Selecting a Silo

Determine your Specific Parameters

- Volume
- Maximum Height
- Cone Angle
- Properties of material
  - Free Flowing pellet or Powder
  - Abrasiveness
  - Moisture Regain Properties

Determine Tank Construction Options

- Welded Construction
- Bolted/Gasketed Construction
- Welded Galvanized

Determine Internal Coating Requirement and Thickness

- Epoxy Internal Lining
- Epoxy External Coating
- FDA Approved
- Painted

Determine Design Criteria

- Seismic Conditions
- Wind Loads
- Excessively Heavy Deck Loads
- Soil Conditions could affect diameter specification

Special Features or Options

- Fill lines
- Access ladders and crossovers
- Electrical Conduit and Sensors Installed
- Venting and Filtration
- Is PRV required
- Blending Silo construction
- Load Cell's

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AQUA POLY EQUIPMENT CO.

Tank Fabrication

Advanced Tank Manufacturing

Founded in 1981, Imperial was among the first to adapt modern manufacturing processes to the design and fabrication of bulk storage tanks. Today, the company's state-of-the-art manufacturing facility, based on an assembly line model rather than the typical job-shop approach, is the most advanced plant of its kind in the industry. The latest technology and equipment provides superior design flexibility, product quality and manufacturing efficiency. As a result, Imperial not only offers customers competitive pricing, but also the industry's fastest turnaround time on made-to-order units.

Design and Engineering

Specializing exclusively in tank design, Imperial engineers use proprietary tank design software to transform your application requirements into custom storage solutions supported by detailed drawings, materials lists, production schedules and cost estimates. The program incorporates data developed from hundreds of installations; plus factors such as wind load, soil and seismic conditions; as well as current local, national and international building codes. Underlying our engineers' expertise are close working relationships and ongoing communication with our customers.

Fabrication

Pride of workmanship is evident in every Imperial tank. From thorough inspection of incoming materials, to computerized metal cutting and shaping technologies, to ongoing training and certification of our workforce, Imperial tanks are built better. Every Imperial welder is qualified to ASME section IX standards and their work is overseen by AWS certified inspectors.

Finishing

Tanks are often one of the most visually prominent features of a manufacturing plant. A quality finish not only improves a tank's performance and reduces cleaning and maintenance costs, it also contributes to the plant's appearance. Imperial's 15,000-square-foot cleaning/painting and finishing facility provides the best finish in the industry. Factory-trained painters apply epoxy and polyurethane coatings, or custom paint system as defined by your project requirements, in a controlled environment. Stainless steel and aluminum tanks are chemically cleaned and then protected for transit.

The Quality Difference

Quality assurance at Imperial is comprehensive. Product testing procedures usually considered extraordinary among other tank builders are standard operating procedure. Starting with raw materials, and through every stage of construction, every Imperial tank is inspected and reinspected. Completed tanks routinely undergo pressure testing, weld x-rays and dye-penetrant analysis.

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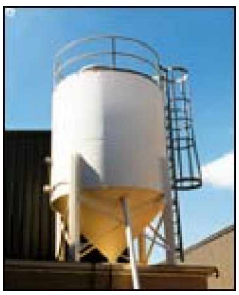
Tank Construction Capabilities

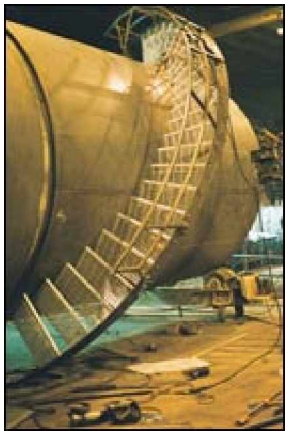
Imperial welded tanks, blenders and bins are available in a broad selection of materials, designs, sizes and features to meet the most demanding specifications:



Materials - depending on specific application needs, Imperial constructs tanks from carbon steel, stainless steel, aluminum or any of several specialty alloys.

One-piece welded construction provides superior strength, integrity and performance, as well as easy on-site installation.

Sizes up to 14' in diameter (holding 10,000 cubic feet or 75,000 gallons at maximum) are factory complete and delivered as a single unit. Larger tanks available as components for field-assembly.



Silo support options - choice of skirt, structural leg or lug supports. Modification for load cell mounting also available for all designs.

Linings and coatings per customer specifications are factory applied in a controlled environment and meet all industry and federal standards.

Operational designs to accommodate mass-flowing, free-flowing and blended materials operations.

Hopper designs for center draw, offset discharge, chisel bottom and transitional-multiple outlets.

Liquid storage available in both vertical tanks and saddle supported horizontal tanks.

Customization capabilities - Imperial maintains a full complement of standard designs, all of which can be customized for specific applications.

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Custom Storage Tanks / Transportation

Every tank application is different: Different storage needs, different tank size and tank shape demands. Different loading and loadout/ discharge operations. Different support and mounting requirements. Different ancillary equipment and system integration....

Imperial offers customers unmatched flexibility to optimize storage and system performance with tank features that match the specific needs of their unique application. Starting with one of Imperial's wide-range of standard storage tank configurations, the design is then customized with the modification or addition of any of several components. The result is a customized storage tank without the high cost of custom manufacturing.

Storage tank components commonly customized for optimal tank and process system performance, include:

- Size and shape adjustments, including alternated top designs.
- Support structures for truck and railcar loadout.
- Custom-fabricated weldments.
- Spiral stairways and towers.
- Platforms, decks, railings and catwalks.
- Partitioned storage tanks and hoppers.
- Doors, loading and discharge portals.
- Wear-resistant linings.
- Insulated storage tanks.

Tank Transportation

Imperial makes delivery easier and with its dedicated fleet of trucks with knowledgeable drivers. The self-unloading trailers are designed specifically for transporting tanks, and all drivers are experts at protecting the load on-route. Imperial will, of course, also ship via other carriers or modes of transportation specified by its customers. In either case, tanks are carefully prepared for transport.

Factory-welded tanks are delivered complete-ready to set in place and put into immediate operation.

Field-welded assemblies (used when storage requirements exceed sizes feasible for one-piece construction and transportation) are delivered precision-aligned components, complete with shop-prepared engineering drawings for fast, no-problem erection.

"Self Unloading Capability"

Site requirements for self-unloading trailers include:

- A firm, load supporting unloading area
- A reasonably flat unloading area
- An unloading area at least twice the size of the tank diameter by twice the tank length

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Model HMI Operator Interface – Inventory Monitor

General

- Interface via RS485 with industry-leading Model SMU sensor
- Multi-functional displays measured and calculated values
- Unique back-lit display ensures visibility
- NEMA 4 enclosure suitable for indoor or outdoor use
- Automatic, manual or auto/manual operating modes
- Display 12-character alphanumeric name for silo contents

The Model HMI operator interface is the human machine interface for the industry-leading Model SMU silo monitoring inventory level sensor. The HMI controls the SMU sensor operation, displays measured and calculated values such as distance, level, volume, weight and percent. The HMI also displays sensor and system diagnostic errors should they occur.

The HMI can operate in Manual, Automatic or Auto/Manual modes. In the Manual mode the HMI will initiate measurements by depressing the MEAS button, followed by the channel number, followed by ENTER. In the Automatic mode of operation the HMI can be programmed to operate the SMU sensors automatically. Menu options allow the user to select days of operation, time window and the measurement interval.

The Model HMI operator interface is available to interface with up to 8 or 16 channels. The individually addressable SMU "smart" sensors are wired to the HMI using a single RS485 network cable. Multiple SMU "smart" output sensors (up to a maximum of 16) can be connected to the HMI using a single RS485 network cable.

Applications

The Model HMI can be used with the SMU sensor in a wide variety of applications. These include, but are not limited to, simple inventory monitoring of a broad list of powders and bulk solids, as well as a wide range of liquids and slurries. These include coarse and fine granular solids, powders, liquids, foodstuffs and even some sticky or corrosive substances.

Ordering Information

The ordering of a Model HMI operator interface is quick and easy. Refer to the below part number list to select the sensor version that's right for you.

6-8611-21	2-Channel 115VAC
6-8621-21	2-Channel 230VAC
6-8611-81	8-Channel 115VAC
6-8621-81	8-Channel 230VAC
6-8611-61	16-Channel 115VAC
6-8621-61	16-Channel 230VAC

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Model KA/KAX Bin Level Indicators

General

The Model KA/KAX line of rotary paddle bin level indicators consist of the most reliable, rugged and economical point level controls available for detection of dry bulk materials. These units are easy to install and are proven performers in a wide variety of bulk materials: powders and granular.

These rotary paddle level indicators can be used to eliminate bin overflow, maintain a predetermined material level, indicate plugging of conveyors and pneumatic lines or provide any number of level control functions. The KA/KAX model of bin level indicators incorporates a feature that automatically shuts off the motor of the unit when the paddle is in a stalled position, which both extends the life of the motor and minimizes maintenance.

Principle of Operation

The operation of the Model KA/KAX bin level indicator is simple and easy to understand. The unit is installed through the wall of the vessel, so that the paddle protrudes inside the vessel. A small electric motor drives the paddle, which rotates freely in the absence of material.

When the paddle is impeded from rotating by material, the motor rotates within the housing, which triggers two switches. The first switch is a “dry” electrical contact that is available to control a process function or an alarm circuit. The second switch cuts the power to the motor, preventing a locked rotor condition, thus extending the motor life. This also activates the signaling device, which is wired through that same motor switch. When the material level drops, the loaded stretched tension spring returns the motor to its original running position and the unit is reactivated.

Applications

The rugged and reliable design of the Model KA/KAX makes the unit compatible with many granular, pelletized and powder bulk applications. These rotary paddle bin level indicators can be used for high level indication of materials over 10 lb/ft3 (160 kg.m3) and for low and intermediate level indication for materials over 5 lb/ft3 (80 kg/m3). These units can be mounted almost anywhere dry bulk materials are stored, including bins, hoppers, silos and tanks. The Model KA is the most popular and is used for non-hazardous electrical locations, while the Model KAX is used for hazardous area locations requiring explosionproof devices.

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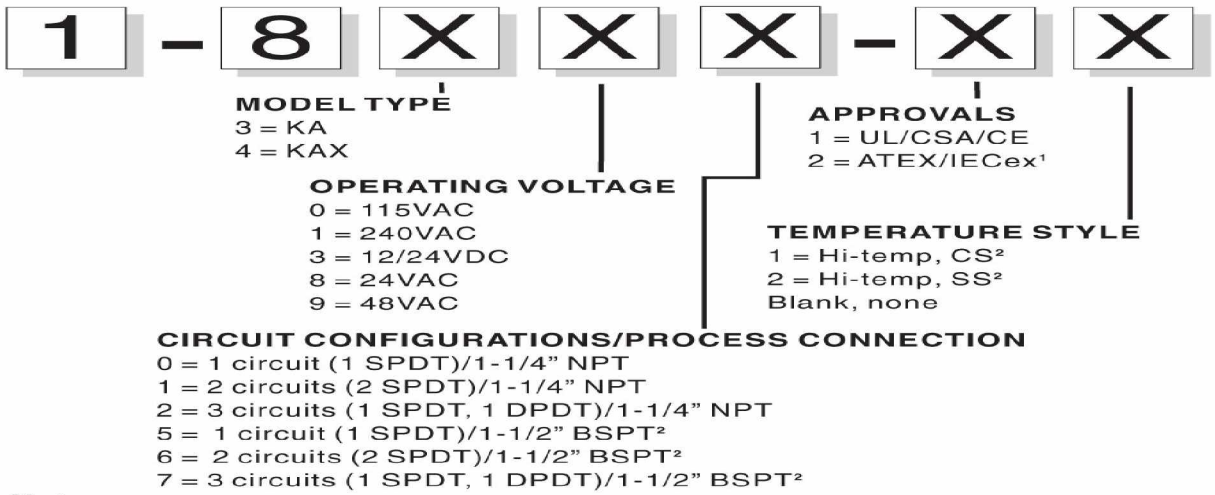
Model KA/KAX Bin Level Indicators

Ordering Information

The Model KA/KAX is simple and easy to specify and is available with a number of motor voltages, switch output selections and accessory items. Consult the following part number table for further information.



Note:
1 Available with Model KAX only.
2 1-1/2" BSPT process connection is not available with high temperature style selection. A mounting plate is furnished for the process connection on all high temperature units.

ACCESSORIES

Flexible Coupling

1-3335	Spring flex

Paddles

See "Accessories" section

Cable Extension

1-1176-2-78: Flexible extension, 304 SS, 78 inches (2 m) length (can be modified in the field for shorter length)	

Solid Shaft Extensions:

1-1175-1-#*	1/4" Pipe, SCH-40, Galvanized
1-1175-2-#*	1/4" Pipe, SCH-40, Stainless Steel

Shaft Guards:

1-1174-1-#*	1-1/4" Pipe, SCH-40, Galvanized
1-1174-2-#*	1-1/4" Pipe, SCH-40, Stainless Steel

Mounting Plates

1-0100	Mounting plate with 1-1/2" BSPP half coupling, CS
1-0101	Mounting plate with 1-1/4" NPSM half coupling, CS
1-0102	Mounting plate with 1-1/4" NPSM full coupling, CS
1-0112	Mounting plate with 1-1/4" NPSM half coupling, SS
1-0113	Mounting plate with 1-1/4" NPSM full coupling, SS
1-0115	Mounting plate with 1-1/2" BSPP full coupling, CS
1-3316	Mounting plate, heavy duty alum. with 1-1/4" NPT

* # = Extension and guard lengths (not to exceed 144 inches (3.6 m) in length)

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Model SMU Silo Monitoring Unit – Inventory Monitor

General

- Industry-best measurement resolution of 0.01ft (0.12")
- Virtually maintenance-free split-compartment design
- Hall-effect sensors (patent pending) maximize reliability
- Interface with HMI operator interface
- No heaters required for most all cold climates
- Freeze-resistant flange eliminates frozen bobs

The Model SMU is the leading silo monitoring unit for granular plastic applications where an inventory measurement is needed. The SMU is the sensor part of the inventory monitoring system and communicates with the Model HMI operator interface, also included in this catalog.

The second edition of the Model SMU is designed to handle some of the harshest and most dynamic conditions and incorporates technological advancements (patent pending), requires no field adjustments and its robust deign is virtually maintenance free. The SMU is suited for most any application and can be equipped with a variety of mounting flanges and plumb-bobs.

The SMU sensor offers a choice of outputs and sensor interface:

- RS485 "smart" communications output for use with the HMI operator interface
- 4-20mA analog output (input to PLC/DCS)
- AC/DC pulse output (input to PLC/DCS or "old style" console)

Principle of Operation

Once a measurement cycle is initiated, the Model SMU sensor controls the descent of the plumb bob, attached to a heavy-duty stainless steel cable, into the vessel. The SMU measures the amount of cable dispenses via its unique optical measurement system. The SMU's optic system is completely sealed from the internal environment of the electronics compartment, which is isolated and sealed from the mechanical compartment to ensure long-term reliable operation.

The descent of the bob is maintained at an optimal speed by the smart motor control system, contributing to the elimination of cable slack and maximizing the motor life. In conjunction with the unique dual optical sensing system, the smart motor control system guarantees that the bob will stop when it contacts the material surface and eliminates the need for a mechanical brake. When the bob reaches the material surface, the SMU reverses the direction of the motor and transmits the distance value.

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Model SMU Silo Monitoring Unit – Inventory Monitor

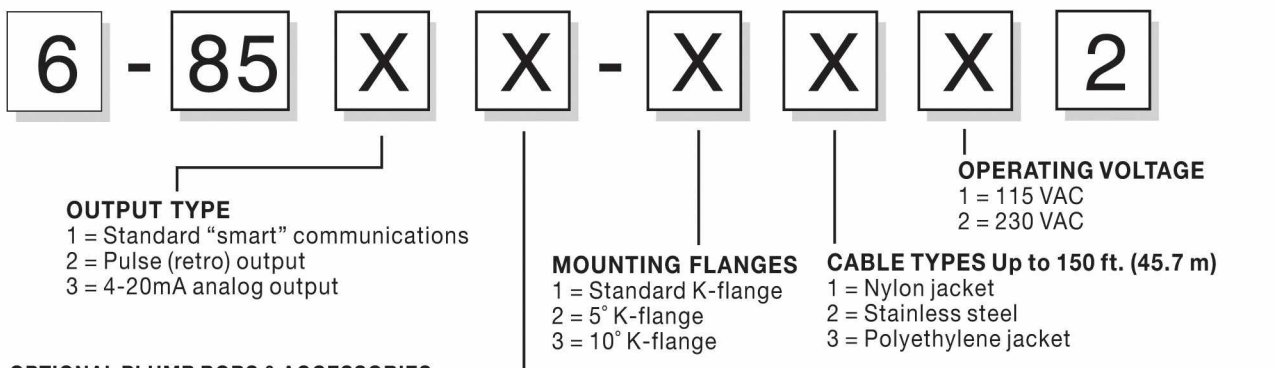
Applications

The Model SMU sensor and inventory monitoring system, when combined with the Model HMI operator interface, can be used in a wide variety of applications. These include, but are not limited to, simple inventory monitoring with the standalone HMI operator interface to applications where an analog or pulse output are required to input to a PLC or DCS.

Materials being monitored include a broad list of powders and bulk solids, as well as a wide range of liquids and slurries. These include coarse and fine granular solids, powders, liquids, foodstuffs and even some sticky or corrosive substances.

Ordering Information

The ordering of a Model SMU inventory monitor is quick and easy. Refer to the below part number table to select the sensor version that's right for you.



OPTIONAL PLUMB BOBS & ACCESSORIES

6-2190	Digestible Plumb Bob
6-2021	Cast Epoxy Plumb Bob
6-3123	Cast Aluminum with Teflon® Coating
6-3136	316 Stainless Steel
6-4106	316 Stainless Steel Inverted Cone
6-4126	Teflon®-Coated 316 Stainless Steel Inverted Cone
6-4108	316 Stainless Steel Ball Float
6-4128	Teflon®-Coated 316 Stainless Steel Ball Float
6-3125	5° Mounting Flange
6-3128	10° Mounting Flange

Note: 6-3103 cast aluminum plumb bob is included with each SMU.

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