

# Packaged systems

Bently Nevada asset condition monitoring



# Complete system enclosure packages

In about the same time it takes to deliver unconfigured monitoring racks and components, Bently Nevada Asset Condition Monitoring team can deliver a complete packaged system using our standard cabinet designs.

Packaged systems address the need for a completely site-ready solution that can be commissioned at site faster and with fewer complications. This is accomplished by performing work at the factory that would normally be done in the field. The enclosed instrumentation is delivered to site configured, integrated, documented, pre-wired, labeled, and tested. The site simply connects field wiring and power using the enclosure's easily accessible, clearly labeled terminals.

Customers around the world choose our system

- **Simplicity** – A packaged system cost-effectively simplifies and streamlines the hundreds of details associated with placing a machinery protection and management system into service.
- **Quality** – Built to the same rigorous standards of quality as all of Bently Nevada products, attention to detail and craftsmanship permeate every facet of our cabinets.
- **Protection** – Specifically designed to protect personnel from accidental contact with enclosed electrical instruments and to protect those instruments against specified environmental conditions.



- **Convenience** – Internal layout permits convenient system installation and wiring, while the exterior is attractively designed to complement your particular installation site.
- **Scope** – We can install, wire, and commission our cabinets and enclosed instrumentation at your site, in addition to providing a full range of project management, training, and other services.
- **Flexibility** – We provide a full range of cabinet designs to best meet our customers' needs. We offer a standard "off-the-shelf" cabinet as well as engineered solutions to address non-standard customer requirements. We can accommodate third-party instrumentation and components in our cabinets. We also can provide customers with cabinets specifically designed and manufactured for installation in hazardous environments.
- **Single-Source Supplier** – All manufacturing operations and services are coordinated by us, providing greater convenience, simplified communications, a single point of responsibility, less travel to multiple vendors, and time savings. When Factory Acceptance Testing (optional) is specified, we test not just the cabinet, but the installed instrumentation as well. This reduces the installation and testing time required on-site.
- **Extensive Applications Experience** – We have more than 45 years experience in projects for rotating machinery monitoring systems in diverse applications around the world.
- **Computer-Aided Design/Drafting** – Clear, high quality drawings offer consistency throughout the documentation package.
- **Electrical Design** – Power distribution systems are designed to meet the monitoring equipment needs while preventing false trips, missed trips, or fault conditions.
- **Quality Assurance** – All cabinets are subjected to a battery of standard inspections and tests at our manufacturing centers, assuring system quality and compatibility upon arrival in the field.
- **Field Service** – We pride ourselves in our service excellence. Product Service and/or Design and Installation Services are available for installing new cabinets in the field, providing turnkey convenience.
- **Training** – Your needs for system orientation and training can be provided at the factory on your specific hardware, rather than on typical equipment. The result is enhanced familiarity and greater confidence by those who will actually be using the system once commissioned in the field.



# Overview: world-class instruments deserve world-class enclosures

A variety of display options are available and fully configured upon request.

Power and signal wiring are segregated for enhanced protection and reduced susceptibility to measurement interference.

Electromagnetic compatibility (CE marking) for customers requiring additional protection of the electrical components and where required in European applications.

All cabinets have built-in cooling to prolong instrument life.

Monitoring systems are configured at the factory to match customer-specific application details (performed upon request).

Certification to CSA and US standards are available for cabinets installed in North American sites.

Factory Acceptance Testing (FAT) available for complete system including instrument racks, communications processors, computers, software, and related equipment.

The accessibility of all components is ideal for field installation and maintainability. Complete design services are available to fit difficult requirements at a competitive price.

Order support provides schedule, single point of contact, expediting, and other services to meet your project plans/schedules.

Foreign language support is available upon request.

ISO 9001 Certified (North America and Europe locations).

Outline dimensions/internal layout/power/field termination/data communication drawings are supplied for easy field installation and maintenance.

## Standard<sup>1</sup> equipment and options

### NEMA 12 Enclosures – Indoor Floor mounted<sup>2</sup>

The standard features of the IP54/NEMA 12 enclosures are as follows:

Includes 100 mm base/plinth (used for bottom cable entry or to meet height requirements for display). Color: RAL7022 (umber gray).

Solid front and rear access door with 3-point latches and key locks to prevent unauthorized entry.

- Outlet filter and inlet fan installed in rear door. Light with motion detector.
- Power Termination Blocks<sup>4</sup>
  - Phoenix UT 6 (beige) or equivalent.
- Signal Terminal Blocks<sup>4</sup>
  - Phoenix UT 2.5 (beige) or equivalent.
- Recorder Termination Blocks<sup>4</sup>
  - Phoenix UT 2.5 (beige) or equivalent.
- Relay Termination Blocks
  - Phoenix UT 2.5 (beige) or equivalent.PVC insulated wire for all wiring.

- Cable guide rings and/or PVC wireway for routing cable.
- Four removable eye-bolt lifting lugs.
- Print pocket for documentation storage.
- Two copper bus bars (earth and signal common).
- Provision for primary and secondary line power.
- Options for 120 VAC/60 Hz, 240 VAC/50 Hz, or 125 VDC operation.
- DIN-mount double-pole circuit breakers supplied for each 3500 power supply and electrical device.
- Field-cable entry through removable gland plates in bottom of enclosure<sup>6</sup>.
- Ring-tongue type wire lugs are used for connection to bus bars.
- Screw clamp style terminals are used for all other wiring with ferrules.
- Simplex power outlet<sup>5</sup>.  
Internal wires are labeled per GE standard conventions.

### Notes:

<sup>1</sup> Custom cabinets and modifications to standard cabinet designs are available upon request.

<sup>2</sup> Wallmount style cabinet dimensions vary with installed equipment and applications.

<sup>3</sup> Height does not include optional 100 mm base.

<sup>4</sup> Knife disconnect terminals provided upon request.

<sup>5</sup> Outlet style based on end user location.

<sup>6</sup> Bulkhead-mount racks mounted on rear mounting panel.

# System configuration

All Bently Nevada monitoring systems included in a Packaged System are configured<sup>1</sup> with project-specific data<sup>2</sup>. Typical information required to configure monitoring systems includes the following:

- Channel Types
- Full-Scale Ranges
- Alert and Danger Setpoints
- Transducer Orientations
- Relay Logic Configuration
- Modbus<sup>3</sup> Register Mapping<sup>3</sup>

## Notes:

<sup>1</sup> Configuration software is used to perform system configuration and verify system functionality.

<sup>2</sup> If provided by customer. A GE project engineer is assigned to each Packaged Systems order to develop a complete list of required data.

<sup>3</sup> This pertains to the interfaces between the monitoring systems and control/automation systems, such as distributed controls systems, turbine controllers, or programmable controllers. Other protocols are supported as well.

# Convenience features

- Internal enclosure lighting with motion detection.
- Convenience outlet to power portable equipment during commissioning or during other maintenance periods.
- Cable entry gland plates and cable clamping options.

# Equipment protection features

## Standard

- Ventilation—air circulation fans and filters are provided to ensure that adequate and clean cooling is provided for the installed instrumentation.
- Over-temperature monitoring utilizing internal thermostat with contacts for remote alarming.



# Drawings and documentation

A comprehensive drawing package is provided with each enclosure, ensuring that Packaged Systems are fully documented for those responsible for site installation and design, and for those responsible for system maintenance over its entire life cycle.

## The Standard drawing package includes:

- Mechanical Layout
- Rack Front/Rear View (showing individual monitor modules)
- Internal Wiring Diagrams (including power schematics)
- Nameplate Schedule
- Product Operation/Maintenance Manuals for all installed instruments

## Optional drawings (at additional cost) include:

- Loop Drawings

Documentation is provided in Adobe® PDF format.

# Lighting and surge protection

Lightning-caused electrical surge poses significant problems to electronic equipment. Often, a lightning strike has significant financial implications beyond simply damaging the monitoring equipment; it can lead to a false or missed machine trip, impacting your plant's processes. Proper cabinet and system wiring design is essential in protecting your instrumentation from lightning and surges while providing physical protection for the enclosed equipment. Attention must be given to component layout, proper grounding, wiring and component spacing, signal isolation, barriers and surge suppressors, wire routing, and many other details.

The best way to ensure the myriad details are properly addressed is to let us supply your complete system enclosure packages. Our design engineers and assemblers have years of experience working with all aspects of cabinets, including comprehensive documentation and labeling for ease-of-installation and maintenance.

# Standard factory testing

Standard manufacturing tests, verifications, and quality checks are performed at the factory on every cabinet and installed instrument that we ship, including:

- All hardware including monitors, monitor options, power supplies, tagging, and other details are inspected and verified against the cabinet Bill of Materials.

- A point-to-point continuity check of all wiring is performed with the instrumentation unpowered.
- AC voltage wiring is tested at 1500 VAC for one minute (high-pot) wire-to-wire and wire-to-chassis.
- Equipment installed in the cabinet is mechanically inspected and power is applied for component functional checks.

## Notes:

<sup>1</sup> ISO 9001:2015 certified facility.

<sup>2</sup> ISO certification pending.

<sup>3</sup> All locations adhere to comprehensive Baker Hughes Health, Safety and Environmental (HSE) policies and are regularly audited for compliance by company staff.



# Optional factory acceptance testing

Optional Factory Acceptance Testing (FAT) refers to extensive system testing performed prior to shipping, in addition to standard factory testing. The FAT is performed on assembled, functioning monitoring systems.

Factory Acceptance Testing advantages:

- Stress Reduction – after the hardware order is placed, we will help you gather/define the necessary configuration data – work that sometimes gets put off until deadlines loom. Then, we configure the systems to your specifications.
- Site Readiness – there is less to do once the equipment arrives on-site and startup approaches because every FAT includes:
  - Configuration Audit
  - Complete channel-by-channel loop check using state-of-the-art equipment for simulating transducer inputs
- Timeliness – problems are identified sooner and resolved faster.

Normally, the customer or their designated inspector is present to witness all FAT-related testing and verification. While customer presence is not strictly required (our protocol remains the same regardless), we have found that the FAT is more successful when customers participate directly, allowing face-to-face communication with our engineers.

To simplify logistics and reduce delays, the FAT is normally conducted at the same location where manufacturing takes place. Witnessed Remote FAT testing available using HD streaming for customers wishing to limit travel for cost savings or HSE advantages. Manufacturing/FAT facilities are available in the following global regions:

- North America: Minden, NV, USA
- South America: Campinas, Brazil
- Europe: Fót, Hungary
- Africa/Middle East: Dammam, Saudi Arabia; Jebel Ali, Dubai, UAE
- Asia: Pune, India; Singapore; Seongnam, South Korea; Shanghai, China

# Packaged system manufacturing locations



