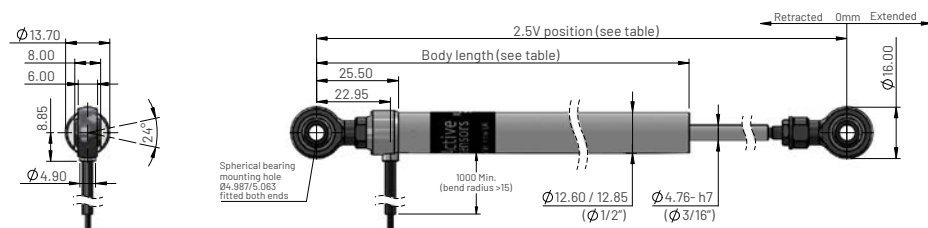


XLS1320HV-XXX-R5 (High Voltage) DC/DC LVDT Contactless Linear Position Sensors
5mm Rod-end mounting, 25mm to 200mm measurement range, Supply +6Vdc to +36Vdc, Output +0.5Vdc to +4.5Vdc

Active
sensors



■ Ordering information

XLS1320HV-XXX-R5

Measurement range (MR) in mm

General Tolerance

Length (mm)	.X= ±0.30	.XX= ±0.10	.XXX= ±0.05	Angle (°)	±1
-------------	-----------	------------	-------------	-----------	----

Parameter	Values						Units	Tol.	Notes
Measurement range (MR)	025	050	075	100	150	200	mm	-	Ref.
Electrical stroke (from 0mm)	±12.5	±25.0	±37.5	±50.0	±75.0	±100.0	mm	-	Ref.

Physical Attributes

Body length	96.4	124.4	159.4	184.4	239.4	294.4	mm	±0.5	
2.5V position (0mm)	20.5	33.0	45.5	58.0	83.0	108.0	mm	±2 Adj.	10
Mechanical range	Measurement range +2 (+1 each end)						mm	Max.	
Weight	101	113	125	137	157	185	grams	Nom.	15
Materials	Body and shaft: 316 S/Steel, Rear cap: Peek 450G, PCB: FR4 Tg135, Rod end (R5): (Body): Alloy 6026, (Race): GR Nylon, (Ball) Ni plated steel, Coils: Ø 0.1mm Cu wire E180 Grd 2 (IEC 60317-23 / MW77) with Nife screen, Epoxy: Stycast, Elastomer: (Coil link): MIL-A-46146, (PCB coat): MIL-I-46058C.						-	-	Info.
Electrical connection	3 Core x 24AWG (Red, White, Black), silver plated Cu (19/0.13), XL-ETFE insulation (MIL-W-22759/19) with FDR25 jacket, Ø3.1mm x 1000mm (Min.).						-	-	Info.
Sensor identification	Polyester label (Acrylic adhesive), Model number: 'XLS1320HV-XXX-R5', Serial number: 'SN XXXXXXXX', (Month/Year/Number).						-	-	Info.

Performance Specification

Non-linearity		<0.5	<0.4	<0.3			±%FS	←	3, 4
Resolution		Virtually infinite					-	-	Info.
Accuracy		<1.00	<0.90	<0.85			±%FS	←	4, 9, 12
Thermal error	Steady state	<0.65					±%FS	←	4, 9
	Dynamic	<0.10					±%FS	←	4, 8
Thermal coefficient of Vo		+50					ppm FS/°C	±50	4, 7, 9
Coil C/T sampling rate		6.1	4.6	4.0	3.4	3.2	3.0	KHz	Nom.
Frequency response		500					Hz	Nom.	5
Repeatability		< Output noise level					-	←	
Hysteresis		< Output noise level					-	←	
Settling time		<10					ms	Nom.	2, 11
Operating Life (25mm cycle)		>100 x 10 ⁶					cycles	←	
Shaft operating force (Horizontal, over OT)		<15					grams	←	
Shaft velocity		<10					m/s	←	
Insulation resistance (over OT)		>50					MΩ	←	14

Input Constraints

Input voltage (+Vs) RED lead	+6.0 to +36.0 unregulated						Vdc	←	1, 2, 13
Supply current (+Is)	<10						mAdc	←	6
Inrush current (below settling time)	<20						mAdc	←	6
Power consumption	<125						mW	←	6
Line regulation (+Vs=+6 to +36Vdc)	<0.025						mV/V	-	Info.
OVP Overvoltage protection (+Vs)	up to ±70						Vdc	←	13
Reverse polarity protection (+Vs)	up to +50						Vdc	←	13

Parameter	Values						Units	Tol.	Notes
Measurement range (MR)	025	050	075	100	150	200	mm	-	Ref.
Electrical stroke (from 0mm)	±12.5	±25.0	±37.5	±50.0	±75.0	±100.0	mm	-	Ref.
Overcurrent protection (+Is max)	up to -50						mAdc	Nom.	13

Output Characteristics

Output voltage (Vo) WHITE lead	+0.50 to +4.50						Vdc	Nom.	1
Output short circuit protection (Iout)	30						mAdc	Nom.	13
Sensitivity (Vo/mm)	160.0	80.0	53.3	40.0	26.7	20.0	mV / mm	±2%	3, 10
Output noise and ripple	<0.03						%FS (rms)	←	4
Output load (RL)	>1						KΩ	←	

Environmental Conditions

Operating temperature	-40°C to +125°C								
Cold IEC 60068-2-1 Test Ae	-40°C for 2 hr								10
Dry heat IEC 60068-2-2 Test Be	+125°C for 2 hr								10
Thermal shock IEC 60068-2-14 Test Na	-20°C, +85°C at ±10°C/min, (10 cycles) *								16
Humidity IEC 60068-2-30 Test Db	+20°C, +55°C, 90-95%RH, 12 hr +12 hr (6 cycles) *								16
Vibration IEC 60068-2-64 , XYZ	20g, 10-2000Hz, Random, (8 hr/axis) *								16
Shock IEC 60067-2-27 , XYZ	250g, 11ms, Half-sine, (3 shocks/axis) *								16
Conducted RF immunity IEC 61000-4-6	10Vrms, 150KHz - 80MHz *								10
Radiated RF immunity IEC 61000-4-3	10V/m, 80MHz - 1GHz, 80% AM 1KHz Sinewave *								10
Radiated RF emissions IEC 61000-6-4	< TBD dBμV, 30MHz - 1GHz *								10
Electrostatic discharge IEC 61000-4-2	4KV, level 2, (contact discharge) *								10
Transient/Burst immunity IEC 61000-4-4	2KV Power lines, 1KV Signal lines, 5KHz, level 3 *								10
Degrees of protection ISO 20653:2013 *	IP66KS / IP67S / IP69KS ('S' denotes no shaft motion during water test) (NEMA 250, Type 4, Type 6 Equivalent)								16
	IP6X	Talc particle size <75μm, 2Kg/m³ for 2 hr. Orientation: Horizontal							
	IPX7S	Immersion in water, at 1m for 30 min at +23°C±5°C. Orientation: Horizontal							
	IPX6KS	Elliptical water jet from 2.5m at 75 ltr/min (1,000 kPa) for 3 min, at 5 rpm and at +23°C±5°C. Orientation: Vertical (cable exit at top).							
	IPX9KS	Omnidirectional water jets from 100 to 150mm, at +50°C for 15 min, +60°C for 30 min, >+75°C (Steam) for 15 min. Orientation: Vertical (cable exit at top).							

Abbreviations / Symbols

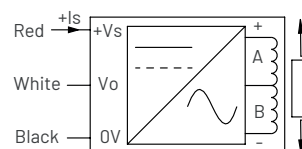
Tol.	Value tolerance	←	Limit indicated with parameter value	Max.	Maximum value	OT	Operating temperature
Adj.	Adjustment range	Ref.	Reference value (no tolerance)	Min.	Minimum value		
Nom.	Nominal value	Info.	For information only	min	Minute/s		

* Design criteria, testing to be completed

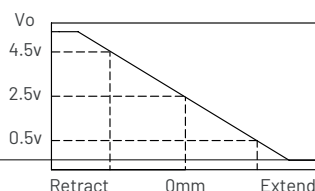
Notes

- Incorrect wiring can cause internal damage to the sensor.
- Input voltage rise time < 4ms for +Vs > +6Vdc.
- Non-linearity error and sensitivity is calculated from least squares best fit method over MR at +20°C±5°C.
- FS is defined as sensitivity x measurement range (MR).
- Bandwidth (-3dB) with a -20dB/decade first order roll-off.
- Excludes sensor output current (Vo/RL).
- Average sensor drift over stated temperature range when mounted by rod-end (R5) on a stainless steel plate.
- From +20°C to +85°C at approx. +5°C/min.
- From -20°C to +85°C.
- When +Vs=+12Vdc ±0.25Vdc.
- To within 0.5%FS of final output voltage, after power on.
- 1.2 x Root Sum Square (RSS) of thermal (steady and dynamic), non-linearity, hysteresis and repeatability errors.
- To sensor supply 0V (Black lead) for <10s.
- Between all leads and conductive case, at 125Vdc for >5s.
- Excluding cable. Cable weight: 1.8 gram / 100mm.
- Not electrically operating during the test.
- See sensor operating temperature derating graph, (+Vs v °C).
- Duty cycle <10%, between +Vs=±50Vdc and ±70Vdc.

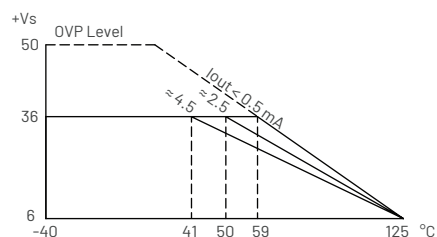
Electrical connections (see note 1)



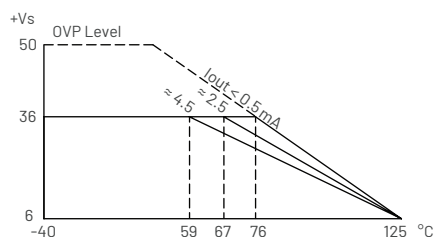
DC Output schematic



Derating MR = 25 to 75mm



Derating MR = 100 to 200mm



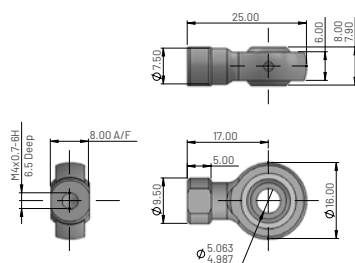
Derating v +Vs (Iout < 0.5mA)

+Vs (Vdc)	MR		mm
	25 to 75	100 to 200	
12	< 112	< 115	°C
24	< 86	< 95	°C
36	< 59	< 76	°C
50	< 30	< 54	°C

Accessories

5mm rod end

PT1322-0104-19



Material	
Body	Aluminium 6026, anodised black
Ball	HT-M05 (100Cr6, Ni plated)
Race	GR-nylon, LV-3H
Weight: 6.1g	