LVDT displacement sensor

Differential transformer displacement sensor (LVDT) can be widely applied in aerospace, machinery, construction, textile, railway, coal, metallurgy, plastics, chemical engineering and scientific research institutions and other national economic fields to measure linear displacement, elongation, vibration, object thickness, expansion and on the like. The product has the characteristics of no-slip contact, long service life, safe and reliable, etc.

LVDT has excellent performance and adopts convenient single power source 9-28 V DC for power supply. With its electronic circuit sealed in stainless steel metal tubes, LVDT can work in the wet and dust and other extreme ambient. The output can be set into standard 0-5V voltage signal, 4-20mA current signal, or RS485 digital signal output and so on.

LVDT displacement sensor has three basic types: split type, spring-back type and pneumatic type, and can be customized according to customer's requirements. The measuring range of LVDT split type is 0-500mm. It has the characteristics of water-proof, dust-proof and good dynamic performance. The measuring stroke range of LVDT spring-back type is 0-100mm. The contact probe adopts wear-resistant chromium plating hard tool steel. The measuring stroke range of pneumatic type LVDT is 0-15mm, and the working pressure is 0.15-0.7MPa.

- The resolution is up to 0.1 μm and the repeatability is 1 μm.
- No contact point friction, and long service life.
- Customizable non-standard product.

Inquiry Soway

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Data download

www.sowaysensor.com/product/

Application Fields

Transportation

Precision measurement

Mechanical equipment

Industrial manufacturing

Product Serie

SDVH8 Series inductance measuring head

Application fields: axle diameter detection, precision micro-displacement measurement, mobile phone shell detection.

SDVN8-4 Series pneumatic type

Application fields: glass production line detection, metal processing detection, cylinder displacement detection and control, building materials processing measurement and control.

SDVN8-8 Series pneumatic type

Application fields: Shaft diameter inspection, glass production inspection, precision displacement measurement, online inspection of automotive parts.

SDVB20 Series spring-back type

Application fields: shaft diameter runout test, valve position test and control, material hardness and material stress test, wea measurement of high-speed train brake device and roll gap measurement.

SDVB20 Serie pring-back type

Application fields: splashing environments, such as glass grinding machine and glass cutting, etc.

SDVG20 Series split type

Application fields: machine tools and tool positioning, hydraulic cylinder positioning, cement industry, bridge deck displacement detection, valve position detection and control, metro tunnel engineering protection.

SDVG28 explosion-proof split type

Application fields: location detection in the ambient of petroleum and petrochemical, high-risk dust and the like.

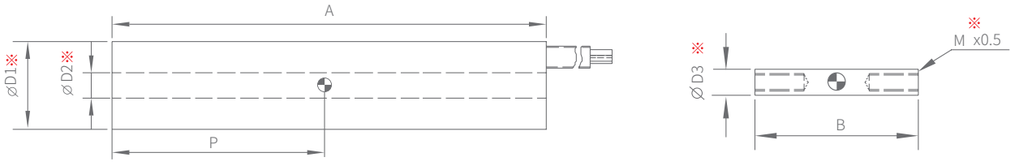
Basic Performance Parameter

	SDVG20 series split		SDVB20 series res ilient type		SDVN8-4 series resilient type	SDVN8-8 series resilient type	SDVH8 pen type series	
Power supplyw	9 ~28V DC							
Operating current	Voltage output type power supply current ⩽ 12mA							
	Second-wire 4- 20 mA current output type LV DT, power supply current 4- 20 mA displacement range							
Displa cement range	2.5,5 ,10, 15,25mm	50,100, 250,500mm	2.5, 5,10, 15,25mm	50,100mm	4mm	8mm	2,5,8mm	10mm
Output signal	0 ～ 5V (9 ~28V DC supply voltage)							
	0 ~10V (15 ~28V DC supply voltage)							
	4 ~20mA (two-wire system, 15-28 V DC supply voltage)							
	Digital output (9-12 VDC supply voltage)							
Linear ity error	± 0.25%	± 0.5%	± 0.25%	± 0.5%,	± 0.25%			± 0.35%
Repetitive error	⩽ 0.01%F.S				1μm			
Resolution	<0.1μm (maximum), the digital output is 16bit							
Working temperature	-25°C ~ +85°C							
Temperature coefficient	Zeropoint ⩽ 0.025%F.S/°C							
	Sensitivity ⩽ 0.025%F.S/°C							
Operating pressure	/				0.03~0.06MPa		/	
Thrust force	/				0.25N（±0.05）	0.1N~0.35N	1N	
Leve of protection	IP64				/			

Remark: 1. digital output linear ity error: 0.25%,and 0.1% ,etc. are optional.
2. If the customized product is an AC output sensor,Excitation voltage: 3Vrms,Excitation frequency: 5 KHz.
3. SDVN8-4, SDVN8-8, and SDVH8 pen types require a transmitter to obtain a DC output signal.

Machine Dimension

SDVG series split-type：

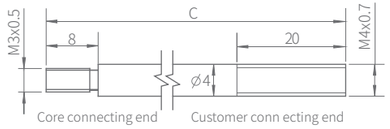


Parameter	SDVGseries split type								
Displacement range (mm)	2.5	5	10	15	25	50	100	250	500
Outline length A (mm)	80	90	110	130	170	210	290	498	800
Core length B (mm)	20	30	40	50	70	80	120	150	180
Electrical zero point position P (mm)	21	26	36	46	66	86	126	230	381

Remark: the factory default is that when the sensor guider rod moves towards the outgoing line, the output will increase. The round point position where the center point of the core locates ◔ is the position of the electric zero point (middle point of measuring range).

※ Mechanical dimensions can be adjusted. If there are specific requirements, please consult the business personnel. Standard outer dimensions D1=20 mm, D2=6.0 mm, D3=4.8 mm, M=3(common dimensions of D1 are 20 mm, 12 mm and 8 mm, and other dimensions can be customized as required.)

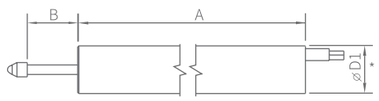
SDVG20 series core connecting rod:



Parameter	SDVG20 series core connecting rod dimen sion								
Displacement range (mm)	2.5	5	10	15	25	50	100	250	500
Core connecting rod length (mm)	58	58	68	78	98	128	168	346	618

※Remark: The iron core of the separated LVDT needs to be connected to the object to be measured by connecting rods. These connecting rods must be made of non-magnetic material. They can be made of 304 or 316 non-magnetic stainless steel. Both ends of the rod are equipped with threads. Threads of different lengths and customer connection end requirements can be customized according to customers' special requirements.

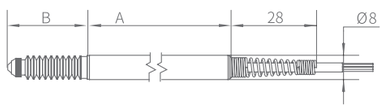
SDVB20 spring-back series :



Parameter	SDVB20 spring-back type						
Displacement range (mm)	2.5	5	10	15	25	50	100
Outline length A (mm)	80	90	110	130	170	210	291
Guide rod free state exposed length B (mm)	5	8	15	22	34	60	131

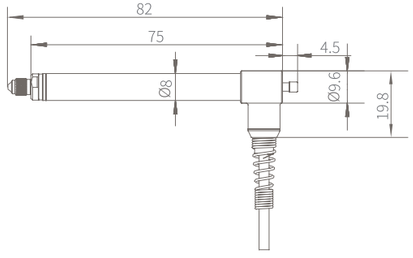
Remark:
1. The factory default is that the output increases when the sens or guide rod move inward.
2. Above size is limited to analog outpu t. If it is digital output produc t, length A needs to be increased by 62 m m.
※ Standard outer diameter dimensions D1=20mm, which can also be customized according to customer requirements.

SDVH8 pen type series

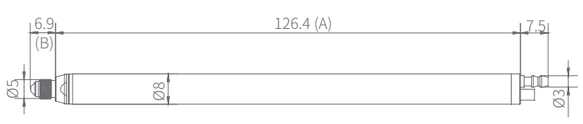


Parameter	SDVH8 series spring-back type				
Displacement range (mm)	2	2.5	5	8	10
Outline length A (mm)	65	65	91	121	121
Guide rod free state exposed length B (mm)	17	17	20	30.3	30.3

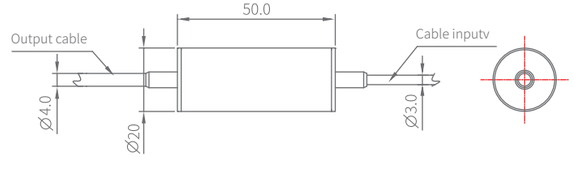
SDVN8-4 series resilient type



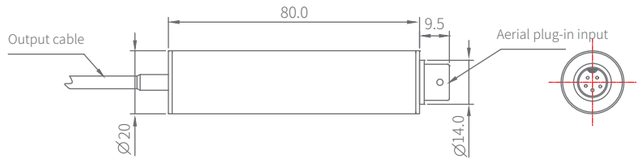
SDVN8-8 series resilient type



Transmitter 1

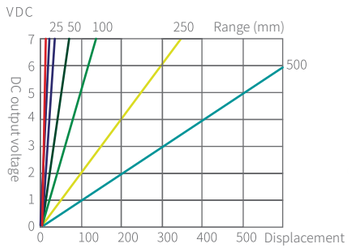


Transmitter 2

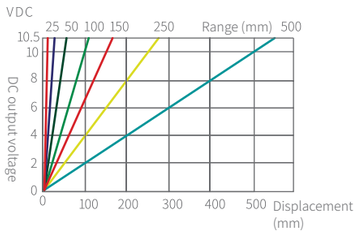


Output Graph

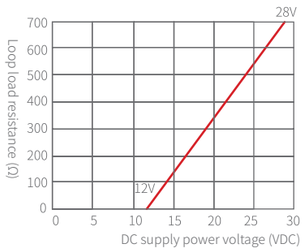
The relationship between 0-5V output voltage and displacement of different range SDVG 20 series:
(power supply voltage 9-28 V DC, recommended power supply voltage 12 V DC)



The relationship between 0-10V output voltage and displacement of different range SDVG 20 series:
(power supply voltage 15-28 V DC, recommended power supply voltage 15 V DC)



Relationship between maximum loop load resistance and power supply voltage of current output type LVDT:
(power supply voltage 15-28 VDC, recommended power supply voltage 24VDC, load resistance 500Ω)

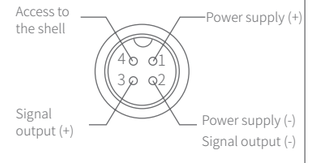


Wiring Method

The output voltage value of DC stabilized power supply must be in the specified range (see the basic performance parameter table on page 3), and wiring should be carried out according to the correct connection position. The output connection modes include direct-out cable type and socket type.

Cable color definition:
Red wire power supply (+)
Black wire: power supply (-), signal output (-)
Blue wire: signal output (+)

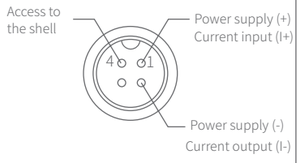
Definition of socket pin:



Analog voltage output

Cable color definition:
Red wire: power supply (+), current input (I+)
Black wire: power supply (-), current output (I-)

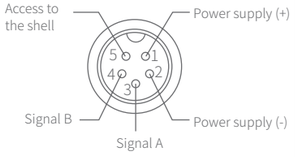
Definition of socket pin:



Analog current output

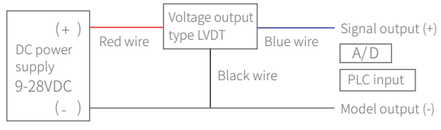
Cable color definition:
Red wire power supply (+)
Black wire: Power supply (-)
Blue wire: Signal A
White wire: Signal B

Definition of socket pin:

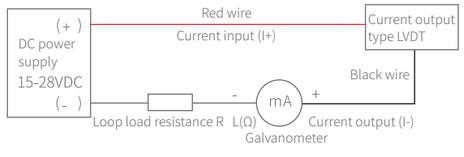


Digital RS485 signal output

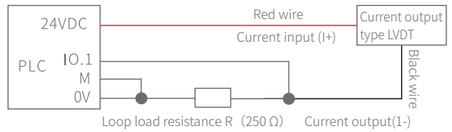
Voltage output type wiring diagram:



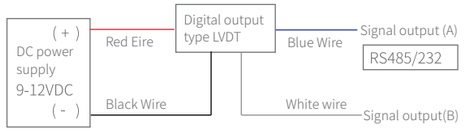
Two-wire current output type wiring diagram:



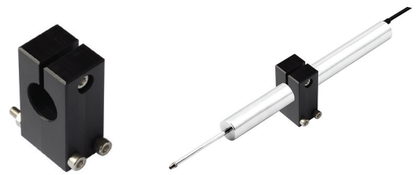
Two -wire current output type wiring diagram (PLC access):



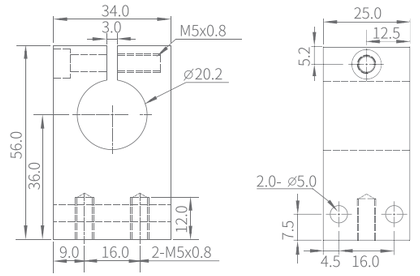
Digital output type wiring diagram:



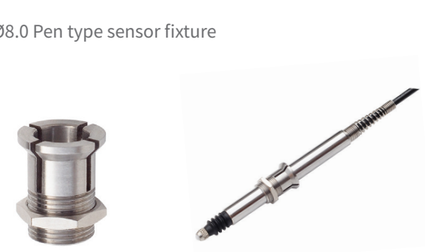
Installation

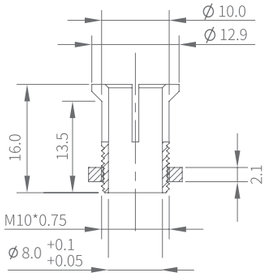


The location and installation of LVDT requires non-metallic fixture with low thermal expansion coefficient for fixation. If metal fixture is used, the product performance will be affected. The company has standard fixture accessories for users to choose, and users can also customize the installation of fixture.



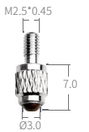
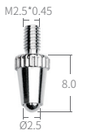
Ø8.0 Pen type sensor fixture





Sensor Probe

Unit：mm

Ball probe	Zirconia ball probe HL2A0002	PAI plastic ball probe HL2A0016	Stainless steel dial indicator probe HL2A0005	White steel ball probe HL2A0028	White plastic steel ball probe HL2A0029	Black ceramic ball probe HL2A0030
						
	Ruby ball probe (plastic steel)			Tungsten steel (alloy) ball probe		
	HL2A0031	HL2A0016	HL2A0005	HL2A0028	HL2A0029	HL2A0030
						

Flat probe	Tungsten steel D6 flat probe HL2A0008	Tungsten steel D7 flat probe HL3A0001	White steel flat probe HL2A0036	HL2A0037	HL2A0038	HL2A0039
						
	White steel flat probe					
	HL2A0040	HL2A0041	HL2A0042	HL2A0043	HL2A0044	HL2A0045
						
	White steel flat probe					
	HL2A0046		HL2A0047		HL2A0048	
						

Other probes	Knife edge (flat head) probe HL2A0049	Arc probe (semi-circle) HL2A0050	Taper probe HL2A0051
			

Product Selection List

SDV	□	□□	□	-	□□□	□	-	□□□	-	□□	□
	Sensor Type	Main body external diameter	Relationship between electronic case and main body structure		Range	Accuracy		Signal output		Installation information	Outgoing mode
	G: Split E: explosion-proof type B: resilient type H: long guide rail spring-back type N: pneumatic mode	8 12 20 28	The standard form is the default; B: The electronic case and the coil separate type; Z: Customized		Up to 3 bits, unit: mm.	A: 0.25% B: 0.5% C: 1% D: 2% S: 0.1%(Only applicable to digital output)		See Schedule 1for information		See Schedule 2 for information	D: Aviation plug P: Straight-out cable M: With digital display output

Appendix Table 1: Signal output information

	□	□		□
Analog output	Output format	Output range		Signal direction
	A: Current output	4mA~20mA		P:Forward N:Reverse
	V: Voltage output	1、0V~10V 2、0V~5V A、AC output		
Digital output	Output format	Data format & Baud Rate		
	M:Mod bus (Standard baud rate:9600)	RTU format	ASCII format	
		0：2400 1：4 800 2：9600 3：19200 4：38400 5：76800 6：115200	A：2400 B：4800 C：9600 D：19200 E：38400 F: 76800 G: 115200	

Note:
When P is in the forward position and the measuring rod moves inward, the output increases.
When P is in the reverse position and the measuring rod moves outward, the output also increases.

Selection example： SDVB20-20A-A1-CFP

Represents rebound type, outer diameter 20 mm, displacement range 20mm, accuracy 0.25% FS, current 4-20mA forward output, stainless steel round shell, standard cable coming out of the end.

Appendix 2: Sensor body installation information

□	□	
C: Cylindrical M: Standard thread	Code	Thread/outer diameter
	8	8
	B	12
	F	20
	I	28
	Z	Customized

Supporting CollectionSystem


Model	DAS-8R	DAS-8U	DAS-16R	DAS-16U	DAS-32R
Supply voltage	220VAC or 24VDC				
Measurement signal method	Single ended/differential				
Measurement signal range	0~5V、±5V、±10V				
Input	0-5VDC				
Output signal	RS485/8 channels	USB/8 channels	RS485/16 channels	USB/16 channels	RS485/32 channels
Resolution	24 bit ADC 5uV/10SPS、16 bit ADC 80uV/10SPS				
Sampling rate	5SPS-200kSPS tunableness				
AD conversion time	1.5μs				
ADCNumber of digits	16 bit (SAR)、24 bit (△ - Σ)				
System measurement accuracy	±0.001%				
Storage temperature	-25~+85°C				
Working temperature	-30~+100 °C				
Mechanical dimensions	275*250*110mm				