

Technical Information

Float level gauge LT5

Mechanical tank gauge for measuring liquid level



Application

The Float Tank Gauge LT5 plays an important role in all areas of industry. Operation of LT11/12/14/16 in a wide variety of applications over many years has proven their reliability.

Common applications

- Petroleum products, such as crude oil, kerosene, diesel fuel, and heavy oil
- Cooking oils, such as vegetable oil, palm oil, seed oil, and animal oil
- Highly viscous liquids, such as asphalt
- Chemical products (for corrosive products and toxic vapors, a liquid seal pot can be used to achieve airtightness)
- Measurement of liquefied gas in spherical tank

Your benefits

- It is a mechanical level gauge that requires no electrical power.
- Reproducibility can be checked with a check handle.
- Direct tank-side reading allows tank contents to be checked quickly and easily.
- It can be installed on a wide variety of tanks, including cone roof tanks, floating roof tanks, covered floating roof tanks, and spherical tanks.
- It can also be used in conjunction with analog/digital transmitters to perform tank inventory management.

Table of contents

Document information	3
Symbols used	3
Documentation	5
Function and system design	6
Operating principle	6
Combination with analog transmitter	6
Combination with digital transmitter	6
Input/Output	7
Measuring range	7
Accuracy	7
Installation	8
Measuring tape and wire lengths	8
Sealing for wetting liquid and gas parts	11
Material certificates	12
Installation reference diagram and order codes	13
Environment	33
Operating temperature limits	33
Process	33
Range of process pressure	33
Mechanical construction	34
Dimensions of LT5	34
Process connection	41
Display method	41
Display coupling	41
Float	41
Weight	41
Painting color	41
List of material standards	42
Operability	43
Display	43
Dial display	43
Counter display	43
Certificates and approvals	44
Protection class	44
Order information	45
Accessories	46
Hoist handle	46
Seal pot	47
Gauge supporter	48
Guide pipes	50
Mounting / enclosed accessories	51
Anchor weight	52
Wire guide metal, wire guide socket	53

Document information

Symbols used

Safety symbols



This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.



This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.



This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.



This symbol contains information on procedures and other facts which do not result in personal injury.

Electrical symbols



Alternating current



Direct current and alternating current



Direct current



Ground connection

A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.

Protective earth (PE)

Ground terminals that must be connected to ground prior to establishing any other connections.

The ground terminals are located on the interior and exterior of the device:

- Interior ground terminal: protective earth is connected to the mains supply.
- Exterior ground terminal: device is connected to the plant grounding system.

Tool symbols



Phillips head screwdriver



Flat blade screwdriver



Torx screwdriver



Allen key



Open-ended wrench

Symbols for certain types of information and graphics

Permitted

Procedures, processes or actions that are permitted

Preferred

Procedures, processes or actions that are preferred

Forbidden

Procedures, processes or actions that are forbidden

Tip

Indicates additional information



Reference to documentation



Reference to graphic



Notice or individual step to be observed

1., 2., 3.

Series of steps



Result of a step



Visual inspection



Operation via operating tool



Write-protected parameter

1, 2, 3, ...

Item numbers

A, B, C, ...

Views



Safety instructions

Observe the safety instructions contained in the associated Operating Instructions



Temperature resistance of the connection cables

Specifies the minimum value of the temperature resistance of the connection cables

Documentation

The following documents can be found in the Download area of our website (www.endress.com/downloads).



For an overview of the scope of the associated Technical Documentation, refer to the following: *W@M Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from nameplate

Technical Information (TI)

Planning aid

The document contains all the technical data on the device and provides an overview of the accessories and other products that can be ordered for the device.

Brief Operating Instructions (KA)

Guide that takes you quickly to the 1st measured value

The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning.

Operating Instructions (BA)

The Operating Instructions contain all the information that is required in various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.

Safety Instructions (XA)

Depending on the approval, the following Safety Instructions (XA) are supplied with the device. They are an integral part of the Operating Instructions.

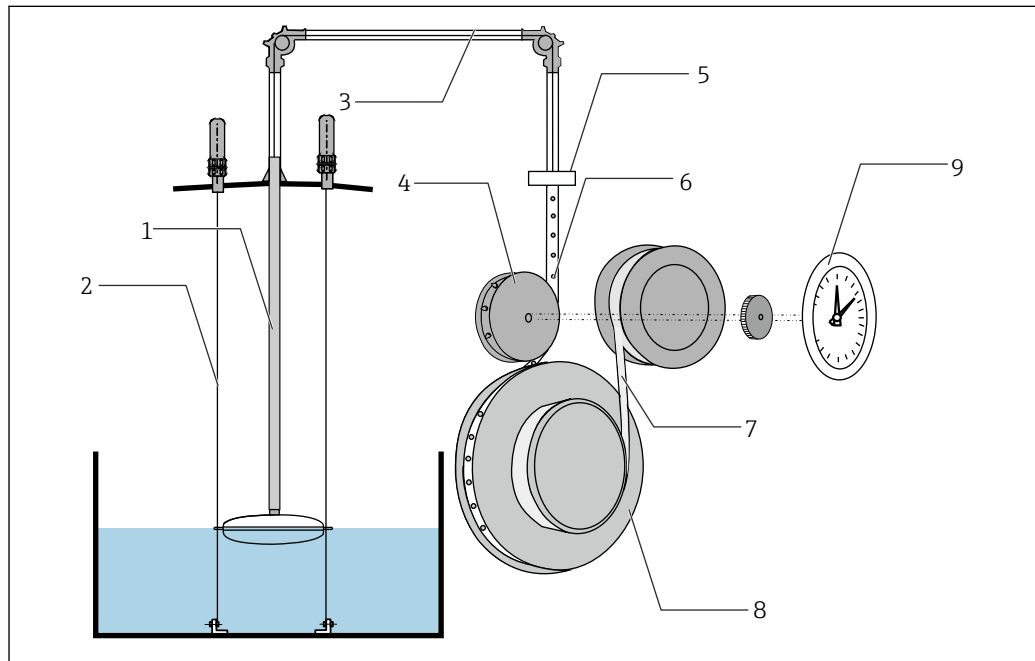


The nameplate indicates the Safety Instructions (XA) that are relevant to the device.

Function and system design

Operating principle

The liquid level detected by the float is transmitted to the gauge head through the measuring tape. This change in liquid level is converted to the sprocket's angle of rotation. The measuring tape has uniformly spaced small holes, and it indicates the liquid level by driving the gear mechanism in an extremely precise manner. After the measurement, the measuring tape is wound around the tape drum. A conster is directly attached to the tape drum, constantly giving a certain amount of tension to the measuring tape. This ensures that the float and the measuring tape are always in equilibrium, and the amount of float travel associated with changes in the liquid level is continuously indicated.



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1 Operating principle

- 1 Measuring tape
- 2 Guide wire
- 3 Guide pipe
- 4 Sprocket
- 5 Gauge head connection
- 6 Measuring tape (with sprocket driving holes)
- 7 Conster
- 8 Tape drum
- 9 Scale plate

Combination with analog transmitter

AT1


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

 For more information, refer to the technical information for AT1.

Combination with digital transmitter

TMD1

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

 For more information, refer to the technical information for TMD1.

Input/Output

Measuring range	Spec.	Range
		LT5

Accuracy	Spec.	Range
		φ400 mm float
	φ140 mm float	± 30 mm (1.18 in) (density limit 1 g/cm ³ measuring range 10 m (32.80 ft))

Installation

Measuring tape and wire lengths

The lengths of the measuring tape and wire are longer than the actual measurement length and vary depending on each option. The following tables show the actual lengths according to options in 060 for each option of specification 070. However, note that the maximum length that can be displayed on the display of the gauge head simply corresponds to the measurement range. See the following tables and select the appropriate length accordingly.

1. Measuring tape SUS316, CRT

060 measurement range		Length (total length)	Perforated tape (measurement length)	Non-perforated tape	Spare parts
1	2.5 m	13 m	7 m	6 m	56004412
2	5 m	13 m	7 m	6 m	56004412
3	10 m	24 m	12 m	12 m	017860-5302
4	16 m	45 m	22 m	23 m	017860-5304
5	20 m	45 m	22 m	23 m	017860-5304
6	30 m	65 m	32 m	33 m	017860-5305
F	60 ft	134.50 ft	69.89 ft	65.61 ft	Contact Endress+Hauser
H	100 ft	216.52 ft	108.26 ft	108.26 ft	Contact Endress+Hauser

2. Measuring tape SUS316, tank top mounting

060 measurement range		Length (total length)	Perforated tape (measurement length)	Non-perforated tape	Spare parts
1	2.5 m	7.15 m	7 m	0.15 m	017860-5306
2	5 m	7.15 m	7 m	0.15 m	017860-5306
3	10 m	12.15 m	12 m	0.15 m	017860-5307
4	16 m	22.15 m	22 m	0.15 m	017860-5309
5	20 m	22.15 m	22 m	0.15 m	017860-5309
6	30 m	32.15 m	32 m	0.15 m	017860-5310
F	60 ft	72.17 ft	69.89 ft	3.28 ft	Contact Endress+Hauser
H	100 ft	111.54 ft	108.26 ft	3.28 ft	Contact Endress+Hauser

3. Measuring tape SUS316, seal pot/BT

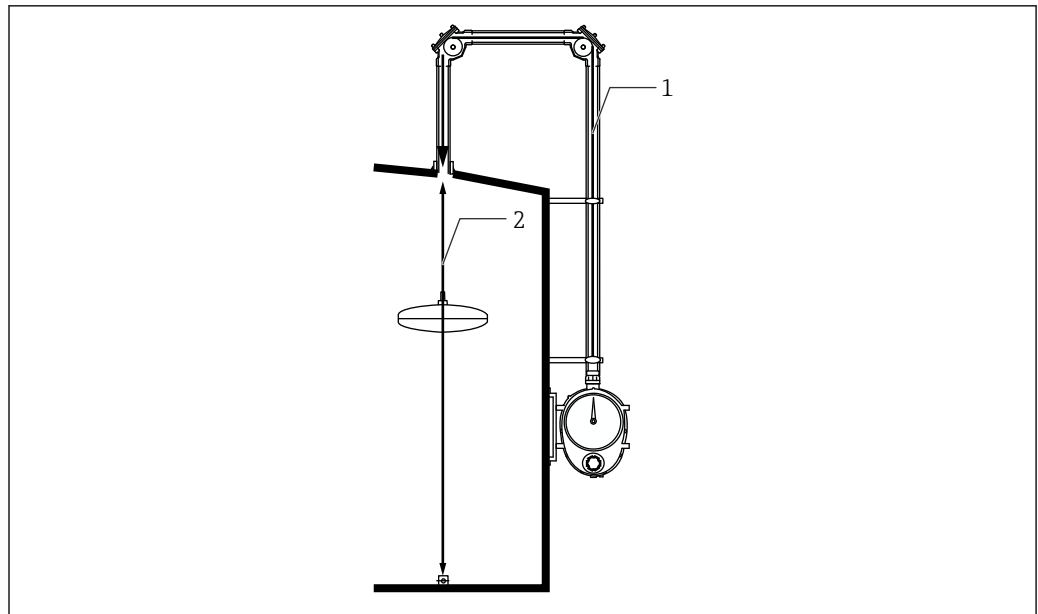
060 measurement range		Length (total length)	Perforated tape (measurement length)	Non-perforated tape	Spare parts
1	2.5 m	24 m	7 m	17 m	Contact Endress+Hauser
2	5 m	24 m	7 m	17 m	Contact Endress+Hauser
3	10 m	35 m	12 m	23 m	Contact Endress+Hauser
4	16 m	55 m	22 m	33 m	Contact Endress+Hauser
5	20 m	55 m	22 m	33 m	Contact Endress+Hauser
6	30 m	75 m	32 m	43 m	017860-5210
F	60 ft	167.31 ft	69.89 ft	98.42 ft	Contact Endress+Hauser
H	100 ft	249.33 ft	108.26 ft	141.07 ft	Contact Endress+Hauser

4. Measuring tape SUS316 + wire SUS316, FRT

060 measurement range		Length (total length)	Perforated tape (measurement length)	Non-perforated tape	Wire	Spare parts
1	2.5 m	16 m	6.7 m	0.3 m	9 m	017860-0005
2	5 m	16 m	6.7 m	0.3 m	9 m	017860-0005
3	10 m	26 m	11.7 m	0.3 m	14 m	017860-0007
4	16 m	46 m	21.7 m	0.3 m	24 m	017860-0011
5	20 m	46 m	21.7 m	0.3 m	24 m	017860-0011
6	30 m	66 m	31.7 m	0.3 m	34 m	017860-0013
F	60 ft	147.63 ft	67.91 ft	67.91 ft	78.74 ft	Contact Endress +Hauser
H	100 ft	219.80 ft	107.28 ft	67.91 ft	111.54 ft	Contact Endress +Hauser

5. Measuring tape SUS316 + PFA-coating SUS316 wire, seal pot/CRT

060 measurement range		Length (total length)	Perforated tape (measurement length)	Non-perforated tape	Wire	Spare parts
1	2.5 m	18 m	6.7 m	0.3 m	11 m	017860-0006
2	5 m	18 m	6.7 m	0.3 m	11 m	017860-0006
3	10 m	28 m	11.7 m	0.3 m	16 m	017860-0008
4	16 m	48 m	21.7 m	0.3 m	26 m	017860-0012
5	20 m	48 m	21.7 m	0.3 m	26 m	017860-0012
6	30 m	68 m	31.7 m	0.3 m	36 m	017860-0014
F	60 ft	154.19 ft	67.91 ft	67.91 ft	86.30 ft	Contact Endress +Hauser
H	100 ft	226.37 ft	107.28 ft	67.91 ft	118.11 ft	Contact Endress +Hauser



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2 Measuring tape and wire (example: option 1 for specification 070 and option 5 for specification 060)

1 Perforated tape

2 Non-perforated tape / wire

i In the above diagram, the maximum measurable distance is 22 mm, and there is up to 23 m of clearance. For this reason, the total length of the measuring tape is 45 m.

Sealing for wetting liquid and gas parts **List of materials**

Product name	Units	Sealing material name	Sealing material type	Materials of packing/o-ring
LT5-1	Gauge head	Rear cover	Cover packing	V#6502
		Check shaft	O-ring	FKM
		Sprocket shaft	Oil seal	FKM
		Blind board	Packing	NBR
	90° sheave elbow	Aluminum sheave elbow	Cover packing	V#6502
		Stainless steel sheave elbow		
		Bearing	O-ring	Silicon rubber
	U-seal pot	Aluminum sheave elbow	Cover packing	V#6502
			Bearing o-ring	Silicon rubber
		Stainless steel sheave elbow	Cover packing	V#6502
			Bearing o-ring	Silicon rubber
		PVC sheave elbow	Cover packing	V#6502
			Bearing o-ring	PTFE
	Top anchor	Aluminum, threaded type	Cover packing	V#6502
		Stainless tank welding type		
	Top anchor	Aluminum flange, threaded type		
Stainless flange welding type		Spring negator packing		
LT5-4/LT5-6	Gauge head	Rear cover	Cover packing	PTFE
		Check handle unit	Gland packing	PTFE/CR
		Internal magnet cover	O-ring	PTFE
		External magnet cover	O-ring	NBR *CR for ammonia specification
		Coupling	O-ring	PTFE
	Gate valve	Shaft	Shaft packing	PTFE
		Cap nut	Packing	PTFE
LT5-4	90° sheave elbow	Cover	Cover packing	PTFE
		Bearing	O-ring	PTFE
	135° sheave elbow	Cover	Cover packing	PTFE
		Bearing	O-ring	PTFE
	Top anchor	Aluminum flange integrated type	Spring negator packing	PTFE
		Stainless flange welding type		
LT5-6	90° sheave elbow	Cover	Cover packing	PTFE
		Bearing	O-ring	PTFE
	135° sheave elbow	Cover	Cover packing	PTFE
		Bearing	O-ring	PTFE
	Top anchor	Iron flange welding type	Spring negator packing	PTFE
		Stainless flange welding type		

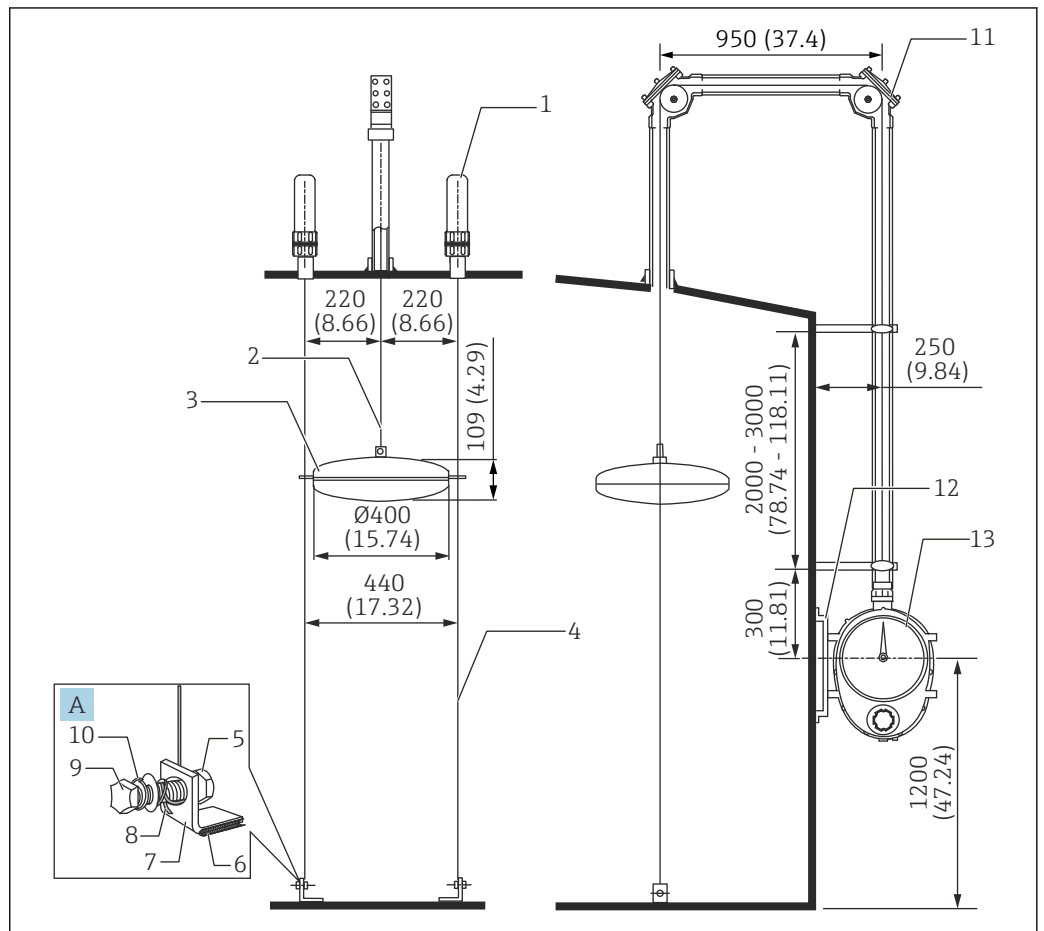
Material certificates

When material certificates are required, order them when ordering the products. Certificates can be provided for the following parts.

- Iron high-pressure gauge head (the flange is the same, as it is integrated with the gauge head), cover, magnet cover, check shaft (with no hoisting), plug
- Stainless steel measuring tape and wire (excluding PFA-coated wire)
- Stainless steel float
- Stainless steel or iron high-pressure top anchor main body, cover, flange
- Stainless steel guide wire (excluding PFA-coated wire)
- Stainless steel anchor hook
- Iron high-pressure sheave elbow main body (same for the flange as it is integrated with the sheave elbow main body), cover
- Stainless steel gate valve

Installation reference diagram and order codes

For a cone roof tank (CRT)



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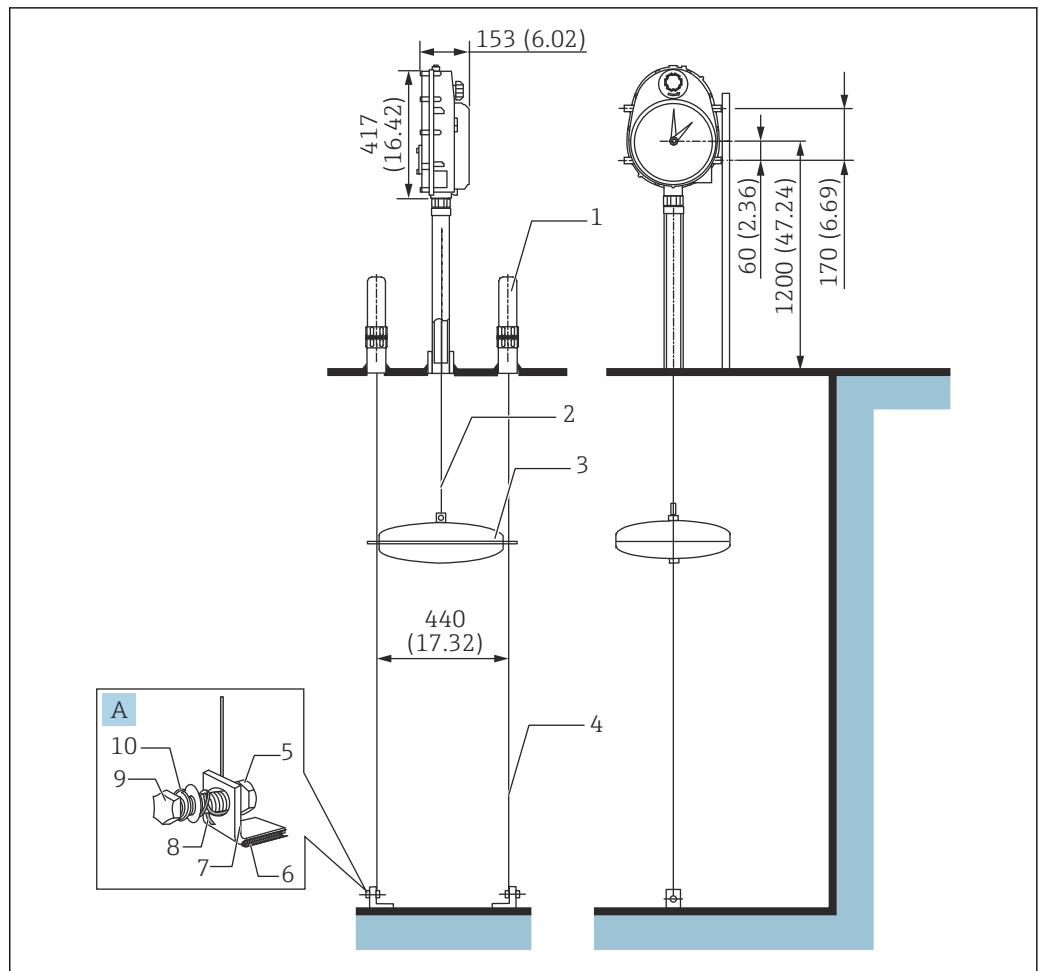
3 Mounting on a cone roof tank. Unit of measurement mm (in)

- A Anchor hook
- 1 Top anchor
- 2 Measuring tape
- 3 Float
- 4 Guide wire
- 5 Nut
- 6 Wetted part (welded to the tank)
- 7 Anchor hook
- 8 Guide wire
- 9 Bolt
- 10 Washer
- 11 90° sheave elbow
- 12 Gauge supporter
- 13 Gauge head

Order code examples (LT5-111A031B11A111200000+PA)

Items	Target	Code	Specifications	Quantity
020	Gauge head	1	0.01961 MPa/2.84 psi, aluminum (ADC12)	1
030	Gauge head process connection	11	Rc 1-1/2, union nut, SUS316, thread JISB0203	
040	Display; cover	A	Dial display: Acrylic	
050	Crank unit	0	None	
060	Measuring range	3	10 m	
070	Measuring tape	1	Measuring tape, CRT	
080	Float	B	D 400 mm SUS316 tape connection 5.0 kg, $0.65 \leq \text{density} 1.05$, with ring	
090	Top anchor	11	2x R1, aluminum (ADC6), thread JIS B0203	
100	Guide wire	A	Single wire with 3 mm diameter x 2 wires	
110	Anchor hook; mounting bolt	1	Iron; SUS316	
120	90 ° sheave elbow	112	2x Rp1-1/2, aluminum (ADC6), thread B0203	
130	135 ° sheave elbow	000	None	
140	Seal pot	0	None	-
150	Gate valve	0	None	
620	>>Enclosed accessories	PA	Gauge supporter SS400 low/medium-pressure gauge head	1

Mounting on a tank top (for an underground tank)



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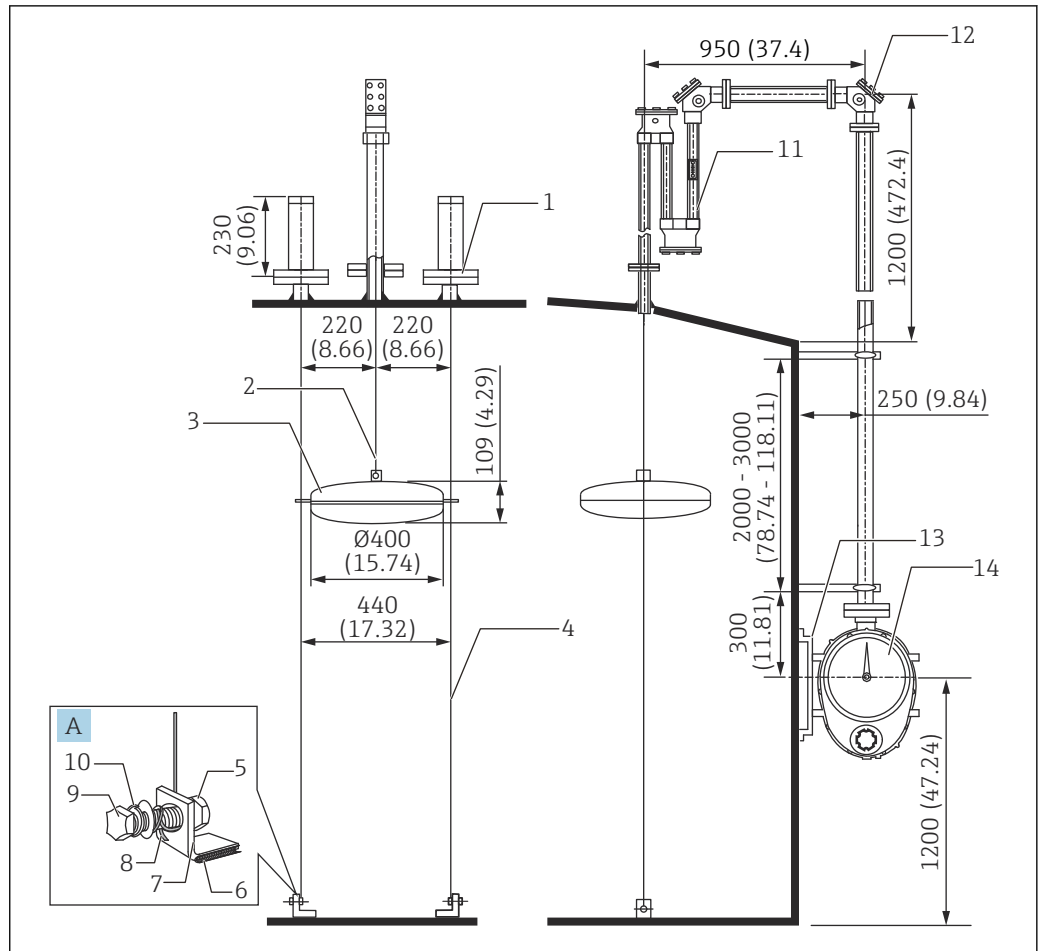
4 Mounting for an underground tank, unit. Unit of measurement mm (in)

- A Anchor hook
- 1 Top anchor
- 2 Measuring tape
- 3 Float
- 4 Guide wire
- 5 Nut
- 6 Wetted part (welded to the tank)
- 7 Anchor hook
- 8 Guide wire
- 9 Bolt
- 10 Washer

Order code examples (LT5-111C022B11A100000000)

Items	Target	Code	Specifications	Quantity
020	Gauge head	1	0.01961 MPa/2.84 psi, aluminum (ADC12)	1
030	Gauge head process connection	11	Rc 1-1/2, union nut, SUS316, thread JISB0203	
040	Display; cover	C	Reverse mounting, dial display, acrylic	
050	Crank unit	0	None	
060	Measuring range	2	5 m	
070	Measuring tape	2	Measuring tape, tank top mounting	
080	Float	B	D 400 mm SUS316 tape connection 5.0 kg, $0.65 \leq \text{density} 1.05$, with ring	
090	Top anchor	11	2x R1, aluminum (ADC6), thread JIS B0203	
100	Guide wire	A	Single wire with 3 mm diameter x 2 wires	
110	Anchor hook; mounting bolt	1	Iron; SUS316	
120	90 ° sheave elbow	000	None	-
130	135 ° sheave elbow	000	None	
140	Seal pot	0	None	
150	Gate valve	0	None	

Cone roof tank (with seal pot for CRT)



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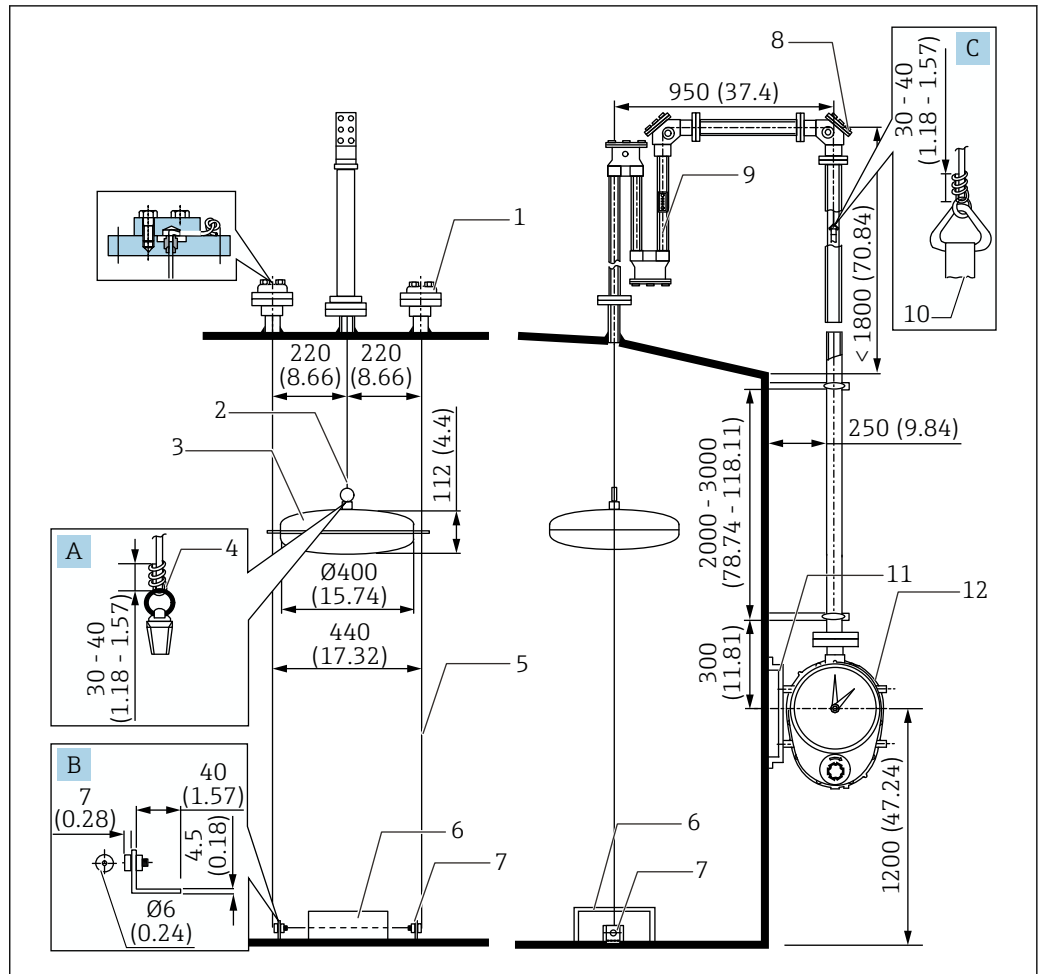
5 Installation on a cone roof tank with seal pot for CRT. Unit of measurement mm (in)

- A Anchor hook
- 1 Top anchor
- 2 Measuring tape
- 3 Float
- 4 Guide wire
- 5 Nut
- 6 Wetted part (welded to the tank)
- 7 Anchor hook
- 8 Guide wire
- 9 Bolt
- 10 Washer
- 11 Seal pot
- 12 90° sheave elbow
- 13 Gauge supporter
- 14 Gauge head

Order code examples (LT5-11AA023B1BA21A1000F0+PA)

Items	Target	Code	Specifications	Quantity
020	Gauge head	1	0.01961 MPa/2.84 psi, aluminum (ADC12)	1
030	Gauge head process connection	1A	10K 40A RF, aluminum (AC4A), flange JIS B2220	
040	Display; cover	A	Dial display: Acrylic	
050	Crank unit	0	None	
060	Measuring range	2	5 m	
070	Measuring tape	3	Measuring tape, seal pot /BT	
080	Float	B	D 400 mm SUS316 tape connection 5.0 kg, $0.65 \leq \text{density} 1.05$, with ring	
090	Top anchor	1B	2x10K 40A RF, SUS316, flange JIS B2220	
100	Guide wire	A	Single wire with 3 mm diameter x 2 wires	
110	Anchor hook; mounting bolt	2	SUS316; SUS316	
120	90 ° sheave elbow	1A1	1x 10K 40A RF, aluminum (ADC6+AC4A), flange JIS B2220	1
130	135 ° sheave elbow	000	None	-
140	Seal pot	F	10K 40A RF, SUS316, flange JIS B2220	1
150	Gate valve	0	None	-
620	>>Enclosed accessories	PA	Gauge supporter SS400 low/medium-pressure gauge head	1


Cone roof tank (with seal pot PVC for CRT)



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6 Installation on a cone roof tank with seal pot PVC for CRT. Unit of measurement mm (in)

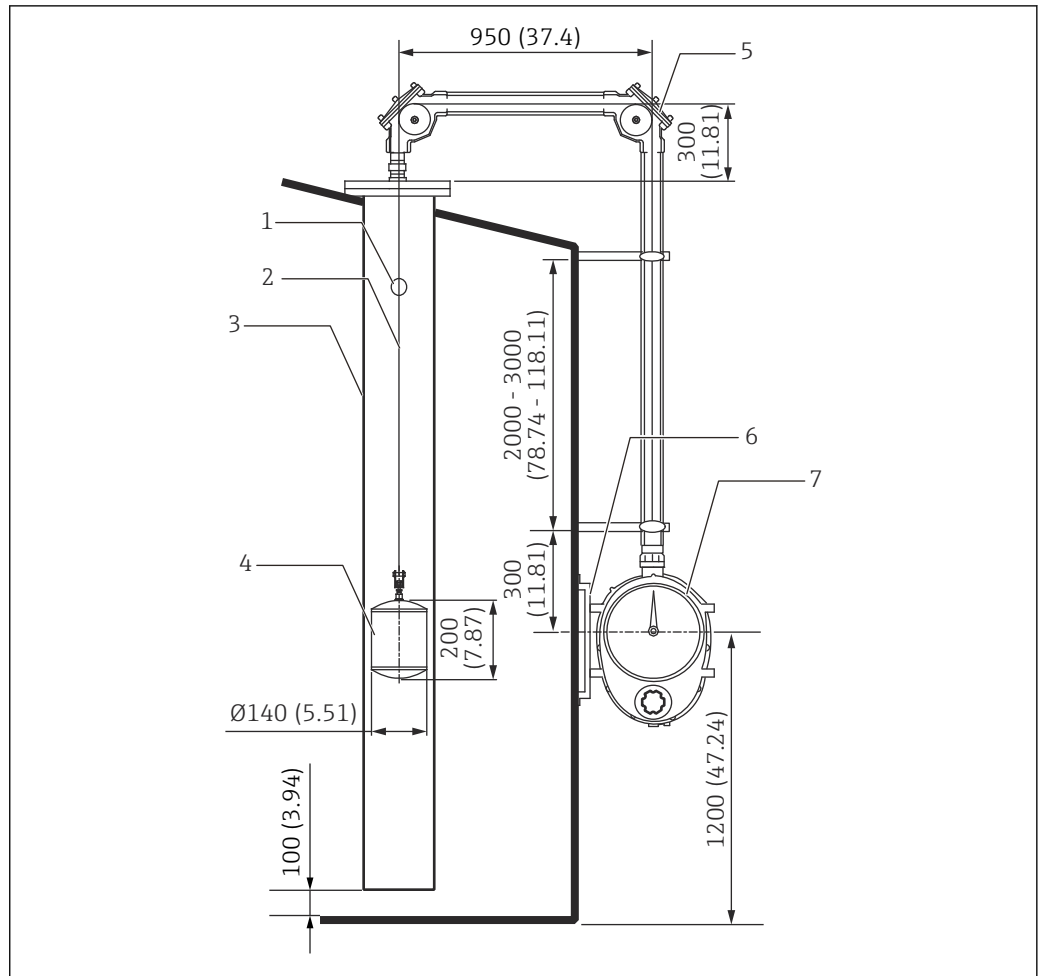
- A Float tip
- B Anchor hook details
- C Triangle bracket for measuring wire
- 1 Top anchor
- 2 Measuring wire
- 3 Float
- 4 Teflon tube
- 5 Guide wire (PFA-coated wire)
- 6 Wire protection stand (not supplied)
- 7 Anchor hook
- 8 90° sheave elbow
- 9 Seal pot
- 10 Measuring tape
- 11 Gauge supporter
- 12 Gauge head

-  ■ Coil the enclosed Teflon tube around the measuring wire 10 to 15 times.
- Coat the anchor hook if necessary.
- Position the connection part C in the diagram so that it is approx. 10 mm (0.39 in) below the sheave elbow when the liquid level is 0 and approx. 100 mm (3.94 in) from the gauge head when the tank is full.

Order code examples (LT5-11AA025H1NC41A1000N0+PA)

Items	Target	Code	Specifications	Quantity
020	Gauge head	1	0.01961 MPa/2.84 psi, aluminum (ADC12)	1
030	Gauge head process connection	1A	10K 40A RF, aluminum (AC4A), flange JIS B2220	
040	Display; cover	A	Dial display: Acrylic	
050	Crank unit	0	None	
060	Measuring range	2	5 m	
070	Measuring tape	5	Tape + PFA-coated wire, seal pot/CRT	
080	Float	H	D 400 mm SUS316 tape connection 5.0 kg, $0.65 \leq \text{density} 1.05$, with ring	
090	Top anchor	1N	2x10K 40A RF, PVC, flange JIS B2220	
100	Guide wire	C	4.6 mm diameter, strand wire, PFA-coated wire x 1 wire	1
110	Anchor hook; mounting bolt	4	SUS316; PVC	2
120	90 ° sheave elbow	1A1	1x 10K 40A RF, aluminum (ADC6+AC4A), flange JIS B2220	1
130	135 ° sheave elbow	000	None	-
140	Seal pot	N	10K 40A FF, PVC, flange JIS B2220	1
150	Gate valve	0	None	-
620	>>Enclosed accessories	PA	Gauge supporter SS400 low/medium-pressure gauge head	1

Compact cone roof tank (guide pipe method)



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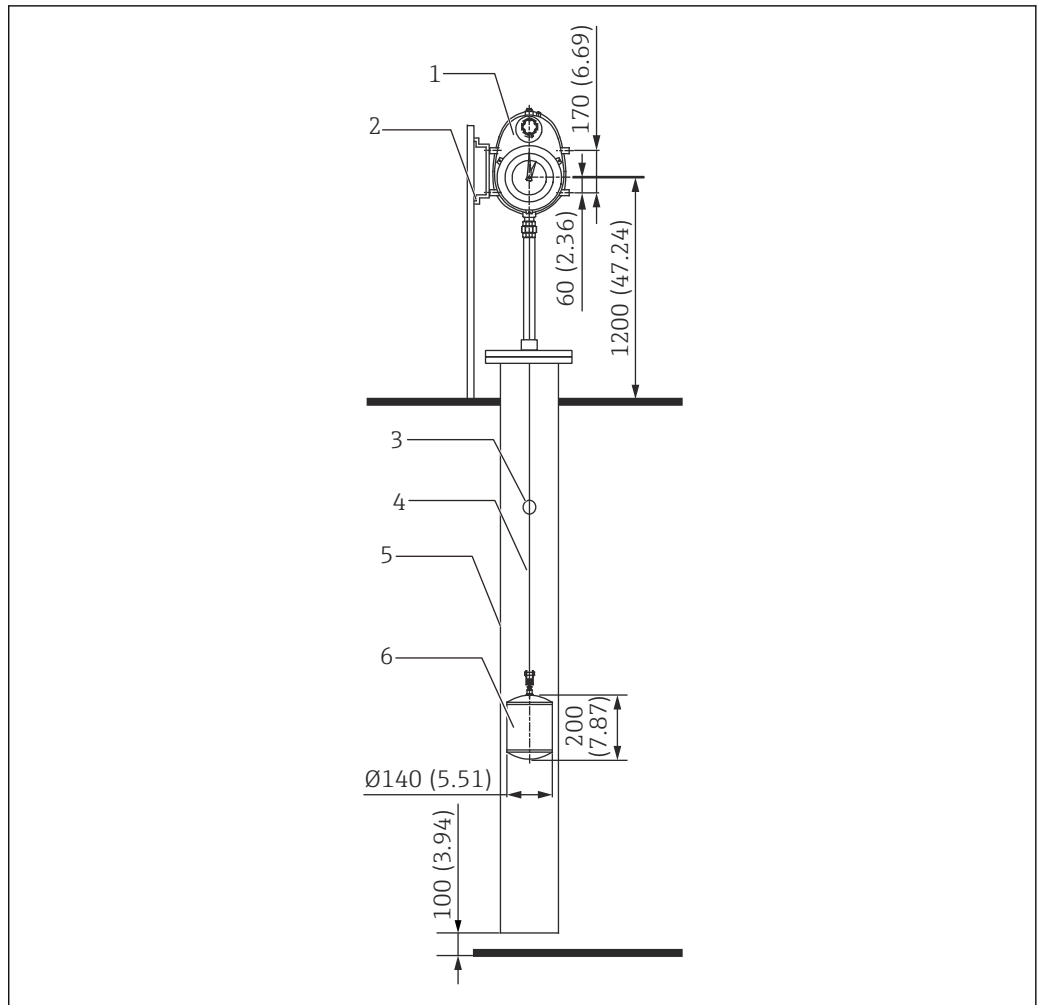
7 Mounting on a compact cone roof tank. Unit of measurement mm (in)

- 1 Ventilation hole
- 2 Measuring wire
- 3 Guide pipe (Stillwell)
- 4 Float
- 5 90° sheave elbow
- 6 Gauge supporter
- 7 Gauge head

Order code examples (LT5-111A021L000011200000+PA)

Items	Target	Code	Specifications	Quantity
020	Gauge head	1	0.01961 MPa/2.84 psi, aluminum (ADC12)	1
030	Gauge head process connection	11	Rc 1-1/2, union nut, SUS316, thread JISB0203	
040	Display; cover	A	Dial display: Acrylic	
050	Crank unit	0	None	
060	Measuring range	2	5 m	
070	Measuring tape	1	Measuring tape, CRT	
080	Float	L	D 140 mm SUS316 tape connection 2.4 kg, $0.94 \leq \text{density} 2.0$, without ring	
090	Top anchor	00	None	
100	Guide wire	0	None	
110	Anchor hook; mounting bolt	0	None	
120	90 ° sheave elbow	112	2x Rp1-1/2, aluminum (ADC6), thread JIS B0203	2
130	135 ° sheave elbow	000	None	-
140	Seal pot	0	None	
150	Gate valve	0	None	
620	>>Enclosed accessories	PA	Gauge supporter SS400 low/medium-pressure gauge head	1

Mounting on a tank top (guide pipe method)



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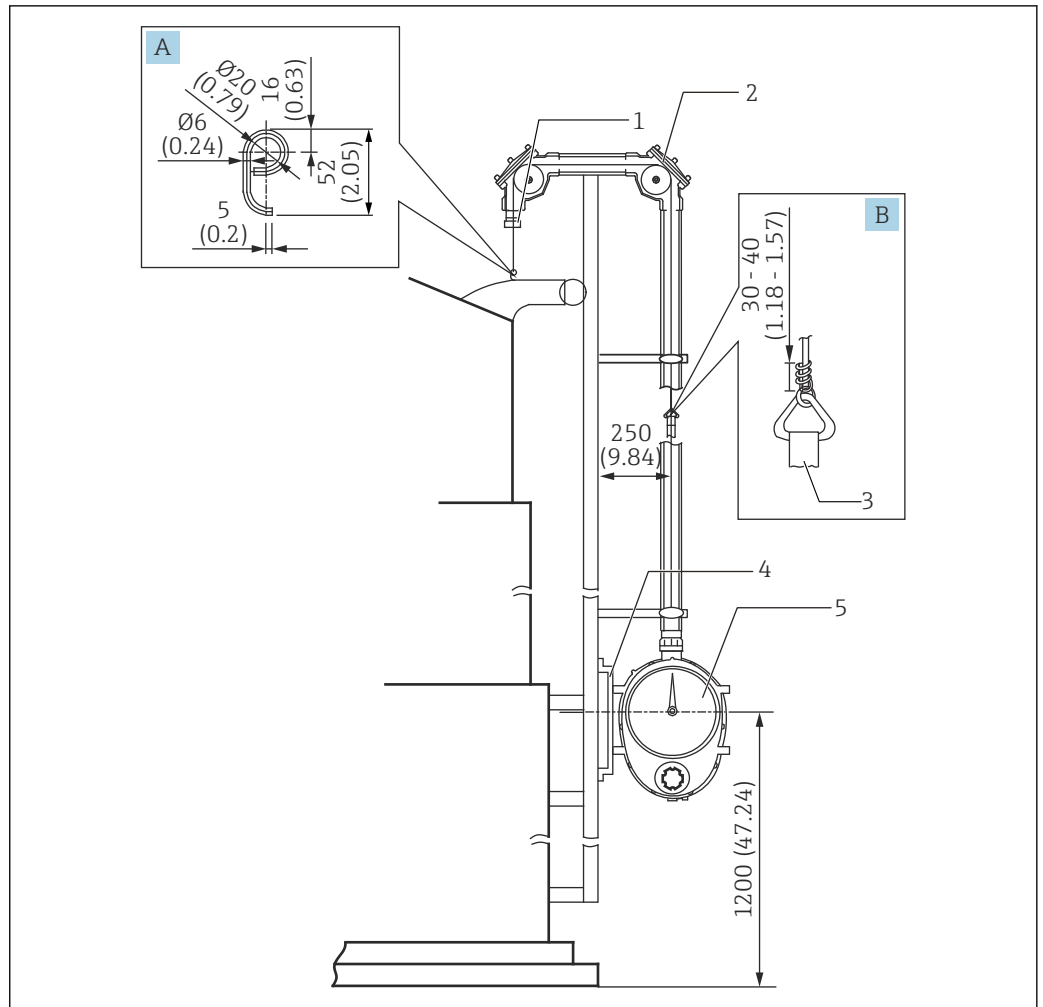
8 Tank top mounting, unit. Unit of measurement mm (in)

- 1 Gauge head
- 2 Gauge supporter
- 3 Ventilation hole
- 4 Triangle bracket for measuring wire
- 5 Guide pipe (Stillwell)
- 6 Float

Order code examples (LT5-111C022L000000000000+PA)

Items	Target	Code	Specifications	Quantity	
020	Gauge head	1	0.01961 MPa/2.84 psi, aluminum (ADC12)	1	
030	Gauge head process connection	11	Rc 1-1/2, union nut, SUS316, thread JISB0203		
040	Display; cover	C	Reverse mounting, dial display, acrylic		
050	Crank unit	0	None		
060	Measuring range	2	5 m		
070	Measuring tape	2	Measuring tape, tank top mounting		
080	Float	L	D 140 mm SUS316 tape connection 2.4 kg, 0.94 ≤ density 2.0, without ring		
090	Top anchor	00	None		-
100	Guide wire	0	None		
110	Anchor hook; mounting bolt	0	None		
120	90 ° sheave elbow	000	None		
130	135 ° sheave elbow	000	None		
140	Seal pot	0	None		
150	Gate valve	0	None		
620	>>Enclosed accessories	PA	Gauge supporter SS400 low/medium-pressure gauge head	1	

Gas holder



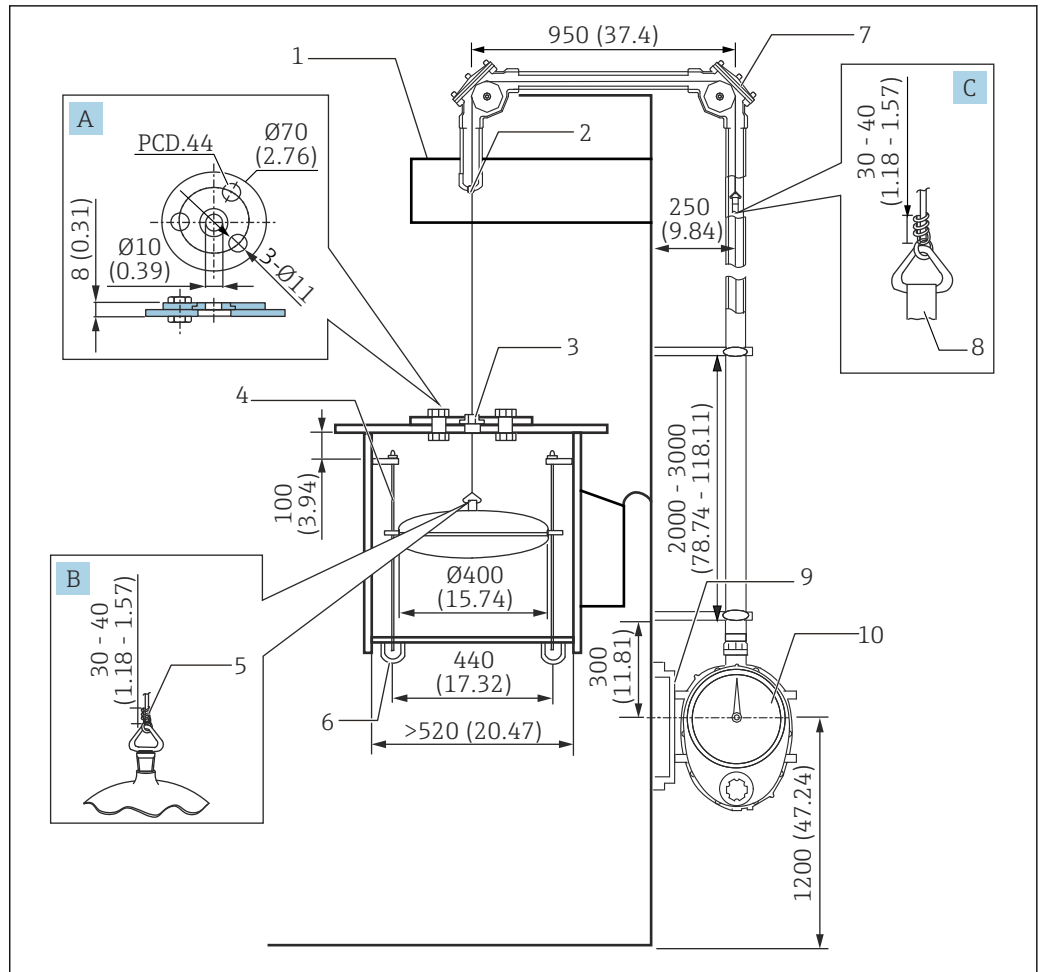
9 Mounting a gas holder. Unit of measurement mm (in)

- A Gas holder wire hook
- B Triangle bracket for measuring wire
- 1 Wire guide socket
- 2 90° sheave elbow
- 3 Measuring tape
- 4 Gauge supporter
- 5 Gauge head

Order code examples (LT5-111A0340000011200000+PAPFPH)

Items	Target	Code	Specifications	Quantity
020	Gauge head	1	0.01961 MPa/2.84 psi, aluminum (ADC12)	1
030	Gauge head process connection	11	Rc 1-1/2, union nut, SUS316, thread JISB0203	
040	Display; cover	A	Dial display: Acrylic	
050	Crank unit	0	None	
060	Measuring range	3	10 m	
070	Measuring tape	4	Tape + wire, FRT	
080	Float	0	None	
090	Top anchor	00	None	
100	Guide wire	0	None	
110	Anchor hook; mounting bolt	0	None	
120	90 ° sheave elbow	112	2x Rp1-1/2, aluminum (ADC6), thread JIS B0203	2
130	135 ° sheave elbow	000	None	-
140	Seal pot	0	None	
150	Gate valve	0	None	
620	>>Enclosed accessories	PA	Gauge supporter SS400 low/medium-pressure gauge head	1
620	>>Enclosed accessories	PF	Wire guide socket, Rc1-1/2	
620	>>Enclosed accessories	PH	Gas holder wire hook	

For a floating roof (FRT)



A0041203

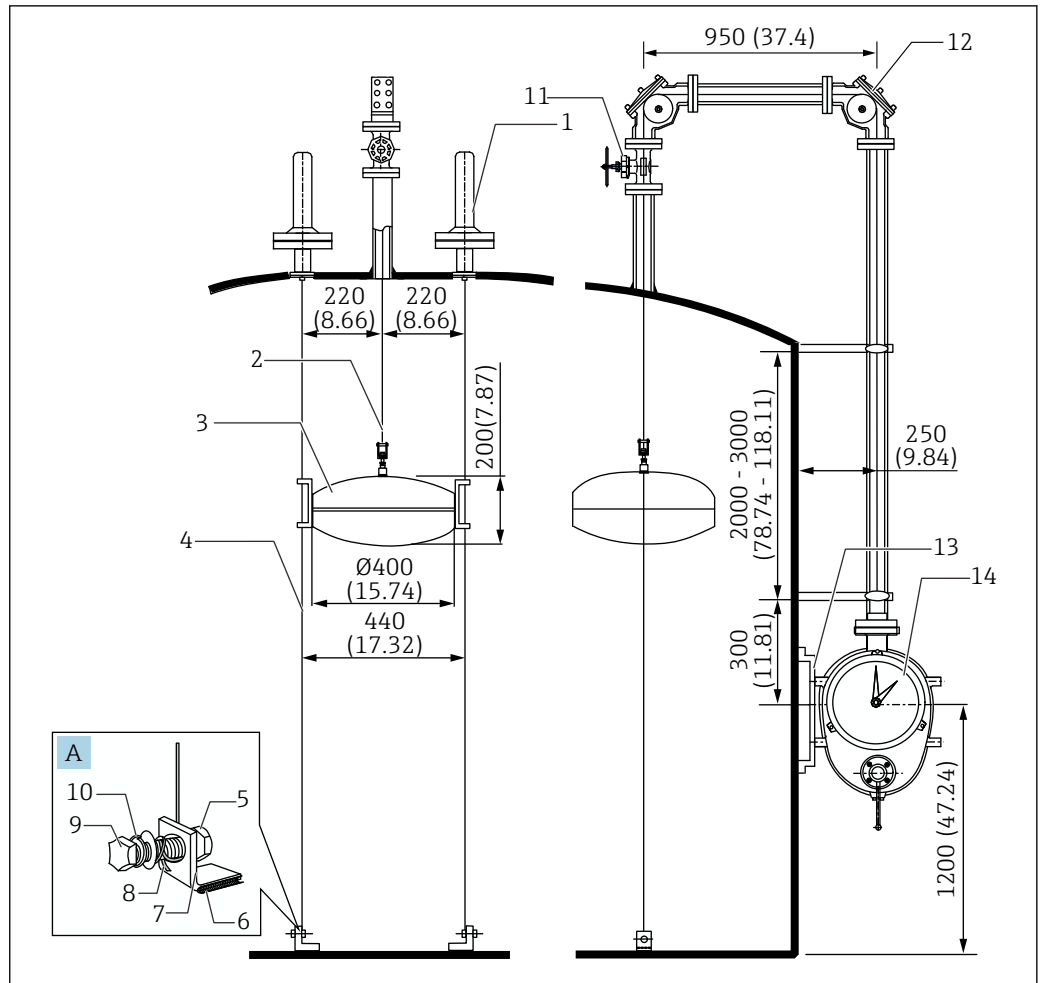
10 Mounting on a floating roof tank. Unit of measurement mm (in)

- A Wire guide metal
- B Top of the float
- C Triangle bracket for measuring wire
- 1 Roof stand
- 2 Wire guide socket
- 3 FRT wire guide metal
- 4 Guide bar: $\phi 16$ mm (0.63 in)
- 5 Stainless steel wire (accessory)
- 6 Pipe end: 1^B Sch 40 to 80
- 7 90° sheave elbow
- 8 Measuring tape
- 9 Gauge supporter
- 10 Gauge head

Order codes (LT5-111A054E000011200000+PAPEPF)

Items	Target	Code	Specifications	Quantity
020	Gauge head	1	0.01961 MPa/2.84 psi, aluminum (ADC12)	1
030	Gauge head process connection	11	Rc 1-1/2, union nut, SUS316, thread JISB0203	
040	Display; cover	A	Dial display: Acrylic	
050	Crank unit	0	None	
060	Measuring range	5	20 m	
070	Measuring tape	4	Tape + wire, FRT	
080	Float	E	D 400 mm SUS316 wire connection 5.0 kg, $0.65 \leq \text{density} 1.05$, with ring	
090	Top anchor	00	None	
100	Guide wire	0	None	
110	Anchor hook; mounting bolt	0	None	
120	90 ° sheave elbow	112	2x Rp1-1/2, aluminum (ADC6), thread JIS B0203	2
130	135 ° sheave elbow	000	None	-
140	Seal pot	0	None	
150	Gate valve	0	None	
620	>>Enclosed accessories	PA	Gauge supporter SS400 low/medium-pressure gauge head	1
620	>>Enclosed accessories	PE	FRT wire guide metal	
620	>>Enclosed accessories	PF	Wire guide socket, Rc1-1/2	

Medium-pressure dome roof tank



A0041204

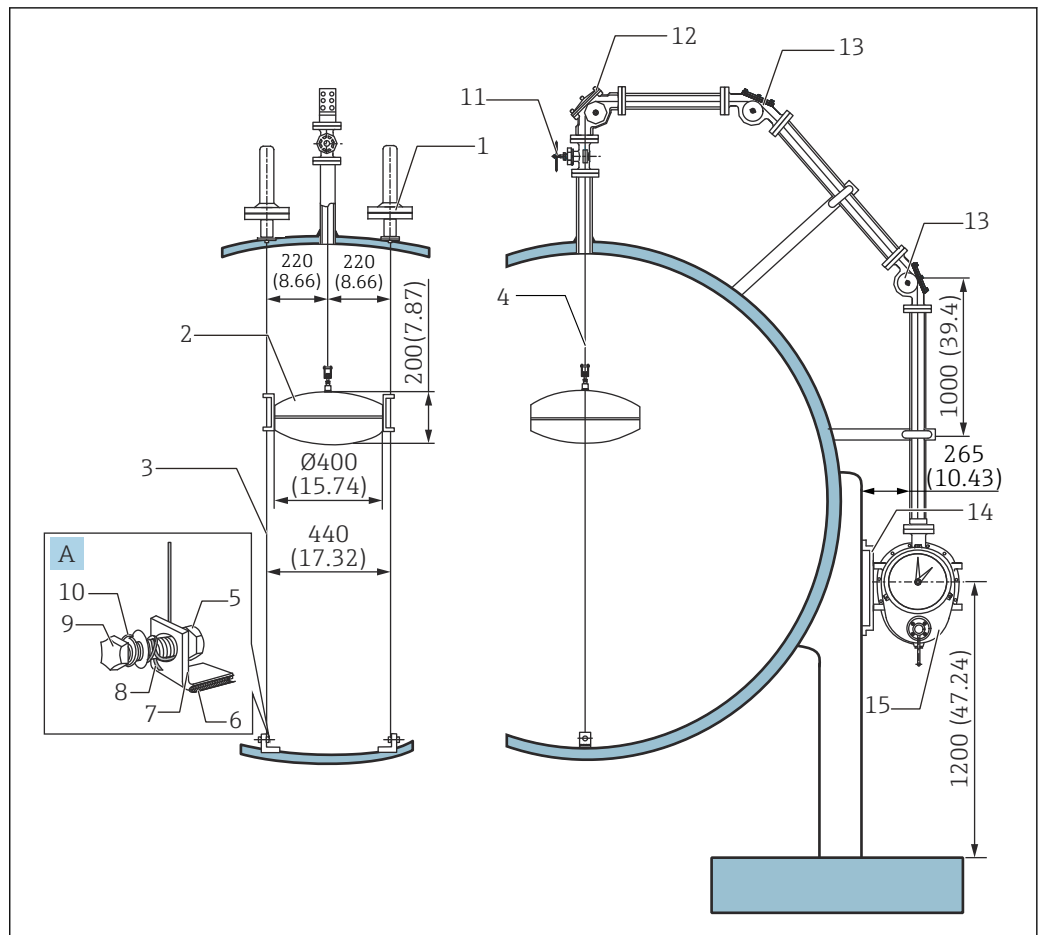
11 Mounting on a medium-pressure dome roof tank. Unit of measurement mm (in)

- A Anchor hook
- 1 Top anchor
- 2 Measuring tape
- 3 Float
- 4 Guide wire
- 5 Stainless steel wire (accessory)
- 6 Nut
- 7 Anchor hook
- 8 Guide wire
- 9 Bolt
- 10 Washer
- 11 Gate valve
- 12 90° sheave elbow
- 13 Gauge supporter
- 14 Gauge head

Order code examples (LT5-44AB151R4AA24A200001+PA)

Items	Target	Code	Specifications	Quantity
020	Gauge head	4	0.09807 MPa/14.22 psi, aluminum (AC4CT6)	1
030	Gauge head process connection	4A	10K 40A RF, aluminum (AC4CT6), flange JIS B2220	
040	Display; cover	B	Dial display; glass + iron	
050	Crank unit	1	Selected	
060	Measuring range	5	20 m	
070	Measuring tape	1	Measuring tape, CRT	
080	Float	R	D 400 mm SUS316 wire connection 8.3 kg, 0.5 ≤ density 0.7, with ring	
090	Top anchor	4A	2x10K 40A RF, aluminum (AC4CT6), flange JIS B2220	
100	Guide wire	A	Single wire with 3 mm diameter x 2 wires	
110	Anchor hook; mounting bolt	2	SUS316; SUS316	
120	90 ° sheave elbow	4A2	2x 10K 40A RF, aluminum (ADC6), flange JIS B2220	
130	135 ° sheave elbow	000	None	
140	Seal pot	0	None	-
150	Gate valve	1	10K 40A RF, SCS13, flange JIS B2220	
620	>>Enclosed accessories	PA	Gauge supporter SS400 low/medium-pressure gauge head	

High-pressure sphere tank



A0041205

12 Mounting on a high-pressure sphere tank. Unit of measurement mm (in)

- A Anchor hook
- 1 Top anchor
- 2 Float
- 3 Guide wire
- 4 Measuring tape
- 5 Nut
- 6 Wetted part (welded to the tank)
- 7 Anchor hook
- 8 Guide wire
- 9 Bolt
- 10 Washer
- 11 Gate valve
- 12 90° sheave elbow
- 13 135° sheave elbow
- 14 Gauge supporter
- 15 Gauge head

Order code examples (LT5-66GB153R6GA26G16G204+PC)

Items	Target	Code	Specifications	Quantity
020	Gauge head	6	2.45 MPa/355.25 psi, iron (SCPL1)	1
030	Gauge head process 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	20 m	
070	Measuring tape	3	Measuring tape, seal pot / BT	
080	Float	R	D 400 mm SUS316 wire connection 8.3 kg, 0.5 ≤ density 0.7, with ring	
090	Top anchor	6G	2x20K 40A RF, iron, flange JIS B2220	
100	Guide wire	A	Single wire with 3 mm diameter x 2 wires	
110	Anchor hook; mounting bolt	2	SUS316; SUS316	
120	90 ° sheave elbow	6G1	1x 20K 40A RF, iron, flange JIS B2220	1
130	135 ° sheave elbow	6G2	2x 20K 40A RF, iron, flange JIS B2220	2
140	Seal pot	0	None	-
150	Gate valve	4	20K 40A RF, SCS13, flange JIS B2220	1
620	>>Enclosed accessories	PC	Gauge supporter SS400 high-pressure gauge head	

Environment

Operating temperature limits	Spec.	Range
	LT5-1	Joint: -200 to 200 °C (-328 to 392 °F) Body: -20 to 70 °C (-4 to 157 °F)
LT5-4/LT5-6	Joint: -45 to 80 °C (-49 to 176 °F) Body: -20 to 70 °C (-4 to 157 °F)	

Process

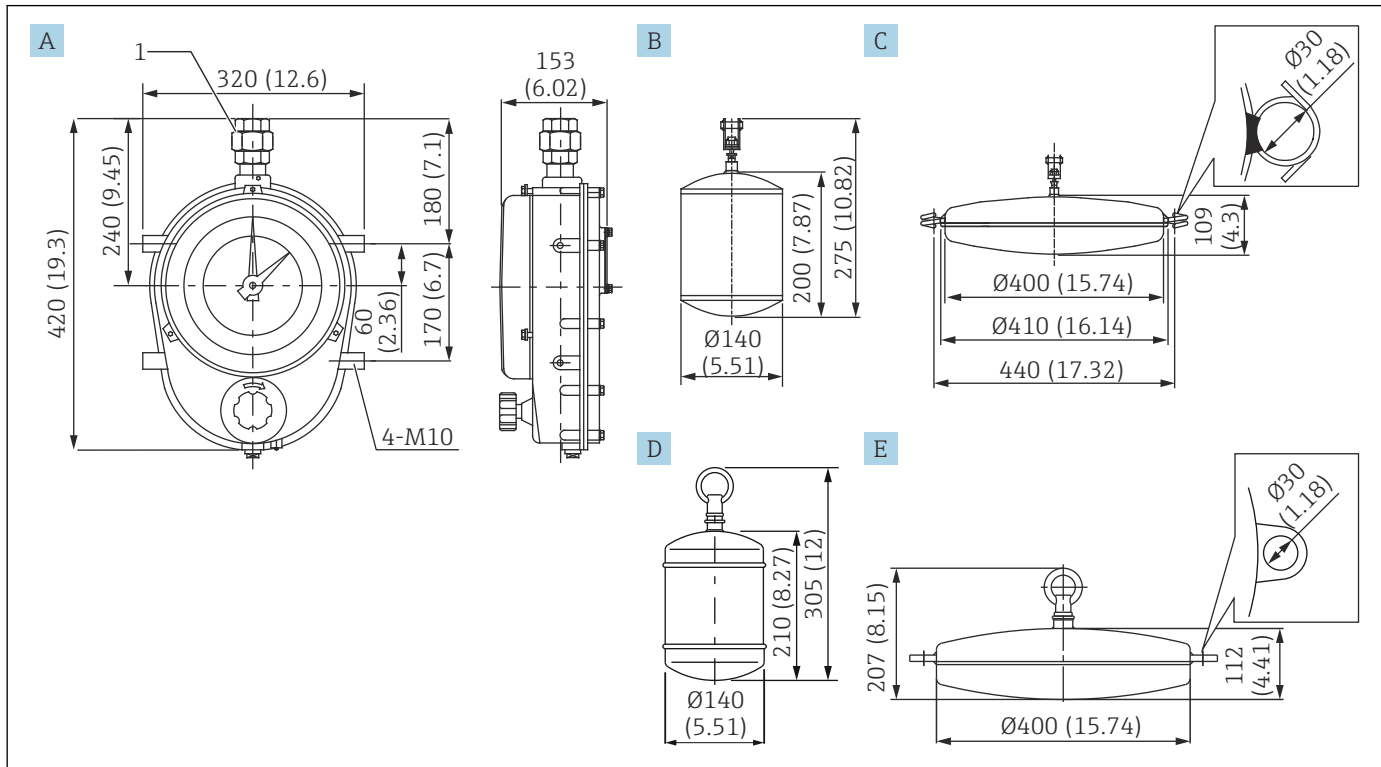
Range of process pressure	Specifications	Housing materials	Range of process pressure				
			Standard	Specifications	bar	MPa	psi
LT5-1 (low pressure)		Aluminum	0.1961 bar/0.01961 MPa/2.84 psi				
LT5-4 (medium pressure)		Aluminum	0.9807 bar/0.09807 MPa/14.22 psi				
LT5-6 (high pressure)		Iron	JIS	10K	9.8	0.98	142.13
				20K	24.5	2.45	355.33
			ASME	Cl.150	9.8	0.98	142.13
				Cl.300	24.5	2.45	355.33
			JPI	150 lbs	9.8	0.98	142.13
				300 lbs	24.5	2.45	355.33

Mechanical construction

Dimensions of LT5

Dimensions of common components are used for the installation conditions. Contact your Endress +Hauser Sales Center if you are using different components.

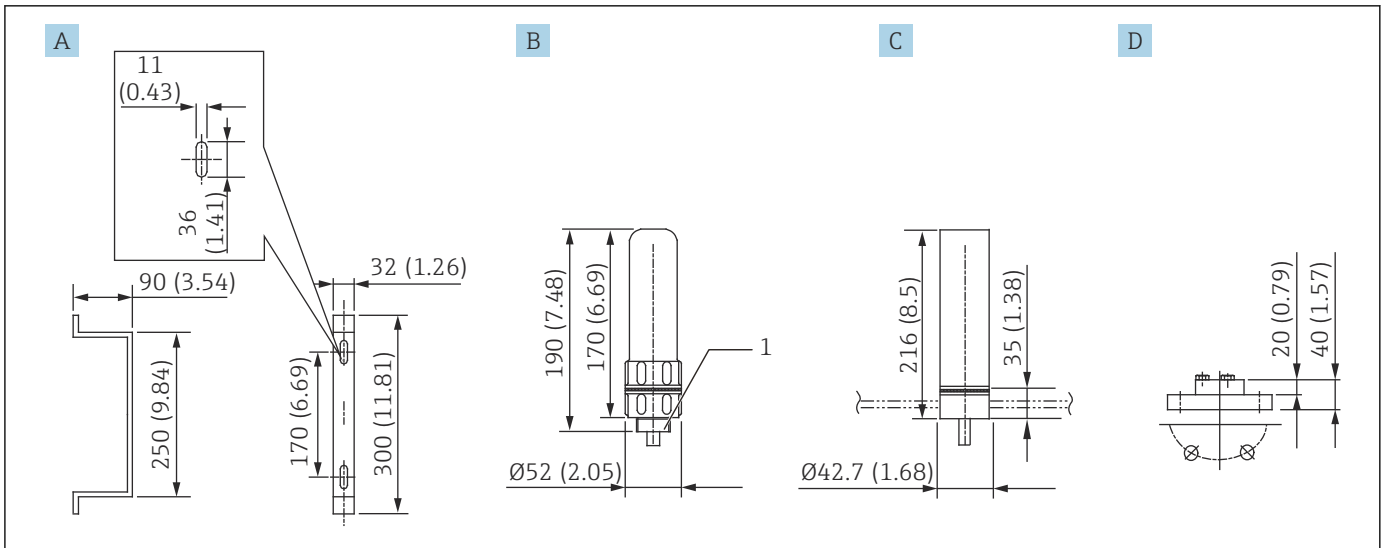
Dimensions of LT5-1 (threaded, low-pressure type)



A0041186

13 LT5-1/float dimensions. Unit of measurement mm (in)

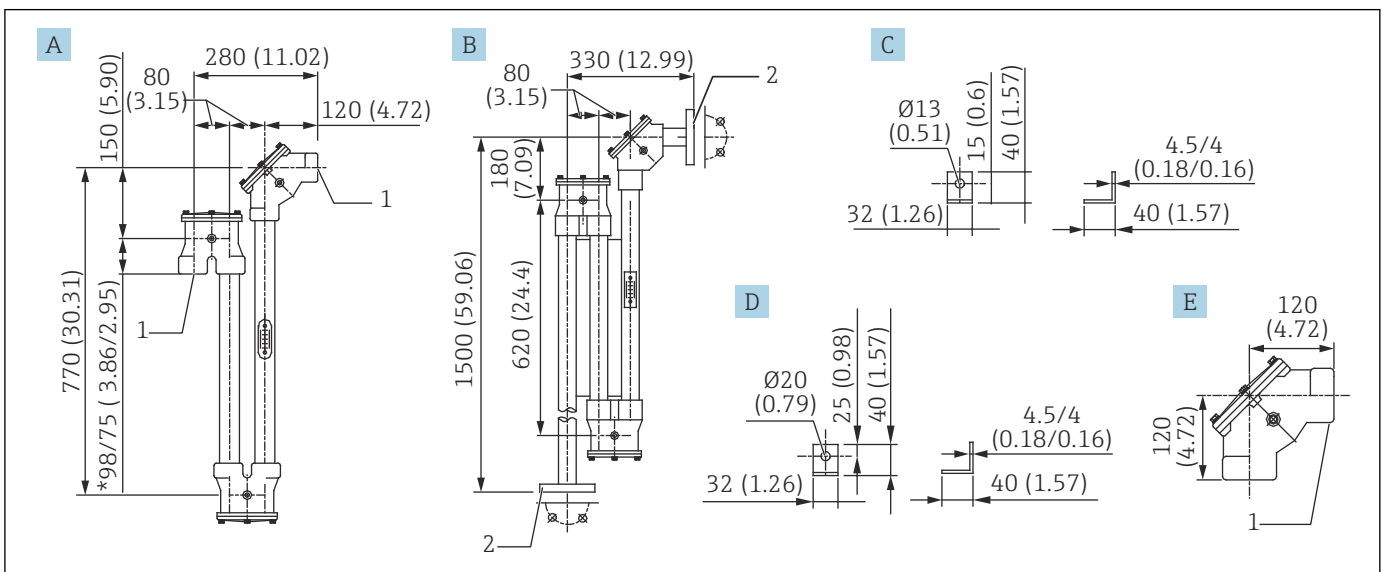
- A Gauge head (ADC12)
- B Float ϕ 140 (SUS316)
- C Float ϕ 400 (SUS316)
- D Float ϕ 140 (PVC)
- E Float ϕ 400 (PVC)
- 1 Union nut (select from JIS Rc 1-1/2 / ANSI NPT 1-1/2; if there is no union nut, select Rp 1-1/2)



A0041188

14 Accessory 1. Unit of measurement mm (in)


- A Gauge supporter (select from iron / SUS304)
- B Top anchor (ADC6)
- C Top anchor (SUS316 / socket welding type)
- D Top anchor (PVC) (only flange type is available for PVC)
- 1 Select from JIS R1 / ANSI NPT1



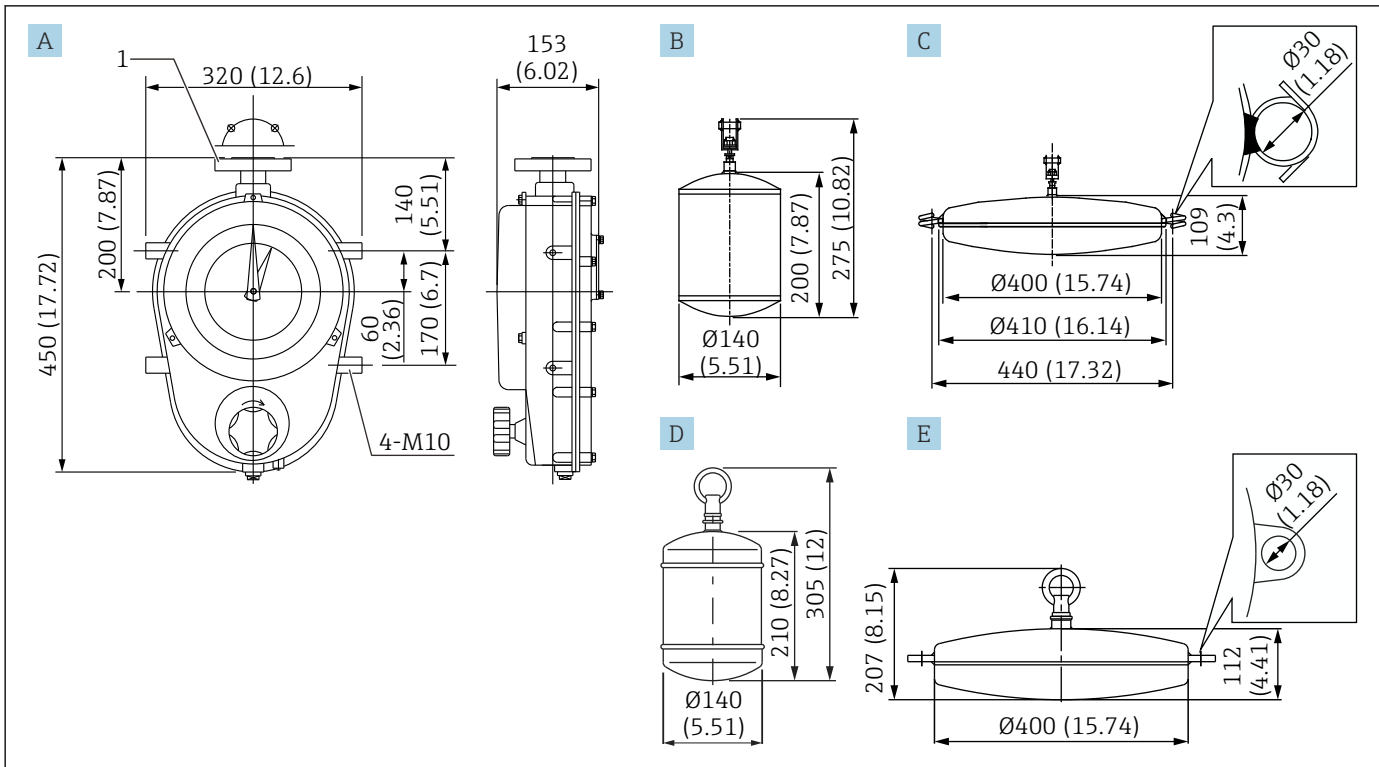
A0041189

15 Accessory 2. Unit of measurement mm (in)

- A Seal pot (select from aluminum / SUS316)
- B Seal pot (PVC) (only flange type is available for PVC)
- C Anchor hook (select from iron / SUS316)
- D Anchor hook (PVC bolt)
- E 90 ° sheave elbow (select from ADC6 / SCS14)
- 1 Threaded (select from Rp1-1/2 / NPT1-1/2 as an option)
- 2 Flange (select from JIS 10K 40A FF / ASME NPS1-1/2" Cl.150 FF / JPI 40A 150 lbs FF)

 The 75 mm in seal pot 98/75 indicates the dimension for SUS316.

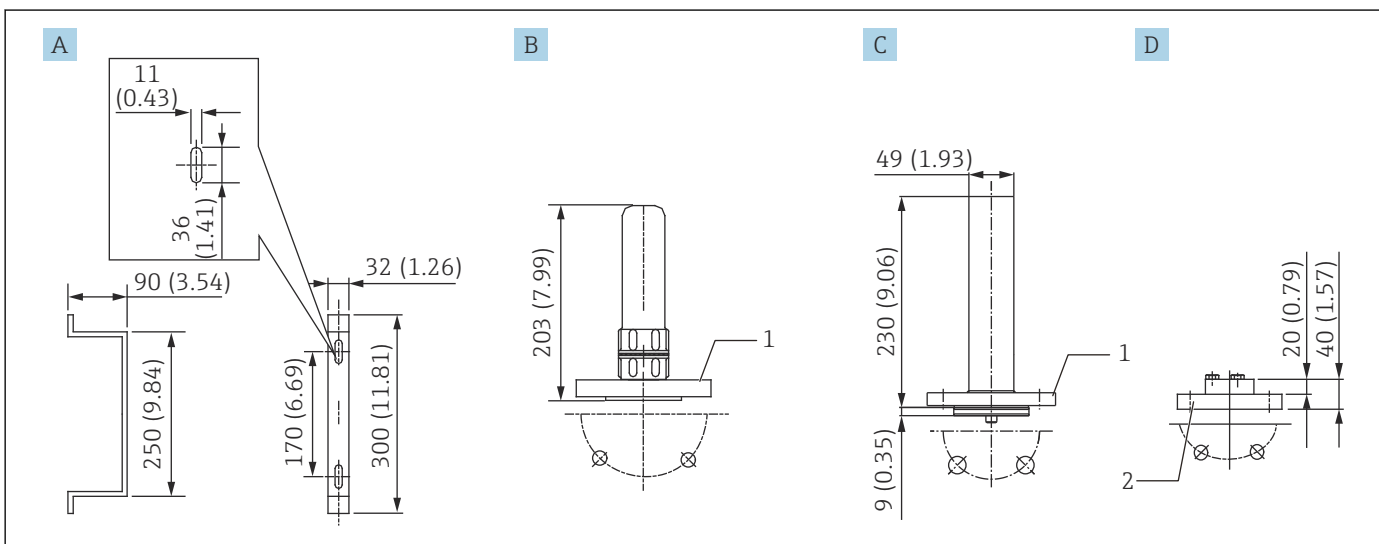
Dimensions of LT5-1 (flange, low-pressure type)



A0041187

16 Dimensions of LT5-1. Unit of measurement mm (in)

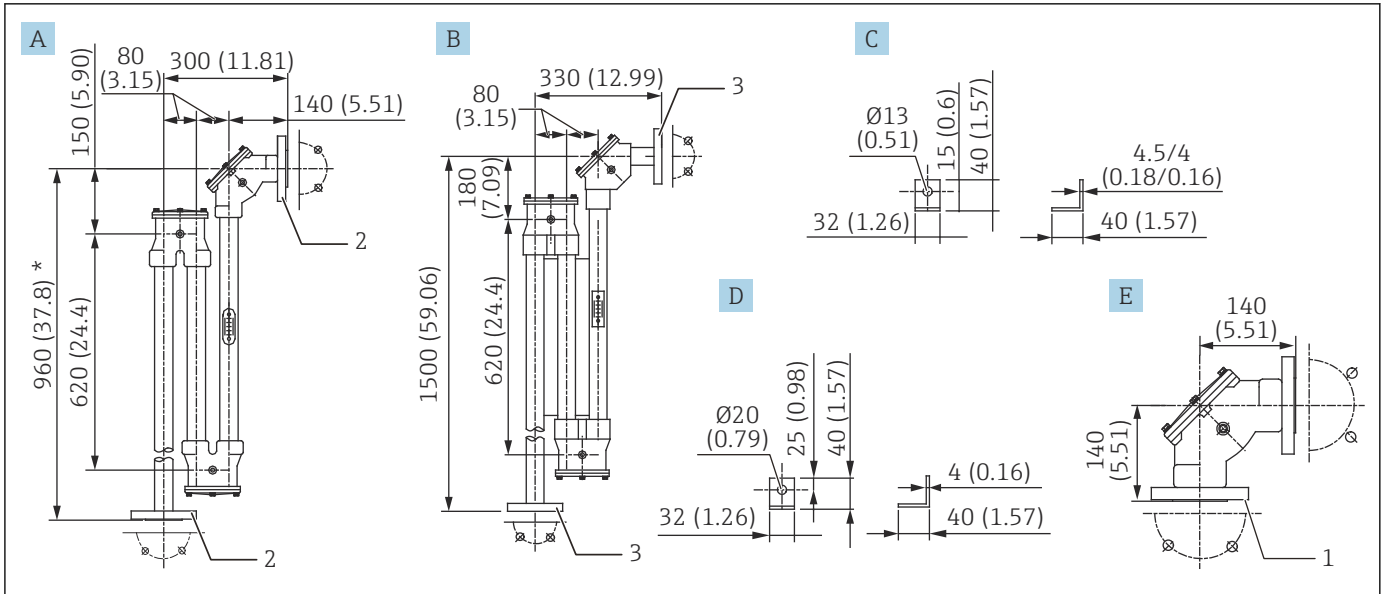
- A Gauge head (ADC12)
- B Float φ140 (SUS316)
- C Float φ400 (SUS316)
- D Float φ140 (PVC)
- E Float φ400 (PVC)
- 1 Flange (select from JIS 10K 40A RF / ASME NPS1-1/2" Cl.150 RF / JPI 40A 150 lbs RF)



A0041191

17 Accessory 1. Unit of measurement mm (in)

- A Gauge supporter (select from iron / SUS304)
- B Top anchor (ADC6+AC4A)
- C Top anchor (SUS316)
- D Top anchor (PVC)
- 1 Flange (select from JIS 10K 40A RF / ASME NPS 1-1/2" Cl.150 RF / JPI 40A 150 lbs RF)
- 2 Flange (select from JIS 10K 40A FF / ASME NPS 1-1/2" Cl.150 FF / JPI 40A 150 lbs FF)



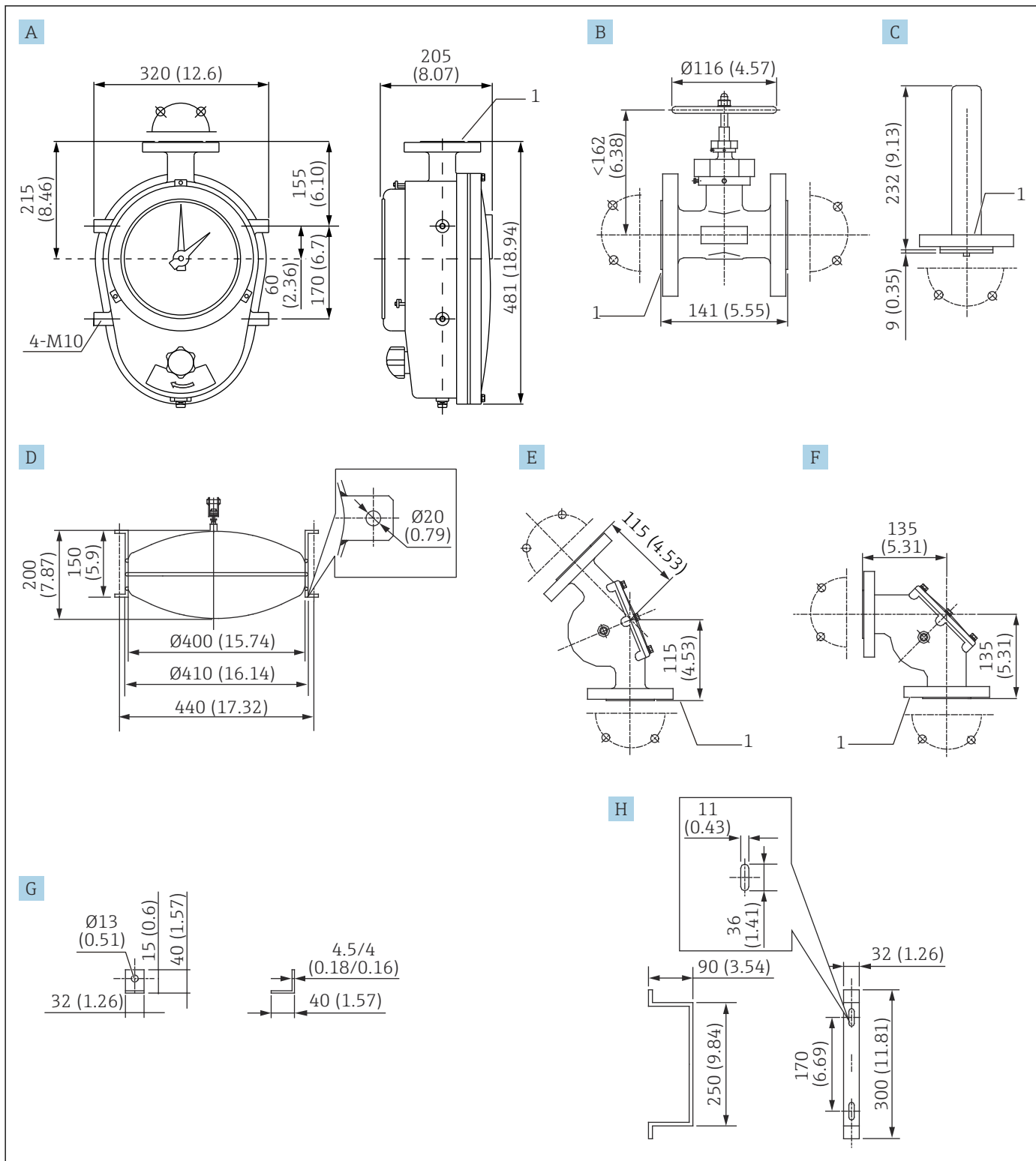
A0041192

18 Accessory 2. Unit of measurement mm (in)

- A Seal pot (select from aluminum + iron / SCS14+SUS316; see notes below)
- B Seal pot (PVC)
- C Anchor hook (select from iron / SUS316)
- D Anchor hook (PVC bolt)
- E 90° sheave elbow (select from ADC6+AC4A / 5CS14+SUS316)
- 1 Flange (select from JIS 10K 40A RF / ASME NPS 1-1/2" RF / JPI 40A 150 lbs RF)
- 2 Flange (select from JIS 10K 40A RF / ASME NPS 1-1/2" Cl.150 RF / JPI 40A 150 lbs RF)
- 3 Flange (select from JIS 10K 40A FF / ASME NPS 1-1/2" Cl.150 FF / JPI 40A 150 lbs FF)

- i** ■ Tape only: 960 mm (37.8 in)
- Tape + wire: 1500 mm (59.06 in)

Dimensions of LT5-4 (flange, medium-pressure type)



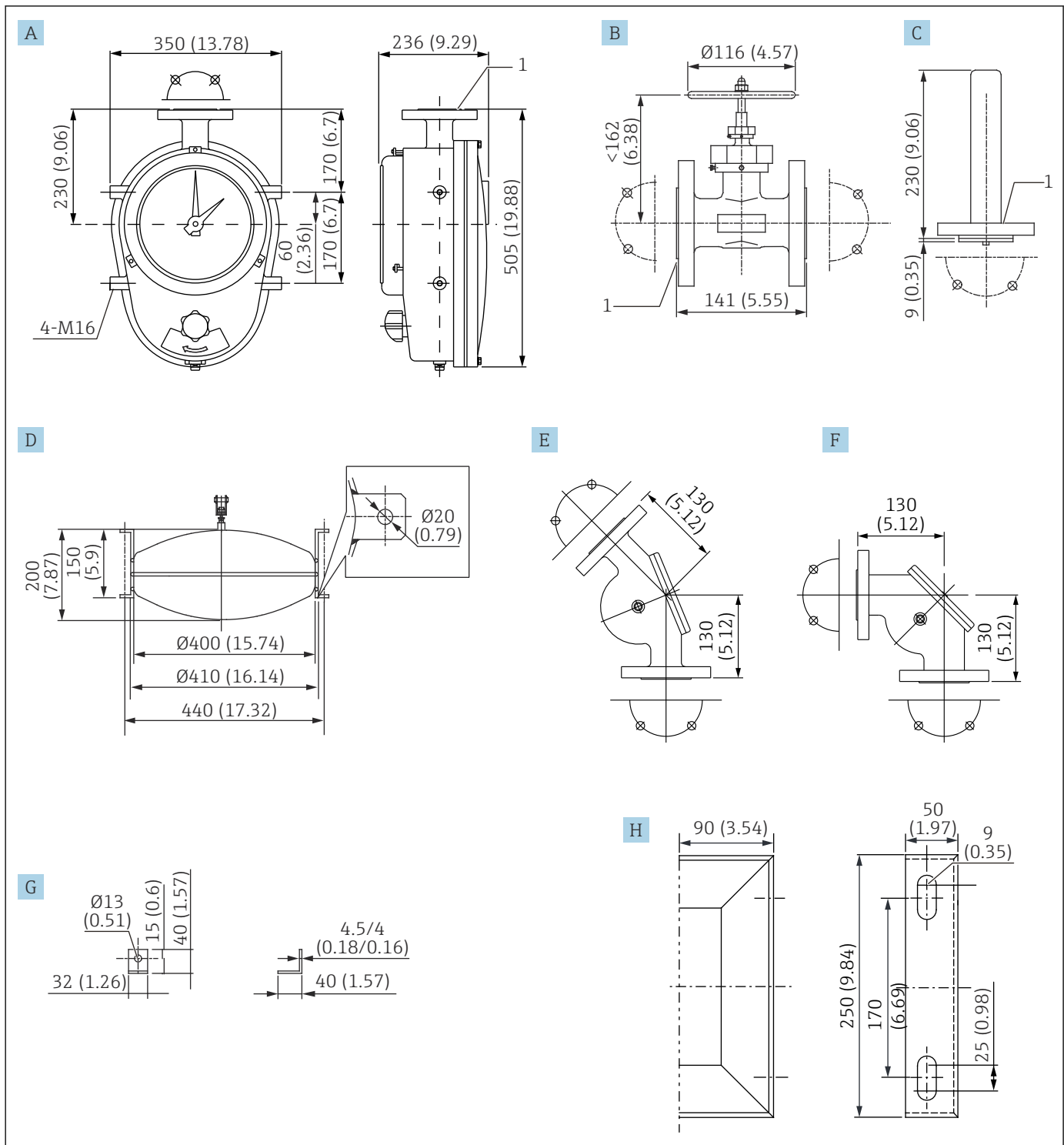
A0041193

19 Dimensions of LT5-4. Unit of measurement mm (in)

- A Gauge head (AC4CT6)
- B Gate valve (SCS13)
- C Top anchor (AC4CT6)
- D Float $\phi 400$ (SUS316)
- E 135° sheave elbow (AC4CT6)
- F 90° sheave elbow (AC4CT6)

- G* Anchor hook (select from iron / SUS316)
- H* Gauge supporter (select from iron / SUS304)
- 1* Flange (select from JIS 10K 40A RF / ASME NPS 1-1/2" Cl.150 RF/ JPI 40A 150 lbs RF)

Dimensions of LT5-6 (flange, high-pressure type)




A0041194

20 Dimensions of LT5-6. Unit of measurement mm (in)

- A Gauge head (iron)
- B Gate valve (SCS13)
- C Top anchor (select from iron / SUS316)
- D Float ϕ 400 (SUS316)
- E 135° sheave elbow (iron)
- F 90° sheave elbow (iron)
- G Anchor hook (select from iron / SUS316)
- H Gauge supporter (select from iron / SUS304)
- 1 Flange (select from JIS 10K/20K 40A RF / ASME NPS 1-1/2" CL.150/300 RF / JPI 40A 150/300 lbs. RF)

Process connection		Specifications	Description
LT5-1	Threaded, low-pressure type		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 type Flange spec. / flange material		10K 40A RF, aluminum (AC4A), flange JIS B2220 10K 40A RF, SUS316, flange JIS B2220 NPS 1-1/2" Cl.150 RF, aluminum (AC4A) flange ASME B16.5 NPS 1-1/2" Cl.150 RF, SUS316 flange ASME B16.5 40A 150 lbs RF, aluminum (AC4A), flange JPI 7S-15 40A 150 lbs RF, SUS316, flange JPI 7S-15
LT5-4	Flange, medium-pressure type Flange spec. / main body material		10K 40A RF, aluminum (AC4CT6), flange JIS B2220 NPS 1-1/2" Cl.150 RF, aluminum (AC4CT6) flange ASME B16.5 40A 150 lbs RF, aluminum (AC4CT6), flange JPI 7S-15
LT5-6	Flange, high-pressure type Flange spec. / main body material / bolt material		10K 40A RF, iron, flange JIS B2220 NPS 1-1/2" Cl.150 RF, iron flange ASME B16.5 40A 150 lbs 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 300 lbs RF, iron, flange JPI 7S-15

Display method Two pointers or a counter (minimum readable scale: 1 mm)


 Only a counter display is available for 30 m and 100 ft specifications.

Display coupling *Coupling of the display and the internal parts of the gauge head*

Specifications		Description
LT5-1	Threaded / flange, low-pressure type	Coupling: Penetration shaft
LT5-4	Flange, medium-pressure type	Coupling: Pressure bulkhead magnet coupling
LT5-6	Flange, high-pressure type	Coupling: Pressure bulkhead magnet coupling

Float

Specifications		Weight	ρ : Liquid density (g/cm ³)
LT main unit \varnothing 400	Low-pressure type	4.2 kg	$0.5 \leq \rho < 0.65$
	Low-pressure type	5.0 kg	$0.65 \leq \rho < 1.05$
	Low-pressure type	8.0 kg	$1.05 \leq \rho < 2.0$
	High-pressure type	8.3 kg	$0.5 \leq \rho < 0.7$
LT main unit \varnothing 140	Low-pressure type	2.1 kg	$0.5 \leq \rho < 0.94$
	Low-pressure type	2.4 kg	$0.94 \leq \rho < 2.0$

 For the low-pressure type, select either SUS316 or PVC for the material.

Weight

Specifications		Description
LT5-1	Threaded / flange, low-pressure type	Approx. 8 kg
LT5-4	Flange, medium-pressure type	Approx. 22 kg
LT5-6	Flange, high-pressure type	Approx. 100 kg

Painting color

- Gauge head: Blue
- Other parts: Silver

List of material standards*Aluminum*

Code	Description
ADC12	Aluminum alloy die casting (SI-Si-Cu)
AC4CT6	Aluminum alloy casting (Si7Mg)
AC4A	Aluminum alloy casting (Si10Mg)

Stainless steel

Code	Description
SUS304	Stainless steel (18Cr-8Ni)
SUS316	Stainless steel (18Cr-12Ni-2.5Mo)
SCS13	Cast stainless steel equivalent to SUS304
SCS14	Cast stainless steel equivalent to SUS316

Other

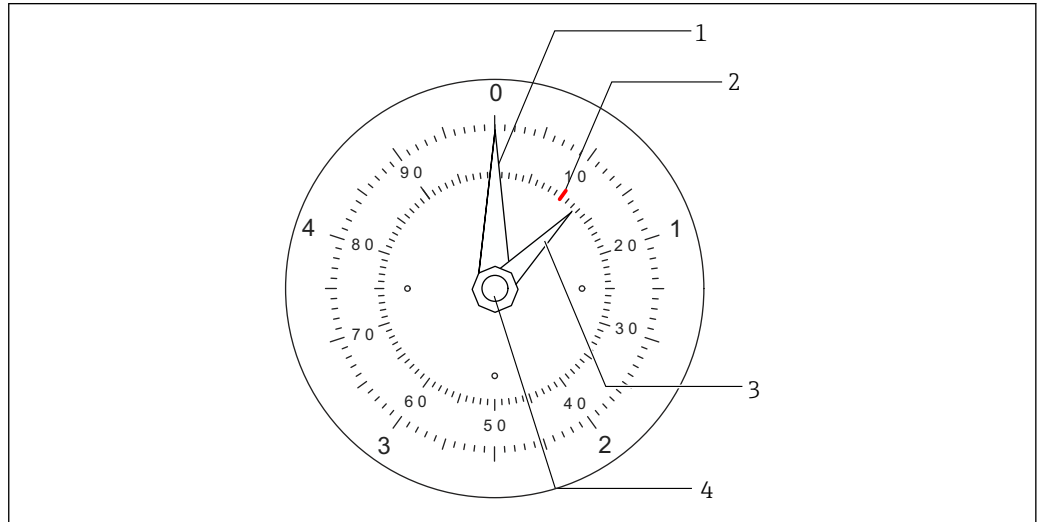
Code	Description
SGP (white pipe)	Carbon steel pipe
PVC	Polyvinyl chloride

Operability

Display

There are two types of LT displays: a two-pointer dial type and a counter type. Select the dial display when the tank height is 20 m or 60 ft or lower. For taller tanks, select the counter display.

Dial display

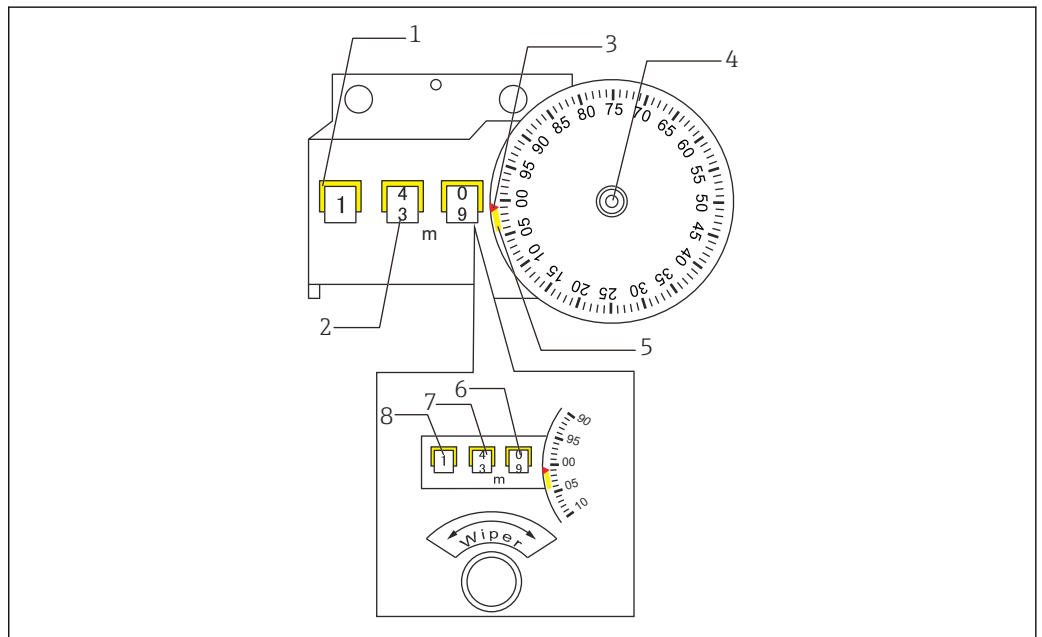


A0041231

21 Dial display (scale plate for 5 m (16.4 ft))

- 1 Long pointer (white)
- 2 Example: 10 mm position
- 3 Short pointer (green)
- 4 Cap nut

Counter display



A0041232

22 Counter display

- 1 Counter (yellow)
- 2 Counter (black)
- 3 Pointer (red)
- 4 Thread
- 5 Range (yellow)
- 6 No. 1 drum
- 7 No. 2 drum
- 8 No. 3 drum

Certificates and approvals

Protection class

Waterproof: IP65

Order information

Detailed ordering information is available from the following sources:

- In the Product Configurator on the Endress+Hauser website: www.endress.com -> Click "Corporate" -> Select your country -> Click "Products" -> Select the product using the filters and search field -> Open product page -> The "Configure" button to the right of the product image opens the Product Configurator.
- From your nearest Endress+Hauser sales organization: www.addresses.endress.com



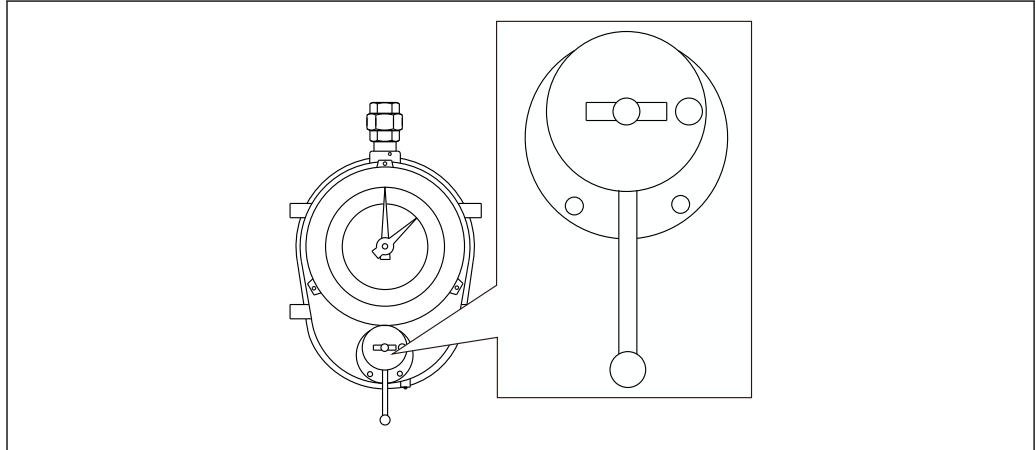
Product Configurator - the tool for individual product configuration

- Up-to-the-minute configuration data
- Depending on the device: Direct input of measuring point-specific information such as measuring range or operating language
- Automatic verification of exclusion criteria
- Automatic creation of the order code and its breakdown in PDF or Excel output format
- Ability to order directly in the Endress+Hauser Online Shop

Accessories

Hoist handle

A hoist handle is mounted on the gauge head, and it can hoist up and lower the float manually. This prevents the float and measuring tape from becoming damaged in areas with poor measuring conditions, such as a tank with a stirrer, by hoisting the float in advance.

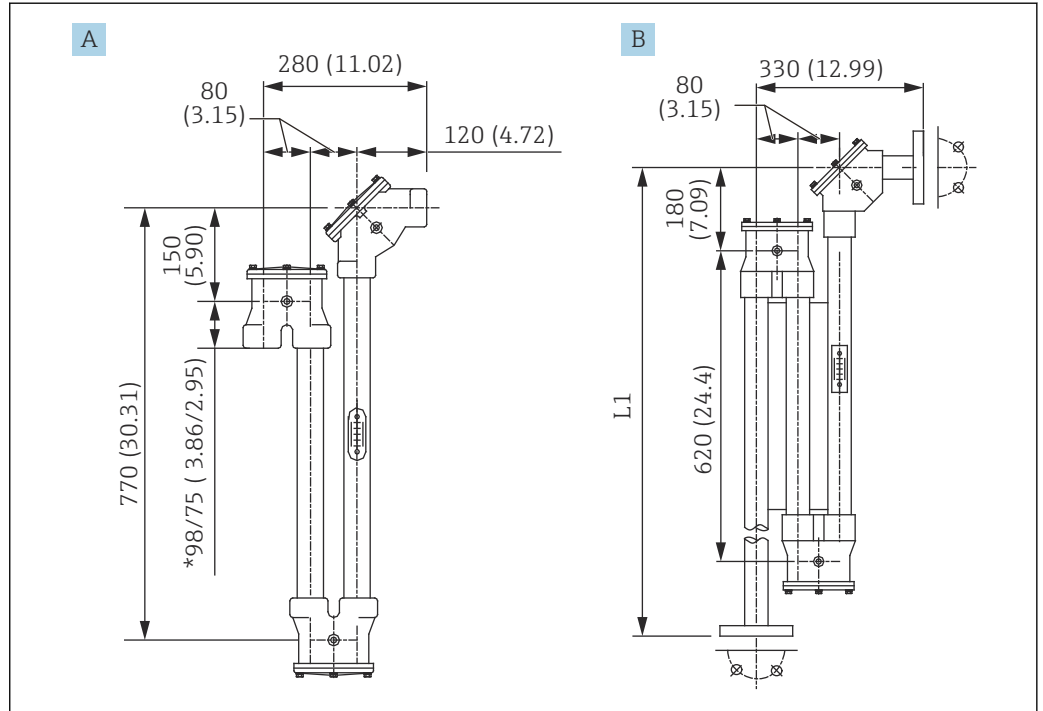


 23 Hoist handle

Seal pot

A seal pot is filled with liquid sealant to lock out vapors inside the tank.

Liquid sealant	Liquid paraffin (spindle oil): 1 150 cc
Maximum sealing pressure	400 mm H ₂ O
Shape	U-shaped
Connection standards	Threaded type / flange type
Material	AC4A+SGP galvanized pipe / SUS316 / PVC



24 Seal pot. Unit of measurement mm (in)

A Seal pot (SUS316/SGP/AC4A)

B Seal pot (PVC)

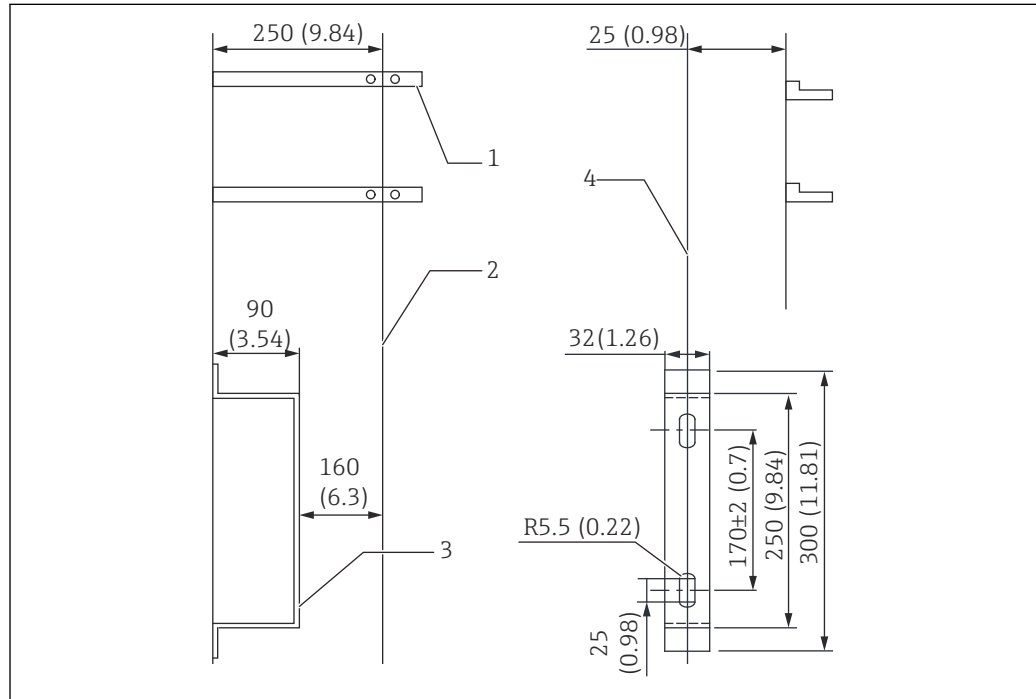
L1 Tape + wire: 1 500 mm (59.06 in) / Tape only: 960 mm (37.8 in)

i The 75 mm (2.95 in) in seal pot 98/75 indicates the dimension of SUS316.

Gauge supporter

A gauge supporter is used for mounting the gauge on the external wall of a tank. Note that pipe supporters are not supplied.

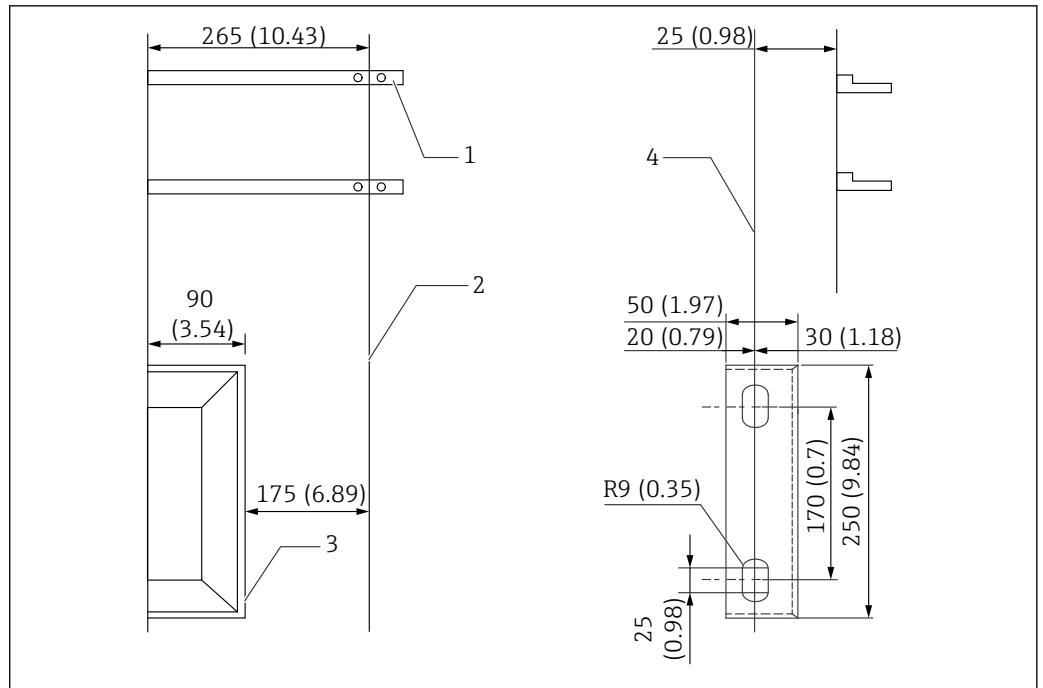
i In LT5-6 (high-pressure gauge head), the distance between the tank's external wall and the center of the gauge head is 15 mm (0.59 in) longer compared to that of LT5-1 (low-pressure gauge head) / LT5-4 (medium-pressure gauge head).



A0041179

25 Gauge supporter (low/medium pressure). Unit of measurement mm (in)

- 1 Pipe supporter (not supplied)
- 2 Center line of the mounting position
- 3 Gauge supporter (based on the selected option SS400: t = 4.5 / SUS304: t = 4.0), mounting bolt
- 4 Center line of the gauge supporter



A0041180

26 Gauge supporter (high pressure). Unit of measurement mm (in)

- 1 Pipe supporter (not supplied)
- 2 Center line of the mounting position
- 3 Gauge supporter (based on the selected option SS400: t = 4.0 / SUS304: t = 4.0), mounting bolt
- 4 Center line of the gauge supporter

Guide pipes

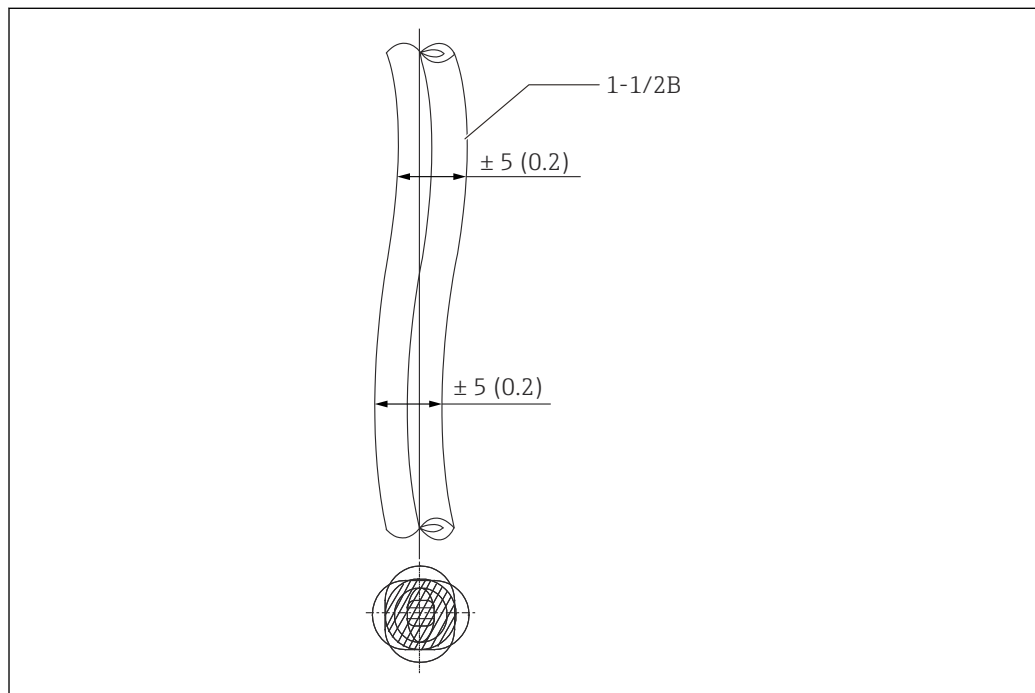
Selecting and mounting guide pipes

Guide pipes are required for most installations, except for tank top and underground applications. Guide pipes are usually used in three locations:

- Gauge head to sheave elbow
- Sheave elbow to sheave elbow
- Sheave elbow to tank roof

Precautions regarding installation

- Note that guide pipes and pipe supporters are not supplied by Endress+Hauser.
- Ensure that any bends in guide pipes are 5 mm (0.17 in) or smaller.
- The space (piping distance) between a sheave elbow and a sheave elbow must be no more than 2.5 m (8.2 ft).



A0041181

27 Mounting guide pipes. Unit of measurement mm (in)


NOTICE

Recommended materials for guide pipes

- Always use a galvanized carbon steel pipe ("white gas pipe") for guide pipes. If the application is for extremely corrosive gas, a stainless steel or hard PVC pipe with a resin inner lining is recommended.

Mounting / enclosed accessories

Ordering information: 610 mounting accessories

NA	Copper-free gear	<p>If copper materials are used in the gear mechanism for whatever reason, the material is switched to something else, such as aluminum or stainless steel. The sealing material for the magnetic coupling and drain plug will be switched from NBR to CR. This is useful for applications with ammonium.</p> <p> As a general rule, copper materials cannot be used for the gear mechanism.</p>
NB	Custody transfer seal	In this option, holes are created in bolts that are used for the main body's rear cover and the display cover. Subsequent to bonded approval, a displacer wire for sealing may be inserted.
NC	Fixed tape guide	This option is for holding down the tape inside so that the tape does not become dislodged. It is useful for applications in which hunting may occur with the float. It is included as a standard item for LT5-4 and LT5-6.
ND	Dust protector	This is an internal component that prevents dust that is generated from using iron pipes from entering inside the gear head. It is included as a standard item for LT5-4 and LT5-6.
NE	Conster winding drum, aluminum	This is an aluminum conster winding drum. It is useful when the standard Bakelite conster winding drum cannot be used. For LT5-4 and LT5-6, the standard conster winding drum is aluminum.


Ordering information: 620 enclosed accessories

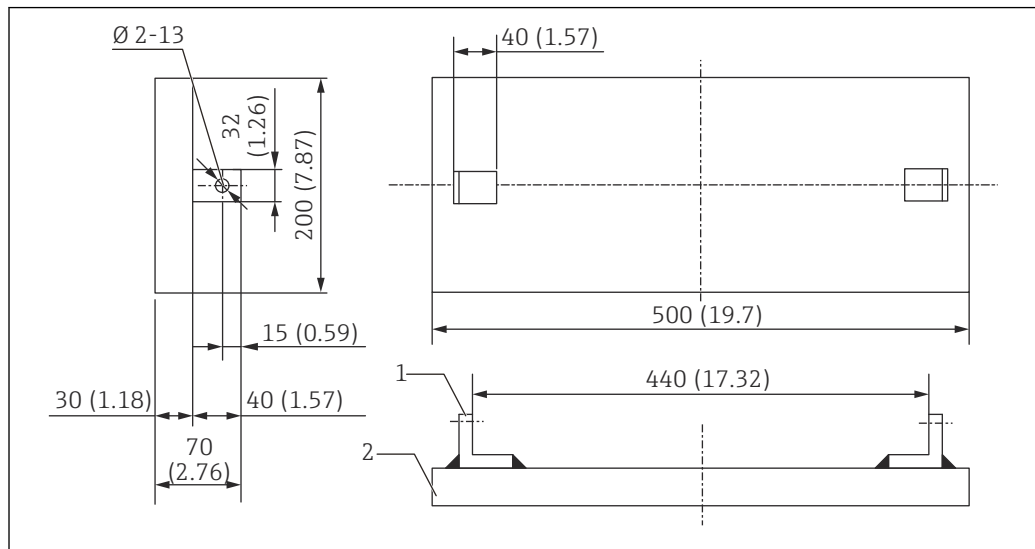
PE	FRT wire guide metal	This wire guide is installed on the floating roof. It prevents the measuring wire from wear due to contact with the roof.
PF	Wire guide socket Rc1-1/2	This socket is installed on the pipes of a floating roof tank or a gas holder tank. It prevents the measuring wire from wear due to contact with the pipes.
PG	Wire guide socket NPT1-1/2	
PH	Gas holder wire hook	This hook is welded onto a gas holder tank and connected to a measuring wire.

Anchor weight


If an anchor hook cannot be secured at the bottom of a tank (such as when there is liquid inside the tank), an anchor weight is used in order to keep the guide wire taut.

Material	SS400/SUS316
Weight	Approx. 23 kg (50.71 lb)

 Special specifications are required for using this anchor weight.

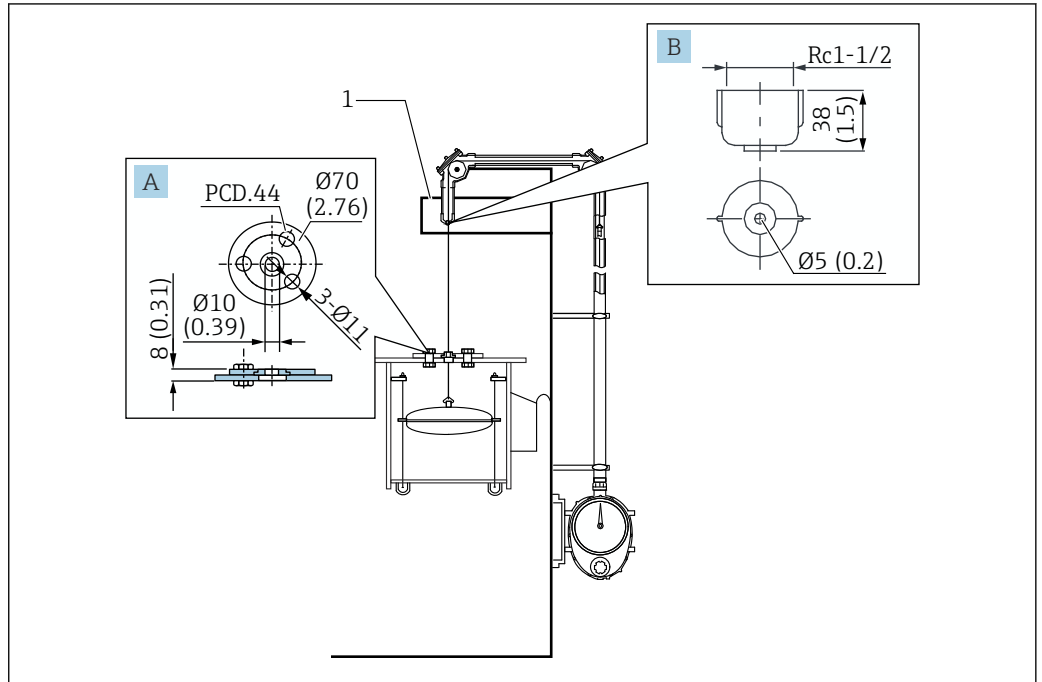


A0041260

 28 Anchor weight. Unit of measurement mm (in)

- 1 Anchor hook
- 2 Anchor weight

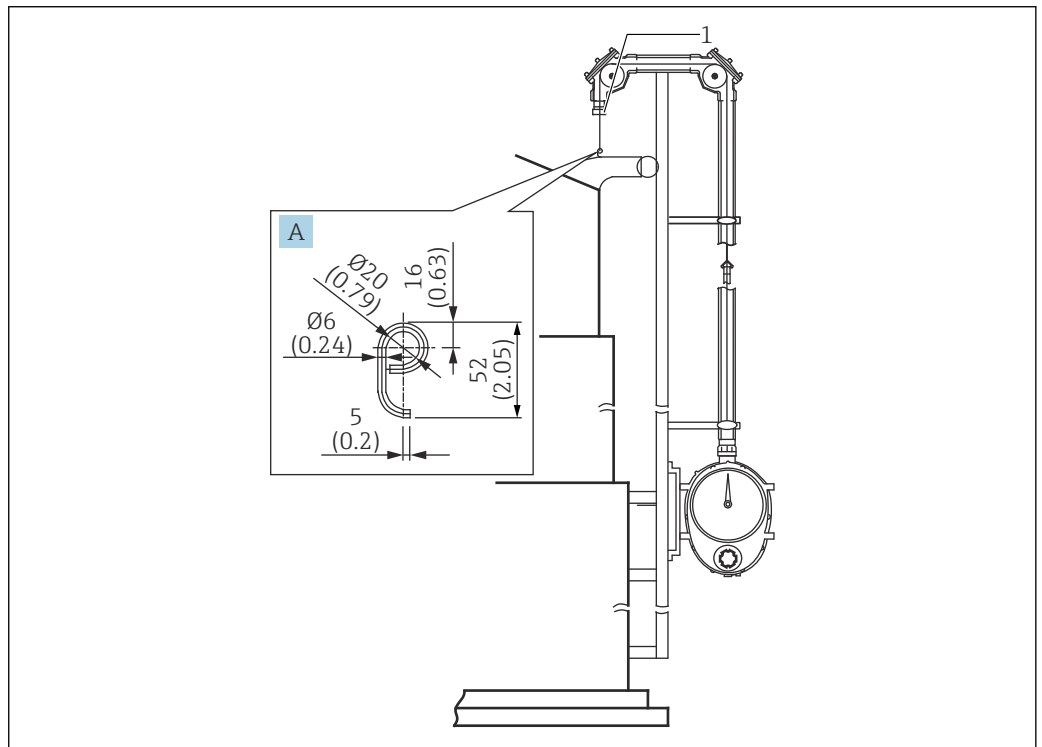
Wire guide metal, wire guide socket



A0041261

29 Wire guide metal, wire guide socket. Unit of measurement mm (in)

- A Wire guide metal
- B Wire guide socket
- 1 Roof stand



A0041262

30 Wire hook / wire guide socket. Unit of measurement mm (in)

- A Wire hook
- 1 Wire guide socket



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