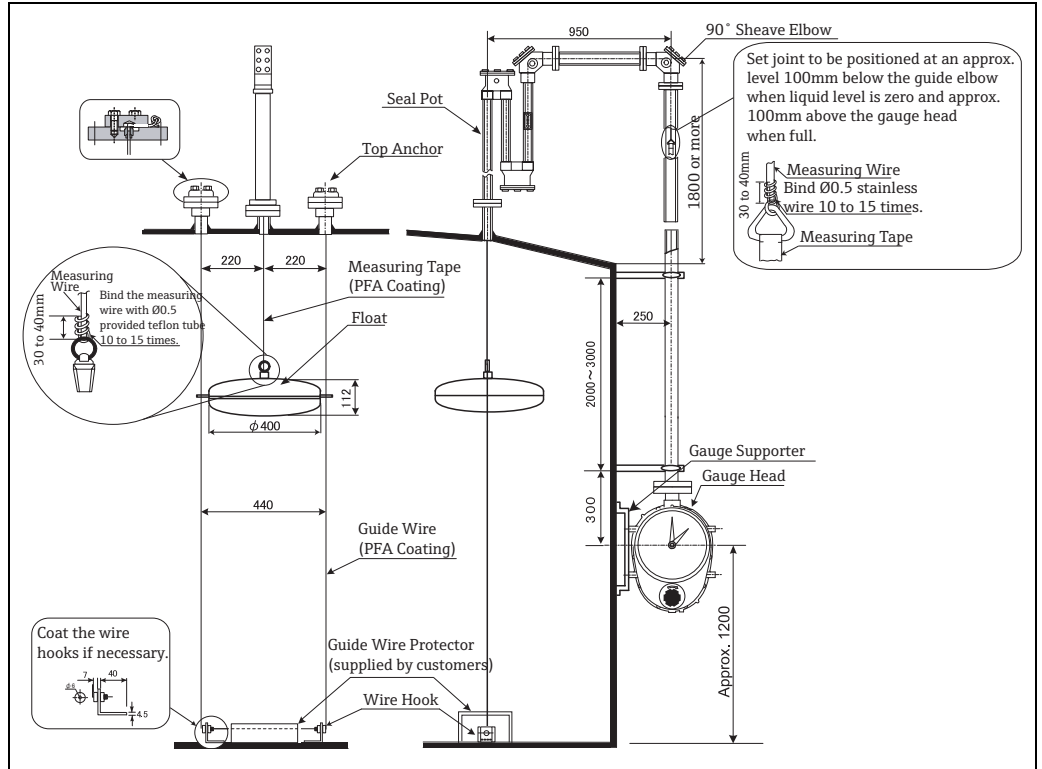


Figure 5: Cone Roof Tank with Seal Pot PVC

Order Code (LT5-11AA025H1NC41A1000N0+PA)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	1	0...0.1961bar/0.01961MPa/2.84psi, Alu (ADC12), Low pressure	1
030	Gauge Head Connection	1A	10K 40A RF, Alu (AC4A), flange JIS B2220	
040	Display; Cover	A	Dial display; Acrylic	
050	Crank Unit	0	Not selected	
060	Measuring Range	2	5m	
070	Measuring Tape	5	Measuring tape + PFA coated wire, seal pot/CRT	1
080	Float	H	D400mm PVC wire connection 5.0kg, density range $\geq 0.65... < 1.05$, rings	1
090	Top Anchor	1N	2x 10K 40A FF, PVC, flange JIS B2220	2
100	Guide Wire	C	Diameter 4.6mm strand wire, PFA coated	1
110	Bottom Anchor; Fixing Bolt	4	SUS316; PVC	2
120	90 Degree Sheave Elbow	1A1	1x 10K 40A RF, Alu (ADC6+AC4A), flange JIS B2220	1
130	135 Degree Sheave Elbow	000	Not selected	0
140	Seal Pot	N	10K 40A FF, PVC, flange JIS B2220	1
150	Valve	0	Not selected	0
620	>>Accessory Enclosed	PA	Gauge supporter, Iron	1

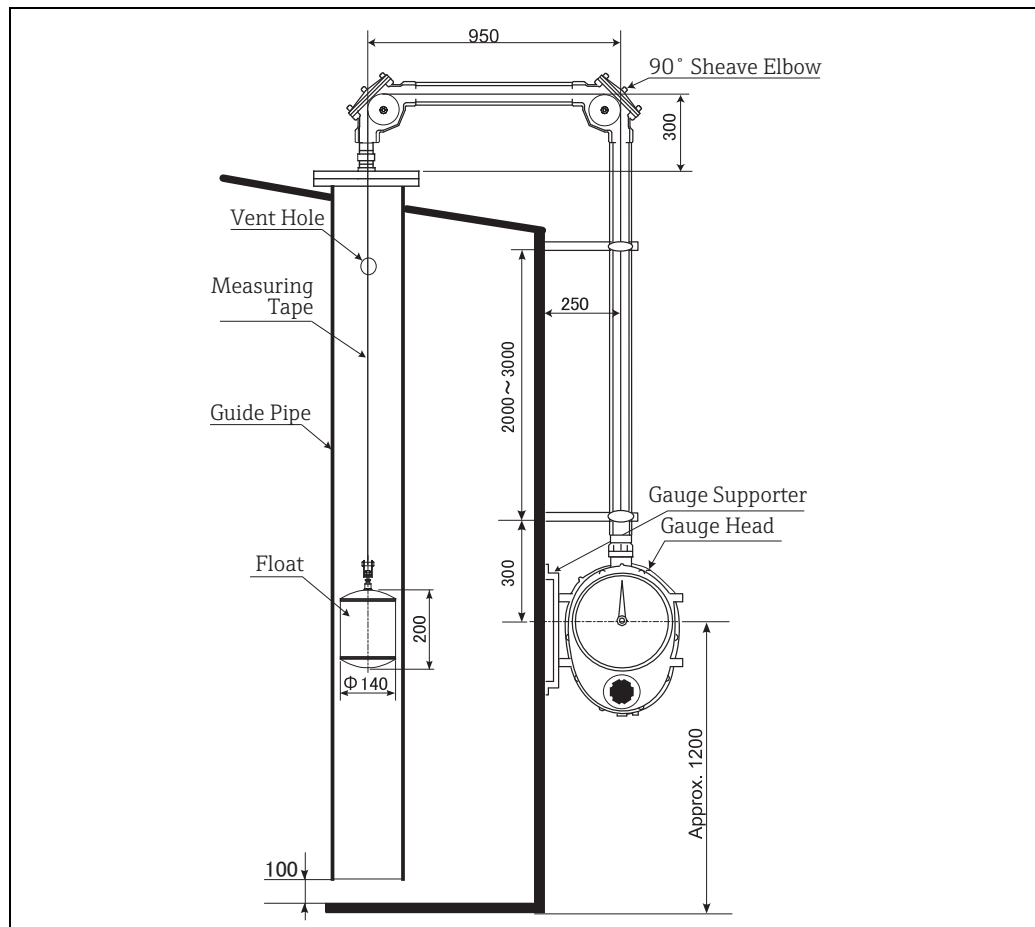
**Compact Cone Roof Tank
(Guide Pipe Method)**


Figure 6: Compact Cone Roof Tank (Guide Pipe Method)

Order Code (LT5-111A021L000011200000+PA)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	1	0...0.1961bar/0.01961MPa/2.84psi, Alu (ADC12), Low pressure	1
030	Gauge Head Connection	11	Rc 1-1/2, union nut, SUS316, thread JIS B0203	
040	Display; Cover	A	Dial display; Acrylic	
050	Crank Unit	0	Not selected	
060	Measuring Range	2	5m	
070	Measuring Tape	1	Measuring tape, CRT	
080	Float	L	D140mm SUS316 tape connection 2.4kg, density range $\geq 0.94 \dots \leq 2.0$, no rings	1
090	Top Anchor	00	Not selected	0
100	Guide Wire	0	Not selected	0
110	Bottom Anchor; Fixing Bolt	0	Not selected	0
120	90 Degree Sheave Elbow	112	2x Rp1-1/2, Alu (ADC6), thread JIS B0203	2
130	135 Degree Sheave Elbow	000	Not selected	0
140	Seal Pot	0	Not selected	0
150	Valve	0	Not selected	0
620	>>Accessory Enclosed	PA	Gauge supporter, Iron	1

**Tank Top Mount
(Guide Pipe Method)**

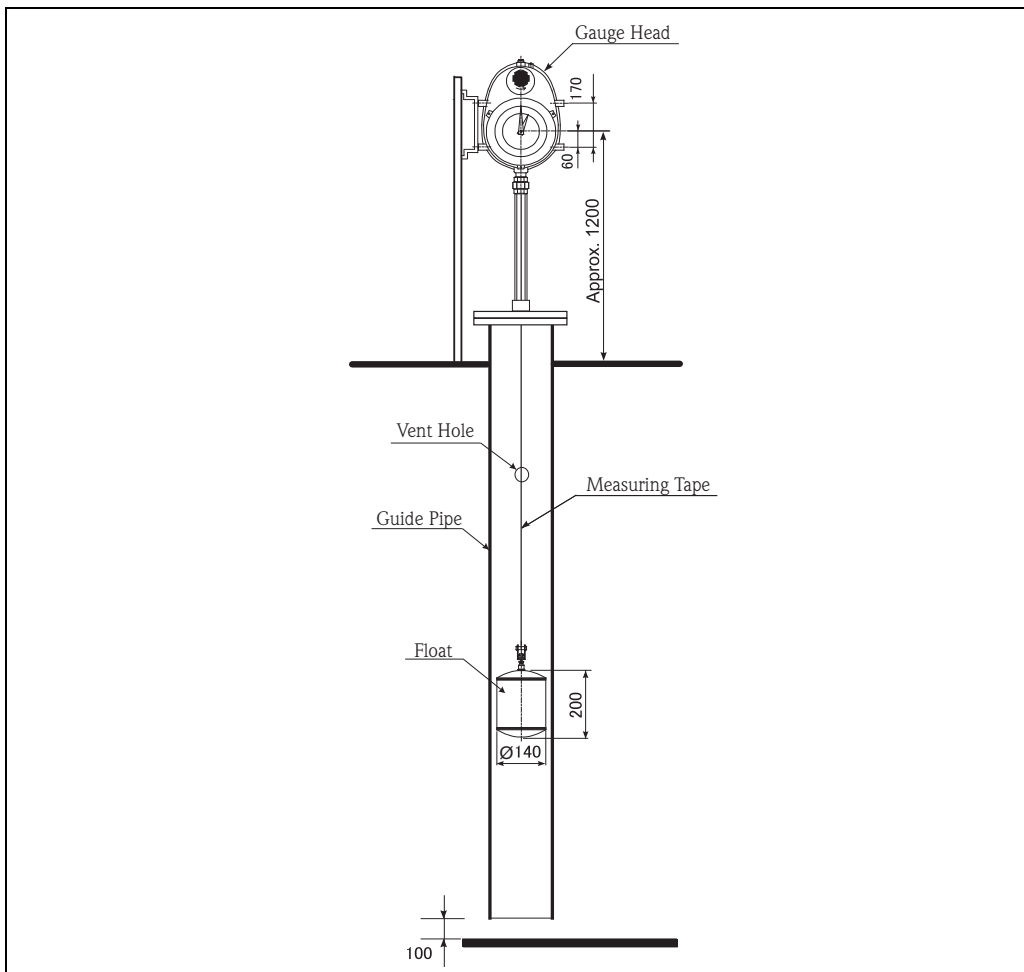


Figure 7: Tank Top Mount (Guide Pipe Method)

Order Code (LT5-111C022L000000000000+PA)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	1	0...0.1961bar/0.01961MPa/2.84psi, Alu (ADC12), Low pressure	1
030	Gauge Head Connection	11	Rc 1-1/2, union nut, SUS316, thread JIS B0203	
040	Display; Cover	C	Dial display upside down; Acrylic	
050	Crank Unit	0	Not selected	
060	Measuring Range	2	5m	
070	Measuring Tape	2	Measuring tape, tank top installation	1
080	Float	L	D140mm SUS316 tape connection 2.4kg, density range $\geq 0.94... \leq 2.0$, no rings	1
090	Top Anchor	00	Not selected	0
100	Guide Wire	0	Not selected	0
110	Bottom Anchor; Fixing Bolt	0	Not selected	0
120	90 Degree Sheave Elbow	000	Not selected	0
130	135 Degree Sheave Elbow	000	Not selected	0
140	Seal Pot	0	Not selected	0
150	Valve	0	Not selected	0
620	>>Accessory Enclosed	PA	Gauge supporter, Iron	1

Gas Holder

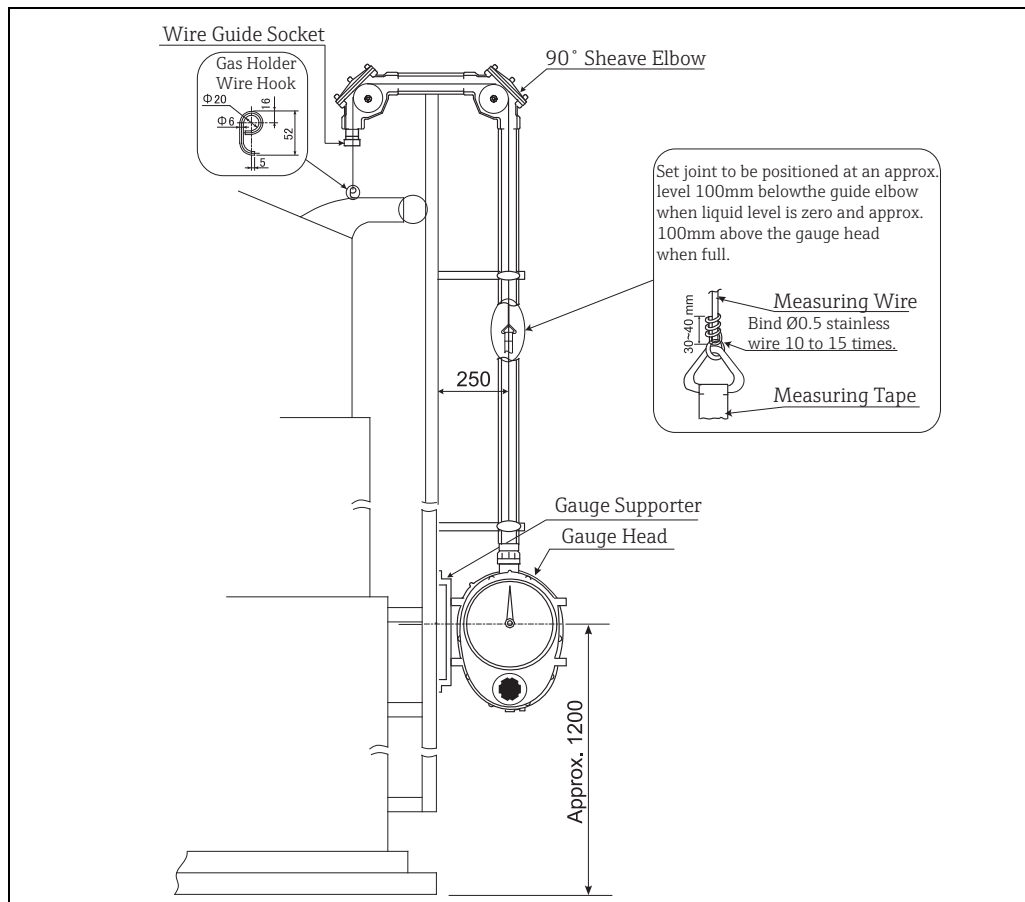


Figure 8: Gas Holder

Order Code (LT5-111A0340000011200000+PAPFPH)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	1	0...0.1961bar/0.01961MPa/2.84psi, Alu (ADC12), Low pressure	1
030	Gauge Head Connection	11	Rc 1-1/2, union nut, SUS316, thread JIS B0203	
040	Display; Cover	A	Dial display; Acrylic	
050	Crank Unit	0	Not selected	
060	Measuring Range	3	10m	1
070	Measuring Tape	4	Measuring tape + wire, FRT	
080	Float	0	Not selected	0
090	Top Anchor	00	Not selected	0
100	Guide Wire	0	Not selected	0
110	Bottom Anchor; Fixing Bolt	0	Not selected	0
120	90 Degree Sheave Elbow	112	2x Rp1-1/2, Alu (ADC6), thread JIS B0203	2
130	135 Degree Sheave Elbow	000	Not selected	0
140	Seal Pot	0	Not selected	0
150	Valve	0	Not selected	0
620	>>Accessory Enclosed	PA	Gauge supporter, Iron	1
620	>>Accessory Enclosed	PF	Wire guide socket, RC1-1/2	1
620	>>Accessory Enclosed	PH	Gas holder wire hook	1

Floating Roof Tank (FRT)

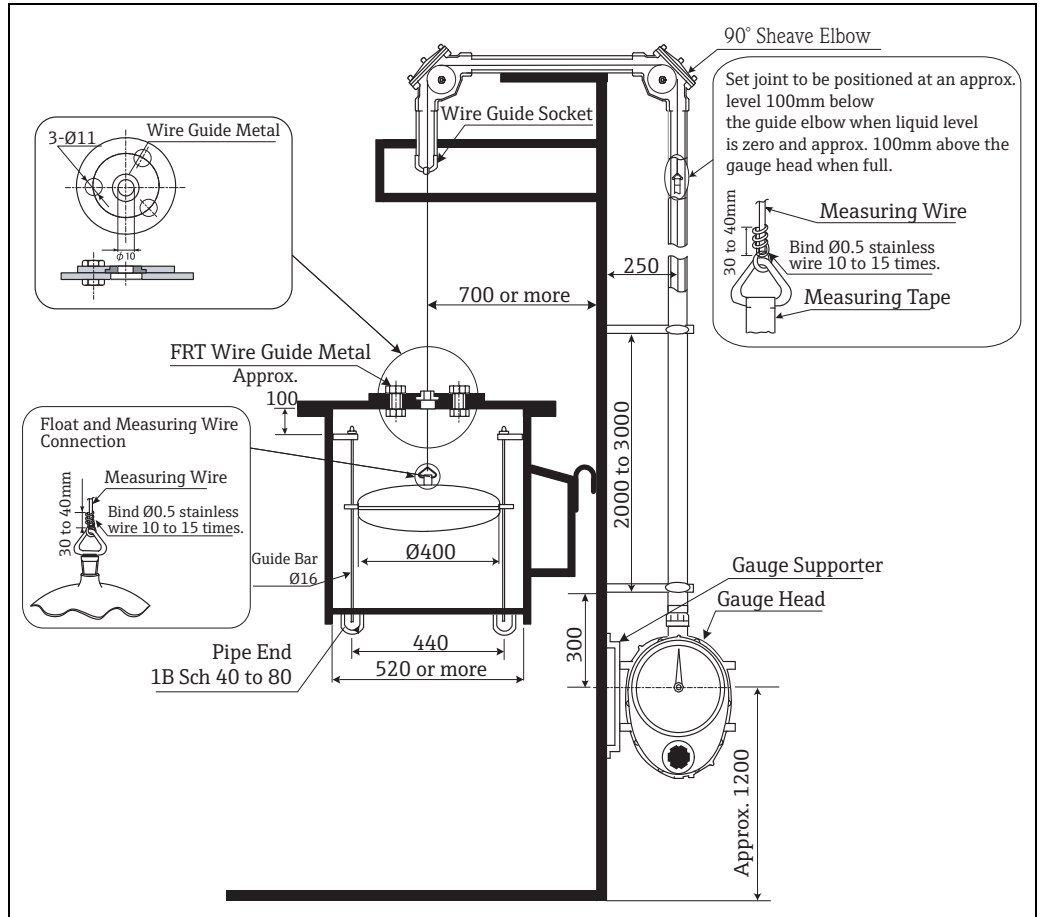


Figure 9: Floating Roof Tank

Order Code (LT5-111A054E000011200000+PAPEPF)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	1	0...0.1961bar/0.01961MPa/2.84psi, Alu (ADC12), Low pressure	1
030	Gauge Head Connection	11	Rc 1-1/2, union nut, SUS316, thread JIS B0203	
040	Display; Cover	A	Dial display; Acrylic	
050	Crank Unit	0	Not selected	
060	Measuring Range	5	20m	
070	Measuring Tape	4	Measuring tape + wire, FRT	1
080	Float	E	D400mm SUS316 wire connection 5.0kg, density range >= 0.65...< 1.05, rings	1
090	Top Anchor	00	Not selected	0
100	Guide Wire	0	Not selected	0
110	Bottom Anchor; Fixing Bolt	0	Not selected	0
120	90 Degree Sheave Elbow	112	2x Rp1-1/2, Alu (ADC6), thread JIS B0203	2
130	135 Degree Sheave Elbow	000	Not selected	0
140	Seal Pot	0	Not selected	0
150	Valve	0	Not selected	0
620	>>Accessory Enclosed	PA	Gauge supporter, Iron	1
620	>>Accessory Enclosed	PE	Wire guide metal FRT	1
620	>>Accessory Enclosed	PF	Wire guide socket, RC1-1/2	1

Dome Roof Tank (Medium Pressure)

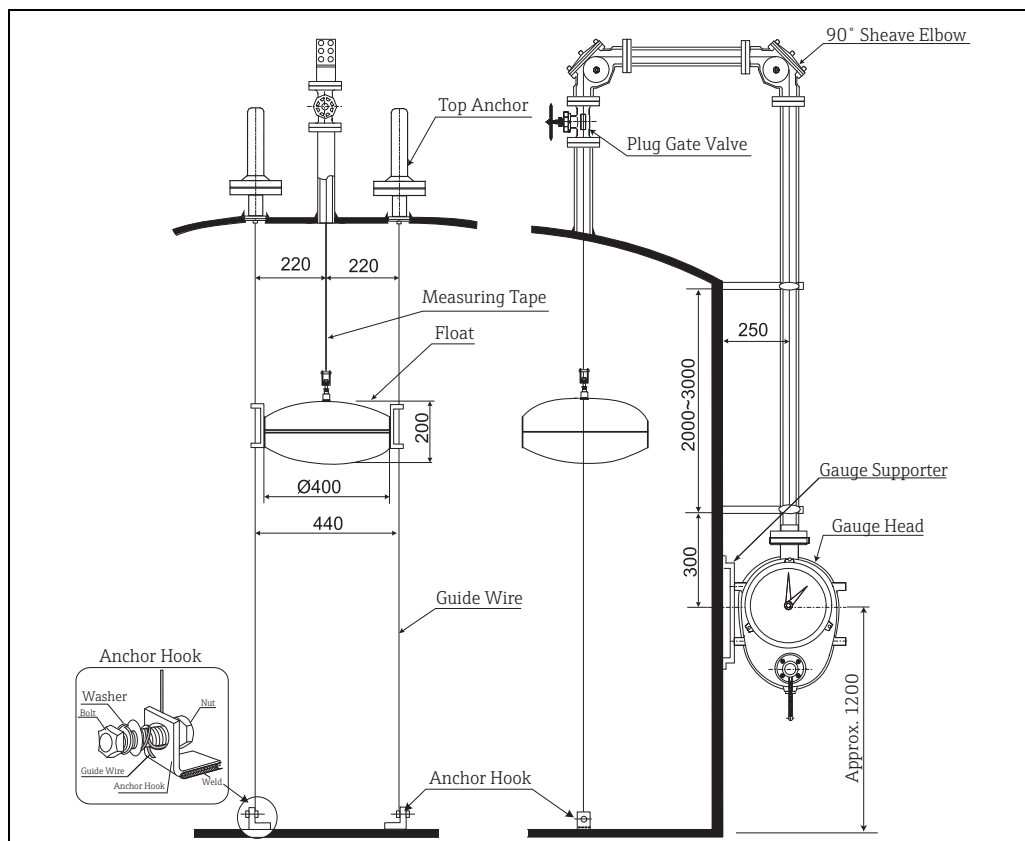


Figure 10: Doom Roof Tank for Medium Pressure

Order Code (LT5-44AB151R4AA24A200001+PA)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	4	0...0.9807bar/0.09807MPa/14.22psi, Alu (AC4CT6), medium pressure	1
030	Gauge Head Connection	4A	10K 40A RF, alu (AC4CT6), flange JIS B2220	
040	Display; Cover	B	Dial display; Glass + Iron	
050	Crank Unit	1	Selected	
060	Measuring Range	5	20m	
070	Measuring Tape	1	Measuring tape, CRT	1
080	Float	R	D400mm SUS316 tape connection 8.3kg, density range $\geq 0.5 \dots \leq 0.7$, rings	1
090	Top Anchor	4A	2x 10K 40A RF, Alu (AC4CT6), flange JIS B2220	2
100	Guide Wire	A	Diameter 3mm solid wire	2
110	Bottom Anchor; Fixing Bolt	2	SUS316; SUS316	2
120	90 Degree Sheave Elbow	4A2	2x 10K 40A RF, Alu (AC4CT6), flange JIS B2220	2
130	135 Degree Sheave Elbow	000	Not selected	0
140	Seal Pot	0	Not selected	0
150	Valve	1	10K 40A RF, SCS13, flange JIS B2220	1
620	>>Accessory Enclosed	PA	Gauge supporter, Iron	1

**Spherical Tank
(High Pressure)**

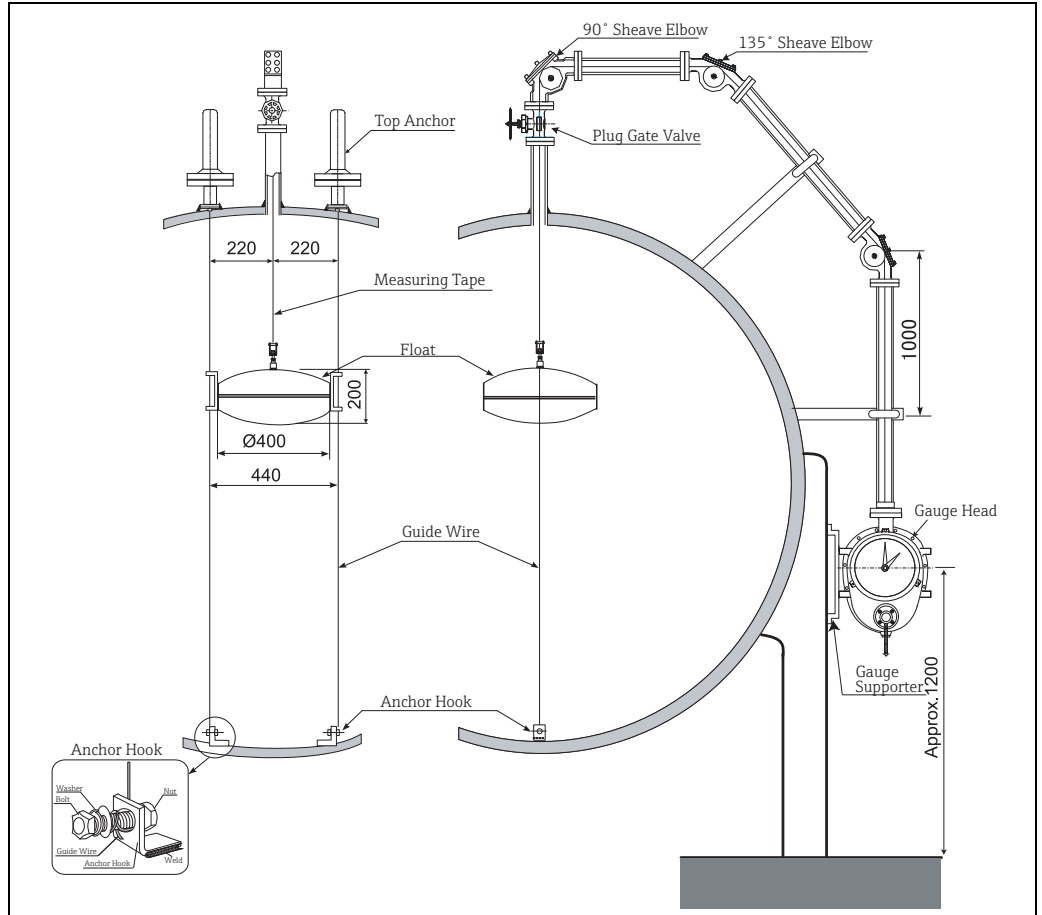


Figure 11: Spherical Tank for High Pressure

Order Code (LT5-66GB153R6GA26G16G204+PC)

Feat.	Feature Text	Option	Option Text	Qty.
020	Gauge Head	6	0...24.5bar/2.45MPa/355.25psi, Iron, high pressure	1
030	Gauge Head Connection	6G	20K 40A RF, Iron, flange JIS B2220	
040	Display; Cover	B	Dial display; Glass + Iron	
050	Crank Unit	1	Selected	
060	Measuring Range	5	20m	
070	Measuring Tape	3	Measuring tape, seal pot/BT	1
080	Float	R	D400mm SUS316 tape connection 8.3kg, density range $\geq 0.5 \dots \leq 0.7$, rings	1
090	Top Anchor	6G	2x 20K 40A RF, Iron, flange JIS B2220	2
100	Guide Wire	A	Diameter 3mm solid wire	2
110	Bottom Anchor; Fixing Bolt	2	SUS316; SUS316	2
120	90 Degree Sheave Elbow	6G1	1x 20K 40A RF, Iron, flange JIS B2220	1
130	135 Degree Sheave Elbow	6G2	2x 20K 40A RF, Iron, flange JIS B2220	2
140	Seal Pot	0	Not selected	0
150	Valve	4	20K 40A RF, SCS13, flange JIS B2220	1
620	>>Accessory Enclosed	PC	Gauge supporter, Iron, high pressure	1

Mechanical Construction (Design and Dimension)

LT5-1 (Threaded Type, Low Pressure)

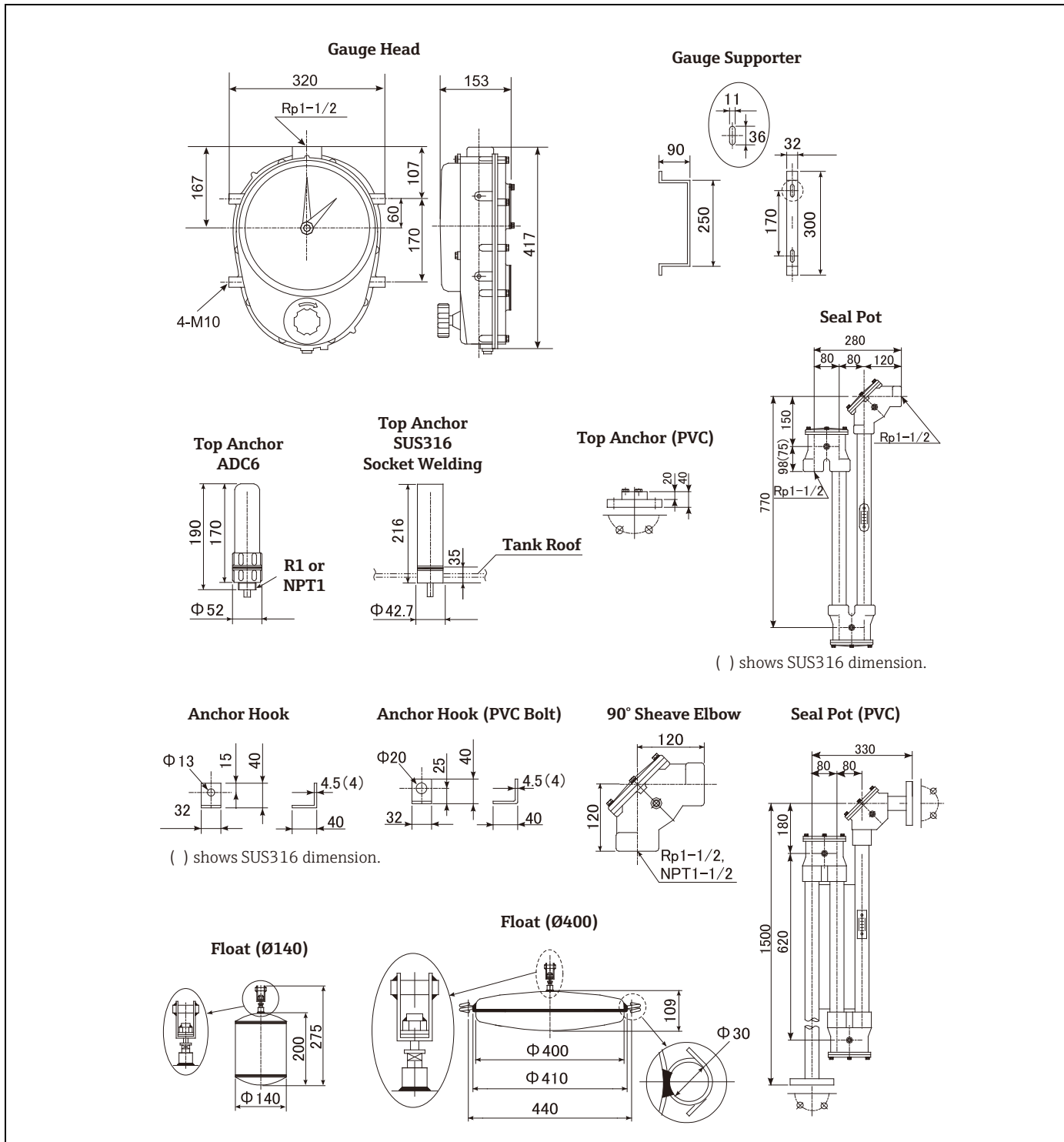


Figure 12: LT5-1 Dimensions 1

LT5-1
(Flange Type, Low Pressure)

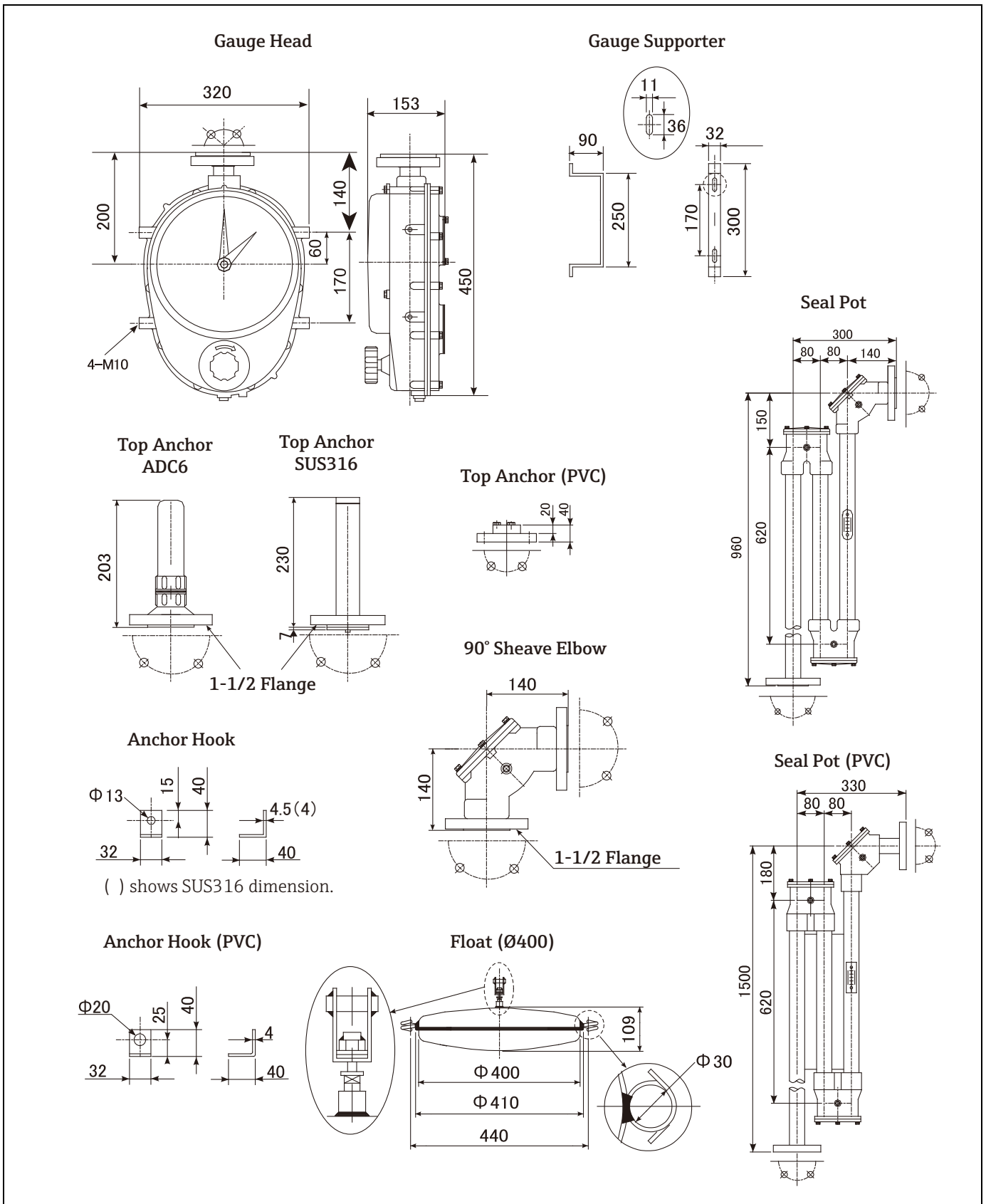


Figure 13: LT5-1 Dimensions 2

LT5-4 (Flange Type, Medium Pressure)

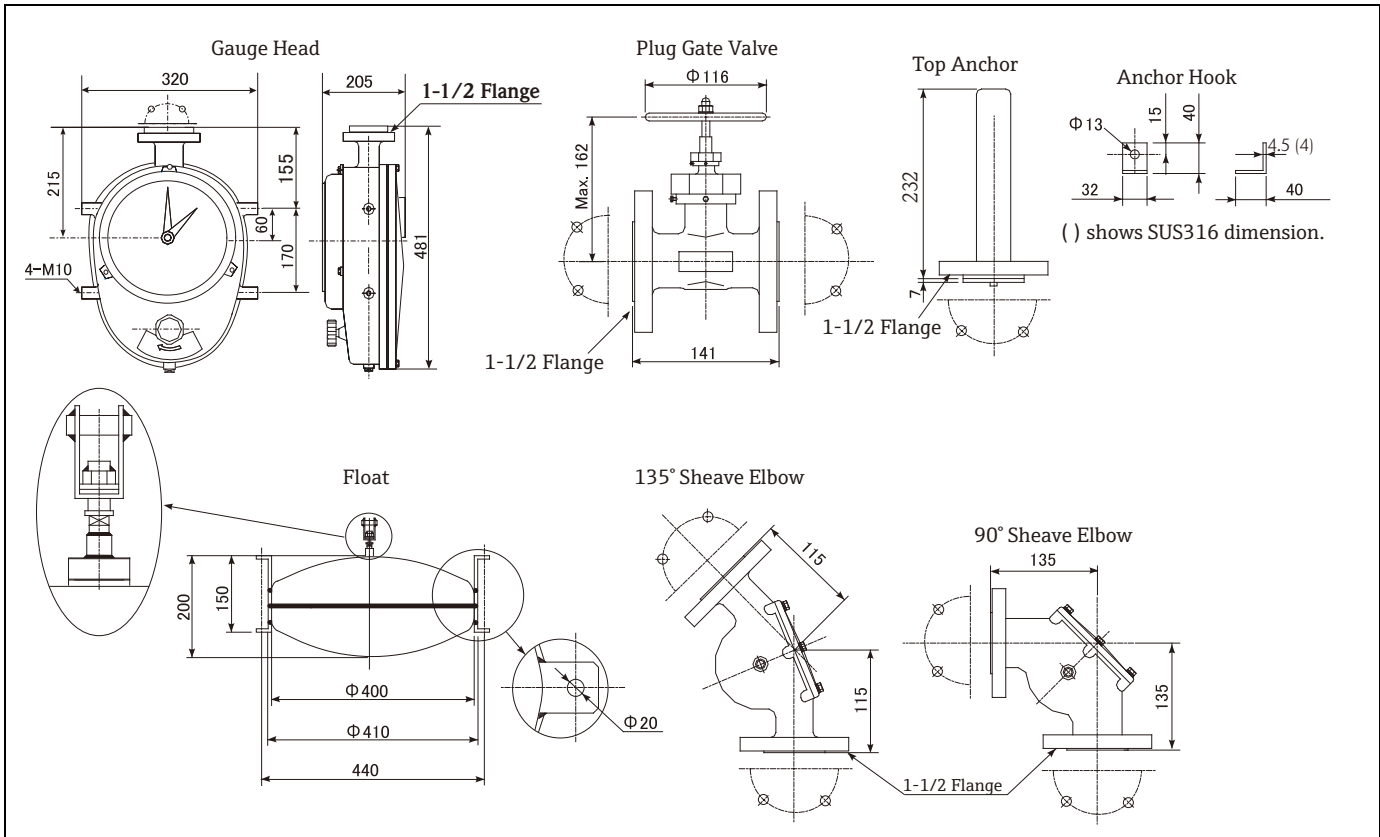


Figure 14: LT5-4 Dimensions

LT5-6 (Flange Type, High Pressure)

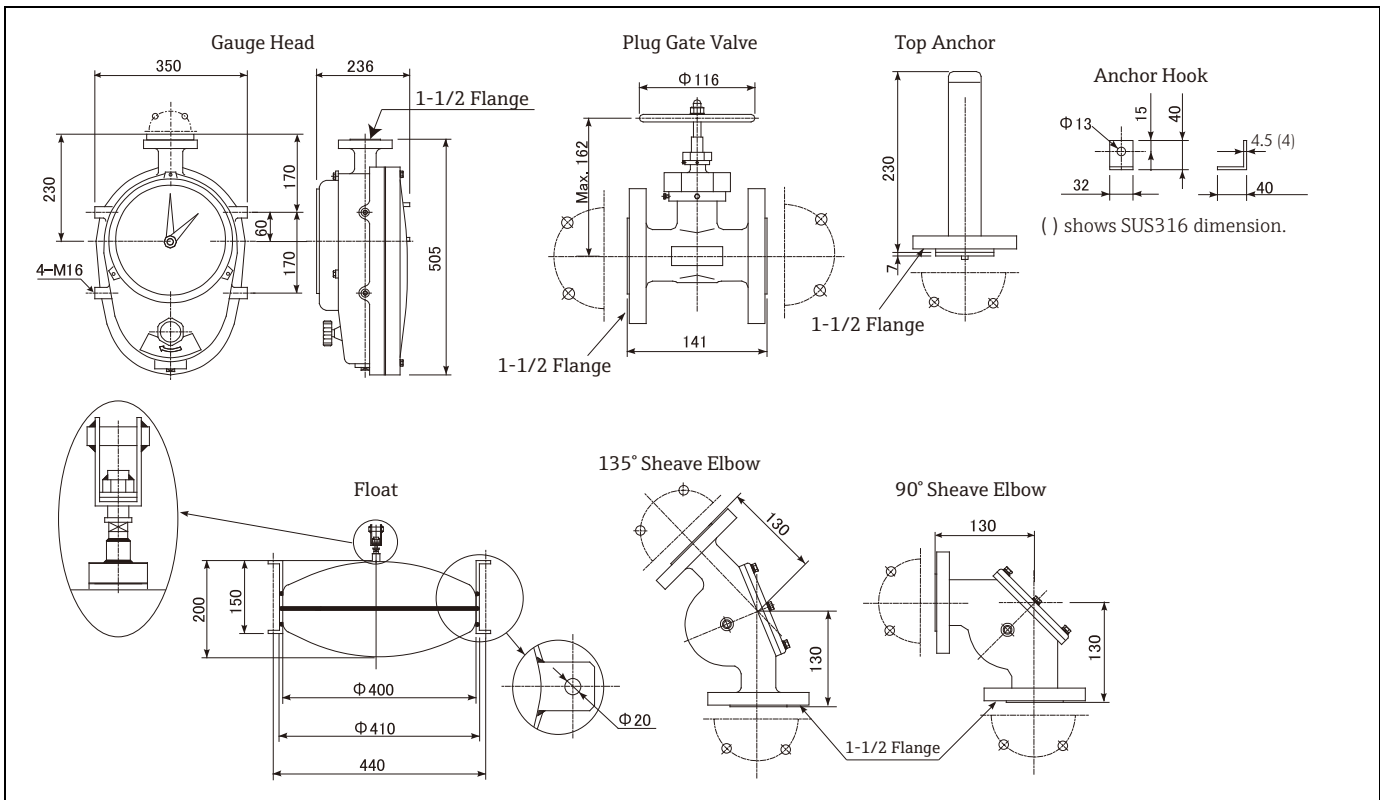


Figure 15: LT5-6 Dimensions

Display

Dial display: Two pointers or Counter (min. readable scale:1mm)



Counting meter displays are the only available specification for gauging rages extending to 30m (100ft) or more.

Gauge Head Process Connection

Product Roots	Specifications
LT5-1 (threaded, low pressure)	Rp 1-1/2, w/o union nut, thread JIS B0203 Rc 1-1/2, union nut, SUS316, thread JIS B0203 NPT 1-1/2, union nut, SUS316, thread ANSI
LT5-1 (flange, low pressure) Flange spec./material	10K 40A RF, Alu (AC4A), flange JIS B2220 10K 40A RF, SUS316, flange JIS B2220 NPS 1-1/2" Cl.150 RF, Alu (AC4A) flange ASME B16.5 NPS 1-1/2" Cl.150 RF, SUS316 flange ASME B16.5 40A 150lbs RF, Alu (AC4A), flange JPI 7S-15 40A 150lbs RF, SUS316, flange JPI 7S-15 10K 150A RF, SUS316, flange JIS B2220 NPS 6" Cl.150 RF, SUS316 flange ASME B16.5 150A 150lbs RF, SUS316, flange JPI 7S-15
LT5-4 (flange, medium pressure) Flange spec./material	10K 40A RF, alu (AC4CT6), flange JIS B2220 NPS 1-1/2" Cl.150 RF, Alu (AC4CT6) flange ASME B16.5 40A 150lbs RF, Alu (AC4CT6), flange JPI 7S-15
LT5-6 (flange, high pressure) Flange spec./Gauge material/Bolt material	10K 40A RF, Iron, flange JIS B2220 NPS 1-1/2" Cl.150 RF, iron flange ASME B16.5 40A 150lbs RF, Iron, flange JPI 7S-15 20K 40A RF, Iron, flange JIS B2220 NPS 1-1/2" Cl.300 RF, iron flange ASME B16.5 40A 300lbs RF, Iron, flange JPI 7S-15

Coupling (Gauge Head and Display)

Product Roots	Coupling
LT5-1 (threaded/flange low pressure)	Shaft
LT5-4 (flange, medium pressure)	Pressure Bulkhead Magnet Coupling
LT5-6 (flange, high pressure)	Pressure Bulkhead Magnet Coupling

Gauge Head Total Weight

Product Roots	Weight
LT5-1 (threaded/flange low pressure)	Approximately 15kg
LT5-4 (flange, medium pressure)	Approximately 22kg
LT5-6 (flange, high pressure)	Approximately 100kg


Painting Color

- Gauge Head Body: Blue
- Other components: Silver

Float

Ø400	Weight	ρ: Liquid Density (g/cm³)
Low pressure	4.2 kg	$0.5 \leq \rho < 0.65$
Low pressure	5.0 kg	$0.65 \leq \rho < 1.05$
Low pressure	8.0 kg	$1.05 \leq \rho < 2.0$
Medium/High pressure	8.3 kg	$0.5 \leq \rho < 0.7$

Ø140	Weight	ρ: Liquid Density (g/cm³)
Low pressure	2.1 kg	$0.5 \leq \rho < 0.94$
Low pressure	2.4 kg	$0.94 \leq \rho < 2.0$

 SUS316 or PVC is an available option for float material in low pressure conditions.

**List of Sealing Materials for
Wetting Liquid and Gas Part**

Products	Units	Parts Name	Name of Sealing Parts	Materials of Packing/O-ring
LT5-1	Gauge Head	Rear Cover	Rear Packing	V#6502
		Check Shaft	O-ring	FKM
		Sprocket Shaft	Oil Seal	FKM
		Blind Board	Packing	NBR
	90° Sheave Elbow	Aluminum Sheave Elbow	Rear Packing	V#6502
		Stainless Steel Sheave Elbow		
		Bearing	O-ring	Silicon Rubber
	Liquid Seal Unit	Aluminum Sheave Elbow	Rear Packing	V#6502
			Bearing O-ring	Silicon Rubber
		Stainless Steel Sheave Elbow	Rear Packing	V#6502
			Bearing O-ring	Silicon Rubber
		PVC Sheave Elbow	Rear Packing	V#6502
			Bearing O-ring	PTFE
	Top Anchor	Aluminum Threaded Type	Rear Packing	V#6502
		Stainless Tank Welding Type		
	Top Anchor	Aluminum Flange/Threaded Type	Spring Negator Packing	V#6502
Stainless Flange Welding Type				
LT5-4/LT5-6	Gauge Head	Rear Cover	Rear Packing	V#6502
		Check Handle	Gland Packing	PTFE/CR
		Internal Magnet Cover	O-ring	PTFE
		External Magnet Cover	O-ring	NBR (* When selecting copper free, the material of O-ring is CR.)
		Coupling	O-ring	PTFE
	Gate Valve	Shaft	Shaft Packing	PTFE
		Cap Nut	Packing	V#6502
LT5-4	90° Sheave Elbow	Cover	Rear Packing	V#6502
		Bearing	O-ring	PTFE
	135° Sheave Elbow	Cover	Rear Packing	V#6502
		Bearing	O-ring	PTFE
	Top Anchor	Flange Integral Pattern	Spring Negator Packing	V#6502
		Stainless Flange Welding Type		
LT5-6	90° Sheave Elbow	Cover	Rear Packing	V#6502
		Bearing	O-ring	PTFE
	135° Sheave Elbow	Cover	Rear Packing	V#6502
		Bearing	O-ring	PTFE
	Top Anchor	Rolled Steel Flange Welding Type	Spring Negator Packing	V#6502
		Stainless Flange Welding Type		

Human Interface

Display LT displays feature dial type and counter type. Normally, when tank height is 20mm or less, the dial display type indicator is used. When tank height is over 20mm, the counter display type indicator is selected.

Dial Display

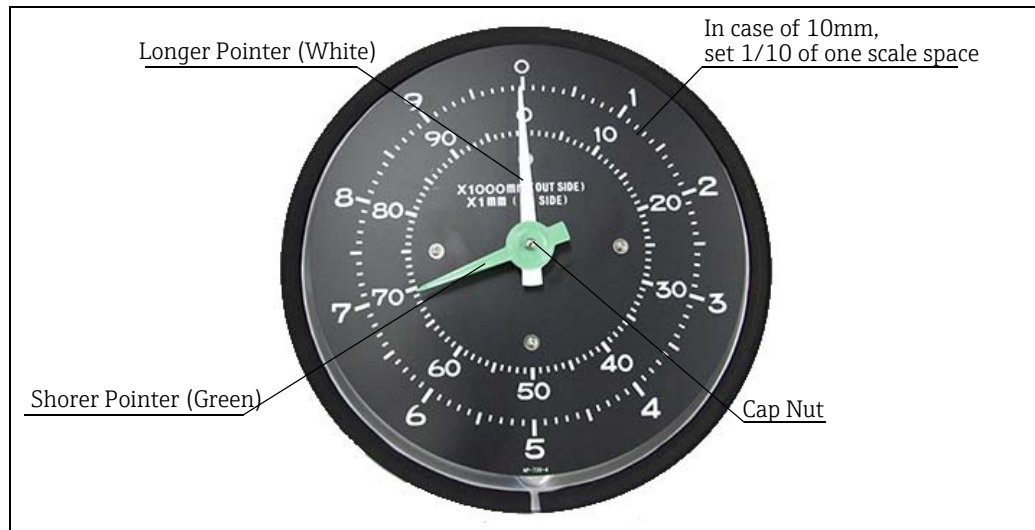


Figure 16: Dial Display

Counter Display

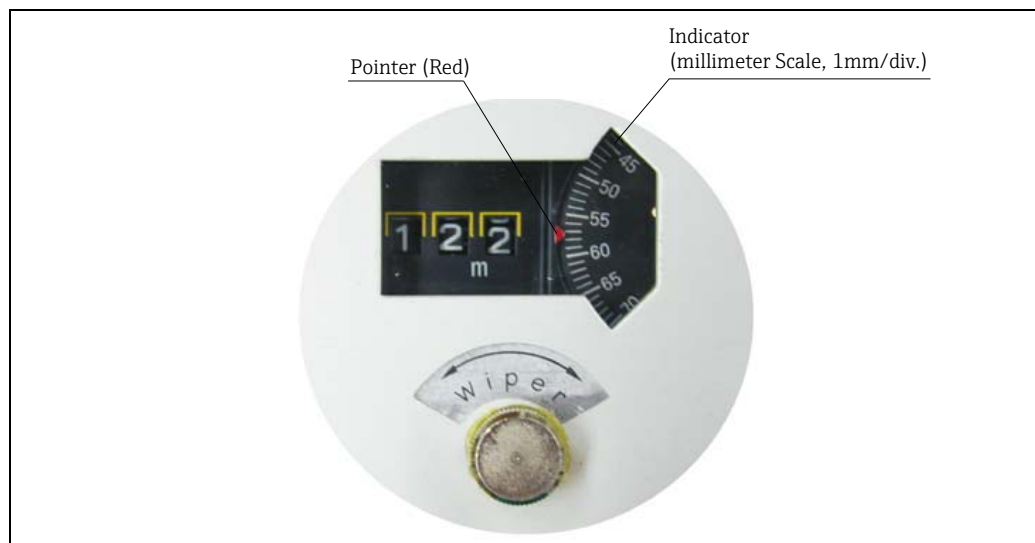


Figure 17: Counter Display

Certificates and Approvals

Protection Class Waterproof: IP55

Order Information

LT5

020	Gauge Head:		
	1	0...0.1961bar/0.01961MPa/2.84psi, Alu (ADC12), low pressure	
	4	0...0.9807bar/0.09807MPa/14.22psi, Alu (AC4CT6), medium pressure	
	6	0...24.5bar/2.45MPa/355.25psi, Iron, high pressure	
	9	Special version, TSP-no. to be spec.	
030	Gauge Head Connection:		
	1A	10K 40A RF, Alu (AC4A), flange JIS B2220	
	1B	10K 40A RF, SUS316, flange JIS B2220	
	1C	NPS 1-1/2" Cl.150 RF, Alu (AC4A) flange ASME B16.5	
	1D	NPS 1-1/2" Cl.150 RF, SUS316 flange ASME B16.5	
	1E	40A 150lbs RF, Alu (AC4A), flange JPI 7S-15	
	1F	40A 150lbs RF, SUS316, flange JPI 7S-15	
	1R	10K 150A RF, SUS316, flange JIS B2220	
	1T	NPS 6" Cl.150 RF, SUS316 flange ASME B16.5	
	1U	150A 150lbs RF, SUS316, flange JPI 7S-15	
	10	Rp 1-1/2, w/o union nut, thread JIS B0203	
	11	Rc 1-1/2, union nut, SUS316, thread JIS B0203	
	12	NPT 1-1/2, union nut, SUS316, thread ANSI	
	4A	10K 40A RF, alu (AC4CT6), flange JIS B2220	
	4C	NPS 1-1/2" Cl.150 RF, Alu (AC4CT6) flange ASME B16.5	
	4E	40A 150lbs RF, Alu (AC4CT6), flange JPI 7S-15	
	6A	10K 40A RF, Iron, flange JIS B2220	
	6C	NPS 1-1/2" Cl.150 RF, iron flange ASME B16.5	
	6E	40A 150lbs RF, Iron, flange JPI 7S-15	
	6G	20K 40A RF, Iron, flange JIS B2220	
	6J	NPS 1-1/2" Cl.300 RF, iron flange ASME B16.5	
	6L	40A 300lbs RF, Iron, flange JPI 7S-15	
	99	Special version, TSP-no. to be spec.	
040	Display; Cover:		
	A	Dial display; Acrylic	
	B	Dial display; Glass + Iron	
	C	Dial display upside down; Acrylic	
	D	Dial display upside down; Glass + Iron	
	E	Mechanical counter; Iron	
	Y	Special version, TSP-no. to be spec.	
050	Crank Unit:		
	0	Not selected	
	1	Selected	
	9	Special version, TSP-no. to be spec.	
060	Measuring Range		
	F	60ft	
	H	100ft	
	1	2.5m	
	2	5m	
	3	10m	
	4	16m	
	5	20m	
	6	30m	
	9	Special version, TSP-no. to be spec.	
070	Measuring Tape:		
	0	Not selected	
	1	Measuring tape, CRT	
	2	Measuring tape, tank top installation	
	3	Measuring tape, seal pot/BT	
	4	Measuring tape + wire, FRT	
	5	Measuring tape + PFA coated wire, seal pot/CRT	
	9	Special version, TSP-no. to be spec.	

080	Float
	A D400mm SUS316 tape connection 4.2kg, density range $\geq 0.5... < 0.65$, rings
	B D400mm SUS316 tape connection 5.0kg, density range $\geq 0.65... < 1.05$, rings
	C D400mm SUS316 tape connection 8.0kg, density range $\geq 1.05... \leq 2.0$, rings
	D D400mm SUS316 wire connection 4.2kg, density range $\geq 0.5... < 0.65$, rings
	E D400mm SUS316 wire connection 5.0kg, density range $\geq 0.65... < 1.05$, rings
	F D400mm SUS316 wire connection 8.0kg, density range $\geq 1.05... \leq 2.0$, rings
	G D400mm PVC wire connection 4.2kg, density range $\geq 0.5... < 0.65$, rings
	H D400mm PVC wire connection 5.0kg, density range $\geq 0.65... < 1.05$, rings
	J D400mm PVC wire connection 8.0kg, density range $\geq 1.05... \leq 2.0$, rings
	K D140mm SUS316 tape connection 2.1kg, density range $\geq 0.5... < 0.94$, no rings
	L D140mm SUS316 tape connection 2.4kg, density range $\geq 0.94... \leq 2.0$, no rings
	M D140mm SUS316 wire connection 2.1kg, density range $\geq 0.5... < 0.94$, no rings
	N D140mm SUS316 wire connection 2.4kg, density range $\geq 0.94... \leq 2.0$, no rings
	O D140mm PVC wire connection 2.1kg, density range $\geq 0.5... < 0.94$, no rings
	P D140mm PVC wire connection 2.4kg, density range $\geq 0.94... \leq 2.0$, no rings
	Q D140mm PVC wire connection 2.4kg, density range $\geq 0.94... \leq 2.0$, no rings
	R D400mm SUS316 tape connection 8.3kg, density range $\geq 0.5... \leq 0.7$, rings
	Y Special version, TSP-no. to be spec.
	0 Not selected
090	Top Anchor:
	00 Not selected
	1A 2x 10K 40A RF, Alu (ADC6+AC4A), flange JIS B2220
	1B 2x 10K 40A RF, SUS316, flange JIS B2220
	1C 2x NPS 1-1/2" Cl.150 RF, Alu (ADC6+AC4A) flange ASME B16.5
	1D 2x NPS 1-1/2" Cl.150 RF, SUS316 flange ASME B16.5
	1E 2x 40A 150lbs RF, Alu (ADC6+AC4A), flange JPI 7S-15
	1F 2x 40A 150lbs RF, SUS316, flange JPI 7S-15
	1N 2x 10K 40A FF, PVC, flange JIS B2220
	1P 2x NPS 1-1/2" Cl.150 FF, PVC flange ASME B16.5
	1Q 2x 40A 150lbs FF, PVC, flange JPI 7S-15
	11 2x R1, Alu (ADC6), thread JIS B0203
	12 2x R1, SUS316, thread JIS B0203
	13 2x NPT1, Alu (ADC6), thread ANSI
	14 2x NPT1, SUS316, thread ANSI
	15 2x weld-fixing, SUS316 weld-in socket
	4A 2x 10K 40A RF, Alu (AC4CT6), flange JIS B2220
	4B 2x NPS 1-1/2" Cl.150 RF, Alu (AC4CT6) flange ASME B16.5
	4C 2x 40A 150lbs RF, Alu (AC4CT6), flange JPI 7S-15
	6A 2x 10K 40A RF, Iron, flange JIS B2220
	6B 2x 10K 40A RF, SUS316, HP, flange JIS B2220
	6C 2x NPS 1-1/2" Cl.150 RF, iron flange ASME B16.5
	6D 2x NPS 1-1/2" Cl.150 RF, SUS316, HP flange ASME B16.5
	6E 2x 40A 150lbs RF, Iron, flange JPI 7S-15
	6F 2x 40A 150lbs RF, SUS316, HP, flange JPI 7S-15
	6G 2x 20K 40A RF, Iron, flange JIS B2220
	6H 2x 20K 40A RF, SUS316, flange JIS B2220
	6J 2x NPS 1-1/2" Cl.300 RF, iron flange ASME B16.5
	6K 2x NPS 1-1/2" Cl.300 RF, SUS316 flange ASME B16.5
	6L 2x 40A 300lbs RF, Iron, flange JPI 7S-15
	6M 2x 40A 300lbs RF, SUS316, flange JPI 7S-15
	99 Special version, TSP-no. to be spec.
100	Guide Wire:
	A Diameter 3mm solid wire
	B Diameter 3mm strand wire
	C Diameter 4.6mm strand wire, PFA coated
	Y Special version, TSP-no. to be spec.
	0 Not selected

110										Bottom Anchor; Fixing Bolt:	
										0	Not selected
										1	Iron; SUS316
										2	SUS316; SUS316
										3	Iron; PVC
										4	SUS316; PVC
										9	Special version, TSP-no. to be spec.
120										90 Degree Sheave Elbow:	
										000	Not selected
										1A1	1x 10K 40A RF, Alu (ADC6+AC4A), flange JIS B2220
										1A2	2x 10K 40A RF, Alu (ADC6+AC4A), flange JIS B2220
										1B1	1x 10K 40A RF, SCS14+SUS316, flange JIS B2220
										1B2	2x 10K 40A RF, SCS14+SUS316, flange JIS B2220
										1C1	1x NPS 1-1/2" Cl.150 RF, Alu (ADC6+AC4A) flange ASME B16.5
										1C2	2x NPS 1-1/2" Cl.150 RF, Alu (ADC6+AC4A) flange ASME B16.5
										1D1	1x NPS 1-1/2" Cl.150 RF, SCS14+SUS316 flange ASME B16.5
										1D2	2x NPS 1-1/2" Cl.150 RF, SCS14+SUS316 flange ASME B16.5
										1E1	1x 40A 150lbs RF, Alu (ADC6+AC4A), flange JPI 7S-15
										1E2	2x 40A 150lbs RF, Alu (ADC6+AC4A), flange JPI 7S-15
										1F1	1x 40A 150lbs RF, SCS14+SUS316, flange JPI 7S-15
										1F2	2x 40A 150lbs RF, SCS14+SUS316, flange JPI 7S-15
										111	1x Rp1-1/2, Alu (ADC6), thread JIS B0203
										112	2x Rp1-1/2, Alu (ADC6), thread JIS B0203
										121	1x Rp1-1/2, SCS14, thread JIS B0203
										122	2x Rp1-1/2, SCS14, thread JIS B0203
										131	1x NPT1-1/2, Alu (ADC6), thread ANSI
										132	2x NPT1-1/2, Alu (ADC6), thread ANSI
										141	1x NPT1-1/2, SCS14, thread ANSI
										142	2x NPT1-1/2, SCS14, thread ANSI
										4A1	1x 10K 40A RF, Alu (AC4CT6), flange JIS B2220
										4A2	2x 10K 40A RF, Alu (AC4CT6), flange JIS B2220
										4C1	1x NPS 1-1/2" Cl.150 RF, Alu (AC4CT6) flange ASME B16.5
										4C2	2x NPS 1-1/2" Cl.150 RF, Alu (AC4CT6) flange ASME B16.5
										4E1	1x 40A 150lbs RF, Alu (AC4CT6), flange JPI 7S-15
										4E2	2x 40A 150lbs RF, Alu (AC4CT6), flange JPI 7S-15
										6A1	1x 10K 40A RF, Iron, flange JIS B2220
										6A2	2x 10K 40A RF, Iron, flange JIS B2220
										6C1	1x NPS 1-1/2" Cl.150 RF, iron flange ASME B16.5
										6C2	2x NPS 1-1/2" Cl.150 RF, iron flange ASME B16.5
										6E1	1x 40A 150lbs RF, Iron, flange JPI 7S-15
										6E2	2x 40A 150lbs RF, Iron, flange JPI 7S-15
										6G1	1x 20K 40A RF, Iron, flange JIS B2220
										6G2	2x 20K 40A RF, Iron, flange JIS B2220
										6J1	1x NPS 1-1/2" Cl.300 RF, iron flange ASME B16.5
										6J2	2x NPS 1-1/2" Cl.300 RF, iron flange ASME B16.5
										6L1	1x 40A 300lbs RF, Iron, flange JPI 7S-15
										6L2	2x 40A 300lbs RF, Iron, flange JPI 7S-15
										999	Special version, TSP-no. to be spec.

130	135 Degree Sheave Elbow:
	000 Not selected 1A2 2x 10K 40A RF, Alu (AC4A+AC4A),flange JIS B2220 1C2 2x NPS 1-1/2" Cl.150 RF, Alu (AC4A+AC4A) flange ASME B16.5 100 2x 40A 150lbs RF, Alu (AC4A+AC4A),flange JPI 7S-15 112 2x Rp1-1/2, Alu (AC4A), thread JIS B0203 132 2x NPT1-1/2, Alu (AC4A), thread ANSI 4A2 2x 10K 40A RF, Alu (AC4CT6),flange JIS B2220 4C2 2x NPS 1-1/2" Cl.150 RF, Alu (AC4CT6) flange ASME B16.5 4E2 2x 40A 150lbs RF, Alu (AC4CT6),flange JPI 7S-15 6A2 2x 10K 40A RF, Iron, flange JIS B2220 6C2 2x NPS 1-1/2" Cl.150 RF, iron flange ASME B16.5 6E2 2x 40A 150lbs RF, Iron, flange JPI 7S-15 6G2 2x 20K 40A RF, Iron, flange JIS B2220 6J2 2x NPS 1-1/2" Cl.300 RF, iron flange ASME B16.5 6L2 2x 40A 300lbs RF, Iron, flange JPI 7S-15 999 Special version, TSP-no. to be spec.
140	Seal Pot:
	A Rp1-1/2, Alu + Iron, thread JIS B0203 B Rp1-1/2, SCS14 + SUS316,thread JIS B0203 C NPT1-1/2, Alu + Iron, thread ANSI D NPT1-1/2, SCS14 + SUS316, thread ANSI E 10K 40A RF, Alu + Iron, flange JIS B2220 F 10K 40A RF, SUS316, flange JIS B2220 G NPS 1-1/2" Cl.150 RF, Alu+iron flange ASME B16.5 H NPS 1-1/2" Cl.150 RF, SUS316 flange ASME B16.5 J 40A 150lbs RF, Alu + Iron, flange JPI 7S-15 K 40A 150lbs RF, SUS316, flange JPI 7S-15 N 10K 40A FF, PVC, flange JIS B2220 P NPS 1-1/2" Cl.150 FF, PVC flange ASME B16.5 Q 40A 150lbs FF, PVC, flange JPI 7S-15 Y Special version, TSP-no. to be spec. 0 Not selected
150	Valve:
	0 Not selected 1 10K 40A RF, SCS13, flange JIS B2220 2 NPS 1-1/2" Cl.150 RF, SCS13 flange ASME B16.5 3 40A 150lbs RF, SCS13, flange JPI 7S-15 4 20K 40A RF, SCS13, flange JIS B2220 5 NPS 1-1/2" Cl.300 RF, SCS13 flange ASME B16.5 flange ASME B16.5 6 40A 300lbs RF, SCS13, flange JPI 7S-15 9 Special version, TSP-no. to be spec.
570	>> Service:
	H1 Cleaned (neutral detergent) H2 Cleaned (alcohol) H3 Separate delivery, see additional spec. H9 Special version, TSP-no. to be spec.

580	>> Test, Certificate:
	JA 3.1 Material certificate, wetted metallic parts, EN10204-3.1 inspection certificate J1 Calibration report J2 PT certificate J3 Delivery specifications document J4 As built drawing J5 Traceability document J6 Certificate of origin J7 Inspection procedure document J8 Strength calculation document K1 Wall thickness measurement K2 KHK approval K9 Special version, TSP-no. to be spec.
610	>> Accessory Mounted:
	NA Copper-free gear NB Custody transfer seal NC Fixed tape guide ND Dust protector NE Conster drum large, Alu O9 Special version, TSP-no. to be spec.
620	>> Accessory Enclosed:
	PA Gauge supporter, Iron PB Gauge supporter, SUS304, PC Gauge supporter, Iron, high pressure PD Gauge supporter, SUS304, high pressure PE FRT Wire guide metal PF Wire guide socket, RC1-1/2 PG Wire guide socket, NPT1-1/2 PH Gas holder wire hook R9 Special version, TSP-no. to be spec.
895	>> Marking:
	Z1 Tagging (TAG), see additional spec.
LT5-	Complete product designation

Crank Device

Crank Device

A crank is attached to the gauge head and enables the float to be raised or, lowered, manually. This is particularly useful on large tanks or other situations where turbulence is expected.



Figure 18: Crank Device

Seal Pot

Seal Pot

Seal pots prevent toxic or corrosive vapors from escaping the tank through the gauge installation.

- Liquid paraffin or spindle oil: 1150cc
- Max seal pressure: 400mmH₂O
- Shape: U-shape
- Process connection: thread or flange
- Material: AC4A+SGP, SUS 316 or PVC

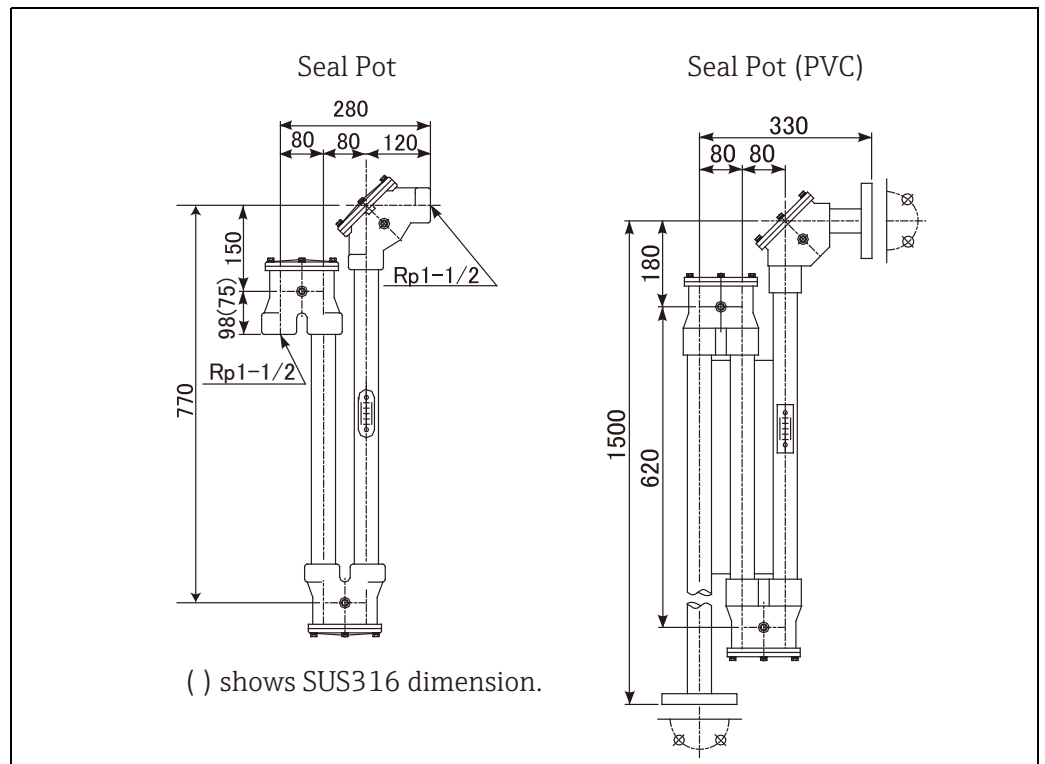


Figure 19: Seal Pot

Gauge Supporter

Gauge Supporter

Gauge supporter is used to attach to the outer wall of the tank.

i Distance between outer tank wall and gauge head (LT5-6 for high pressure) is 15mm greater than for that of LT5-1 (for low pressure) and LT5-4 (for medium pressure).

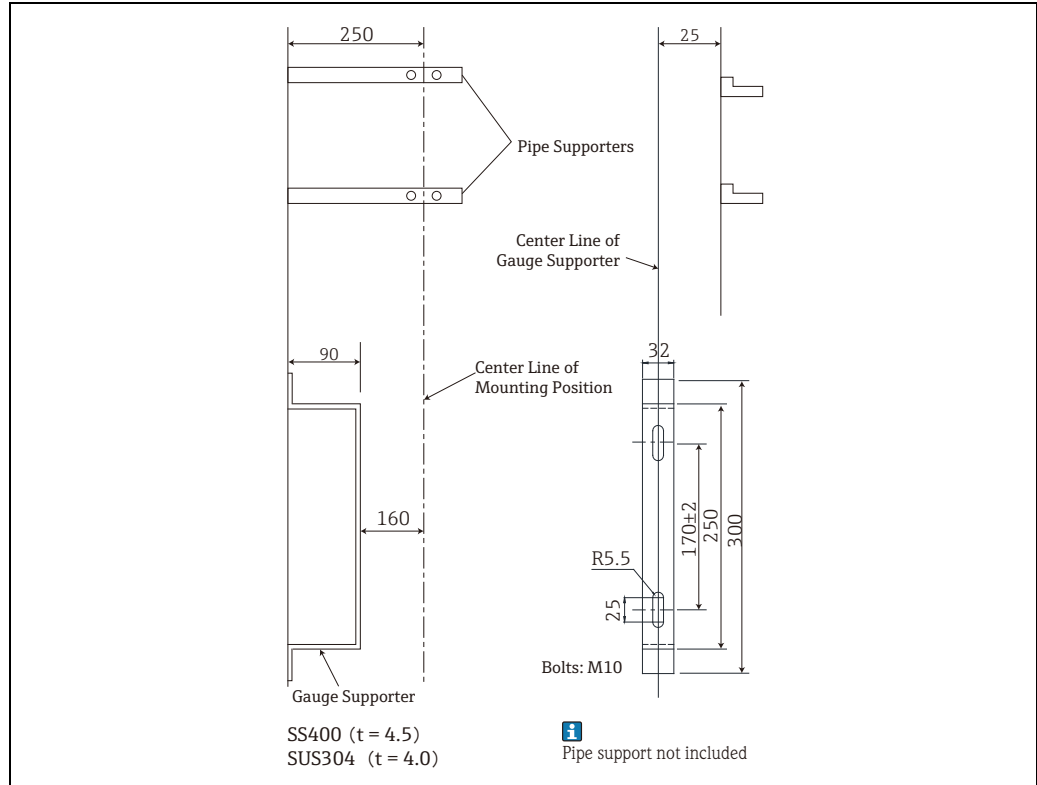


Figure 20: Gauge Supporter for Low/Medium Pressure

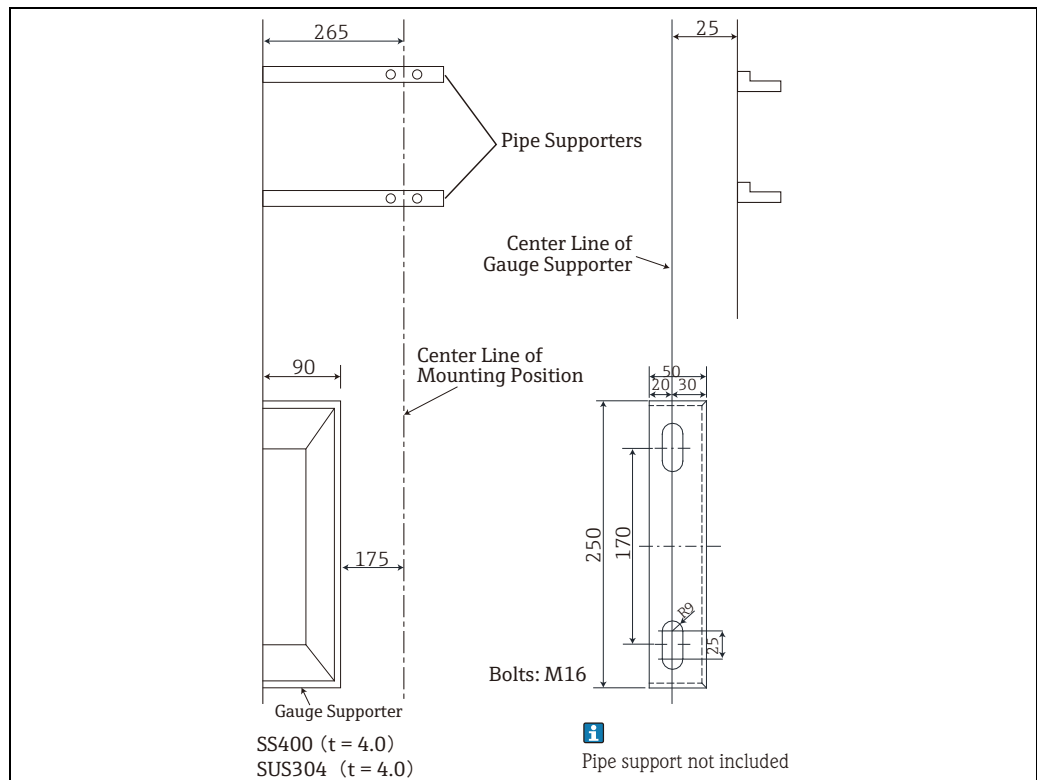


Figure 21: Gauge Supporter for High Pressure

Options

Options

Order Code: 610 Accessory

NA: Copper-free gear	Aluminum or stainless steel, in place of copper, is available for gear unit; an ideal choice for applications containing ammonia. Sealant for magnet coupling and drain plug are changed to CR from NBR.
NB: Custody transfer seal	Applies in main body rear cover bolts and in display cover bolts. Subsequent to bonded approval, a displacer wire for sealing may be inserted.
NC: Fixed tape guide	Prevents measuring tape from derailing from the tape drum; effective in applications where float hunting may occur.
ND: Dust protector	Prevents dust, caused by iron pipe, from entering internal workings of gauge head. Supplied as standard.
NE: Conster drum large, Alu	Aluminum conster drum option. Effective for applications in which bakelite conster drums can not be used. Aluminum conster drums are standard fro LT5-4 and LT5-6.

Order Code: 620 Accessory

PE: FRT Wire Guide Metal	Wire guide made from PTFE and installed in floating roofs to prevent measuring wire from contacting and scraping roof (refer to Figure 23: Wire Guide Metal).
PF: Wire guide socket, RC1-1/2 PG: Wire guide socket, NPT1-1/2	Wire guide socket made from PVC and installed in floating roof tanks or gas holding tank pipes; prevents measuring wire from contacting and rubbing on pipe (refer to Figure 23: Wire Guide Socket).
PH: Gas holder wire hook	Wire hook welded to gas holder tank and connected to measuring wire (refer to Figure 23: Wire Hook).

Special Anchor Weight

The anchor weight is used for maintaining guide wires, in applications where fixed anchors have not been installed.

- Material: SS400 or SUS316
- Weight: 23kg

NOTICE

When anchor weight is required, order it as TSP (special order).

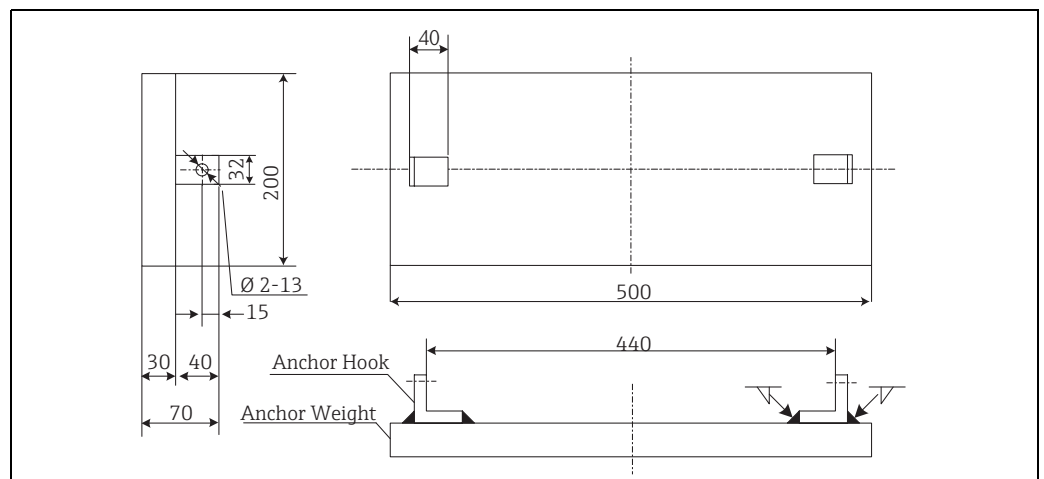


Figure 22: Anchor Weight

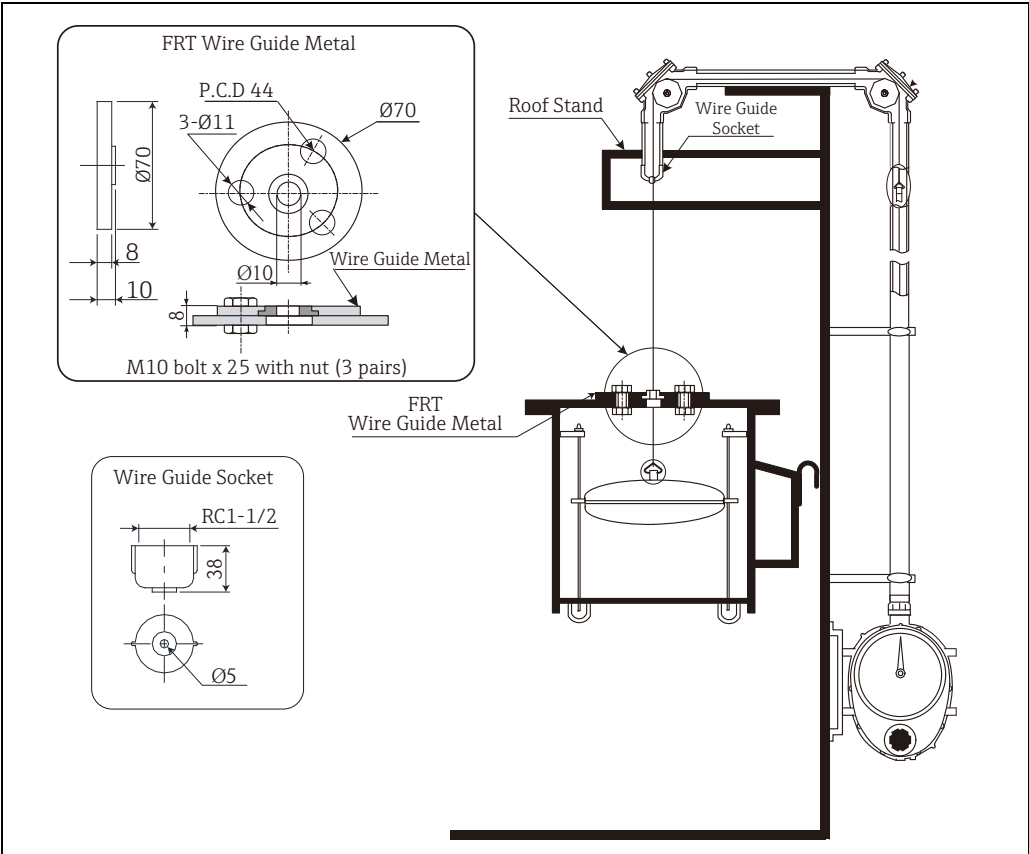


Figure 23: Wire Guide Metal and Wire Guide Socket

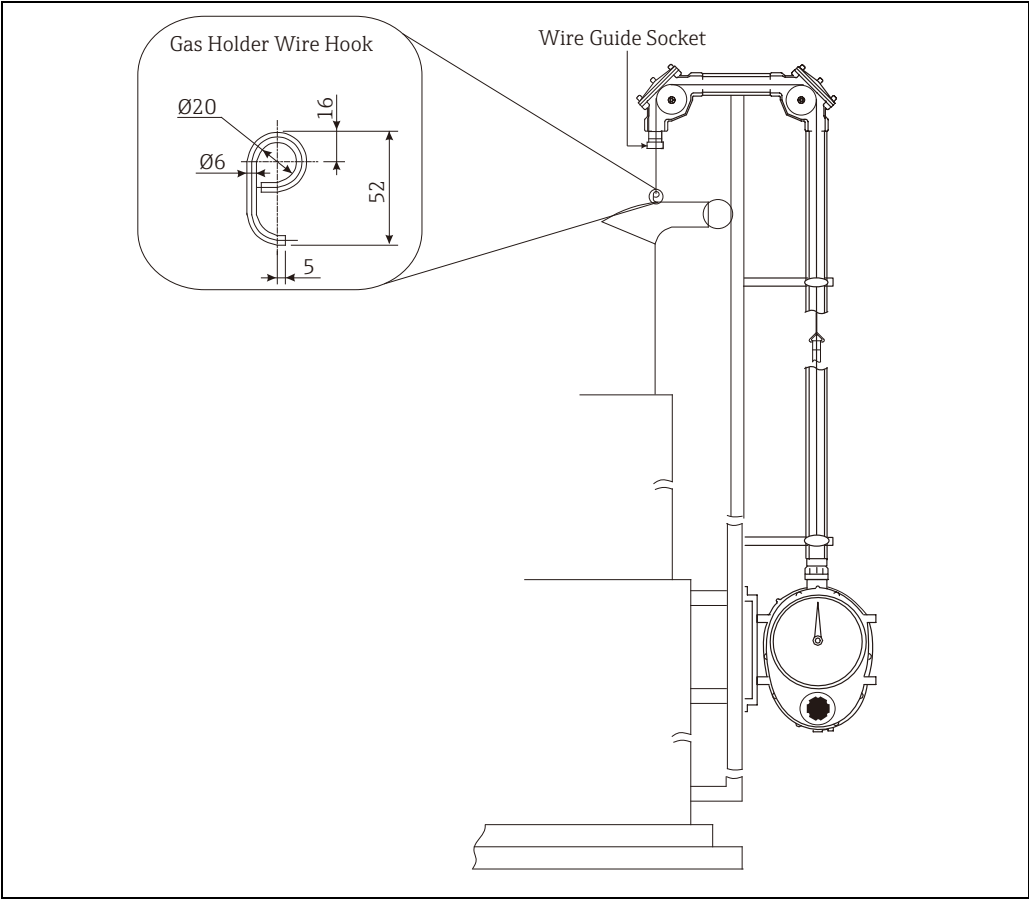


Figure 24: Wire Hook

Appendix

Materials Defined by Standards

Aluminum

Symbols	Descriptions
ADC12	Aluminum Alloy Die Casting (Si-Si-Cu)
AC4CT6	Aluminum Alloy Casting (Si7Mg)
AC4A	Aluminum Alloy Casting (Si10Mg)

Stainless Steel

Symbols	Descriptions
SUS304	Stainless Steel (18Cr-8Ni)
SUS316	Stainless Steel (18Cr-12Ni-2.5Mo)
SCS13	Stainless Steel Cast Steel equivalent to SUS304
SCS14	Stainless Steel Cast Steel equivalent to SUS316

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