



# Compressor health @ your fingertips

GEnyus: advanced diagnostics for conventional and hyper reciprocating compressors



## What it is

Compressor diagnostics is the process of determining the root cause of detected anomalies by observing and analyzing the difference between actual and expected behavior (e.g. vibration, temperature, pressure). The goal is to keep machines operating at peak performance, to avoid abnormal wear and to identify incipient problems before a failure occurs. Traditional procedures involve periodic manual calculation and interpretation of values from pressure gauges, temperature sensors and vibration monitors.

## How it works

GEnyus continuously monitors the compressor's mechanical and thermodynamic behavior, and analyzes machine and process data with sophisticated diagnostic software to assess the machine's condition, detect problems at an early stage, and provide specific maintenance recommendations. Its remote, modular design provides the opportunity to extend monitoring, troubleshooting and diagnostics to multiple compressors simultaneously. This real-time assessment of the compressor's condition increases productivity and safety, reduces unplanned outages and reduces maintenance costs.

## A new kind of diagnostic system

With an installed fleet of over 6,000 reciprocating compressors and 40 years of OEM experience, GE's engineers have developed GEnyus – an advanced system of mathematical models that predicts the behavior of critical machine components and processes, individually and in combination. Each model is designed to address a specific feature such as:

- Prediction of thermodynamic behavior of gas mixtures
- Calculation of compressor performance
- Prediction of cylinder valve behavior
- Analysis of pressure and flow pulsation and mechanical vibration in piping systems
- Evaluation of bearing behavior

GEnyus quickly detects abnormal compressor behavior – and reliably predicts future performance deviations. It manages approximately 10,000 associations between individual parameters – correlating more than 100 symptoms and diagnosing 50 different anomalies in critical components such as:

- Connecting rod small end bearings
- Connecting rod big end bearings
- Main bearings
- Piston rings in any cylinder of any stage
- Piston rider bands in any cylinder of any stage
- Cross-head shoes

## GEnyus does the hard part for you

By continuously and automatically calculating the relationship between various changing parameters, GEnyus identifies and prioritizes potential causes of performance deviations.

This gives your engineering and maintenance staff a key advantage. They no longer have to spend valuable time gathering information and extrapolating alternative scenarios – but can immediately initiate corrective actions, knowing where best to focus their efforts before more serious problems develop.

GEnyus improves response time, reduces risk of damage and increases ongoing compressor safety and performance.

It helps avoid unplanned shutdowns and achieves significant savings – both in regular maintenance and emergency repair costs.

## A whole team of specialists in one tool

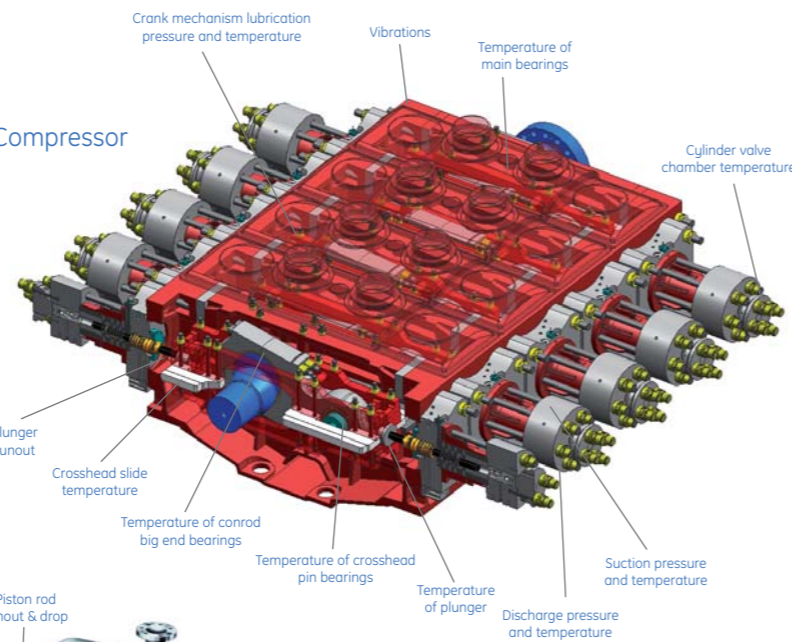
GEnyus interfaces with the existing Control/Supervisory system and sensors to collect data and status parameters. It processes them in a dedicated Human Machine Interface and clearly displays warnings, trends, diagnostics and recommendations – so operators can take any necessary machine control actions through the existing Control Panel or DCS system and plan maintenance actions.

### Key system features:

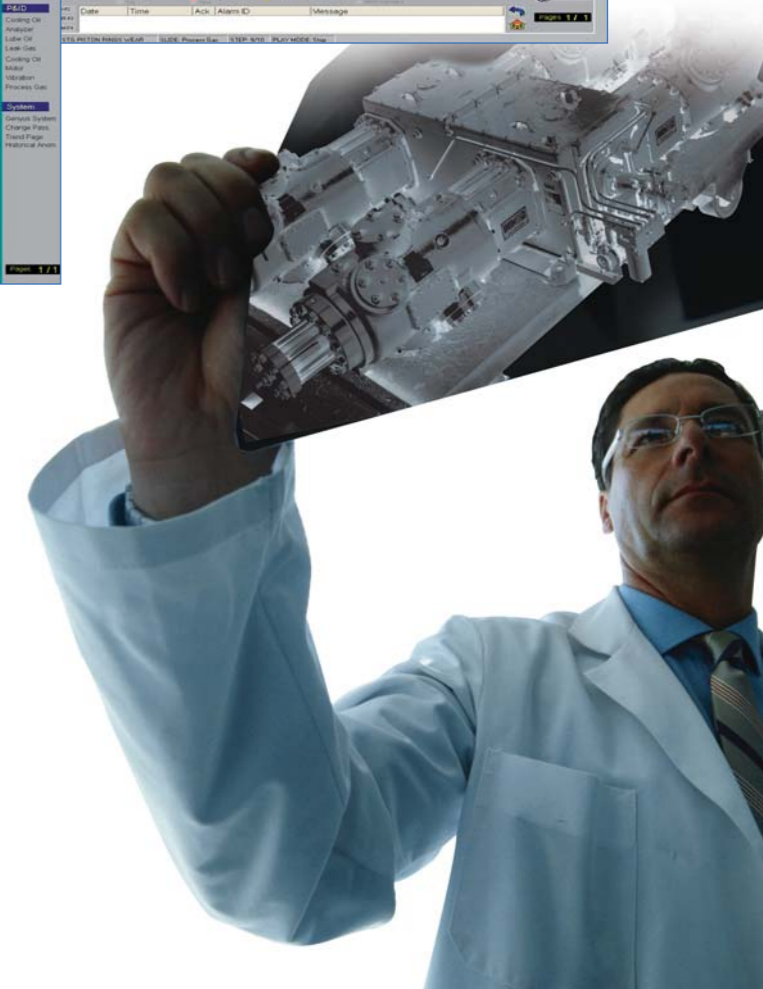
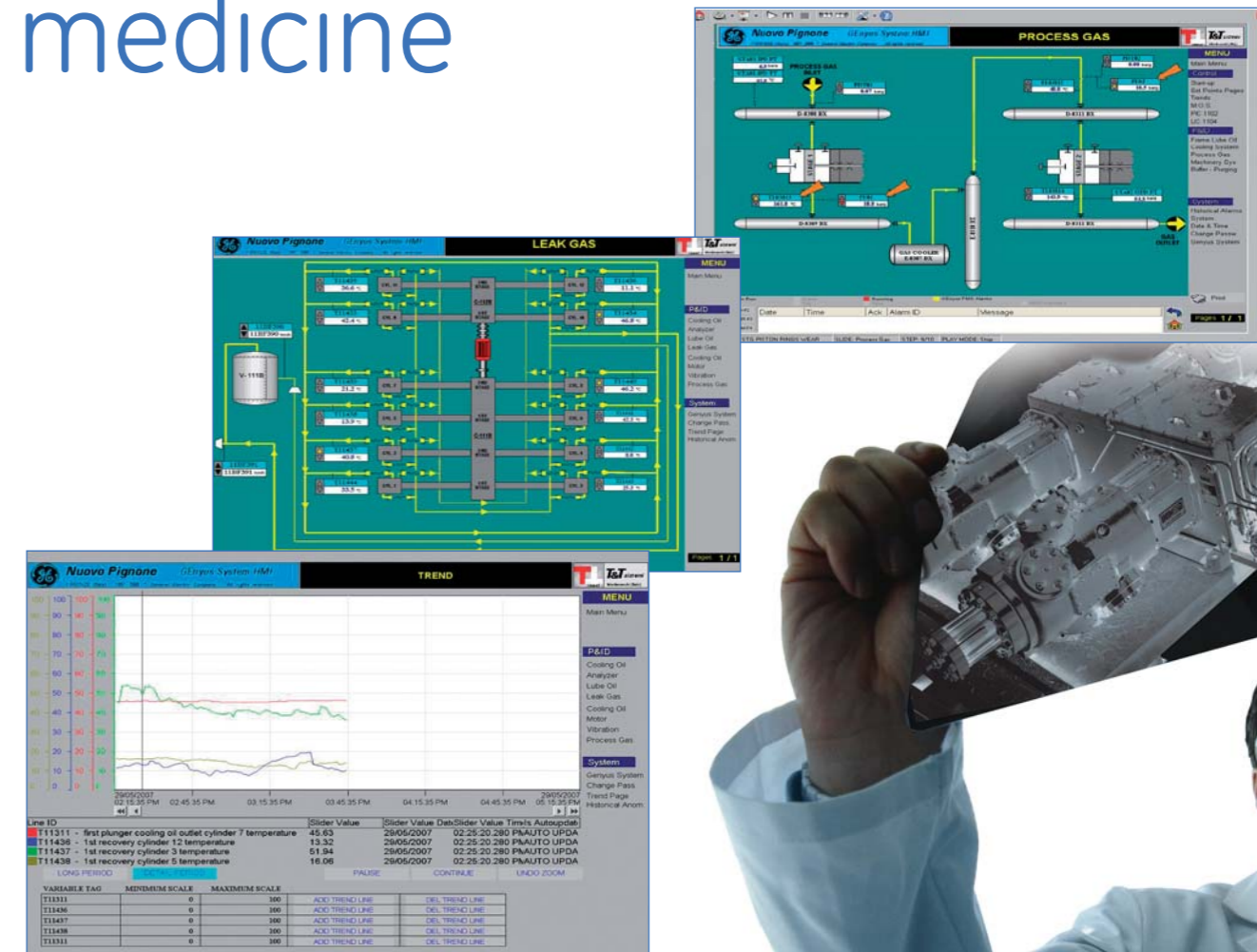
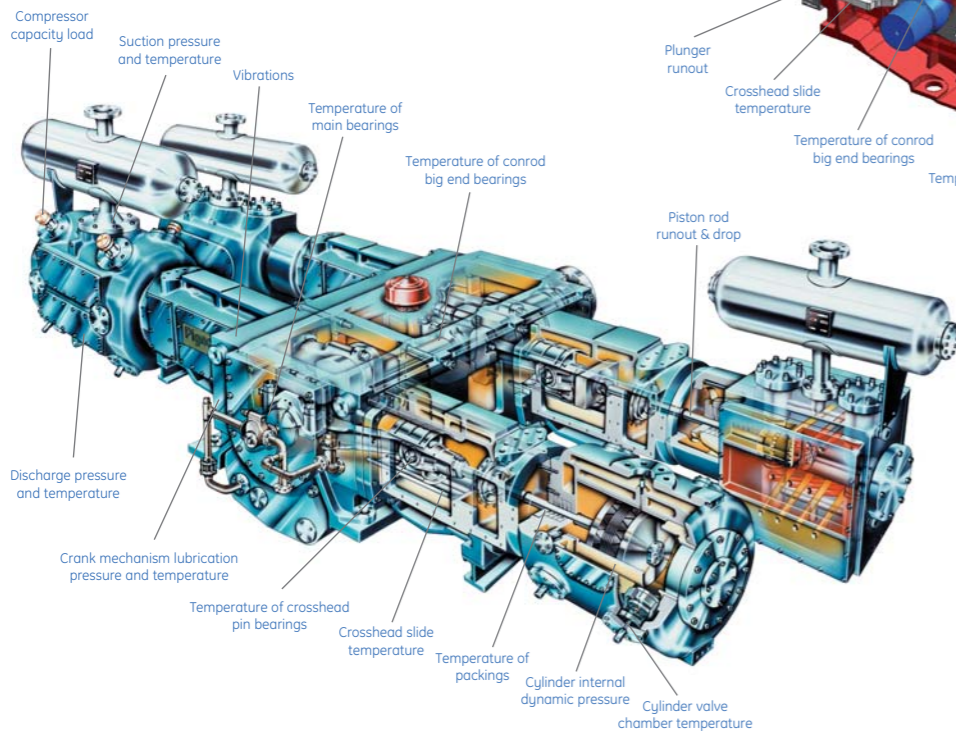
- Diagnostic software with thermodynamic and mechanical simulation modules
- Schematic machine/process view
- Trend display and storage
- Real-time data collection, management and storage
- All associated set-up and support services:
  - Site-specific engineering services
  - Control panel upgrade and field instrumentation as required
  - Installation, set-up and training
  - Optional Remote Monitoring, Diagnostics and Tele-assistance

# Preventive medicine

Hyper Compressor



Conventional Compressor



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GE imagination at work