



Level



Pressure



Flow



Temperature

Liquid
Analysis

Registration

Systems
Components

Services



Solutions

Technical Information

LT11/LT12/LT14/LT16

Float Gauge

Mechanical Tank Gauge for Accurate and Reliable Level Measurement



Application

LT series float gauges have been developed for use in all areas of industry. Many years of operation 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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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.

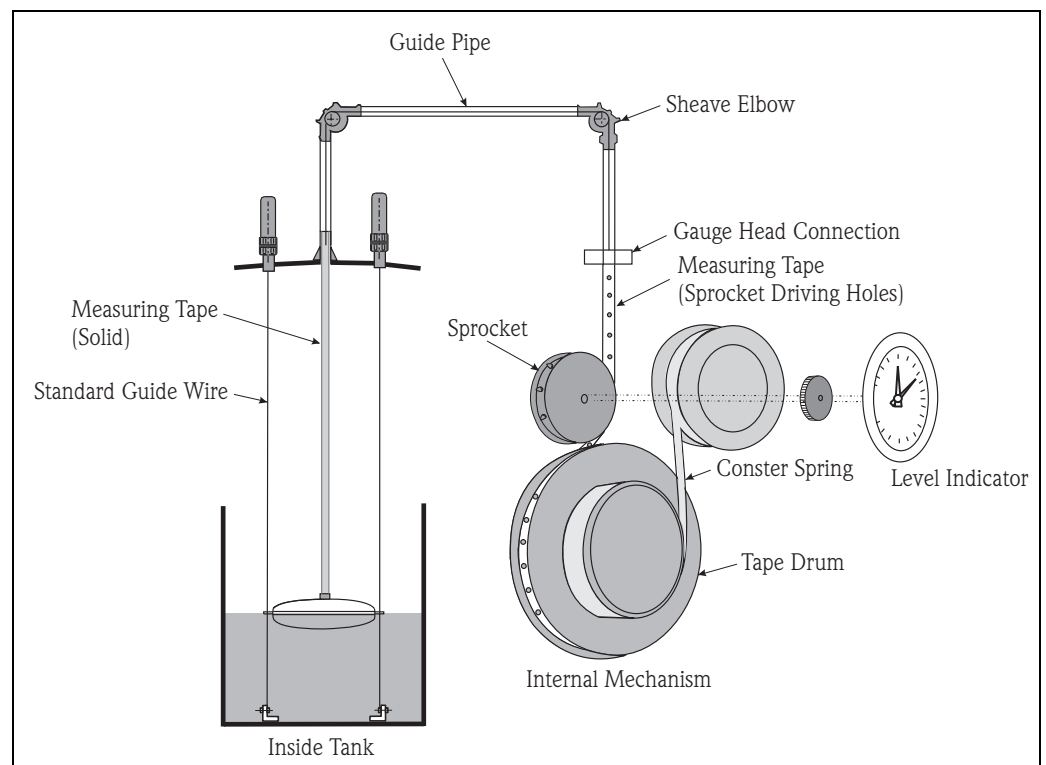


Figure 1: System Layout

Combine with Analog Transmitter

AT1

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

AT500

- 6 points alarm signal output

Combine with Digital Transmitter

TMD1

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

Performance Characteristics

Measuring Ranges

Product Roots	Measuring Range
LT11/LT12/LT14/LT16	0 - 2.5, 5, 10, 16, 20, 30m

Accuracy

Product Roots	Measuring Range
LT11/LT12/LT14/LT16	±2mm (Under the condition of; specific gravity: 1g/cm ³ , measuring range; 10m)
LT11 Application (060) ...005, 008	±30mm (Under the condition of; specific gravity: 1g/cm ³ , measuring range; 10m)

Maximum Operating Pressure

Product Roots	Measuring Range
LT11 (threaded type for low pressure)	19.61kPa (0.2kgf/cm ²)
LT12 (flange type for low pressure)	19.61kPa (0.2kgf/cm ²)
LT14 (flange type for middle pressure)	98.07kPa (1kgf/cm ²)
LT16 (flange type for high pressure)	2.45MPa (25kgf/cm ²), *2.0MPa (in case of SUS304 bolt)



Note!

Enabled pressure varies depending on the flange specifications.

Operating Temperature Limits

Product Roots	Measuring Range
LT11/LT12	Wetted parts: -200~+200°C Gauge head: -20~+70°C
LT14/LT16	Wetted parts: -45~+80°C Gauge head: -20~+70°C

Operating Conditions: Installation

Cone Roof Tank (CRT)

LT11

Gauge head, sheave elbow and top anchor of LT12 are connected with flange.

Refer to page 15 "Process Connection" list.

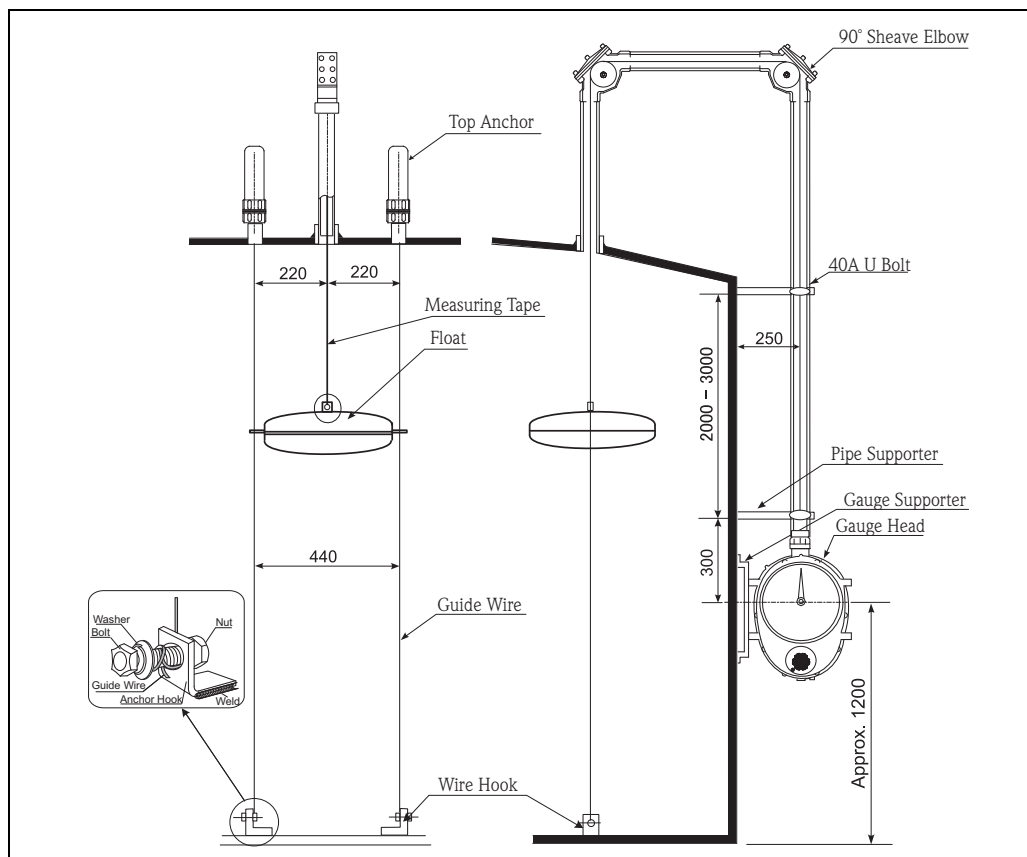


Figure 2: Cone Roof Tank (CRT)

Application (060)

LT11		Wetted parts	Wetted parts : SUS316	Wetted parts:SUS316, Top anchor:SUS316
Application	without Crank unit	A01	A04	A06
	with Crank unit	B01	B01	B06
	Guide wire	Single wire	Single wire	Single wire
Item	Material/Quantity		Material/Quantity	Material/Quantity
Gauge head (threaded 1 1/2)	Outer coating : ADC12/1		Outer coating : ADC12/1	Outer coating : ADC12/1
90° sheave elbow (threaded 1 1/2)	Outer coating : ADC6 / Roller : SUS316L/2		Outer coating: ADC6 / Roller : SUS316L/2	Outer coating : ADC6 / Roller : SUS316L/2
Top anchor	Outer coating : ADC6 / Inner coating : SUS316 (threaded 1) / 2		Outer coating : ADC6 / Inner coating : SUS316 (threaded 1) / 2	All SUS316 (Socket weld type) / 2
Float Ø400	Outer coating : SUS316/1		SUS316/1	SUS316/1
Guide wire	SUS316/2		SUS316/2	SUS316/2
Measuring tape	SUS316/1		SUS316/1	SUS316/1
Gauge supporter	SS400/1		SS400/1	SS400/1
Anchor hook	SS400/2		SUS316/2	SUS316/2
LT1200		Wetted parts	Wetted parts : SUS316	Wetted parts:SUS316, Top anchor:SUS316
Application	without Crank unit	A11	A14	A15
	with Crank unit	B11	B14	B15
	Guide wire	Single wire	Single wire	Single wire
Item	Material/Quantity		Material/Quantity	Material/Quantity
Gauge head (flange 1 1/2)	Outer coating : ADC12/1		Outer coating : ADC12/1	Outer coating : ADC12/1
90° sheave elbow (flange 1 1/2)	Outer coating : ADC6 / Roller : SUS316L/2		Outer coating : ADC6 / Roller : SUS316L/2	Outer coating : ADC6 / Roller : SUS316L/2
Top anchor (flange 1 1/2)	Outer coating : ADC6 / Inner : SUS316/2		Outer coating : ADC6 / inner coating : SUS316/2	All SUS316/2
Float Ø400	SUS316/1		SUS316/1	SUS316/1
Guide wire	SUS316/2		SUS316/2	SUS316/2
Measuring tape	SUS316/1		SUS316/1	SUS316/1
Gauge supporter	SS400/1		SS400/1	SS400/1
Anchor hook	SS400/2		SUS316/2	SUS316/2

Tank Top Mount (Underground Tank)

LT11

Gauge head, sheave elbow, seal pot, and top anchor of LT11 are connected with threaded.

Refer to page 15 "Process Connection" list.

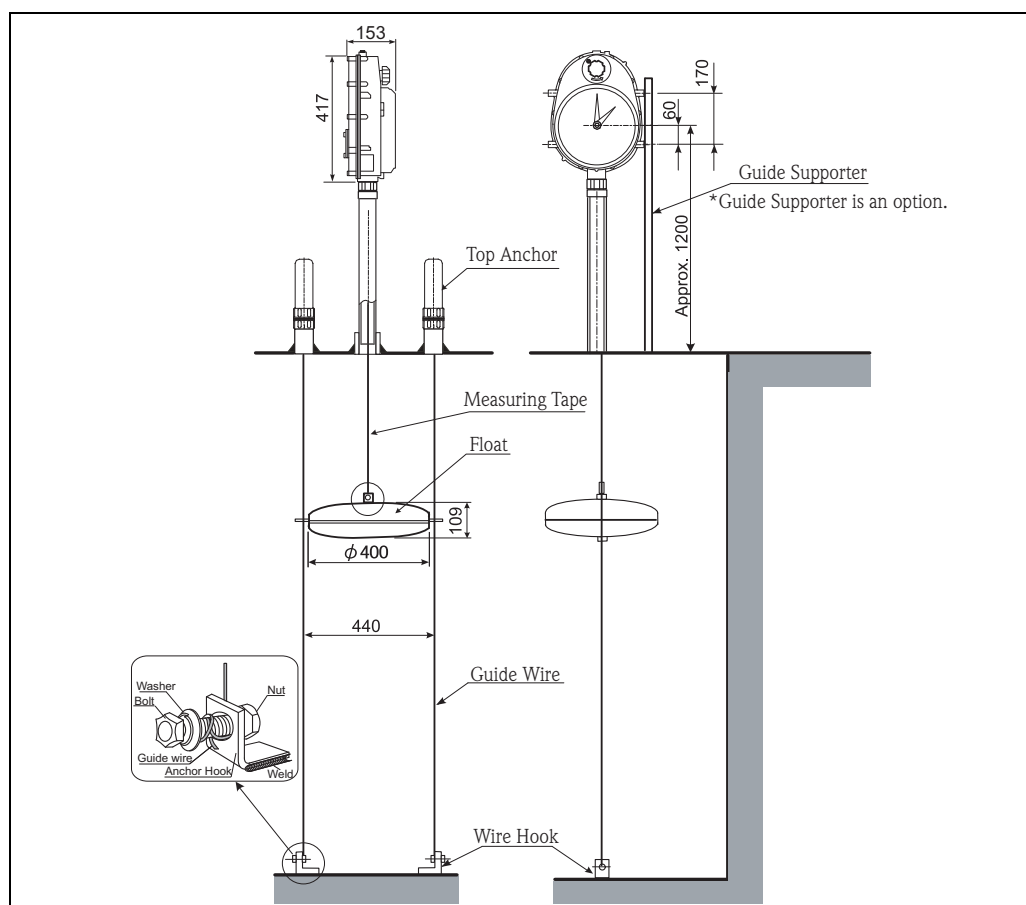


Figure 3: Tank Top Mount (Underground Tank)

Application (060)

LT11		Wetted parts	Wetted parts:SUS316, Top anchor:SUS316
Application	without Crank unit	A07	A10
	with Crank unit	C07	C10
	Guide wire	Single wire	Single wire
Item		Material/Qty.	Material/Qty.
Gauge head (threaded 1 1/2)		Outer coating : ADC12 (inverted mounting) /1	Outer coating : ADC12 (inverted mounting) /1
Top anchor		Outer coating : ADC6 / Inner coating : SUS316 (threaded) /2	All SUS316 (Socket weld type) /2
Float Ø400		SUS316/1	SUS316/1
Guide wire		SUS316/1	SUS316/1
Measuring tape		SUS316 (all hole) /1	SUS316 (all hole) /1
Anchor hook		SS400/2	SUS316/2

LT1200		Wetted parts	Wetted parts:SUS316, Top anchor:SUS316
Application	without Crank unit	A40	A43
	with Crank unit	B40	B43
	Guide wire	Single wire	Single wire
Item		Material/Quantity	Material/Quantity
Gauge head		Outer coating : ADC12 (inverted mounting) /1	Outer coating : ADC12 (inverted mounting) /1
Top anchor (flange 1 1/2)		Outer coating : ADC6 / Inner coating : SUS316/2	All SUS316/2
Float Ø400		SUS316/1	SUS316/1
Guide wire		SUS316/2	SUS316/2
Measuring tape		SUS316 (all hole) /1	SUS316 (all hole) /1
Anchor hook		SS400/2	SUS316/2

Cone Roof Tank (CRT) with Seal Pot

LT12

Gauge head, sheave elbow, seal pot, and top anchor of LT11 are connected with threaded.

Refer to page 15 "Process connection" list.

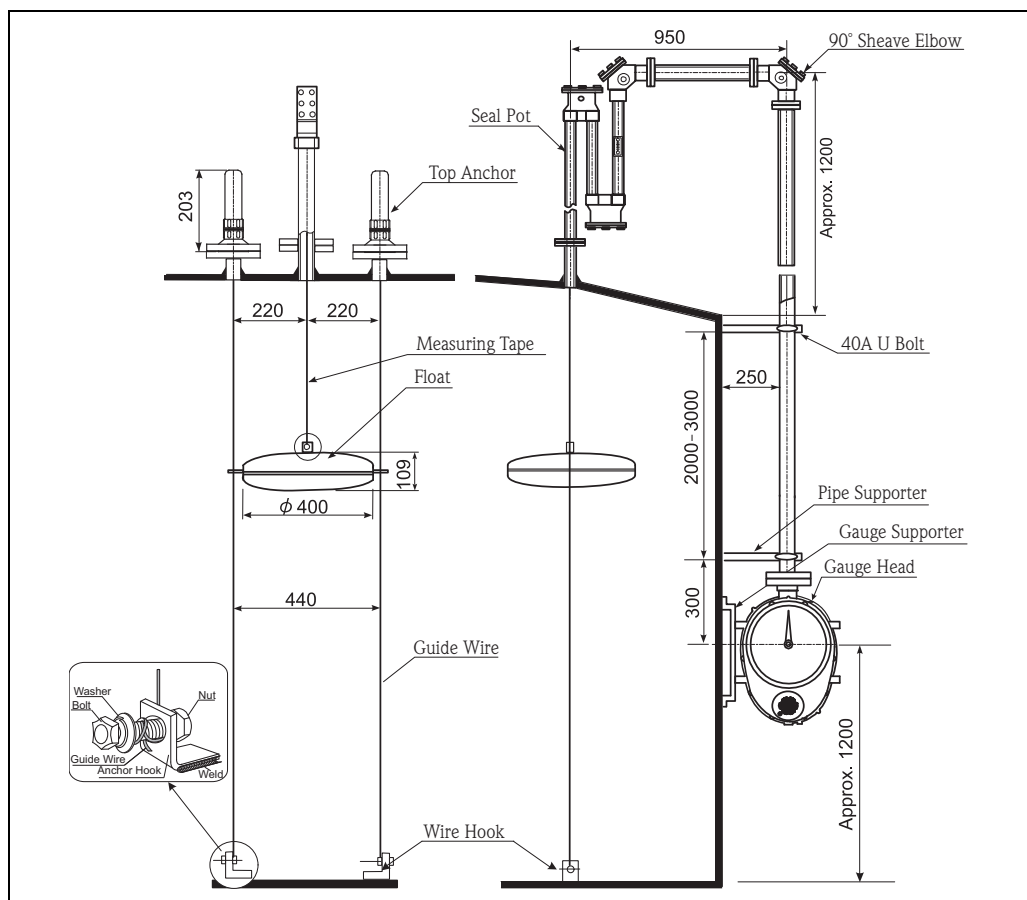


Figure 4: Cone Roof Tank with Seal Pot

Application (060)

LT11		Wetted parts		Wetted and gas parts: SUS316	
Application	without Crank unit	A50		A54	
	with Crank unit	B50		B54	
	Guide wire			Single wire	
Item		Material/Qty.		Material/Qty.	
Gauge head (threaded 1 1/2)		Outer coating : ADC12/1		Outer coating : ADC12/1	
Seal pot (threaded 1 1/2)		Outer coating : ADC, AC, SGP / Roller : SUS316L/2		Outer coating : SCS14, SUS316 / Roller : SUS316L/1	
90°sheave elbow (threaded 1 1/2)		Outer coating : ADC6 / Roller : SUS316L/1		Outer coating : ADC6 / Roller : SUS316L/1	
Top anchor		Outer coating : ADC6 / Inner coating : SUS316 (threaded 1") / 2		All SUS316 (Socket weld type) / 2	
Float Ø400		SUS316/1		SUS316/1	
Guide wire		SUS316/2		SUS316/2	
Measuring tape		SUS316/1		SUS316/1	
Gauge supporter		SS400/1		SS400/1	
Anchor hook		SS400/2		SUS316/2	

LT12		Wetted parts		Wetted and gas parts: SUS316	
Application	without Crank unit	A55		A59	
	with Crank unit	B55		B59	
	Guide wire	Single wire		Single wire	
Item		Material/Qty.		Material/Qty.	
Gauge head (flange 1 1/2)		Outer coating : ADC12/1		Outer coating : ADC12/1	
Seal pot (flange 1 1/2)		Outer coating : ADC, AC, SGP / Roller : SUS316L/1		Outer coating : SCS14, SUS316 / Roller : SUS316L/1	
90°sheave elbow (flange 1 1/2)		Outer coating : ADC6 / Roller : SUS316L/1		Outer coating : ADC6 / Roller : SUS316L/1	
Top anchor (flange 1 1/2)		Outer coating : ADC6 / Inner coating : SUS316/2		All SUS316/2	
Float Ø400		SUS316/1		SUS316/1	
Guide wire		SUS316/2		SUS316/2	
Measuring tape		SUS316/1		SUS316/1	
Gauge supporter		SS400/1		SS400/1	
Anchor hook		SS400/2		SUS316/2	

Cone Roof Tank (CRT)
with Seal Pot PVC

LT12

For LT11, gauge head and 90° Sheave elbow is connected with threaded, seal pot and top anchor are connected with flange.

Refer to page 15 "Process connection" list.

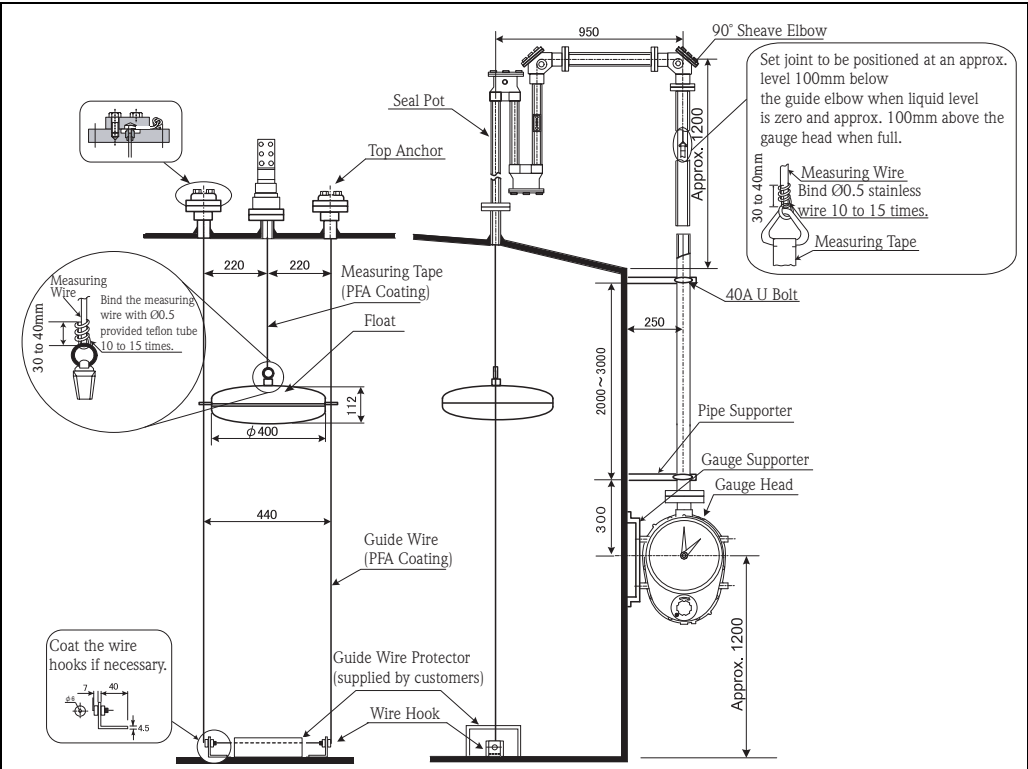


Figure 5: Cone Roof Tank with Seal Pot PVC

Application (060)

LT11		Wetted parts:PVC,SS400, Gas parts:PVC,PFA	Wetted parts:PVC,SUS316, Gas parts:PVC,PFA
Application	without Crank unit	060	062
	Guide wire	Stranded wire	Stranded wire
Item		Material/Qty.	Material/Qty.
Guage head (threaded 1 1/2)		Outer coating : ADC12/1	Outer coating : ADC12/1
Seal pot (flange1 1/2)		Outer coating :PVC / Roller : PVC/1	Outer coating : PVC / Roller : PVC/1
90°sheave elbow (threaded 1 1/2)		Outer coating : ADC6 / Roller : SUS316L/1	outer coating : ADC6 / Roller : SUS316L/1
Top anchor (flange1 1/2)		All PVC/2	All PVC/2
Float Ø400		PVC/1	PVC/1
Guide wire		SUS316 (PFA coating)/1	SUS316 (PFA coating)/1
Meas. Wire + Meas. Tape		SUS316(PFA coating) + SUS316/1	SUS316(PFA coating)+SUS316/1
Gauge		SS400/1	SS400/1
Wire hook		SS400 + PVC/2	SUS316 + PVC/2

LT12		Wetted parts:PVC,SS400,Gas parts:PVC,PFA	Wetted parts:PVC,SUS316, Gas parts:PVC,PFA
Application	without Crank unit	061	063
	Guide wire	Stranded wire	Stranded wire
Item		Material/Qty.	Material/Qty.
Guage head (flange 1 1/2)		Outer coating : ADC12/1	Outer coating : ADC12/1
Seal pot (flange 1 1/2)		Outer coating : PVC / Roller : PVC/1	Outer coating : PVC / Roller : PVC/1
90°sheave elbow (flange 1 1/2)		Outer coating : ADC6 / Roller : SUS316L/1	Outer coating : ADC6 / Roller : SUS316L/1
Top anchor (flange 1 1/2)		All PVC/2	All PVC/2
Float Ø400		PVC/1	PVC/1
Guide wire		SUS316 (PFA coating)/1	SUS316 (PFA coating)/1
Meas. Wire + Meas. Tape		SUS316(PFA coating) + SUS316/1	SUS316(PFA coating) + SUS316/1
Guage supporter		SS400/1	SS400/1
Wire hook		SS400 + PVC/2	SUS316 + PVC/2

Tank Top Mount
(Guide Pipe Method)

LT11

Refer to page 15 "Process connection" list.

Note!
When hoisting up and down the float by using a crank unit, perform it slowly to prevent the float sticking from the guide pipe.

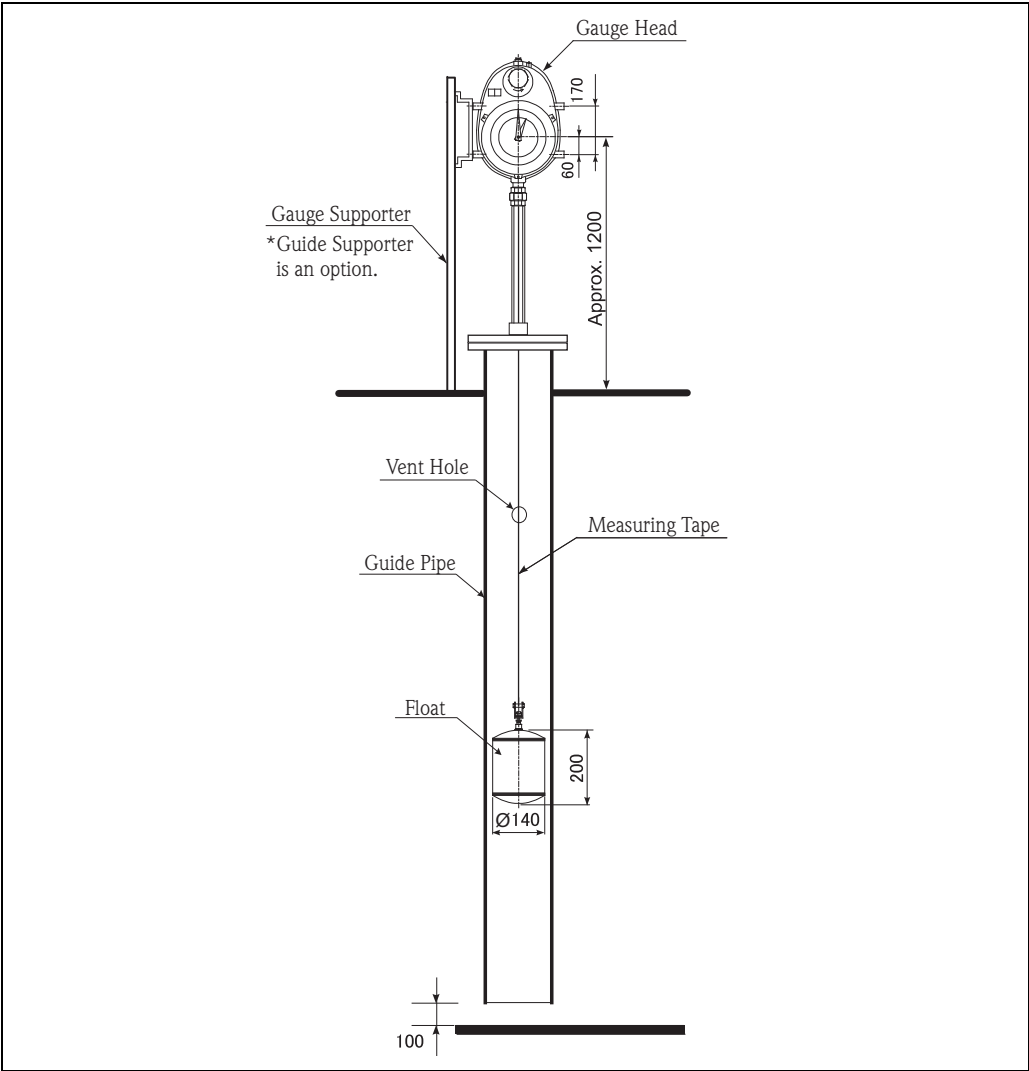


Figure 7: Tank Top Mount (Guide Pipe Method)

Application (060)

LT11	Max.10m/Guide pipe
Application	008
Item	Material/Qty.
Guage head	Outer coating : ADC12 (inverted mounting)/1
Float Ø140	SUS316/1
Measuring tape	SUS316/1

Gas Holder**LT11**

Guide head and 90°sheave elbow of LT12 are connected with flange.

Refer to page 15 "Process connection" list.

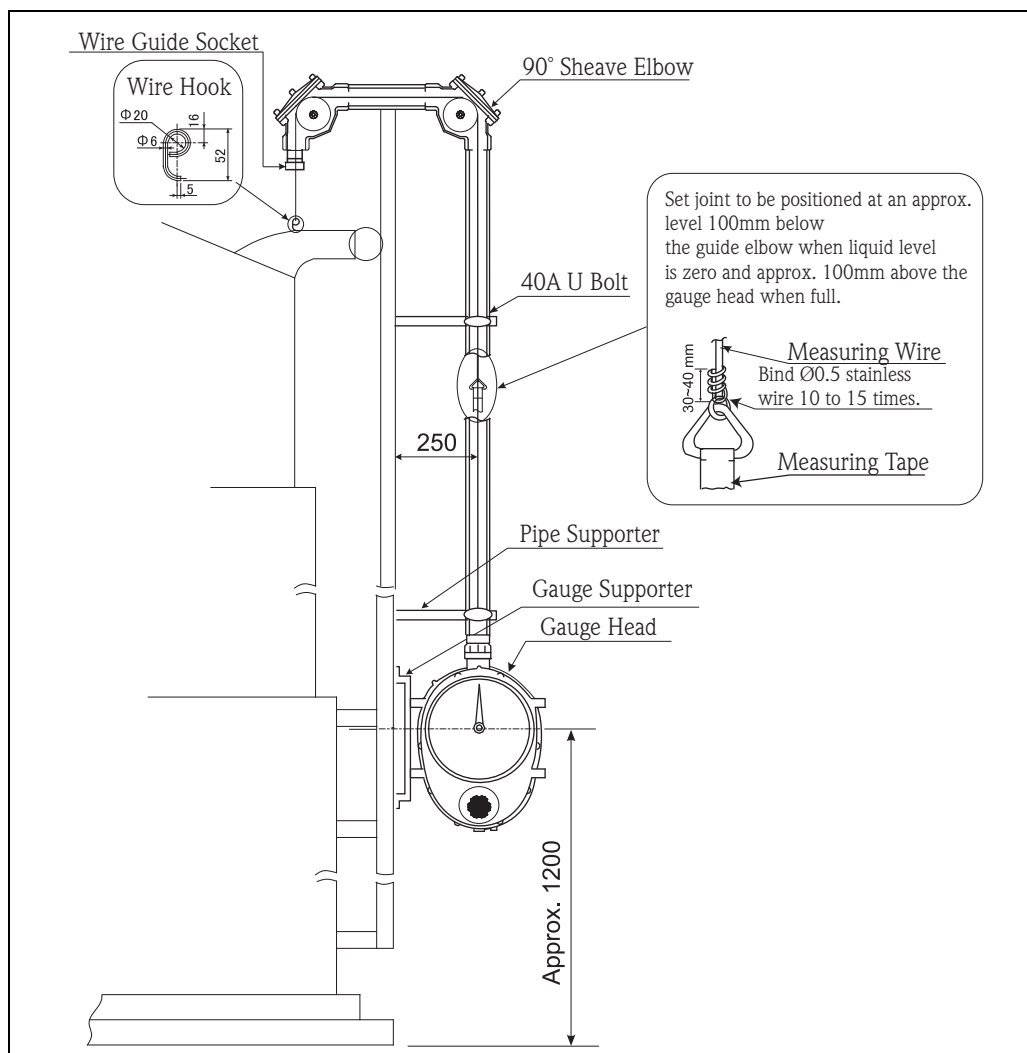


Figure 8: Gas Holder

Application (060)

	LT11	LT12
Application	251	252
Item	Material/Qty.	Material/Qty.
Gauge head	Outer coating : ADC12/1	Outer coating : ADC12/1
90°sheave elbow	Outer coating : ADC6/ Roller : SUS316L (threaded 1 1/2) /2	Outer coating : ADC6 / Roller : SUS316L (flange 1 1/2) /2
Meas. wire + Meas. Tape	SUS316+SUS316/1	SUS316+SUS316/1
Gauge supporter	SS400/1	SS400/1
Measuring wire hook	SS400/1	SS400/1
Wire guide socket (threaded 1 1/2)	Casting iron + PVC/1	Casting iron + PVC/1

Floating Roof Tank (FRT)
LT11/LT12

Gauge head and sheave elbow of
LT12 are connected with flange.

Refer to page 15 "Process connection"
list.

LT11

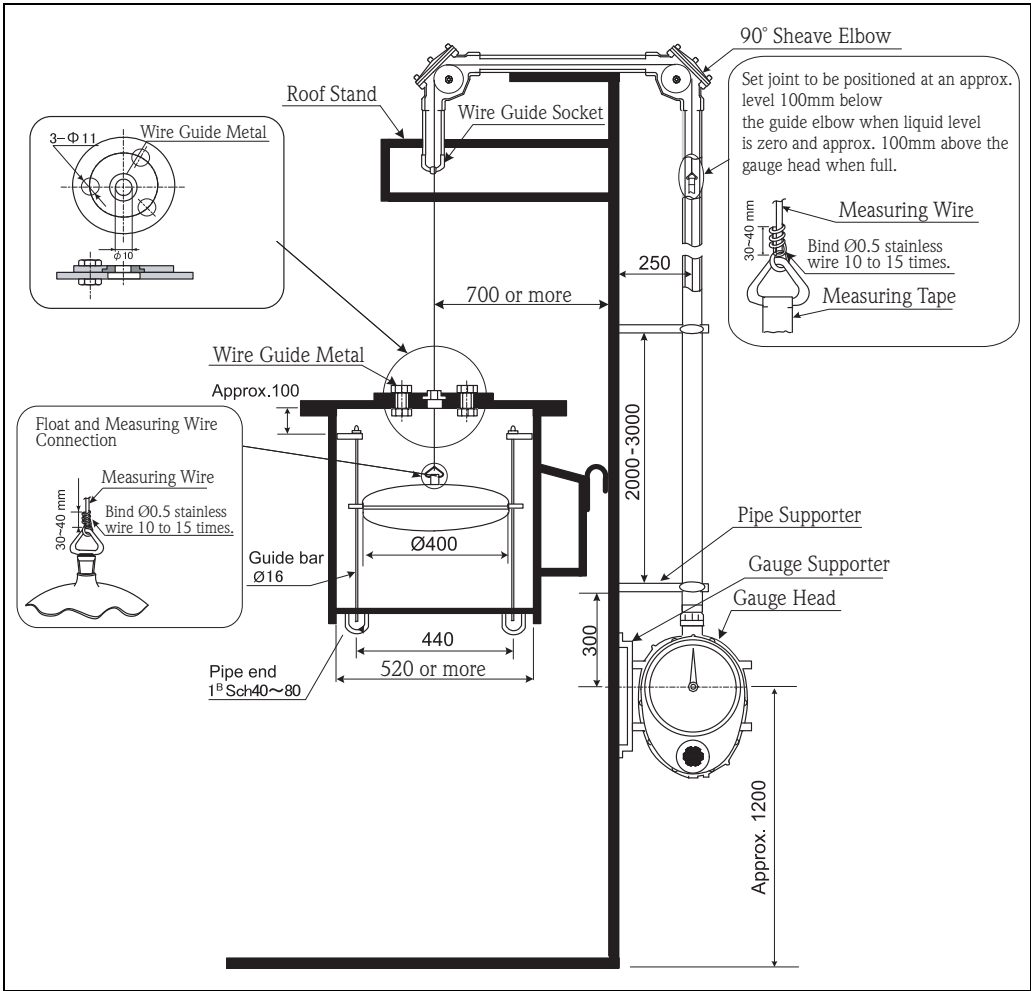


Figure 9: Floating Roof Tank

Application (060)

Application	LT11	LT12
	261	262
Item	Material/Qty.	Material/Qty.
Guage head	Outer coating : ADC12/1	Outer coating ADC12/1
90°sheave elbow	Outer coating : ADC6/ Roller : SUS316L (threaded 1 1/2)/2	Outer coating : ADC6 / Roller : SUS316L (flange 1 1/2)/2
Float Ø400	SUS316/1	SUS316
Meas. Wire + Meas. Tape	SUS316 + SUS316/1	SUS316 + SUS316/1
Gauge suppoter	SS400/1	SS400/1
Wire guide metal (flange)	SS400 + PTFE/1	SS400 + PTFE/1
Wire guide socket	Casting iron + PVC/1	Casting iron + PVC/1

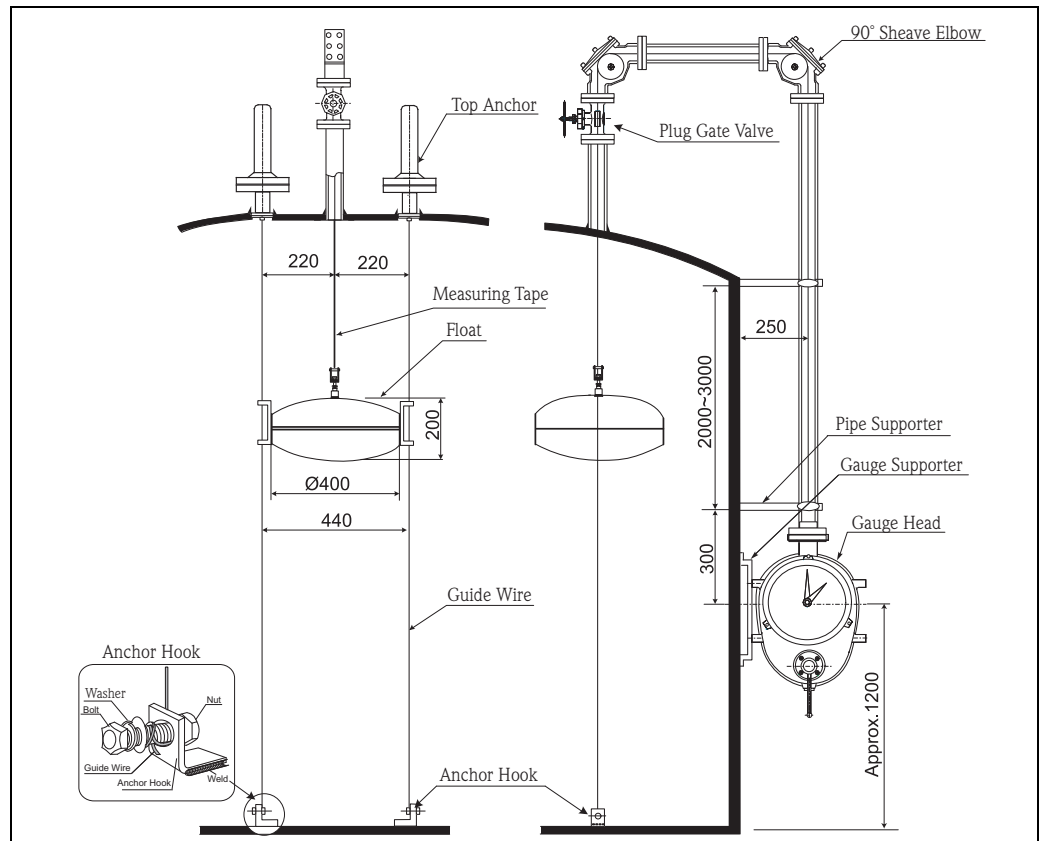
**Doom Roof Tank
(Medium Pressure)**
LT14


Figure 10: Doom Roof Tank for Medium Pressure

Application (060)

LT14				
Tank Shape/ Application		Nonspherical Tank	Spherical Tank	Spherical Tank
		Wetted Parts: SUS316	Wetted Parts: SUS316	Wetted Parts: SUS316 Outer Coating: SCS13
Application	without Crank Unit	040	078	041
	with Crank Unit	094	098	095
Item		Material/Quantity	Material/Quantity	Material/Quantity
Gauge Head		Outer Coating: AC4CT6	Outer Coating: AC4CT6	Outer Coating: SCS13
Float Ø400		SUS316	SUS316	SUS316
Plug Gate Valve (Flange 1-1/2)		Outer Coating: AC4CT6	Outer Coating: AC4CT6	Outer Coating: SCS13
90° Sheave Elbow (Flange 1-1/2)		Outer Coating: AC4CT6 Roller: SUS316L (2pcs.)	Outer Coating: AC4CT6 Roller: SUS316L (1pc.)	Outer Coating: SCS13 Roller: SUS316L (1pc.)
135° Sheave Elbow (Flange 1-1/2)			Outer Coating: AC4CT6 Roller: SUS316L (1pc.)	Outer Coating: SCS13 Roller: SUS316L (2pcs.)
Measuring Tape		SUS316	SUS316	SUS316
Top Anchor (Flange 1-1/2)		Outer Coating: AC4CT6 Inner Coating: SUS316	Outer Coating: AC4CT6 Inner Coating: SUS316	Outer Coating: SUS316 Inner Coating: SUS316
Guide Wire (Single Wire)		SUS316	SUS316	SUS316
Anchor Hook		SUS316	SUS316	SUS316

Spherical Tank
(High Pressure)

LT16

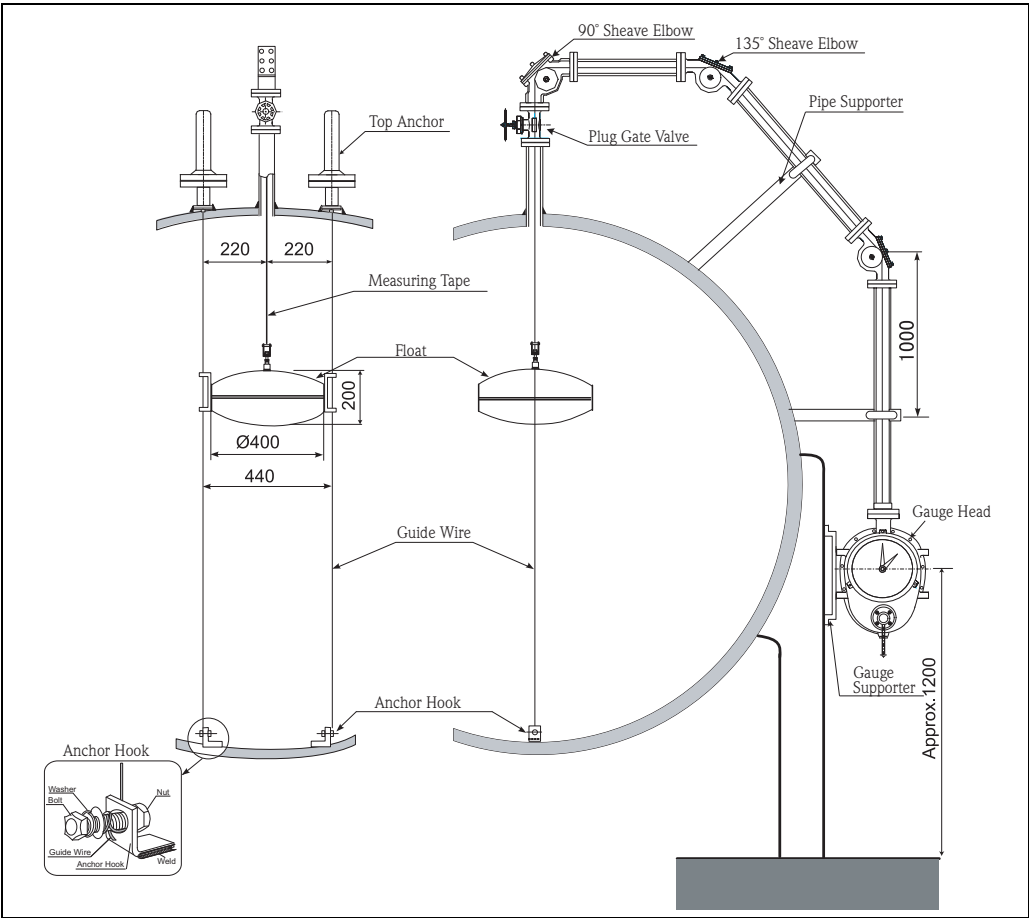


Figure 11: Spherical Tank for High Pressure

Application (060)

LT16				
Tank Shape/ Application		Nonspherical Tank	Spherical Tank	Pressure Tank/Tank Top Mounting
		Wetted Parts: SUS316	Wetted Parts: SUS316	Wetted Parts: SUS316
Application	without Crank Unit	042	043	044
	with Crank Unit	096	097	
Item		Material/Quantity	Material/Quantity	Material/Quantity
Gauge Head		SCPL1	SCPL1	SCPL1
Float Ø400		SUS316	SUS316	SUS316
Plug Gate Valve (Flange 1-1/2)		Outer Coating: SCS13	Outer Coating: SCS13	Outer Coating: SCS13
90° Sheave Elbow (Flange 1-1/2)		Outer Coating: SCPL1 Roller: SUS304 (1pc.)	Outer Coating: SCPL1 Roller: SUS304 (2pcs.)	
135° Sheave Elbow (Flange 1-1/2)		Outer Coating: SCPL1 Roller: SUS304 (2pcs.)		
Measuring Tape		SUS316	SUS316	SUS316
Top Anchor (Flange 1-1/2)		Outer Coating: STPL380, S25C Inner Coating: SUS316	Outer Coating: STPL380, S25C Inner Coating: SUS316	Outer Coating: STPL380, S25C Inner Coating: SUS316
Guide Wire (Single Wire)		SUS316	SUS316	SUS316
Anchor Hook		SUS316	SUS316	SUS316

Mechanical Construction (Design and Dimension)

LT11 (Threaded Type, Low Pressure)

040	Gauge Head		Sheave Elbow	Seal Pot	Top Anchor (except Socket Type)	Top Anchor/Seal Pot (PVC)
0	Rp 1-1/2	Without Union	Rp 1-1/2	Rp 1-1/2	R1	10K 40A FF JIS
A	Rc 1-1/2	With Union	Rp 1-1/2	Rp 1-1/2	R1	10K 40A FF JIS
B	NPT1-1/2	With Union	NPT1-1/2	NPT1-1/2	NPT1	150lbs 1-1/2 FF ANSI
C	G1-1/2	With Union	Rp 1-1/2	Rp 1-1/2	R1	10K 40A FF JIS

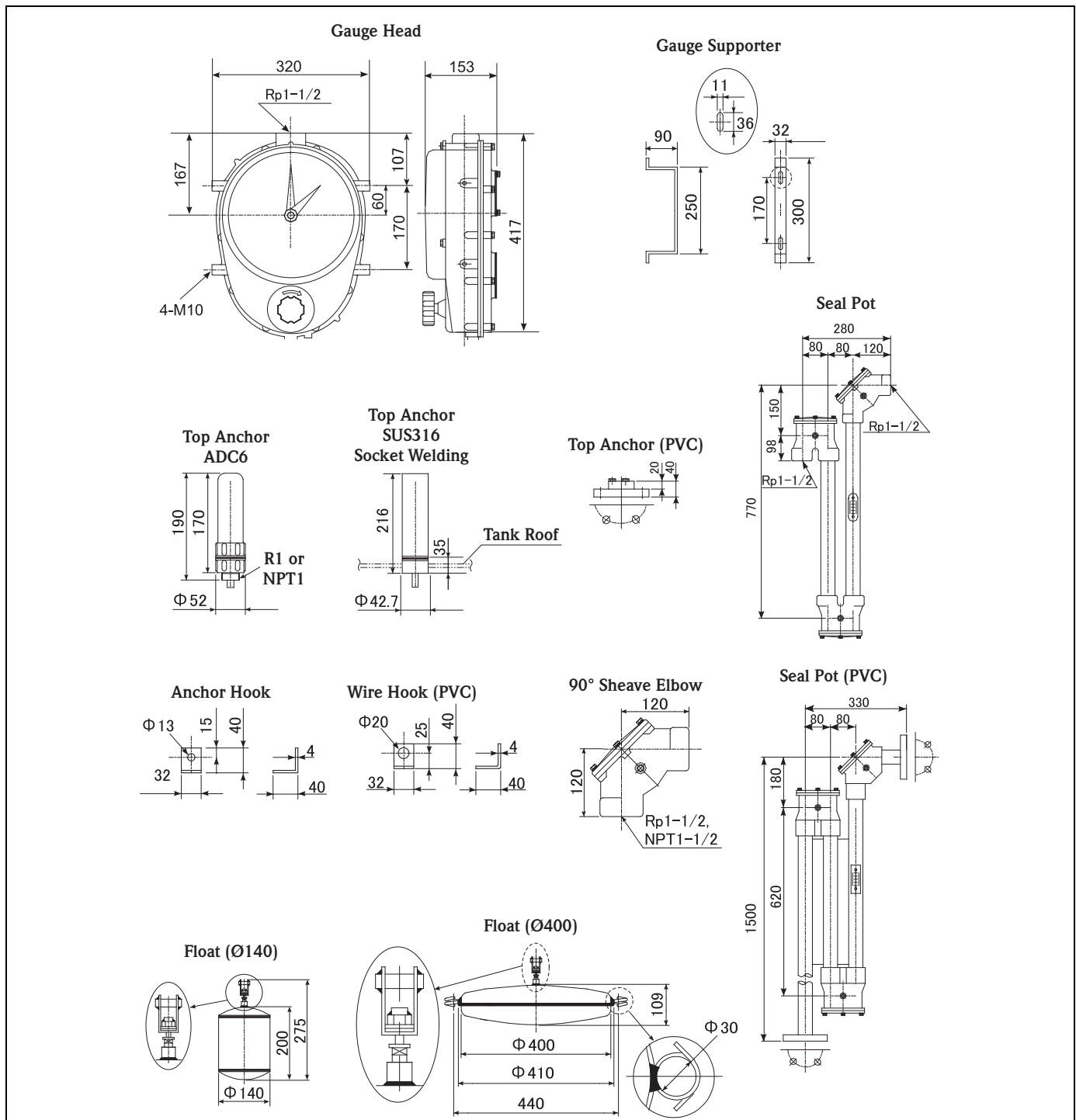


Figure 12: Dimensions of LT11

LT12
(Flange Type, Low Pressure)

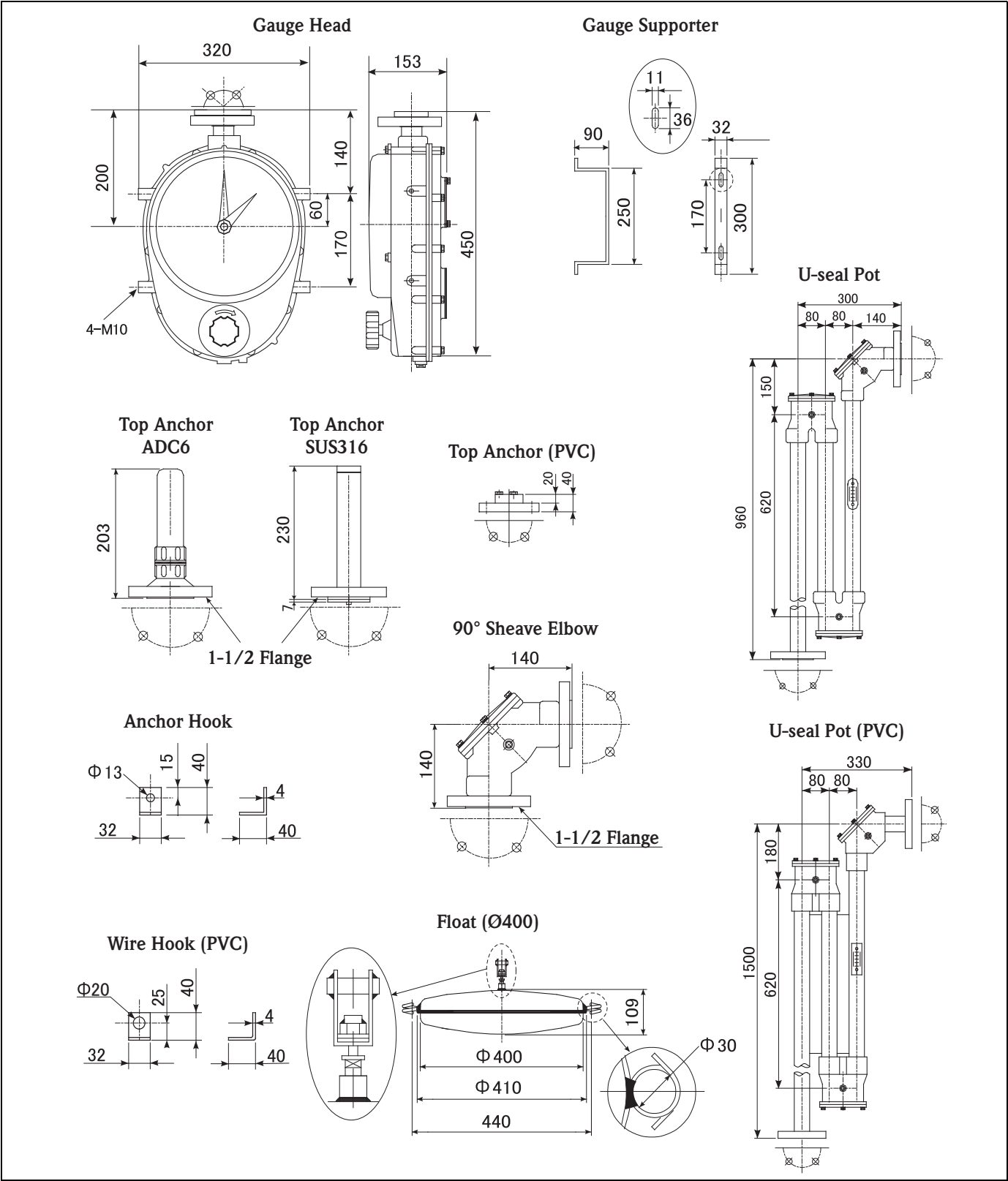


Figure 13: Dimensions of LT12

LT14 (Flange Type, Medium Pressure)

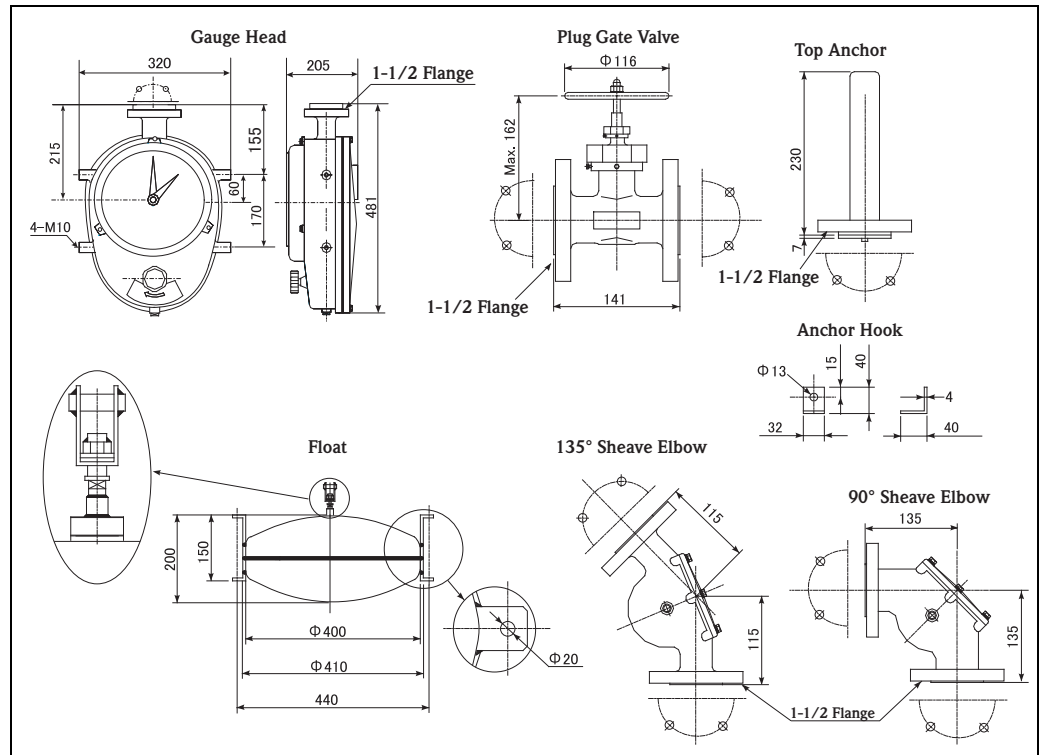


Figure 14: Dimensions of LT14

LT16 (Flange Type, High Pressure)

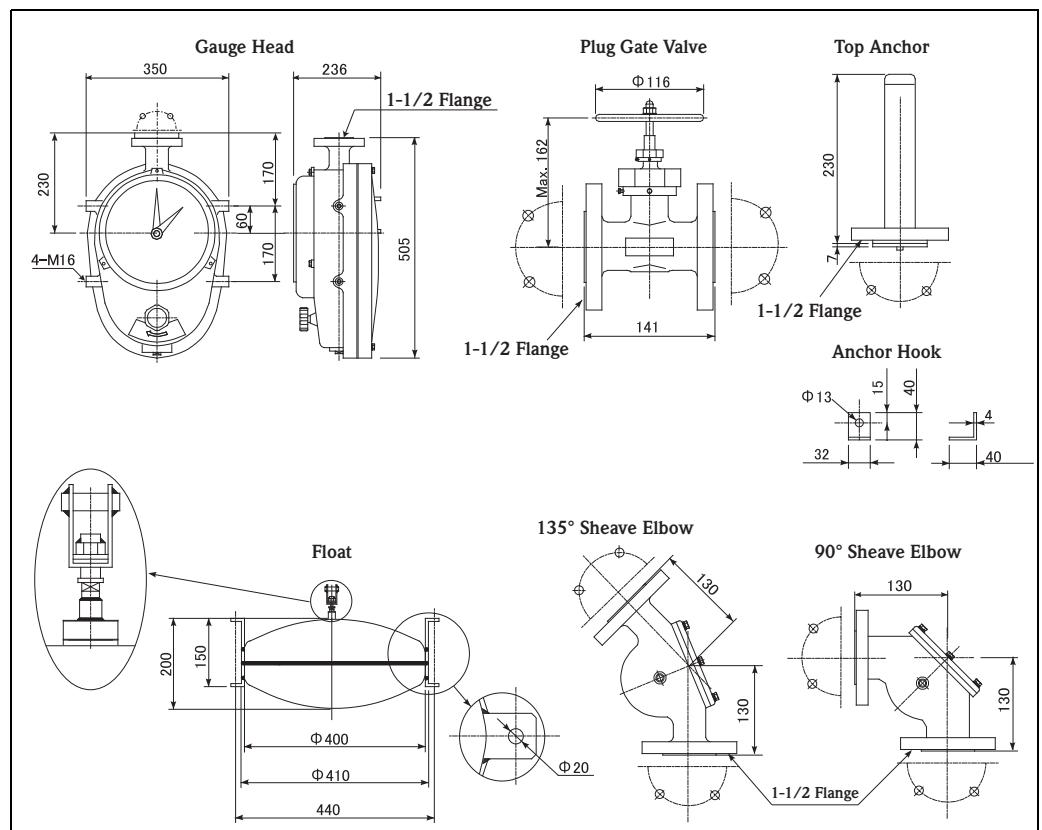


Figure 15: Dimensions of LT16

Display

Product Roots	Range
LT11 (threaded , low pressure)	Dial display: two pointers or Counter (min. readable scale:1mm) *30m (only counter display) (LT 1 1 2 □)
LT12 (flange, low pressure)	Dial display: two pointers or Counter (min. readable scale:1mm) *30m (only counter display) (LT 1 2 2 □)
LT14 (flange, medium pressure)	Dial display: two pointers or Counter (min. readable scale:1mm) *30m (only counter display) (LT 14 2 □)
LT16 (flange, high pressure)	Dial display: two pointers or Counter (min. readable scale:1mm) *30m (only counter display) (LT 1 6 2 □)

Process Connection

Product Roots	Specification
LT11 (threaded, low pressure)	Thread JISB0203 Rp1-1/2 , w/o union nut Thread JISB0203 Rc1-1/2 , union nut , sleeve , SUS316 Thread ANSI NPT1-1/2 , union nut, sleeve , SUS316 Thread JIS B0202 G1-1/2 , union nut , sleeve , SUS316
LT12 (flange, low pressure) Flange spec./material	10K 40A RF, AC4A, flange JIS B2220 10K 40A RF, SUS316, flange JIS B2220 1-1/2 150lbs RF, AC4A, flange ANSI B16.5 1-1/2 150lbs RF, SUS316, flange ANSI B16.5 40A 150lbs RF, AC4A, flange JPI 7S-15 40A 150lbs RF, SUS316, flange JPI 7S-15
LT14 (flange, medium pressure) Flange spec./material	10K 40A RF, AC4CT6, JIS flange B2220 10K 40A RF, SCS13, JIS flange B2220 1-1/2 150lbs RF, AC4CT6, ANSI flange B16.5 1-1/2 150lbs RF, SCS13, ANSI flange B16.5 40A 150lbs RF, AC4CT6, JPI flange 7S-15 40A 150lbs RF, SCS13, JPI flange 7S-15
LT16 (flange, high pressure) Flange spec./Gauge material/ Bolt material	10K 40A RF, SCPL1,SNB7, JIS flange B2220 20K 40A RF, SCPL1,SNB7, JIS flange B2220 10K 40A RF, SCS13,SUS304, JIS flange B2220 20K 40A RF, SCS13,SUS304, JIS flange B2220 20K 40A RF, SCS13,SNB7, JIS flange B2220 1-1/2 150lbs RF, SCPL1,SNB7, ANSI flange B16.5 1-1/2 300lbs RF, SCPL1,SNB7, ANSI flange B16.5 1-1/2 150lbs RF, SCS13,SUS304, ANSI flange B16.5 1-1/2 300lbs RF, SCS13,SUS304, ANSI flange B16.5 1-1/2 300lbs RF, SCS13,SNB7, ANSI flange B16.5 40A 150lbs RF, SCPL1,SNB7, JPI flange 7S-15 40A 300lbs RF, SCPL1,SNB7, JPI flange 7S-15 40A 150lbs RF, SCS13,SUS304, JPI flange 7S-15 40A 300lbs RF, SCS13,SUS304, JPI flange 7S-15 40A 300lbs RF, SCS13,SNB7, JPI flange 7S-15

Coupling (Gauge Head and Display)

Product roots	Range
LT11 (threaded, low pressure)	Shaft (oil seal)
LT12 (flange, low pressure)	Shaft (oil seal)
LT14 (flange, medium pressure)	Pressure Bulkhead Magnet Coupling
LT16 (flange, high pressure)	Pressure Bulkhead Magnet Coupling

Total Weight/Painting Color

Type	Range
LT11 (threaded, low pressure)	Approx. 15kg, silver
LT12 (flange, low pressure)	Approx. 15kg, silver
LT14 (flange, medium pressure)	Approx. 22kg, silver
LT16 (flange, high pressure)	Approx. 100kg, silver

**Note!**

Stainless steel is not painted.

Float

Ø400	Weight	ρ : Liquid Density (g/cm ³)
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	$1.05 \leq \rho < 2.0$
High pressure	8.3 kg	$0.5 \leq \rho < 0.7$

Ø140	Weight	ρ : Liquid Density (g/cm ³)
Low pressure	2.1 kg	$0.5 \leq \rho < 0.94$
Low pressure	2.4 kg	$0.94 \leq \rho < 2.0$

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

Products	Units	Parts Name	Name of Sealing Parts	Materials of Packing/O-ring
LT11/12	Gauge Head	Rear Cover	Rear Packing	HYCAR Cork
		Check Shaft	O-ring	FKM
		Sprocket Shaft	Oil Seal	FKM
		Blind Board	Packing	NBR
	90° Sheave Elbow	Aluminum Sheave Elbow	Rear Packing	HYCAR Cork
		Stainless Steel Sheave Elbow		V#6502
		Bearing	O-ring	Silicon Rubber
	Liquid Seal Unit	Aluminum Sheave Elbow	Rear Packing	HYCAR Cork
			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
LT11	Top Anchor	Aluminum Threaded Type	Rear Packing	HYCAR Cork
		Stainless Tank Welding Type		V#6502
LT12	Top Anchor	Aluminum Flange/Threaded Type		HYCAR Cork
		Stainless Flange Welding Type	Spring Negator Packing	V#6502
LT14/16	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
LT14	90° Sheave Elbow (Aluminum/Stainless)	Cover	Rear Packing	V#6502
		Bearing	O-ring	PTFE
	135° Sheave Elbow (Aluminum/Stainless)	Cover	Rear Packing	V#6502
		Bearing	O-ring	PTFE
	Top Anchor	Flange Integral Pattern	Spring Negator Packing	V#6502
		Stainless Flange Welding Type		V#6502
LT16	90° Sheave Elbow (Iron/Stainless)	Cover	Rear Packing	V#6502
		Bearing	O-ring	PTFE
	135° Sheave Elbow (Iron/Stainless)	Cover	Rear Packing	V#6502
		Bearing	O-ring	
	Top Anchor	Rolled Steel Flange Welding Type	Spring Negator Packing	V#6502
		Stainless Flange Welding Type		V#6502

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

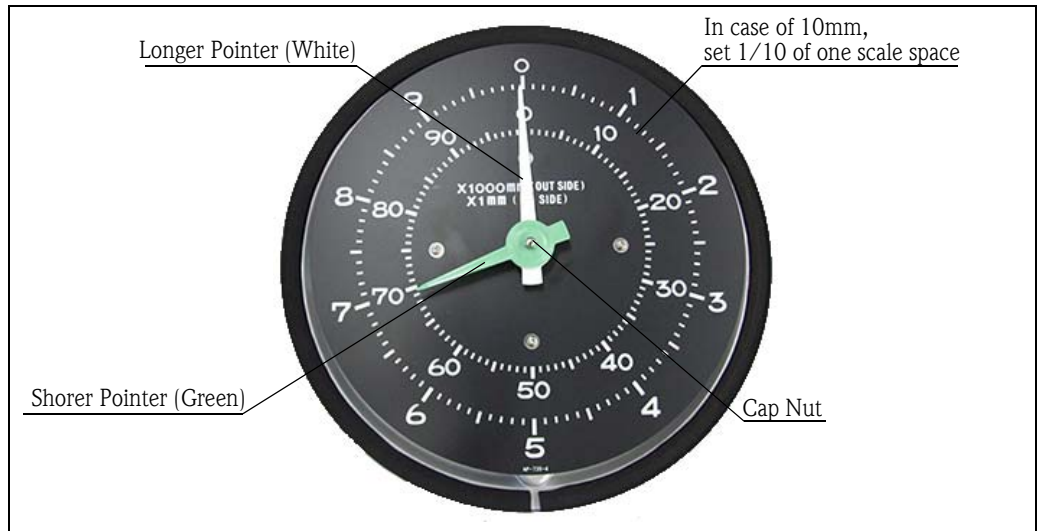


Figure 16: Dial Display

Counter Display

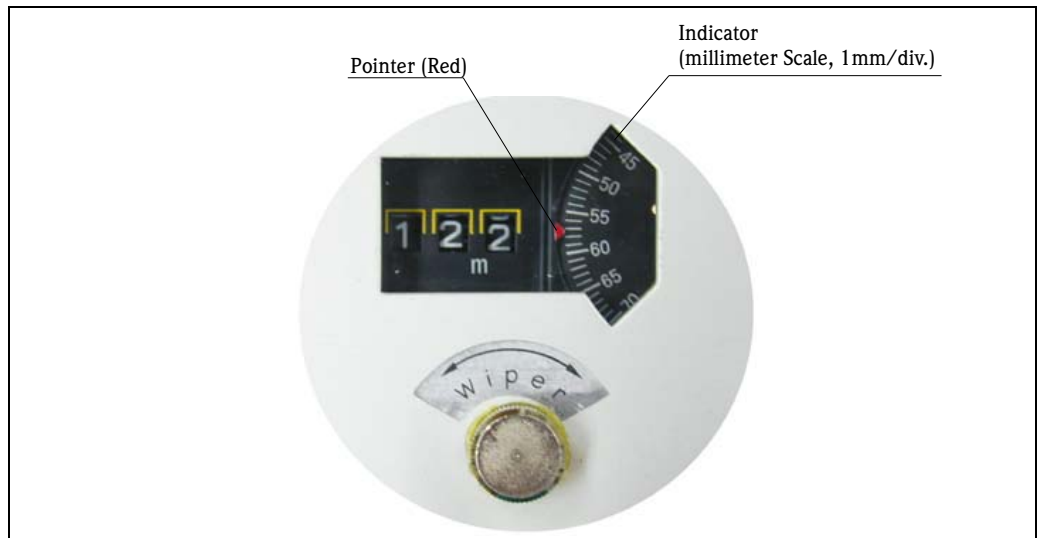


Figure 17: Counter Display

Certificates and Approvals

Protection Class

Product roots	Class
LT11/LT12/LT14/LT16	IP55

Order Information

LT11 (LT1100)

010					Display:
				1	Dial 2 pointers
				2	Numeric (mechanical counter)
				5	Dial 2 pointers , up side down
				9	Special version, TSP-no. to be spec.
020					Crank Unit:
				0	Not selected
				1	Selected
030					Function:
				0	Basic version
				9	Special version, TSP-no. to be spec.
040					Process Connection:
				0	Thread JIS B0203 Rp 1-1/2, w/o union nut, SUS316
				A	Thread JIS B0203 Rc 1-1/2, union nut, sleeve, SUS316
				B	Thread ANSI NPT1-1/2, union nut, sleeve, SUS316
				C	Thread JIS B0202 G1-1/2, union nut, sleeve, SUS316
				9	Special version, TSP-no. to be spec.
050					Measuring Range:
				1	2.5m
				2	5m
				3	10m
				4	16m
				5	20m
				6	30m (numeric display only)
				9	Special version, TSP-no. to be spec.
060					Application:
				AAA	Gauge head only , accessories ordered by selection tool
				000	Gauge head only
				005	CRT, guide pipe installation
				008	Tank top, guide pipe installation
				060	PVC, SS400 wire hook
				062	PVC, SUS316 wire hook
				251	Gas holder
				261	FRT tank
				A01	Standard application for CRT , tape not installed (solid guide wire , 2 anchor hooks)
				A04	Wetted parts, SUS316 , tape not installed (solid guide wire, 2 anchor hooks)
				A06	Wetted / gas parts, SUS316 , tape not installed (solid guide wire, 2 anchor hooks)
				A07	Underground standard, tape not installed (solid guide wire, 2 anchor hooks)
				A10	Underground standard, SUS316 tape not installed (solid guide wire, 2 anchor hooks)
				A50	Seal pot standard, tape not installed (solid guide wire , 2 anchor hooks)
				A54	Seal pot all SUS316, tape not installed (solid guide wire , 2 anchor hooks)
				B01	Standard, crank unit ,tape not installed (solid guide wire , 2 anchor hooks)
				B04	Wetted parts SUS316, crank unit, tape not installed (solid guide wire , 2 anchor hooks)
				B06	Wetted / gas parts SUS316, crank unit, tape not installed (solid guide wire , 2 anchor hooks)
				B50	Seal pot standard, crank unit, tape not installed (solid guide wire , 2 anchor hooks)
				B54	Seal pot SUS316, crank unit, tape not installed (solid guide wire, 2 anchor hooks)
				C07	Underground tank installation, crank unit, tape not installed (solid guide wire, 2 anchor hooks)
				C10	Underground tank installation, tape not installed (solid guide wire, 2 anchor hooks)
				999	Special version, TSP-no. to be spec.
LT11					Product designation (part 1)

070									Float:
									1 4.2 kg , d = 400mm
									2 5.0 kg , d = 400mm
									3 8.0 kg , d = 400mm
									4 Not selected
									5 2.1 kg , d = 140mm
									6 2.4 kg , d = 140mm
									9 Special version, TSP-no. to be spec.
080									Additional Option; Color:
									0 Basic version
									C Copper free
									D Glass display cover
									J Copper free, glass display cover
									9 Special version, TSP-no. to be spec.
LT11-									Complete product designation

LT12 (LT1200)

010	Display:				
	1	Dial 2 pointers			
	2	Numeric (mechanical counter)			
	5	Dial 2 pointers , up side down			
	9	Special version, TSP-no. to be spec.			
020	Crank Unit:				
	0	Not selected			
	1	Selected			
030	Function:				
	0	Basic version			
	9	Special version, TSP-no. to be spec.			
040	Process Connection:				
	1	10K 40A RF, AC4A, flange JIS B2220			
	A	10K 40A RF, SUS316, flange JIS B2220			
	2	1-1/2 150lbs RF, AC4A, flange ANSI B16.5			
	B	1-1/2 150lbs RF, SUS316, flange ANSI B16.5			
	3	40A 150lbs RF, AC4A, flange JPI 7S-15			
	C	40A 150lbs RF, SUS316, flange JPI 7S-15			
	9	Special version, TSP-no. to be spec.			
050	Measuring Range:				
	1	2.5m			
	2	5m			
	3	10m			
	4	16m			
	5	20m			
	6	30m(numeric display only)			
	9	Special version, TSP-no. to be spec.			
060	Application:				
	AAA	Gauge head only , accessories ordered by selection tool			
	000	Gauge head only			
	061	PVC , SS400 wire hook			
	063	PVC , SUS316 wire hook			
	252	Gas holder			
	262	FRT tank			
	A11	Standard application for CRT , tape not installed (solid guide wire , 2 anchor hooks)			
	A14	Wetted parts , SUS316 , tape not installed (solid guide wire , 2 anchor hooks)			
	A15	Wetted / gas parts , SUS316 , tape not installed (solid guide wire , 2 anchor hooks)			
	A40	Underground standard , tape not installed (solid guide wire , 2 anchor hooks)			
	A43	Underground standard , SUS316 tape not installed (solid guide wire , 2 anchor hooks)			
	A55	Standard, seal pot , tape not installed (solid guide wire , 2 anchor hooks)			
	A59	Seal pot all SUS316 , tape not installed (solid guide wire , 2 anchor hooks)			
	B55	Standard, seal pot, crank unit, tape not installed (solid guide wire , 2 anchor hooks)			
	B59	Seal pot all SUS316, crank unit, tape not installed (solid guide wire , 2 anchor hooks)			
	B11	Standard, crank unit , tape not installed (solid guide wire , 2 anchor hooks)			
	B14	Wetted parts SUS316, crank unit, tape not installed (solid guide wire , 2 anchor hooks)			
	B15	Wetted / gas parts SUS316, crank unit, tape not installed (solid guide wire , 2 anchor hooks)			
	B40	Underground tank installation, crank unit, tape not installed (solid guide wire , 2 anchor hooks)			
	B43	UTI, Wetted parts SUS316, crank unit, tape not installed (solid guide wire , 2 anchor hooks) UTI = Underground tank install			
	999	Special version, TSP-no. to be spec.			
LT12-					Product designation (part1)

070									Float:
									1 4.2 kg , d = 400mm
									2 5.0 kg , d = 400mm
									3 8.0 kg , d = 400mm
									4 Not selected
									9 Special version, TSP-no. to be spec.
080									Additional Option; Color:
									0 Basic version
									C Copper free
									D Glass display cover
									J Copper free, glass display cover
									9 Special version, TSP-no. to be spec.
LT12-									Complete product designation

LT14 (LT1400)

010		Display:	
1	Dial 2 pointers		
2	Numeric (mechanical counter)		
5	Dial 2 pointers , up side down		
9	Special version, TSP-no. to be spec.		
020		Crank Unit:	
0	Not selected		
1	Selected		
030		Function:	
0	Basic version		
9	Special version, TSP-no. to be spec.		
040		Process connection:	
1	10K 40A RF, AC4CT6, flange JIS B2220		
A	10K 40A RF, SCS13, flange JIS B2220		
3	1-1/2 150lbs RF, AC4CT6, flange ANSI B16.5		
C	1-1/2 150lbs RF, SCS13, flange ANSI B16.5		
5	40A 150lbs RF, AC4CT6, flange JPI 7S-15		
E	40A 150lbs RF, SCS13, flange JPI 7S-15		
9	Special version, TSP-no. to be spec.		
050		Measuring Range:	
1	2.5m		
2	5m		
3	10m		
4	16m		
5	20m		
6	30m(numeric display only)		
9	Special version, TSP-no. to be spec.		
060		Application:	
AAA	Gauge head only , accessories ordered by selection tool		
000	Gauge head only		
040	Standard, sheave elbow 90°x 2		
041	Wetted / gas parts , SUS316, sheave elbow 90°x 1, 135°x 2		
078	Alu, sheave elbow 90°x1, 135°x 2		
094	Standard, sheave elbow 90°x 2, crank unit		
095	Wetted / gas parts , SUS316, crank unit, sheave elbow 90°x 1, 135°x 2		
098	Alu, sheave elbow 90°x1, 135°x 2, crank unit		
999	Special version, TSP-no. to be spec.		
070		Float:	
4	Not selected		
5	8.3kg, d=400mm		
9	Special version, TSP-no. to be spec.		
080		Additional Option; Color:	
0	Basic version		
C	Copper free		
9	Special version, TSP-no. to be spec.		
LT14-		Complete product designation	

LT16 (LT1600)

010		Display:	
1	Dial 2 pointers		
2	Numeric (mechanical counter)		
5	Dial 2 pointers , up side down		
9	Special version, TSP-no. to be spec.		
020		Crank Unit:	
0	Not selected		
1	Selected		
030		Function:	
0	Basic version		
9	Special version, TSP-no. to be spec.		
040		Process Connection:	
1	10K 40A RF, SCPL1,SNB7, flange JIS B2220		
2	20K 40A RF, SCPL1,SNB7, flange JIS B2220		
A	10K 40A RF, SCS13, SUS304, flange JIS B2220		
B	20K 40A RF, SCS13, SUS304, flange JIS B2220		
G	20K 40A RF, SCS13, SNB7, flange JIS B2220		
3	1-1/2 150lbs RF, SCPL1, SNB7, flange ANSI B16.5		
4	1-1/2 300lbs RF, SCPL1, SNB7, flange ANSI B16.5		
C	1-1/2 150lbs RF, SCS13, SUS304, flange ANSI B16.5		
D	1-1/2 300lbs RF, SCS13, SUS304, flange ANSI B16.5		
H	1-1/2 300lbs RF, SCS13, SNB7, flange ANSI B16.5		
5	40A 150lbs RF, SCLP1, SNB7, flange JPI 7S-15		
6	40A 300lbs RF, SCLP1, SNB7, flange JPI 7S-15		
E	40A 150lbs RF, SCS13, SUS304, flange JPI 7S-15		
F	40A 300lbs RF, SCS13, SUS304, flange JIS B2220		
J	40A 300lbs RF, SCS13, SNB7, flange JIS B2220		
	Special version, TSP-no. to be spec.		
050		Measuring Range:	
1	2.5m		
2	5m		
3	10m		
4	16m		
5	20m		
6	30m (numeric display only)		
9	Special version, TSP-no. to be spec.		
060		Application:	
AAA	Gauge head only , accessories ordered by selection tool		
000	Gauge head only (except tank top installation)		
042	Standard, sheave elbow 90°x 1, 135°x 2		
043	Sheave elbow 90°x 2		
044	Tank top installation		
096	Standard, sheave elbow 90°x 1, 135°x 2 , crank unit		
097	Sheave elbow 90°x 2 , crank unit		
999	Special version, TSP-no. to be spec.		
070		Float:	
4	Not selected		
5	8.3kg, d=400mm		
9	Special version, TSP-no. to be spec.		
080		Additional Option; Color:	
0	Basic version		
B	Gauge head bolts SUS304		
C	Cooper free		
F	Cooper free, Gauge head bolts SUS304		
9	Special version, TSP-no. to be spec.		
LT16-		Complete product designation	

Accessories

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: 23 kg.

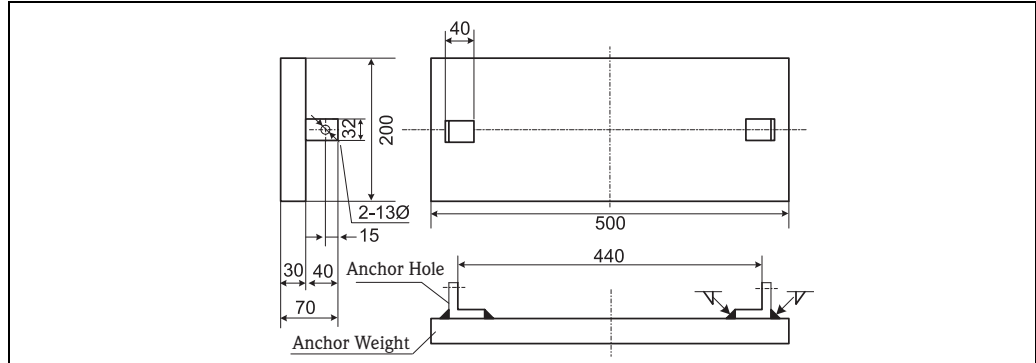


Figure 18: Anchor Weight

Seal Pot for LT11/LT12

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

- Liquid sealant: e.g.
- liquid paraffin or spindle oil: 1150cc
- Max seal pressure: 40kPa
- Shape: U-shape
- Process connection: thread or flange
- Material: AC4A+SGP, SUS 316 or PVC
- Refer to page 15,16.

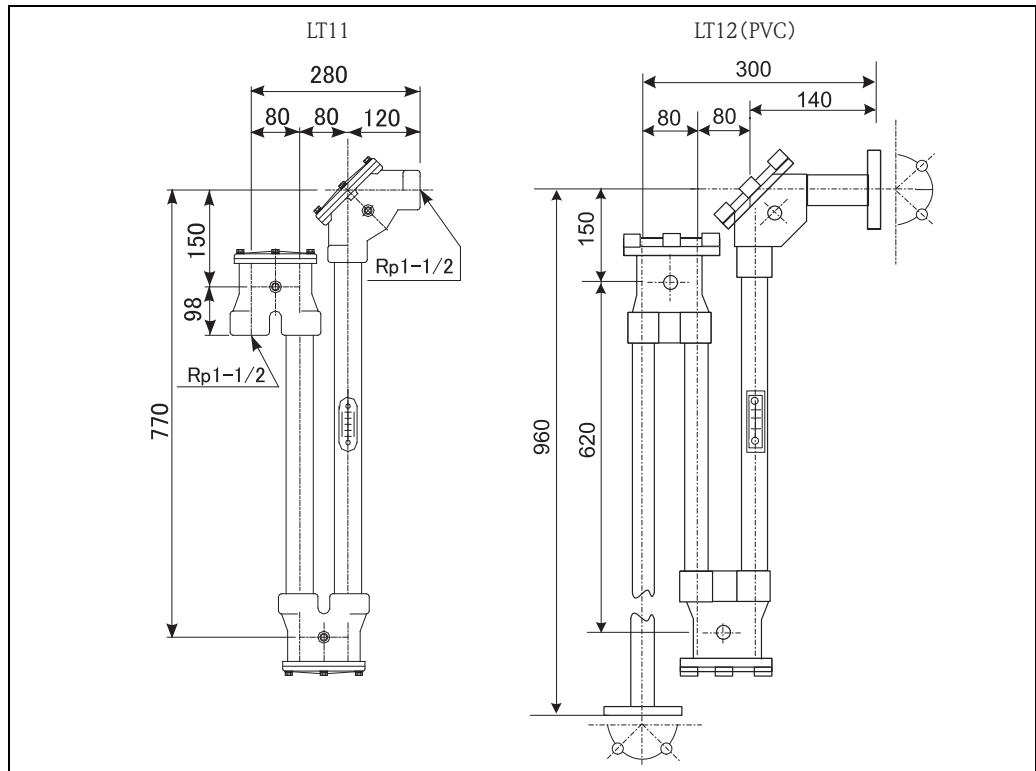


Figure 19: Seal Pot for LT11/LT12

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 20: Crank Device

Gauge and Pipe Supporters (LT11/LT12)

Gauge and pipe supporters are used to attach to the outer wall of the tank.

Material: SS400

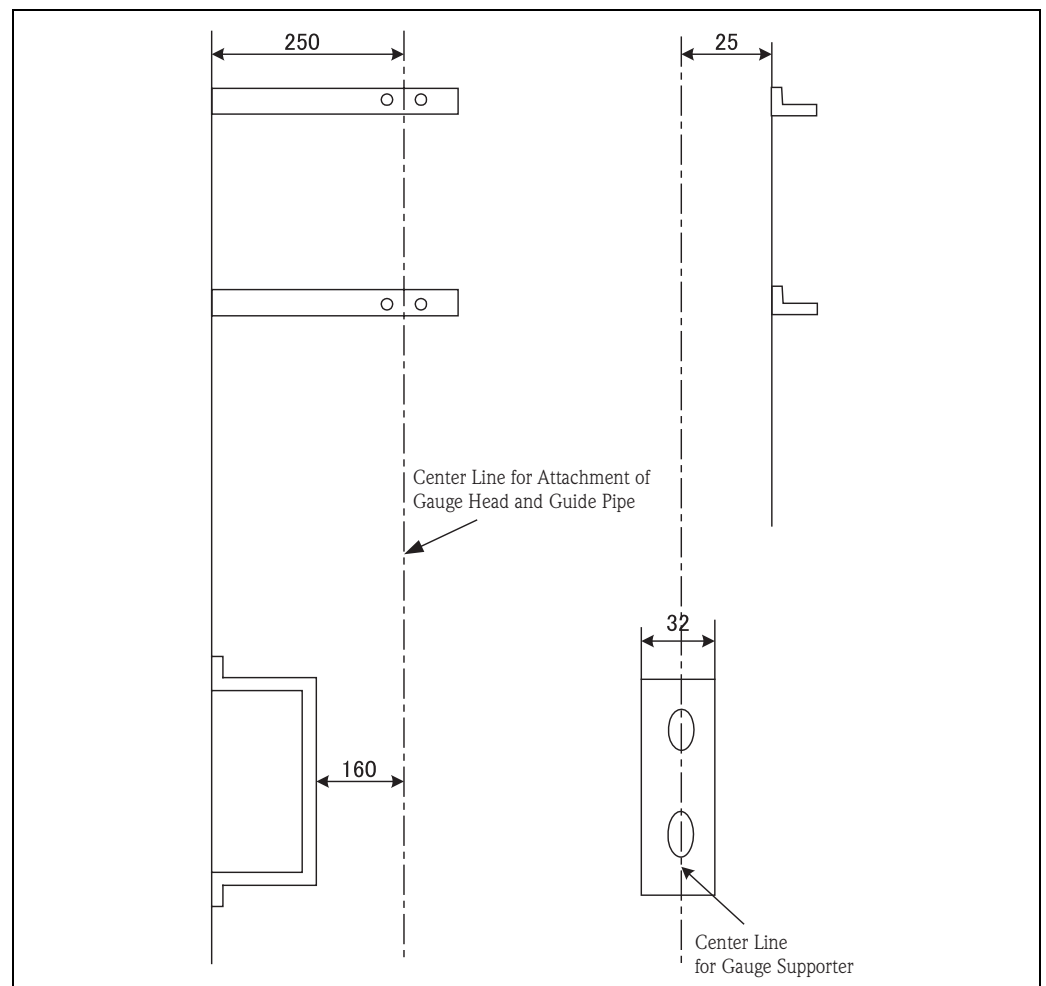


Figure 21: Gauge and Pipe Supporters for LT11/LT12

Gauge and Pipe Supporters
(LT14/LT16)

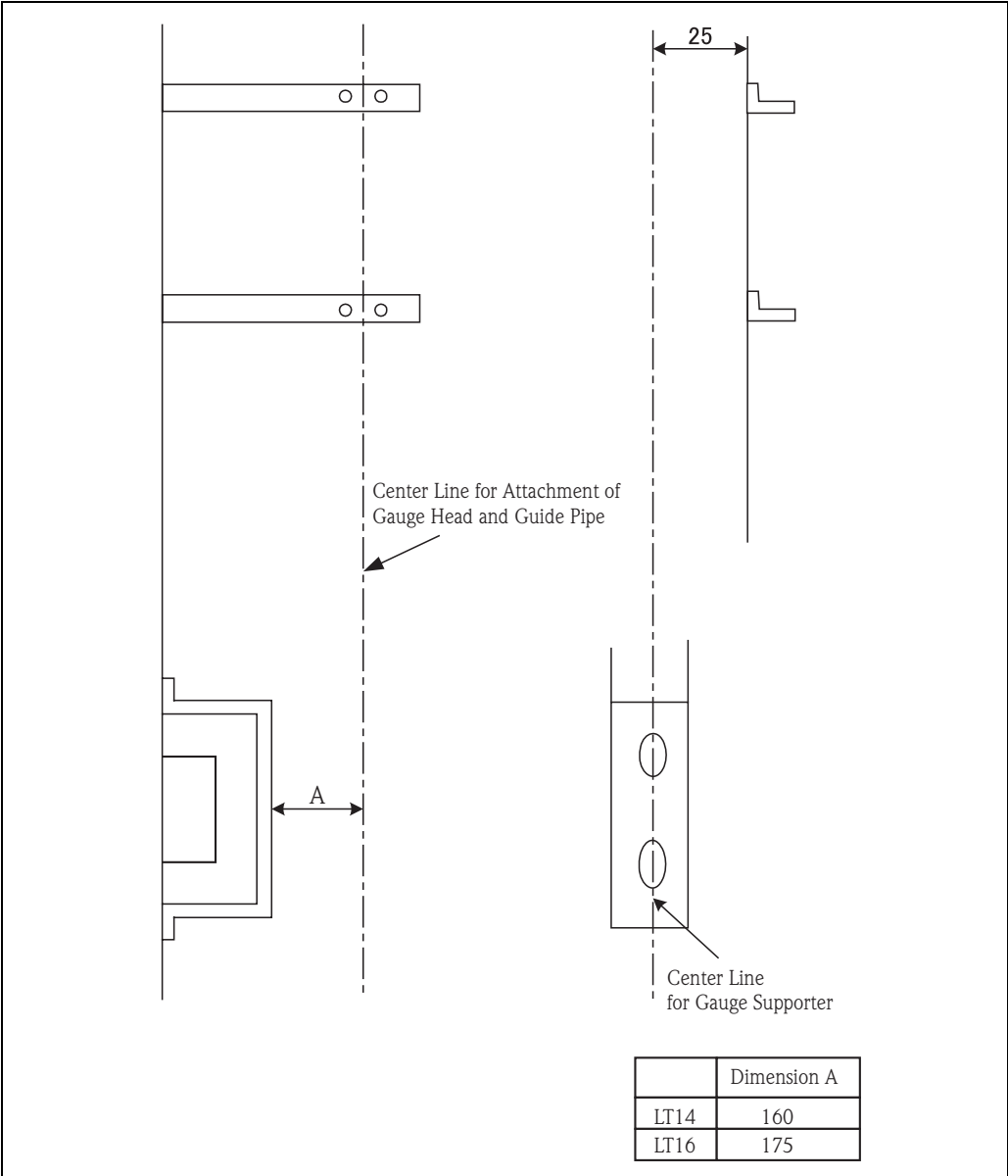


Figure 22: Gauge and Pipe Supporters for LT14/LT16

List of Application and Materials

LT11

Note:
 ■Number(the number of accessories) and Mark (*) listed on this list are applied as specification. ■Connecting screw standards and connecting flange standards of accessory are compliant with selected spec. in connecting standards.
 ■Material: SUS304: Stainless, SUS316:Stainless, SUS316L: Stainless casting, SCS13:Stainless casting, SCS14: Stainless casting, STPL:Iron pipe, SS400: Cast steel, SS400: Iron, ADC:Aluminum, AC: Aluminum, PFA: Perfluoroalkoxy, PTFE:Perfluoroalkoxy, PVC: Polyvinyl chloride
 ■Tank type: CRT: Conerroof tank, FRT: floating roof tank

Kit code													LT11									
Accessories	Specification	without Crank unit with Crank unit		Gauge head	000	005	008	060	062	251	261	A01 B01	A04 B04	A06 B06	A07 C07	A10 C10	A50 B50	A54 B54				
		Stranded wire (including coated wire)	Solid wire																			
Guide wire	Tank application Material, Standards							*	*			*	*	*	*		*	*				
Float	Coating/OD																					
Seal pot	Coating/Roller																					
90° Sheave elbow	Connection																					
Measuring tape	Outer coating																					
Guide wire	Coating																					
Anchor hook (welding mounting)	L shape x 2																					
Wire guide socket	Outer coating/connection																					
Gauge support	Outer coating/mounting																					

LT12

LT12									
Kit code									
Accessories	Specification	without Crank unit with Crank unit	000						
			Guide wire						
Guide wire	Tank application	Material, Standards	061						
			063						
Float	Coating/OD	SUS316/D400 SUS316/D140	252						
			Wet gas holder						
Seal pot	Coating/Roller	ADC,AC,SGP/SUS316L SCS14,SUS316/SUS316L	063						
			1						
90° Sheave elbow	Connection	PVC/PVC Screw: 1-1/2 Flange: 1-1/2	1						
			1						
Measuring tape	Outer coating	ADC or AC SCS13 SCS14	1						
			1						
Top anchor	Roller	SUS316L SUS304	1						
			1						
Guide wire	Connection	Screw: 1-1/2 Flange: 1-1/2	1						
			1						
Anchor hook (welding mounting)	Tape	SUS316 SUS316+SUS316	1						
			1						
Wire hook (welding mounting)	Tape & wire	SUS316+PFA coating	1						
			1						
Wire guide socket	Configuration for deliver	Separate tape and gauge head	1						
			1						
Guide wire metal	Coating	ADC or AC SUS316	1						
			1						
Measuring wire hook	Shaft & spring	SUS316	1						
			1						
Gauge support	Inner & outer coating	PVC	1						
			1						
Gauge support	Connection	Screw: 1 Flange: 1-1/2	1						
			1						
Guide wire	Coated standard wire x 1	SUS316 D3, PFA coating D4.6	1						
			1						
Anchor hook (welding mounting)	Solid wire x 2	SUS316 D3	1						
			1						
Wire hook (welding mounting)	L shape x 2	SS400 SUS316	1						
			1						
Wire guide socket	L shape x 2	SS400+PVC	1						
			1						
Guide wire metal	Outer coating/connection	SUS316+PVC	1						
			1						
Measuring wire hook	Outer coating/connection	Cast iron & PVC, screw 1-1/2	1						
			1						
Gauge support	Outer coating/mounting	SS400 & PTFE, flange	1						
			1						
Gauge support	Outer coating/mounting	SS400, Welding mounting	1						
			1						

LT14/LT16

Model			LT14				LT16			
Kit Code	Specifications	Without Crank Unit	000	040	078	041	000	042	043	044
		With Crank Unit		094	098	095		096	097	
Guid Wire	Tank Application	Solid Wire		*	*	*	*	*	*	*
Accessories	Material, Standards	Gauge Head	Nonsphere Parts: SUS316	Sphere Tank/Wetted Parts: SUS316/Coating: SCS13	Sphere Tank/Wetted Parts: SUS316/Coating: SCS13	Sphere Tank/Wetted Parts: SUS316	Gauge Head	Sphere Tank/Wetted Parts: SUS316	Nonsphere Tank/Wetted Parts: SUS316	Pressure Tank/Top Mount/Wetted Parts: SUS316
Float	Coating/OD	SUS316/D400	1	1	1	1		1	1	1
Plug Gate Valve	Coating/Connection	AC/Flange 1-1/2	1	1	1			1	1	1
Plug Gate Valve SCS13	Coating/Connection	SCS13/Flange 1-1/2				1		1	1	1
90° Sheave Elbow	Coating/Connection	SCS13/Flange 1-1/2				1		1	1	1
		ADC or AC/Flange 1-1/2	2	1						
	Roller	SCPL/Flange 1-1/2				1				
		SCS13/Flange 1-1/2				1				
135° Sheave Elbow		SUS316L	*	*	*	*				
	Coating/Connection	SUS304						*	*	
		ADC or AC/Flange 1-1/2		2						
	Roller	SCPL/Flange 1-1/2						2		
Measuring Tape		SCS13/Flange 1-1/2				2				
		SUS316L		*	*	*				
	Tape	SUS304						*		
Top Anchor	Coating/Connection	SUS316 (Single Item)	1	1	1	1		1	1	1
		ADC or AC/Flange 1-1/2	2	2						
	Shaft & Spring	STPL/Flange 1-1/2						2	2	2
		SUS304/Flange 1-1/2				2				
Guide Wire	Solid Wire x 2	SUS316 D3				*		*	*	*
Wire Hook	L type x 2	SUS316 (Welding Mount)				2		2	2	2

Japan

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