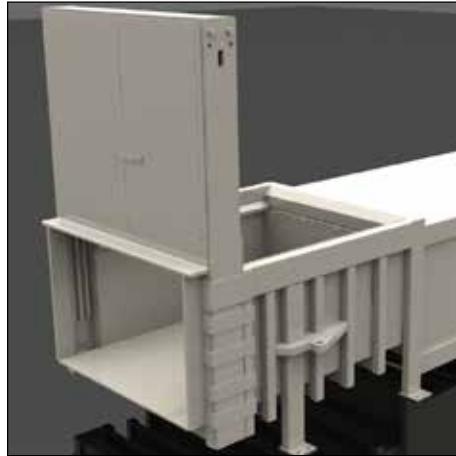
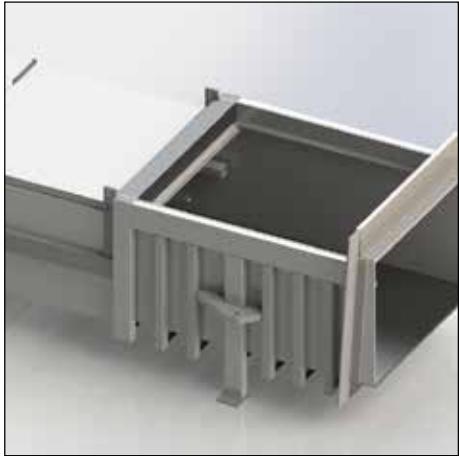


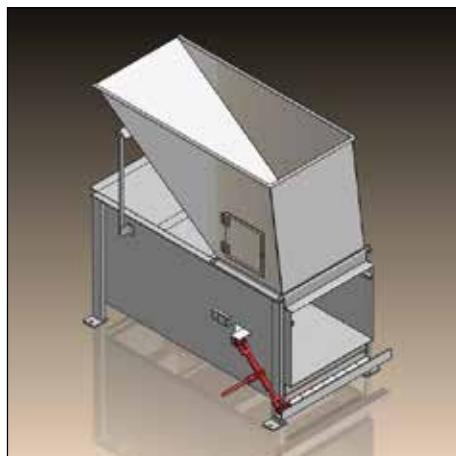
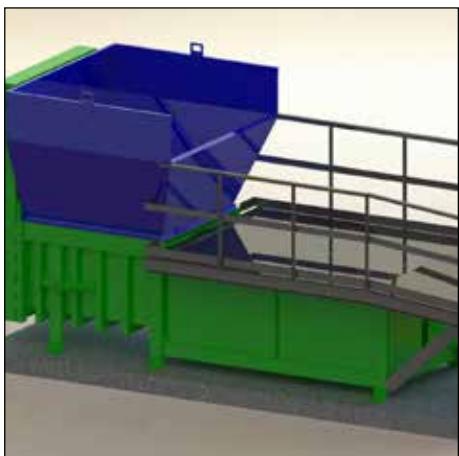
Stationary and Self-Contained
Compactors and Transfer Stations

Design Guide

HEAVY DUTY
INDUSTRIAL



INDUSTRIAL



COMMERCIAL

PRECRUSHER

- **Compactor construction and component design considerations**

- **Identification and selection of standard and optional equipment features**



The Best Value...

**Built Tough.
Built Better.
Built to your Needs.**

All compactors on the market may serve the same function and look similar, but an SP Compactor is superior in ways that you can't readily see unless you scrutinize the design, the construction and the component quality.

This design guide will help you:

- Review critical compactor design, construction and component functions to assist with your compactor evaluation and selection, and;
- Determine the best combination of standard and optional features to match your specific application design needs and your performance and budget requirements.

Please feel free to call or email us with any questions, or to discuss your requirements with our application engineering staff.

We welcome the opportunity to work with you!



SP Industries designs and manufactures a comprehensive standard line of industrial and commercial grade compactors, precrushers, transfer station equipment and cart dumpers to meet small to large capacity operations. Every unit is tailored to the specific application with a wide variety of user-selected standard and optional design features detailed in this design guide. (Examples of CP-4002 4 cu.yd configurations shown clockwise from top left: fully enclosed compactor; extended snout for deeper container penetration; standard side load, ground load application; compactor stand with rear clean out

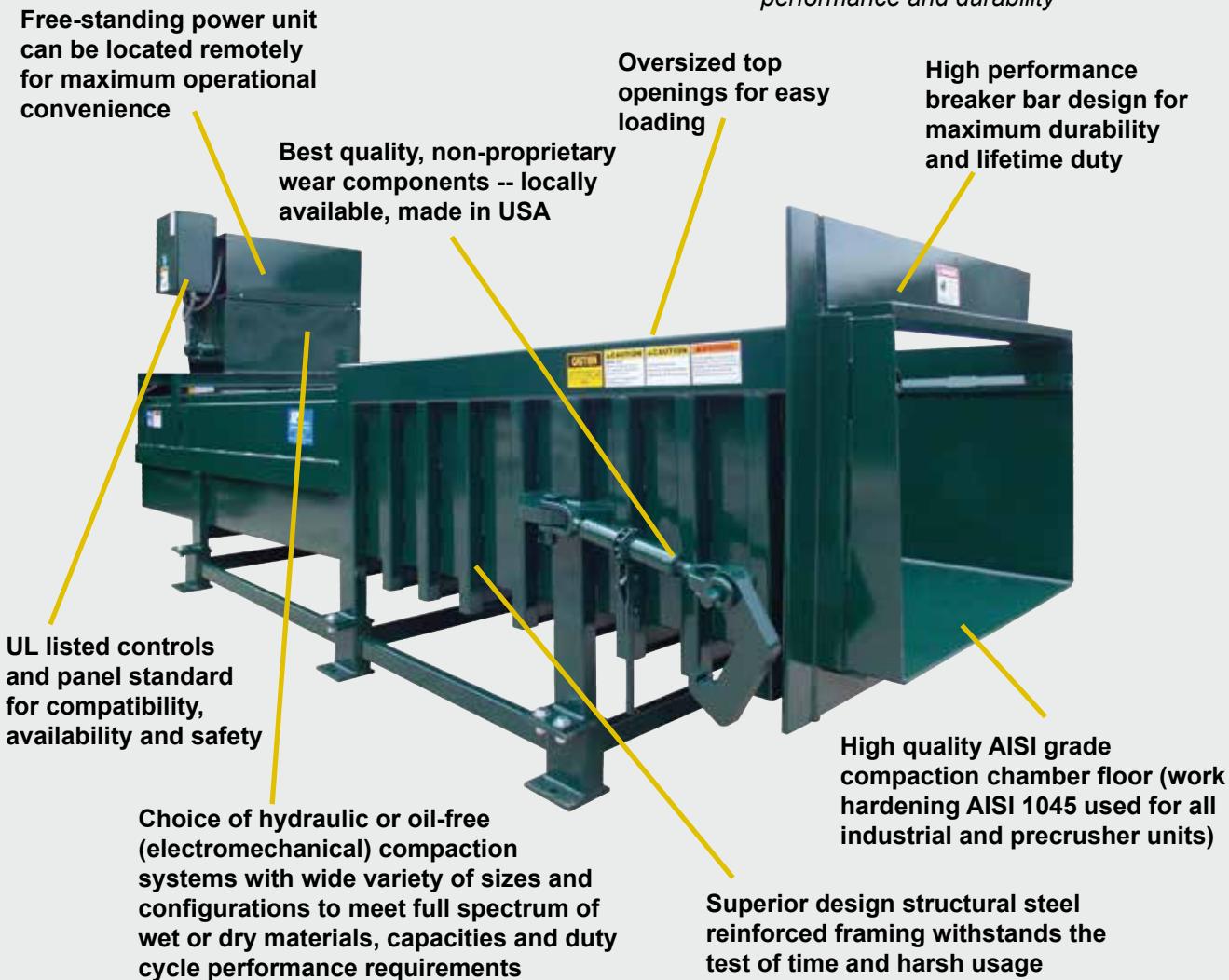


Contents:

Compactor Types and Functions	4 – 5
Design Considerations: Construction Materials and Design	6 – 9
Sizing the Compactor to Application Capacity Requirements	10 – 11
Tailoring to the Application: Standard and User-Selected Optional Features	
Structural Features	12 – 17
Control Features	18 – 21
Power Unit Features	22 – 23

Design Superiority of an SP Compactor...

See pages 6 – 9 for details on critical design features that determine compactor performance and durability



Compactor Types

Stationary Compactors

Stationary compactors are bolted or welded to a permanent surface and used to pack waste material into a compaction container or trailer. Once full, the receiver container is hauled to a landfill to be emptied. Stationary compactors are available in several design grades:



Industrial

- Recommended for installations requiring up to one pull per day
- Waste materials are typically larger and heavier such as packaging material, wooden skids and crates, and scrap process material
- 3 models range in capacity from 2 to 4 cu.yds.
- Typical installations include industrial manufacturing plants, institutional facilities, high volume retail outlets and warehouses, and facilities generating purely recyclable material



Commercial

- Recommended for installations with lighter weight, low volume waste handling requiring one pull per week or less
- 12 models range in capacity from under 2 cu.yds. up to 6 cu.yds.
- Typical installations include retail outlets, grocery stores, business offices, hotels, warehouses and light industrial plants



Heavy Duty Industrial

- Recommended for installations requiring one pull per day or more
- Extra heavy duty construction and dual cylinder rams provide long life performance and maximum payloads for larger/heavier waste materials such as packaging material, wooden skids and crates, and scrap process material
- 13 models range in capacity from 2 to 13 cu.yds.
- Typical installations include industrial manufacturing plants, institutional facilities, high volume retail outlets and warehouses, and facilities generating purely recyclable material

Hydraulic Oil-Free Compactors



EM Series electromechanical compactors utilize powerful electric motor driven rams in place of hydraulic cylinders. EM compactors are ideal for facilities desiring the very best solution in the industry for "clean compaction".

Hydraulic fluid free operation also simplifies system complexity (no pumps, no hoses, no check valves, no potential leaks), saves workspace, provides easier, safer, cleaner operation, and an environmentally-improved approach to compacting.

Precrushers

Precrushers are a specialized stationary compactor unit used in conjunction with an industrial or heavy duty industrial compactor.

- Recommended for installations processing large volumes of bulky and difficult to compact dry waste materials such as barrels, crates, cable spools, appliances, scrap steel, etc. or wet wastes including recyclables, pulp/paper, food processing and packaging, etc.
- Precrushers break down waste materials inside an extremely powerful and heavy duty compaction chamber before it is loaded into the primary compactor. This precrushing greatly increases the volume of material that will fit into the container
- 5 dry waste and 11 wet waste models range in capacity from 3 to 9 cu.yds.



The precrusher gate mechanism is an integral part of the precrusher unit and NOT an add-on feature to a stationary compactor. Due to the tremendous forces generated, the integrity of the equipment and the safety of the operator is questionable when the precrusher gate is designed as an add-on feature to a compactor



An effective dewatering precrusher system presses the wet waste against a steel barrier not against previously processed material. Extracted liquids are channeled to a collection system for disposal or additional processing for reuse or sale.

Transfer Stations



Transfer stations provide a more cost effective method of handling wastes for municipalities where landfills are several miles away or where curbside pick-up is not available.

- Transfer stations provide a gathering point for solid waste, enabling waste to be condensed and transferred to high volume trailers for transportation to the landfill
- Ideal compactor size is determined by a number of factors including volume of waste; typical generation points, residential, commercial, or industrial; the abundance of large bulky items, and the receiving container or trailer.
- 7 models range in capacity from 3 to 13 cu.yds.

Self-Contained Compactors



A self-contained compactor is designed to handle high volume liquid applications. The compactor is permanently attached to the container and mounted on its understructure. When the container is full, the entire unit is loaded onto a roll-off hoist truck for transportation to the landfill.

The volume of liquid that can be held is determined by the height of the sump on the compactor and the quality of the seal on the container door.

Note: roll-off hoist trucks use a variety of designs to load and secure the containers for transportation. The understructure of the self-contained compactor must match the hauler's truck system. Consult the hauler for the correct understructure before ordering the compaction equipment.



Design Considerations: Construction Materials & Design



Structural Steel vs Formed Steel Support

Structural steel supports used in compactor construction come in a variety of shapes including channel, I-beam, and tube. Of these forms, the tube is the strongest and is often used on the sides of the compaction chamber for support in critical areas. Additionally, the closed tube shape reduces debris deposits on the outside of the unit.

A combination of these supports are used to strengthen the steel plate used throughout the compactor. Larger numbers of supports as well as stronger shapes are critical in areas such as the compaction chamber floor and ram top which are susceptible to high impact forces when heavy material is dropped into the compactor.

Forming a steel plate into a support shape will increase the strength of the steel; however, the shape is not nearly as strong as a structural shape of the same dimensions. Structural shapes have added strength at the bend points, formed shapes do not (in fact, forming the steel may actually weaken it at the bend point).

When evaluating a compactor's integrity: the type, size, and number of supports in critical areas is crucial and more so for heavy duty applications.

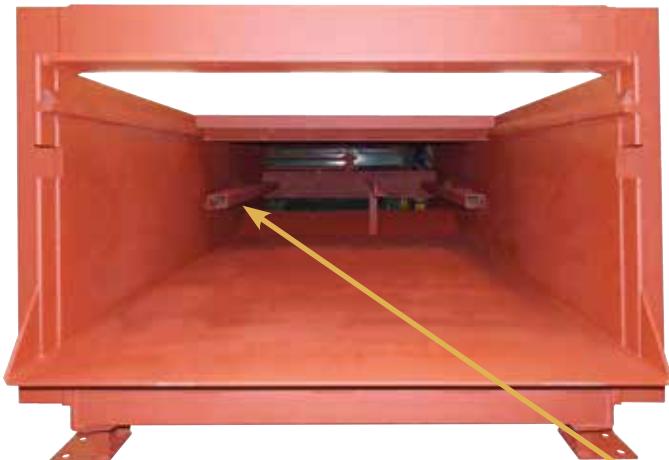
Breaker Bar

The name says it all. The structure of the breaker bar must be strong enough to withstand the forces generated by the compactor. If the breaker bar bends past its yield point, the compactor will become deformed and useless.

To evaluate the quality of the breaker bar, have the compactor manufacturer give you the section modulus of the breaker bar and what forces it can withstand. The breaker bar should be able to withstand at least 2-1/2 times the force generated by the cylinders.

Thrust Beam

Located at the back of the compactor, the thrust beam is used to attach the cylinder(s), and must be able to withstand 1-1/2 times the force of the cylinder(s). Bending this component beyond the yield point will destroy the compactor.



Compaction Chamber Floor Plate

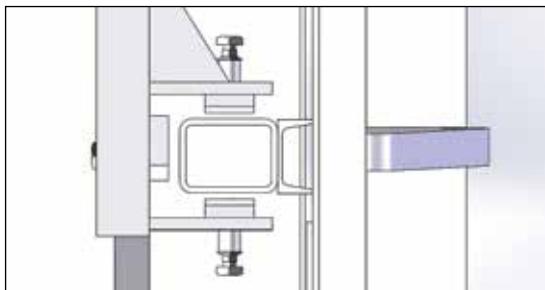
Steel used in construction of the compaction chamber floor should be high quality and relatively flat. SP Compactors use AISI grade steel A36 for commercial units, and a harder steel AISI 1045 for all industrial and precrusher units. (AISI 1045 steel is considered work hardening, which means that the steel actually gets harder the longer it is used.)

It goes without saying that higher grades of steel are stronger, more consistent in strength throughout, and relatively flatter. A wavy floor will cause waste material to build up between the ram and floor. As such, lower grades of steel will wear and weaken more quickly, significantly shortening the life of the floor and the compactor.

Note: the steel used on the bottom of the ram, which rides on top of the chamber floor, should conversely NOT be as hard as the chamber floor steel. Both plates will last longer if the two steel plates working against each other are of different hardnesses.

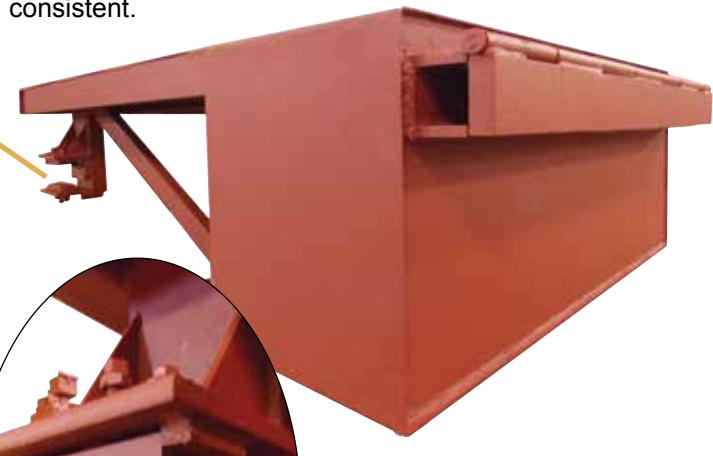
Ram Guide System

A ram guide system maintains the ram from fishtailing side-to-side, and bucking up-and-down during movement.



Ideally, the ram should ride on the compaction chamber floor. This uses the entire surface of the floor to support the ram and resist waste material build-up between the ram and the compaction chamber floor.

Engineering shows us that the ram riding on the floor will not cause any significant loss of forward force from the friction between the ram bottom and the compaction chamber floor. Once the ram is moving, the coefficient of friction is the same whether the supporting area is one square inch or one-thousand square inches keeping weights and materials consistent.



Top left: Structural tubing mounted to the thrust beam serve as a guides for the ram.

Above and inset: The 3-point guide shoes wrap around the tubes to limit ramp movement and promote smooth ram operation.

Forward force lost between a ram which rides on the floor and one that is suspended above the floor is negligible.

The actual guide system consists of a number of adjustable wear blocks at the back of the ram and ram hold-down bars above the ram on each of the compaction chamber walls. Wear blocks are made of a special hardened plastic such as Nylatron which will slowly wear before the steel wall or support it is in contact with wears.

The principle is to give the guides a good surface to work on so that the ram movement remains stable. Any movement side-to-side or up-and-down will cause the compactor ram and compaction chamber to wear more quickly; shortening the life of the compactor.

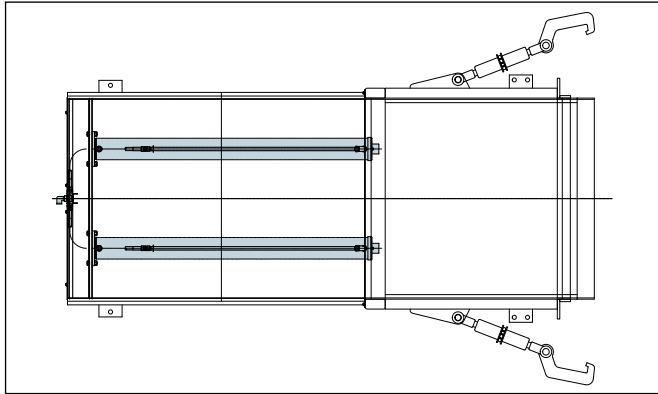
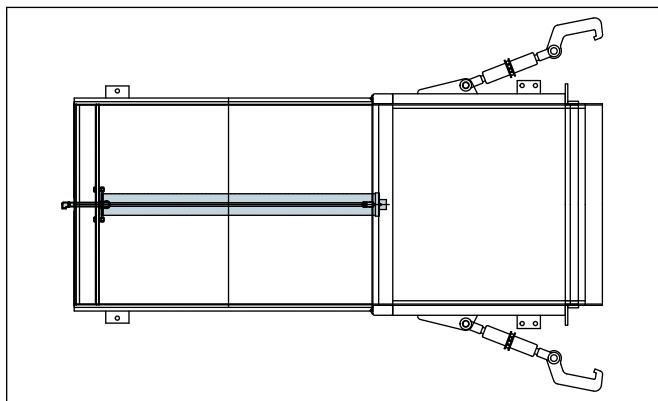
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Design Considerations: Construction Materials & Design

Hydraulics

Cylinders

A hydraulic cylinder is measured by its bore (the inside diameter of the casing), rod (the outside diameter of the movable rod), and stroke (the length the rod is able to move). The force that the cylinder can exert is determined first by the size of the bore; a larger bore cylinder is capable of exerting greater forces. The diameter of the rod determines whether or not the rod can withstand the force it is generating. A larger rod means a stronger cylinder.

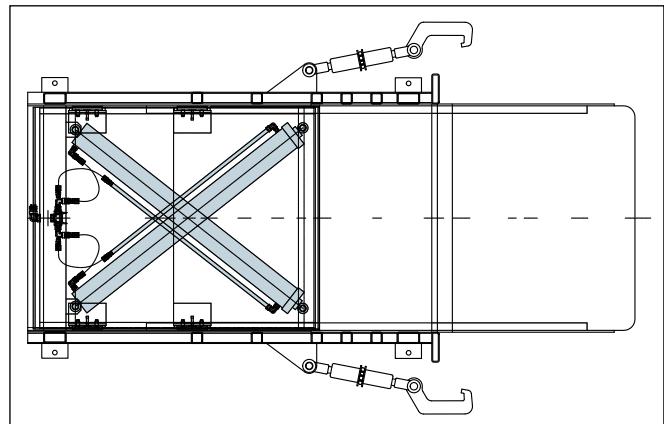


Some compactors are equipped with one cylinder (single cylinder models); others with two (dual cylinder models). Generally, two cylinders of the same size will have twice the force of one, and they can be spaced to spread the force generated against the ram face more evenly than one cylinder pushing in the middle. Larger compactors with wider ram faces tend to have less side-to-side ram movement when they employ two cylinders.

In addition, longer cylinders must be supported to assure against sagging or bending from the force they generate, and their own weight and the weight of the oil inside when they are fully extended.

Many compactor models use two hydraulic cylinders which are crossed. The cylinders are mounted on each side of the compactor and opposite sides of the ram.

This design helps to shorten the overall length of the compactor and is useful in certain applications.



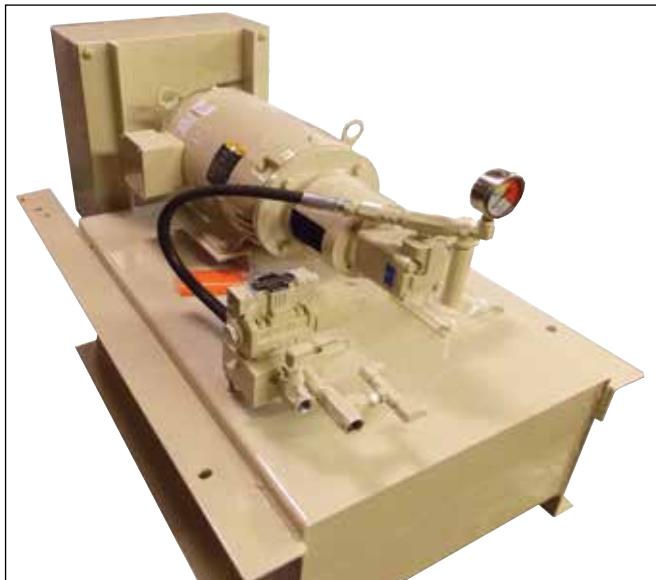
However, one notable shortcoming is that crossed cylinders do not generate as much force as straight push cylinders of the same size. A crossed cylinder pushes at an angle to the ram movement which reduces the forward force of the ram. Cylinders with greater final angles to the ram face will have less final forward thrust on the ram.

Oil

Hydraulic oil is the lifeblood of the compactor. Clean high-grade oil should be used in the power unit at all times. Lower grade oils can break down faster and cause components to wear out more quickly. A pour point of -30° F is a must for cold climates. Oil heaters and coolers are available for extreme conditions.

Electrical Components

Pump

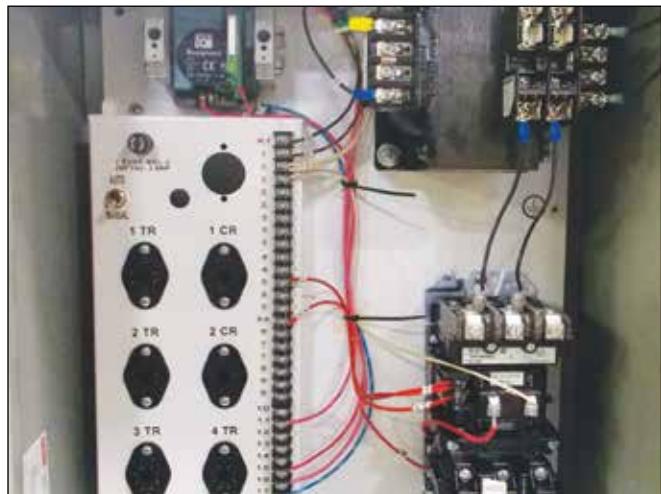


The hydraulic pump moves the oil into the cylinder(s). The rating for the pump is in GPM (gallons per minute). The larger the number, the faster the pump can move the oil and the faster the ram will move forward and back.

Two considerations should be made when the pump is specified. First, the internal operation of the pump is designated as vane or gear. In order to keep noise levels during operation at a minimum, the vane pump design operates at a lower noise or decibel level.

The pump will have an effect on how loud the machine will operate and at what speed the ram will move. A vane pump will operate at a lower decibel level than a gear pump and will help to keep the equipment operating within OSHA restrictions.

A constant displacement pump will maintain operating speed even under load conditions; as opposed to hi-low pump which slows the cycle time when under pressure. If cycle times are being assessed, consideration should be made concerning the speed of the compaction cycle when it is actually compacting the waste material.



All components should be UL listed for compatibility and safety. Once the control panel is complete the entire panel can be UL certified if necessary. In this case a UL inspector will check the panel and mark it as certified.

The components should be NEMA rated, which are designed for heavy duty industrial use and readily available for repair or replacement if necessary.

An electrical panel can be designed to be controlled with relay logic or PC logic. Relay logic uses individual switches, timers and relays to direct the control of the operation of the compactor. If a control fails, it can be readily replaced with a like control.

PC logic uses an electronic control board to control the operation of the compactor. If this board fails, a new control board must be purchased from the manufacturer for replacement.



Compactor Sizing and Selection

Use the following three step evaluation process to select the appropriate compactor type and size, and properly outfit it to the specific needs of the installation.

If you have any questions, need assistance with sizing/selection, or are concerned about special processing of difficult materials, please contact SP Industries to discuss your requirements with our application and engineering staff.

1: Evaluate a Compactor for Cost-Effectiveness

The two primary areas of concern to consider when selecting a compactor are the cost to haul the trash to the landfill, and the cost of labor to handle it.

Utilizing a compactor packs more waste into a compaction container which means fewer trips to the landfill. Assuming the garbage hauler is charging per pull — fewer pulls means fewer charges. Additionally, landfill charges are either based on weight or volume. If the fee is based on weight, compaction will not reduce landfill charges, but if it's based on volume, then compaction will reduce overall landfill costs.

In regard to labor savings: an appropriately designed approach and access to the compactor can reduce employee labor and time. Also, the labor spent breaking down large bulky items and trying to fit more material into the container are eliminated.

Bottom line: After evaluating these factors, if a compactor can not save you money, then don't buy one! If you're not sure, consult your supplier to survey your facility. They can help make a recommendation for the type of system you need and determine the appropriate size system to service your capacity.

2: Maximize Compaction Ratio and Container Weight Efficiency

Compaction ratios provide a good estimate of compactor performance. For instance, consider the amount of trash that typically fills a 30 cubic yard open-top dumpster. Utilizing a 4:1 compactor, the equivalent of 4 of these containers can now be contained in one load, thus reducing hauling charges 75%.

SP Industries recommends evaluating the weight of the trash material to be handled in conjunction with the compaction ratio.

For example, a compactor with a 10:1 ratio may seem more advantageous than a 4:1 machine. But, what if the waste in the container weighs 5,000 lbs prior to compaction? With a legal weight limit for hauling in the 18,000 to 20,000 lbs. range, a 4:1 compactor will fill the container to absolute legal weight limit capacity. Choosing a compaction ratio beyond 4:1 in this application would be unnecessary and cost-ineffective.

Similarly, if the non-compacted waste weighs 2,000 lbs., a 4:1 ratio machine will only compact 8,000 lbs. into the container, less than 1/2 the maximum load limit. This will cost more money with the increased number of pulls and hauling fees to the landfill. For this application, a 10:1 ratio will fill the container to maximum weight capacity and cost-efficiency.

Bottom line: Don't be fooled by a sales pitch regarding phenomenal compaction ratios. Use the maximum legal container weight as the goal to reach when compacting. Then select the lowest compaction ratio that reaches this goal considering the particular mix of trash being generated at the facility. Skip the hype, do the math.



3: Size Compactor Capacity and Performance to the Application

Stationary compactors range in capacity from 3/4 to 13 cubic yards. (SP Industries self-contained models range up to 39 cubic-yards — contact factory for more information on these.)

When handling voluminous amounts of waste, several other factors should also be considered to properly determine the overall capacity and performance of the machine:

Duty Cycle: For installations requiring only one pull or less per week, a commercial grade unit is sufficient. For more frequent pulls, an industrial unit is required. For one pull or more per day, a heavy duty industrial compactor is recommended. (See *selection chart below*.)

Cycle Time: Compactor cycle time speed varies widely between different size machines. As such, cycle time plays a pivotal role in determining the actual volume of material that a compactor will process. For example, based on the specific waste flow rate of material from a given facility, an 8 cubic yard compactor with a faster cycle time can operate more efficiently in moving the volume of waste than a large 13 cubic yard machine. (See *selection chart below and select model specifications*.)

Cleartop Opening: The size of the compactor opening must accept the size of the trash material being loaded, and accommodate the loading method available at the facility. (See *selection chart below and select model specifications*.)

Loading Access: The cleartop opening should be configured with the appropriate hopper, chute and other loading features for maximum ease and efficiency. (See “*Structural Features*” section for recommendations, pages 12-17.)

Control: Depending on the physical placement of the compactor, a variety of remote operating and safety controls should be considered. (Refer to the “*Control Features*” section for recommendations, pages 18-21.)

Power Unit: Particularly for high performance, severe duty installations, enhanced functionality for the hydraulics and power unit should be considered. (Refer to the “*Power Unit Features*” section for recommendations, pages 22-23.)

Compactor Comparison

Compactor Type	Commercial	Industrial	Heavy-Duty Industrial	Precrusher	Heavy-Duty Precrusher
Duty Cycle (# pulls)	≤1/week	≥1/week to ≤1/day	≥1/day	≥1/week to ≤1/day	≥1/day
Models	12	13	7	4	5
Operating Mode Hydraulic (H); Electromechanical (EM)	H or EM	H or EM	H	H	H
Capacity* (cu.yds.)	1/3 – 6	2 – 8	3 – 13	3 – 7	3 – 9
Cleartop Opening* (L” x W”)	24 x 29 to 75 x 56	47 x 58 to 96 x 78	47 x 58 to 114 x 77	48 x 57 to 90 x 76	48 x 57 to 124 x 76
Maximum Compaction Force* (bs.)	25,130 – 56,500	56,500 – 113,100	115,450 – 157,000	101,800 – 118,740	124,540 – 161,620
Cycle Time*	26 – 50	47 – 89	50 – 89	54 – 80	69 – 97
Compaction Ratio Performance* (approx.)					
Mixed	Paper, Cardboard, 10% Wood	4 : 1	6 : 1	7 : 1	8 : 1
	Paper, Cardboard, 50% Wood	3 : 1	3 : 1	4 : 1	5 : 1
Metals	Scrap, Turnings, Clips, Shavings	—	5 : 1	6 : 1	6 : 1
	Barrels, Roll Stock	—	4 : 1	5 : 1	7 : 1
Wet Waste	Solid/Liquid Mix	—	2 : 1	3 : 1	2 : 1
	Food Scraps	—	5 : 1	6 : 1	5 : 1
Wood	Chips, Scraps	—	3 : 1	4 : 1	5 : 1
	Skids, Pallets, Crates	—	3 : 1	4 : 1	5 : 1
Specialized Functionality					
Dewatering		:	:	:	:
Fluid Recovery		:	:	:	:

* Minimum – maximum range listed; dependent on specific model.



Tailoring to the Application: Structural Features

SP Industries offers a diverse range of design features that provide maximum configurability to meet specific application requirements. Primary structural design features are standard equipment on all SP compactors with no additional cost. Less frequently required optional structural features are extra charge items, but readily available to add to your system without additional lead-time.

Standard Structural Features

- Breaker Bar
- Floor, Side & Top Supports
- Frame Floor
- Hydraulic Cylinder Support
- Precrusher Gate
- Ram Guides
- Ram Hold Down Bars
- Ram Wiper
- Ratchet Load Binders
- Rear Cross Member
- Removable Access Panel
- Weather Hood

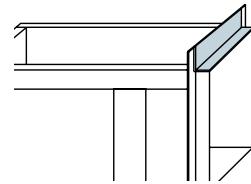
Optional Structural Features

- 750# Walk On Deck
- 5,000# Deck
- 10,000# Drive On Deck
- Access Doors
- Bridge Chutes
- Compactor Stands
- Container Centering Guide Island
- Container Centering Guide Rails
- Container Centering Guide Rails with Stops
- Deck Extensions
- Disinfectant Spray System
- Dog House Type Hoppers
- Full Enclosures
- Hand Rails
- Hoppers, Side or Rear Load
- Pinning Tunnel
- Safety Gates
- Safety Interlock
- Security Chutes
- Security Door and Thimble
- Telescopic Chute
- Through Wall Ratchet Kit

Standard Features

Breaker Bar

The steel cross member at the top front of the compaction opening that holds the compaction chamber together



helps break oversized material down in size so it will fit into the compaction container opening. Our breaker bars have been designed to withstand a minimum of three times the maximum compactor force rating per the ANSI Z245.2 safety standards. Material wedged between the ram and breaker bar will create forces much greater than the compaction force. For instance, the breaker bar on a machine with a compaction force of 102,000 lbs. is engineered to withstand forces greater than 306,000 lbs. At those forces ram movement will stop or the material will give before the breaker bar will be permanently deformed.

Floor, Side & Top Supports

Structural steel channels, beams, angles, and tubes are used to provide the most reliable and strongest support.

Frame Floor

AR 235 Abrasion resistant work hardening plate is standard on all compactors and precrushers. This grade steel increases in hardness with use. Special Hardox AR floors are available upon request.

Hydraulic Cylinder Support

Used on the CP-3101-HD and all larger industrial machines (that have a 74" or larger stroke) including all PC models to support the cylinder(s). They support the longer cylinders keeping the cylinder and rod in line when the cylinder rod is extended, this prolongs the life of the seals and piston rings.

Precrusher Gate

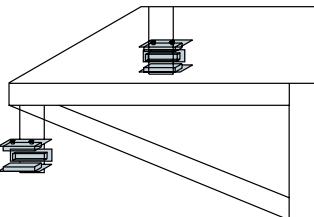
A standard feature on all precrusher/compactor units. It is a vertical gate at the front of the compaction chamber which, when closed, provides a steel wall for the material in the chamber to be crushed against by the ram. It is used for bulky material such as crates, barrels, white goods and pallets to reduce the volume of the material before compacting it into the container.



Ram Guides

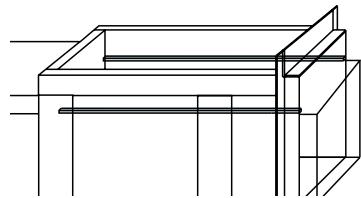
Nylatron pads on each side of the ram guide the ram inside the frame and maintain the ram against bucking and fishtailing. The wear guides are adjustable and if needed replaceable.

These wear pads are like brake shoes and require adjustment or replacement based upon the usage of the machine.



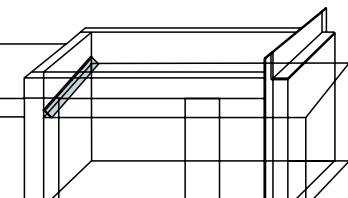
Ram Hold Down Bars

Steel wearbars running along the top of each side of the compaction chamber which hold the ram down during the compaction cycle.



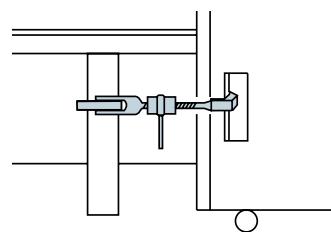
Ram Wiper

A hinged wear bar at the back of the compaction chamber which wipes debris off the ram top when it retracts into the compactor.



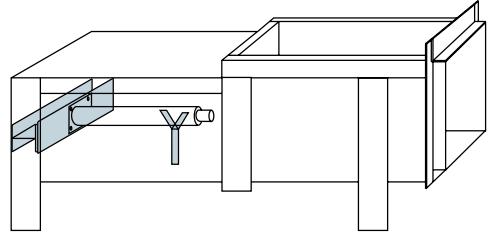
Ratchet Load Binders

To secure a compaction container or trailer to the compactor. Heavy duty swivel hooks for a positive machine-to-container hook up. The ratchet load binders are designed to withstand more than the force generated by the hydraulic system. Containers attached to this system must also be designed to withstand the same or greater forces per ANSI Z245.21 safety standards.



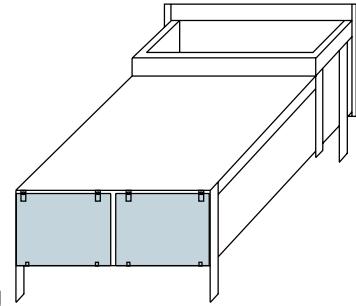
Rear Cross Member (Thrust Beam)

A combination beam and plate weldment to which the cylinder(s) is/are bolted (foot mounted). This member is designed to withstand more than the forces capable of being generated by the hydraulic power source per the ANSI Z245 series safety standards.



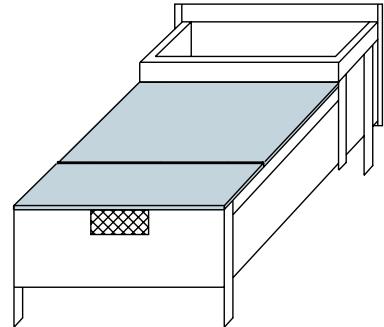
Removable Access Panel

Bolted on top and/or rear of the compactor for access to internal compactor components such as the cylinder(s), limit switch, guide shoes and hydraulic piping. Lockout/tag out procedure must be followed before removing access panels per OSHA guidelines.



Weather Hood/Access Panel

Standard on the CP-4001, CP-4002 and CP-6002. The weather hood keeps the weather out and allows easy access to internal components of the compactor. Lockout/tag out procedure must be followed before removing access panels per OSHA guidelines.



Tailoring to the Application: Structural Features

Optional Features

750 lb Capacity Walk-On Deck

Available on all models for rear hopper loading systems. Cannot support the weight of a forklift or cart dumper.

5,000 lb Capacity Deck

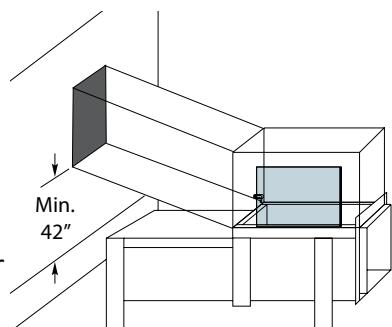
Available on SC and SCS models of self-contained compactor/containers.

10,000 lb Capacity Drive-On Deck

Available on models of stationary compactors CP-2101 and larger for rear loading with a forklift or cart dumper system.

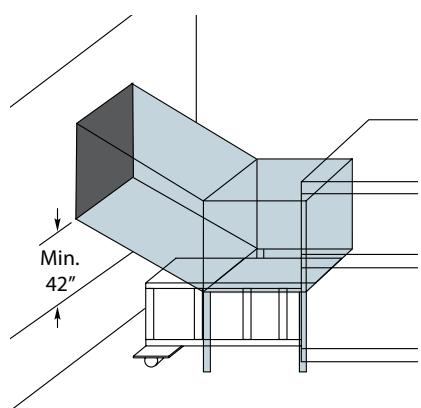
Access Doors

An interlocked access door is available on a chute to allow access for cleaning the chute or clearing a jam. When the door is opened, the compactor will shut off. When entering the chute, all OSHA lock-out / tag-out procedures are required to be followed.



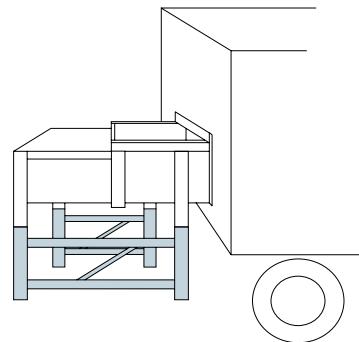
Bridge Chutes

Bridge chutes are available for side or rear loading of self-contained compactor/containers. These chutes allow the SCS unit to be removed from under the chute for hauling. Loading doors of chutes could require interlocks per ANSI/OSHA guidelines.



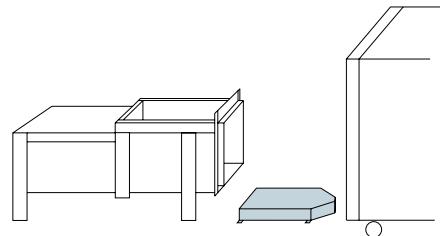
Compactor Stands

These stands are used to raise the compactor to the loading height of a transfer trailer or for special applications to pack into the top of a compaction containers.



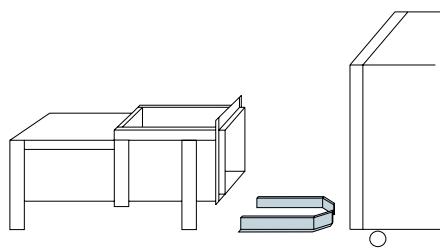
Container Centering Guide Island

A covered island which aligns the container with the compactor when the container is rolled back into position for attachment to the compactor.



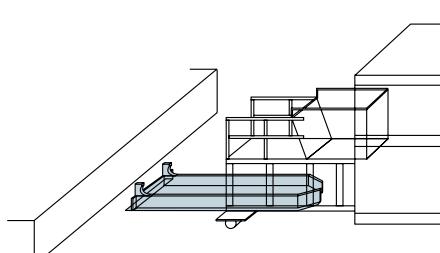
Container Centering Guide Rails

Various lengths are available to align the container with the compactor when it is rolled back into position for attachment to the compactor.



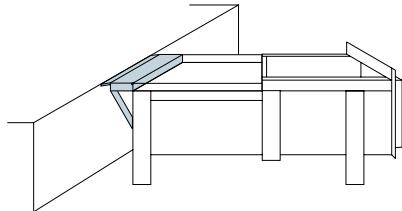
Container Centering Guide Rails w/Stops

Guide rails with stops are available to align self-contained compactor/containers with their loading systems. Systems available include angle or channel type guides.



Deck Extensions

For joining machine deck with building dock and providing necessary clearance for access to the rear of the machine.

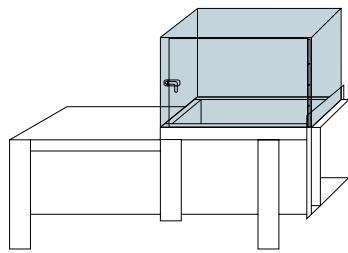


Disinfectant Spray System

A premeasured intermittent spray helps to eliminate offensive odors and/or vermin. One aerosol can is included with our standard canister system.

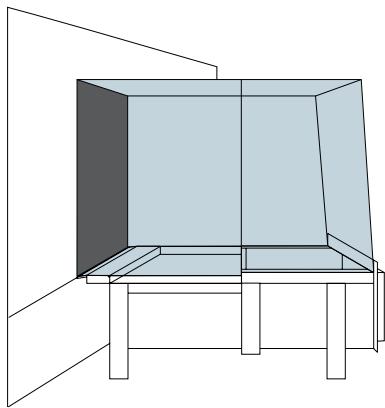
Dog House Type Hoppers

Enclosed hoppers are available for loading from rear and from either or both sides of the compactor. The doors must be equipped with safety interlocks to stop the machine when the door is opened.



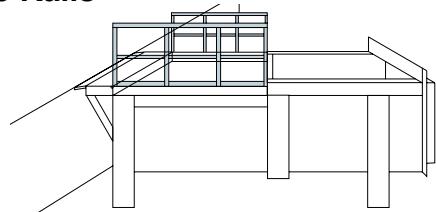
Full Enclosures

These enclosures are designed to completely cover the compactor deck and chamber opening to close off the area and reduce heat or air conditioning loss from the building and protect the operator from the weather.



Hand Rails/Toe Rails

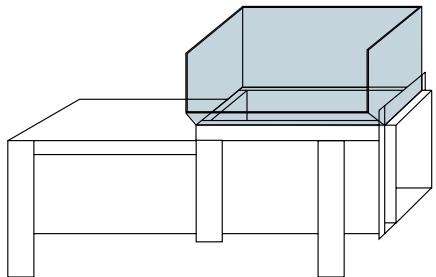
Safety approved 42" height per OSHA and ANSI recommended safety standards. Hand/toe rails are required when working surface is 48" or higher off the ground.



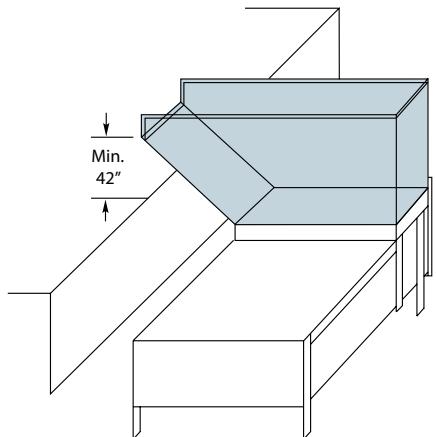
Hoppers, Side or Rear

Standard size hoppers are available for all stationary compactors, precrusher/compactors and self-contained compactor/containers. See the standard hopper charts for sizes. Special hoppers are available on request. All meet ANSI Z245.2 series specifications.

Side load hopper from the ground is shown with ANSI type load lip allowing for 84" of guarding distance from any moving hazard.



Side load hopper with a 42" load lip from a dock



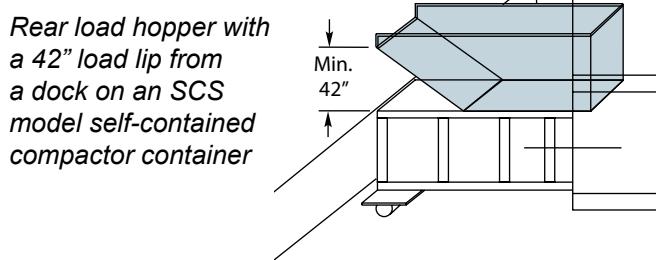
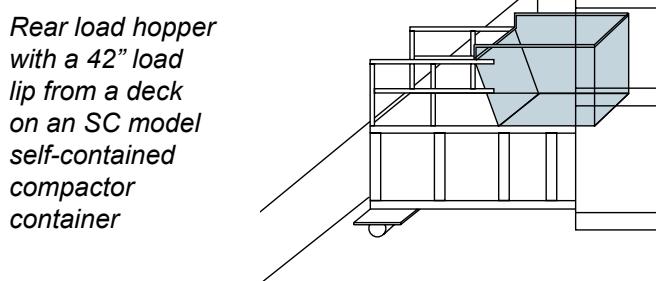
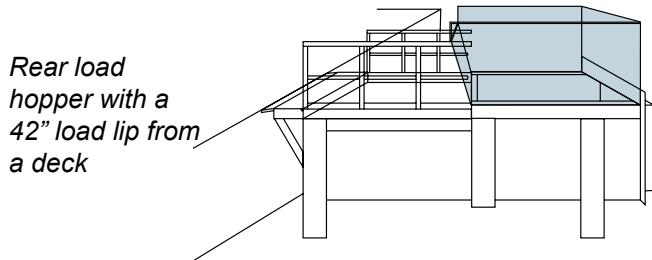
Hoppers continued on next page...



Tailoring to the Application: Structural Features

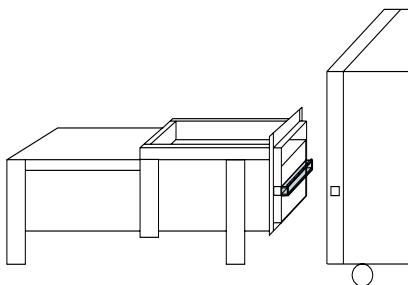
Optional Features

Hoppers continued from previous page...



Pinning Tunnel

A hinged tunnel mounted on the face of the ram which aligns with holes in the door of the attached container. This allows a chain, cable or pinning sword to be inserted through the holes in the container door and between the ram face and the refuse to retain the refuse from spilling out of the container when the container is pulled away from the compactor.



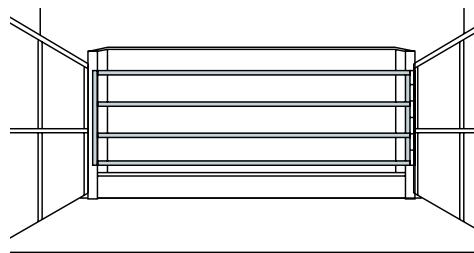
A small technical diagram showing a side view of a pinning tunnel. It consists of a rectangular frame with a hinge on one side. A horizontal bar or "sword" is shown being inserted through a hole in the frame and another hole in a vertical panel, likely a container door, to secure the refuse.

Safety Interlock

A safety switch is mounted on a chute or hopper door, or hopper gate when guarding or loading height is less than 42" H and a hazard is less than 84" away which can be reached. The interlock switch will only allow the machine to run when the door or gate is closed. Machine operation will stop when the door or gate is opened.

Safety Gates

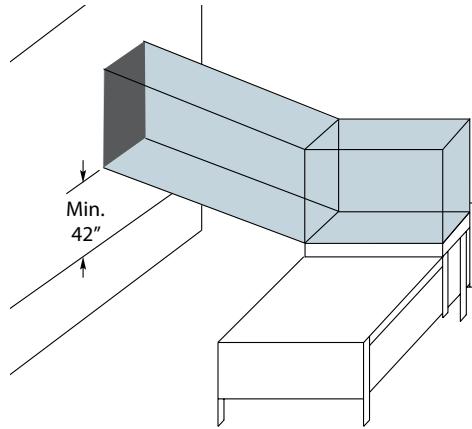
Used to close off loading areas and equipped with a safety interlock switch to ensure that the operator is at a safe distance before the compactor is started per ANSI Z245.2 series specifications.



A technical line drawing showing a set of safety gates. The gates are made of metal bars and are positioned in front of a rectangular opening, likely a loading area. They are designed to be closed to prevent operators from getting too close to the compactor while it is running.

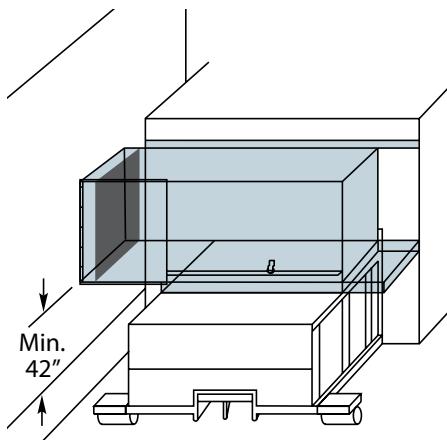
Security Chutes

Fully enclosed chutes are available for side or rear loading of a stationary compactor from the inside of a building. Loading doors of chutes could require an interlock per ANSI/OSHA guidelines.



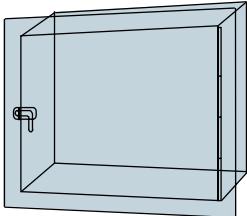
Telescopic Chute

Telescopic chutes are available for side loading of self-contained compactor/containers. These chutes are attached to the compactor and slide away from the wall opening to allow the SC unit to be removed for hauling. Loading doors of chutes could require an interlock per ANSI/OSHA guidelines.



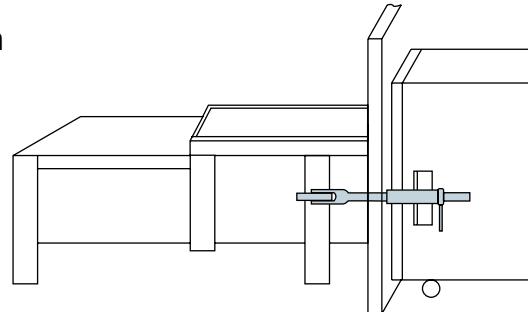
Security Door and Thimble

Used as a through the wall access to a security chute. The door can be locked for safety and security. A loading height of at least 42" is required for walking/working surface safety standards and must be supplied with a safety interlock per ANSI Z245 series standards.



Through Wall Ratchet Kit

The kits have special load



binders that allow the hauler to unhook and re-hook the container outside the building, from the compactor inside of building. This eliminates the need for the hauler to have access to the interior of the building. Shut off controls must be located outside at the hookup area per ANSI Z245 series standards.

Tailoring to the Application: Control Features

SP Industries offers a diverse range of design features that provide maximum configurability to meet specific application requirements. Primary control features are standard equipment on all SP compactors with no additional cost. Less frequently required optional control features are extra charge items, but readily available to add to your system without additional lead-time.

Standard Control Features

- Automatic Safety Retract Start
- Automatic Shut-Off
- Automatic Multicycle Operation
- Automatic/SMPC (Sustained Manual Pressure Control) Selector Switch
- Full Load Indicator
- Gate Up/Down Controls
- Key Lock Start
- Key Operated Jog Controls
- Pinning Boost/Override System
- Precrusher Gate Up/Down Controls
- Pull-To-Start/Push-To-Stop Button
- Ram Position Switch
- Remote Control Head
- Voltage Selection

Optional Control Features

- Advance Full Load Indicator
- Code Start System
- Infrared Start System
- Key Operated Jog Controls
- Low Oil/High Temperature Indicator Light
- Photo Electric Start System
- Pinning Boost/Override System
- Remote Control Head
- Security Latch
- Thermo Oil Heater
- UL Certified Panel

Standard Features

Automatic Safety Retract Start

This built in safety feature causes the ram to retract when the machine is started unless the ram is already in the retracted position, then the ram will move forward when the machine is started. Note: This feature is not available on self-contained compactor/container models which utilize a manual reverse button.

Automatic Shut-Off

When the container is full or the compactor is jammed during the forward stroke, the machine will automatically shut off within 60 seconds or less and a red indicator light will illuminate at the control station.

Automatic Multicycle Operation

The compactor can be set to run one or multiple cycles automatically when started. The number of cycles is determined by the setting on the cycle timer (1TR) located in the main control panel.

Automatic/SMPC (Sustained Manual Pressure Control) Selector Switch

This toggle switch, located inside the main control panel, allows the compactor to be operated in either the automatic or SMPC mode. A compactor must have an ANSI/OSHA approved hopper or guard system installed to be shipped in the automatic position. This item is standard on most machines and optional on units such as the self-contained compactors/containers, precrusher compactor models, CP- 711 and the APT-331.

Full Load Indicator

A light located inside the mushroom emergency stop button illuminates when the container is full or the compactor is jammed in the forward position. The indicator is a separate light on precrusher/compactors and is not available on self-contained compactor/container, pressure switching systems.



Key Lock Start

The keyed switch is the Off/On power switch for compactor operation. When the switch is in the "Off" position, the system is off except for oil heaters. When the switch is in the "On" position the system is live and the machine can be started. To disable the complete system the main disconnect must be locked out and tagged per OSHA standards.

Key Operated Jog Controls

These controls come standard in the main panel on heavy industrial machines; they are available as an option on all other equipment. They provide manual forward and backward operation of the ram. As an option, controls can be mounted on the machine at the left or right front of the charge opening. Note: These controls will not override the shut-off pressure. A Pinning Boost/Override control must be used to override shut-off pressure.

Pinning Boost/Override System

This key operated control allows manual operation of the ram. The Pinning Boost Override system gives the system added operating pressure to clear the compaction chamber when the container system is full and allows the operator to pin off a container when optional pinning tunnels are provided. These controls are standard for 6,7,8, and 13 cu. yd. heavy industrial compactors and all precrushers. They are normally mounted on the machine near the front left of the charge chamber (drivers side).

Precrusher Gate Up/Down Controls

These controls are located with the pinning boost/override controls and allow manual up and down movement of the precrusher gate.

Green Start Button

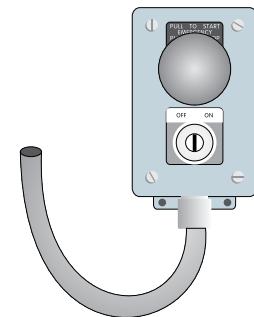
This "push to start" button is used to begin the cycling of the compactor. This operation only starts the compactor when the key lock switch is in the "on" position.

Ram Position Switch

This toggle switch, located inside the main control panel, stops the ram in the desired position, front or rear of the compaction chamber, at the end of the cycle. Note: This feature is not available on self-contained compactors/containers, precrusher/compactor models, CP-711 and APT-331 models.

Remote Control Head

The remote control head is standard on all heavy duty industrial compactors and precrushers. They are optional on commercial compactors. Remote controls are supplied with ten feet of electrical flexible conduit, longer lengths are available. The NEMA 4/13 Indoor/Outdoor control box includes the Key Lock Off/On Switch, Green Start Button, Emergency Stop Button and the Full Load Indicator. The Full/Jam Indicator Light is located in the center of Emergency Stop Button.



Voltage Selection

All motors up to 10 HP may be wired to connect to a 208, 230 or 460 volt, 3 phase, power supply source. Motors which are 15 HP or larger are manufactured to be wired for 230 or 460 only; however, 208 voltage motors are available up to 30 HP and must be specified on the order. Caution: To change from one voltage to another, the motor and transformer must be rewired, primary fuses changed, motor starter changed, and the corresponding thermo overload protection (heater) must be changed. Larger wiring may be required if changing from higher to lower voltage.

Tailoring to the Application: Control Features

Optional Features

Advance Full Load Indicator

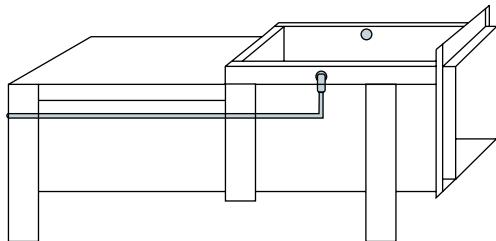
An adjustable pressure actuated switch turns on an amber light in the control head or panel when the container is approximately 95%, 85%, or 75% full, a relay keeps the light on until the circuit is broken. This allows time for the hauler to be contacted before the container is completely full.

Code Start System

A keyless/coded start system which only allows access to compactor operation after a four digit code has been entered.

Infrared Start System

A system which uses an infrared emitter and receiver to begin the compaction cycle. When the signal is



broken the cycle begins. The system is supplied with a safety delay warning feature (per current ANSI Z245.2 specifications) which includes a 5 second, audible warning buzzer, and a 15 second, flashing strobe light that operates before the machine begins cycling.

Key Operated Jog Controls

These controls come standard in the main panel on heavy industrial machines; they are available as an option on all other equipment. They provide manual forward and backward operation of the ram. As an option, controls can be mounted on the machine at the left or right front of the charge opening. Note: These controls will not override the shut-off pressure. A Pinning Boost/Override control must be used to override shut-off pressure.

Low Oil/High Temperature Indicator Light

If the hydraulic oil in the power unit becomes dangerously low, a red light in the main control panel will indicate the condition and the power unit will shut down. If the power unit system temperature becomes dangerously high, a red light in the main control panel will indicate the condition and the power unit will shut down. The system will not operate until the oil level is increased or the temperature has been reduced.

Photo Electric Start System

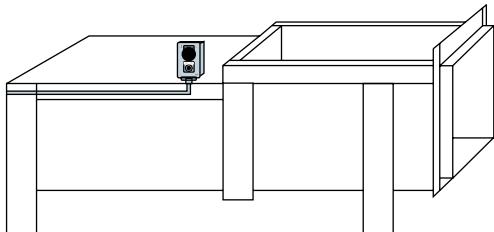
A system which starts a compaction cycle when the light beam across the chamber opening is interrupted. The system is supplied with a safety delay warning feature (per current ANSI Z245.2 specifications) which includes a 5 second, audible warning buzzer which sounds and a 15 second flashing strobe light that operates before the machine begins cycling.

Pinning Boost/Override System

This key operated control allows manual operation of the ram. The Pinning Boost Override system gives the system added operating pressure to clear the compaction chamber when the container system is full and allows the operator to pin off a container when optional pinning tunnels are provided. These controls are standard for 6,7,8, and 13 cu. yd. heavy duty compactors and all precrushers. They are normally mounted on the machine near the front left of the charge chamber (drivers side).

Secondary Remote Control Head

An additional remote control head can be supplied as a second control for an industrial



compactor in order to operate the machine from more than one location, or it can be supplied as the main control head for a system with standard panel mounted controls. Controls must be mounted in accordance to ANSI Z245.2 safety standards.

Security Lock Latch

An electronic locking system which prevents unauthorized access to a compactor's dog house hopper and unauthorized use of the compactor. It is often used in conjunction with a code start system or after market monitor systems.

Thermo Oil Heater

The thermo oil heater is a thermostatically controlled hydraulic oil heater preset at a temperature of 55° F which facilitates operation in cold climates.

UL Certified Panel

The main electrical controls and panel are inspected and certified by a U.L. representative as conforming to U.L. #508 Standard for Safety for Industrial Control Equipment.

Tailoring to the Application: Power Unit Features

SP Industries offers a diverse range of design features that provide maximum configurability to meet specific application requirements. Primary power unit design features are standard equipment on all SP compactors with no additional cost. Less common power unit features are considered "optional" but are readily available and can be added to your system.

Standard Control Features

Constant Displacement Vane Pump
Cylinder(s).....
Hi/Lo Pump (precrusher only)
Hydraulic Hose
Hydraulic Oil
Limit Switch
Motors
Oil Reservoir
Pressure Switch
Remote Power Unit with Power Cable
Soft Shift Hydraulic Valves
Wet Armature Solenoid Directional Control Valve

Optional Power Unit Features

Monitor Gauge
Oil Pressure Gauge
Power Unit Cover
TEFC Motor
Weather Shield
Inverters (Single Phase to 3-Phase)
PLC Control Systems
Automatic Dial Out Systems

Standard Features

Constant Displacement Vane Pump

The low noise vane type pump keeps the normal noise level below 85 db's and maintains consistent system pressure and cycling, even while under load.

Cylinder(s)

All cylinders up to 7" utilize a two piece polyester elastomer seal system that is most tolerant to dirt and contamination with excellent wearing resistance. The 10" cylinders utilize a four piece TPFE seal system with thermo plastic anti-extrusion rings.

Hi/Lo Pump

This type of pump is used on our precrusher/compactor. It produces high volume at low PSI, at 1,400 PSI it diverts the high flow pump oil to the tank and continues with the low oil flow only.

Hydraulic Hose

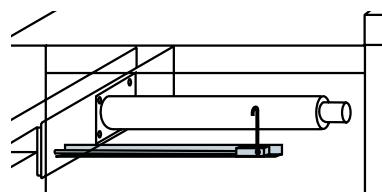
All hydraulic hoses are SAE rated for 2000 PSI minimum working pressure and 8000 PSI minimum burst pressure.

Hydraulic Oil

The hydraulic oil is a premium grade oil with a viscosity index of 100 or higher and a viscosity of 120 to 150 SUS at 100° F. This fluid has antifoam, anti-wear, water separating additives, and a pour point of - 30° F.

Limit Switch

The stroke of the cylinder(s) is controlled by one, double acting limit switch. The switch is set to reverse the cylinder stroke before the rod bottoms out which prevents hydraulic hammering and prolongs the life of the hydraulic system.



Motors

1725 RPM, T-Frame, O.D.P. (Open Drip Proof), 3 phase, 60 hertz, C-Face, high-efficiency.

Oil Reservoir

The oil capacity, being approximately 2-1/2 times larger than the rated pump output, allows for proper oil cooling and ample time to shut down the system if a hydraulic line should burst to prevent dry running of the pump. The reservoir includes an oil level gauge, thermometer, breather, clean out port, and flow baffles.

Pressure Switch

On some compactors and optional features, these switches are utilized to change direction on valves, activate/deactivate lights, and signal other optional features.

Optional Features

Oil Pressure Gauge

An oil filled gauge capable of measuring pressures from 0 to 3,000 PSI.

Monitor Gauge

An oil pressure gauge with color coded indicators for 50%, 75% and 100% of the maximum system pressure. Two models are available; one with the 100% full at 1800 to 2100 PSI, the other with 100% full at 1500 to 1700 PSI.

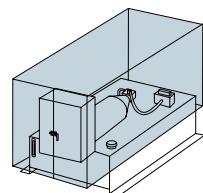


TEFC Motor

Totally Enclosed Fan Cooled motors are available for extreme dust or moisture applications.

Power Unit Cover

A power unit cover shields and protects the power unit from inclement weather and discourages vandalism. A pad lock may be placed on the door for added security.



Remote Power Unit with Power Cable

Completely independent power unit with easily accessible / non-proprietary components. Power cable provided is 10' (longer lengths must be hard piped - refer to any/all local electrical codes).

Soft Shift Hydraulic Valves

Self-contained compactor/containers are equipped with pressure switches and a tapered spool soft shift valve system. This relieves the hydraulic shock when reversing the cylinder rod.

Wet Armature Solenoid Directional Control Valve

A wet armature solenoid directional control valve has self lubricating, movable solenoid parts which provide longer solenoid life.

Weather Shield

A power unit cover with open ends that protects the power unit from inclement weather.

Power Inverter

Allows customer's single phase power service to be converted to 3-phase power, which permits the use of a standard 3-phase motor. Inverters can only be utilized on motors up to 10HP and require the hydraulic pump to be downsized to prevent motor stalling.

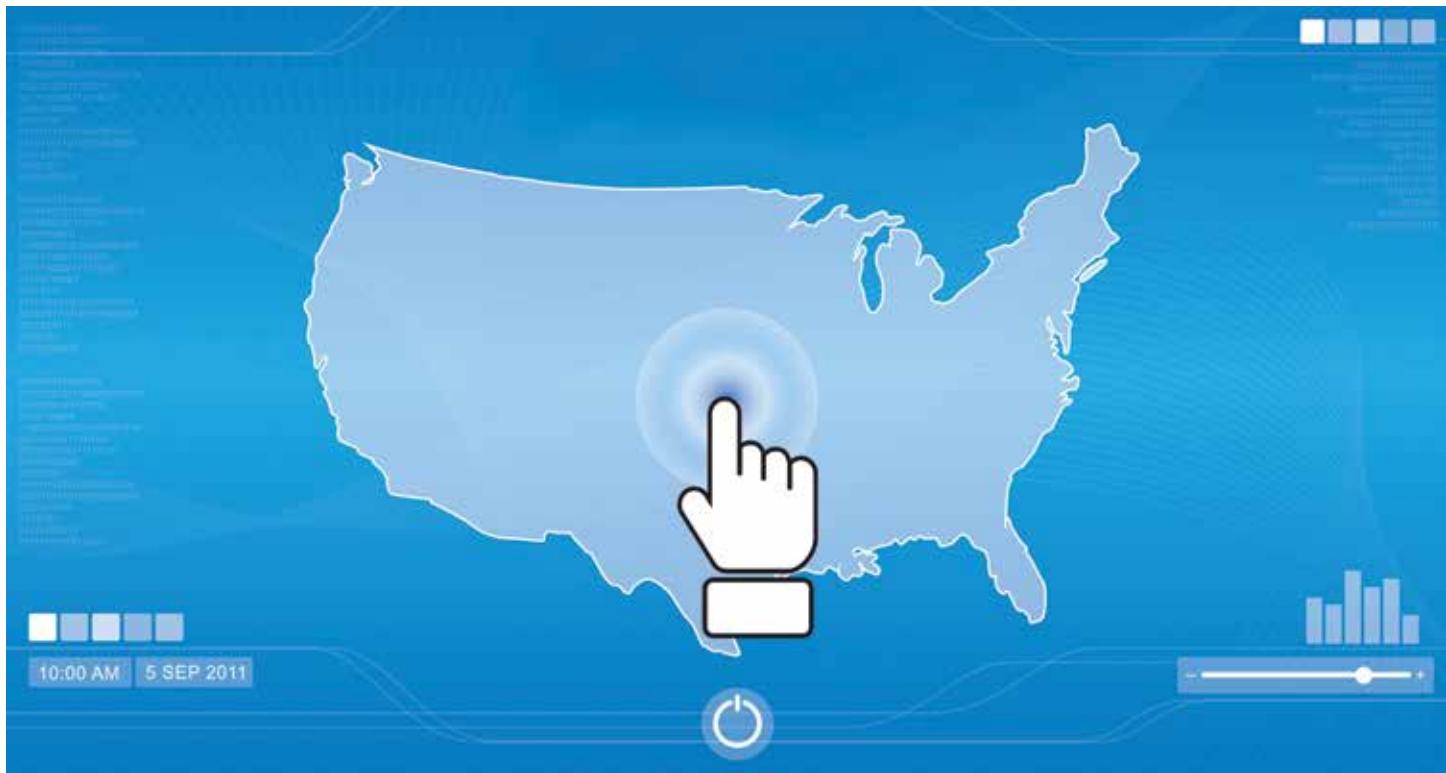
PLC Control System

Available to replace standard Timer/Relay control system. Offers greater functionality compared to the Timer/Relay system.

Automatic Dial Out System

Allows system to notify hauler or management via pre-recorded phone calls when compaction container is near-full or full.

SP Industries Products & Service Nationwide



"Let Your [Index] Finger do the Walking"

SP Industries products and services are available nationwide from our sales and service staff and our network of authorized factory-trained dealerships.

For more information or to discuss your specific application requirements, click the map above or call our home office 8am-5pm EST.



Our new EM Series are 100% electromechanical:

- Completely eliminate hydraulic fluid and hoses
- Free up floor space
- Eliminate bulky power units
- Provide safer operation with 24-volt control system
- Eliminate the risk of hydraulic fluid contamination

Designed for environmentally conscious institutional, commercial, and industrial work environments, EM Series units require less maintenance, and remove the potential for fires, leaking seals, and other hazards associated with hydraulic systems.

We look forward to helping you with all your waste removal, material handling, process recovery and recycling efforts.



SP Industries designs and manufactures a comprehensive standard line of industrial and commercial grade compactors with precrushers, transfer station equipment and cart dumpers to meet small to large capacity operations.

We also offer a wide variety of specialized systems to handle wet waste, food products, metal scrap collection, fluid recovery, newsprint recycling and other difficult and/or voluminous materials.