

# TAKADA Motor Current Multiplex Analysis

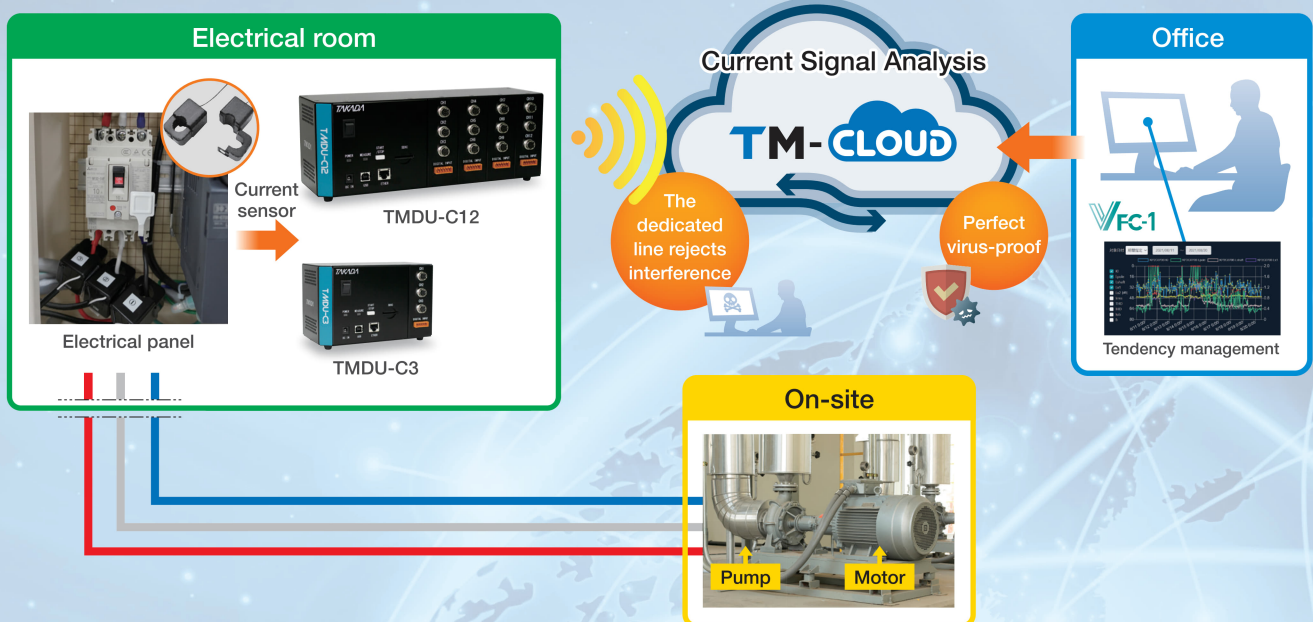


TAKADA-Motor Current Multiplex Analysis

Japan's first!

A monitoring and diagnostic system using electric current detection for rotary machines

## T-MCMA System



TAKADA helps users in solving their facility management issues.

- Support for older equipment
- Reduction of the burden of on-site inspections
- Reduction of maintenance costs
- Prevention of failures and recurrences

**TAKADA's**  
**IoT Solutions**

Visible

Connecting

Changing

**TAKADA**

## What is T-MCMA?

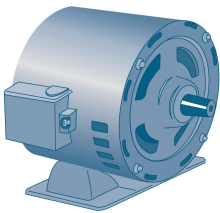
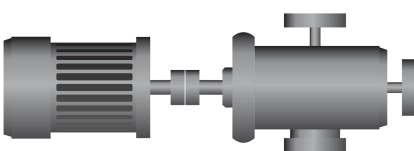
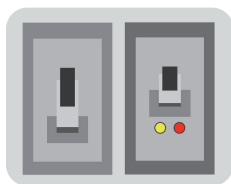
T-MCMA is a system for diagnosing the condition of the motors of rotary machines and other machines on the load side by connecting a current sensor in the electrical panel and analyzing the measured current signal.



## Features of T-MCMA

- Making it possible to measure and diagnose rotary machines regardless of the installation site by simply attaching a clamp to the electrical panel.
- Diagnosing the motors and the machines on the load side.
- Ensuring a wide range of applications (general rotary machines, low-speed rotary machines, and high-voltage motors).
- Inverter diagnosis, winding insulation degradation diagnosis, power quality monitoring, transient current diagnosis, and process diagnosis are also possible.
- Multi-channel on-line monitoring and diagnosis are possible using a wireless network and cloud computing.
- Enabling off-line, on-line, and remote monitoring and diagnosis with a small initial investment.

## Detecting abnormalities in various parts

Part	Detectable item
<b>Motor</b> 	<ul style="list-style-type: none"><li>• Rotor abnormality</li><li>• Stator abnormality</li><li>• Rotating shaft eccentricity</li><li>• Abnormality in inverter-controlled motors</li><li>• Coil insulation abnormality</li></ul>
<b>Rotary machine</b> 	<ul style="list-style-type: none"><li>• Coupling abnormality</li><li>• Rotating shaft abnormality</li><li>• Blade abnormality</li><li>• Abnormality in inverter-controlled rotary machines</li><li>• Bearing abnormality</li></ul>
<b>Power supply</b> 	<ul style="list-style-type: none"><li>• Power supply noise (quality)</li><li>• Inverter abnormality</li><li>• Power consumption</li></ul>



- **Visible** equipment status.
- Diagnostic information **connects** to optimal maintenance.
- Maintenance **changes** based on diagnosis results



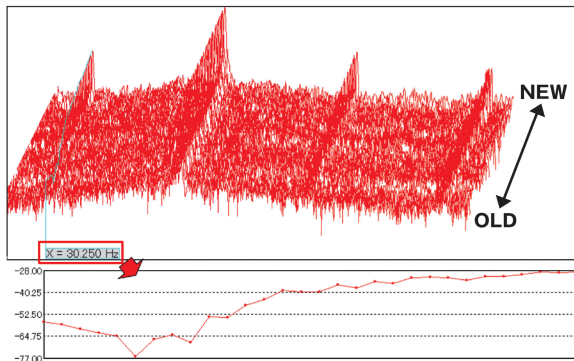
## TAKADA's IoT Solutions

### 1 Visible

Visible equipment status.

回転機械 No.	KI	Lpole	Lshaft	Lx1	Lx2	Irms	THD	IHD	Iub
回転機械 1	0.4811	0.0000	52.06	50.57	0.0000	200.7	3.369	2.641	5,543
回転機械 2	0.3675	0.0000	52.30	47.79	0.0000	179.6	3.296	2.498	5,543
回転機械 3	停止中								

Simple diagnosis window



3D screen

Motors and pumps in these locations are covered.

- 1 Rivers and liquids

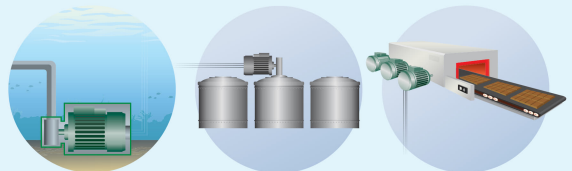
  - Axial-flow pumps
  - Weir motors

2 High places

  - Agitators

3 Dangerous areas

  - High temperatures and radioactivity
  - Oxygen deficiency, explosion-proof, and poisonous gas environments



## 2 Connecting



**Connecting** with on-site equipment anytime and anywhere.



**Connecting** with rotary machines globally using Cloud



**Connecting** with TAKADA's diagnostic experts.



**Connecting** with TAKADA's network of maintenance professionals.

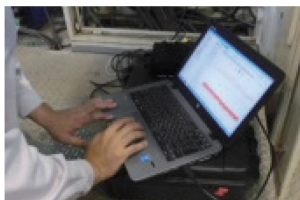
## 3 Changing

### Conventional type

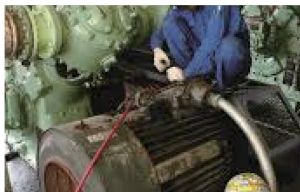
High installation cost.



Taking time and effort to carry the measuring instruments to the site.



Necessary to go to the site to know the condition.



Data may be destroyed in a disaster.



### Cloud-based

Possible to introduce with a small initial investment.



Permanent installation of measuring instruments is possible and allows monitoring at any time and place as long as Internet access is available.



Centrally managed in the cloud  
Any abnormalities in rotary machines will be reported by email.



In times of disaster, the user's data will be protected.





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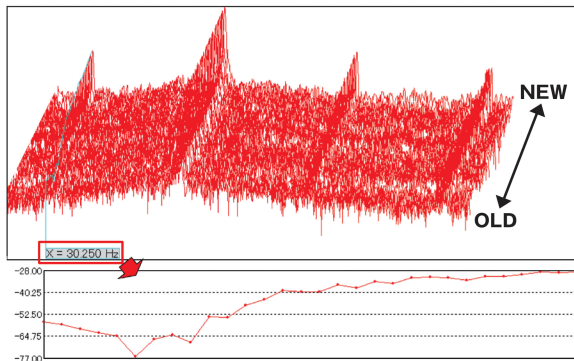
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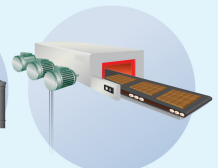
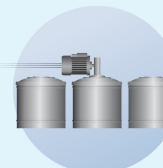
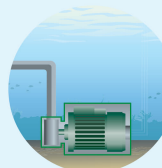
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- Weir motors

2 High places

- Agitators

3 Dangerous areas

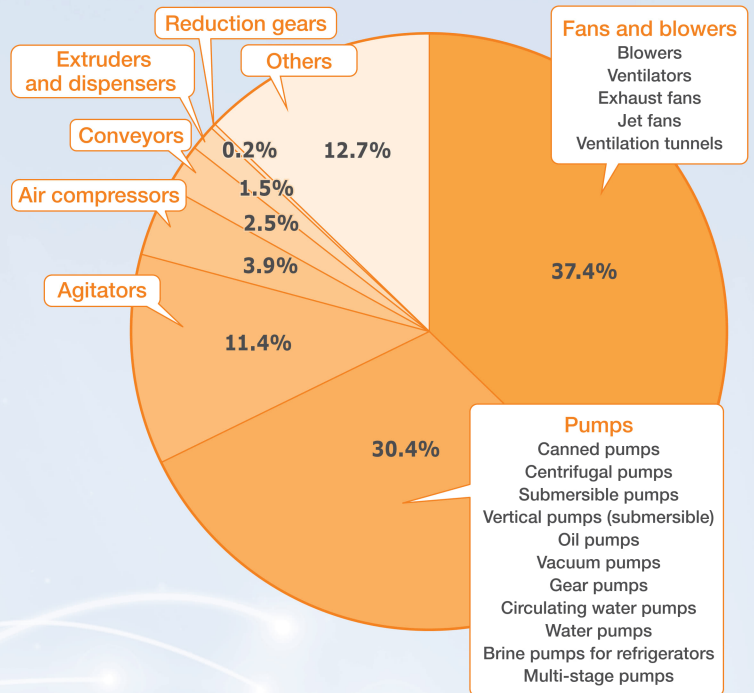
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## Major implementation results

No.	Industrial field	Major target rotary machines	Purpose of use	
			TBM → CBM	Alternative to vibration diagnosis
1	Steel	Ventilators	○	
2	Chemicals	Canned pumps	○	
3	Chemicals	Agitators	○	○ (High places)
4	Social Infrastructure	Emergency drainage pumps for rivers	○	○ (Underwater)
5	Social Infrastructure	Weir opening/closing motors for rivers	○	○ (Insulation)
6	Social Infrastructure	Sewage pumps for sewage treatment plants	○	○ (Underwater)
7	Social Infrastructure	Expressway jet fan	○	○ (High places and dangerous)
8	Power stations	Pumps and fans	○	
9	Transformer substations	Cooling water circulation pumps	○	
10	Food Manufacturing	Submersible pumps	○	○ (Underwater)

## Achievements of T-MCMA in Precision Diagnosis



## Service menu

A trial plan for short-term use with an operating lease

### Trial plan [Monthly payment]

You are not sure if **T-MCMA** is applicable.  
You want to try it out to see what it is really like. The trial plan is recommended for such users.  
**Operating lease for 3-channel type or 12-channel type.**  
**Contract period: Six months**

Next is the secured plan with a long-term contract.

### Secured plan [Monthly payment]

Once the application of **T-MCMA** is confirmed, permanently install it for status monitoring.  
**Long-term operating lease for 3-channel or 12-channel type.**  
**Contract period: One to five years (in one-year increments)**

Technical support

### Technical support

- (1) Handling training
- (2) Initial condition settings and simple diagnosis and tendency management support
- (3) Precision diagnosis and tendency management support (Using cloud data)
- (4) Precision diagnosis and tendency management support (including on-site inspection)
- (5) Software upgrading
- (6) Maintenance of abnormal rotary machines

**New** The service will start in September 2021.



Interface linked to TM-CLOUD®. Six functions to make data checking easier and more convenient.



- (1) Overlay of freely selected parameters
- (2) Overlapped display with different rotary machines
- (3) Simultaneous single screen display of up to 10 multiple graphs

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回転機 3	停止中								
回転機 4	停止中								

- (4) Single screen display of all parameters
- (5) The "Stopped" display for stopped rotary machines
- (6) Automatic warning display by threshold value

Contact: For further information, please feel free to contact the following department.

**TAKADA**

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