Woodward products for compressors

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**Vertex**
- Simplex Controller
- User Configurable
- Compressor control
- One & Two Stage Apps
- Includes Anti-Surge Logic
- Compatible with 505

**Flex500**
- Simplex Controller
- Configurable Steam Logic
- Programmable Compressor Logic
- Turbine & Compressor Control
- Motor & Compressor (500)
- One & Two Stage Apps

**MicroNet**
- Redundant Controller
- Custom Programmable
- Turbine & Compressor Control
- Motor & Compressor Control
- One to Five Stage Apps
**Vertex-XT**
- Simplex Controller
- User Configurable
- Turbine & Compressor Control
- Anti-Surge Protection
- One & Two Stage Apps

**Vertex-Pro**
- Redundant Controller
- User Configurable
- Turbine & Compressor Control
- One & Two Stage Apps
- Includes Anti-Surge Logic

Future
Vertex overview

Applications
- Axial or Centrifugal Compressor Applications
- Turbine or Motor Drive Applications
- 1 or 2 Recycle Loops
- Blowers, fans etc

User Configurable Functionality
  Anti-Surge Control/Protection
    - 1 or 2 recycle loops
    - With stage to stage decoupling
    - Patented Rate PID Anticipation Algorithms

Performance/Capacity Control
  - Performance Control to Anti-Surge Decoupling
  - Speed demand to prime mover (motor, turbine)
  - Throttle valve demand

Surge Detection
  - Surge Counter
  - Configurable actions
## The Vertex benefits

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>One Integrated Control System</td>
<td>• Simple to operate&lt;br&gt;• Simple to support (troubleshoot)&lt;br&gt;• Cost savings in spares</td>
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<tr>
<td>Uses standard OEM qualified control and protection algorithms</td>
<td>Operators &amp; Engineers understand how controllers operate</td>
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<td>40 millisecond scan rates</td>
<td>Accurate and stable compressor control</td>
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<td>Internal Simulator</td>
<td>Allows easy validation of operation as well as plant personnel training</td>
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<tr>
<td>Calculates compressor map ratios and limits automatically</td>
<td>• Lowers risk of operation problems&lt;br&gt;• Easy to make performance/protection improvements</td>
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<tr>
<td>User Friendly Operator Control Panels</td>
<td>Easy for operators to understand and manage system</td>
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<tr>
<td>Integrated motor protection functions</td>
<td>Protects motor from overload conditions</td>
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</table>
(4) Ethernet Ports
(2) Act Outs
(8) Analog Inputs
(2) Speed Sensors
(6) Analog Outputs
(1) Serial Port
(4) CAN Ports
(8) Relay Outputs
(20) Discrete Inputs

Depth = 3.3” (83.82mm)

Input Power

Input Power
Example Air Compressor Control Solution

- All functions are software-enabled/configurable
- Blow-off valve control
- IGV/ICV control
- Auto start/stop
- Motor power/current limiting control
- Control of Auxiliaries
  - Motor starter interface
  - Inlet filter dP
  - Vibration monitoring (4-20 mA)

Distributed I/O (Optional)
Integrated control functions

**Surge Prevention**
- Anti-Surge Control (PID)
- Rate Control (PID)
- BOOST
- Configurable Pre-Pack capability
- Piping Lag compensation

**Surge Recovery**
- Surge Detection
- Surge Recovery Routines
- Surge Min Position

**Process Bias Logic**
- Valve to Valve Decoupling

**Compressor Process Limiting**
- Suction Pressure Override When Compressor is online
- Discharge Pressure Override When Compressor is online

**Aux Functions**
- Sequence Positioning
- Surge Control Line Biasing
- Manual Control Modes
- Auto Gain Compensation
- Surge Counter
- Valve Freeze Logic
**Integrated Operator Control & Service Panels**

**Functionality**
- Control configuration
- Configure I/O to site requirements
- Activate/Deactivate Control Functions
- Adjust Tunable Values
- PID tuning
- CPU run/stop
- Configure Network IP address

**Included Software Tools**
- RemoteView
- Control Assistant - Trending Tool
- AppManager – Application Software Management Tool
- OPC Server program
Front Panel Mount Models
- 8200-1370 = Vertex – Front Panel Mount – OCP, LV
- 8200-1371 = Vertex – Front Panel Mount – OCP, HV
- 8200-1372 = Vertex – Front Panel Mount – OCP, LV, Hazardous Loc Ratings

Back Panel Mount Models
- 8200-1380 = Vertex – Back Panel Mount, LV
- 8200-1381 = Vertex – Back Panel Mount, HV
- 8200-1382 = Vertex – Back Panel Mount, LV, Hazardous Location Ratings

Auxiliaries
- 8200-1100, Distributed I/O Module - RTCnet RTD (100/200ohm)
- 8200-1101, Distributed I/O Module - RTCnet T/C (Fail High)
- 8200-1103, Distributed I/O Module - RTCnet AIO Loop power
- 8200-1104, Distributed I/O Module - RTCnet DIN (16ch)
- 8200-1105, Distributed I/O Module - RTCnet DOUT (16ch)
- 8928-5311 = RemoteView Software License
- 8928-7482 = Vibration Sensor, Accelerometer
- SEC PN = Vibration Sensor, Proximity – Refer to SEC of America website

Vibration Sensor Kit
Distributed I/O Module
Remote View Software Kit