Model LV37
Liquid Level Transmitters with Display

Description

Model LV37 liquid level transmitter is developed from model LV36 liquid level transducer by assembling an LV36 transducer to a Smart Transmitter. A Smart Transmitter is mainly composed of an advanced sensor signal conditioner (SSC), an LCD of 4½ digits and a rigid metal housing.

Thanks to the advanced SSC, the smart transmitter can have 4~20mA current loop with HART protocol which facilitates remote communication. By means of a hand-held HART communicator or a commputer, the transmitter's zero and span can be re-configured or adjusted on site or in a control room through the remote communication. The LCD of 4½ digits indicates readouts on-site. The rigid metal housing provides explosion proof of level of flameproof (Ex d II CT5) or intrinsically safe (Ex ia II CT6), thereore allows the transmitter to be installed in a harsh environment.

As the LV36 transducer functions as a measuring probe for the LV37 transmitter, the working principle of LV37 is the same as LV36's, i.e., measuring static pressure created by liquid column corresponding to the liquid level to be measured.

Moreover, the LV37 also inherits the features of LV36, such as fully 316L stainless steel structure of the probe which is designed to be submerged in dilute liquid for level measurement, wide measuring ranges from 0~1 meter up to 0~200 meter of accuracy up to 0.25%fs, and selectable measuring reference between gauge (or relative) pressure and absolute pressure. For details of model LV36, one can refer to its datasheet on BCM SENSOR website.

Features

- measuring ranges: 0~1mH2O, ..., 0~200mH2O
- output signal: 4~20mA with HART protocol,
  10%~90%Vs ratiometric, 1~5V, SPI,
  transducer output (~60mV @5Vdc)
- accuracy: up to 0.25%fs
- filter for inlet of pressure medium
- materials: 316L SS (pressure membrane),
  316L SS (probe housing)
- construction: all stainless steel probe, rigid and robust
- environment protection: IP68

Applications

- liquid level measuring or monitoring via submerged in liquid
- river water or groundwater level monitoring
- level control in cisterns, diesel/petrol tanks, or chemical canister
- level monitoring in wastewater treatment

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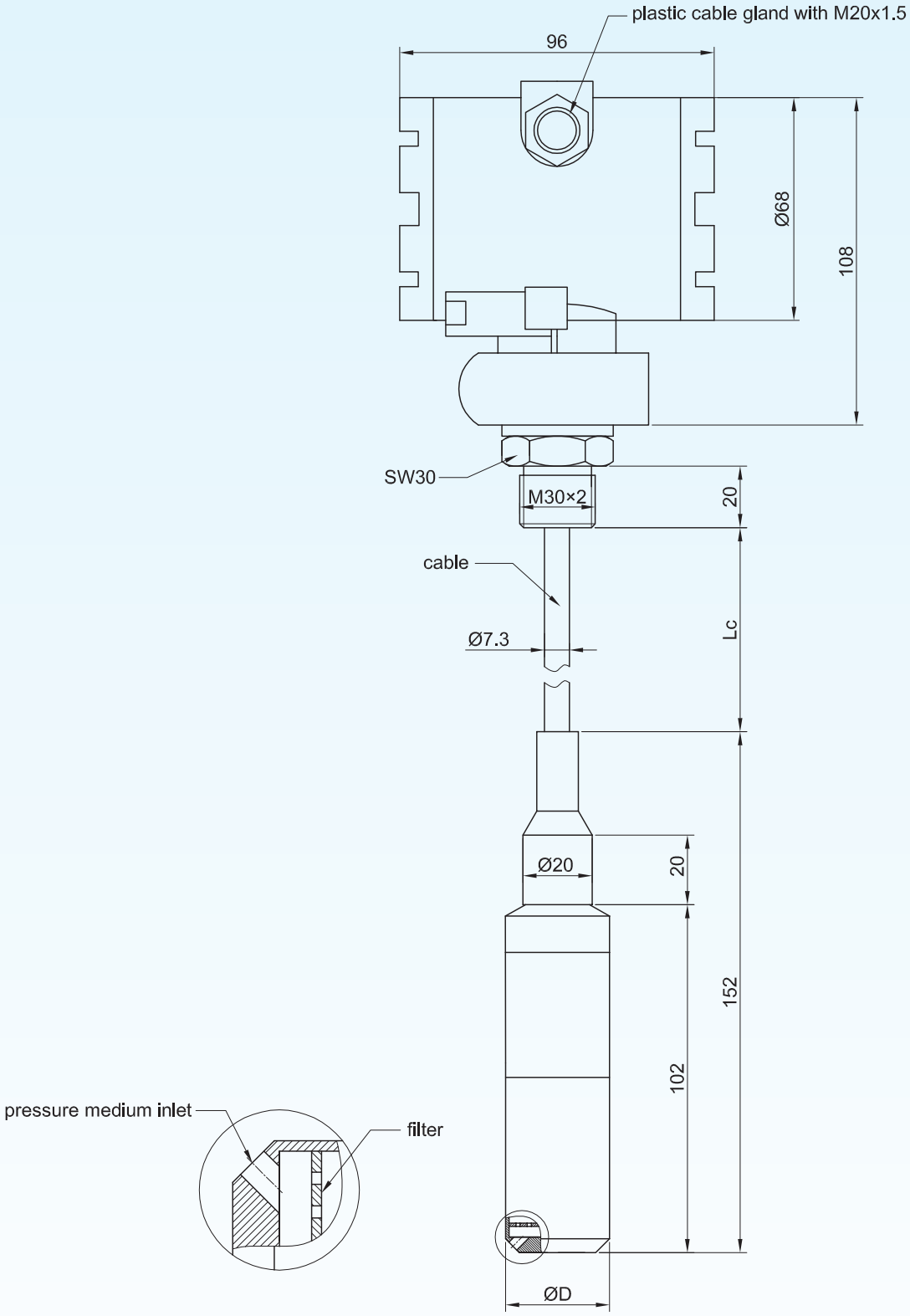
Dimensions



Note: All dimensions are in mm.

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Technical Data

Parameters		Units	Specifications	Notes
medium			dilute liquid, viscous fluid, or any liquid/fluid compatible with 316L SS	
nominal ranges (i.e., full scale, fs)		mH_2O	0~1, ~2, ~5, ~10, ~20, ~50, ~100, ~200	1
measuring reference			gauge (standard), absolute	
safe overload limit		%fs	200	2
ultimate overload limit		%fs	300	
output signal	current loop	mA	4~20 with HART protocol (standard), 4~20mA	
	voltage output	Vdc	10%~90%Vs ratiometric, 1~5	
	digital output		SPI	
power supply (Vs)	current loop	Vdc	12, ..., 30	
	voltage output	Vdc	3, ..., 5 for 10%~90%Vs ratiometric output; 12, ..., 30 for 1~5V otuput	
	digital output	Vdc	3, ..., 5	
accuracy		%fs	±0.25 (standard), ±0.5 for ranges of $1mH_2O$	3
long-term stability		%fs/year	⩽ ±0.1, ⩽ ±0.2 for ranges < $20mH_2O$	
load resistance	current loop	Ω	250, ..., 900	
	voltage output	Ω	⩾ 5000	
insulation resistance		MΩ	⩾ 500 @100Vdc	
compensated temperature range		°C	0 ~ 50	
operating temperature range		°C	-20 ~ +85	
storage temperature range		°C	-40 ~ +85	
temperature drift of zero offset		%fso	⩽ ±0.5 (> $20mH_2O$), ⩽ ±0.75 (5, ..., $20mH_2O$), ⩽ ±1.25 (⩽ $2mH_2O$)	4
temperature drift of span		%fso	⩽ ±0.5 (> $20mH_2O$), ⩽ ±0.75 (5, ..., $20mH_2O$), ⩽ ±1.25 (⩽ $2mH_2O$)	4
process connection			M30x2 male thread	
electrical connection			cable gland with M20x1.5 thread	5&6
diaphragm material			316L SS	
housing material	probe		316L SS	
	smart transmitter		aluminum	
environment protection	probe		IP68	
	smart transmitter		IP65	
explosion proof (option)			Ex d II CT5, Ex ia II CT6	
field display (option)			4 1/2 digits LCD display	
net weight		gram	~250 (probe) + weight of cable + ~1200 (smart transmitter)	

Notes:
1. For customized pressure ranges, consult BCM.
2. “fs” refers to full scale pressure.
3. Accuracy = sqrt (non-linearity^2 + hysteresis^2 + repeatability^2).
4. Calculated as the maximum change of output signal over the compensated temperature range.
5. The vent tube is provided in the cable if the pressure reference is gauge (relative) pressure. The cable will not be equipped with the vent tube if the pressure reference is absolute.
6. For cable length ⩽0.5m, the output can be I^2C bus without other interface;
   For cable length = 1m, ..., 15m, an RS-232 interface is applied to realize I^2C bus.
   For cable length > 15m, an RS-485 interface is applied to realize I^2C bus.

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Ordering Information

position (pos.) 1: model

LV37

pos. 2: nominal ranges vs measuring ranges (^)

0/1mH2O	0/10mH2O	0/100mH2O
0/2mH2O	0/20mH2O	0/200mH2O
0/5mH2O	0/50mH2O	

(^): Any nominal range as listed above is a designed range or a physical capacity of a corresponding transmitter to measure, which is also called the full scale (fs) of this transmitter. When Buyer purchases a transmitter, Buyer has to indicate the measure range of his application in Ordering Code, rather than the transmitter's nominal range. A right transmitter is selected if its nominal range just covers the measuring range of Buyer's application. The measuring range is a range of physical quantity which Buyer wants to measure or monitor with the selected transmitter, and must be either within or maximum equal to the nominal range of this transmitter.

For example, if Buyer wants to purchase a transmitter of 4~20mA output to measure or monitor water level from 1 meter to 4.5 meter, he needs to purchase a transmitter of the nominal range of 0/5mH2O from the list because this nominal range does suitably cover the measuring range in Buyer's application. To do so, he has to indicate the measuring range of 1/4.5mH2O for “pos. 2” in Ordering Code. As a result, when using this transmitter in his application Buyer will obtain an output signal of “4mA” when the measured level is 1 mH2O while “20mA” when the measured level is 4.5 mH2O. When Buyer purchases a transmitter not to measure water level but to measure other liquid level, Buyer has to indicate not only the measuring range but also the density of liquid for “pos. 2” in Ordering Code. For example, suppose the measuring range in Buyer's application is still from 1 meter to 4.5 meter but the liquid is not water but diesel of density 850 kg/m3. In this case, Buyer needs still to purchase the transmitter of the nominal range of 0/5mH2O but he has to indicate 1/4.5mDiesel(850kg/m3) for “pos. 2” in Ordering Code. After this is done, the selected transmitter will be calibrated by BCM SENSOR with the same density of diesel in order for Buyer to obtain the output of “4mA” when the diesel level is 1 meter while “20mA” when the measured diesel level is 4.5 meter.

The calibration data of output signals corresponding to the measuring range can be requested as a customized specification (see “pos. 8”) and supplied as additional service with the purchased transmitter.

pos. 3: pressure referene

G: gauge pressure (standard) A: absolute pressure

pos. 4: output signal

4/20mAwithHART (standard) 4/20mA 1/5V 10%/90%Vs SPI(^^)

(^^): If Buyer indicates 1/4.5mDiesel(850kg/m3) as the measuring range for “pos. 2” in Ordering Code, Buyer will obtain the output of “1638 counts” when the diesel level is 1 meter while “14746 counts” when the measured diesel level is 4.5 meter.

pos. 5: accuracy

0.25%fs 0.5%fs (standard)

pos. 6: cable length between probe and smart transmitter

7.3/PVC/& = Ø7.3mm shielded black PVC cable of “&” meter length

&: Cable length in meters, which Buyer has to define in Ordering Code (&&).
- = 1.5: 1.5 meter cable
- = 3.5: 3.5 meter cable
- = 150: 150 meter cable
- = 200: 200 meter cable

&&: BCM SENSOR suggests Buyer had better define the cable length at least 0.5m longer than the measuring range of liquid when purchasing LV37.

Example: “7.3/PVC/5.5” refers to “Ø7.3mm shielded PVC cable of 5.5 meter length”.

pos. 7: display

ND = no display LCD = 4 1/2 digits LCD display

pos. 8: explosion proof

NE = no explosion proof
Exd = Ex d II CT5
Exia = Ex ia II CT6

pos. 9: customized specifications

If Buyer wants one or more customized specifications, he can indicate “(*), (**), (***)” as the code(s) at the end of the Ordering Code, and further define what is (are) the specific customized specification(s) for "*" (and “**”, “***”, …). If there is no customized specification, the "pos. 8" is omitted. For precise understanding how to define “pos. 8”, refer to the Examples of Ordering Code below.

pos.1	pos. 2	pos. 3	pos. 4	pos. 5	pos. 6	pos. 7	pos. 8	pos. 9

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Examples of Ordering Code

- standard transmitter:

  LV37-0/10mH2O-G-4/20mAwithHART-0.5%fs-7.3/PVC/10.5-ND-NE
  LV37-1/8mH2O-G-4/20mA-0.5%fs-7.3/PVC/11-ND-NE
  LV37-1/8mDiesel(850kg/m3)-G-4/20mAwithHART-0.5%fs-7.3/PVC/vent/11-ND-NE
  LV37-1/8mDiesel(850kg/m3)-G-4/20mAwithHART-0.5%fs-7.3/PVC/vent/11-LCD-Exd

- customized transmitter:

  LV37-1/8mDiesel(850kg/m3)-G-4/20mAwithHART-0.5%fs-7.3/PUR/vent/11-LCD-Exd-(*)

  (*) = Material of cable insulation is PUR.

  LV37-1/8mDiesel(850kg/m3)-G-4/20mAwithHART-0.5%fs-7.3/PUR/vent/11-LCD-Exd-(*)-(**)

  (*) = Material of cable insulation is PUR.
  (**) = The calibration data of output signals corresponding to the measuring range of levels has to be supplied with the purchased transmitter.

The listed dimensions, specifications, and ordering information are subject to change without prior notice.

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