Monitoring Multiple Level Points

Specifications

GNMU Detector

<table>
<thead>
<tr>
<th>Type</th>
<th>Single, high temperature, high temperature, gamma detectors.</th>
<th>Microprocessor-Indicator Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detector</td>
<td>M unit can monitor 1 to 64 detectors.</td>
<td>Interface Outputs</td>
</tr>
<tr>
<td>Response Time</td>
<td>From 1 sec to 255 sec.</td>
<td>Output 1: Alarm</td>
</tr>
<tr>
<td>Read Out</td>
<td>64 pairs of lights that indicate FULL HOPPER or low fly ash buildup on hopper walls or detectors.</td>
<td>Output 2: Sensor Failure alarm</td>
</tr>
<tr>
<td>Aerosol</td>
<td>Two sets of SPECT counts, each set must be acknowledged by a button press or the condition will remain on only on the absence of the alarm condition.</td>
<td>Output 3: Sensor Failure alarm</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>(-40°C) to (20°C)</td>
<td>Special Features:</td>
</tr>
<tr>
<td>Process Temperature</td>
<td>Unlimited</td>
<td>Unit is constantly checking for abnormal conditions.</td>
</tr>
<tr>
<td>Power Required</td>
<td>None required</td>
<td>Has built-in diagnostic tests given early warning of fly ash buildup on hopper walls.</td>
</tr>
<tr>
<td>Weight</td>
<td>668 g (37g)</td>
<td>Source &amp; 5197 Source Heads</td>
</tr>
<tr>
<td>Head Weight</td>
<td>Approximately 3 lb (1.4 kg)</td>
<td>Source: Cesium-137</td>
</tr>
<tr>
<td>Mechanical Safety</td>
<td>Options available.</td>
<td>Safety: Source &amp; 5197 Source Heads are double encapsulated.</td>
</tr>
<tr>
<td>Mechanical Locks</td>
<td>Mechanical operation.</td>
<td>Electrical Interface: The hopper status is multiplexed to a host computer.</td>
</tr>
<tr>
<td>Power Source</td>
<td>115VAC or 240VAC available.</td>
<td>Outputs information is available at the 24VAC monitoring relay.</td>
</tr>
<tr>
<td>Cable Entry</td>
<td>3/8&quot; NPT (10 mm) available, consult factory.</td>
<td>Interface: The hopper status information is available at the 24VDC monitoring relay.</td>
</tr>
</tbody>
</table>

The 6400 is the most advanced system you can install.

By comparing the number of counts each detector emits with a preset count total, the presence of one of five operating conditions can be identified at each hopper:
- Low fly ash or normal hopper conditions, indicated by a high count level.
- Low fly ash buildup, indicated by a medium count level.
- High fly ash level, indicated by a low count level.
- Detector or input channel malfunction, indicated by a zero count level.

On the microprocessor's indicator panel, you'll see a green and red indicator light for each detector input channel. These lights clearly show the operating conditions or fly ash level or buildup in the corresponding hopper. The green light stays on as long as hopper conditions are normal and the detector is emitting a high level of counts. The green light blinks if the count level being received at the microprocessor falls to a medium level, indicating fly ash buildup.

If the hopper reaches a high fly ash condition, or low count, the red light comes on. Both lights will deactivate if there should be a malfunction of either the detector or its input channel.

Whenever the microprocessor receives a medium, low or zero count level from one of the detectors, it also flashes a highly visible red common alarm light and energizes a relay that can be used to turn on a control room alarm. The common alarm light continues to flash until it is acknowledged manually; then it remains on until the cause of the abnormal count is corrected.

The special high-temperature GMYU detector allows the 6400 Level System to work dependably.

The special high-temperature GMYU detector allows the 6400 Level System to work dependably.
The 6400 Level System is a state-of-the-art, microprocessor system with the remarkable ability to monitor as many as 64 fly ash hoppers, continuously, economically and precisely.

A quick look at the microprocessor indicator panel of Thermo MeasureTech's 6400 System preprints fly ash level in any of 64 locations.

The 6400 puts big capacity into small space.

The Thermo MeasureTech 6400 Level System's microprocessor-indicator unit is supremely compact. Its total weight of less than 100 pounds is housed in a NEMA 4W wall-mounted enclosure and can handle inputs from 64 detectors. The indicator panel is equipped with a red and green LED light for each of 64 detector input channels, and these lights are seen easily through a window on the front door. Thermo MeasureTech provides conduit openings and mounting lugs.

The 6400 takes on your plant's environment

The solid design of the Thermo MeasureTech microprocessor-indicator unit ensures that it meets the demands of the most rigorous environments. Because the electronic amplifier is located at the microprocessor-indicator unit, and wall away from the detector, the remote actuator cable becomes more durable, allowing it to handle more miles of test and remote operation. This also reduces the number of connections required, thereby reducing the number of connections required. The indicator panel is mounted on a plunger, which allows it to be easily removed from the wall. The indicator panel is constructed of stainless steel to ensure durability and longevity.

The 6400 is safe and easy to use.

The Thermo MeasureTech 6400 Level System offers the safest surface head design available. Its dual-port and single-beam source heads are constructed of steel-encased lead source. The source head itself is mounted on a plunger, which allows simple redirection and locking of the source in the OFF position. The source head has been designed to be easily removed from any suitable overhead head structure. It is approved for 200 mCi of Ca-137, yet is normally supplied with only 20, 50 or 100 mCi. This allows the 6400 Level System to operate at lower radiation levels than any other design.

Acutation and lockout is simplified by a lever-operated, flexible, push-pull control, allowing the user to be confident that the source head is turned off and locked. A switch is used when the hopper support beam is engaged. A foot switch, the spring-return off feature will initiate a detector alarm. The lever actuator can be turned on or off by a single hand, or more by a foot pedal, or cut off the hopper access doors and, in the case of precipitators, with the high-voltage control.

The standard individual point outputs of Thermo MeasureTech's 6400 are transistor-to-transistor logic (TTL), enabling the indicator panel to be used with systems that require TTL-compatible inputs. Thermo MeasureTech provides a solid-state relay output unit for systems that require a relay output. A cost-saving multiplexed output may be considered if eight or more points are being monitored.
Thermo MeasureTech has years of solid experience in supplying non-contact and contact measurement equipment to the specific needs of the power generation industry. The application and development of the technological advancements made during the seventies has led directly to the development of a system that now is becoming the industry standard. Thermo MeasureTech’s 6400 Level System.

The 6400 Level System combines Thermo MeasureTech’s reliable digital signal and pulse counting techniques with a specialized microprocessor. For you, the result is a level monitoring system with self-diagnostic features, so that plant personnel can verify the operating status of each of its 64 detector input terminals at the detector are standard. Thermo’s self-diagnostics means that your maintenance personnel can differentiate among high fly ash points fly ash build up or a system malfunction as possible causes when the system’s power goes off. It will be set off its own indicators, whether green, red, flashing or off. It will test all its own circuits and indicate the status of each channel. And it will activate its own common alarm light when needed.

The 6400 Level System provides accurate and reliable measurement equipment to the specific needs of the power generation industry. The application and development of the technological advancements made during the seventies has led directly to the development of a system that now is becoming the industry standard. Thermo MeasureTech’s 6400 Level System.

The 6400 Level System from Thermo MeasureTech. Introducing the remarkable expensive overhead welding of mounting hardware. No need for preamplifier mounting lugs. The Thermo MeasureTech 6400 Level System's microprocessor-indicator unit, point level detector, dual- or single-beam source heads, mounters, the source heads and detectors and mechanical source head actuator cables. Optional components, such as standard coaxial cable and key interlocks, are provided by others on request. The basic components of Thermo 6400 Level System consist of microprocessor-indicator unit, point level detector, dual- or single-beam source heads, mounters, the source heads and detectors and mechanical source head actuator cables. Optional components, such as standard coaxial cable and key interlocks, are provided by others on request. The basic components of Thermo 6400 Level System consist of microprocessor-indicator unit, point level detector, dual- or single-beam source heads, mounters, the source heads and detectors and mechanical source head actuator cables. Optional components, such as standard coaxial cable and key interlocks, are provided by others on request.

The 6400 almost does its own maintenance. The self-diagnostic capability of the Thermo 6400 microprocessor simplifies maintenance, so that your personnel can handle the job with ease. This microprocessor system displays the actual number of counts emitted by a detector and tests all alarm output, and internal counting circuits. The number and scope of verification tests it performs on its own is unmatched.

Self-diagnostics means that your maintenance personnel can differentiate among high fly ash points fly ash build up or a system malfunction as possible causes when the system’s power goes off. It will be set off its own indicators, whether green, red, flashing or off. It will test all its own circuits and indicate the status of each channel. And it will activate its own alarm light when needed.

The 6400 puts big capacity into small space. The Thermo 6400 Level System’s microprocessor-indicator unit is supremely compact. Its total weight of less than 100 pounds is housed in a NEWM 11/4” wall-mounted enclosure and can handle inputs from 64 detectors. The indicator panel is equipped with a red and green LED light for each of its 64 detector input channels, and these lights are seen easily through a window on the front door. Thermo provides conduit openings and necessary information. The Thermo 6400 Level System to operate at lower radiation levels than any other design. Acutator and lockout is simplified by a lever-operated, flexible, push-pull control cable, allowing the source head to be opened or closed from a convenient point on the hopper wall. The Thermo MeasureTech 6400 Level System's microprocessor-indicator unit, point level detector, dual- or single-beam source heads, mounters, the source heads and detectors and mechanical source head actuator cables. Optional components, such as standard coaxial cable and key interlocks, are provided by others on request. The basic components of Thermo 6400 Level System consist of microprocessor-indicator unit, point level detector, dual- or single-beam source heads, mounters, the source heads and detectors and mechanical source head actuator cables. Optional components, such as standard coaxial cable and key interlocks, are provided by others on request.

Now you can monitor 64 hoppers at once.

Precisely.

Thermo MeasureTech has years of solid experience in supplying non-contacting fly ash level measurement equipment to the specific needs of the power generation industry. Their many years of experience and application of the technological advancements made during the seventies has led directly to the development of a system that now is becoming the industry standard for the eighties: Thermo MeasureTech’s 6400 Level System.

The 6400 Level System combines Thermo MeasureTech’s reliable digital signal and pulse counting techniques with a specialized microprocessor. For you, the result is a level monitoring system with self-diagnostic features, that plant personnel can verify the operating status of each channel, and know if the hopper support beam is available for servicing. The 6400 Level System offers you the ability to monitor fly ash level in any of 64 locations.

The solid design of the Thermo MeasureTech source head is a free-running 1st CLASS L-Mount, for single-beam source heads, which is used when the hopper support beam is extended to the operating level. The 6400 Level System is to the operating line of any hopper walls. The heavy-duty, stainless-steel control panel and cable and key interlocks, are provided by the instrumentation technician can easily interlock with the hopper access doors and, in the case of precipitators, with the high voltage control panel. The remote actuator cable and on-off handle allow easy operation of the source head by plant personnel from a convenient location.

The Thermo source head has three proven mounting configurations, each one designed to eliminate the need for field welding, and for cutting of lagging or thermal insulation.

The configurations supplied are:

V-Mount, a vertical mounting for dual-beam source heads, which is bolted to the lower flange of the hopper support beam.

L-Mount, for single-beam source heads, which uses uninstalled channels to stiffen the aluminum lagging and to distribute the weight of the source head.

Or monitor multiple level points in remote locations.

Accurately.

In applications where multiple level points are present, the 6400 Level System offers the ability to verify up to 64 points for monitoring, and on-off handles allow easy operation of the source head by plant personnel from a convenient location.

The basic components of Thermo MeasureTech’s 6400 Level System consist of microprocessor-indicator unit, point level detectors, dual- or single-beam source heads, mountings, the source heads and detectors, and mechanical source head actuator cables. Optional components, such as standard coaxial cable and key interlocks, are provided by the instrumentation technician. The 6400 almost does its own maintenance.

The digital-counting technique extends to the operating line of the Geiger-Mueller detector tube. The 6400 Level System is to the operating line of any hopper walls. The heavy-duty, stainless-steel control panel and cable and key interlocks, are provided by the instrumentation technician can easily interlock with the hopper access doors and, in the case of precipitators, with the high voltage control panel. The remote actuator cable and on-off handle allow easy operation of the source head by plant personnel from a convenient location.

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The self-diagnostic capability of the Thermo MeasureTech microprocessor simplifies maintenance, as that your special microprocessor can handle the job with ease. This microprocessor automatically displays the hardware status, whether caused by a detector and tests all alarm, output, and internal counting circuits. The number and scope of verification tests it performs on its own is unparalleled.

Self-diagnostics means that your maintenance personnel can differentiate among fly ash level, fly ash well buildup or a system malfunction as possible causes when the system’s self-diagnostic capability is activated. That’s been worked out of the way of the fly ash buildup, the approximate thickness of the buildup can be determined and the count total displayed with a count total obtained on clean hopper walls.

If the problem is a system malfunction, self-diagnostic can isolate the segment that has failed. Then the instrumentation technician can easily and quickly replace any of the system’s plug-in modules. The chart below clearly defines the comprehensiveness of available options.

Thermo MeasureTech’s digital-counting technique extends to the operating line of the Geiger-Mueller detector tube. The 6400 Level System is to the operating line of any hopper walls. The heavy-duty, stainless-steel control panel and cable and key interlocks, are provided by the instrumentation technician can easily interlock with the hopper access doors and, in the case of precipitators, with the high voltage control panel. The remote actuator cable and on-off handle allow easy operation of the source head by plant personnel from a convenient location.

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The Thermo's level operates on the principle of radiation absorption. A source head is mounted on the outside of a hopper and emits a narrow beam of radiation from a protective housing. This beam penetrates the hopper's walls, insulation, and fly ash. The beam of radiation is detected by a point-level detector mounted on the outside of the opposing hopper wall. Since fly ash is either above the source or built up on hopper walls incomplete.

The radiation that reaches the detector produces an electrical pulse or detector count. The number of counts thus produced is proportional to the level of the radiation detected. The detector counts are then transmitted over coaxial cable to the microprocessor which interprets each detector channel and determines the number of counts it contains.

The 6400 is the most advanced system you can install. By comparing the number of counts each detector emits with a preset count total, the presence of one of five operating conditions can be identified at each hopper:
- low fly ash or normal hopper conditions, indicated by a high count level
- high fly ash buildup, indicated by a medium count level
- low fly ash level, indicated by a low count level
- detector or input channel malfunction, indicated by a zero count level

On the microprocessor's indicator panel, you'll see a green and red indicator light for each detector input channel. These lights clearly show the operating conditions or fly ash level or buildup in the corresponding hopper. The green light stays on as long as hopper conditions are normal and the detector is emitting a high level of counts. The green light blinks if the count level being received at the microprocessor falls to a medium level, indicating fly ash buildup.

If the hopper reaches a high fly ash condition, or low count, the red light comes on. Both lights will deactivate if there should be a malfunction of either the detector or its input channel. Whenever the microprocessor receives a medium, low or zero count level from any of the detectors, it also flashes a highly visible red common alarm light and energizes a relay that can be used to turn on a control room alarm. The common alarm light continues to flash until it is reset by acknowledge the alarm.

The special high-temperature GM75 detector allows the 6400 Level System to work dependably.
### Specifications

**GTM 6400 Detector**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Single, high-temperature radiation absorbance detector</td>
</tr>
<tr>
<td>Source Material</td>
<td>Cesium-137</td>
</tr>
<tr>
<td>Design</td>
<td>Encased, Special Unit is constantly checking for detector failure</td>
</tr>
<tr>
<td>Source Head</td>
<td>5197 Source Heads</td>
</tr>
<tr>
<td>Source &amp; 5197 Source Heads</td>
<td>Source &amp; 5197 Source Heads</td>
</tr>
</tbody>
</table>

**Microprocessor-Indicator Unit**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Outputs</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>115VAC +10%, 60Hz, 340VA or 230VAC available</td>
</tr>
<tr>
<td>Dimensions</td>
<td>26.5 in (67.3 cm) high x 12.75 in (32.4 cm) wide x 20 in (50.8 cm) deep</td>
</tr>
<tr>
<td>Weight</td>
<td>Approximately 35 lb (16kg)</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>Noise required</td>
</tr>
<tr>
<td>Size</td>
<td>11 cm (7.9 in) long x 1.53 in (38 cm) diameter, with 2.25 in housing forming a 4° “V” shape</td>
</tr>
<tr>
<td>Weight</td>
<td>Approximately 3 lb (1.4kg)</td>
</tr>
</tbody>
</table>

### Thermo MeasureTech’s 6400 Level System

The Thermo MeasureTech level operates on the principle of radiation absorbance. A source head is mounted on the outside of a hopper and emits a narrow beam of radiation from a protective housing. This beam penetrates the hopper’s walls, insulation, and baffle plates. The beam of radiation is detected by a point-level detector mounted on the outside of the opposing hopper wall. Since fly ash is either above the source or built up on hopper walls incomplete.

The radiation that reaches the detector produces an electrical pulse or detector count. The number of counts thus produced is proportional to the level of the radiation detected. The detector counts are then transmitted over coaxial cable to the microprocessor which interprets each detector channel and determines the number of counts it contains.

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If the hopper reaches a high fly ash condition, or low count, the red light comes on. Both lights will deactivate if there should be a malfunction of either the detector or its input channel.

Whenever the microprocessor receives a medium, low or zero count level from any one of the detectors, it also flashes a highly visible red common alarm light and energizes a relay that can be used to turn on a control room alarm. The common alarm light remains on until its cause is acknowledged, then it remains on until the cause of the abnormal count is corrected.

The special high-temperature GMT 6400 detector allows the 6400 Level System to work dependably.