



# System 1 Bently Performance module

The **Bently Performance software module** extends functionality of System 1 to include online monitoring of thermodynamic performance. The module fully integrates with the System 1 database and display modules to give users access to comprehensive mechanical and thermodynamic machine-condition information.

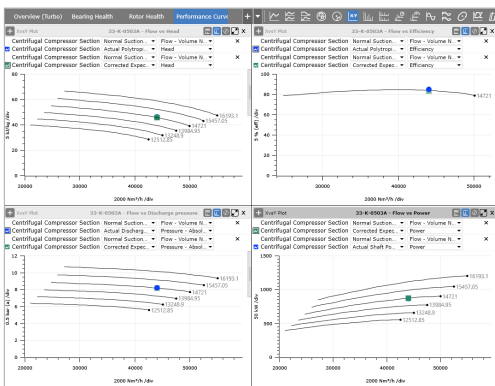
To ensure that Bently Performance is properly installed, configured, and commissioned to meet each customer's application, the module is sold as an engineered solution. This includes services to evaluate and fully implement the requirements for performance-related calculations to achieve data accuracy and repeatability.

Key performance indicators include:

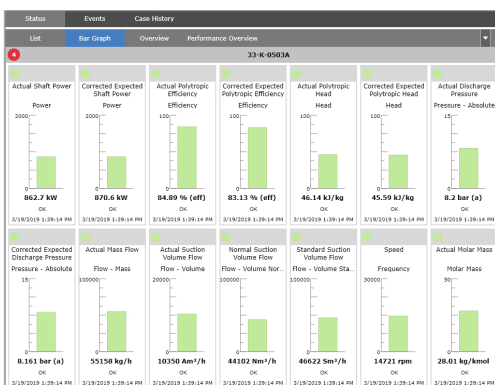
- **Actual:** calculations for current ambient and operating conditions
- **Expected:** expected output for comparison to actual outputs
- **Corrected actual:** actual outputs are transposed to standard day conditions (ISO or site-specific rating)
- **Corrected expected:** expected outputs transposed to standard day conditions

Bently Performance executes computations based on ASME PTC codes. All data is accessible from System 1 Display. By correlating and comparing performance, process, and vibration data within System 1 Display, users will have a better understanding of the overall health of the identified machinery.

The module allows manual input data to be used when input values are not available through System 1 Data Acquisition. The manual input data can be used in performance calculations, and viewed as trended values in System 1 Display.



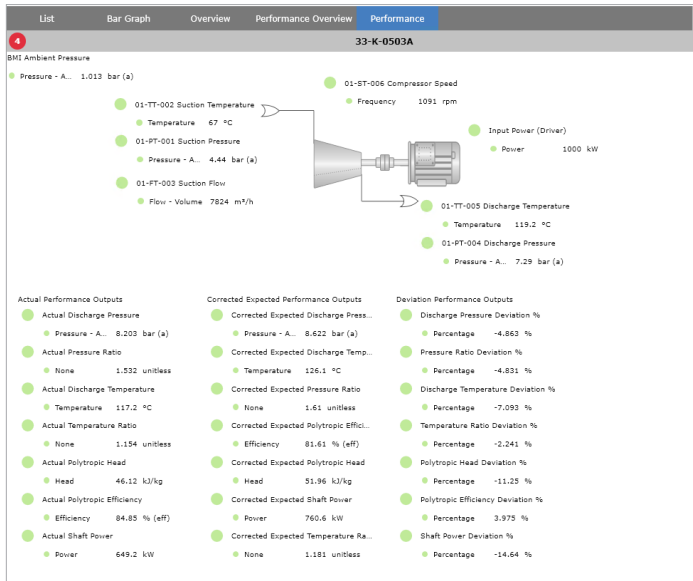
System 1  
compressor  
performance plots



System 1 bar-  
graph view of  
performance KPIs

## Benefits

- Determines machine degradation by comparing measured data with expected data ('new & clean')
- Calculates performance under reference conditions
- Detects inconsistent measurements
- Clear analytical displays: e.g. compressor maps, trends, XY plots, etc.
- Connects to process data sources like DCS, historians, etc., using industrial standard protocols like OPC
- Provides tight integration with System 1



SI Performance display screen

## Capabilities

- Gas turbine modeling
  - Single, two-shaft, three-shaft, aeroderivatives
- Steam turbine modeling
  - Condensing, non-condensing, with/without extraction, with/without induction
- Compressors
  - Wide variety of compressors including (but not limited to): air, process, side stream, screw
- Pumps
  - All types of pumps including water, sea water, vertical, and submersible
- Generators
- Accurate real-gas calculations using extensive library of gas properties and equations of state
- Hydrocarbon processing pedigree
- Traditional displays/plots
  - Bar graphs
  - Multi-variable plots
  - Trend plots
  - Train diagrams
  - Compressor maps
  - Multi-purpose performance maps
- SI/English units
- Integration with System 1, and Decision Support to enable intelligent alarms and customization of knowledge-based rules

### Supported machinery

- Gas turbines
- Steam turbines (HP/IP/LP)
- Compressors
- Pumps
- Generators
- Turbo-expanders
- Expander-recompressors
- Many others rotary assets

### Industry

- Upstream, Midstream, and Downstream Oil and Gas
- LNG
- Chemical and Fertilizer plants
- Pipelines
- Power Generation

### Services

- Field services for commissioning
- Integrated factory acceptance testing
- Onsite and remote monitoring
- Performance model tuning
- Training