

HOPPER SCALES

30 - 4000 m³/h



PRECIA MOLEN has designed and manufactured hopper scales since 1867 and can assist with your loading and unloading operations or with the internal transfer of loose product. These scales are designed to fit simply into often-small silo areas.

Our experience in the weighing of loose products has allowed us to develop a range of hopper scales extending from 30 to 4000 m³/h, with EC certification to meet the requirements of the applicable machinery standard, and EX certification to allow scales to be installed in potentially explosive atmospheres.

Our scales exist in painted steel, with stainless steel components, with a steel or synthetic anti-wear liner and entirely in 304L or 316L stainless steel.

The SCS function self-checks all weighs via a comparator, and is available on our ABS-XL models. This function can be used to regularly check that the main weighing channel is not drifting. This option guarantees the precision of this Automatic Weighing Instrument (AWI) working with no operator-validation of data.

Our technical services can study any scientific project upon request: scales embedded in a floating weighing tower, scales for very high or low density products, scales for very high flow, or scales with a shape or size adapted to your requirements. Example: scales with a flow of 4000 m³/h and approved for Commercial Transactions.

Our hopper scales can be used to weigh a wide range of dry granular products, which flow well, such as cereals, cake, wood pellets, waste and many derived products. After a feasibility study, specific models are available for fertiliser, sugar, liquids, coal, mineral ores, etc.

Our range of hopper scales is built to last, robust and reliable, and fitted with ISO components ensuring long-term working order with little maintenance. All main parts are at eye height to simplify maintenance by your services

Our scales are available with the I410 ABS control system, designed and developed by our R&D teams. When combined with this electronic system, our hopper scales become "Non-constant discontinuous weighing totallers". These scales comply with applicable European MID regulations in terms of metrological certification and are approved for use in commercial transactions, classes 0.2, 0.5, 1 or 2.

Potential precision for all of our models: +/- 0.1%. Hopper scales are designed for use indoors, sheltered from the effects of wind. The traditional temperature range for operation runs from -10°C to +40°C. This range may be adapted to your requirements upon request.

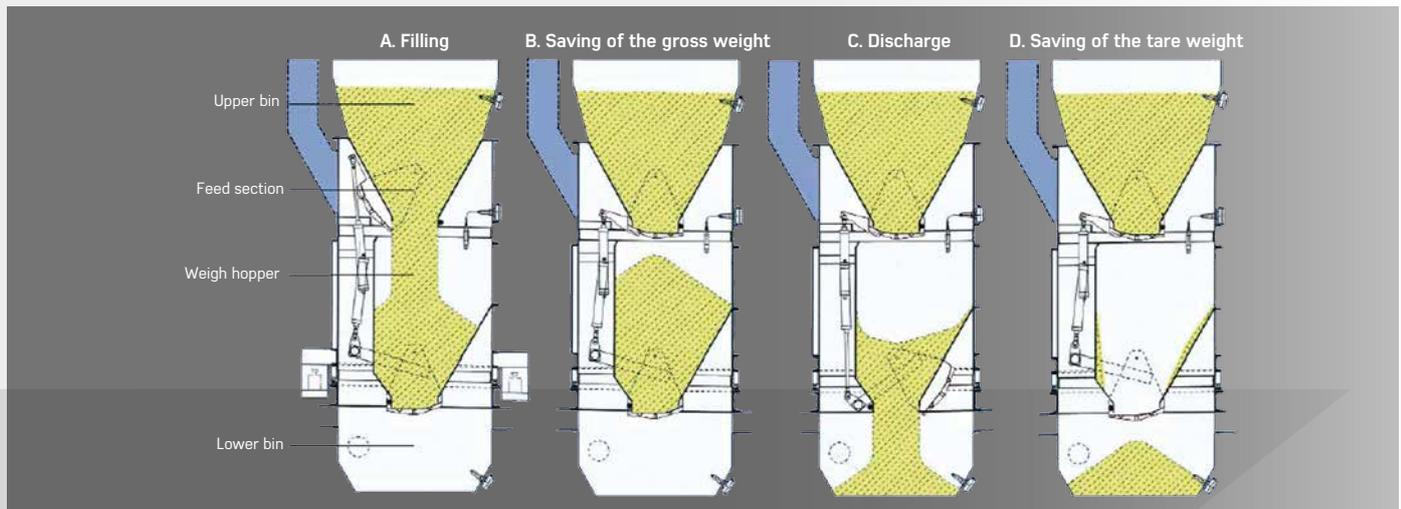
The entire electronic I410 ABS range can offer functionalities enabling the use of a hopper scale with local or remote control thanks to computerised or automatic control systems.

From a dedicated PC, our supervision software Data Bulk ABS can support an I410 ABS terminal related to a hopper scale.

It can be linked to all your hopper scales although its screen will display only 6 per page. The PC can be installed anywhere you like, regardless of its proximity to scales.



HOW HOPPER SCALES OPERATE



A weighing cycle is broken down into 4 phases:

When the cycle starts, the electronic system checks that all startup conditions are satisfied.

Phase A - The feed gate opens to fill the weigh hopper

The upper bin provides a constant supply of product to the scale. Ideally, this bin should be equipped with a capacitive level sensor disabling the opening of the feed gate if the required volume of product is not present. However, if the environment prevents the installation of a level sensor, the I410 ABS program also integrates a function without this upper bin detection input.

Phase B - The feed gate closes and "gross weight" is saved.

Phase C - The discharge gate opens to release the product isolated in the weigh hopper.

The lower bin will discharge the product weighed. This bin must be fitted with a capacitive level sensor disabling the opening of the discharge gate if the volume available is inadequate to hold the product isolated in phase B. The volume checked by this level sensor varies depending on the scale model used.

Phase D - The discharge gate closes and "tare weight" is measured.

The net weight of the cycle is calculated and updates the totaler displayed on the I410 ABS terminal.

OUR RANGE OF HOPPER SCALES

Model	Flow in m ³ /h	Flow in t/h*	Capacity kg	SCS option	ATEX option
ABS-X003	27	20	60	X	•
ABS-X004	40	30	100	X	•
ABS-X007	67	50	200	X	•
ABS-X015	133	100	400	X	•
ABS-X020	200	150	600	X	•
ABS-X027	267	200	800	X	•
ABS-XL02	200	150	800	•	•
ABS-XL03	300	225	1200	•	•
ABS-XL04	400	300	1500	•	•
ABS-XL06	600	450	2500	•	•
ABS-XL08	800	600	3500	•	•
ABS-XL10	1000	750	4000	•	•
ABS-XL12	1200	900	5000	•	•
ABS-XL14	1400	1050	7500	•	•
ABS-XL16	1600	1200	10000	•	•
ABS-XL18	1800	1350	12000	•	•
ABS-XL20	2000	1500	15000	•	•
ABS-XL22	2200	1650	15000	•	•
ABS-XL27	2700	2025	20000	•	•
ABS-XL33	3300	2475	25000	X	•
ABS-XL40	4000	3000	30000	X	•

*Bulk density of 0.75

OPTIONAL SELF-CHECKING SCALES (SCS) SYSTEM

The weigh hoppers of our hopper scales are directly placed on three or four load cells depending on the model.

All models are fitted with Analog/Digital converters.

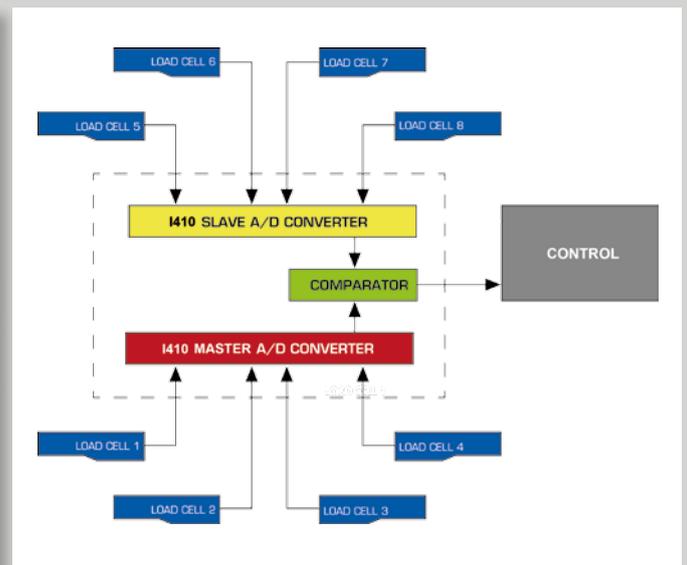
The SCS system involves the use of a second, independent, weighing channel, with its own load cells and A/D converter, for all weighing runs.

The weights measured by this slave channel are periodically compared with the weights measured by the master channel, removing any risk of gradual drift caused by mechanical or electrical factors. This provides an absolute guarantee of constant weighing precision for the entire duration of automatic loading or unloading operations for storage units.

This system may be used for commercial transactions or customs loading operations.

In this case, both weighing channels must be checked and approved separately according to the applicable European regulation, MID 2004/22/EC.

If an error is detected for the master channel, the SCS system can be used to rapidly switch to the slave channel, without stopping the weighing operation while the scale is adjusted.



SCS DIAGRAM CHART

Comparison between the standard version and the SCS version:

▼ Standard hopper scale:

Metrological checks are performed manually by an operator. This is a lengthy operation during which the hopper scale cannot be used.

This system reduces or eliminates checks between 2 annual inspections.

The risk of measurements drifting over time is uncontrolled.

▼ SCS hopper scale:

Metrological checks are performed automatically by the SCS system. These checks are performed periodically during weighing cycles with no interruption to the operation in progress.

The SCS system is effective for both internal use and commercial transactions due to the two channels calibrated with certified reference weights.

CONTROL AND MEASURING SYSTEM

The I410 ABS system comprises a I400 TB ABS transmitter fixed to the scale, which completes the Analog/Digital conversion of the signal from the load cells and transmits the weight measurement to the I410 ABS terminal installed locally or remotely, via a CAN OPEN fieldbus.

Input/output is controlled via the CAN OPEN fieldbus.

The I410 system equipped with the ABS (Automatic Bulk Scale) software is a measuring and control system for all types of new or existing, electronic or hybrid hopper scales, manufactured by our services or another manufacturer, for internal use or commercial transactions.

The I410 system can be driven in semi-automatic mode by an operator or in full-automatic mode by a PC / PLC using the required coupler to communicate through the installed field bus: Ethernet-Modbus/TCP, Ethernet IP, Profibus DP or Device Net.

In semi-automatic mode, the I410 ABS terminal sends data for the current cycle to the PC for display on your supervision screen. In automatic mode, the I410 ABS terminal dialogues directly with your management system.

Modbus RTU communication is another solution for communication with your PC. Optional RS232 or RS485 output modules are available.

A USB memory stick can be used with the I410 ABS terminal. This accessory can be used to save or load optional parameters, scale parameters and product files.

It may also be used as a virtual printer. Startup and operation-end reports can be physically printed, saved on the USB stick, or both, as preferred. You may print operation tickets from your PC or transfer these tickets to your office system via the USB stick.

You can also print information reports for each weighing run (gross weight, tare weight and total weight) and cycle error reports as they come in to monitor the history of a loading or unloading operation.



DeviceNet

Ethernet TCP/Modbus



All hopper scales connected to our I410 ABS system may be connected to an independent supervision system developed by PRECIA MOLEN.

This supervision system can be used to control scales remotely, monitor the phases of cycles, display complete information on current operations, save schedule data for the operations executed and display status for all input/output.



ATEX-CERTIFIED MODELS

The ATEX standard took effect on 1st July 2003 and enforces the technical requirements defined in directive 94/9/EC on explosive atmospheres.

Our Ex scales hold an ATEX certificate (equipment or system) and are supplied with an EC type examination certificate.

ATEX certificate reference for ABS-X Ex models: **LCIE 09 ATEX 3060 X**

ATEX certificate reference for ABS-XL Ex models: **LCIE 04 ATEX 6067 X**

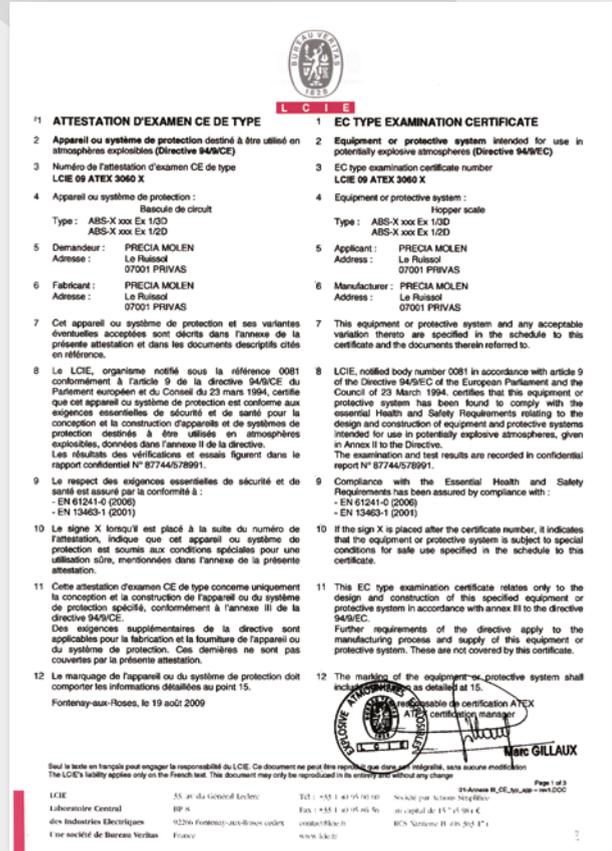
Regulatory markings on our ATEX hopper scales:



The Ex 1/3D marking indicates that the inside of the scale may be a zone 20 and the outside a zone 22, for explosive atmospheres with dust.

PRECIA MOLEN
 Type : ABS-X... Ex 1/3D
 Manufacturing n°:..... Manufacturing year:.....
 Ex II 1/3D T125°C IP66
 LCIE 09 ATEX 3060 X

PRECIA MOLEN
 Type : ABS-XL... Ex 1/3D
 Manufacturing n°:..... Manufacturing year:.....
 Ex II 1/3D T90°C IP66
 LCIE 04 ATEX 6067 X





REFERENCES

- ▼ More than 140 years of experience in the production of hopper scales.
- ▼ Thousands of units installed all over the world.

ADM • AGRALYS • BASF • BORAX
BUHLER • BUNGE • CARGILL
CENTRE GRAIN • CEREPY • CODEMAR
COHESIS COOPAGRI • COSAN
COSUMAR CRISTANOL • CUCKROWNIA
FEED AND FOOD • GBS
GELDORF - DESMET • INVIVO • LIMAGRAIN
LOUIS DREYFUS • SOUFFLET GROUP
MALTEUROP PROMILL • ROQUETTE
ROBUST SAIPOL • SCANDI MAROC
SEA INVEST • SENALIA • SHGT
SILO CORDOBA • SILOPORT
SIMAREX • SNC LAVALIN • SONASTOCK
SoSiPo • STOLZ • SUCRAFOR • SUNABEL
SYLVER FOOD • TAIM • TAME • TEREOS
TERMINAL RIFUSE • TOEPFER • UNIDESHY

SERVICE BASED ON QUALITY AND PROXIMITY

- ▼ PRECIA MOLEN offers complete and rapid services while guaranteeing compliance with regulations thanks to its technicians throughout the world.

Our support desk operates 24 hours a day to ensure a rapid response to requests for service.

Wherever you are in the world, our service teams are always at your disposal.



preciamolen.com



- OUR SUBSIDIARIES
- OVER 40 AGENTS THROUGHOUT THE WORLD

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