

IN-LLT-17

Submersible Level Transmitter.



Installation Guide.

IN-LLT Installation Guide Index:

Description.	Page 3
Ordering Information.	Page 3
Unpacking, Storage and Package Contents.	Page 3
Unpacking.	Page 3
Storage.	Page 3
Package Contents.	Page 3
Optional Extras and Accessories.	Page 3
Specifications.	Page 4
Dimensions.	Page 4
Installation.	Page 4
Check Before Installation.	Page 4
Installation Methods.	Page 4
Installation in Static Water.	Page 5
Installation in Flowing Water.	Page 5
Connecting up the IN-LLT.	Page 6
Connecting the IN-LLT-C 4~20mA.	Page 6
Connecting the IN-LLT-V 0~5V.	Page 6
Reference Tube Installation.	Page 6
IN-LLT Wiring, Installation and Maintenance.	Page 7
IN-LLT Wiring & Installation.	Page 7
IN-LLT Commissioning.	Page 7
IN-LLT Maintenance.	Page 7
Fault Diagnosis.	Page 7

Product Liability. This information describes our products. It does not constitute guaranteed properties and is not intended to affirm the suitability of a product for a particular application. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification. Regrettably, omissions and exceptions cannot be completely ruled out. No liability will be accepted for errors, omissions or amendments to this specification. Technical data are always specified by their average values and are based on Standard Calibration Units at 25°C, unless otherwise specified. Each product is subject to the 'Conditions of Sale'.

Warning: These products are not designed for use in, and should not be used for patient connected applications.
In any critical installation an independent fail-safe back-up system must always be implemented.

Description.

The Intech IN-LLT hydrostatic level transmitters are a fully sealed submersible pressure instrument. The IN-LLT-17 is the slim model and is designed for liquid level measurement. The sensor is housed within a stainless steel IP68 enclosure and provides an industrial output signal of either 4~20mA loop powered, or 0~5Vdc.

The transducer diaphragm is mechanically protected by a Nylon cap that is designed to allow the liquid free access to the diaphragm performing the measurement. The signal cable is sealed to the housing and contains the atmospheric pressure reference tube. IN-LLT units are designed for long term submersible operation.

The IN-LLT level transmitters have advantages of: small size, light weight and long-term stability. It can be applied to measure and control in the various applications such as: petrochemical, medical, metallurgy, power station, mines, city water supply, drainage, hydrology survey and various other industries.



www.intech.co.nz/in-llt

Ordering Information.

ITEMS	CODE		DESCRIPTION
SERIES	IN-LLT-		Hydrostatic Level Transmitter.
OUTPUT	C17-		4~20mA Output (loop powered).
	V17-		0~5Vdc Output.
RANGE		10	0~10 m H ₂ O with 15m Cable.
		20	0~20 m H ₂ O with 30m Cable.
		50	0~50 m H ₂ O with 60m Cable.
		100	0~100 m H ₂ O with 110m Cable.
		150	0~150 m H ₂ O with 160m Cable.
		200	0~200 m H ₂ O with 210m Cable.

Ordering Example.

IN-LLT-C17-20: Ø17mm Slim Size Submersible Level Transmitter with 4~20mA Output, 0~20m H₂O Range and 30m of cable.

We strongly recommend that an overvoltage protection device is used with the IN-LLT if long runs of cable are involved in the installation; to protect against potential Lightning strike or earth potential rises.

IN-LLT Accessory Models.

LPN-OVP (Rev 1) DIN Rail mount OVP unit.

NAA-102 Terminal Box with filter and integral OVP.

Note: A close proximity or direct lightning strike may compromise the OVP protection.

NAA-209 Hanging Cable Clamp.

Unpacking, Storage and Package Contents.

Unpacking.

Attention: Avoid knocking violently when opening to prevent damaging instruments or accessories. Please be careful to prevent damaging the housing and rubber casing of transmitter cable.

Storage.

The transmitter should be stored in dry and ventilated room with ambient temperature –20~85°C, relative humidity no more than 85% and the air in the room without corrosive gas.

Package Contents.

- IN-LLT-17 Hydrostatic Level Transmitter.
- IN-LLT-17 Installation Guide.

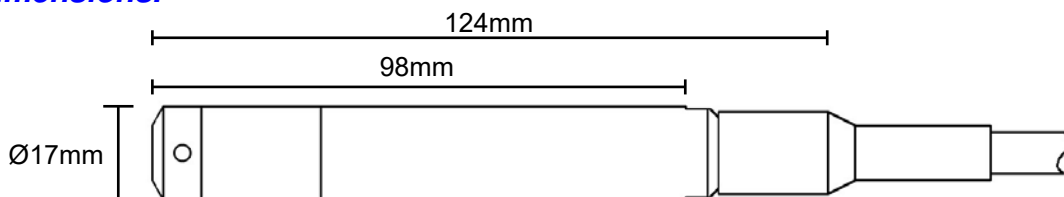
Optional Extras and Accessories:

- Product Quality Certificate.
- Fitted with Polyethylene Cable.
- Over Voltage Protection Unit.
- Vented Connection Box.
- Hanging Cable Clamp.
- Instrument Quality Power Supply.
- Indicator.

Specifications.

Range	10m, 20m, 50m, 100m, 150m, 200m H ₂ O. (See ordering information table.)
Overpressure	1.5 times FS.
Cable	Polyethylene.
Accuracy	±0.5% FS.
Stability	range>20m H ₂ O, ±0.2% FS/year. range<20m H ₂ O, 20mm H ₂ O.
Temperature Error	±0.02% FS/°C (Zero), ±0.05% FS/°C (Span).
Operating Temperature	-10~70°C.
Storage Temperature	-20~85°C.
Current Output Model:	4~20mA (2-wire, Loop Powered).
Power supply (U _T):	12~28Vdc.
Load (Ω):	<(U-11)/0.02.
Voltage Output Model:	0~5V.
Power Supply	12~28Vdc.
Current Draw	<3mA.
Wetted Material Construction:	
IP Rating	IP68.
Overall Diameter	17mm.
Housing	Stainless Steel 304.
Diaphragm	Stainless Steel 316L.
Cap	Black Nylon.
Sealing O-Ring	Viton.
Cable	Ø7.5mm Polyethylene with Vented Tube.
Rubber Casing	Chloroprene Rubber.

Dimensions.



Cable Length: Standard stocked lengths. Longer lengths can be made to order; longest cable length up-to 500 metres.

Installation.

Check before Installation.

Attention - before transmitter installation:

- The static pressure produced by the liquid at installation place exceeds the transmitter FS or not.
- The measuring liquid is compatible with the transmitter construction material or not.
- The measuring liquid may stop up the holes on the protection cap or not.

Installation Methods.

- The transmitter should be installed vertically down.
- In the flowing water, the acted surface should be parallel with the water flowing direction.

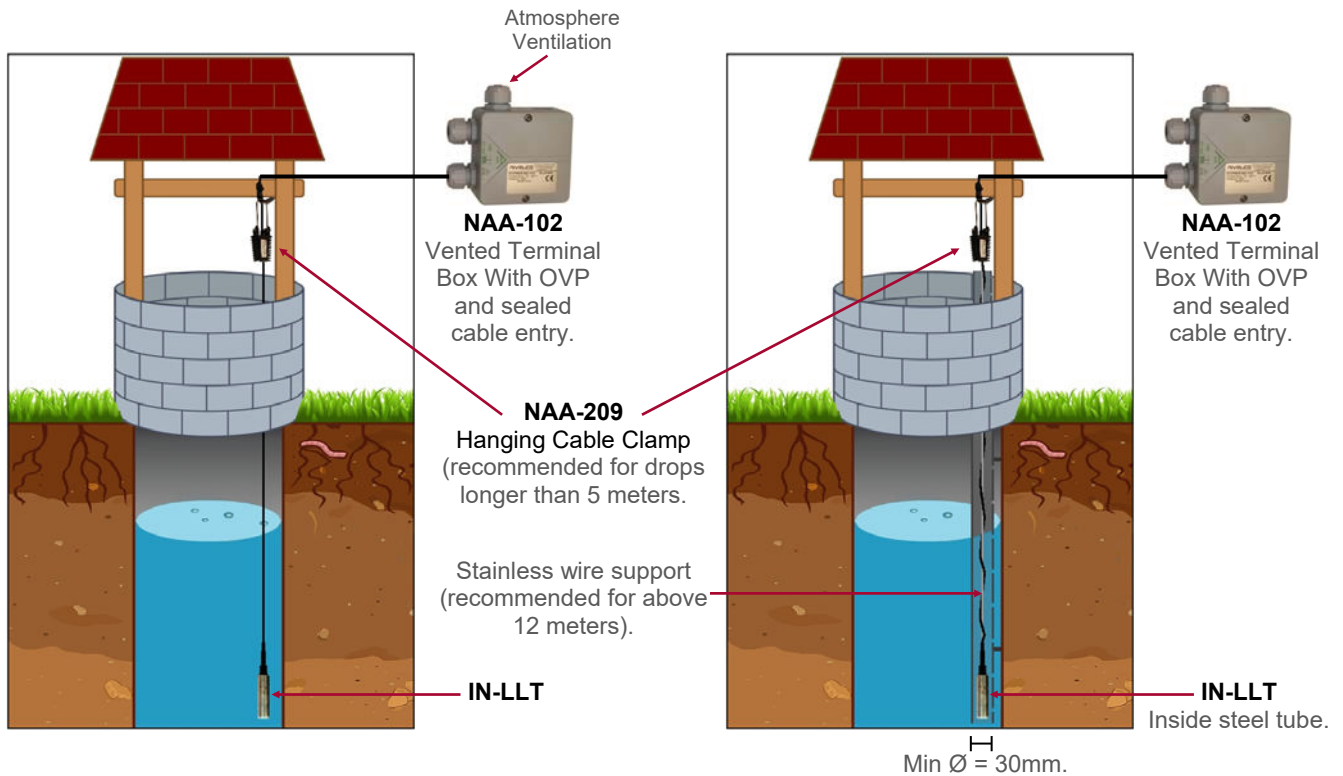
Important

- Warranty is void if water or any fluid enters the IN-LLT hose.
- Mount the IN-LLT where there is least water movement.
- The breather hole in the terminal box must exist and not be blocked. If blocked the IN-LLT will not be able to remove the effects of atmospheric pressure variation from the reading.
- Install the IN-LLT cable into the terminal box up the top end before lowering the IN-LLT transmitter into the water.
- Support and clamp the cable before the terminal box connection.
- Support the cable clear of any surface likely to chafe or damage it.
- Use only screened cabling.
- Use a quality regulated instrumentation 24Vdc power supply for the best results.
- If the IN-LLT is installed on the end of a long cable run, precautions must be taken against potential Lightning strike or earth potential rises. We recommend either the LPN-OVP or NAA-102 protection units.

Installation in Static Water.

For installation in static water.

The IN-LLT cable should be fed from top to prevent water entry into balance capillary. To prevent shaking or destroying the transmitter when pumping, the transmitter should be put away from the liquid resource (see figure 5). Otherwise it should be installed as per figure 6; protected by steel tube.



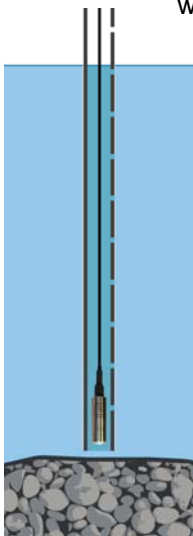
For installation in a deep well.

A steel tube insertion method is usually used (see figure 6). The steel tube must be straight, and the internal diameter must be more than 30mm. Several holes at different heights can be made on the tube to facilitate a smoother rise and fall in water level. If necessary, wrap steel wire around the IN-LLT transmitter to prevent breaking the cable by lifting with the steel wire.

Installation in Flowing Water (e.g. river channel, reservoir area, etc).

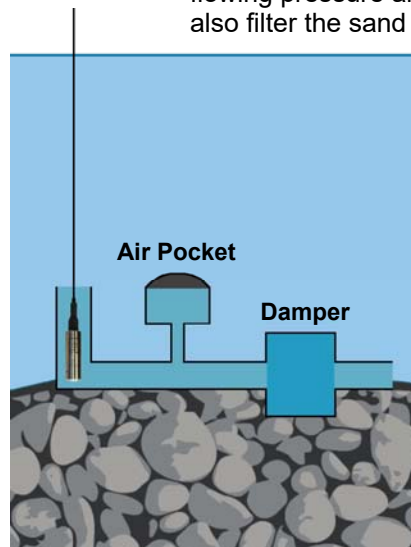
Water-calming equipment is required.

Method one: Insert a protective steel tube in the water channel.



The steel tube wall should be thick enough to withstand water currents. To maintain accurate measurements several holes can be made at different heights on the steel tube to dampen the waves and clear the water pressure influence.

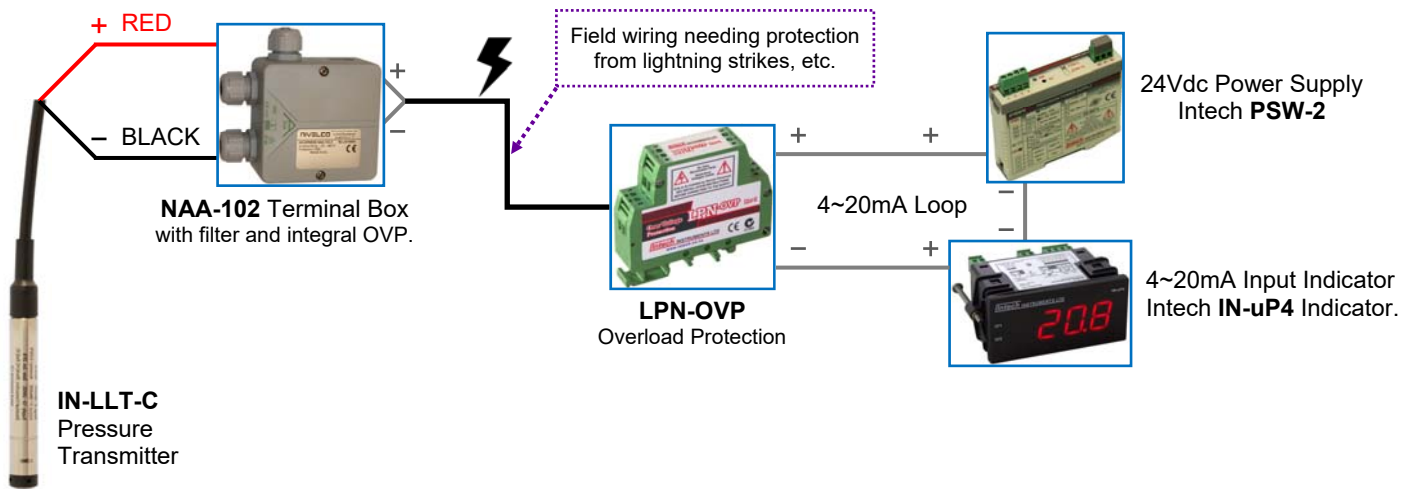
Method two: This method can not only clear water flowing pressure and wave influence, but also filter the sand and mud.



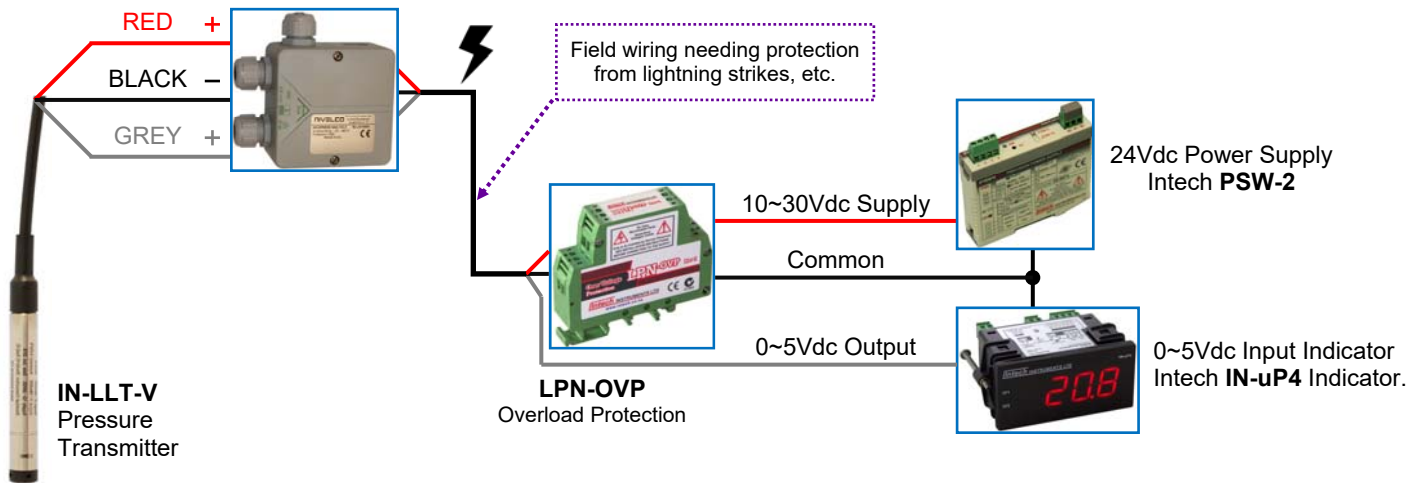
Connecting up the IN-LLT.

Wires should be connected as per the polarity definitions below. Please refer to the LPN-OVP rev1 Installation Guide for more information on terminal connections.

Connecting the IN-LLT-C 4~20mA.



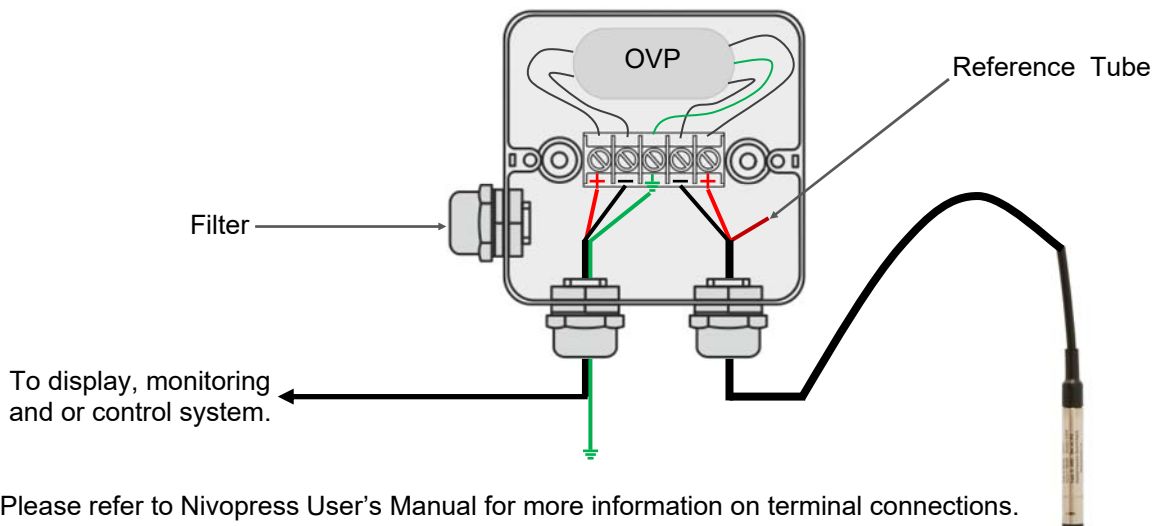
Connecting the IN-LLT-V 0~5V.



Reference Tube Installation.

There is a special plastic tube in the transmitter's cable. The back pressure cavity of the gauge sensor is connected to the atmosphere by this tube. During the process of installation and operation, be sure to keep the reference tube well connected with the atmosphere. Schedule regular cleaning to ensure ingress of foreign matter is not in or around the reference tube.

Always prevent water or any other liquid going through the reference tube which will destroy the transmitter.



Please refer to Nivopress User's Manual for more information on terminal connections.

IN-LLT Wiring, Installation and Maintenance.

**THE IN-LLT TRANSMITTER IS TO BE INSTALLED AND SERVICED BY SERVICE PERSONNEL ONLY.
NO OPERATOR / USER SERVICEABLE PARTS.**

IN-LLT Wiring & Installation.

Mounting:

* Also refer to Connection Diagrams and Notes.

- 1) Mount so the terminals are in a clean environment.
- 2) Do not subject to vibration or excess temperature or humidity variations.
- 3) Avoid mounting in areas with power control equipment.
- 4) Allow 10mm minimum clearance between the terminals and ANY conductive material.

Current and Voltage Signal Wiring:

- 1) All signal cables should be good quality overall screened INSTRUMENTATION CABLE with the screen earthed at one end only.
- 2) Signal cables should be laid a minimum distance of 300mm from any power cables.
- 3) For 2 wire current loops, 2 wire voltage signals or 2 wire current signals, B5102ES is recommended.
It is recommended that you do not ground analogue signals and use power supplies with ungrounded outputs.
- 4) Lightning arrestors should be used when there is a danger from this source.
- 5) Refer to diagrams for connection information.

Power Supply Wiring:

- 1) Use Only Instrument Quality Power Supplies.
- 2) A readily accessible disconnect device and a 1A, 250Vac overcurrent device, must be in the power supply wiring.

IN-LLT Commissioning.

- 1) Once the above wiring has been thoroughly checked, apply power to the and the circuit. Allow at least a 5 minute warm-up period, sometimes up to 30 minutes is required for a more reliable output.
- 2) **Calibration Check:** Take a measurement of the value being measured (e.g. using a dipstick), and ensure that this agrees with the level being indicated on the display. Adjust for any differences. It is recommended to measure both a high and low value and compare these readings with your physical level.

IN-LLT Maintenance.

- 1) Check the IN-LLT transmitter for wear or damage and replace if defective.
- 2) Check the protection cap and diaphragm cavity are clean (please take care).
- 3) Do not violently pull cables or poke the diaphragm with metal or other hard objects.
- 4) Check the cables and connections to the lightning arrestor, power supply and indicator, making sure they're connected securely and undamaged.
- 5) Repeat (2) of commissioning. Do it regularly - at least once per year.

Fault Diagnosis.

The IN-LLT level transmitter is an integrative full-sealed construction without movable parts inside, which means the unit has the advantage of long-term stability and reliability. If a failure occurs, such as no output, output too big or too small and unreliable, please turn off the excitation firstly, then check the installation as per the above section 'Maintenance'. If unsuccessful, the transmitter may be damaged; please contact Intech Instruments.

Notes:

- 1) In the event that the IN-LLT level transmitters are being used with liquids other than water, please ensure that the seals and cable will not be compromised.
- 2) Two kinds of cable are available; Polyethylene (PE) & Polyurethane (PUR). Polyethylene cable is the stock standard.
- 3) If the IN-LLT is prone to lightning strikes, we strongly recommend the use of the optional NAA-102 or LPN-OVP to protect the device.
- 4) At standard conditions: (@4°C, $g=9.80665 \text{ m/s}^2$)
 $1\text{m H}_2\text{O} = 0.1\text{kgf/cm}^2 = 9.80665\text{kPa}$
- 5) For special requirements, please feel free to contact us.

Intech[®]
Instruments
www.intech.co.nz
Christchurch Ph: +64 3 343 0646
Auckland Ph: 09 827 1930
Email: sales@intech.co.nz