



### Performance features

- Measurement range up to 60mm (2.4")
- 56 different stroke lengths
- High reliability contactless technology
- Single or dual output models
- Multiple mounting options
- Operating temperature 150°C (300°F)
- Compact and lightweight design

### Applications

- Industrial
- Automotive
- Marine
- Medical
- Off-road vehicles
- Aerospace research



## Description

Active Sensors range of sealed high temperature Hall Effect linear position sensors are specifically designed to provide precision linear measurements utilising proven contactless technology. The sensors, which are available with single and dual output options are lightweight and compact in design and provide a versatile measurement solution for control and monitoring systems.

LH sensor comprises two parts, the fully encapsulated sealed sensing circuit and a magnetic actuator. There is no electrical contact between the two parts (contactless), making the sensor ideal for measurement systems that experience severe shock and vibration. The sensor is also suitable for applications that suffer fluid and debris contamination.

The sensors operate from either a 5Vdc regulated or 8 to 30Vdc unregulated supply and have built-in over voltage and reverse polarity protection. The output signal is 0.5 - 4.5V and the operating temperature is a superior 150°C (300°F). LH sensors are available with single or independent dual output options and the measurement range of 5mm to 60mm is specified by the customer when ordering (in 1mm increments) Mounting options include body screws or spherical rod-end bearings.

# LH1000 series – single and dual output

## Description

The LH1000 Hall Effect linear position sensor is compact, robust and maintenance free. The sensor design, with the absence of any mechanical linkages makes it suitable for use in harsh environments where debris, fluids and vibration are present. Mounting of the sensor housing and actuator are easily made using 3mm cap head screws (supplied). The LH1000 sensor is available with single or independent dual output options and the measurement range, which is specified by the customer when ordering is 10mm to 50mm (in 1mm increments). The sensor is used in a variety of industrial, automotive, vehicle, marine control and measurement applications.

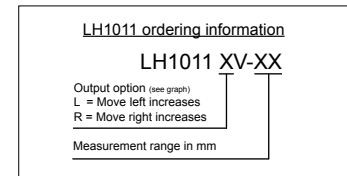
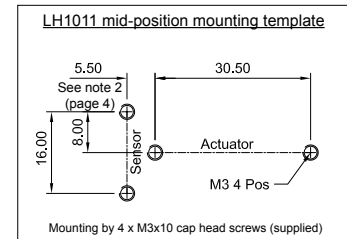
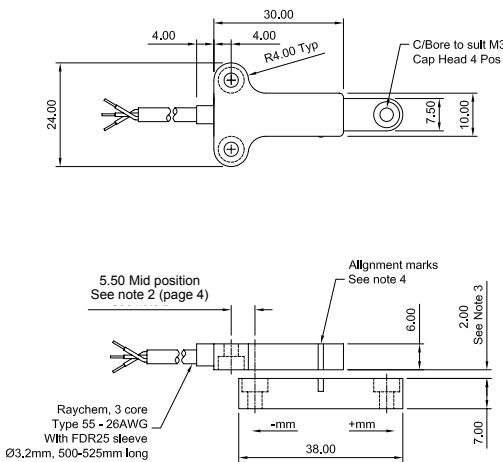
### Model features

- Measurement range 10mm up to 50mm (2")
- Single and dual output options
- Superior contactless technology
- Fully encapsulated circuit
- No mechanical linkages
- Mounting fixings supplied
- Compact and lightweight



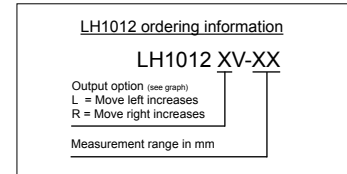
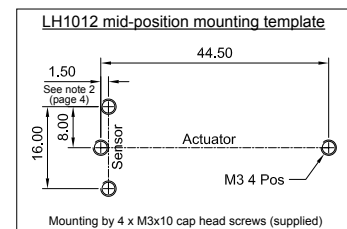
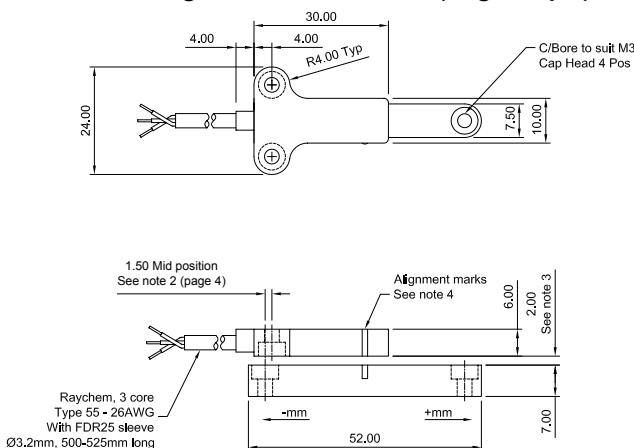
## Model dimensions and mounting

### LH1011 - measurement range from 10mm to 25mm (single output)



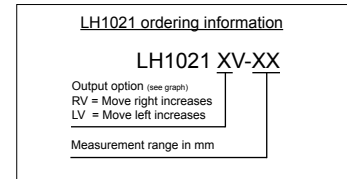
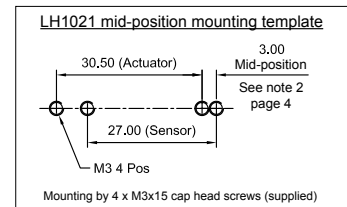
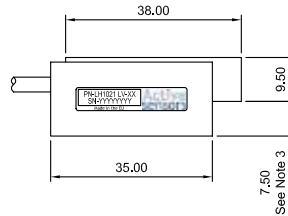
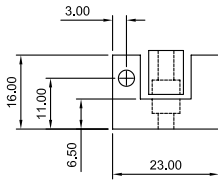
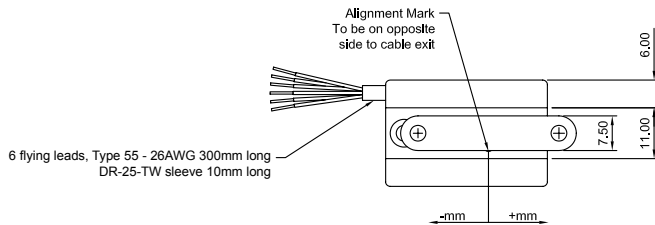
For full electrical specification and electrical connections, please see page 3 & 4

### LH1012 - measurement range from 26mm to 50mm (single output)



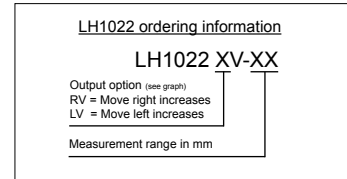
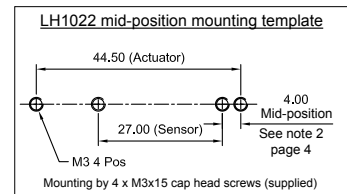
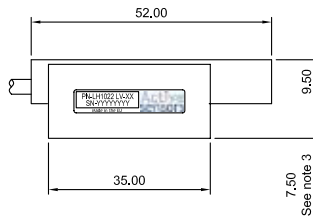
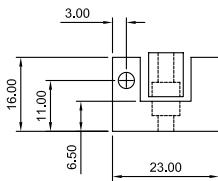
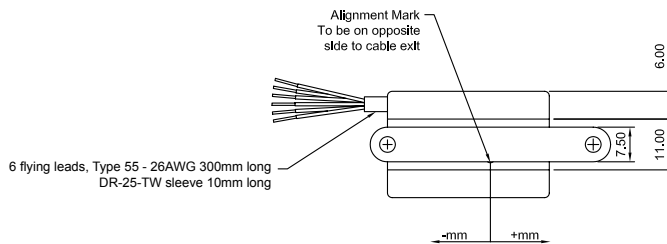
For full electrical specification and electrical connections, please see page 3 & 4

## LH1021 - measurement range 12mm to 25mm (dual output)



For full electrical specification and electrical connections, please see page 3 & 4

## LH1022 - measurement range 26mm to 50mm (dual output)

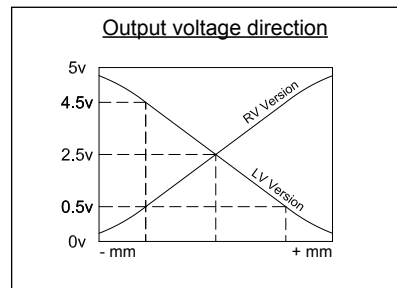
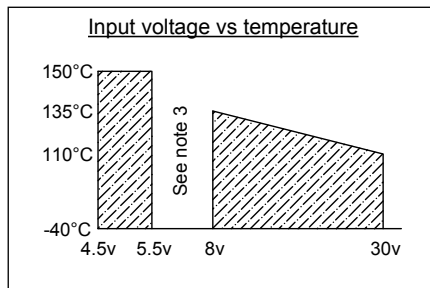


For full electrical specification and electrical connections, please see page 3 & 4

## LH1000 series electrical & mechanical information (single and dual output)

Electrical connections LH1011 and LH1012 (see note 1)	
Wire Colour	Function
Red	Supply Voltage (Vs)
White	Output Voltage (Vout)
Black	Ground

Electrical connections LH1021 and LH1022 (see note 1)		
	Wire Colour	Function
Channel 1	Red	Supply Voltage (Vs)
	White	Output Voltage (Vout)
	Black	Ground
Channel 2	Blue	Supply Voltage (Vs)
	Yellow	Output Voltage (Vout)
	Green	Ground



## LH1000 series electrical & mechanical information (single and dual output) cont...

### Input Specification (per channel)

Supply voltage (Vs)	5.0±10% regulated	8 to 30 unregulated	V DC
Over voltage protection	Up to 50		V DC
Supply current	<15		mA
Reverse polarity protection	Up to -10		V DC
Power on settlement time	<100		mS
Input voltage rise time	0.25 minimum		V/mS

### Output Specification (per channel)

Output type	Analogue		
Output direction	See output characteristics		
Voltage output (Vout)	0.5 - 4.5 (ratiometric with Vs)	0.5 - 4.5	V DC
Monotonic range	0 - 100% measurement range		
Load resistance	>10K		Ohms
Output noise	<5		mV rms

### Performance Specification (per channel)

Measurement range	5mm to 60mm in 1mm increments		mm
Resolution	0.025		% of measurement
Sensitivity tolerance (see note 6 and 7)	<±2.5%		FS
Non-linearity (see note 7)	<±1%		FS
Tracking between channels	<2%		FS
Temperature coefficient	<±0.003%	<±0.011%	FS/°C
Update rate	>500		Hz
Max operating speed	1		m/S

### General Specification

IP Rating	IP67		
MTBF	Single: 166 million	Dual: 83 million	hours@ 55°C
Dither life	Contactless - no degradation		
Operational temperature	-40 to +150	See de-rating graph	°C
Storage temperature	-55 to +150		°C
Materials	Module and Actuator - Glass filled polymer		
Max torque screw setting	1		Nm

### Notes:

1. Incorrect wiring may cause internal damage.
2. When the sensor is positioned as shown the instrument is mid-travel (2.5v output).
3. The output is calibrated to meet the specification with the air gap shown, any variation on this will effect the performance.
4. The sensor should be mounted with the alignment marks as shown to achieve the specified operation.
5. Do not operate between 5.5V and 8V.
6. Ideal sensitivity (mV/mm) is calculated from the ideal span of 4000mV (4.5-0.5V dc) divided by the measurement range in mm.
7. Sensitivity and Non-linearity are calculated from Least Squares Best Fit method.
8. Due to Hall effect technology used in this device, ferrous materials and magnetics fields may influence output.

# LH1200 series – single and dual output

## Description

The LH1200 is a sealed, high temperature Hall Effect linear position sensor and for ease of installation, the stainless steel operating shaft is guided within the sensor body. The sensor body is mounted with 3mm cap head screws (supplied). The LH1200 sensor is available with single or independent dual output options and the measurement range, which is specified by the customer when ordering is 5mm to 60mm (in 1mm increments). The sensor is rugged and suitable for use in a variety of industrial, automotive, vehicle, marine control and measurement applications.

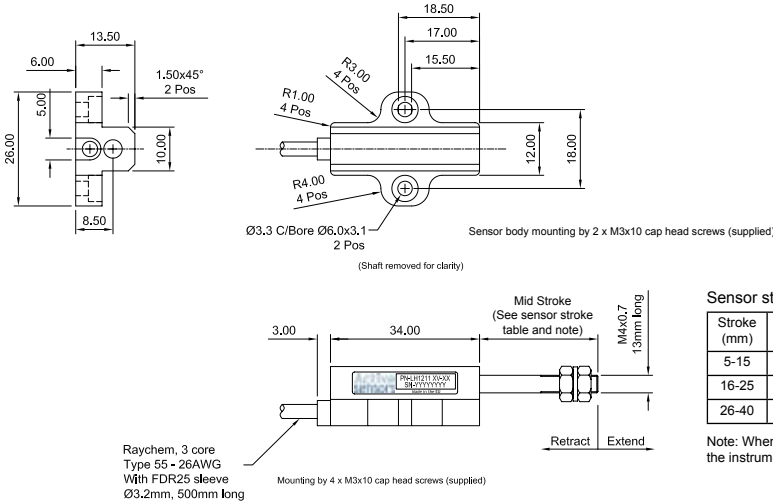
### Model features

- Measurement range 5mm to 60mm (2.4")
- Single and dual output options
- Guided operating shaft
- Superior contactless technology
- Mounting fixings supplied
- Fully encapsulated circuit
- Compact and lightweight



## Model dimensions and mounting

### LH1211 - measurement range from 5mm to 40mm (single output)



Stroke (mm)	Mid Stroke (mm)	Mid Stroke output (V)	Weight (g) (approx.)
5-15	22.5	2.5±0.130	20
16-25	27.5	2.5±0.080	21
26-40	35	2.5±0.50	22

Note: When the sensor is positioned as shown the instrument is mid-travel (2.5v output).

**LH1211 ordering information**

LH1211 XV-XX

Output option (see graph)  
 L = Retract output increases  
 R = Extend output increases

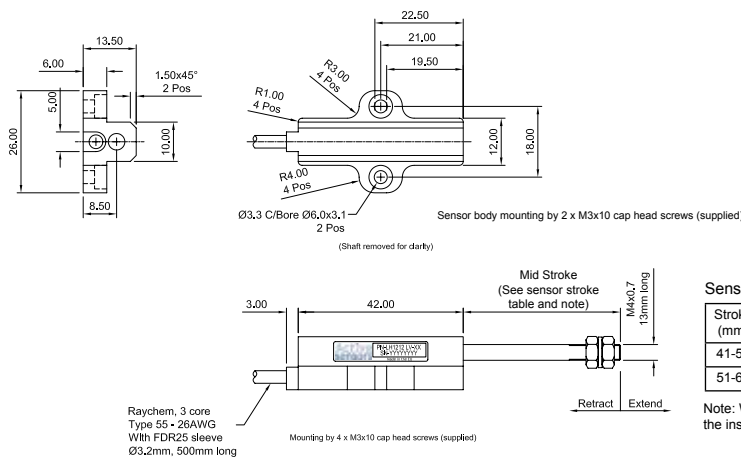
Measurement range in mm

**Electrical connections (see note 1)**

Wire Colour	Function
Red	Supply Voltage (Vs)
White	Output Voltage (Vout)
Black	Ground

For full electrical specification, please see page 8

### LH1212 - measurement range from 41mm to 60mm (single output)



Stroke (mm)	Mid Stroke (mm)	Mid stroke output (V)	Weight (g) (approx.)
41-50	40	2.5±0.040	25
51-60	45	2.5±0.033	27

Note: When the sensor is positioned as shown the instrument is mid-travel (2.5v output).

**LH1212 ordering information**

LH1212 XV-XX

Output option (see graph)  
 L = Retract output increases  
 R = Extend output increases

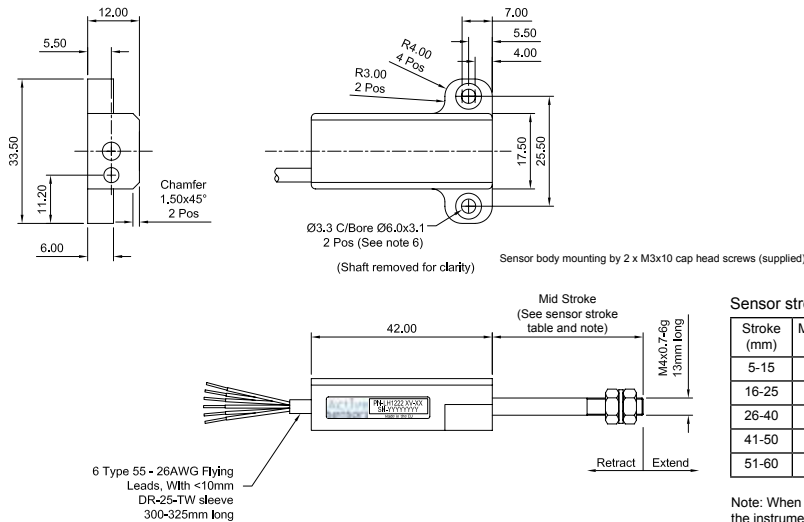
Measurement range in mm

**Electrical connections (see note 1)**

Wire Colour	Function
Red	Supply Voltage (Vs)
White	Output Voltage (Vout)
Black	Ground

For full electrical specification, please see page 8

## LH1222 - measurement range from 5mm to 60mm (dual output)



### LH1222 ordering information

LH1222 XV-XX

Output option (see graph)  
L = Retract output increases  
R = Extend output increases

Measurement range in mm

### Electrical connections (see note 1)

Wire Colour	Function
Red	Supply Voltage (Vs)
White	Output Voltage (Vout)
Black	Ground
Blue	Supply Voltage (Vs)
Yellow	Output Voltage (Vout)
Green	Ground

### Sensor stroke table LH1222

Stroke (mm)	Mid Stroke (mm)	Mid Stroke output (V)	Weight (g) (approx.)
5-15	22.5	2.5±0.130	24
16-25	27.5	2.5±0.080	25
26-40	35	2.5±0.050	26
41-50	40	2.5±0.040	27
51-60	45	2.5±0.033	28

Note: When the sensor is positioned as shown the instrument is mid-travel (2.5v output).

For full electrical specification, please see page 8

## LH1300 series – single and dual output

### Description

The LH1300 is a sealed, high temperature Hall Effect linear position sensor and for ease of installation, mounted using a choice of spherical rod-end bearings. The sensor circuit is fully encapsulated in a magnetically shielded housing and the operating shaft is stainless steel. The compact LH1300 sensor is available with single or independent dual output options and the measurement range, which is specified by the customer when ordering is 5mm to 60mm (in 1mm increments). The sensor is compact, rugged and sealed to prevent the ingress of fluids. The LH1300 is used in a variety of industrial, automotive, vehicle, marine control and measurement applications.

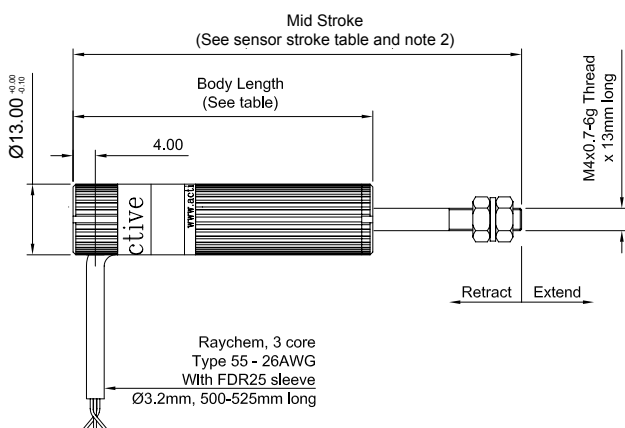
### Model features

- Measurement range 5mm to 60mm (2.4")
- Single and dual output options
- Body clamp and rod-end bearing mounting
- Magnetically shielded sensing circuit
- Fully encapsulated circuit
- Superior contactless technology
- Compact and lightweight



### Model dimensions and mounting

#### LH1311 - measurement range 5mm to 60mm (single output)



### Sensor stroke table LH1311

Stroke (mm)	Body length (mm)	Mid Stroke (mm)	Mid stroke output (V)	Weight (g)
5-25	54.00	80.5	2.5 ±0.130	24
26-40	85.00	119.0	2.5 ±0.050	33
41-50	95.00	134.0	2.5 ±0.040	40
51-60	111.00	155.0	2.5 ±0.033	48

Note: When the sensor is positioned as shown the instrument is mid-travel (2.5v output).

### LH1311 ordering information

LH1311 XV-XX

Output option (see graph)  
L = Retract output increases  
R = Extend output increases

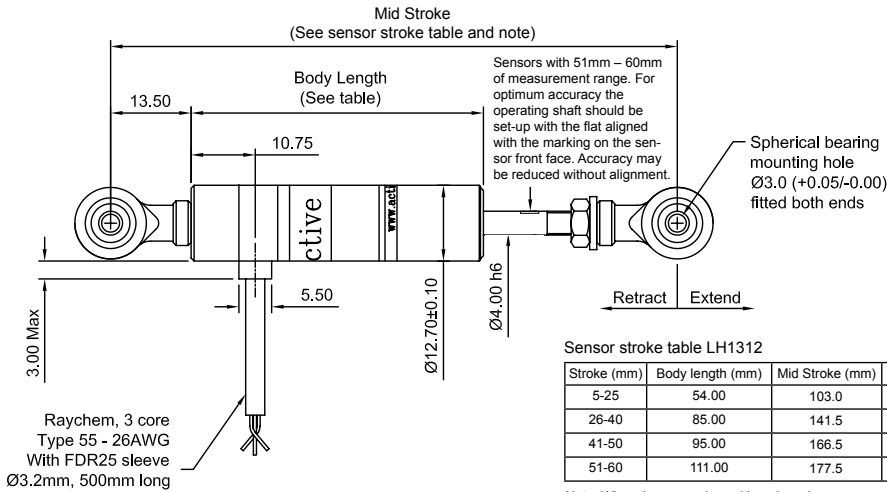
Measurement range in mm

### Electrical connections (see note 1)

Wire Colour	Function
Red	Supply Voltage (Vs)
White	Output Voltage (Vout)
Black	Ground

For full electrical specification, please see page 8

**LH1312 - measurement range 5mm to 60mm (single output)**



Sensor stroke table LH1312

Stroke (mm)	Body length (mm)	Mid Stroke (mm)	Weight (g)
5-25	54.00	103.0	24
26-40	85.00	141.5	33
41-50	95.00	166.5	40
51-60	111.00	177.5	48

Note: When the sensor is positioned as shown the instrument is mid-travel (2.5v output).

**LH1312 ordering information**

**LH1312 XV-XX**

Output option (see graph)  
 L = Retract output increases  
 R = Extend output increases

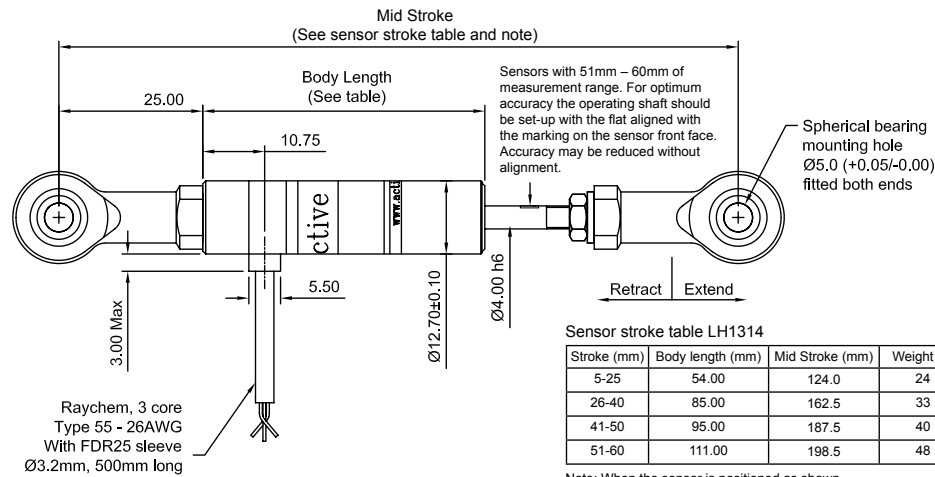
Measurement range in mm

**Electrical connections (see note 1)**

Wire Colour	Function
Red	Supply Voltage (Vs)
White	Output Voltage (Vout)
Black	Ground

For full electrical specification, please see page 8

**LH1314 - measurement range 5mm to 60mm (single output)**



Sensor stroke table LH1314

Stroke (mm)	Body length (mm)	Mid Stroke (mm)	Weight (g)
5-25	54.00	124.0	24
26-40	85.00	162.5	33
41-50	95.00	187.5	40
51-60	111.00	198.5	48

Note: When the sensor is positioned as shown the instrument is mid-travel (2.5v output).

**LH1314 ordering information**

**LH1314 XV-XX**

Output option (see graph)  
 L = Retract output increases  
 R = Extend output increases

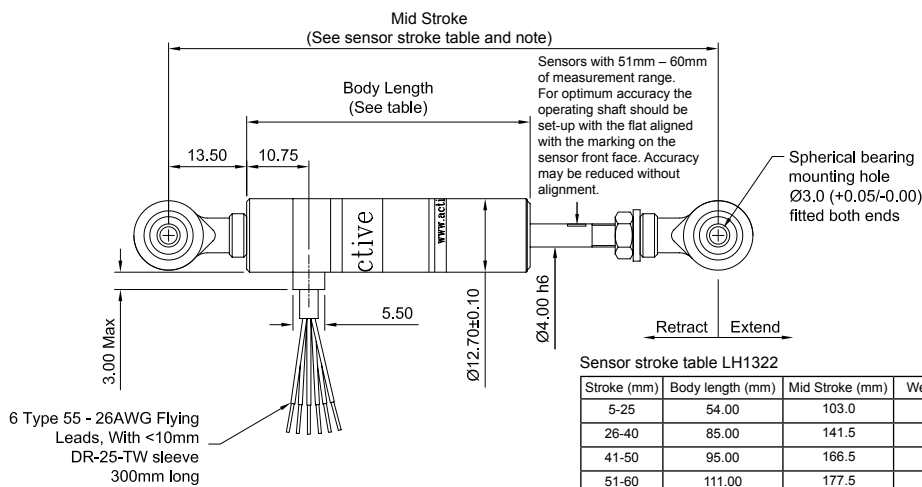
Measurement range in mm

**Electrical connections (see note 1)**

Wire Colour	Function
Red	Supply Voltage (Vs)
White	Output Voltage (Vout)
Black	Ground

For full electrical specification, please see page 8

**LH1322 - measurement range 5mm to 60mm (dual output)**



Sensor stroke table LH1322

Stroke (mm)	Body length (mm)	Mid Stroke (mm)	Weight (g)
5-25	54.00	103.0	24
26-40	85.00	141.5	33
41-50	95.00	166.5	40
51-60	111.00	177.5	48

Note: When the sensor is positioned as shown the instrument is mid-travel (2.5v output).

**LH1322 ordering information**

**LH1322 XV-XX**

Output option (see graph)  
 L = Retract output increases  
 R = Extend output increases

Measurement range in mm

**Electrical connections (see note 1)**

Wire Colour	Function
Red	Supply Voltage (Vs)
White	Output Voltage (Vout)
Black	Ground
Blue	Supply Voltage (Vs)
Yellow	Output Voltage (Vout)
Green	Ground

For full electrical specification, please see page 8

## Electrical & mechanical information LH1200 & LH1300 series (single and dual output)

### Input Specification (per channel)

Supply voltage (Vs)	5.0±10% regulated	8 to 30 unregulated	V DC
Over voltage protection	Up to 50		V DC
Supply current	<15		mA
Reverse polarity protection	Up to -10		V DC
Power on settlement time	<100		mS
Input voltage rise time	0.25 minimum		V/mS

### Output Specification (per channel)

Output type	Analogue		
Output direction	See output characteristics		
Voltage output (Vout)	0.5 - 4.5	0.5 - 4.5	V DC
Line regulation	Ratiometric with Vs	<0.01% FS/V	
Monotonic range	0 - 100% measurement range		
Load resistance	>10K		Ohms
Output noise	<5		mV rms

### Performance Specification (per channel)

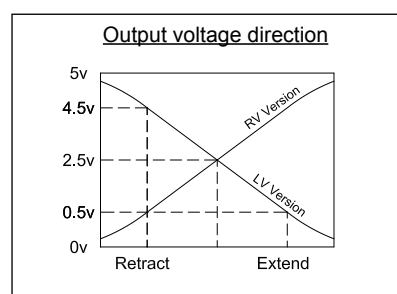
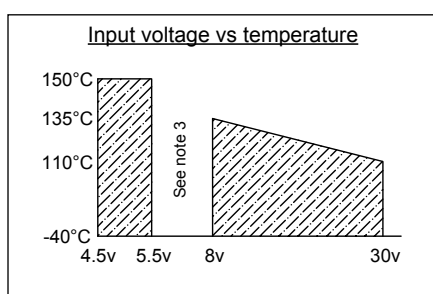
Measurement range	5mm to 60mm in 1mm increments		mm
Resolution	0.025		% of measurement
Sensitivity tolerance (see note 4 and 5)	<±2.5%		FS
Non-linearity (see note 6)	<±1%		FS
Tracking between channels	<2%		FS
Temperature coefficient (Vout)	<±0.003%	<±0.011%	FS/°C
Update rate	500 Nom		Hz
Max operating speed	1		m/S

### General Specification

IP rating	IP67		
Life	25 million cycles		
Dither life	Contactless - no degradation		
Operational temperature	-40 to +150	See de-rating graph	°C
Storage temperature	-55 to +150		°C
Materials	Case - Glass filled polymer, Shaft - Stainless steel 303		
	LH1200	Case - Glass filled polymer with Aluminium Sulph Anodised sleeve, Shaft - Stainless steel 303	
	LH1300		
Max torque screw setting	1		Nm

### Notes:

1. Incorrect wiring may cause internal damage.
2. When the sensor is positioned as shown the instrument is mid-travel (2.5v output).
3. Do not operate between 5.5V and 8V.
4. Ideal sensitivity (mV/mm) is calculated from the ideal span of 4000mV (4.5-0.5V dc) divided by the measurement range in mm.
5. Sensitivity and Non-linearity is calculated from Least Squares Best Fit method.
6. Secured using 2 x M3x10 cap head screws (supplied).
7. Due to Hall effect technology used in this device, ferrous materials and magnetics fields may influence output.



## Design and manufacturing service

Active Sensors product expertise and in-depth application knowledge allow for innovative and creative solutions to complex control and measurement problems. We are market leaders in providing sensor designs for critical control and measurement applications for the industrial, automotive and aerospace industries. Working in partnership with our design engineers, customers can utilise the latest sensor technology in their machine, vehicle or manufacturing systems. If you are an OEM and wish to discuss product options or Active Sensors design capabilities, please contact our specialist sales team.

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