INDUMART Canada
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Smart Level Transmitter

SERIES: LTS320

- MEASURES LIQUID LEVEL IN OPEN TANKS
- 0.1% ACCURACY
- 4-20 mA OUTPUT & DIGITAL COMMUNICATION
- HART PROTOCOL INSTRUMENT
- LOCAL ZERO AND SPAN ADJUSTMENTS
- 16:1 RANGEABILITY
- MINIMUM SPAN 16 cmH2O (15.6 mBAR)
- MAXIMUM SPAN 40.8 mH2O (4 BAR)
- INTRINSICALLY SAFE INSTRUMENT
- 14 PRESSURE UNITS OR % OF THE SPAN
- 4-DIGIT LCD DISPLAYS PRESSURE OR LEVEL
- AUTOMATIC TEMPERATURE COMPENSATION
- LONG-TERM STABILITY AND SERVICE LIFE
- BRACKET FOR 2" PIPE MOUNTING (OPTION)

INTRODUCTION

Utilizing the smart technology in manufacturing of pressure transmitters resulted in introduction of a new transmitter with a lot more features than the old analogue model.

When deciding about purchasing analogue or smart transmitters for pressure systems, you will find that smart transmitters have higher accuracy and precision along with faster dynamic response than the analogue ones. This will give the smart models an advantage to produce tighter process control.

Moreover, smart transmitters reduce commissioning by allowing fast identification, fast configuration, fast loop tuning and improved self diagnostics. They can be configured and serviced in the field or from a remote location, such as the control room, along the 4-20 mA line. This ease of field service can be very important to quick field troubleshooting and improves maintenance issues.

Smart transmitters communicate through HART (Highway Addressable Remote Transducer) protocol, a platform ready for complete digital integration of your process system. The HART communication protocol is capable of performing simultaneous analogue and digital communications. HART protocol allows multi-drop instrument installation, operation over remote telephone communication lines and transmission of multiple variables when operating digitally.

SMART LTS320

Indumart LTS320 Series of Smart Level Transmitters are two-wire microprocessor-based instruments, which can measure the liquid level head in open tanks, indicate the head pressure value on its wide LCD display, and generate a 4-20 mA output signal directly or inversely proportional to the liquid level of the tank. Digital communication for remote calibration and monitoring is also provided, superimposing a digital signal on the same pair of wires that carries the 4-20 mA signal.

These transmitters can be configured utilizing any of the three following methods: **(1)** with having the capability of digital communication (Bell 202 standard FKS), they may be configured using a hand-held terminal with HART protocol, **(2)** by a PC with a dedicated interface and the Indumart smart configuration software (STS300), **(3)** locally configuring the instrument (zero and span) by means of 2 pushbuttons on the transmitter. The 4-digit LCD indicator displays the measured reading in one of 14 available pressure units or in percentage of the measuring span; selectable via STS300 software.

The LTS320 transmitter with 316 stainless steel diaphragm measures liquid level with spans from 16 cmH2O (15.625 mbar) to 40.8 mH2O (4 bar).

Thermal drift is automatically compensated using the signal from a thermistor integrated into the pressure sensor. The high accuracy sensor coupled with the temperature compensation feature give a measurement precision, which is more than adequate for even the most demanding applications.

Due to the materials and technology used in the construction of these pressure transmitters, these instruments are excellent in reliability and resistance to corrosion against the majority of chemically aggressive media.

The electronic circuit boards meet the electromagnetic compatibility (EMC) requirements of EN50081-2 and EN50082-2. Intrinsically safe electronics, for use in hazardous areas, is a standard feature of Series LTS320 Level Transmitters.

Measuring Ranges for Series LTS320 Smart Level Transmitters

Range Code	Nom. Range (mH2O)	Min. Span (mH2O)	Overpressure (mH2O)
D	0...2.55	0.16	20
E	0...6.12	0.383	61
F	0...16.3	1.02	102
G	0...40.8	2.55	163

HINTS TO THE BUYERS

1) The first question when purchasing a pressure actuated level transmitter is the **TYPE**: Smart or Analogue? Smart transmitters have remarkable advantages over the analogue ones. These features have been mentioned in the introduction part of this brochure. Cost comparison is also important, since the initial cost of a smart transmitters is higher than that of an analogue model, but in future, you will save on installation, start-up, calibration, spare parts inventory and maintenance costs.

2) **ACCURACY** of the transmitter utilized in a process is often very important. However, because each process has its own characteristics, in many cases, increasing precision after a certain point will not improve performance.

3) Wide **TURNDOWN RATIO** is an asset when you are concerned about keeping the number of spare transmitter in the stock. In order to receive the most accurate reading from any pressure transmitter available in the market, choose the one with the closest nominal range to your application, and try not to use the turndown ratio in high extend, since the accuracy is based on the full scale, and increasing the turndown ratio decreases accuracy of the instrument.

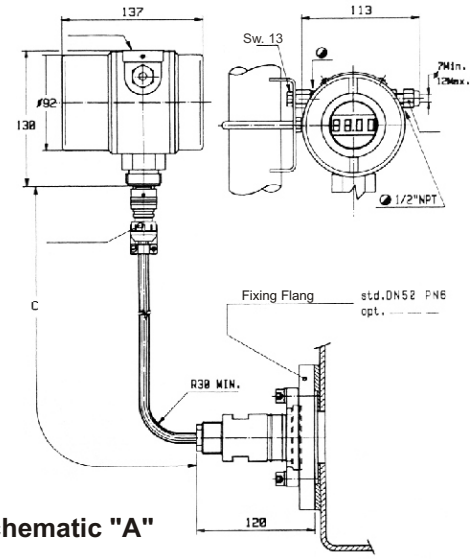
4) Among the advantages of using **HART** protocol is the fact that different brands of smart transmitters can use the same hand-held terminal. For example ROSEMOUNT hand-held terminal can program Indumart transmitters.

SPECIFICATIONS

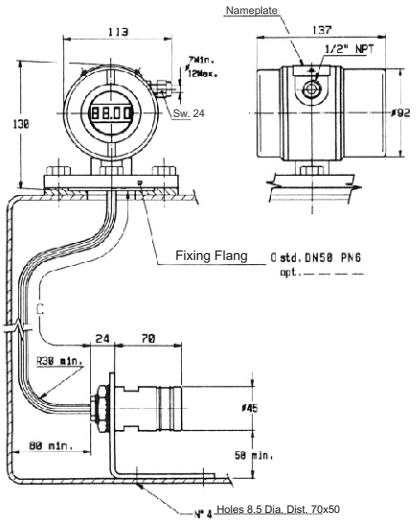
Performance: Unless otherwise stated the performance specifications are at 20˚C and nominal range, and errors are shown as a percentage of the nominal span.

Accuracy	Better than 0.1% including linearity, repeatability and hysteresis errors
Resolution	≤0.01%
Measuring Span	6.25% to 100% of the nominal span (See the Range Tables)
Over-pressure Limits	(See the Range Tables)
Adjustments	Zero & Span
Zero Adjustment	Digital Calibration ±15%
Linearity Adjustment	8 points within the nominal range
Damping	Digitally adjustable from 0 to 15 sec.
Min. Response Time	0.1 second
Transfer Function	Linear or square root (selectable)
Output Signals	4...20 mA, 2-wire; Digital (Bell 202 Standard FSK) using HART protocol
Fail-safe Output	In case of malfunction the analogue output is forced to the fail-safe state of 3.8 or 23.2 mA (selectable)
Settling Time	120 ms @ 27˚C
Thermal Drift	Specified for -10 to 65˚C range,
Zero:	±0.1% / 10˚K
Span:	±0.1% / 10˚K at nominal range
Power Supply	12.5 to 30 VDC with no load
Supply vs. Load	18.25 VDC for up to 250 Ω 24 VDC for up to 500 Ω 30 VDC for up to 760 Ω
Power Supply Effect	Negligible between 12.5 and 30 VDC
Display	4-digit LCD
Measuring Units	14 pressure units or % of the measuring span (selectable)
Case	Die cast Aluminum alloy, finished with epoxy resin; 304 St. Steel (option)
Wetted Parts	Diaphragm in Hastelloy C; other wetted parts in 316 st. steel; bolts in st. steel; gaskets in PTFE
Sensor Element	Piezoresistive
Filling Fluid	Silicon oil
Connecting Cable	Alcryn insulated; conductor & shield in copper, reference tubing in PTFE
Cable Specifications	Insulation: 5000 VAC Capacitance: conductor/conductor 50pF/m Capacitance: conductor/sheild 90 pF/m inductance: 1 mH/km L/R loop rate ≤ 10 µH/Ω
Electric Connection	½" NPT and cable gland PG 13.5 for 7 to 12 mm diameter cable
Mounting	Direct; 2" pipe mounting (option)
Environ. Protection	IP-66, protection against sea waves and dust proof; suitable for tropical environment to DIN 50.015 standard
Explosion Protection	Intrinsic safety EEx ia IIC, T6, T5, T4 For Zone 0 groups IIA, IIB, IIC;
Temp. Medium	-20...+80˚C
Ambient	-20...+80˚C
Relative Humidity	0 to 100%
LCD Display Reading	-10...+70˚C
EMC Emission	EN50081-2
Susceptibility	EN 50082-2

DIMENSIONS (mm)



Schematic "A"



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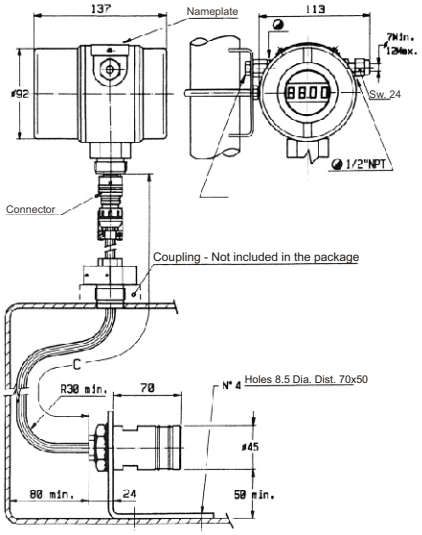


Schematic "C"

ORDER CODE

SMART LEVEL PRESSURE TRANSMITTER

Model: **LTS320** **-** [ ] [ ] [ ] [ ] [ ]

NOMINAL RANGE
0...2.55 mH2O / 0...250 mbar / 0...3.6 psi	D
0...6.12 mH2O / 0...600 mbar / 0...8.7 psi	E
0...16.3 mH2O / 0...1600 mbar / 0...23.2 psi	F
0...40.8 mH2O / 0...4000 mbar / 0...58 psi	G

MOUNTING
As per schematic A*	A
As per schematic B*	B
As per schematic C*	C
Special	D

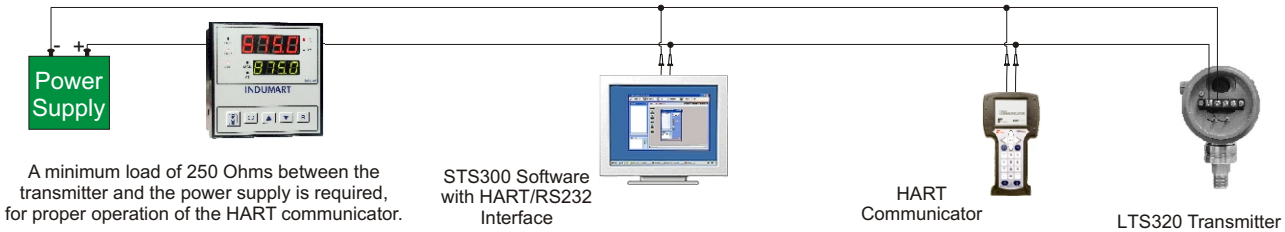
CABLE
Without	0
1 meter (3.28 feet)	1
2 meters (6.56 feet)	2
3 meters (9.84 feet)	3
4 meters (13.1 feet)	4
5 meters (16.4 feet)	5
6 meters (19.7 feet)	6
7 meters (23.0 feet)	7
8 meters (26.2 feet)	8
Special	9

CALIBRATION
Nominal range (standard)	1
Configured (optional); please supply the range and the spec. weight	2

OPTIONS
Without	0
304 St. steel enclosure	1
2" pipe mounting bracket	2
2" pipe mounting bracket and 304 st. steel enclosure	3

* Please specify the connection size, if different from the schematic.

CONNECTION DIAGRAM FOR PROGRAMMING THE TRANSMITTER



A COMPLETE LINE OF PRESSURE INSTRUMENTS @ INDUMART

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