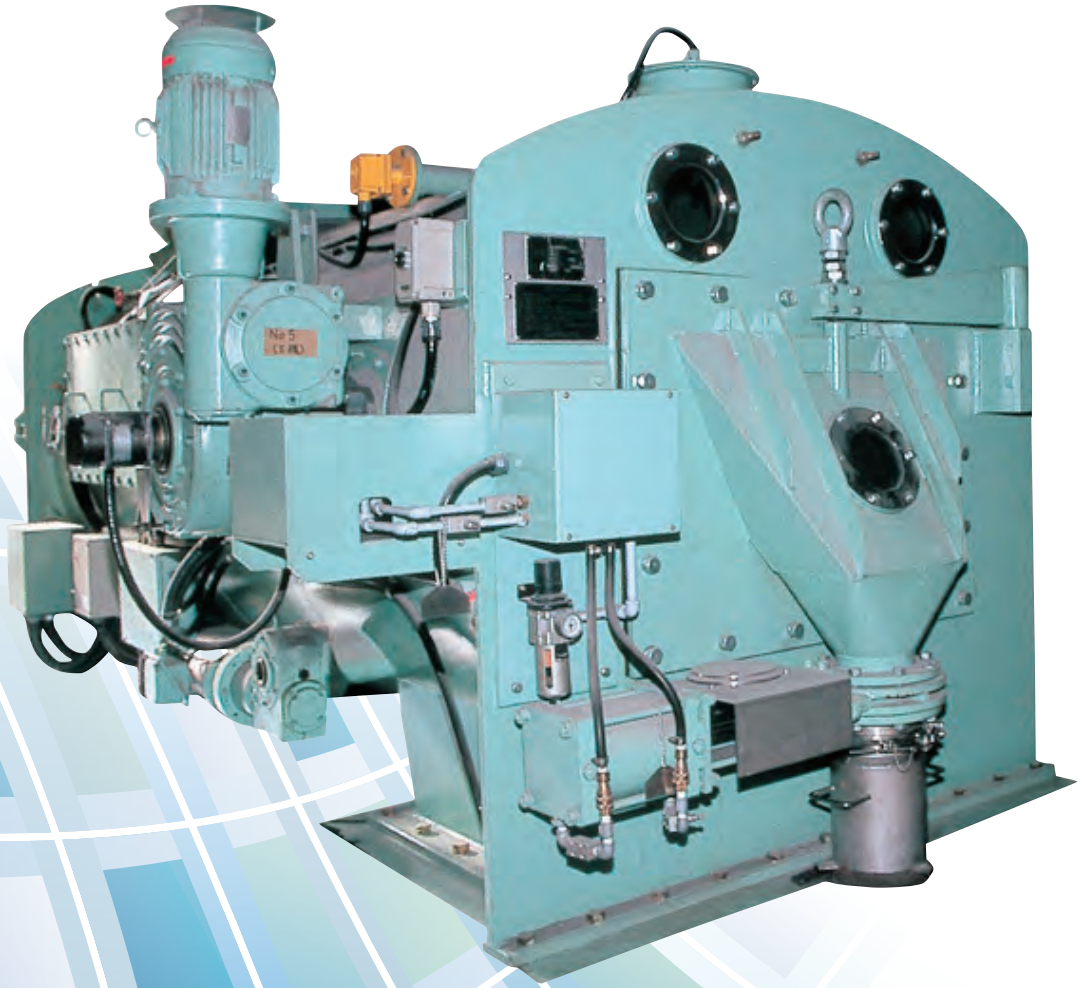
Yamato

SAFETY COAL FEEDER

COAL FEEDER

GM-BSC22



THE FUTURE OF COAL ENERGY

The coal-fueled thermal power generation will go hand in hand with preservation of the nature.

Thanks to the technological advances in suppressing emission of gases harmful to the environment, such as NOx, SOx, and CO_2, coal has come back into the spotlight as an alternative energy source in thermal power generating facilities around the world.

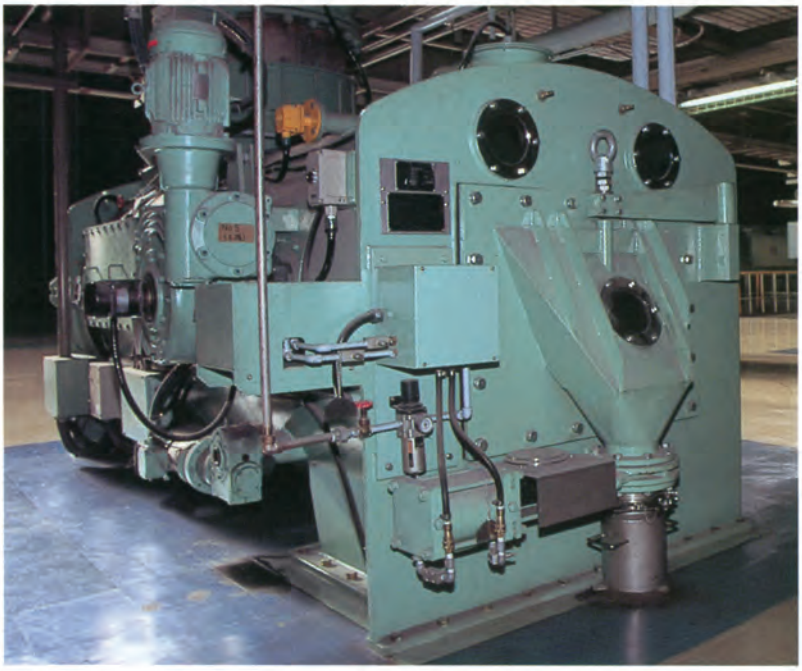
It is said that by the year 2010, the coal-fueled thermal power generation will have contributed by more than half the total energy generated in the world. In addition to electric utilities companies, an increasing number of corporations—especially manufacturers, both public and private sectors—have become to own thermal power generating facilities with the coal as a source of energy.

Yamato Scale Co., Ltd. has been known for decades as an established manufacturer of weighing equipments that are capable of working in such a harsh environment.
Our daily activities—quality control, production, and maintenance—have all received ISO9000 series certification.

Pressure-Resistant Gravimetric Coal Feeder

GM-BSC22

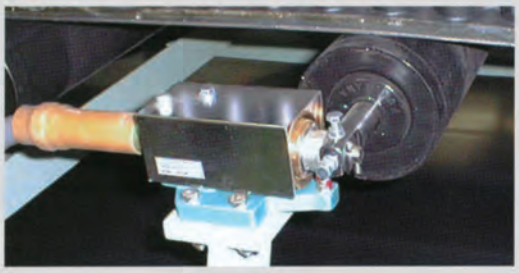
This is a continuous weighing machine used to weigh and feed specified amount of coal from the coal storage tank directly into the pressurized mill.



FEATURES

1. Dust-proof, explosion-proof load cell

A dust-proof, exposion-proof load cell is incorporated as the weighing sensor.

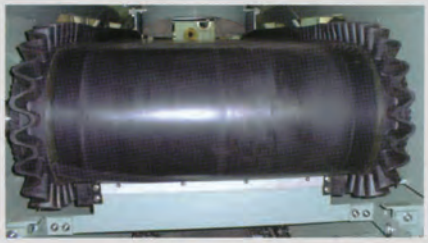


2. User-friendly controller CFC-2000

The CFC-2000 makes zero and span adjustments digitally, without bothersome analogue adjustments. The adjusted values are calculated automatically and stored in memory by pressing a key.

3. A specially designed conveyor belt & clean-out conveyor

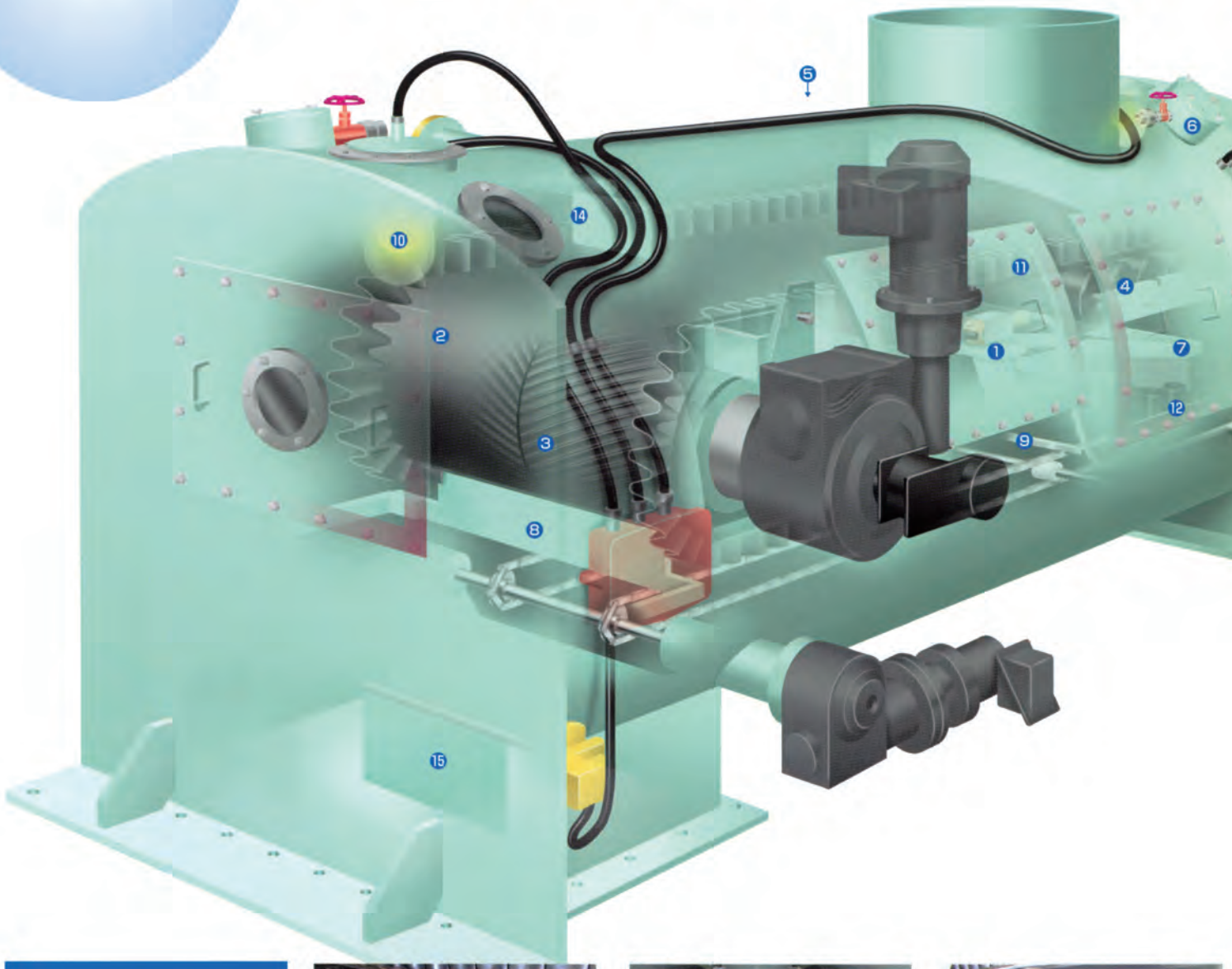
The conveyor belt is equipped with corrugated lugs (60 mm H) to prevent coal from spilling over the sides of the belt. The design and materials used in the conveyor belt leave no gaps.
The clean-out conveyor underneath collects any spilled coal to prevent accumulation and eliminate a possibility of natural flashing.



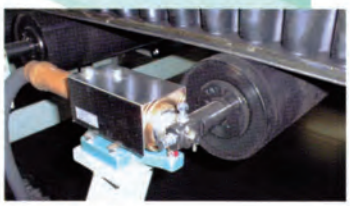
4. Cylindrically-shaped Pressure-Resistant Chamber

Its airtight design does not allow any air to leak out. The cylindrical inlet chute allows the maximum constant flow of coal from the coal storage area—indispensable in securing maximum efficiency.

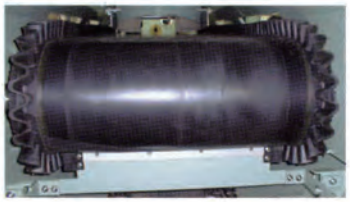
THE CONSTRUCTION



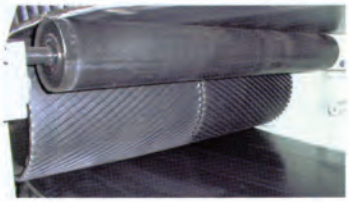
Advantages



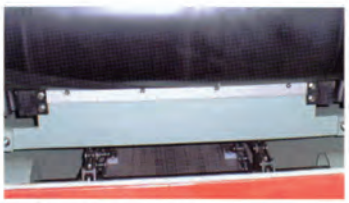
1 Load cell
The dust-proof, explosion-proof load cell yields a linearity of +/- 0.05%. The load cell supports the weighing carrier rollers directly, retaining highly accurate weight readings.



2 The conveyor belt
The conveyor belt is equipped with corrugated lugs which spread when the belt passes over rollers, to prevent coal from spilling over the sides of the belt.

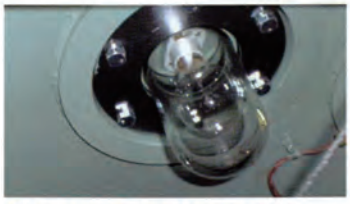


3 Rubber lagging covered head roller
The head roller is covered with rubber lagging, which helps prevent the accumulation of coal on the surface of the roller, and keeps the conveyor belt from skidding sideways.



8 External belt cleaner
This cleaner scrapes coal off the top surface of the conveyor belt. The stainless steel blade is kept pressed against the surface of the belt by a counterweight.

9 Clean-out conveyor
The clean-out conveyor is installed in the bottom of the chamber, right under the conveyor belt. It sweeps any spilled coal or dust into the mill, to prevent an accumulation of spilled coal.



10 Inspection light (2 points)
Inspection lights are installed to make it easy to inspect the inside of the chamber through the inspection windows.

Principle of operation

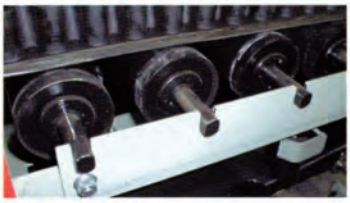
The coal in the coal bunker is fed on the conveyor belt (weighing belt) inside the pressure-resistant chamber, through the coal gate and the downspout.
The chamber inlet chute is cylindrically-shaped to maximize loading efficiency.

The load cell installed beneath the conveyor belt measures the amount of coal discharged from the conveyor belt into the mill as a load factor (kg/m) when it passes over the weighing section. The belt speed (m/min.) is detected by the pulse generator attached to the driving unit.

These two signals are multiplied in the control panel to generate an instantaneous feed rate signal (kg/m x m/min. = kg/min.). The signal is compared with the feed rate setting, PI adjusted, and used as a motor control signal to control the variable speed motor in order to achieve the desired feed rate.
The feed rate setting supplied from the central control room allows automatic remote control.

The control panel

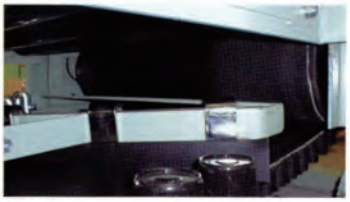
All the instruments used to control the coal feeder are installed in the control panel—each coal feeder has its own panel (standard).
The control panel houses the CFC-2000 controller, motor controller, etc.
Both an indoor and outdoor type are available, depending on the installation location.
The interface to the upstream control room is made from the control panel.



④ Carrier roller
Carrier rollers are installed to reduce conveyor belt friction, caused by the head pressure of the coal.

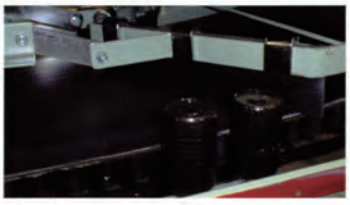
⑤ Air seal
The air seal keeps the coal dust from blowing back into the coal feeder.

⑥ Poking hole and aspirated air
A poking hole is provided in the chamber to allow operators to break clogging in the outlet shute with a stick through it. When the hole is open, aspirated air will blow to prevent the coal dust from being blown out.



⑦ Internal belt cleaner & tail roller
The cleaner scrapes any coal off the underside of the conveyor belt. The tail roller is covered with a rubber lining to prevent an accumulation of coal.

⑪ Inspection door & windows (5 points)
An inspection door and 5 windows are installed to make service and maintenance easy.



⑫ Side rollers (4 points)
Side rollers are installed at 2 points on either side of the return belt, to prevent undesirable belt skidding. When in contact with the belt, they rotate smoothly.

⑬ Inspection window with air cleaner
Five inspection windows are installed to allow inspection inside the chamber.
An air cleaner can be activated to clean the inside of the inspection windows.

⑭ Detecting an insufficient amount of coal being fed
Clogging in the inlet mouth is easily detected by the stainless steel paddle switch, which transmits a paddle signal to indicate that an insufficient amount of coal is being fed.

⑮ Detecting clogging in the outlet
Clogging in the outlet mouth is easily detected by a paddle switch which is activated when pushed up by the coal overflowing the mouth of the outlet.

CONTROLLER
CFC-2000

FEATURES

1. User-friendly operation
The CFC-2000 does not require any analogue adjustments. The zero and span settings can be adjusted digitally. The adjusted values are calculated automatically and can be stored in memory just by pressing a key.

2. Self-diagnosis
Self-diagnosis functions have been incorporated to detect load cell errors, CPU errors, and other problems.

3. Multi-language support New function
In addition to English, CFC-2000 is capable of displaying Japanese, Korean (Hangul) and Chinese (simplified/traditional).

<English>

<Japanese>

<Korean>

<Chinese (Simplified)>

<Chinese (Traditional)>

4. Various graph display functions New function
① Measured values displayed continuously on a graph
To check the feed rate setting (SV), feed rate (PV), control output (MV), speed, and load factor values over the past five minutes on a graph.

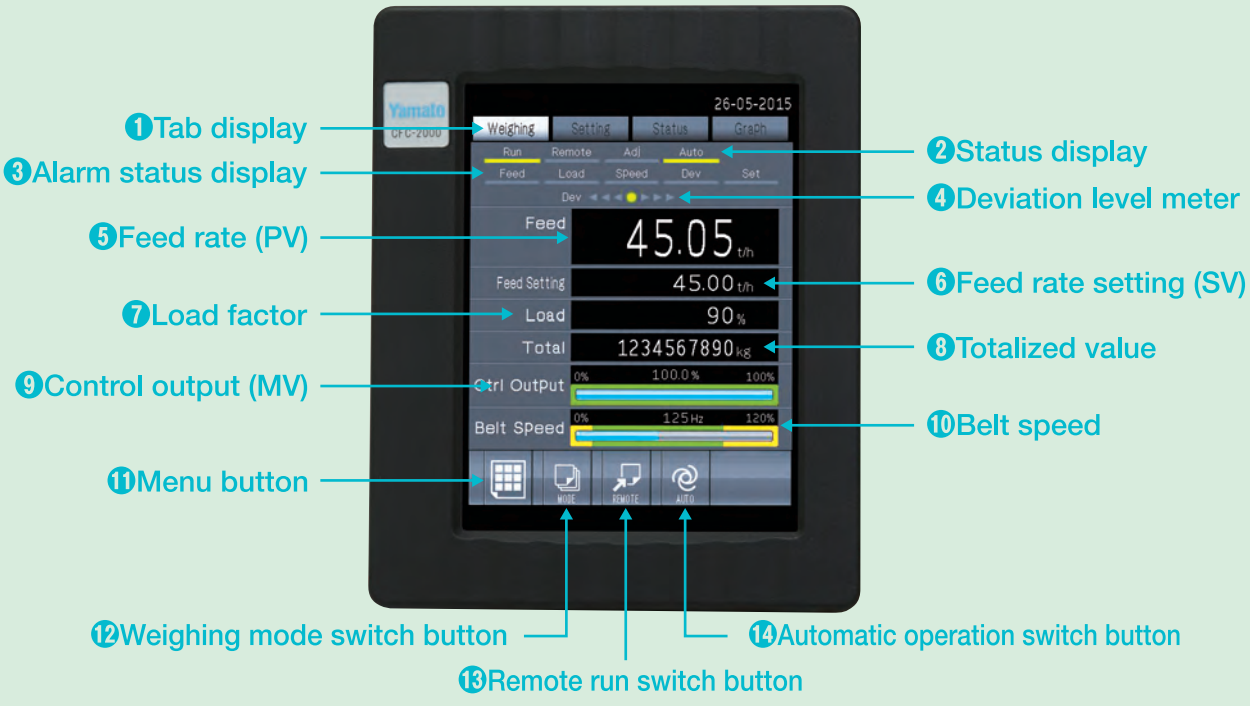
<Real-time graph display>

② Real-time graph display function
To display weighed values on a graph using up to 10 elements, 20,000 samples, and a 10-ms minimum interval. The graph can be used for analyzing control characteristics and checking past weighing status information.

③ Zero-point memory weight graph display function
Changes in the zero point for each zero point adjustment, allows monitor the zero point changes resulting from load cell errors and sticking.

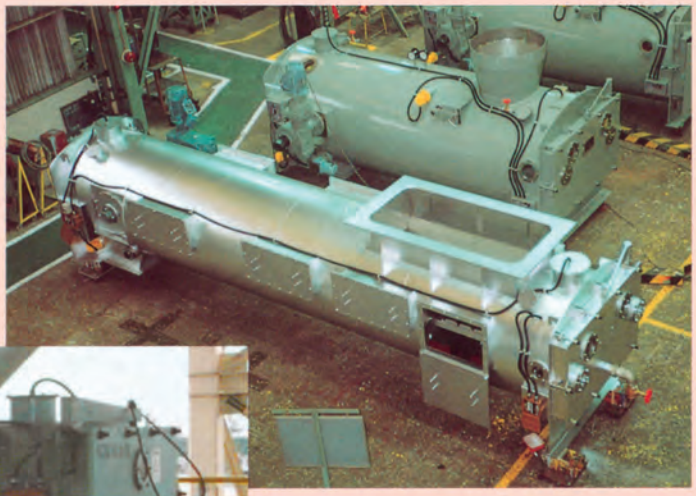
5. Error history memory
The time and duration of errors are recorded in a history log and can be displayed or reviewed.
This will help operators to figure out what caused the errors.

6. Volumetric operation switchover
The load cells and speed detectors are always monitored.
The mode is automatically switched over to volumetric operation, if and when an error occurs.



CUSTOM-MADE EQUIPMENT

We custom-make specially-designed coal feeders if a special inlet mouth size or a special pitch is required between the inlet and outlet mouths.

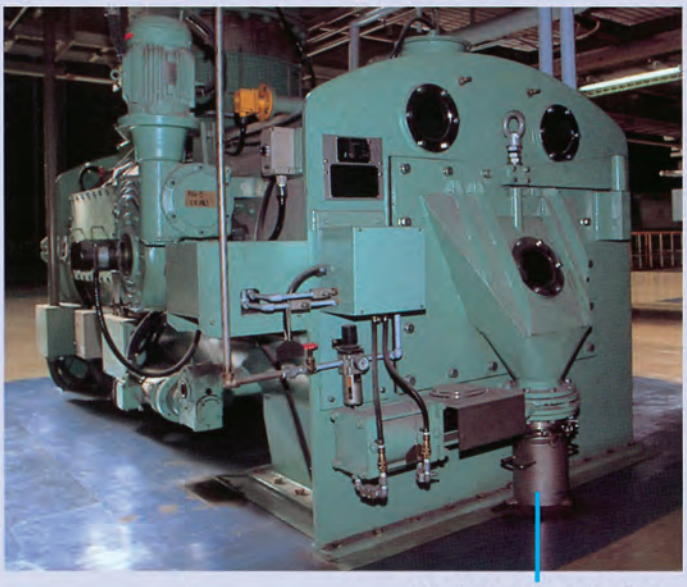


We also custom-make coal feeders equipped with both feeding and weighing conveyors inside the chamber that will allow a flexible layout with a variable distance between the inlet and outlet mouths.

OPTION

Coal sampling device

This device is used to sample the coal inside the chamber. Automatic and manual types are available.



Coal sampling device

Coal gate

It is positioned between the coal bunker and the downspout of the coal feeder, to stop the coal flow when you need to perform service, maintenance, etc.
Automatic and manual types are available.

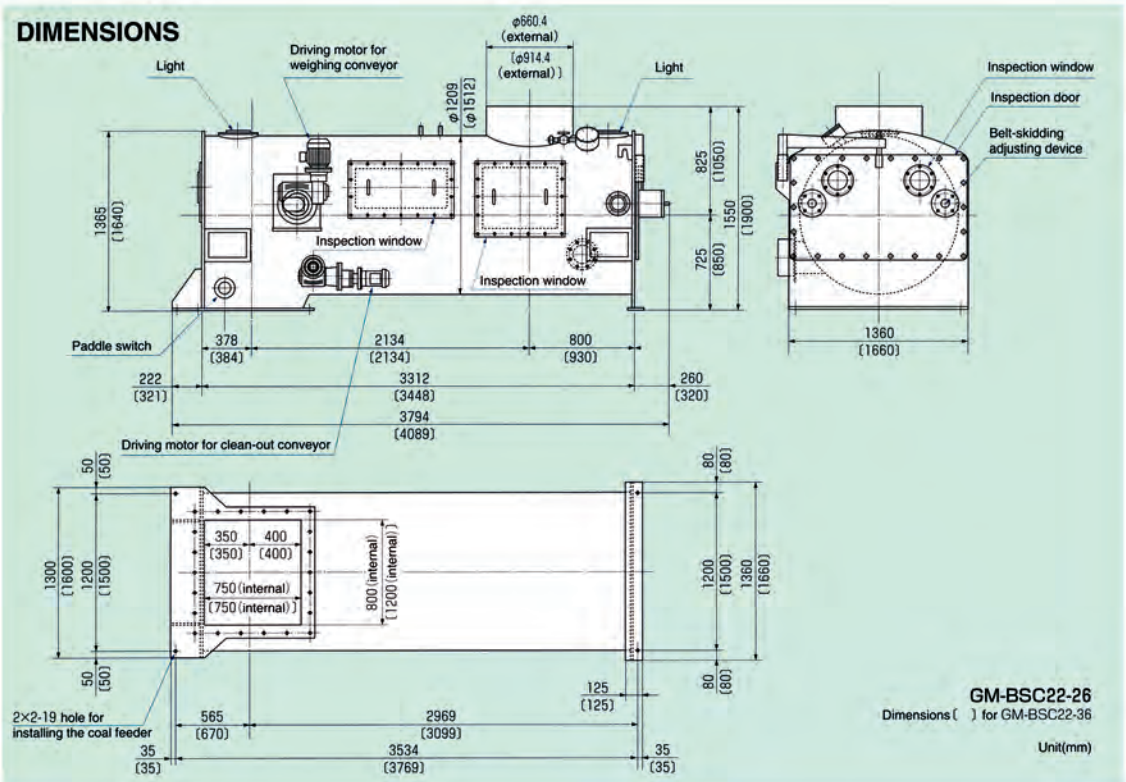
Miscellaneous

- Downspout
- Coal flow monitor
- Dresser coupling
- Explosion-proof electric parts
- Coal chute

STANDARD SPECIFICATIONS

Model		GM-BSC22-26	GM-BSC22-36
Downspout size		26 inch (660.4mm)	36 inch (914.4 mm)
Feeding capacity		max. 120 tons/hr.	max. 180 tons/hr.
Weighing accuracy		+/- 1/200	
Setting mode		Instantaneous value setting mode	
Control mode		control	
Product		coal	
Bulk densit		0.6 ~ 1.0	
Particle size		50 mm maximum	
Weighing length		500 mm	400 mm
Coal weight / m		70 kg/m	100 kg/m
Belt width		850 mm	1,150 mm
Belt		Flexible belt with corrugated lugs	
Inlet mouth		660.4 mm Dia.	914 mm Dia.
Outlet mouth		750 × 800 mm	750 × 1,200 mm
Pitch (between inlet and outlet mouths)		2,134 mm	
Chamber diameter (inner)		1,200 mm	1,500 mm
Chamber thickness (wall)		t 4.5 mm	t 6 mm
Drive motor	weighing conveyor	Inverter motor	
	clean-out conveyor	General purpose motor	
Reduction gear		Shaft-mounted reducer	
Net weight		2,500 kg	3,800 kg

DIMENSIONS



The contents of this catalogue are subject to change without notice.

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