

SV3300 series proximity sensor system



Overview

The proximity sensor system uses the principle of eddy current to measure the relative position of the target axis. Able to continuously monitor the shaft vibration, shaft displacement and key phase of rotating machinery.

The SV3300 series proximity sensor system consists of the following parts:

SV3300 Probe

SV3300 Extension Cable

SV3300 Driver/Transmitter with HART

The voltage signal output by the driver or the current signal output by the transmitter is proportional to the distance between the top of the probe and the surface of the conductor under test, it can measure both axial displacement and radial vibration, as well as key phase and speed. It is mainly used for vibration and displacement measurement of oil film bearing machinery, and key phase and speed measurement. The transmitter with HART protocol can provide 4-20mA current proportional to the relative distance, and the BNC interface can provide dynamic buffered signals and gap voltage measurement.

The SV3300 series approaching sensor system fully complies with the API670 standard. The probe, extension cable, and driver / transmitter with HART protocol have good interchangeability. According to different measurement ranges, the probe can be used with different top diameter specifications ($\Phi 5\text{mm}$, $\Phi 8\text{mm}$, $\Phi 11\text{mm}$), and driver / transmitter with HART protocol is mounted on a 35mm-DIN rail.

SV3300 series proximity sensor system selection principle:

1. Select the probe specifications ($\Phi 5\text{mm}$, $\Phi 8\text{mm}$, $\Phi 11\text{mm}$) by referring to the linear range of the sensor according to the measurement range, and then determine the probe type (front installation, reverse installation) and housing size according to the space and structure of the field mechanical installation, and then select the probe length (0.5m , 1m, 5m, 9m).

2. Determine the system length (5m or 9m) according to the distance from the installation position of the field probe on the rotating machine to the front end / transmitter box with HART protocol, and then select the extension cable length that matches the probe length (1m, 0.5m) (4m, 4.5m, 8m, 8.5m).

3. Determine the driver / transmitter model with HART protocol based on system length and measurement parameters and measurement range.

4. The combined probe and extension cable length (5m or 9m) is defined as the system length.



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Technical specifications

Probe

Tip Material: Ryton (PPS)

Case Material: AISI 304SS (SST)

Specifications: 3D axial FEP insulated coaxial cable

Impedance: 75Ω

Distributed Capacitance: 21.3pF/ft

Probe Length: 0.5m、1m、5m or 9m

Temperature Range: -40°C ~+80°C

Top Diameter: 5mm、8mm、11mm

Armor Protective Sleeve: Optional flexible armor protective sleeve with FEP jacket

Installation: front and back

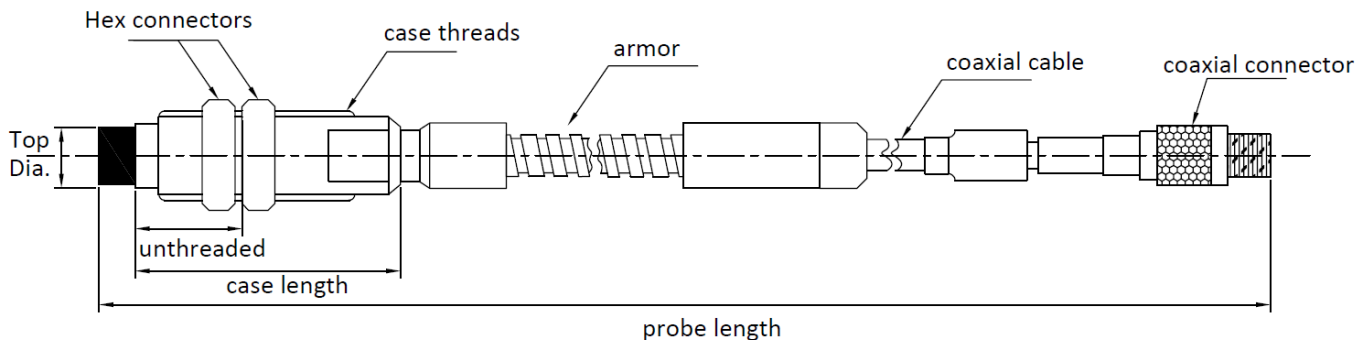
Protection Class: IP66

Lock nut: used for sealing and locking to prevent the probe from loosening caused by mechanical vibration

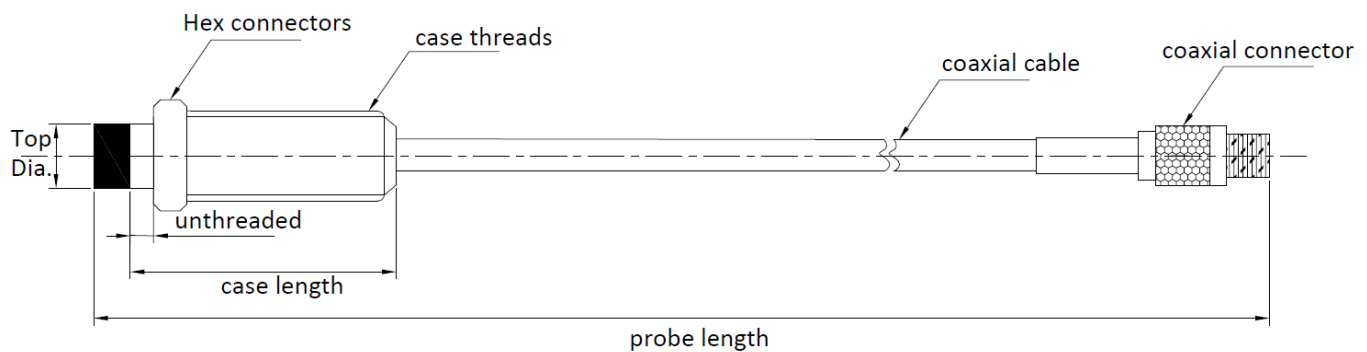
Gap Setpoint: 1.27mm (50mils) ;
Vgap=9.8V~10V

Standard Target Material: 4140 steel, the user can provide the actual shaft material according to the special calibration, and the measurement accuracy is higher.

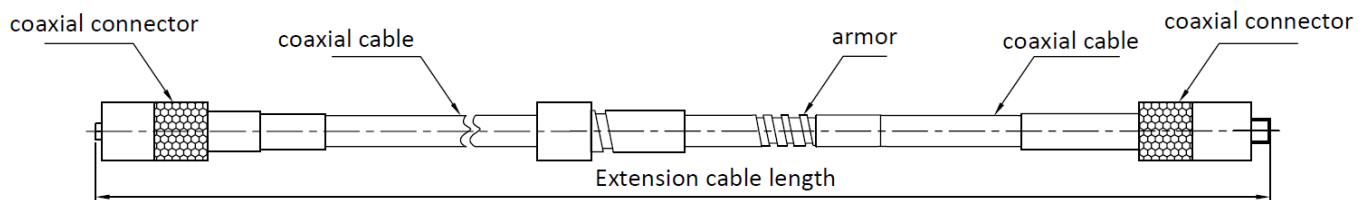
Explosion-proof grade: NEPSI/EAC/IECEX/ATEX, Exia IIC T4



Standard probe diagram



Reverse probe diagram

SV3300 series proximity sensor system**Extension Cable****Impedance:** 75Ω**Distributed Capacitance:** 21.3pF/ft**Specifications:** 3D axial FEP insulated coaxial cable**Distributed capacity:** 21.3pF/ft**Cable seal:** All cable seals are withdrawn**Temperature Range:** -40°C ~+80°C**Joint material:** brass gold-plated hexagonal joint**Protection Class:** IP66**Armor protective sleeve:** Optional flexible armor protective sleeve with FEP jacket**Explosion-proof grade:** NEPSI/EAC/IECEX/ATEX, Exia IIC T4**Minimum Bend Radius:** 25.4mm**Relative Humidity:** 100% condensing but not submersible and with connectors properly protected**Cable Length:** 4m、4.5m、8m、8.5m

Extension cable diagram

Driver**Material:** PBT plastic material**Power:** -18 VDC ~ -26 VDC**Sensitivity:** -7.87 V/mm (-200mV/mil), ± 5%

(5&8mm probe)

-3.94 V/mm (-100mV/mil), ± 5% (11mm probe)

Explosion-proof grade: NEPSI/EAC/IECEX/ATEX,

Exia IIC T4

Non-linearity: maximum 0.015mm (0.6mils)

departure from straight line over 2.5 mm (100mils) range

Linear range: 5mm and 8mm probes are 2mm (80mil) linear range starting from about 0.25mm

from the surface of the test object, from 0.25mm to 2.5mm

11mm probe is 4mm (160mil) linear range starts from about 0.25mm from the surface of the measured object, from 0.25mm to 4.5mm

Frequency Response: 0-10KHz, ±5%**Temperature Range:** -40°C ~+80°C**Isolation:** 500Vrm circuit to ground**Interchange error:** when the probe, extension cable and / or front end are randomly replaced, the maximum error in the sensitive area is ± 5%**Housing:** Polymer with internal RFI/EMI spray shielding potted for long life

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Transmitter with HART

Material: PBT plastic material

Power(Vs): 17 VDC ~ 28 VDC, Non-polarized connections

Frequency Response: 5Hz-1kHz, -3dB pk-pk vibration

0Hz-15Hz, -3dB position

Linear Range: 0.5-2.5mm (5&8mm probe)

0.5-4.5mm (11mm probe)

Temperature Range: -40°C ~ +80°C

BNC Output: 7.87V/mm (200 mV/mil), (5&8mm probe)

3.94V/mm (100 mV/mil), (11mm probe)

Explosion-proof grade: NEPSI/EAC/IECEX/ATEX, Exia IIC T4

Maximum Loop Resistance: $R_L=50 \times (V_S-17)$ ohms

Interchange error: when the probe, extension cable and / or front end are randomly replaced, the maximum error in the sensitive area is $\pm 5\%$

Housing: Polymer with internal RFI/EMI spray shielding potted for long life.

Communication: Smart HART protocol, users can modify the measuring range of the transmitter according to their needs.

HART version number: Support version 7.0 and above

Vibrotech integrated eddy current transmitter can directly replace METRIX / BENTLY entire series of similar products. The PPC-8011 calibrator can also be used for on-site calibration.

The user can modify the parameters of the transmitter through the HART Communicator:

Transmitter type		Lower range limit	Upper range limit	Damping value
Displacement Transmitter AVT	5&8 mm	0.25~2.5mm Any value	2.5~0.25mm Any value	0-8s
	11mm	0.25~4.5mm Any value	4.5~0.25mm Any value	0-8s
Vibration transmitter RVT		0	Arbitrarily switch the specified range provided in the sample	0-8s
Speed transmitter SVT		0	Rotating speed: 120~100000rpm	Number of keyways: 1~99 keyway

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Model selection guide

Standard SV3300 Probe SV330AAA-BB-CC-DD-02

AAA: Model No. BB: Unthreaded Length CC: Case Length DD: Probe Length

Tip Dia.	Case Threads	Armor	AAA Model No.	BB Unthreaded Length	CC Case Length	DD Probe Length			
5mm	1/4"-28	No	171	Standard 00=0.0in Increments 05=0.5in Maximum = Case Length -1.0in	Std: 30=3.0in Min: 10=1.0in Delta: 05=0.5in Max: 95=9.5in	05=0.5m±.05m 10=1.0m±.10m 50=5.0m±.50m 90=9.0m±.90m			
	1/4"-28	Yes	172						
8mm	3/8"-24	No	101						
	3/8"-24	Yes	102						
11mm	1/2"-20	No	191						
	1/2"-20	Yes	192						
5mm	M8X1	No	173				Standard 00=0.0mm Increments 01=10mm Maximum = Case Length -20mm	Std: 07=70mm Min: 02=20mm Delta: 01=10mm Max: 25=250mm	
	M8X1	Yes	174						
8mm	M10X1	No	103						
	M10X1	Yes	104						
11mm	M14X1.5	No	193						
	M14X1.5	Yes	194						

Reverse SV3300 Probe SV330AAA-BB-CC-DD-02

AAA: Model No. BB: Unthreaded Length CC: Case Length DD: Probe Length

Case Threads	Tip Dia.	Armor	AAA Model No.	BB Unthreaded Length	CC Case Length	DD Probe Length
3/8"-24	8mm	No	105	02=0.2in	12=1.2in	05=0.5m±.05m 10=1.0m±.10m
	11mm	No	195			
M10X1	8mm	No	106	05=5mm	30=30mm	
	11mm	No	196			

SV3300 Extension Cable SV330AAA-BBB-CC

AAA: Model No. BBB: Case Length CC: Armor

Tip Dia.	AAA Model No.	BBB Case Length	CC Armor
5&8mm	130	040=4.0m	00=No 01=Yes
		045=4.5m	
11mm	830	080=8.0m	
		085=8.5m	

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SV3300 Driver SV330AAA-BB-CC

AAA: Model No. BB: System length CC: Mounting

Tip Dia.	AAA Model No.	BB System length	CC Mounting
5&8mm	180	50=5m System	01=35mm-DIN
11mm	880	90=9m System	

SV3300 Vibration Transmitter RVT33ABC -EE-FF

A: System length B: Tip Dia. C: 4-20mA Output EE: Shaft material FF: Probe type

A System length	B Tip Dia.	C 4-20mA Output	EE Shaft material	FF Probe type
F=5m	0=5&8mm	0=75um, pk-pk 1=100um, pk-pk 2=125um, pk-pk 3=250um, pk-pk 4=500um, pk-pk 5=200um, pk-pk	00 = standard 4140 steel 01=17-4PH with tungsten carbide 02=17-4PH without tungsten carbide 03=316L with tungsten carbide 04=316L without tungsten carbide 05=2Cr13 with tungsten carbide 06=2Cr13 without tungsten carbide 07=42-CrM with tungsten carbide 08=42-CrM without tungsten carbide 09=13stainless steel with tungsten carbide 10=13stainless steel without tungsten carbide 11=31803 without tungsten carbide XX= Others (customers need to provide target materials)	V0 = Default Vibrotech SV3300 B3=Bently 3300XL B7= Bently 7200 M1=Metrix 10000 M2= Metrix 2030 M8= Metrix 8030
N=9m				

SV3300 Displacement Transmitter AVT33ABC -EE-FF

A: System length B: Tip Dia. C: 4-20mA Output EE: Shaft material FF: Probe type

A System length	B Tip Dia.	C 4-20mA	EE Shaft material	FF Probe type
F=5m N=9m	0=5&8mm	0=0.5-2mm, $\pm 0.75\text{mm}$ 1=0.5-2.5mm, $\pm 1\text{mm}$	00 = standard 4140 steel 01=17-4PH with tungsten carbide 02=17-4PH without tungsten carbide 03=316L with tungsten carbide 04=316L without tungsten carbide 05=2Cr13 with tungsten carbide 06=2Cr13 without tungsten carbide 07=42-CrM with tungsten carbide 08=42-CrM without tungsten carbide 09=13stainless steel with tungsten carbide 10=13stainless steel without tungsten carbide 11=31803 without tungsten carbide XX= Others (customers need to provide target materials)	V0 = Default Vibrotech SV3300 B3=Bently 3300XL B7= Bently 7200 M1=Metrix 10000 M2= Metrix 2030 M8= Metrix 8030
	1=11mm	1=0.5-4mm, $\pm 1.75\text{mm}$ 2=0.5-4.5mm, $\pm 2\text{mm}$		

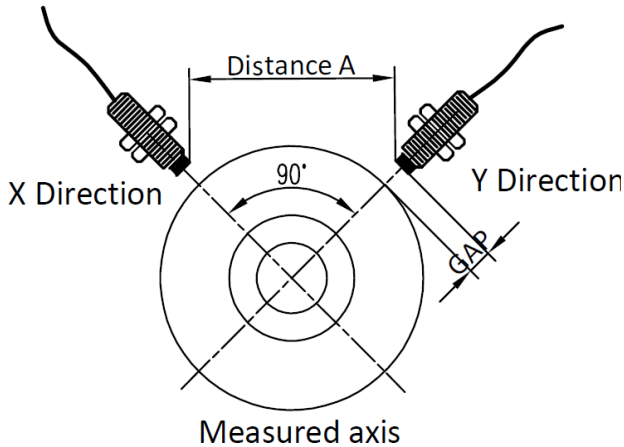
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SV3300 Key phase / Speed transmitter SVT33AB-CC-DDDDDD-EE-FF

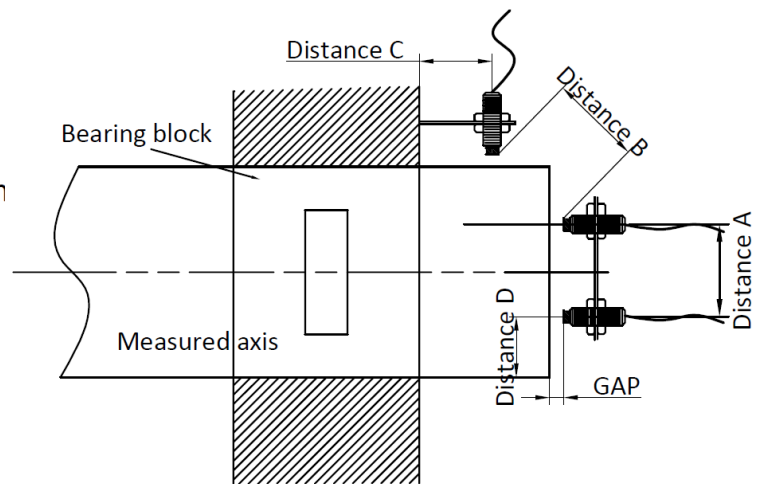
A: System length B: Tip Dia. CC: keyway DDDDDD:4-20mA Output EE: Shaft material FF: Probe type

A System length	B Tip Dia.	CC keyway	DDDDDD 4-20mA Output	EE Shaft material	FF Probe type
F=5m	0=5&8mm	01=1 keyway (min)	000120= 120rpm(min)	00 = standard 4140 steel 01=17-4PH with tungsten carbide 02=17-4PH without tungsten carbide 03=316L with tungsten carbide 04=316L without tungsten carbide 05=2Cr13 with tungsten carbide 06=2Cr13 without tungsten carbide 07=42-CrM with tungsten carbide 08=42-CrM without tungsten carbide 09=13stainless steel with tungsten carbide 10=13stainless steel without tungsten carbide 11=31803 without tungsten carbide XX= Others (customers need to provide target materials)	V0 = Default Vibrotech SV3300 B3=Bently 3300XL B7= Bently 7200 M1=Metrix 10000 M2= Metrix 2030 M8= Metrix 8030
N=9m		99=99keyways(max)	100000= 100000rpm(max)		

Probe installation diagram



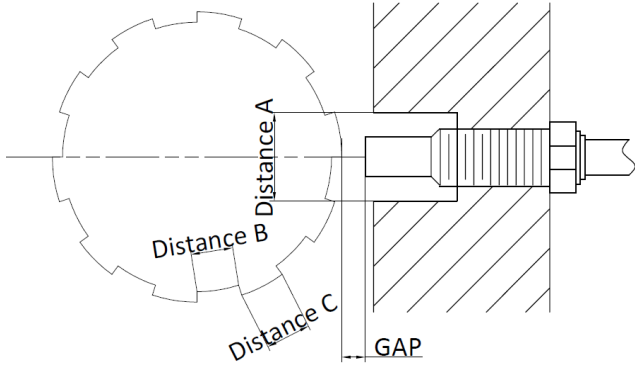
Radial vibration installation
Suitable for 5 & 8mm probes
Distance A ≥ 25mm
GAP ≈ 1.25mm



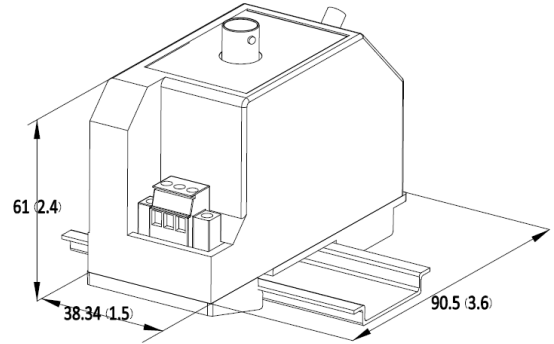
Distance C & D > 1.5 times of probe diameter
The diameter of the measured shaft ≥ 3 times the diameter of the probe
11mm probe distance A & B ≥ 38mm
5 & 8mm probe distance A & B ≥ 25mm

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Probe installation diagram



Driver / Transmitter Dimension Plan



Distance A \geq 2 times of probe diameter

unit: mm(in)

Key slot opening depth 0.5mm, width 8mm, length 16mm

11mm probe GAP \approx 2.25mm

5 & 8mm probe GAP \approx 1.25mm

Wiring diagram

