# Bently Nevada 136711-01

## RTD/TC Internal Barrier I/O Module



Bently Nevada 136711-01 is the non-isolated RTD/TC I/O module with internal barriers and internal terminations for the 3500/60 temperature-monitoring assembly. It provides the rear sensor interface and barrier function for the approved temperature-transducer arrangement. The front 3500/60 monitor conditions the temperature inputs and compares them with programmed alarm setpoints, supporting six-channel machinery temperature monitoring. This exact spare belongs to the 3500/60 arrangement without recorder outputs; it is separate from the 136711-02 version for the 3500/61 and must be matched to the supported intrinsic-safety transducer configuration.

## Technical Specifications

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|---|---|
| **Product Identity** | |
| Part number | 136711-01 |
| Component | RTD/TC I/O with internal barriers and internal terminations |
| Isolation designation | Non-isolated |
| I/O dimensions (H x W x D) | 241.3 x 24.4 x 163.1 mm |
| Rack space | One full-height rear slot |
| **Functional Configuration** | |
| Applicable monitor | 3500/60 temperature monitor |
| Four-wire inputs | Four-wire RTDs and thermocouples excluded by barrier-system document |
| IS earthing | Required in each rack with internal barriers |
| **Performance & Power** | |
| Recorder outputs | 3500/60 arrangement is without recorder outputs |
| **Environment** | |
| Supported barrier temperature inputs | Specified three-wire RTD and thermocouple systems |
| Operating temperature | 0 to +65 degrees C with internal-barrier I/O |
| Storage temperature | -40 to +85 degrees C |

Selected original manufacturer material follows on pages 3–6.

## Compatibility & Selection Guide

System compatibility. The associated 3500/60 monitor uses 3500 Rack Configuration Software for RTD or thermocouple temperature measurements. The non-isolated RTD/TC design permits the supported input types according to the monitor and barrier configuration. Internal-barrier applications also have documented software/firmware, IS earthing and system restrictions; the barrier option is not the same as galvanically isolated TC I/O.

## Wiring & Installation Reference

### Barrier-compatible temperature inputs

1. Confirm the sensor wiring type Check the permitted three-wire RTD or thermocouple configuration in the internal-barrier compatibility table.

2. Verify the /60 I/O identity Keep 136711-01 matched to the 3500/60-specific arrangement rather than the /61 or TC-isolated spare.

### IS earth and physical separation

1. Check the system earth Confirm the dedicated 3500/04-01 IS Earthing Module position.

2. Review the cabinet layout Apply the manufacturer routing and minimum separation requirements, with space for the deeper barrier I/O.

### Installation precautions

Maintain the required IS earth and separation of safe and hazardous circuits. Internal barriers do not make 136711-01 a TC-isolated I/O, and four-wire RTDs/thermocouples are outside the documented barrier compatibility.

View installation requirements (PDF) — page 5 · View installation requirements (PDF) — page 5

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|---|---|
| | Termination, 12-position, Blue. |
| 00580444 | Connector Header, Internal Termination, 15-position, Green. |
| 134542 | 3500/60 & 3500/61 User Guide |

## 3500/60 -Specific

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|---|---|
| 163179-01 | 3500/60 Temperature Monitor (without recorders) |
| 133827-01 | 3500/60 RTD/TC Non-Isolated I/O Module, External Terminations. |
| 133819-01 | 3500/60 RTD/TC non-Isolated I/O Module, Internal Terminations |
| 133835-01 | 3500/60 TC Isolated I/O Module, Internal Terminations. |
| 133843-01 | 3500/60 TC Isolated I/O Module, External Terminations. |
| 136711-01 | 3500/60 RTD/TC I/O Module with Internal Barriers and Internal Terminations. (Not-Isolated) |

## 3500/61 -Specific

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|---|---|
| 163179-02 | 3500/61 Temperature Monitor (with recorders) |
| 133819-02 | 3500/61 RTD/TC Non-Isolated I/O Module Internal Terminations. |
| 133827-02 | 3500/61 RTD/TC Non-Isolated I/O Module External Terminations. |
| 133835-02 | 3500/61 TC Isolated I/O Module Internal Terminations. |
| 133843-02 | 3500/61 TC Isolated I/O Module External Terminations. |
| 133892-01 | 3500/61 Recorder Output External Termination Block (Terminal Strip connectors). |
| 133900-01 | 3500/61 Recorder Output External Termination Block (Euro Style connectors). |
| 136711-02 | 3500/61 RTD/TC I/O Module with Internal Barriers and Internal Terminations. (Not-Isolated) |

# Installation Guidelines

The internal barriers for a 3500 rack are incorporated in special Monitor I/O Modules. These barriers provide explosion protection for transducer systems that are connected to the 3500 system. An intrinsically safe (IS) earthing module provides the IS earth connection through the 3500 system backplane.

The IS Earth Module requires a dedicated I/O module position and precludes the use of this monitor position for other 3500 System modules. This limits a standard 19-inch rack to 13 monitor positions. Furthermore, a number of installation options are not available when internal barriers are installed in a 3500 rack.

## New Rack Installations

The same rack can contain both internal barrier and standard I/O module types without compromising the separation between hazardous and safe area field wiring.

The External Termination option is not available for I/O modules with internal barriers because hazardous area approvals do not allow the use of intrinsically safe wiring within a multi-cored cable assembly.

Monitors that contain Triple Modular Redundant (TMR) rack options cannot use internal barrier I/O modules since connecting a transducer to multiple I/O module inputs will compromise the integrity of the IS system.

A rack that contains any internal barrier module must have a 3500/04-01 IS Earthing Module to provide the Barrier Module IS earth connection.

## I/O Module Positioning

Internal barrier I/O modules have an increased depth over that of standard barrier I/O modules. Consider the rack position with respect to adjacent modules to ensure that you can easily access the I/O modules during maintenance.

Internal barrier I/O and IS Earthing modules can occupy any general-purpose rack position and can be adjacent to standard I/O module types without compromising the 50 mm (2 in) physical separation requirement between safe and hazardous area field wiring.

Follow these guidelines when positioning I/O modules:

- Group all internal barrier I/O modules in adjacent rack positions to simplify the installation.
- Place the IS Earthing Module in a rack position that provides easy access for routine online maintenance.
- Consider the IS Earthing Module's positioning relative to adjacent internal barrier I/O modules and cabinet bulkheads.

If you plan to install standard I/O modules or the IS Earthing Module between a pair of internal barrier I/O modules, allow a minimum of two rack positions so that you can easily access the standard I/O or IS Earthing Module online without disturbing the adjacent I/O modules.

## Upgrading a 3500 Rack

To upgrade a 3500 rack with standard I/O modules to a rack containing one or more internal barrier I/O modules, replace the standard I/O modules with the appropriate internal barrier modules. You can order the IS Earthing Module separately. See Ordering Information on page 7. for more information.

> The IS Earthing Module must be installed in a dedicated monitor position.

Revision 2.3 or later of 3500 Rack Configuration software is required to enable the use of internal barriers with the following monitor types:

- 3500/25
- 3500/40
- 3500/42
- 3500/50
- 3500/60
- 3500/61
- 3500/62
- 3500/70
- 3500/72

The following firmware revisions are required:

| Monitor | Firmware Version | Firmware Rev |
|---|---|---|
| 3500/25 | 1.06 | D or later |
| 3500/50 | 1.05 | E or later |
| 3500/60 | 1.06 | E or later |
| 3500/61 | 1.06 | E or later |
| 3500/62 | 1.06 | C or later |

No firmware revisions are required for the following monitors:

- 3500/40M
- 3500/42M
- 3500/70M
- 3500/72M

## Cabinet and Panel Installations

The internal barrier I/O modules add approximately 50 mm (2 in) to the depth of the rack to provide the 50 mm (2 in) physical separation between safe and hazardous area field wiring. Hence, a standard rack with internal barrier modules will not fit into a 400 mm cabinet.

The bulkhead rack version is available for installations that require this cabinet type. A standard rack with internal barrier modules will fit comfortably in a 600 mm cabinet and the 3500/06 Weatherproof Housing.

We recommend the following installation guidelines for the internal barriers within a cabinet or panel:

- The positioning of the hazardous and safe area connectors dictates installations route the hazardous area field wiring above the 3500 rack and safe area wiring below the 3500 Rack.
- Installations should carefully route the safe area wiring from the bulkhead version along the top of the 3500 rack to maintain the 50 mm (2 in) separation between safe and hazardous area wiring.

When multiple racks are installed within the same cabinet, hazardous area and safe area wiring can share the same cable trays as long as a separator is physically insulating the wires from one another.

## Compatible Monitors and Transducers

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|---|---|
| Compatible Monitors | 3500/25 Keyphasor Monitor<br><br>3500/40M Proximitor Monitor<br>3500/42M Proximitor/Seismic Monitor<br>3500/44M Aeroderivative (only with mods)<br><br>3500/50 Tachometer Monitor<br><br>3500/60 Temperature Monitor<br>3500/61 Temperature Monitor with Recorders<br>3500/62 Process Variable Monitor<br>3500/64 Dynamic Pressure Monitor (only with mods)<br><br>3500/70M Recip Impulse/Velocity Monitor<br>3500/72M Recip Rod Position Monitor |
| **Compatible Transducer Systems** | |
| Proximity | 3300 XL Proximitor Sensor<br>3300 5 mm Proximitor Sensor<br>3300 XL 8 mm Proximitor Sensor<br>3300 RAM Proximitor Sensor<br>7200 5 & 8 mm Proximitor Sensor |
| Acceleration | 23733-03 Standard Acceleration Transducer<br>330400 Standard Integral Acceleration Transducer<br>330425 Standard Integral Acceleration Transducer<br>49578-01 Standard Acceleration Transducer<br>Modified 86517 Interface Module |
| Velocity | Velomitor Sensor<br>High Temperature Velomitor Sensor |
| Temperature | **3-wire Thermocouples:**<br>Type J<br>Type K<br>Type E<br>Type T<br><br>**3-wire RTDs:**<br>10 Ω 3-wire Copper<br>100 Ω 3-wire Platinum<br>120 Ω 3-wire Nickel |
| Process Variable | +4 to +20 mA |

The Internal Barrier system does not support the following transducer systems:

- 11 mm, 14 mm, 16 mm, 25 mm, 35 mm, or 50 mm Proximitor Sensors
- Velocity Seismoprobe Sensors (/42)
- Velocity-to-Displacement Converter (/40)
- Magnetic pick-up (/50)
- 4-wire RTDs and Thermocouples (/60, /61)
- 1-5 Vdc Process Variables (/62)
- 0-10 Vdc Process Variables (/62)

Internal barriers are compatible with **approved** Bently Nevada transducer systems. For all other transducer systems, please consult your local Bently Nevada sales professional.