Remote Condition Monitoring System
Cyclops² remote condition monitoring system
We make your plant predictive maintenance easier

Digital context
Digital transformation is proving itself of critical importance for business continuity. In the industrial world, digitalization is unquestionably contributing to improving plants’ efficiency, productivity and reliability via, amongst others, new remote predictive maintenance solutions offering operators continuous monitoring and enhanced analytics.

Termomeccanica’s Cyclops² solution
Termomeccanica, with its unique capacity to cater to customer needs with innovative engineered pumping solutions has recently introduced Cyclops² in its portfolio of services. This enhanced remote condition monitoring system - available in both wireless & wired versions - allows our customers to monitor their pumping systems so as to analyze & predict their performance and proactively identify & address issues before they cause downtime & disruptions.

General IoT approach
Termomeccanica designed Cyclops² following an IoT approach, i.e. integrating wireless sensors installed on the pumps to be monitored with gateways that collect the performance data measured & transmit it via a secure connection to a dedicated cloud service that customers can easily access through a mobile application.

Application fields
Cyclops² can be used on all pumps – Termomeccanica’s and other OEMs – installed in our usual industrial sectors, i.e. in Oil & Gas, Petrochemical, Power Generation, Desalination and Water transmission plants as well as other industrial facilities such as steel mills.

Stress-free installation & activation
All pumps manufactured by Termomeccanica are systematically equipped with Cyclops²’s standard module, which can be activated and upgraded upon request at any time through a series of Service contracts - feel free to contact us for any request you may have in this regard.

Cyclops² can, of course, also be easily adapted and installed on other OEMs’ pumps.
**Cyclops² remote condition monitoring system**

**How it works**

**Smart wireless sensors**
measuring pump performance parameters such as temperature & vibrations

**Data transmission system**
collects data from sensors & safely transmits it to a Cloud system via encrypted network (4G, Wi-Fi, Ethernet)

**On-line cloud storage & analytics software**
the data transferred to the Cloud system is analysed through a proprietary software allowing to identify & predict pump criticalities

**Mobile application - reporting & alerts**
customers can consult easy-to-interpret reports any time anywhere on a computer, tablet or cell phone. They can also receive alerts when parameters deviate from a chosen threshold limit.
Cyclops² remote condition monitoring system

How it works

Data collection – smart wireless sensors
Cyclops² smart wireless sensors are easy to install & use and allow for highly efficient & reliable continuous pump performance data collection.

The Cyclops² smart wireless sensors family include:
- Temperature sensors
- 3-axial vibration sensors
- Amperage sensors
- Rotation speed (RPM) sensors
- General purpose sensors (pressures, etc.)

Cyclops² wireless sensors’ key features are:
- 3.6V Li - TL-5935 long-life battery
- Design in compliance with ATEX Class 2
- Secure & long-distance transmission capacity
- Customization of measurement intervals & alert values

Safe data transmission & on-line storage
Cyclops² wireless sensors are connected to a Termomeccanica on-line cloud service through an easy to install & use data transmission system which ensures safe encrypted transmission via 4G, Wi-Fi or Ethernet connectivity.

Termomeccanica’s on-line cloud service allows customers to access data, trends & analysis in an easy & flexible mobile way, i.e. via their computers, tablets or cell phones, anywhere at any time.

Enhanced analytics proprietary software
Termomeccanica has developed a proprietary software with enhanced analytics capacity with the view to support its customers in optimizing the condition monitoring and predictive maintenance of their pumps.

In fact, Cyclops² software allows customers not only to identify but also to predict their pumps’ criticalities and, consequently, to define & take/plan corrective actions before disruption/ downtime occur.

Our software includes data analysis and post-processing related to the parameters monitored by the service module type chosen by the customer.

Cyclops² also includes a smart alert option, i.e. the application automatically sends an alert to the customer if a pump performance parameter deviates from a standard threshold limit.

User friendly reporting application
Termomeccanica’s Cyclops² mobile application offers a user-friendly customer interface as well as easy-to-interpret report formats such as trending graphics.
Cyclops² remote condition monitoring system
A flexible modular service offering key benefits to plant operators

<table>
<thead>
<tr>
<th>Cyclops² Service module type</th>
<th>Temp.</th>
<th>Vibrations</th>
<th>Amperage</th>
<th>Speed</th>
<th>Pressure</th>
<th>Other pump parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>●</td>
<td>●</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Intermediate</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Advanced</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

Wireless-Cyclops² - service modules
Termomeccanica declines its wireless-Cyclops² following a flexible modular approach, starting from a pre-installed standard module including basic temperature and vibration measurements up to advanced configurations designed together with customers in order to answer their specific requirements.

Wired-Cyclops² option
For pumps performing critical services, e.g. water injection pumps for oil extraction service, Termomeccanica also offers a wired version of Cyclops² for real time continuous monitoring of all functional pump parameters through signal capture from junction box or directly from DCS. An option for customers looking for ultimate reliability and efficiency.

Our expert Service team of qualified engineers & technicians is at your disposal to assist you throughout all the stages of the process — from defining the best module for your condition monitoring needs, to installing & activating the service, up to supporting you in implementing any subsequent predictive maintenance action.

Cyclops² - key benefits for plant operators
Cyclops² is an easy to install & use integrated system which:
- allows continuous & accurate on-line pump performance data measurement (vs periodic less precise manual measurements)
- enhances statistical analysis, facilitating troubleshooting (identification of criticalities/ malfunctions & planning of corrective actions before failure)
Cyclops² therefore contributes to a pump:
- repair costs reduction
- MTBF increase
- unscheduled downtime & outage reduction
- Residual life calculation
- reliability & efficiency increase
- preventive maintenance automation & optimization

Cyclops² cloud-based solution with mobile application also allows for an easy and secure access to data and relative analysis.

All in all, Cyclops² answers the plant operators’ need for smart solutions related to machines & systems contributing to total plant efficiency & reliability as well as opex & risks reduction.

Remote Condition Monitoring System
To optimize your pumping equipment maintenance, contact us right away at the following dedicated e-mail:

cyclops2@termomeccanica.com