Cat.No.8313-00

Heat Stress Monitor Model SK-180GT

Model

SK-180GT

SK-180GT is a compact all-in-one heat stress monitor that can measure temperature, heat radiation to calculate WBGT index, which is used as a guide for preventing heat stroke and estimating heat stress in a hot environment. Conforms to JIS B 7922 Class

A Proper Environmental Assessment is the First Step to the Prevention of Heat Stress

- Uses WBGT (heat stress index) to estimate heat stress
  WBGT stands for Wet Bulb Globe Temperature, which is an index designated to prevent heat stroke and estimate heat stress in a hot environment.
  It is based on not only the ambient temperature but also humidity and heat radiation.

- Conforms to JIS B 7922 Class 2
  The Ministry of Health, Labour and Welfare of the Government of Japan promotes Combat Heat Stroke Campaign every year to eliminate casualties from heat illness.

  The article 10 "Activities in detail at each workplace" in the implementation guideline of the campaign stipulates as follows:
  "Prepare a WBGT measuring device conformed to JIS Z 8504 or JIS B 7922. If the WBGT indices differ greatly at each worksite due to heat radiation or such, prepare a device which is easily portable."
  SK-180GT is easily portable, conformed to JIS B 7922 Class 2, and equipped with a black globe measurable heat radiation, to fully satisfies this requirement.

Features

- Conforms to JIS B 7922 Class 2
  SK-180GT complies with the Class 2 of JIS B 7922 "Electronic wet bulb globe temperature (WBGT) index meter."

- Black globe equipped to measure heat radiation
  A globe on the top detects heat radiation generated by direct and reflected sunlight, for accurate environmental evaluation with temperature, humidity, and globe temperature together assigned to calculation.

- Supports two types of heat stress bar graph displays
  SK-180GT displays either one of the bar graphs of the following heat stress levels of your choice.
  ▪ "Heat stress prevention guidelines for exercise"
  ▪ "Heat stress prevention guidelines for daily life"

- Supports switching between two measurement environments, outdoors and indoors
  The formula for calculating WBGT index differs when measured outdoors and indoors.
  Choosing either one according to the environment enables accurate measurement.

- Alarm function
  A buzzer sounds and an LED light blinks when the WBGT reaches a set value.

- A variety of accessories equipped for easy carrying and installation
  SK-180GT is a compact portable kit with a carabiner, belt attachment parts, and a neck strap included in the kit.
  Also, a screw hole in the back enables the unit to be installed on an optional tripod.

- Keylock function equipped to prevent incorrect operation
  This function prevents unexpected suspension of measurement.

Bar Graph Display of WBGT Index

- **Measured WBGT (heat stress index) is shown on a bar graph so that you can easily check the danger.**

Either one of the following warning levels can be selected to be displayed.
▪ "Heat stress prevention guidelines for exercise"
▪ "Heat stress prevention guidelines for daily life"

"Heat stress prevention guidelines for exercise": Abstracted from "A Guidebook for the Prevention of Heat Disorder During Sports Activities," Japan Sport Association, 2013.

WBGT	Warning level	Guide
Above 31 °C	Danger	All exercise should be stopped except for special cases. Children must stop it especially.
28 to 31°C	Severe warning	The risk of heat stress is high, so avoid exercises that can increase body temperature, such as long runs or something intense. Those who are not strong physically or not acclimated to heat must stop exercise. Take a break and replenish water with salt as often as possible.
25 to 28°C	Warning	The risk of heat stress increases, so take a break and replenish water with salt as appropriate. Have a rest every 30 minutes when you do intense exercise.
21 to 25°C	Caution	Fatal accidents may occur due to heat stress. Pay attention to signs of heat stress, and replenish plenty of water with salt between exercises.
Below 21°C	Almost safe	The risk of heat stress is usually low, but supplementation with water and salt is necessary. Heat stress could occur even under this WBGT in events such as marathons, so caution is advised.

"Heat stress prevention guidelines for daily life": Abstracted from "Heat stress prevention guidelines for daily life," Japanese Society of Biometeorology, 2013

WBGT	Type of risks in relation to physical activity	Remarks
Danger (31°C or higher)	Risk during any physical activity	Risk of occurrence is high for the elderly, even when they rest. Avoid going out and stay in a cool room.
Severe warning (28 to 31°C)	Risk during any physical	Avoid direct sunlight outdoors and watch for any rise in room temperature indoors

	activity	
Warning (25 to 28°C)	Risk during moderate to vigorous physical activity	Take adequate rest regularly when exercising or doing vigorous work.
Caution (25°C or lower)	Risk during very vigorous physical activity	Low in risk basically, but high in risk when doing vigorous exercise or heavy labor.

* "28 to 31°C" indicates 28°C or higher, lower than 31°C.

- **You can also check the warning level by reading WBGT value itself.**

"Table of threshold values of WBGT heat stress index": Abstracted from "Utilization of WBGT for the Prevention of Heat Stroke," Japan's Ministry of Health, Labour and Welfare

Level	Examples	WBGT threshold	
		For those acclimated to heat (°C)	For those not acclimated to heat (°C)
0 Resting	Resting	33	32
1 Low metabolic rate	Sitting at ease: light manual work (writing, typing, drawing, sewing, book-keeping); hand and arm work (small bench tools, inspection, assembly or sorting of light materials); arm and leg work (driving vehicles in normal conditions, operating foot switch or pedal). Standing: drill (small parts); milling	30	29

	machine (small parts); coil winding; small armature winding; machining with low power tools; casual walking (speed up to 3.5 km/h).				
2 Moderate metabolic rate	Sustained hand and arm work (hammering in nails, filling); arm and leg work (off-road operation of trucks, tractors or construction vehicles); arm and trunk work (work with pneumatic hammer, assembly of tractors, plastering, intermittent handling of moderately heavy material, weeding, hoeing, picking fruit or vegetables); pushing or pulling light-weight carts or wheelbarrows; walking at a speed of 3.5 to 5.5 km/h; forging.	28		26	
3 High metabolic rate	Intense arm and trunk work (carrying heavy material, shoveling, sledge hammer work, sawing, planing or	When you don't feel air flow 25	When you feel air flow 26	When you don't feel air flow 22	When you feel air flow 23

	chiseling hard wood, hand mowing, digging); walking at a speed of 5.5 to 7 km/h; pushing or pulling heavily loaded carts or wheelbarrows; chipping castings; laying concrete blocks.				
4 Very high metabolic rate	Very intense activity at fast to maximum pace (work with an axe, intense shoveling or digging); climbing stairs; running; walking at a speed greater than 7 km/h.	When you don't feel air flow 23	When you feel air flow 25	When you don't feel air flow 18	When you feel air flow 20

* The above table is a combination of the tables of WBGT threshold and the classification of levels of metabolic rate, both included in ISO 7243:2017 Ergonomics of the thermal environment - Assessment of heat stress using the WBGT index.

* "Those not acclimated to heat" indicates people who have not been exposed to heat every day during the week preceding the day they exercise on.

Alarm Function

A buzzer sounds and an LED light blinks when the WBGT reaches a set level of your choice.

- If the measured WBGT reaches the set level, an alarm is activated for 10 seconds. You can turn on and off the buzzer while the blinking of the LED cannot be turned off.
- If the WBGT continues to exceed the set level, the alarm works for 2 seconds every 10 minutes.
- If the WBGT increases or decreases as much as the warning level changes during the

WBGT is higher than the set level, the alarm works for 10 seconds to notify such change.

- The sound of a buzzer differs depending on the warning level.

Heat stress prevention guidelines for exercise	Heat stress prevention guidelines for daily life	Buzzer sound
Almost safe/Caution	Caution	Beep, beep, beep
Warning	Warning	Beep-beep, beep-beep
Severe warning	Severe warning	Beep-beep-beep, beep-beep-beep
Danger	Danger	Beeeep, Beeeep

Practical Examples

- Being compact and portable
- Keylock function to prevent incorrect operation
- A carabiner, belt attachment parts, and a neck strap equipped
- A screw hole in the back enables the unit to be installed on an optional tripod.

Specifications

Product Name	Heat Stress Monitor Model SK-180GT	
Cat. No.	8313-00	
Model	SK-180GT	
Measuring Range	Temperature	0.0 to 50.0°C
	Humidity	10.0 to 95.0%rh
	WBGT	0.0 to 50.0°C
	Globe temperature (not shown)	0.0 to 60.0°C
Accuracy	Temperature	±0.6°C (20.0 to 40.0°C) ±1.0°C (other than above)
	Humidity	±5.0%rh (30 to 90% within 20 to

		30°C) ±7.0%rh (other than above)
	WBGT	±2.0°C (20.0 to 40.0°C) ±3.0°C (other than above)
	Globe temperature (not shown)	±0.6°C (20.0 to 40.0°C) ±1.0°C (other than above)
Resolution	0.1	
Sampling Time	Approx. 20 seconds	
Operation Ambient	Temperature: 0 to 50°C Humidity: Less than 95%rh (no condensing) Wind speed: 0.3 to 3.0 m/s	
Power Requirement	3VDC Lithium coin battery (CR2032) x2 in parallel connection	
Battery Life	Approx. 6 months in continuous use if the alarm works twice a day	
Buzzer Volume	Approx. 75 dB	
Material	ABS resin for the case and the globe	
Dimensions	Body: (W) 60 x (H) 122 x (D) 25 mm Globe: Ø40 mm	
Weight	Approx. 70 g (including batteries)	
Standard Accessories	Instruction manual, lithium coin battery (CR2032) x2, neck strap x1, carabiner x1, belt attachment parts x1, key ring x1	
Optional Accessories	No.8310-90 Tripod for SK-180GT (Model ZF-400WSH)	

* Batteries included initially are for test use and may last shorter than their expected life.

Related Products

	8310-90	Tripod	This tripod is used with WBGT Heat Stress Monitor Model SK-170GT and SK-180GT. Height: 1520mm, Weight: 1280g When SK-170GT is installed on the ZF-400WSH tripod, the height of the globe becomes higher than 150 cm above the ground. *The picture above is an example that SK-170GT is installed on it. Model SK-170GT is sold separately.

	8311-00	WBGT Heat Stress Monitor Model SK-160GT	This is a Wall-mount/desk-top type instrument that indicates the indoor WBGT Index and the guideline with four warning levels and measures temperature and humidity. When the measured value exceeds the set WBGT index, buzzer sounds and LED lights. Atomic clock is equipped.
	8312-00	WBGT Heat Stress Monitor Model SK-170GT	The SK-170GT is a handy type instrument that can measure temperature, humidity and globe temperature to measure the WBGT index. This can be used as a guide for preventing heat stroke and estimating heat stress of working and activity environments. (Conforming to JIS B 7922 Class 2)
	8310-00	WBGT Heat Stress Monitor Model SK-150GT	The SK-150GT is a handy type device that can measure temperature, humidity and globe temperature to approximate the WBGT index (*). This can be used as a guide for preventing heat related illness and estimating heat stress of working and activity related environments.
	1051-00	Digital Thermohygrometer (guide for a comfortable environment) PC-5500TRH	This is a digital thermohygrometer that measures temperature and humidity. The unit displays the estimated values of temperature or humidity to achieve a comfortable environment.
	1076-50	Personal Comfort Checker PC-7960GTI	Handy type comfort checker displays Temperature, Humidity, Heat stress index, Seasonal influenza index and UV index. Each index is displayed with bars and icons. Unsafe conditions are indicated at each level by Alarm function.