Instruction Manual
No. 7683-01 Hot Wire Anemometer
Model SK-28V

SATO KEIRYOKI MFG. CO., LTD.

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Thank you for purchasing the SK-28V Hot Wire Anemometer.

- This product is designed to measure air velocity, statistic pressure and temperature.
  Do not use it for other purposes.
- Read this manual thoroughly before using the SK-28V and keep this manual in a safe place for your future references.

Warning

Beware of explosion!

The SK-28V is not explosion-proof. Never use it in an atmosphere containing flammable gases.

* If there is anything you are not unclear about using the SK-28V, please contact our retailer or our service network

Descriptions

Adopting the principle of thermal anemometer, this product can measure wide range of air velocity. The measured value can be read without requiring correction and conversion of measured value due to temperature compensation of our own.

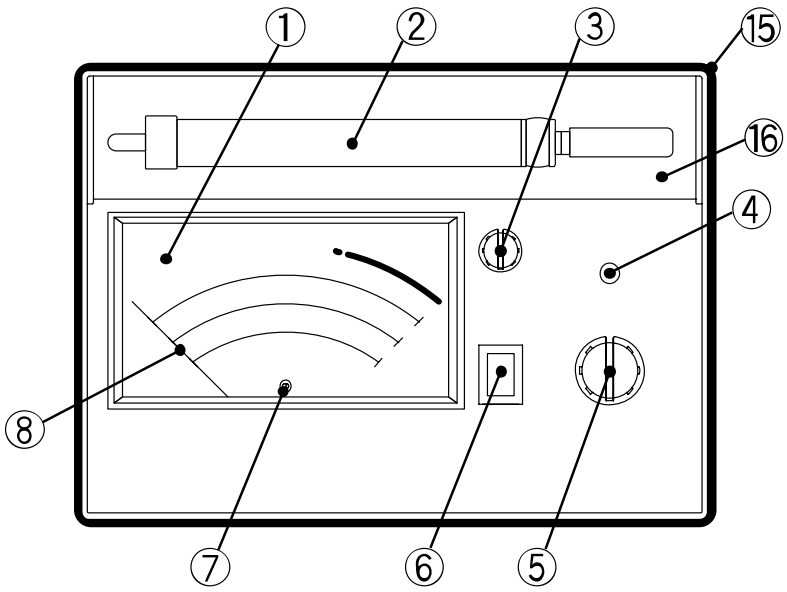
Features

- **Analog display:**
  Easy to read the measured values
- **Multi functions**
  Three parameters of air velocity, air temperature and static pressure can be measured.
- **Dual measuring ranges**
  Switchable HIGH and LOW ranges make reading accuracy higher.
- **Carry Case**
  Easy storing the instrument
  Measurement can be performed without taking the unit out of the carry case.

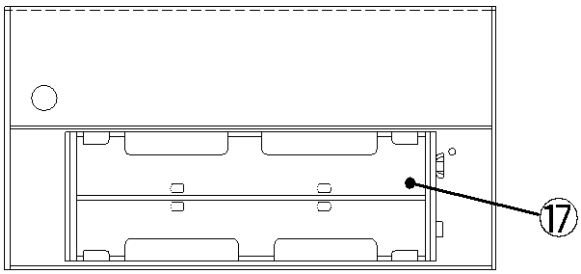
Names of Sections

Main unit

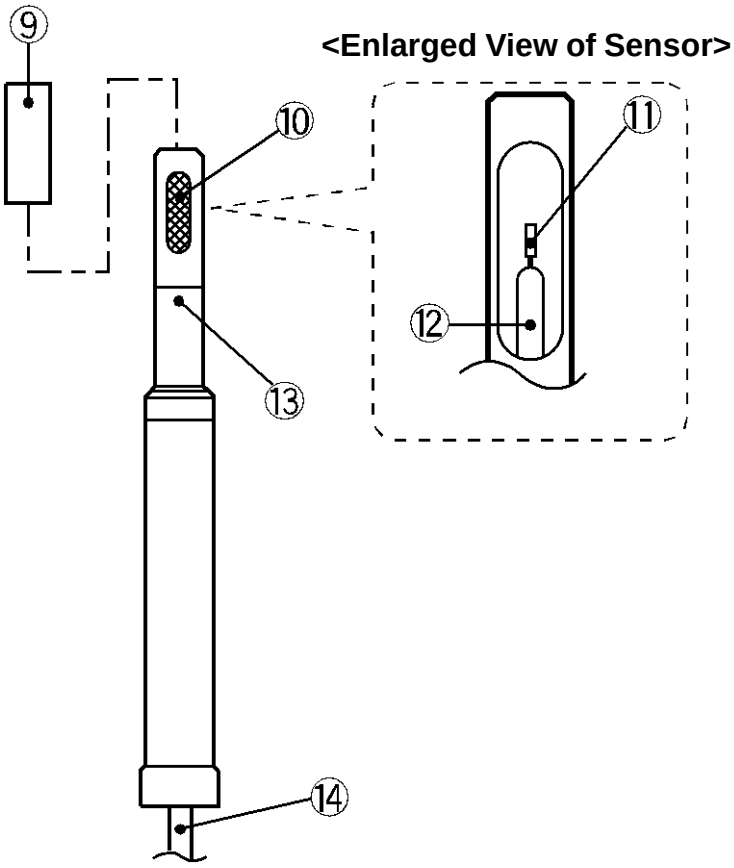
<Top View>



<Rear View>



Sensor Probe



① Scale Plate
② Sensor Probe
③ Zero Point Adjustment
④ Power Lamp
⑤ Function Switch
⑥ Range Selector
⑦ Zero Adjustment Pivot
⑧ Pointer
⑨ Sensor Cap
⑩ Detection Window (with mesh)
⑪ Air velocity Sensor
⑫ Temperature Sensor
⑬ Wind Direction Mark
⑭ Sensor Cord
⑮ Carrying Case
⑯ Sensor Storage
⑰ Battery Compartment

How to Use

- **Loading batteries**

(1) Place the Function Switch in Power-Off position.

(2) Take the main unit out of the carrying case and load six “C” size alkali batteries (LR14) in the battery compartment located at the back of the unit. Make sure to load them with correct polarities.

(3) Put the unit back to the carrying case. Place the Function Switch in BATT position and make sure that pointer has fully moved to the right (plus side). If the pointer points the left of zero (minus side) or moves to neither side, check if the batteries are properly set.

- **Adjustment and confirmation before starting measurement**

For proper use of this instrument, make adjustment and confirmation in following procedure before every measurement.

A Confirmation of battery capacity

(1) Place the Function Switch in BATT position. Confirm that the pointer is in the blue zone of the scale plate. When the batteries are new, the pointer will point to the right end (plus side), which is normal.

Note: The power lamp will not light during this procedure.

(2) If the pointer is not in the blue zone, replace all the batteries with new ones.

Note: When replacing the batteries, the Function Switch must be in Power-Off position. After replacement, place the Function Switch in BATT position and confirm that the pointer points to the right end (plus side).

B Zero adjustment of pointer

(1) Place the instrument horizontally.

(2) Confirm that the Function Switch is in Power-Off position.

(3) Confirm that the pointer points the zero on the scale.

(4) If the pointer does not point the zero, set the pointer at the zero by carefully turning the Zero Adjustment Pivot with a screwdriver either to left or right.

Note: See the scale plate from straight above.

C Heat-running and zero point adjustment

(1) Place the Function Switch to either of Air Velocity or Static Pressure position. Then put the sensor cap on the probe and run the heat for more than 5 minutes. The pointer will gradually return to zero point from left (minus).

***** This is the time required to stabilize after electric current flows through the circuit and the sensor.

(2) If the pointer does not point to zero of the scale after the heat-running, set the pointer to zero by turning the rotary switch of zero point adjustment.

***** For fine adjustment, place the Range Selector Switch to HIGH first. Then switch the Range Selector Switch to LOW position and adjust it again.

Note: Be sure to make the zero point adjustment under normal temperature (at 20°C±15°C). If the pointer fully points to the left (minus) or right (plus) end, turn function switch to Power-Off position and contact us since it will not be normal.

● Measurement range (Range Selector)

Measuring ranges of air velocity, temperature and static pressure are as follows.

Select HIGH and LOW depending on the circumstances.

Range	LOW	HIGH
Air velocity	0.5 to 3 m/sec.	3 to 40 m/sec.
Temperature	0 to 60°C	60 to 120°C
Static pressure	0 to 500 Pa	500 to 4500 Pa

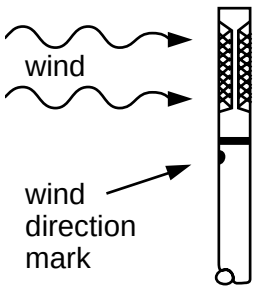
● How to measure air velocity

(1) Place Function Switch in Air Velocity position. Put the sensor cap on the probe and make zero point adjustment.

Note: Place Range Selector Switch in HIGH position when air velocity cannot be estimated.

(2) Measure air velocity facing the wind direction mark of the probe (red arrow mark under the detection window) to windward.

Note: Face the detection window vertically against the wind direction. If the mark is aslant against the wind direction, the air velocity will be indicated higher than the actual value.



* When the ambient temperature to be measured is high, it will take some time until the temperature of sensor section rises to the ambient temperature (about 3 minutes at 100°C). Take measurement after the temperature of sensor section is fully stabilized. Also, when taking measurement in a normal ambient temperature in LOW range (lower than 3 m/sec.) wait until the temperature is fully stabilized.

● How to measure temperature

Place the Function Switch in Temperature position for temperature measurement. Right after measuring air velocity and static pressure, the temperature of the sensor itself is about 100°C higher than ambient temperature. Start to measure temperature after full stabilization (it takes at least 2 minutes) for accurate measurement.

* Zero point adjustment is not required in temperature measurement.

● How to measure static pressure

(1) Make a hole of about 6 mm in diameter at the measurement point of duct or so.
(2) Place the Function Switch in Static Pressure position and do the zero point adjustment with sensor cap on the probe.
(3) Remove the sensor cap and fully insert the probe into the adaptor for static pressure and fasten it with the clamp ring. Make sure to face the wind direction mark to the sucker for negative pressure. (Refer to Fig. 1)
(4) Strongly press the sucker for negative pressure against the measurement hole and take measurement. (Refer to Fig. 2)

Fig. 1

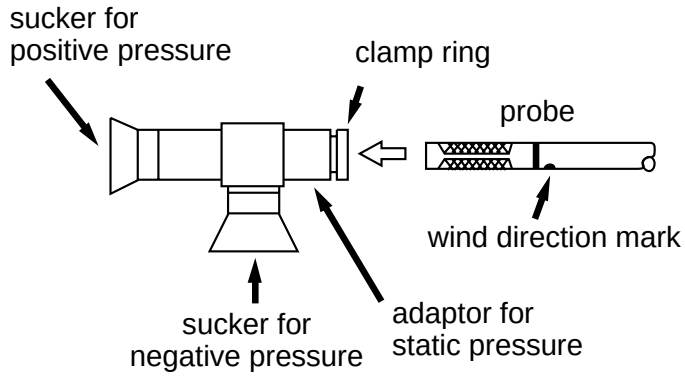
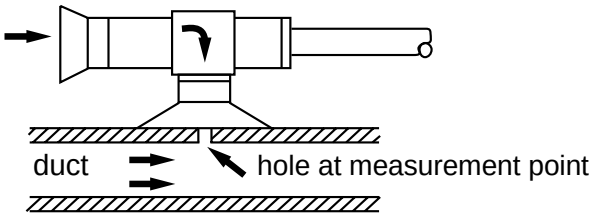


Fig. 2



● Operation after measurement

(1) Place the Function Switch in OFF position. (Power lamp goes out)
(2) Put sensor cap on the probe to protect the sensor.
(3) When probe has been extended, retract it for storing in the case.
(4) Put all the accessories in the case after confirming.

NB: * After measurement, place the function switch in OFF position and turn off the power. (With the Function Switch in BATT. position, the batteries are still being used even though the power lamp is off.)

* Take the batteries out when the instrument is not used for a long time. Otherwise the battery fluid may leak and cause troubles.

Cautions

- **Cautions in operation**

(1) The probe and the instrument are delicately made. Be careful not to drop or give shocks to them.
(2) Do not forcefully bend or pull the sensor cord, which may cause troubles.
(3) Never remove the metal mesh of the detection window at measurement.
(4) Never touch the sensor directly. There is the possibility of getting a burn since temperature of the sensor gets very high (about 100°C higher than ambient temperature) after the measurement of air velocity and static pressure.

- **Cautions on characteristics**

(1) If the ambient temperature changes when the sensor is covered with the sensor cap while the Function Switch is in Air velocity position, pointer will point the minus side. However, this is not abnormal because the radiation of the sensor in non air-flow state is different from the radiation in air current.
(2) The maximum temperature of air to be measured should not exceed 120°C.
(3) If sensor or mesh of detection window is stained, the accuracy of measured value of air velocity will be affected. In such a case, contact us for cleaning unit (on charge bases).
(4) Never wipe or rub the unit with a dry cloth or like for cleaning. Doing so may generate static electricity, causing the pointer to move and never to return.

- **Caution in general**

(1) Never put sensor probe into liquid.
(2) The SK-28V is calibrated in normal ambient. If the component of air is extremely different from the normal ambient, an error may arise in the measured value.
(3) Never touch the sensor until it cools down when measurement was made in 50°C or higher state. There is a possibility of getting a burn.
(4) Do not use this unit in dusty environment to avoid the sensor malfunctions.
(5) Never disassemble or modify this unit and probe.
(6) For measurement, put this unit in a horizontal place or strap the case with the unit on your shoulder. Be careful not to slant the unit. Doing so may affect the measurement accuracy.
(7) Use the unit within the measuring range. Doing so may cause malfunctions.
(8) This unit is not waterproof. Never get the unit wet.

*** If you have any other concerns, please contact our retailer or visit our website for further assistance.**

Specifications

Name	Hot Wire Anemometer
Model	SK-28V
Cat. No.	No. 7863-01
Measuring Object	Clean air in normal pressure
Measuring Range (Dual ranges)	Air Velocity : 0.5 to 3 m/s, 3 to 40 m/s Temperature : 0 to 60°C, 60 to 120°C Static Pressure : 0 to 500 Pa, 500 to 4500 Pa
Accuracy	Air Velocity : ± (5% of FS + 0.1m/s) at 18 to 28°C, ± (5% of FS + 0.1m/s + δUt (*)) at 0 to 18°C, 28 to 120°C Temperature : ± 0.5°C at 0 to 120°C Static Pressure : ± 2% of FS in 10Pa or higher
Operating Ambient	Ambient temperature of instrument : 5 to 45°C Ambient humidity of instrument : less than 85% RH
Temperature Compensation	0 to 120°C
Power Requirement	9.0VDC: “C” size alkali battery (LR14) ×6 pcs.
Battery Life	About 20 hours in continuous use at air velocity of 20m/s at 25°C (in use of new “C” size batteries)
Sensor Element	Specially coated platinum element
Dimensions	Probe : Ø8 to Ø18.7mm×(180 to 930mm) (telescoping type) Sensor cord : Ø6 × 3,000mm (length changes depending on probe length) Main unit : (W)214×(H)117×(D)155mm
Materials	Body : Aluminum Sensing stem : Brass (BS) w/ chrome plating
Weight	about 2.3 kg (including batteries and carrying case)
Accessories	Adaptor for static pressure×1 “C” size Alkali battery×6 Carrying case ×1

All specifications and appearances subject to change with or without notice.

*) δUt = 0.003 X FS x ΔT(at 0 to 18°C: ΔT=3°C, at 28 to 120°C: ΔT=77°C)

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