

LPN-DP Differential Pressure Transmitter

Programmable Differential Pressure Input to 4~20mA Loop Powered Output Transmitter.

Features.

- Very Low Pressure Resolution.
- Fine Zero & Span Adjustment.
- Coarse Zero & Span Adjustment Via Dip Switches.
- 3~15psi Pneumatic P to I using 100kPa Model.
- Precision Temperature Compensation.
- IP67 Enclosure.
- Fast Response Time.
- High Accuracy & Linearity.
- Compact Size.
- Selectable 5 Second Dampening.
- Reverse Polarity Protection.



Description.

The LPN-DP Series Differential Pressure Transmitters provide a very cost effective solution for pressure applications that require high accuracy over very low operating pressure ranges. The sensor is a solid state device and hence offers reliability and long life. The series is designed for use with non-corrosive, non-ionic working fluids such as air, dry gases and the like. (Fluids must generally be compatible with plastic, aluminium, RTV, Silicon and Glass.)

The LPN-DP can be used to measure bipolar differential, gauge pressure or vacuum. The LPN-DP-BAR can also be used to measure atmospheric pressure from 900~110mbar.

Ordering Information.

Model	LPN-DP-100mm	Differential Range within ± 20 to ± 100 mm W.G.
	LPN-DP-1000mm	Differential Range within ± 125 to ± 1000 mm W.G.
	LPN-DP-40kPa	Differential Range within ± 8 to ± 40 kPa.
	LPN-DP-100kPa	Differential Range within ± 20 to ± 100 kPa.
	LPN-DP-BAR	900~1100mbar absolute..

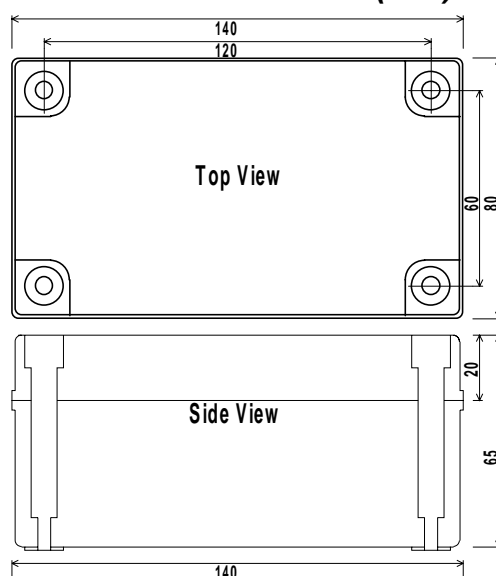
Other Higher Ranges available on request.

Note: Common mode pressure MUST be within ranges as per specifications.

Typical Applications.

- HVAC monitoring of
 - Filter Differential Pressures
 - Fan Static Pressures
 - Clean Room Pressures
 - Variable Air Volume Systems
 - Velocity Pressures
- Analytical Instruments.
- Liquid Level Measurement.
- Leak Detection.
- General Automation.

Enclosure Dimensions. (mm)



Quality Assurance Programme.

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design, development, production and final inspection grant long term reliability of the instrument.

LPN-DP Specifications.

Input

	LPN-DP 100mmWG	LPN-DP 1000mmWG	LPN-DP 40kPa	LPN-DP 100kPa (Bar)
MAXIMUM PRESSURE DIFFERENTIAL	100mmWG (4" WG)	1000mmWG (40" WG)	40kPa (6psi)	100kPa (15psi)
PROOF PRESSURE	250mmWG (10" WG)	14000mmWG (560" WG)	140kPa (20psi)	200kPa (30psi)
MAXIMUM COMMON MODE PRESSURE	3750mmWG (150" WG)	35000mmWG (1400" WG)	340kPa (50psi)	340kPa (50psi)

1kPa =0.009869Atm
 =0.01Bar
 =0.14504psi
 =101.973mmWG
 =7.5009mmHg

WARNING: Due to the delicate nature of the internal pressure sensor in the **LPN-DP-100mmWG**. It must be handled with care.

- Dropping it may destroy the pressure sensor.
- Blowing into it may also destroy the sensor.

Output

2 Wire 4~20mA (Loop Powered).

Power Supply

8~40Vdc (Loop Powered).

Maximum Output Current

30mA.

Supply Voltage Sensitivity

<±0.01%/V FSO.

Output Load Resistance

800Ω @ 24Vdc (50Ω/V above 8Vdc).

Pressure Fittings

Hi \ Lo Pressure Connections by 6mm 'Push-fit'.

	100mmWG, BAR	1000mmWG, 40kPa, 100kPa
Combined Linearity & Hysteresis	±0.5% FSO	±0.1% FSO.
Temperature Drift (Note 1)	±0.02%/C FSO (0~50C)	±0.02%/C FSO (0~70C)
Repeatability	±0.2% FSO.	±0.2% FSO.
Long Term Stability of Offset & Span	±0.5% FSO	±0.1% FSO.
Fully Compensated Temperature Range	0~50C	0~70C.
Humidity Limits	0~80%RH Max. Non-condensing.	0~90%RH Max. Non-condensing.

Corrosion Proofed

Circuit Boards and Components by Isonel 642.

(Except DIP Switches, DP Sensor and Terminals.)

Note 1. Specifications based on typical values for maximum sensor pressure range at 25C.

Note 2. Proof pressure is the pressure above which devices will not return to guaranteed specifications.

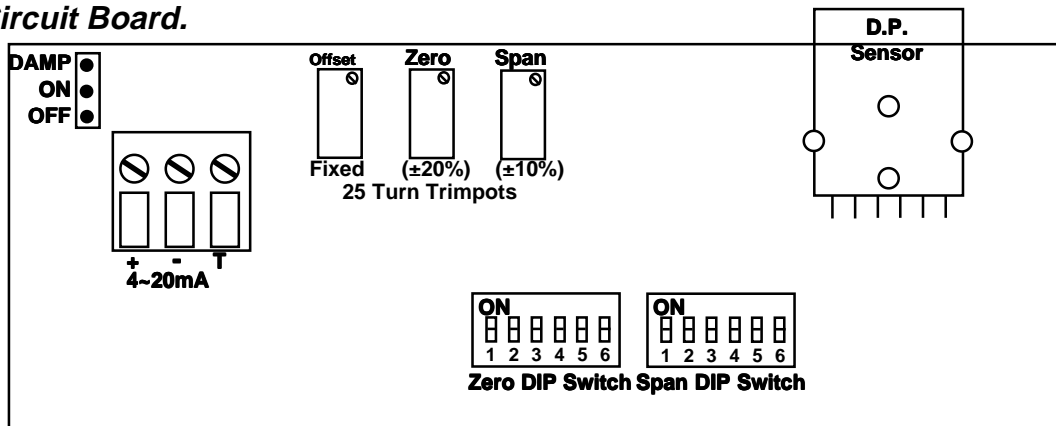
Note 3. Long term stability is based on a 1 year period.

Note 4. Specifications based on Standard Calibration Unit, unless otherwise specified.

Note 5. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification.

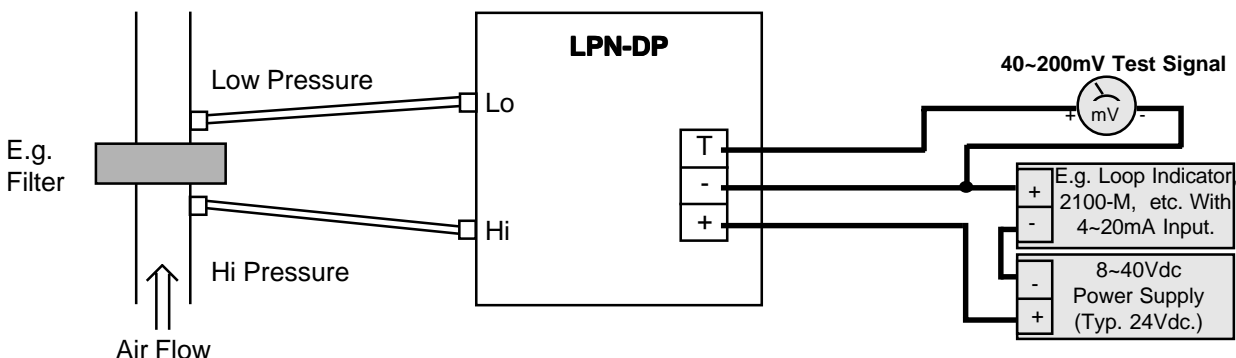
No liability will be accepted for errors, omissions or amendments to this specification.

Layout of Circuit Board.



Note: Do not adjust the OFFSET trimpot. This is factory set.

Terminations.



Note: The LPN-DP-BAR has only the 'Hi' port fitted, and measures atmospheric pressure.

Intech INSTRUMENTS LTD.

Christchurch
 Ph: 03 343 0646
 Fx: 03 343 0649

Nelson
 Ph: 03 546 6840
 Fx: 03 548 8797

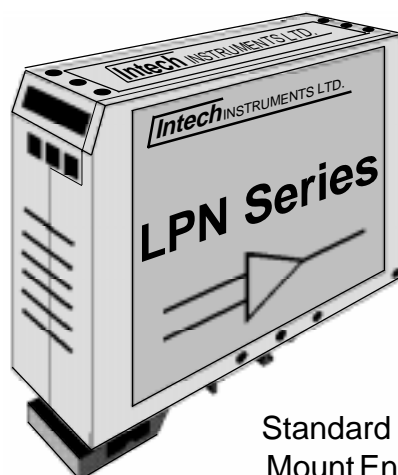
Auckland
 Ph: 09 827 1930
 Fx: 09 827 1931

LPN-R RTD Transmitter.

Linearised 3 Wire RTD
Input to 4~20mA Output
Loop Powered Transmitter.

Features.

- Pt100 RTD Standard Input.
- High Accuracy.
- Linear With Temperature
- 40~200mV Output Test Signal.
- LED Indication of Loop Current.
- Low Cost.
- Easy to Install.
- Compact DIN Rail Mount Enclosure.
- Available Standard or Special Calibration.
- Reverse Polarity Protection.
- Corrosion Proofed Circuit Board & Components by Isonel 642. (Except Terminals & DIP Switches)



Standard DIN Rail
Mount Enclosure.

Ordering Information.

LPN-R - - -
EN SB ST Range. eg. -50/50C

ENCLOSURE (EN)		SENSOR BREAK (SB)		SENSOR TYPE (ST)	
<i>blank</i>	Standard DIN Rail Mount	US	Upscale	<i>blank</i>	Pt100
C	Conduit Box	DS	Downscale	<i>other</i>	SPECIFY
CB	Conduit Box, PCB Only				
E	IP67 Piccolo Enclosure				
EG	IP67 Enclosure c/w Glands				
H	Industrial Connection Head Mount				
L	Low Profile DIN Rail Mount				

Ordering Examples.

LPN-R 0~100C.

LPN-R; Standard DIN Enclosure; Upscale Sensor Break; Pt100 Input; 0~100C.

LPN-R-E-Cu100~150C.

LPN-R; Piccolo IP67 Enclosure; Upscale Sensor Break; Cu10 Input; 0~150C.

Specifications.

RTD Input.	Pt100 DIN (3 Wire type). Other Types of RTD Available. Eg. JIS Pt100, Pt250, Pt500, Pt1000, CU10, CU100, Ni100 or Specify.
Sensor Current.	1mA.
Lead Wire Resistance.	10Ω/Wire max. 1Ω/Wire max. LPN-R-H Only.
Zero Range	-200C to 200C.
Span Range	15C to 800C.
Output	-mA 2 wire 4~20mA. (Loop Powered.) -mV 40~200mV ∝ 4~20mA. (Indicative Test Signal Only.) Other Output Voltages Available. e.g. 1~5V.
Power Supply.	8~40Vdc. (Loop Powered).
Supply Voltage Sensitivity.	<±0.005%/V FSO.
Output Load Resistance	800Ω @ 24Vdc. (50Ω/V above 8Vdc.)
Maximum Output Current	Limited to <30mA.
Sensor Fail	-Upscale 23mA Min. -Downscale 3.6mA Max.
Accurate to	<±0.1% FSO Typical.
Linearity & Repeatability.	<±0.1% FSO Typical.
Ambient Drift.	<±0.01%/C FSO Typical
RFI Immunity.	<1% Effect FSO Typical.
Operating Temperature.	0~70C.
Storage Temperature.	-20~80C.
Operating Ambient Humidity.	90% RH Max. Non-condensing.

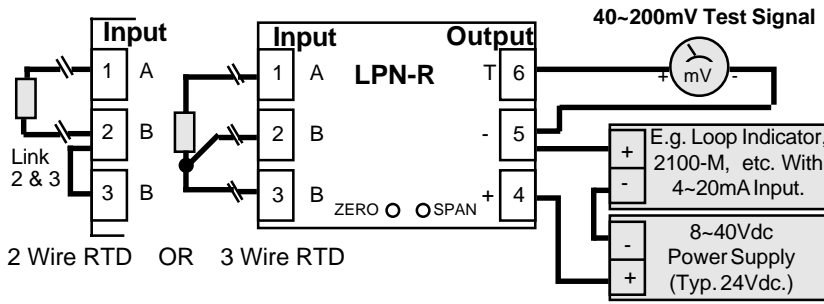
Note 1. Specifications based on Standard Calibration Unit, unless otherwise specified.

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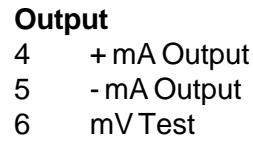
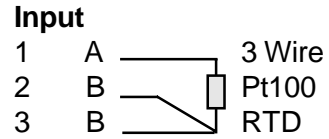
Quality Assurance Programme.

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design / development, production and final inspection grant the long term reliability of the instrument.

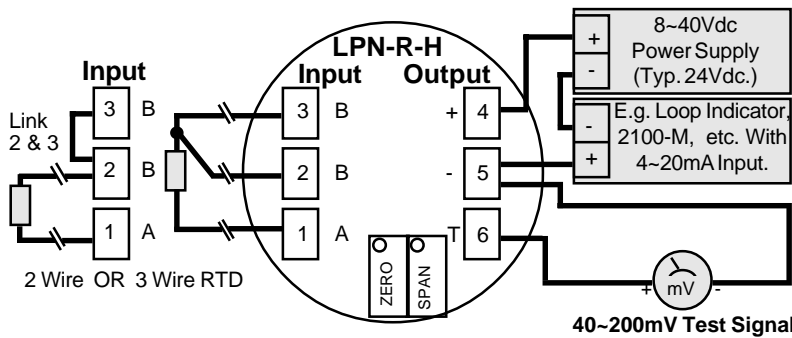
Examples of LPN-R Connections.



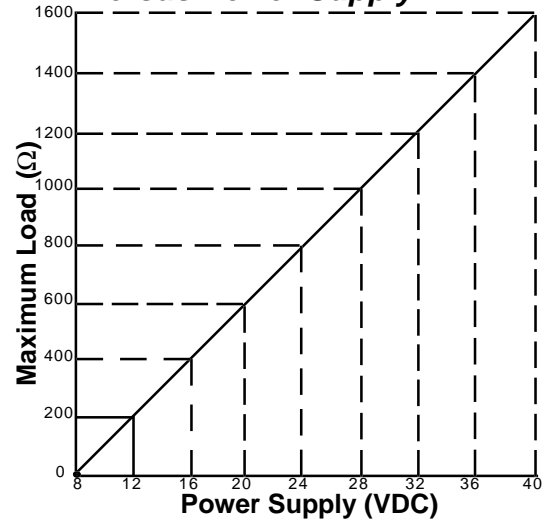
LPN-R Terminations.



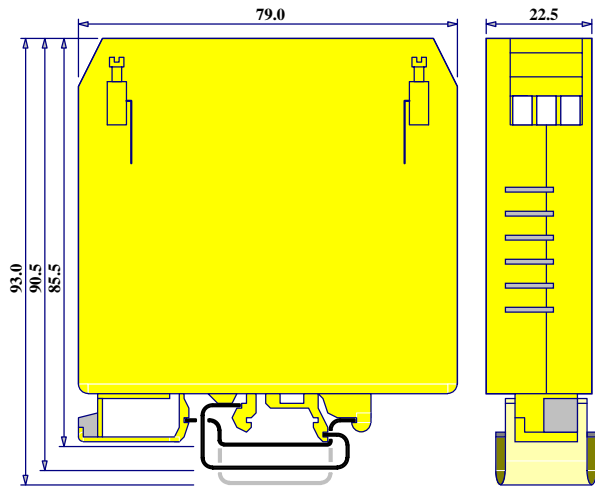
Examples of LPN-R-H Connections.



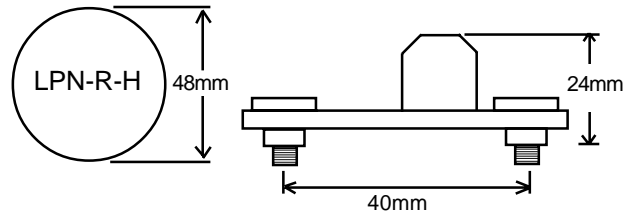
Graph Of Maximum Load Versus Power Supply.



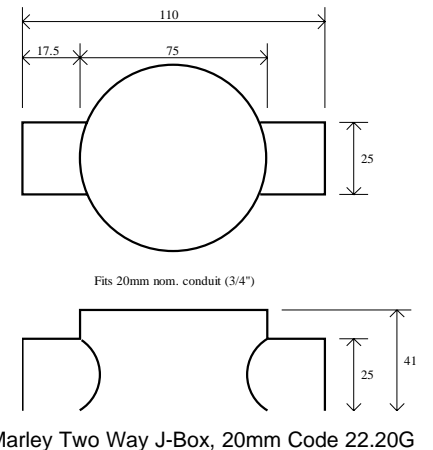
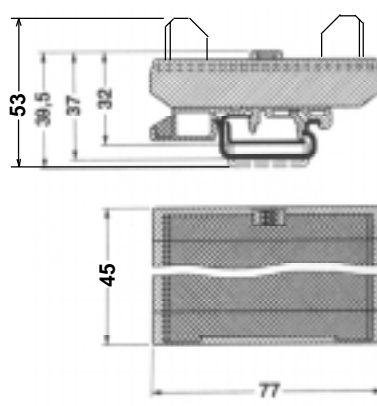
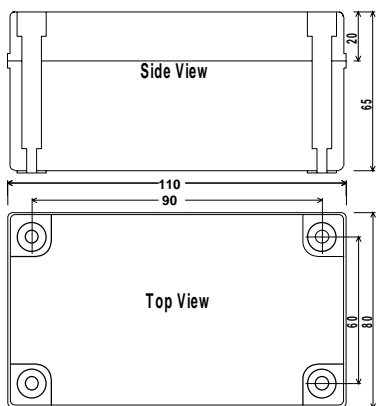
LPN-R Enclosure Dimensions.



LPN-R-H Enclosure Dimensions.



LPN-R-E Enclosure Dimensions. LPN-R-L Enclosure Dimensions. LPN-R-C Enclosure Dimensions.

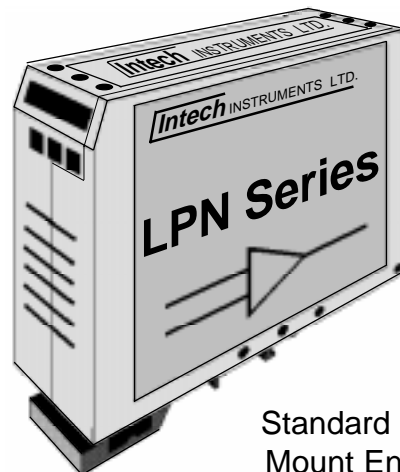


LPN-P Potentiometer Transmitter.

3 Wire Potentiometer
Input to 4~20mA Output
Loop Powered Transmitter.

Features.

- High Accuracy.
- 40~200mV Output Test Signal.
- LED Indication of Loop Current.
- Low Cost.
- Easy to Install.
- Compact DIN Rail Mount Enclosure.
- Available Standard or Special Calibration.
- Reverse Polarity Protection.
- Corrosion Proofed Circuit Board & Components by Isonel 642. (Except Terminals & DIP Switches)



Ordering Information.

LPN-P Standard 0~100% Input.

Standard DIN Rail
Mount Enclosure.

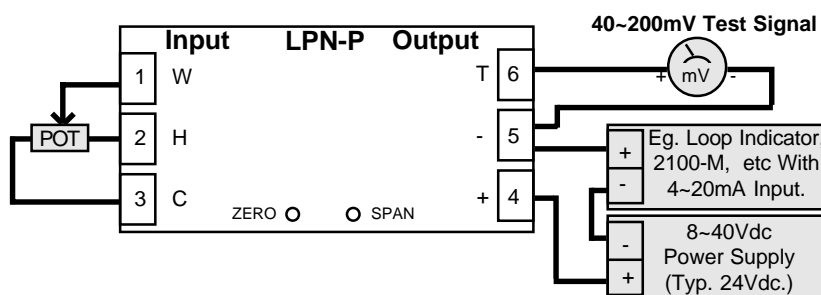
Specifications.

Potentiometer Input		3 Wire Potentiometer. Excitation = 2.5V.
		Minimum Potentiometer Resistance = 1kΩ. Maximum Potentiometer Resistance = 1MΩ.
Output	- mA	2 Wire 4~20mA. (Loop Powered.)
	- mV	40~200mV ∝ 4~20mA. (Indicative Test Signal Only.)
		Other Output Voltages Available. eg 1~5V.
Power Supply		8~40Vdc.
Supply Voltage Sensitivity		<±0.005%/V FSO.
Output Load Resistance		800Ω @ 24Vdc. (50Ω/V Above 8Vdc.)
Maximum Output Current		Limited to <30mA.
Accurate to		<±0.1% FSO Typical.
Linearity & Repeatability		<±0.1% FSO Typical.
Ambient Drift		<±0.01%/C FSO Typical.
R.F. Immunity		<1% Effect FSO Typical.
Response Time		200msec Typical. (10 to 90% 50msec Typical.)
Operating Temperature		0~70C.
Storage Temperature		-20~80C.
Operating Humidity		90%RH Max. Non-Condensing.
Construction		6.6 Polyamide Thermoplastic Rail Mount Enclosure.

Note 1. Specifications based on Standard Calibration Unit, unless otherwise specified.

Note 2. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification.
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Examples of Input Connection.



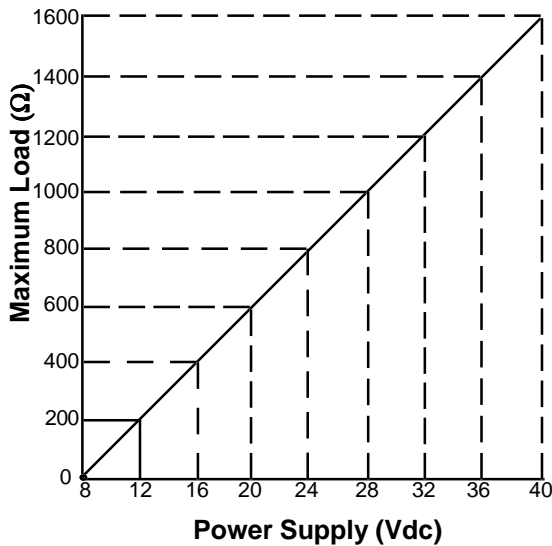
Terminations.

Input	1	WIPER
	2	HIGH
	3	COM
Output	4	+mA
	5	-mA
	6	mV TEST

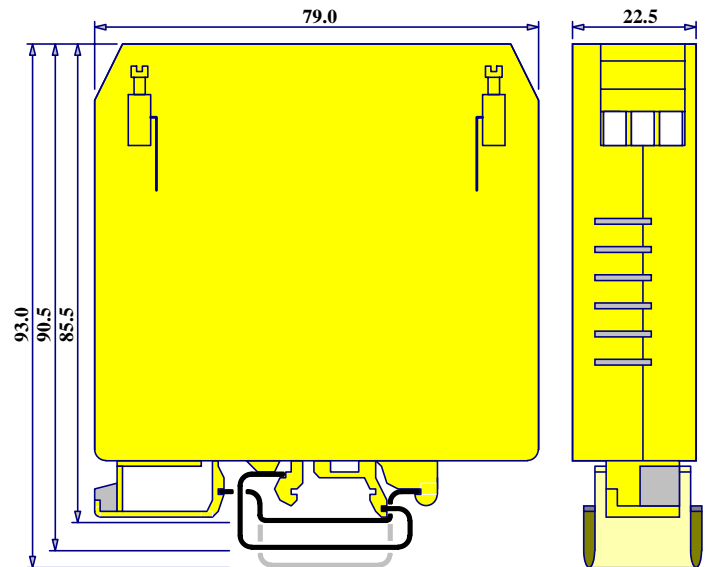
Quality Assurance Programme.

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design / development, production and final inspection grant the long term reliability of the instrument.

LPN-P Graph Of Maximum Load Versus Power Supply.



Enclosure Dimensions.



The Proper Installation & Maintenance of LPN-P.

MOUNTING.

- (1) Mount in a clean environment in an electrical cabinet on DIN or EN mounting rail.
- (2) Do not subject to vibration or excess temperature or humidity variations.
- (3) Avoid mounting in cabinets with power control equipment.
- (4) To maintain compliance with the EMC Directives the LPN-P is to be mounted in a fully enclosed steel cabinet. The cabinet must be properly earthed, with appropriate input / output entry points, and cabling.

WIRING.

- (1) All 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 and 2 wire voltage signals or 2 wire current signals, Austral Standard Cables B5102ES is recommended. For 3 wire transmitters, RTDs, resistance probes, and potentiometers Austral Standard Cables B5103ES is recommended.
- (4) It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
- (5) Lightning arrestors should be used when there is a danger from this source.
- (6) Refer to diagrams for connection information.

COMMISSIONING.

- (1) Once all the above conditions have been carried out and the wiring checked apply power to the LPN-P loop and allow five minutes for it to stabilize.
- (2) Due to cable resistance and errors within the potentiometer itself a small error may occur (usually less than 1%). To remove this error adjust the Zero and Span trimpots in the top of the LPN-P enclosure with a small screwdriver. (Clockwise to increase the output reading & Anticlockwise to decrease the output reading)
- (3) Take a low (approx 10%) and high (approx 90%) reading of the variable being measured by the transducer supplying the signal to the LPN-P, and ensure that this agrees with the level being indicated by the PLC or indicator, etc, that the LPN-P is connected into. Adjust for any difference using the Zero and Span trimpots in the top of the LPN-P enclosure.

MAINTENANCE.

- (1) Repeat (3) of Commissioning.
- (2) Do it regularly - at least once every 12 months.

LPN-H Humidity and Temperature Transmitter.

The LPN-H has two independent, 2 wire, 4~20mA loop powered outputs:
One for relative Humidity;
One for Temperature.

Features.

- Dual 4~20mA Outputs.
- Monolithic IC Humidity Sensor.
- %RH Temperature Compensated Linear Output.
- Pt100 RTD Sensor.
- Temperature Output 0~100C. (0~200F Optional)
- Temperature Output Linearised.
- Very Compact Design.
- High Accuracy.
- Low Cost.
- Easy to Install.
- Reverse Polarity Protection.
- Internally Accessible Span & Zero Adjustments.
- Wide Power Supply Range.



Description.

The LPN-H is a complete relative humidity and temperature sensing module, with two independent loop powered 4~20mA output signals, representing 0~100%RH and 0~100C.

Two versions are available:

- (i) Wall mount.
- (ii) Duct mount.

Both version come complete in an industry standard aluminium connection head. The relative humidity sensor and temperature compensating sensor protrude from the head inside a protective cap. This cap allows air to circulate to the sensors.

Reliability.

The wide operating range of the humidity and temperature sensors offer long term reliability over a broad range of applications. The sensors resist contaminating vapours such as organic solvents, chlorine, and ammonia.

Ordering Information.

MODEL: LPN-H-D	220mm Duct Mount, 0~100%RH Transmitter, 0~100C Transmitter.
LPN-H-W	Wall Mount, 0~100%RH Transmitter, 0~100C Transmitter.
LPN-H-F	100mm Flange for LPN-H-D

Note: 0~200F temperature output optional. Please specify when ordering.

Quality Assurance Programme.

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design, development, production and final inspection grant the long term reliability of the instrument.

LPN-H %RH Transmitter Specifications.

Accurate to	<±2% FSO Typical. 0~100%RH @ 25C Saturated Salt Calibration.
Ambient Temperature Drift	<±0.05%/C FSO Typical.
Humidity Sensor	Important: For continuous measurements of ≥95%RH, refer to note 4 below.
	-Hysteresis ±0.8% of Span Typical.
	-Linearity ±0.5%RH Typical.
	-Repeatability ±0.5%RH Typical.
	-Long Term Drift ±1%RH Typical at 50%RH in 5 years.

LPN-H Temperature Transmitter Specifications.

Accurate to	<±0.1% FSO Typical.
Linearity and Repeatability	<±0.1% FSO Typical.
Ambient Temperature Drift	<±0.02%/C FSO Typical.
RTD Sensor	Pt100 RTD, Class A Din 43760.
Sensor Current	0.5mA.

LPN-H Common Specifications.

Output.	2 wire 4~20mA (Loop Powered).
Power Supply.	9~40Vdc.
Supply Voltage Sensitivity.	<±0.01%/V FSO.
Maximum Output Current.	Limited to <36mA.
Output Load Resistance.	750Ω @ 24Vdc. (50Ω/V Above 9Vdc).
R.F. Immunity.	<1% Effect FSO Typical.
Isolation Between %RH and Temperature	50Vac/dc Max.
Operating Temperature.	-at head ^{A)} 0~70C.
	-at sensor ^{B)} -30~85C (LPN-H-D)
Storage Temperature.	-30~85C.
Operating Humidity.	-at head ^{A)} 90%RH Max. Non-condensing.
	-at sensor ^{B)} 0~100%RH. Refer note 4 below.

Note: ^{A)} 'at head' refers to ratings for electronics housed in the connection head.

^{B)} 'at sensor' refers to ratings for electronics housed in the protective cap.

Note 1. Good airflow and good air mixing must be maintained over the sensor to minimise local temperature fluctuations, and to ensure accurate measurements.

Note 2. Specifications based on Standard Calibration Unit, unless otherwise specified.

Note 3. Due to ongoing research and development designs, specifications, and documentation are subject to change without notification.

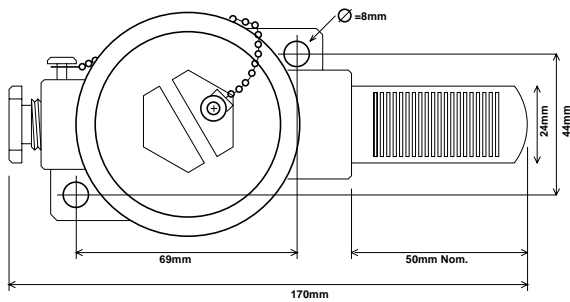
No liability will be accepted for errors, omissions or amendments to this specification.

Note 4. The RH sensors quickly recover from condensation or wetting with no shift in calibration. However, after 24 hours or longer exposures to either high >95%RH or continuous condensation, an upward shift of 2% to 3%RH may occur. This shift is repeatable and can be reversed by placing the sensor in a low 10%RH environment for a 10 hour period.

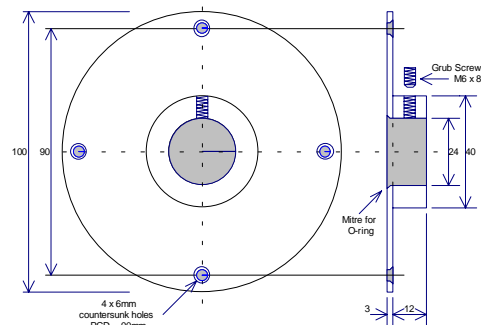
CONDENSATION occurs whenever the surface temperature of the sensor's active area drops below the ambient dew point of the surrounding gas. Condensation forms on the sensor (or any surface) even if the surface temperature only momentarily drops below the ambient dew point. Small temperature fluctuations near the sensor can unknowingly cause condensation to form when operating at humidity levels above 95%.

While quick to condense, water is slow to evaporate in high humidity conditions. (ie when the surface temperature of the sensor is only slightly above the ambient dew point.) Because of this, a sensor's recovery from either condensation or wetting is much longer than its normal time response. During recovery, the sensor outputs a constant 100%RH signal, regardless of the ambient RH.

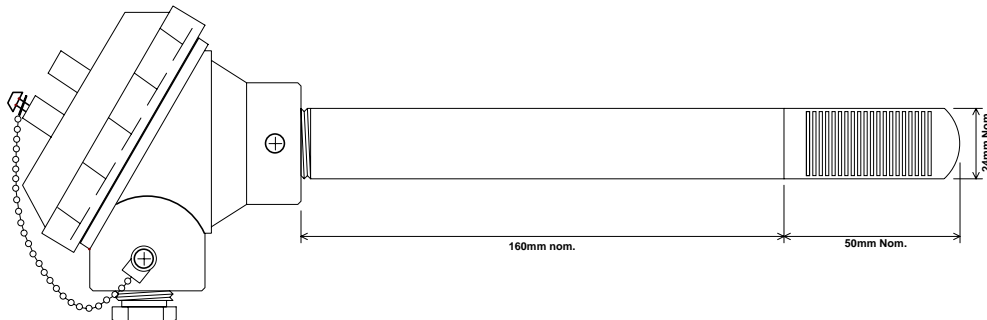
LPN-H-W Dimensions.



LPN-H-F Dimensions.



LPN-H-D Dimensions.



LPN-R-H, In Head RTD Transmitter.

Linearised In-Head 3 Wire RTD
Input to 2 Wire 4~20mA
Loop Powered Output Transmitter.

Features.

- Fits RTD Connection Heads
- Pt100 RTD Standard Input.
- High Accuracy.
- Linear With Temperature.
- 40~200mV Output Test Signal.
- LED Indication of Loop Current.
- Low Cost.
- Easy to Install.
- Compact DIN Rail Mount Enclosure.
- Available Standard or Special Calibration.
- Reverse Polarity Protection.
- Corrosion Proofed Circuit Board & Components.
by Isonel 642. (Except Terminals & DIP Switches.)



SAMPLE PICTURE.

Ordering Information.

LPN-R-H - - -

| | |

SB ST Range.

SENSOR BREAK (SB)		SENSOR TYPE (ST) SENSOR BREAK	
US	Upscale	blank	Pt100
DS	Downscale	other	SPECIFY

Ordering Examples.

LPN-R-H 0~100C

LPN-R-H; Upscale Sensor Break; Pt100 input; 0~100C.

LPN-R-H-DS-Cu10 0~150

LPN-R-H; Downscale Sensor Break; Cu10 input; 0~150C.

Specifications.

RTD Input.	Pt100 DIN (3 Wire Type). Other Types of RTD Available. Eg. JIS Pt100, Pt250, Pt500, Pt1000, CU10, CU100, Ni100 or specify.
Sensor Current.	1mA.
Lead Wire Resistance.	1Ω/Wire Max.
Zero Range	-200C to 200C.
Span Range	15C to 800C.
Output	-mA 2 wire 4~20mA. (Loop Powered.) -mV 40~200mV ∝ 4~20mA. (Indicative Test Signal Only.) Other Output Voltages Available. e.g. 1~5V.
Power Supply.	8~40Vdc. (Loop Powered).
Supply Voltage Sensitivity.	<±0.005%/V FSO.
Output Load Resistance	800Ω @ 24Vdc. (50Ω/V Above 8Vdc.)
Maximum Output Current	Limited to <30mA.
Sensor Fail	-Upscale 23mA min. -Downscale 3.6mA max.
Accurate to	<±0.1% FSO Typical.
Linearity & Repeatability.	<±0.1% FSO Typical.
Ambient Drift.	<±0.01%/C FSO Typical
RFI Immunity.	<1% Effect FSO Typical.
Operating Temperature.	0~70C.
Storage Temperature.	-20~80C.
Operating Ambient Humidity.	90% RH Max. Non-condensing.

Note 1. Specifications based on Standard Calibration Unit, unless otherwise specified.

Note 2. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification. No liability will be accepted for errors, omissions or amendments to this specification.

Terminations.

Input

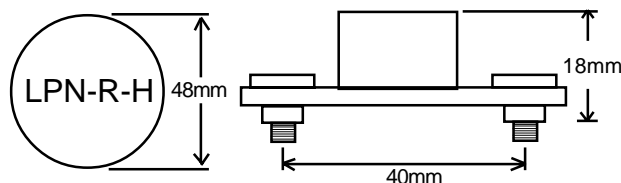


- 1: A RTD
2: B Pt100
3: B 3 Wire

Output

- 4: +mA
5: -mA
6: mV test

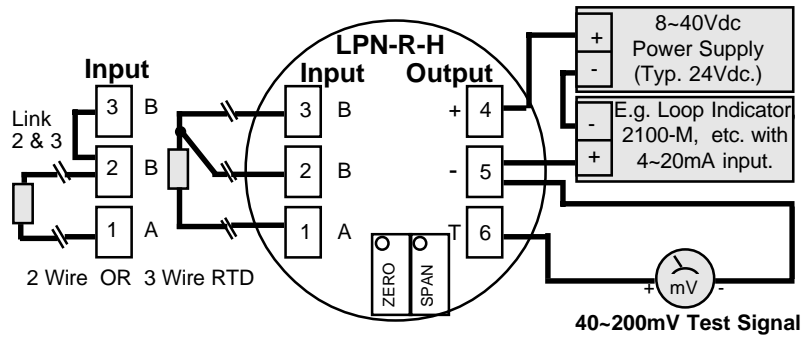
Dimensions.



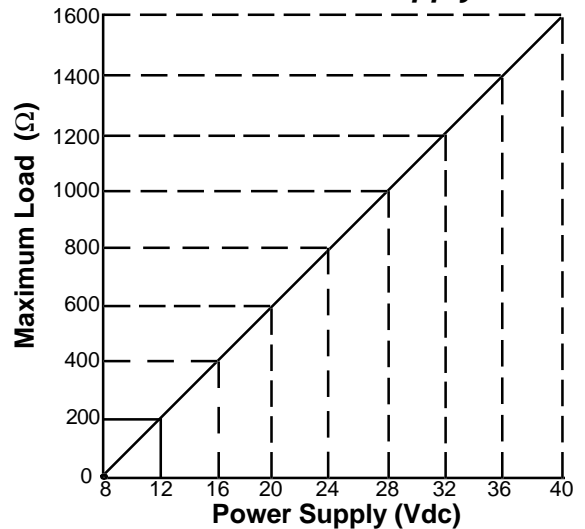
Quality Assurance Programme.

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Example of LPN-R-H Input Connections.



Graph Of Maximum Load Versus Power Supply.



The Proper Installation & Maintenance of LPN-R-H.

MOUNTING.

- (1) Mount in a clean environment in a probe head ensuring there is enough clearance between the lid and LPN-R-H components.
- (2) Do not subject to vibration or excess temperature or humidity variations.
- (3) Avoid mounting in cabinets with power control equipment.
- (4) To maintain compliance with the EMC Directives, the LPN-R-H must be mounted in a metal enclosure. The enclosure must be properly earthed, with appropriate input / output entry points, cabling and filtering.

WIRING.

- (1) All 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 Austral Standard Cables B5102ES is recommended. For three wire transmitters and RTD's Austral Standard Cables B5103ES is recommended.
- (4) It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
- (5) Lightning arrestors should be used when there is a danger from this source.
- (6) Refer to diagrams for connection information.

RTD'S.

- (1) Avoid locating the RTD where it will be in a direct flame.
- (2) Locate it where the average temperature will be measured. It should be representative of the mass.
- (3) Immerse the RTD far enough so that the measuring point is entirely in the temperature to be measured; nine to ten times the diameter of the protection tube is recommended. Heat that is conducted away from the measuring point causes an inaccurate reading.

COMMISSIONING.

- (1) Once all the above conditions have been carried out and the wiring checked apply power to the LPN-R-H loop and allow five minutes for it to stabilize.
- (2) Due to cable resistance in the RTD legs or errors within the RTD itself a small Zero error may occur (usually less than 0.5C). To remove this error use a calibration standard RTD at the same immersion depth and adjust the Zero trimpot on the top of the LPN-R-H with a small screwdriver, until the two levels agree. (Clockwise to increase the output reading and anticlockwise to decrease the output reading)

MAINTENANCE.

- (1) Check RTD's in place - with a calibration RTD at the same immersion depth.
- (2) Do it regularly - at least once every 6 months.
- (3) Replace defective protection tubes - even if they look good they may not be air or gas tight.
- (4) Check out cables entering the RTD sensor head.