

Motor condition monitoring devices | K6CM Series



Stay alert to signs of motor failure
with round-the-clock monitoring

- Monitor all types of critical motor failures and detect abnormalities early
- Monitor up to 10 motors remotely using the included PC monitoring software
- Prioritize maintenance inspections



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Reduce the amount of required manual inspections

K6CM informs you when your motor needs

[Problems]

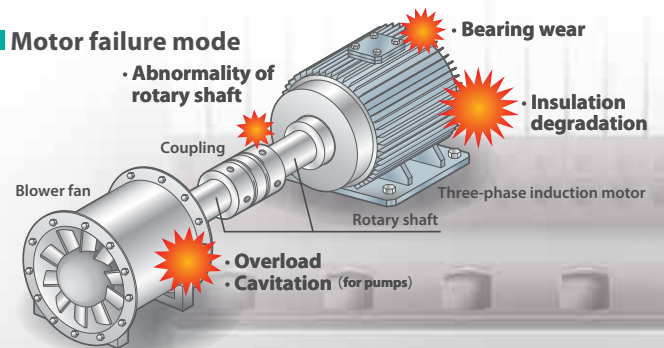
It is difficult to identify multiple failure modes of motors.

Conventional motor condition checks have multiple check items, requiring a skilled maintenance engineer to determine the appropriate maintenance timing. When multiple motors are in use, this process becomes even more time-consuming.

Example of patrol inspection items

Phenomenon Symptoms	Vibration	Heat generation	Decreased electrical resistance	Overcurrent
Bearing wear	✓	✓		✓
Insulation degradation			✓	
Overload	✓	✓		✓
Open phase		✓		

Motor failure mode



AWARDS

K6CM Motor Condition
Monitoring Devices

✦ Development Award of the
TPM Award
for Excellent Products 2018



✦ Good Design Award 2018



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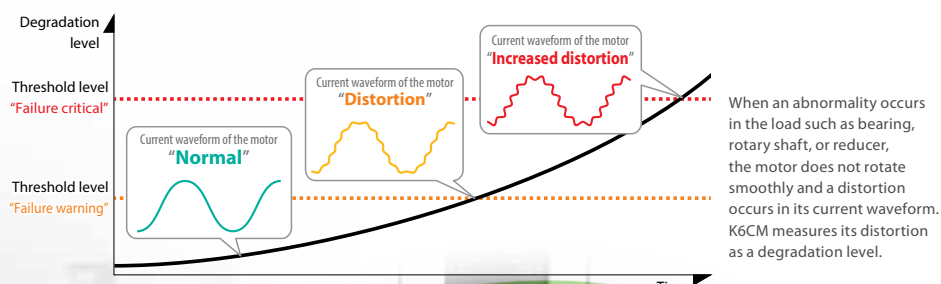
maintenance

[Solution from OMRON]

Continuous motor monitoring that alerts maintenance engineers of potential issues with the motor.

The K6CM consistently monitors motor conditions by observing the motor's current waveform, a process known as comprehensive current diagnosis. The device's threshold setting makes it possible to effectively time maintenance needs without relying on an engineer.

What is comprehensive current diagnosis?



* The screen is a sample image.

Rotary fan



Conveyor



Pump



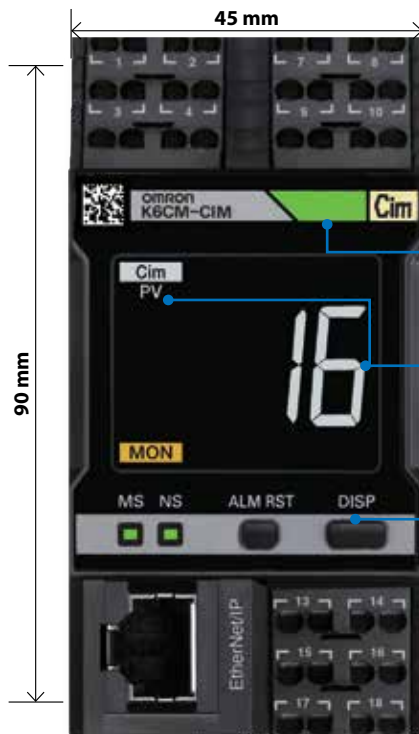
Monitors the 3-phase induction motor which is the driving force of every facility.

Motor Condition Monitoring Device Lineup

Note. Applicable motor type: three-phase induction motor

type
01

Comprehensively monitors motor and load abnormalities through current analysis



Alarm bar display

- Green : Status normal
- Yellow : Failure warning
- Red : Failure critical

Display

- [PV] : Present value
- [MIN] : Minimum value
- [MAX] : Maximum value

Switches the units of the measured value displayed

- [CIM] : Degradation level
- [A] : Current

<Actual size>

K6CM-CIM

Comprehensive current diagnosis type



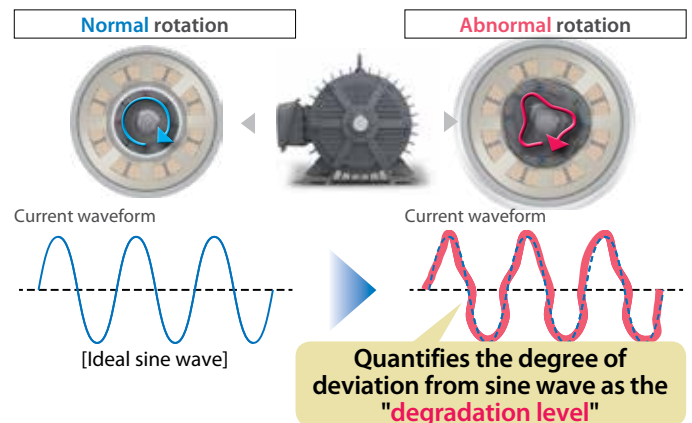
Easy setup!

To perform monitoring, simply clamp the CT to the power line connected to the three-phase induction motor.



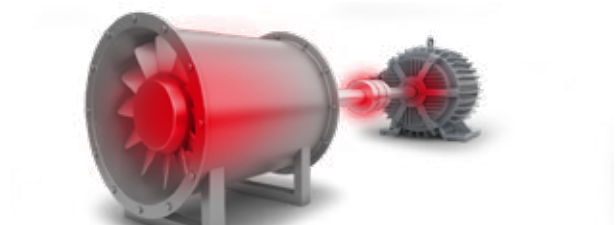
Detects abnormalities of three-phase induction motors

When an abnormality occurs in a three-phase induction motor, a change occurs in the "stator" and "rotor" of the motor, which affects the current waveform. Comprehensive current diagnosis makes it possible to capture condition changes by comparing the normal current waveform (ideal sine wave) and abnormal current waveform.



Also detects load abnormalities

When a load abnormality occurs, the current waveform of the motor changes, which allows the load abnormality to be detected.



1. Abnormalities in load (blower fan) and rotary shaft

2. Effect on the current waveform of the motor

type
02

Monitors bearing abnormalities through vibration and temperature analysis



K6CM-VBM



Bearing wear



Overload



Open phase

Vibration & temperature monitoring type

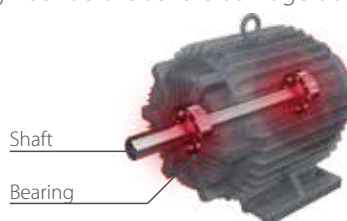
Detects abnormalities in bearings

By constantly monitoring for vibrations, the K6CM can detect early signs of bearing wear and alert the maintenance engineer before severe damage occurs.

Constantly monitors temperature

The surface temperature of the routinely inspected motor can be measured at the same time as vibrations.

+
Pre-amplifier and
Vibration & temperature sensor
K6CM-VBS



Shaft

Bearing

This eliminates the need to
measure the temperature
on site.



type
03

Constantly monitors the insulation resistance



K6CM-ISM



Insulation degradation

Insulation resistance monitoring type

Measures insulation resistance

With conventional products, measurement with a Megger Tester was necessary to check for insulation degradation. K6CM-ISM can be used to perform this inspection during operation, making it possible to constantly monitor degradation trends while reducing the burden on the maintenance personnel.

Measures insulation resistance on secondary side of inverter

The "insulation resistance" of the motor can be measured even if an inverter is used



This eliminates the need for complicated
insulation resistance measurements.



Features

Three functions for monitoring motor condition

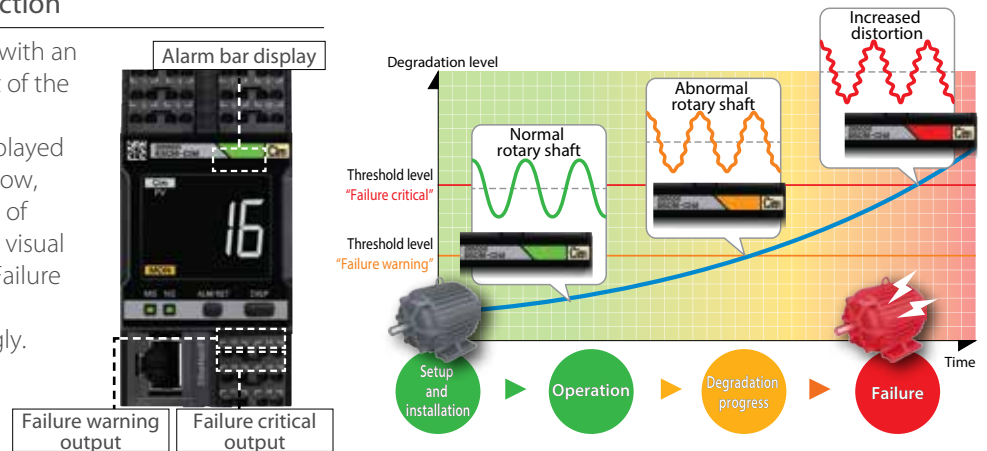
1

Visual inspection through alarm bar display and two-step output

Alarm bar and output function

The K6CM series is equipped with an alarm bar display on the front of the product.

The condition of motor is displayed by color-coding as green, yellow, or red. This shows the degree of abnormality and is helpful for visual inspection near the motor. "Failure warning" and "failure critical" statuses are output accordingly.



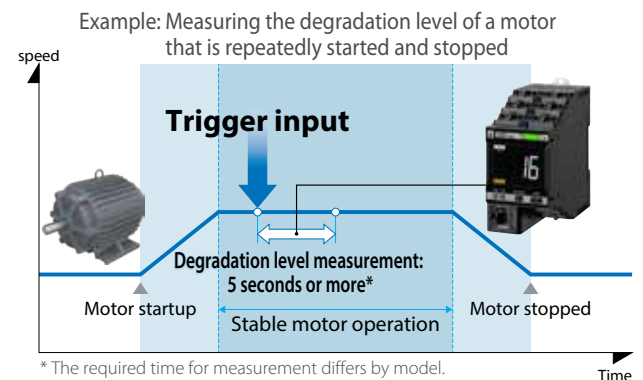
2

Monitors stable values even when load fluctuates

Trigger input function

The K6CM is equipped with a trigger input function that determines the measurement timing according to the motor operation in order to accurately diagnose the condition of motors that are repeatedly started and stopped.

The motor condition is determined from the operation signals (auxiliary output of the contactor and the PLC control signal), and measurement is only performed when the motor operation is stabilized, enabling fixed point observation on a daily or monthly basis under the same conditions.



* The required time for measurement differs by model.

3

Self-diagnosis function that improves system reliability

Self-diagnosis function

When constantly monitoring for a long period of time, unexpected failures and other problems of measuring devices must be taken into consideration.

The K6CM series is equipped with a self-diagnosis function as standard. The reliability of the system is improved by monitoring the service life of the device to be measured.



→ Status display "AGE"

Lights up when the guideline for the replacement time is reached.



Our shared Value Design for Panel (herein after referred to as Value Design) concept for the specifications of products used in control panels will create new value for our customers' control panels. Combining multiple products that share the Value Design concept will further increase the value provided to control panels.

Motor Condition Monitoring Tool

The Motor Condition Monitoring Tool software for setting and monitoring is directly linked to the K6CM. Both allow the motor condition to be monitored visually with green, yellow, and red color-coding.

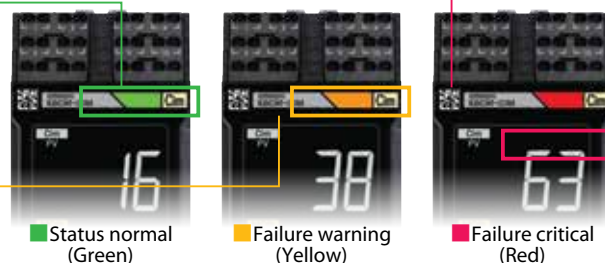


Motor condition list display



The conditions of up to 10 motors are displayed as a list through the K6CM series connected to the network. The data of up to 30 K6CM units can be viewed. (Three types of K6CM can be installed to one motor)

Displays condition list at same time as device displays



Error history display



— Vibration/temperature monitoring type
— Insulation resistance monitoring type
— Comprehensive current diagnosis type

Displays the alarm statuses of multiple motors. Allows changes in the motor condition to be checked as a time series.

Trend graph display



Allows the measured value trends to be checked on graphs.

Initial setting

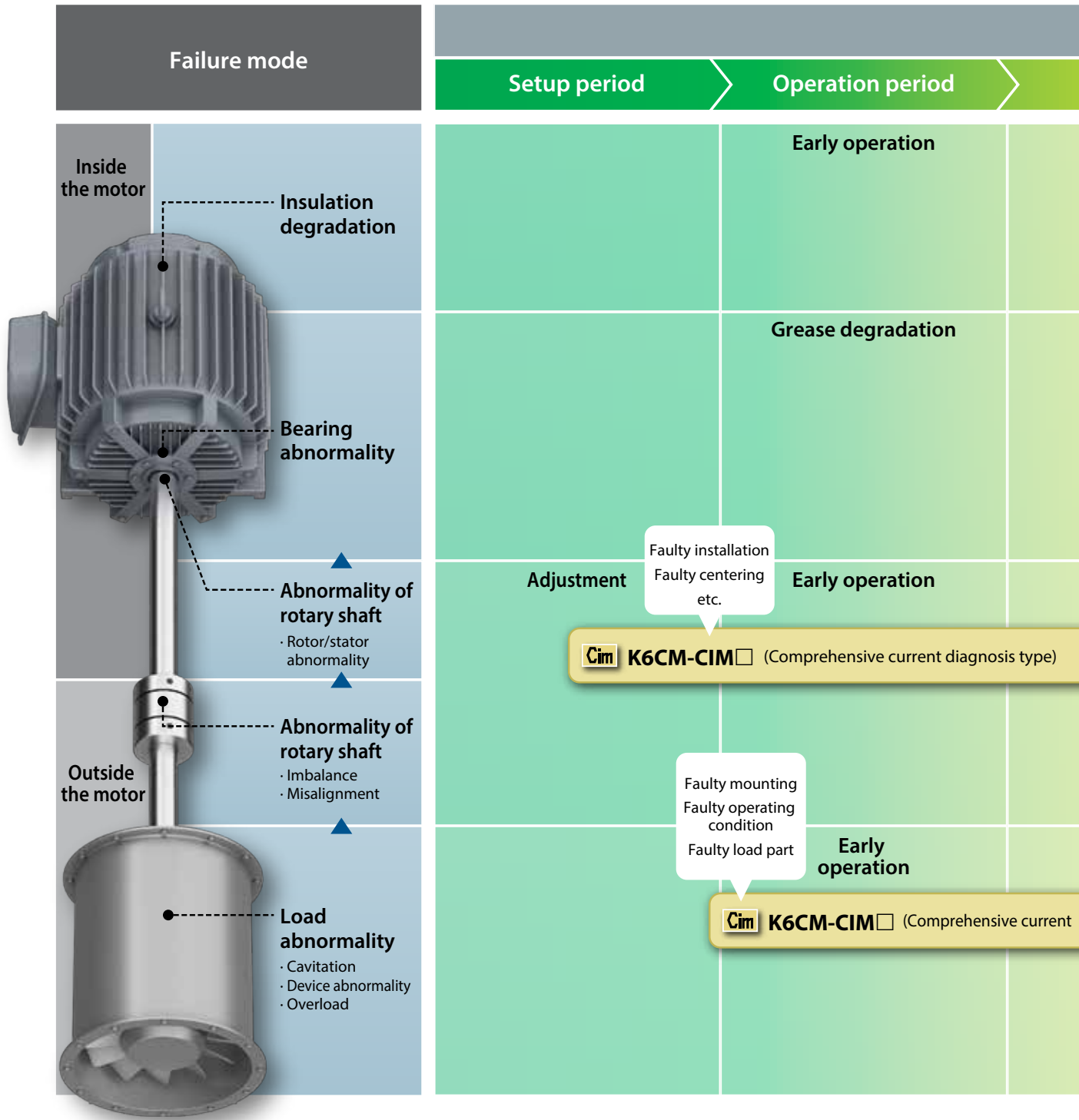
Initial settings of the K6CM series such as trigger input settings, motor information registration, network settings, and threshold adjustment can be made from a PC.

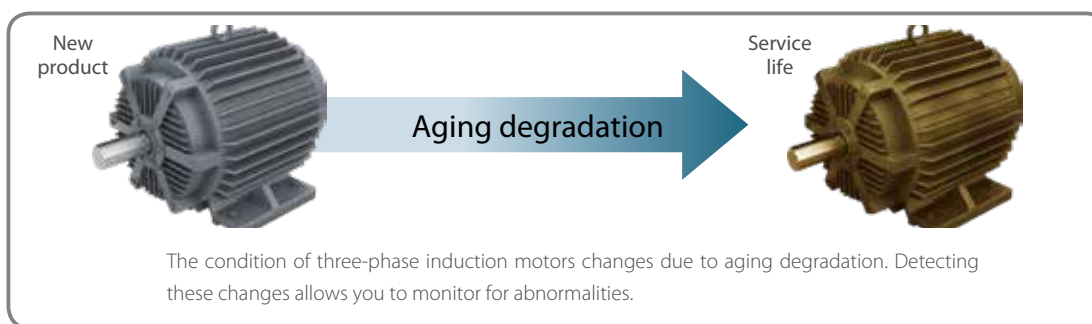
Data can be output as a CSV file








Measured and accumulated data can be output in CSV format. This is useful for creating reports and statistical materials.


Degradation progress/failure mode correspondence table


After installing a three-phase induction motor, performing proper maintenance by monitoring the motor condition will prolong its service life.
Please select the optimal model for the type of abnormality you want to detect.





Motor and load condition	
Degradation progress period	Breakdown period
Insulation degradation 	Insulation breakdown
 K6CM-ISM (Insulation resistance monitoring type) [Insulation degradation]	
Bearing damage 	Bearing breakdown
 K6CM-CIM (Comprehensive current diagnosis type) [Degradation level]	
 K6CM-VBM (Vibration & temperature monitoring type) [Velocity/Acceleration]	
Degradation progress of motor [Degradation level]	
 K6CM-VBM (Vibration & temperature monitoring type) [Velocity]	
Degradation progress of load diagnosis type) [Degradation level]	
 K6CM-VBM (Vibration & temperature monitoring type) [Velocity]	

 **K6CM-CIM** (Comprehensive current diagnosis type) [Overcurrent]

 **K6CM-VBM** (Vibration/temperature monitoring type) [Temperature]

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