The selection is detailed on page 6

CSB70

Ultrasonic Level Transmitter

Working principle

The CSB70 series is an ultrasonic technology-based liquid level transmitter suitable for a wide range of liquid applications. After the ultrasonic pulse signal is emitted, it is reflected back by the liquid surface. The transmitter "receives" these reflected signals (echoes) and measures the time delay between transmission and reception. By calculating this time delay, the empty height to the liquid surface can be automatically obtained. The integrated temperature sensor continuously measures the air temperature around the transmitter. This data is used to calculate the speed of sound in the air, which automatically compensates for the air height (temperature effect). The CSB70 level gauge has a remote temperature sensor option. Air height measurement can be output by 4-20mA output mode.

Product description

Ultrasonic methods are proven and economical solutions for liquids and solids. Both integrated and split gauges are available. The measurement principle is based on easy design, assembly, fast and safe commissioning, extended service life and reduced maintenance costs. Typical applications include abrasives and corrosive media, even in harsh environmental conditions.
Ultrasonic level meter emits ultrasonic pulse, the signal is reflected on the surface of the medium, and the instrument detects the return signal. The travel time of the ultrasonic signal is proportional to the transmission distance. If the tank structure is known, the level value can be calculated.
Non-contact and maintenance-free measurements that are not affected by dielectric properties, such as dielectric constant value or density; No feeding or discharge calibration is required and self-cleaning is achieved by vibration of the ultrasonic probe diaphragm

Functional characteristics

Eliminate any problems with the contact meter
Simple setup and operation
Reduced maintenance after installation, low cost installation and commissioning
Minimize process downtime
Non-contact measurement, no moving parts
2 integrated signal relays
Corrosion-resistant PVDF liquid connection material
Two-wire system 24V DC circuit power supply type
Working range 36 ft. (11 m)
It can measure liquid height, air height with liquid surface, capacity or open channel flow
Built-in LCD display
Automatic temperature compensation

Product application

Tank level

Discharge of channel

Catchment area

Tank level

Buffer storage tank

Filter bed level

Technical parameter

Specification	
product	CSB Series Liquid Level Transmitter:
	70-A: Liquid level and empty height measurement:
	70-B: Level, air height, volume and flow measurement with 2 integrated signal relays
	70-C: Liquid level, empty height, capacity (volume) and flow measurement, suitable for hazardous sites
Measurement principle	Ultrasound, propagation travel time technology
Measurement effect	
Measuring range	1 to 26 ft. (0,3 to 8 m)
	1 to 36 ft. (0,3 to 11 m)
	1 to 36 ft. (0,3 to 11 m)
Liquid level resolution	Better than 0.06 in. (1 mm)
Liquid level accuracy	For <3.3 ft. (1 m), ± 0.2 in. (5 mm)
	For >3.3 ft. (1 m), ± 0.5% measure the air height
	For <3.3 ft. (1 m), ± 0.1 in. (2.5 mm)
	For >3.3 ft. (1 m), ± 0.25% measure the air height
Dead zone	12 in. (0,3 m)
Refresh interval	Display: 500 ms; Current output: 200 ms
Display/Configuration	
Integrated display	4/5 digital display for real-time measurement and configuration purposes.
Output unit	For liquid level and air height to liquid level: m, ft, in or none
	For capacity: l, m3, gal, ft3 or none
	For traffic: l/s, l/m, m3/hr, gal/s, gal/m, ft3/m (cfm), ft3/hr or none
Output variable	Used for liquid level and air height to liquid level
	Liquid level (or air height to liquid level), capacity (volume) and flow
	Liquid level (or air height to liquid level), capacity (volume) and flow
Configuration tool	Standard all-in-one button with LCD
	Field manual operator
	Universal control unit
	AMS Suite: Intelligent device management tool
electric	
Power source	Loop power supply
	12 to 30 VDC
	12-40 VDC (non-hazardous places), 12-30 Vdc (hazardous places)
Ground connection	No requirement
Current output	4-20 mA analog signal
Alarm signal	Low = 3.6 mA. Height = 21 mA
	Standard: Low = 3.75 mA. Height = 21.75 mA; Namur NE43: Low = 3.6 mA. Height = 22.5 mA
Saturation level	Low = 3.8 mA. Height = 20.5 mA
	Standard: Low = 3.9 mA. Height = 20.8 mA; Namur NE43: Low = 3.8 mA. Height = 20.5 mA
Relay output	Two all-in-one signal relays, SPST rated 1A @ 30VDC (inductance), 2A @ 30VDC (resistance)
Electrical parameter	Ui= 30 V, Ii = 120 mA, Pi= 0.82 W, Li= 108 H, Ci= 0 n
Lead-in device	Two n14 NPT piping lead-in devices for wire sealing devices. Option: M20 x 1.5 Piping/wire connector.
Output cable	Single shielded twisted pair, minimum 0.22 mm2 (24 AWG), maximum 1.5 mm2 (15 AWG))

Technical parameter

Component material	
Material on the liquid side	PVDF
Body and capping material	Aluminum, painted with polyurethane paint
Cap seal	Silicone rubber
Cap screw	316 stainless steel
Converter body seal	EPDM
machine	
Mounting thread size	2-in-npt or 2-in-bsp. Optional flange fittings for application
Transmitter weight	3.1 lb (1.4 kg)
measure	
Temperature compensation	Automatic integrated temperature compensation. Optional remote temperature sensor for dynamic temperature compensation
Environmental department	
Ambient temperature	-40 to 158 °F (-40 to 70 ° C)
Process temperature	-22 to 158 °F (-30 to 70 ° C)
Process pressure	-4 to 44 psi (-0.25 to 3.0 bar)
Entrance protection	NEMA 4X, IP 66 (when using applicable rated wire seals/blind plugs)
Electromagnetic compatibility	EN61326 (Grade B)

Special function

Advanced software features

Learning program

The transmitter can learn up to four pseudo-echoes (caused by bouncing pulses off obstacles),
Until the actual liquid level is detected.

Empty can mapping

When the tank is empty, the transmitter can learn to recognize up to four false echoes without user interaction.

Current depth

The baseline reference height can be automatically reset using the depth of known user input.

Set to blank

When the tank is known to be empty, the reference height can be automatically reset to the measured empty height.

Dead height

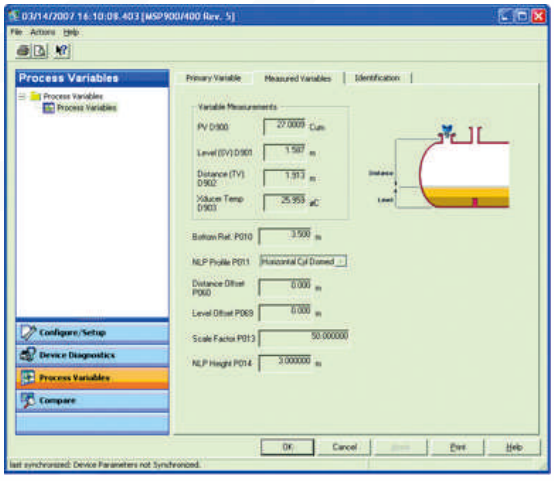
The air height to the surface can be adjusted by the positive or negative drift value entered by the user.

Level drift

The liquid level can be adjusted by the positive or negative drift value entered by the user.

Leave bottom blank

The transmitter specifies an ignored area at the bottom of the tank to avoid false echoes of obstacles.



Choose the right model

Each model of the CSB70 series has a specific purpose, as shown below:

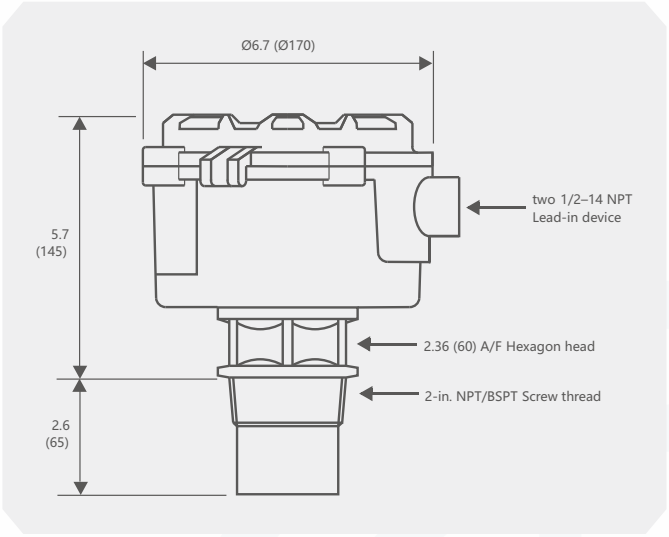
Choose the right CSB70 series transmitter

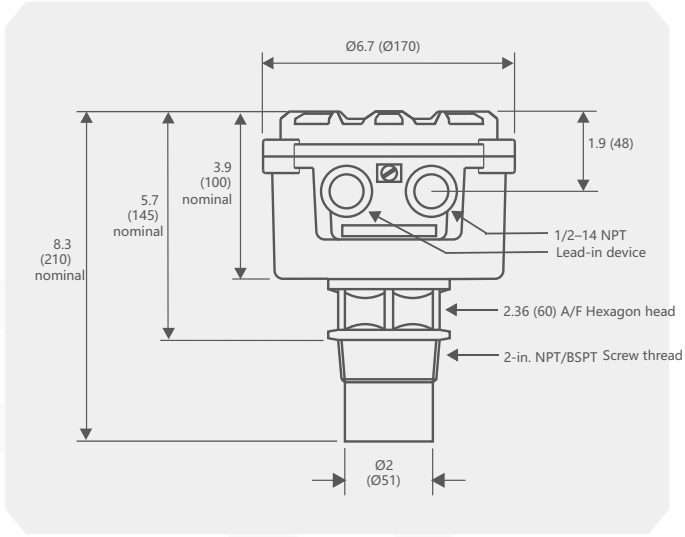
Apply	Model number	Range
Simple level measurement	CSB70-A	26-ft. (8 m) range
	CSB70-B	36-ft. (11 m) range
Level measurement and local relays	CSB70-B	36-ft. (11 m) range
Level measurement in hazardous places	CSB70-E	36-ft. (11 m) range
Measurement of open channel flow or capacity	CSB70-B	Non-hazardous site
	CSB70-E	Dangerous place

The CSB series is HART compatible and can be operated with a field hand operator or AMSTM software for remote access: Leave blank at the bottom of the Smart Device Management Tool

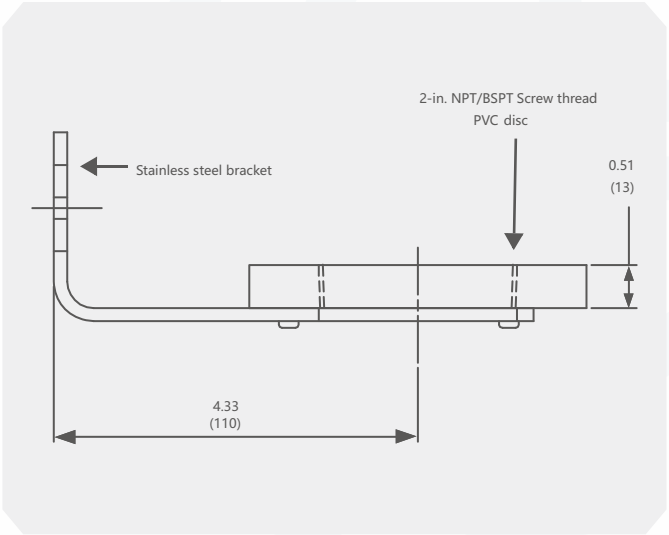
Size mm

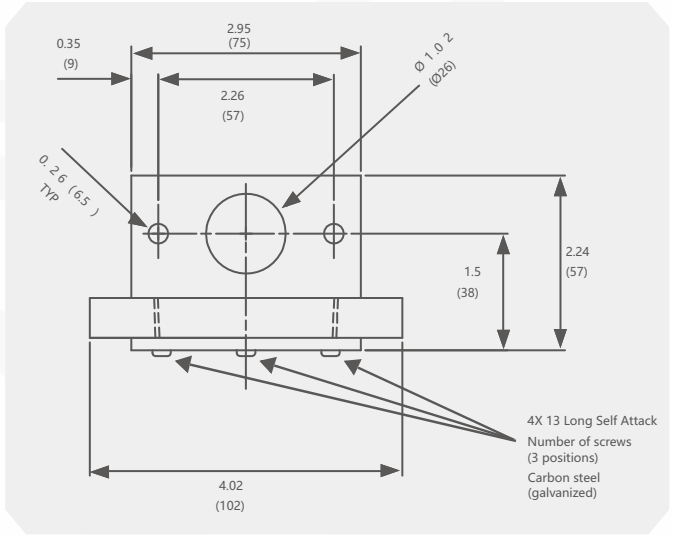
Threaded mount - Aluminum housing (Note: Dimensions in inches (mm)





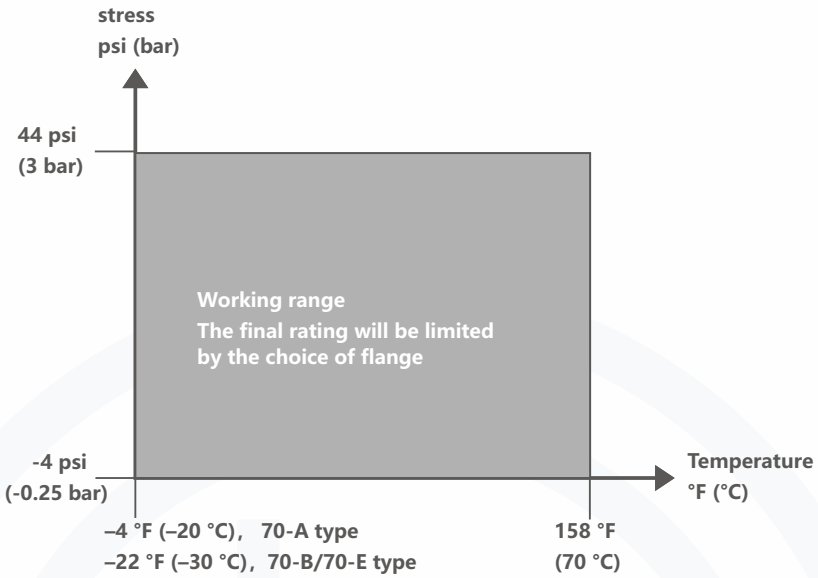
2-in.NPT/BSPT Bracket kit





Pressure and temperature ratings

The temperature/pressure rating for the process depends on the transmitter design as well as the flange material.

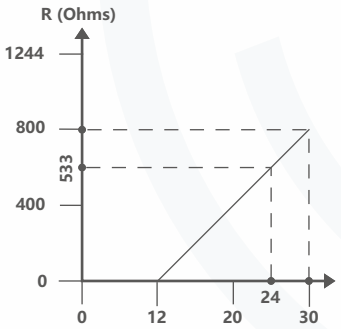


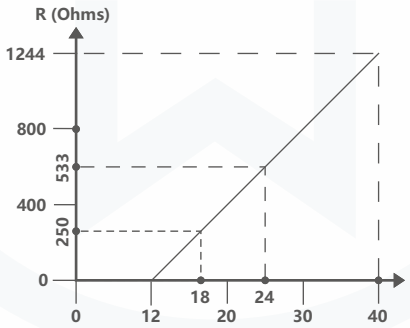
Load limit

The minimum load resistance in the loop is 250 for normal operation of the field hand operator. Communication with the universal controller does not require additional resistors. The maximum load resistance can be determined according to these diagrams:

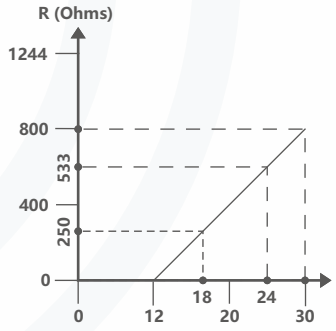
Instructions:

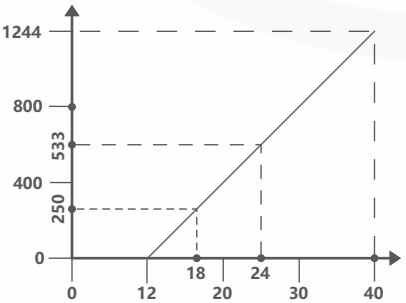
Non-intrinsically safe installation





Intrinsically safe installation





Look out

R = Maximum load resistance

U = External supply voltage

CSB70-A(One-piece)- Selection composition

Selection example **CSB70-A** 30 / A / G / M / F / M / V / X / A

(1 2 3 4 5 6 7 8 9)

· 196 ft. (60 m) Working range · Two-wire DC circuit powered type, 4-20 mA output
· Integrated LCD display and simple button programming · PVDF sensor housing Hydrophilicity ·
NEMA 4X, IP66 aluminum housing

1.Range	R( )	1 to 196ft. (0.3m to 60m) range
2.Output signal	A	4-20mA
3.Shell material	G	Of aluminum
4.Electrical interface	N	1/2-14NPT
	M	M20×1.5
5.Liquid material	F	PVDF
	E	PTFE
6.Thread specification	M	2-in. NPT thread
	L	2-in. BSPT thread
	T()	Other specifications
7.Product certification	Q	CE
	R	Intrinsic safety type
	S	Flameproof type
	U	SIL
	V	Non-explosion proof
8.Alarm option	X	High alarm
	Y	Low alarm
	T()	Other types of report
9.Number of alarm points	A	1
	B	2
	C	3
	D	4
	T()	Other quantity

Instructions:

It indicates that CSB70-A type ultrasonic liquid level transmitter measuring range is 30m, signal output is 4-20mA, housing material is aluminum, electrical interface is M20×1.5, liquid connection material is PVDF, thread specification is 2-in.NPT thread, no explosion-proof, 1 alarm point, high alarm.

Product Certification

Compliance and approval; Ludwig flow meters meet key standards and certifications for process measurement technology;
To ensure the highest reliability in such settings;

CSB70-B(Split type)- Selection composition

Selection example **CSB70-B**

30	A	G	M	F	M	V	X	A	E
1	2	3	4	5	6	7	8	9	10

· 229 ft. (70 m) Working range · 4-20mA output and 2 integrated signal relays (SPST)
Integrated LCD display and simple button programming · Measure liquid level, empty height, tank capacity and open channel flow

1.Range	R( )	1 to 229ft. (0.3m to 70m) range
2.Output signal	A	4-20mA
	B	4-20mA+RS485
3.Shell material	G	Of aluminum
4.Electrical interface	N	1/2-14NPT
	U	M20×1.5
5.Liquid material	F	PVDF
	E	PTFE
6.Thread specification	K	1½-in. NPT Screw thread
	M	2-in. NPT Screw thread
	L	2-in. BSPT Screw thread
	T()	Other specifications
7.Product certification	Q	CE
	R	Intrinsic safety type
	S	Flameproof type
	U	SIL
	V	Non-explosion proof
8.Alarm option	X	High alarm
	Y	Low alarm
	T()	Other types of report
9.Number of alarm points	A	1个
	B	2个
	C	3个
	D	4个
	T()	Other quantity
10.Cable length	E	5m
	F	10m
	T()	Other lengths

Instructions:

It indicates that CSB70-B type split type ultrasonic liquid level transmitter measuring range is 30m, signal output is 4-20mA, housing material is aluminum, electrical interface is M20×1.5, liquid connection material is PVDF, thread specification is 2-in.NPT thread, no explosion proof, 1 alarm point, high alarm, cable length is 5m.

Product Certification

Compliance and approval; Ludwig flow meters meet key standards and certifications for process measurement technology;
To ensure the highest reliability in such settings;

CSB70-E(explosion-proof type)- selection composition

Selection example **CSB70-E**	30	A	G	M	F	M	V	X	A
1	2	3	4	5	6	7	8	9

· 196 ft. (60 m) Working range · Two-wire DC circuit powered type, 4-20 mA output
· Integrated LCD display and simple button programming · PVDF sensor housing Hydrophilicity · NEMA 4X, IP66 aluminum housing

1.Range	R( )	1 to 196ft. (0.3m to 60m) range	
2.Output signal	A	4-20mA	
3.Shell material	G	Of aluminum	
4.Electrical interface	N	1/2-14NPT	
	M	M20×1.5	
5.Liquid material	F	PVDF	
	E	PTFE	
6.Thread specification	M	2-in. NPT thread	
	L	2-in. BSPT thread	
	T()	Other specifications	
7.Product certification	Q	CE	
	R	Intrinsic safety type	
	S	Flameproof type	
	U	SIL	
	V	Non-explosion proof	
8.Alarm option	X	High alarm	
	Y	Low alarm	
	T()	Other types of report	
9.Number of alarm points	A	1	
	B	2	
	C	3	
	D	4	
	T()	Other quantity	

Instructions:

It indicates that CSB70-A type ultrasonic liquid level transmitter measuring range is 30m, signal output is 4-20mA, housing material is aluminum, electrical interface is M20×1.5, liquid connection material is PVDF, thread specification is 2-in.NPT thread, no explosion-proof, 1 alarm point, high alarm.

Product Certification

Compliance and approval; Ludwig flow meters meet key standards and certifications for process measurement technology; To ensure the highest reliability in such settings;

CE Ex SIL

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