KR-939SB3 Three Parameter Vibration Probe

The KR-939SB3 integrated three parameter (oil temperature, oil level, vibration) combination probe is a non bus structured universal combination probe in the safety monitoring system of cooling tower fans. It can be directly connected to the "KR-939B3 fan safety monitor" to achieve single device monitoring. It can also be connected and used with various general secondary instruments, or computer data acquisition and control systems (DCS, PLC, etc.).

This combination probe used for monitoring the safe operation of fan deceleration integrates sensing, conversion, and transmission circuits for measuring oil temperature, oil level, and vibration signals inside, directly outputting 4-20mA standard current signals corresponding to these safety parameters. It can be connected to various general secondary instruments or computer digital acquisition and monitoring systems.

The temperature measurement inside the probe uses a semiconductor integrated sensor; The oil level measurement adopts the principle of thermal conductivity sensing; Magnetoelectric sensors used for vibration measurement can directly obtain the speed signal of mechanical vibration. Through amplifiers, bandpass filters, and true effective value (RMS) converters, complex vibration waveforms within the effective bandwidth are converted into true effective values. Finally, the voltage/current drive circuit generates 4-20mA output.

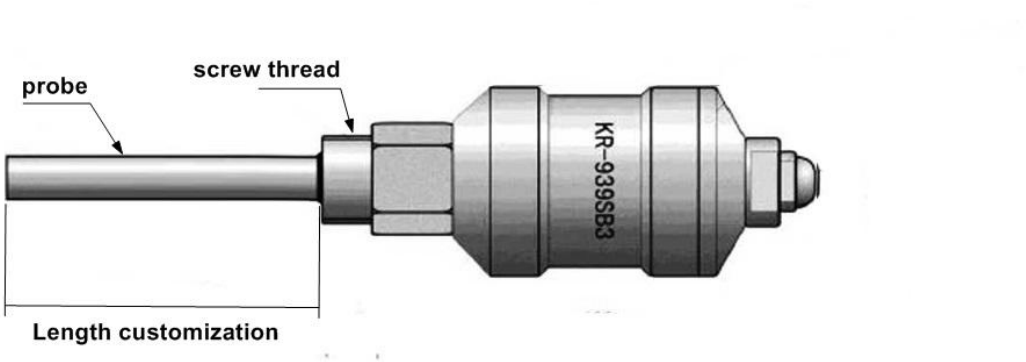
The combination probe is a small integrated all stainless steel anti-corrosion structure, with a long line anti-interference output transmission method. In

addition, good sealing, seismic resistance, and explosion-proof measures enable it to work online for a long time in harsh environments on the measurement site.

This combination probe can conveniently obtain important parameters closely related to the safe operation of the tested object, so it is also very suitable for direct safety monitoring of other rotating machinery, reciprocating motion machinery, and other equipment. It is an essential vibration safety monitoring unit for modern industry, national defense, and scientific research.

Appearance and installation dimensions

Stainless steel fully enclosed waterproof structure, weighing about 0.6kg, with external threads installed on the casing of the fan gearbox. The probe rod is inserted into the gearbox to obtain the lubricating oil temperature, lubricating oil level, and box vibration signals in the gearbox, completing the transmission output. The thread specification and the insertion depth of the probe rod shall be stated when ordering. See the schematic diagram of the external structure in Figure 1.



▶ **Temperature measurement characteristics:**

Lubricating oil temperature measurement range: 0-100 ℃, comprehensive temperature measurement error: ± 1 ℃

▶ **Oil level measurement characteristics:**

Measurement range of lubricating oil level: -10-40 mm (0 mm is the lower limit position of the normal oil level of the gearbox), comprehensive error of oil level measurement: ± 5 mm

When initially powered on, it is necessary to stably preheat for about 2 minutes; The response damping time is about 1 minute; The tested medium must be a non-conductive medium.

▶ **Vibration measurement characteristics:**

Vibration measurement range: 0-20 mm/s, measurement output is proportional to the true effective value (RMS) of vibration velocity, vibration measurement frequency range: 10-1000HZ, comprehensive error of vibration measurement: ± lnm/s • Signal output characteristics:

Active current type output: DC/4-20mA, requiring passive resistive load. Calculation of maximum load resistance (including transmission line internal resistance): Rmax=(V-15)/0 02 (where V is the power supply voltage) • Power supply

▶ **characteristics:**

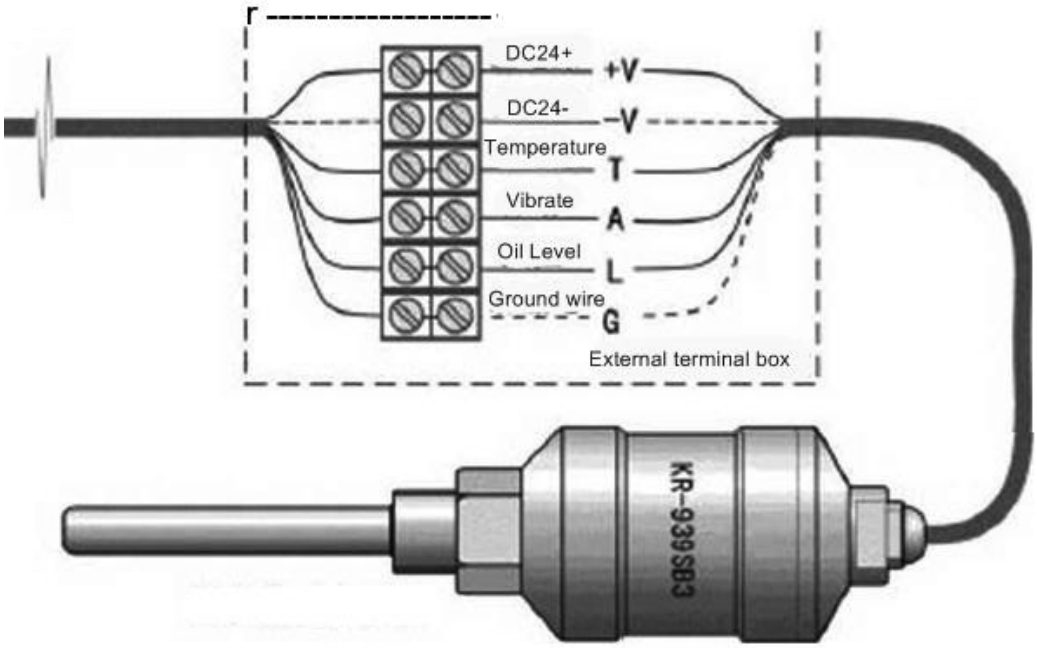
Working voltage: DC/24V ± 2V, no-load working voltage: DC/18V, maximum protection voltage: DC/30V, rated current: DC/80mA, maximum instantaneous working current: 150mA, built-in voltage polarity reverse protection.

▶ **Environmental characteristics:**

Environmental temperature range: -20~80C, environmental humidity range: 0~100% (ports sealed with 704 silicone rubber)

▶ **Electrical connections:**

5-wire 6-terminal connection: 1 #+V:+24V power supply; 2 # G: Connected to the shell and can be shielded; 3 # - V: public ground wire; 4 # T: Temperature signal output; 5 # A: Vibration signal output; 6 # L: Oil level signal output. For typical wiring, refer to the schematic diagram of the probe wiring principle in Figure 2.



Note: The probe has been pre packaged with a five core shielded cable during supply, and the wiring color of the cable is correct

The relationship is as follows:

4 # T-connected yellow; 1 #+V connected to brown; 2 # GND connected to shielded wire; 3 # - V connected to red;

5 # A connected to blue; 6 # L connected to black