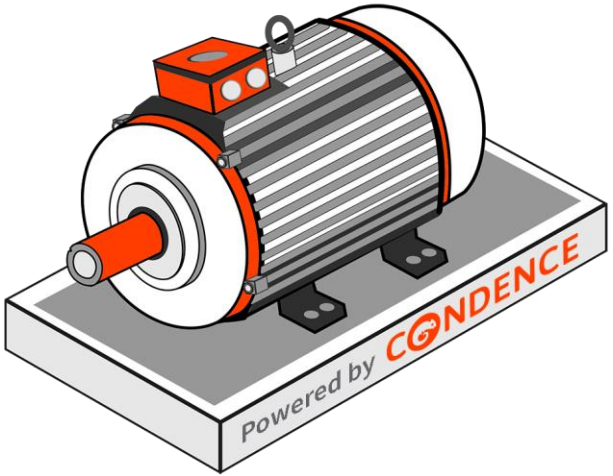
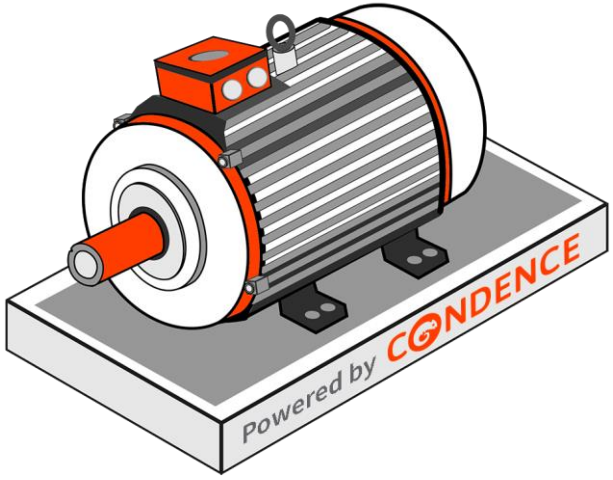
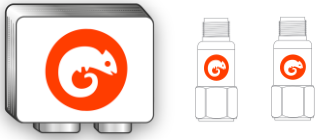
Condence concept: Electric Motor



Condence concept: Electric motor

Holistic view of motor health metrics





Examples of monitored metrics in a motor

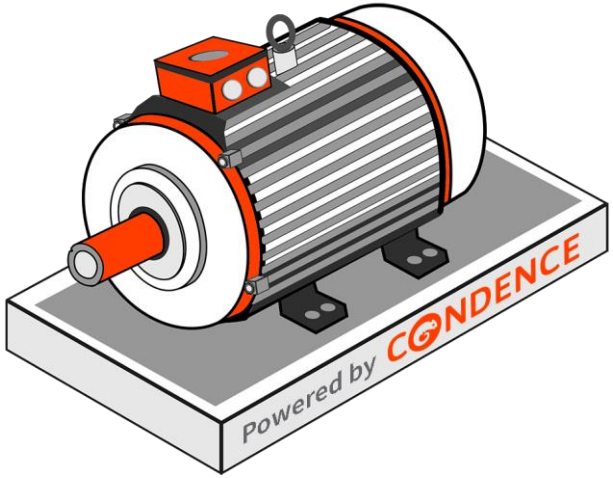
- High frequency vibration
- Bearing failure frequencies
- RPM
- Temperature
- Peak Current

What can we detect by monitoring these metrics?

- Bearing failures
- Mechanical failures
    - Imbalance, Misalignment and looseness
- Rotor and Stator failures
- Resonances
- Temperature changes (overheating)
- Performance decrease
- Changes in power consumption (electrical overload)
- Running times, optimization of asset use

Condence concept: Electric motor

Richest condition indicator: Vibration



For every 10°C that the temperature of a motor rises, the insulation life reduces by 50%.

Accuracy = time
Uses IEPE sensing technology to capture **high frequency vibration**
Wide frequency bandwidth translates into time, **time to react**

Extend the lifespan
Motors are extremely sensitive for overheating and there are many root causes for it. This is why it makes sense to **monitor temperature to avoid overheating**

Continuous & online
Based on continuous sampling (e.g. every 5 min) and edge computing technology
Maximised **time to react** even with fast evolving failures

Eliminating surprise / risk
- Unplanned work is more expensive
- Unplanned downtime is expensive

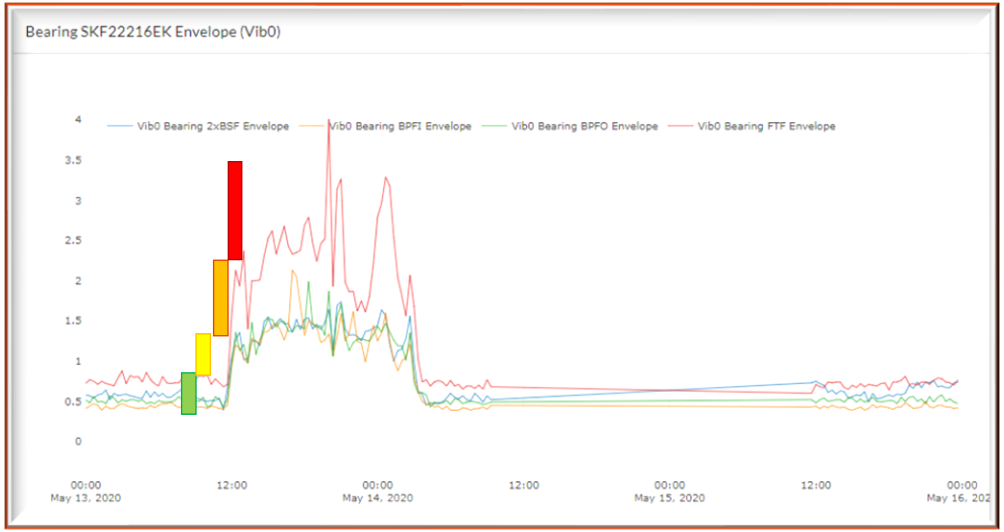
Enable condition based maintenance
Decisions and maintenance based on actual asset condition
- Know when you need to add lubricant to bearings
- Know if temperatures start to rise
- Remove unnecessary manual work (inspection & repairs)
- Eliminate human error via automatic alarms and data availability

Condition based maintenance

Create suggestive notifications

1. Set suggestive severities and thresholds for them
2. Automatic system notifications to trigger workflows
3. Notifications based on actual asset condition
4. Condition based maintenance (CBM)

- Maintenance action needed
- Plan for bearing check and lubrication
- Follow elevated vibration levels
- Normal vibration range



Monitoring view: Default dashboard structure

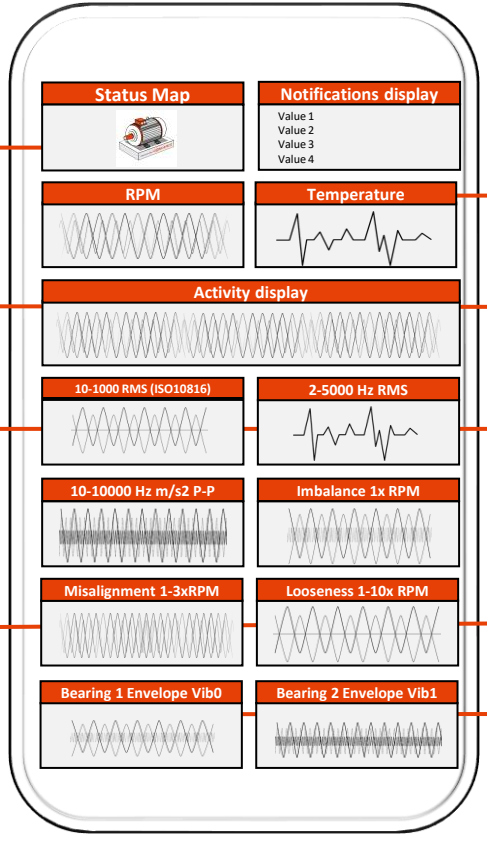
Condence components

Status Map
Image of what is being monitored, e.g. sensor placement and direction

Notifications Display
Displays what has happened / triggered thresholds during the selected time period. Easy configuration and adjustment of notifications in the cloud UI

Trend view widgets
Trend widget displays the calculated / sourced data as a line chart (one or more). Trend widget has plenty of tools available for further analysis and exports.

Activity Display
This period component displays summarised period data as a list view which can be expanded. The period component can be used for monitoring running hours of machinery with detailed information like motor starts and stops or in what times are the assets being used.



Default concept metrics

RPM
Mandatory and important information in variable speed assets.

Temperature
Temperature is the root of cause of various failure modes of a motor.

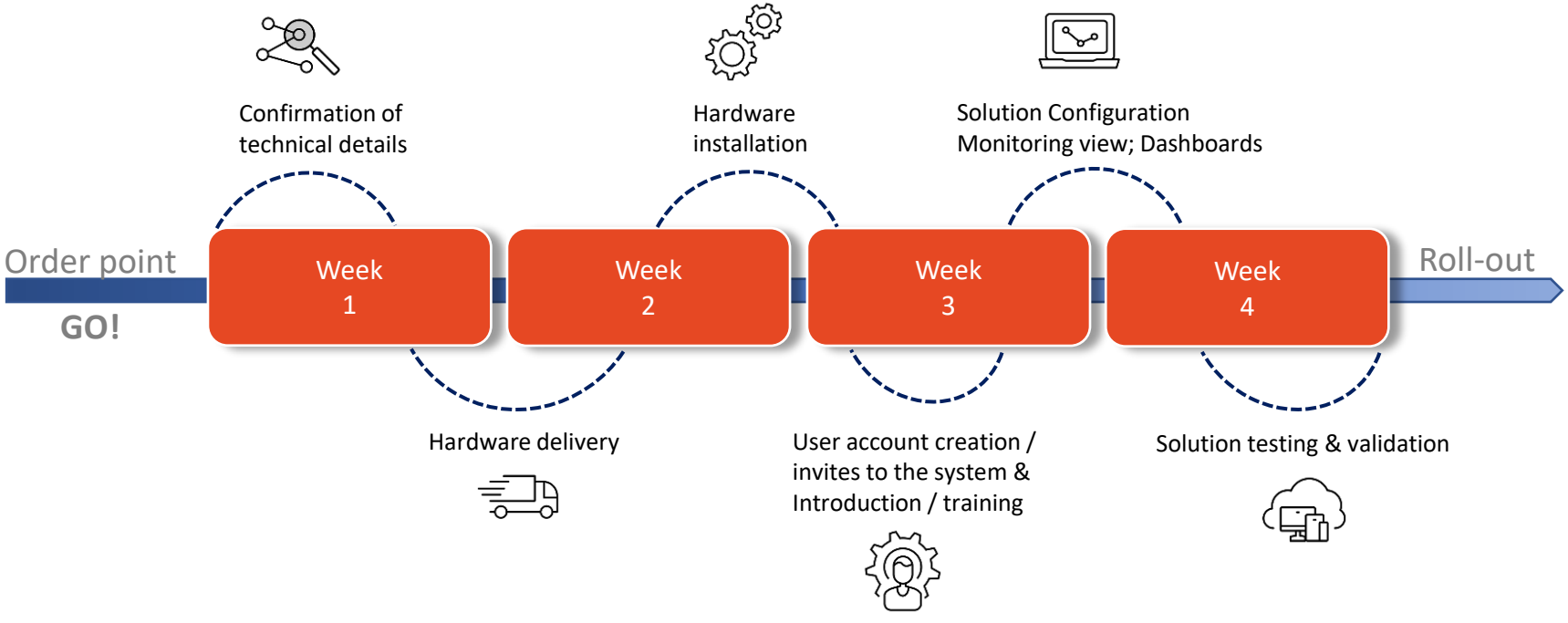
General vibration analyses
- Various frequency ranges
- Acceleration and velocity (e.g. ISO10816)

With Condence you can easily build your preferred measurements and analyses in the cloud UI

Mechanical
Multiples of RPM to detect mechanical phenomena's like imbalance, misalignment and looseness

Bearing failures
Early detection of bearing failures via enveloping high frequency vibration. Failure stages 1-4

Delivery timeline



Read more at:
condence.io/condence-electric-motor/

Condence is a product of Distence Oy

Sinikalliontie 18 B, FI-02630 Espoo, Finland

sales@distence.fi