

Thermo Scientific 6400 Level System

Non-Contacting Fly Ash Hopper Monitoring System

The Thermo Scientific 6400 Level System continuously monitors as many as 64 fly ash hoppers with unmatched precision. The economical, specialized microprocessor combined with digital signal and pulse counting techniques results in a self-diagnostic system that enables plant personnel to verify the operating status of multiple level switches on a single, centralized indicator panel.



Monitoring On Up to 64 Points

The rugged, non-contacting Thermo Scientific 6400 Level System mounts on the exterior of hoppers, silos, chutes or bins to provide accurate, reliable level monitoring on up to 64 points. The system consists of a microprocessor, point level detectors, and single or dual beam source heads. Digital signal and pulse counting techniques enable the system to display the actual number of detector counts received from each designated hopper. A green or red indicator light clearly shows the fly ash level (build-up) in the corresponding hopper, with a red light indicating a high fly ash condition. An optional relay can be used to activate a control room alarm.

Responsive & Dependable

Easy-to-use and maintain, the system's self-diagnostics include alarm condition signals that automatically test all alarm, output and internal counting circuits as well as indicate the status of each channel. If wall build-up, equipment failure or other process problems occur, it will identify and localize the

problem with no memory loss per the unique, detector-count comparison system. The self-diagnostics can also isolate a system malfunction along with the segment that failed, enabling an operator to easily and quickly determine which system plug-in module to replace.

Safest Source Head Design

Constructed of steel-encased lead, the dual-port and single-beam source heads feature the safest design available. The source is mounted on a plunger, allowing for simple retraction and locking of the source in the "off" position. Due to the system's small source requirements, the source head weighs just 35 pounds and suspends easily from any suitable overhead structure. Approved for up to 200 mCi of Cs 137, it is normally supplied with 20, 50 or 100 mCi only, allowing the 6400 Level System to operate at lower radiation levels than any competitive product.

Product Features

- Reliable, non-contacting measurement
- Digital signal and pulse counting techniques
- Self-diagnostic with automatic alarm condition signals
- Safest source head design available
 - Plunger mounting allows simple retraction
 - Remote actuator cable and on-off handle allow for easy operation
 - Interlock capability
- Engineered to endure rugged environments

Thermo Scientific 6400 Level System

GTMB Detector	
Type	Single, high temperature, halogen-quenched Geiger-Mueller tube operated at reduced voltage*
Electrical Connections	Field cable connections made on 600 volt terminal block; Detector to come complete with wire lugs for terminations
Radiation Field Requirement	Approximately 0.1 mR/Hr at the detector
Reproduceability Level	+0.25 in
Ambient Temperature	-40°C to +93°C (-40°F to +200°F)
Process Temperature	Unlimited
Power Requirement	None
Enclosure	NEMA 4 housing supplied with conduit clamps for mounting; For explosion-proof model, consult Thermo Fisher Scientific
Physical Dimensions	13.3 cm (5.25 in) W x 27.9 cm (11 in) H x 3.88 cm (1.53 in) in diameter (L-shaped)
Weight	Approximately 1.4 kg (3 lb)
Mounting	Three-point bolting system (no welding or cutting of hopper's thermal insulation)
Microprocessor-Indicator Unit	
Detector	M-I unit for monitoring
Capacity	1 to 64 detectors
Response Time	1 sec to 255 sec
Read Out	64 pairs of lights; Indications for Full Hopper, Not Full Hopper, Excessive Fly Ash Build-up on Hopper Walls or Detector Failure
Alarms	Two sets of SPDT contacts rated 15 A, 230 VAC; One set is reset by acknowledge button, the other resets only on the absence of the alarm condition
Alarm Conditions	Full hopper or detector failure
Enclosure Rating	NEMA 4
Physical Dimensions (W x H x D)	50.8 cm (20 in) x 67.3 cm (26.5 in) x 32.4 cm (12.75 in); Mounting holes on 35.6 cm (14 in) x 64.1 cm (25.25 in) centers
Weight	37 kg (80 lb)
Ambient Temperature	+28°C to +60°C (-20°F to +140°F)
Power Required	115 VAC +10%, 60 Hz, 340 VA; 230 VAC available (consult Thermo Fisher)
Cable Required	RG58A/U for temperature up to +80°C (+175°F); RG188A/U for high temperature cable up to +210°C (+394°F); Maximum cable run of 1000 feet from M-I to any detector
Interface Outputs	Hopper status information available on TTL compatible outputs for custom displays or computer interfacing; Each output capable of driving 10 standard TTL loads; Optional outputs: solid state relays, mechanical relays or multi-plexed system
Special Features	Continuous check for detector failure; Built-in diagnostic tests; Early warning of fly ash build-up on hopper walls
Source and 5197 Source Heads	
Source Material	Double-encapsulated Cesium 137
Source Size	5 to 200 mCi, depending on hopper size
Head Construction	Lead filled, steel-encased with special dual-beam ports; Adaptable to Kirk or Superior key interlocks; Remote actuator supplied for mechanical operation
Head Weight	Approximately 16 kg (35 lb)
Mechanical Safety	Source is spring loaded to return to its "off" position if the source actuator cable fails
Mounting	Three configurations (no field welding or cutting of lagging or thermal insulation): V-Mount: a vertical mounting for dual-beam source heads that bolts to the lower flange of the hopper support beam H-Mount: a horizontal uni-strut lagging bolt system for dual-beam source heads that is used when the hopper support beam is inaccessible L-Mount: a uni-strut channel system for single-beam source heads that stiffens the aluminum lagging for better distribution of the source head weight

*The operating life of the Geiger-Mueller tube is extended by operating the tube in the lowest possible radiation field, thereby reducing the number of counts emitted.

Available Self-Diagnostic System Tests

Test Number	Test Results
1-64	Displays actual counts received at the detector of designated hopper
65-69	No valid test
70	Sets all green channel indicators on
71	Sets all red channel indicators on
72	Sets all channel indicators flashing
73	Sets all channel indicators off
74	Tests all internal counting circuit electronics and shows status of each channel with green (good) or red (bad)
75	Causes common alarm light and relay to be activated
76-80	Factory parameter verification tests
81-99	No valid test

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