

Sentinel® CPM - Compressor Performance Monitor



Sentinel-CPM calculates compressor performance and determines compressor health and safety in real-time. The Web interface allows users to view data from the CPM module with a web-browser-no software required. PV & PT curves can be viewed with theoretical overlays.

MMS teamed with ACI and licensed their eRCM™ library for all the thermodynamic calculations and it is incorporated in each CPM module.

After a customer uploads their eRCM Viewer™ file of the unit, Sentinel CPM compares actual measurements to theoretically expected values – and notable differences help identify compressor health and safety issues!

Sentinel CPM Key Features:

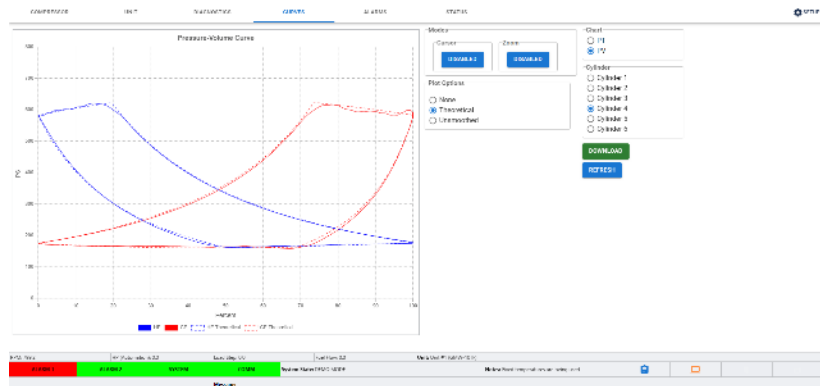
- Real time measurements and alarming of rod loads and degrees of reversal
- Automated leak detection of suction & discharge valves, rings and packing
- eRCM Kernel enhanced with MMS real time compressor performance calcs
- Changeable Usernames, Encrypted Passwords and Multi-Factor Authentication per TSA mandates
- Continuous monitoring of up to 6 double-acting compressor cylinders (up to 10 cylinders w/ an additional CPM module)
- 12 pressure sensor inputs
- 2 Magnetic Pickup inputs (TDC & Deg)
- MODBUS (RS-485 & Ethernet) communication
- Class I, Division 2, Groups A, B, C, D rating
- Alarm Relay - Dry contacts



Sentinel CPM Calculations:

- Cylinder-End HPs
- Suction/Discharge Pressures
- Suction/Discharge VEs
- Rod Reversals & Rod Loads
- OEM Methods and Limits Used
- Theoretical PV Cards
- Theoretical Discharge Temps.
- Flows & Flow Balances
- Calculated Clearances
- Interstage Pressure Predictions
- Gas Leakage Rates

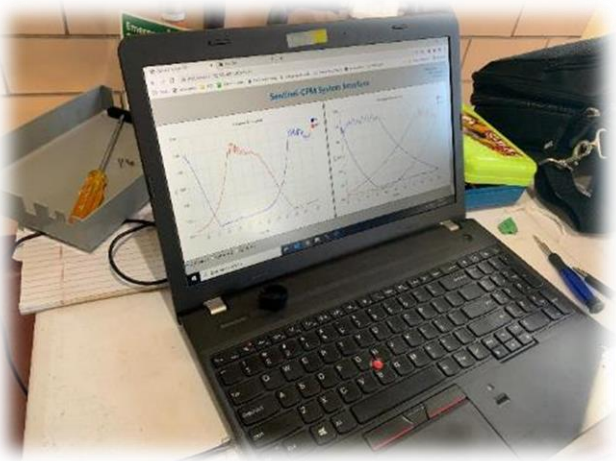
Sentinel-CPM Screens:



P-V / P-T Curves with Theoretical Overlays

Cylinder	Values	Packing	Rings	Volumetric Efficiency	Temperature	Clearance
1	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed
2	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed
3	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed
4	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed
5	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed
6	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed
7	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed
8	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed
9	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed
10	HP: No Cyl	Unsmoothed	No Cyl	Unsmoothed	Unsmoothed	Unsmoothed

Diagnostics & Recommendations



Cylinder	Suction Pressure (psig)	Discharge Pressure (psig)	Comp Ratio	Discharge VE (%)	Suction VE (%)	Discharge Temperature (°F)	Flow (MMSCFD)	Calculated AVG Clearance (%)	Suction Temp (°F)	Discharge Temp (°F)	Min Rod Reversal (degrees)	Rod Load Compression (A-B) (% Limit)	Rod Load Reversal (A-B) (% Limit)
1	107.1	102.0	1.05	6.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0
2	117.0	107.0	1.09	4.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0
3	127.0	117.0	1.12	2.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0
4	137.0	127.0	1.15	0.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0
5	147.0	137.0	1.18	-2.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0
6	157.0	147.0	1.21	-4.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0
7	167.0	157.0	1.24	-6.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0
8	177.0	167.0	1.27	-8.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0
9	187.0	177.0	1.30	-10.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0
10	197.0	187.0	1.33	-12.0	35.0	115.0	0.00	0.00	14.00	211.00	167	28.1	25.0

Compressor Parameters Summary

Sentinel CPM Specifications

Hardware

Power Input	13 W, 24 VDC (18 - 30 VDC)
Sensor Inputs	12 Pressure (4-20 mA or 0-5 V) 2 Magnetic Pickup (TDC & Deg)
Alarm Relay	Dry contacts, Normally energized NO & NC contacts Resistive Load: 2 A, 28 VDC max
Communications	MODBUS, RS-485 & Ethernet

Physical & Environmental

Size	12 x 8 x 2 inch (305 x 203 x 51 mm)
Weight	3 lbs. (1.4 Kg) (w/ Cover & Mounting Plate)
Operating Temp	32 – 140 °F (0 – 60 °C)
Ratings	Class I, Division 2, Groups A, B, C & D Certificate: SUW-CERT220100011