

OPERATION, INSTALLATION, & MAINTENANCE MANUAL

for

Aircon CAS Compressed Air Square

Top-Bag-Removal Baghouse

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**OPERATING PRINCIPLE FOR AIRCON "CAS"
COMPRESSED AIR SQUARE FILTERS**

- A. Dust-laden air or gases enter at the inlet section of the filter.

- B. As the cleaner air is filtered through each bag, the particles remaining in the air stream collect on the outer surface of each bag. As the air passes through this surface, a pressure drop occurs. This pressure drop is proportional to the amount of dirt present on the outer surface of the bag. The use of a gage measuring the differential pressure between the plenum and the upper body section of the filter would assist maintenance personnel to set the desired sequence time and frequency of the pulsed cleaning air required for the filter to operate efficiently.

- C. Only a short duration blast of compressed air (50 to 500 milliseconds) is necessary to clean the bags of the lighter particulates. This blast "pops" or "snaps" the bags away from the cages by an increased pressure inside the bags. The instant this blast is exhausted, the movement of air through the bag collapses it against its cage. This snap action loosens dirt on the outer surface of the bag, and this dirt is then free to fall through the filter to the hopper discharge outlet.

OPERATING INSTRUCTIONS

RECEIVING

Since the filter may be shipped in several sections, a quick inspection should be performed on each section for damage that may have occurred in transit. Also, both the quantity and quality of any parts that may have been shipped loosely should be checked. Boxes containing these parts should be inspected for signs of improper handling that may have caused damage. Any missing or damaged parts should be noted with the shipper before accepting the shipment. Aircon is not responsible for any damage that occurs during shipping. **The purchaser should bring all damage claims against the carrier.**

INSPECTION

Upon accepting the shipment, a closer inspection of the filter is necessary. Care should be taken to thoroughly inspect each section of the filter for dents or cracks. Aircon should be notified of any inconsistencies between the unit and a certified drawing containing Aircon specifications. No changes should be made without the consent of Aircon.

INSTALLATION

The following procedures are recommended to facilitate installation:

Erection: Bolt hopper and inlet section together on the ground. (See next article for proper bolting procedure.) This sub-assembly can then be set on the support structure in order to secure to the mount pads. The plenum can then be bolted to the upper body section, and this second sub-assembly can be bolted onto the lower body section. Be careful to rotate the upper body section so that the explosion doors have the correct orientation with respect to the ladder or access platform. Load the bags and cages. This three-piece assembly can then be set and bolted onto the hopper and inlet sub-assembly that has already been mounted on the structural support. Finally, install the access platform including any necessary ladders.

Bolting: Apply caulking to each body flange. Set, do not slide, one section onto the other, taking care not to loosen the caulking. Use four (4) drift pins located on each wall, and install the bolts on either side of the pins. Finger tighten these bolts. Move these four drift pins around the circumference of the unit 45 degrees, and repeat the above operation. Repeat this same procedure by evenly dividing the angles remaining between the bolts. Remember these bolts require no more than finger tightening. Only after all bolts have been set, should the bolts be properly tightened.

Bag and Cage Installation: Prior to installing the bags, store them in an area free from moisture and harmful chemical vapors. Upon installing the bags, remove blowpipes over all bag rows. Lower the bags through the holes in the tube sheet. Form the snap top of the bag into a kidney shape in order to snap the bag into the tube sheet. Before lowering the cages into the bags, check to see if each bag snap top fits uniformly around its hole in the tube sheet. Since a charge of static electricity collected on the bags presents a fire hazard, each bag contains a copper-ground wire sewn in the bag. Caution is advised that the free end of the copper ground wire is to be secured between the bag cup and tubesheet for proper grounding.

Securing Plenum Doors: No tools are required to secure or to remove the access doors on top of the plenum. Since an excessively tight channel could warp a door, it is sufficient only to hand-tighten each door latch channel with the knob provided.

Auxiliary Equipment: Install additional any equipment required for the operation of the system such an airlock, level indicator, or screw conveyor according to manufacturer specifications. A ¾" NPT plugged coupling is available for the installation of an optional thermocouple in the plenum, and a 1" to 1 ½" NPT plugged coupling is available for the installation of an optional sprinkler system in the top of the plenum.

Electrical: It is necessary to connect the sequence timer control box to a 115 VAC, 60 Hz. isolated circuit free of transient currents. This sequence timer control box may be remotely located from the filter (in a control station) or mounted on the side of the plenum near the header on a specially designed bracket.

Valve Orientation: Check for proper orientation of both solenoid and diaphragm valves. Solenoid valves should be turned so the "IN" label is the side to which the plastic tubing leading to the diaphragm valve is connected. Diaphragm valves

should be oriented so that "IN" is connected to the toe nipples directly above the header. (See manufacturer's literature placed toward the end of this manual.)

Differential Pressure Gage: Two (2) $\frac{1}{8}$ " NPT plugged couplings are available for the installation of a differential pressure gage. Connect this instrument so that the low-pressure side is attached to the fitting above the tube sheet (on the clean-air side).

Explosion Doors: When $\frac{3}{8}$ " metal bolts are used to secure the explosion doors during shipping, replace these bolts with $\frac{3}{8}$ "-16 x " PVC (plastic) bolts. These bolts will be shipped loosely with the unit.

Before Start-up: Purge the 1" to 1 $\frac{1}{2}$ " NPT piping supply line before connecting it to the compressed air header to ensure all contaminants are removed. Before pressurizing the header, check to see that all of the plastic tubing connecting the solenoids to the diaphragm valves are properly fit. Be careful that all diaphragm valves, valve fittings, unions, and plugs have been sufficiently tightened. If any parts require additional tightening, sealing compound should be re-applied. After wiring the sequence timing controller to the solenoid enclosure terminal strip, check both the "ON" firing time and the "OFF" delay time on the timing board. The recommended setting for the "ON" time is 200 milliseconds for all "OFF" times. The "OFF" time should at first be set to 25 or 30 seconds, and only the "OFF" time should be modified or reduced to enhance the performance of this unit. (See manufacturer's literature placed toward the end of this manual for more detailed operating instructions.)

Troubleshooting: Pressurize the header by supplying 90 to 100 [psig] clean, dry, uncontaminated, compressed air. Observe one complete firing cycle. (For the correct number output to each solenoid, please consult the field wiring diagram in this manual.)

COMPRESSED AIR REQUIREMENTS

The following compressed air requirements are essential for a maintenance-free cleaning operation:

- A. Pressure: 90 to 100 [psig]
- B. Quality: uncontaminated, clean, dry air that is free of water, oil, dirt, dust, rust, or scale

The importance of the above requirements for compressed air cannot be overly stressed. There are many methods and types of equipment to condition the air to meet these requirements.

To illustrate:

- 1. Methods: types of compressors, receivers, aftercoolers, dryers, and dirt legs where necessary
- 2. Single line equipment
 - a. In line filters
 - b. Oil & water separators
 - c. Centrifugal separators

FILTER UNIT START-UP CHECKLIST

- A. Unit body sections, supports, and compressed air piping secured with all bolts adequately tightened.
- B. PVC bolts installed in explosion doors after removing shipment bolts (if required).
- C. Unit bags and cages properly installed.
- D. Differential pressure gage or controller properly mounted.
- E. Sequence timer controller properly wired.
- F. Any unused optional or auxiliary NPT connections plugged and sealed airtight.
- G. Clean-out door secured.
- H. Plenum access doors in place and properly secured.
- I. Before turning on process equipment, allow fan to blow air into filter for at least ten (10) minutes. This will reduce the probability that dust will accumulate on cold surfaces within the filter due to condensation. At the conclusion of an operating period, turn off the system fan and other related process equipment twenty (20) minutes before the compressed air supply and timer. This routine will allow the filter to be purged after each use. Remember to discharge all related auxiliary equipment, i.e. the screw conveyor and rotary airlock.

TROUBLESHOOTING

A. Observation: Visible dust leakage

1. Dust exhausted from plenum at constant rate, regardless of valve blasts

Problem: Unsecured or missing bag (or bags)

2. Dust exhausted from plenum at variable rate

Problem: Improperly installed bags (snap bands not adequately seated)

Holes in bags (from either damage or wear)

Dirty plenum (not cleaned after previous bag failures)

B. Observation: Loss of compressed air below header and blowpipes (pressure below 85 psig)

Problem: Loose pipe fittings or plastic tubing

Dirt in diaphragm valve or solenoid plunger

Electrical problem with either compressed air supply or timer

C. Observation: Any single blowpipe blowing constantly

Problem: Defective solenoid or diaphragm valve

Leak in plastic tubing between diaphragm valve and solenoid

D. Observation: Any single blowpipe not blowing

Problem: Defective solenoid valve coil or diaphragm valve

Dirt or foreign material in solenoid or diaphragm valve

E. **Observation:** Differential pressure too high (above 5" wg)

Problem: Insufficient supply of compressed air

Poor filtering media (condensation on bags within unit; dust trapped inside bags; bags stopped up)

Timer control (shut-off interval too long; timer skipping valves; improper timing sequence)

F. **Observation:** Flow rate of air through system too low

Problem: System blower or fan (fan undersized; fan running backwards; fan belt slippage)

High differential pressure resulting from bags not being properly cleaned (See above example.)

System blockage (blockage in duct leading up to filter)

ROUTINE MAINTENANCE

INSPECTION

Daily

Check differential pressure and re-adjust the "OFF" time on the sequence timer unit accordingly.

Weekly

Inspect timer and solenoid valves. Check to see if both the "ON" time and "OFF" time functions are working properly.

Monthly

Lubricate bearings on screw conveyor and fan, and check seals on airlock.

Quarterly (every three months)

Remove several bags to observe their texture. Since a clean bag has a soft texture, a bag will have a hard texture to the degree to which it is not being cleaned.

Check to see if each bag cage fits snugly over the edge of the snap ring of each bag.

Observe the dust accumulation in the plenum. This will alert maintenance personnel to any filtering problems.

SAFETY

Before removing plenum doors and entering plenum, please observe the following safety precautions:

- A. Turn off the system fan or blower and lock out all electrical disconnects for all associated and auxiliary equipment.
- B. Operate pulse-jet cleaning system for several cycles.
- C. For instances where toxic material is being removed by the filter, install a blank in the inlet duct. Remove plenum access doors (see note "G"), and purge the filter with the pulse-jet system for at least 20 minutes.
- D. Discharge any solid material from the unit through the auxiliary discharge equipment.
- E. Turn off electrical power to sequence timer, compressed air unit, and airlock.
- F. Turn off compressed air.
- G. Two operators are required to remove each plenum door. Plenum doors are to be removed completely.

STANDARD FEATURES OF ALL TOP BAG-REMOVAL "CAS" FILTERS

- A. 10 to 12 gage mild steel construction to operate up to +/- 17" [wg]
- B. Lifting lugs on clean air plenum
- C. Handrail surrounding plenum
- D. 4" to 6" schedule 40 pipe header for compressed air reservoir
- E. Removable internal compressed air hard piping
- F. $\frac{3}{4}$ " , 1" , or 1 $\frac{1}{2}$ " NPT diaphragm valves
- G. Compressed-air cleaning regulated by manually adjustable sequence control timer housed in a NEMA 4 enclosure
- H. 1" to 1 $\frac{1}{2}$ " NPT coupling in plenum for optional sprinkler sized to accommodate one (1) $\frac{1}{2}$ " sprinkler per every 50 sq. ft. of plenum floor space
- I. $\frac{3}{4}$ " NPT coupling in plenum for optional thermocouple
- J. Differential pressure gage with $\frac{1}{4}$ " OD tubing connected to two (2) $\frac{1}{8}$ " NPT couplings (one each on opposite sides of the tubesheet) for differential pressure gage connections
- K. Unit painted Aircon gray with metal prepared with rust-inhibitive primer on both interior and exterior surfaces
- L. 5 $\frac{3}{4}$ " diameter, 12 ounce singed polyester, top-removal, snap-in bags with anti-static, copper ground wire
- M. 5 $\frac{5}{8}$ " diameter top-removal, galvanized bag cages
- N. Top-removal plenum access doors
- O. 60 degree hopper flanged to housing
- P. 1 $\frac{1}{4}$ " level indicator coupling in hopper

- Q. Hopper clean-out door
- R. Full welded exterior
- S. Two sets of installation & maintenance manuals

OPTIONAL FEATURES FOR TOP BAG-REMOVAL "CAS" FILTERS

- A. Outlet, inlet, and header orientation per job
- B. 24" to 36" square pressure relief ventilation panels to provide an approximate 40 to 1 (or any customer specified) [cu. ft. unit volume per sq. ft. vent] ventilation ratio
- C. Structural steel support
- D. NEMA 9 explosion-proof solenoid valves, conduit, and sequence timer enclosures
- E. Customer specified filtering media (such as a heavier 16 oz. singed polyester, or Nomex for high-temperature applications, or an epitropic fabric with interwoven carbon fibers to suppress static electricity)
- F. Epoxy paint or regular paint per specified color
- G. Thermocouple to monitor temperature of discharge air
- H. Sprinkler system installed in plenum
- I. Level indicator or poke hole in hopper
- J. Caged ladder to top of plenum
- K. Compressed air header service platform
- L. Interactive pressure gage/sequence timer with "high" and "low" pressure controls for automatically regulating power to the timer
- M. Carbon steel bag cages
- N. Hinged Cages, (for limited clearance access)



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Compressed Air Square "CAS" FILTERS

EFFECTIVE:
 January 1, 2002

SUPERSEDES: January 1, 2000

STANDARD FEATURES

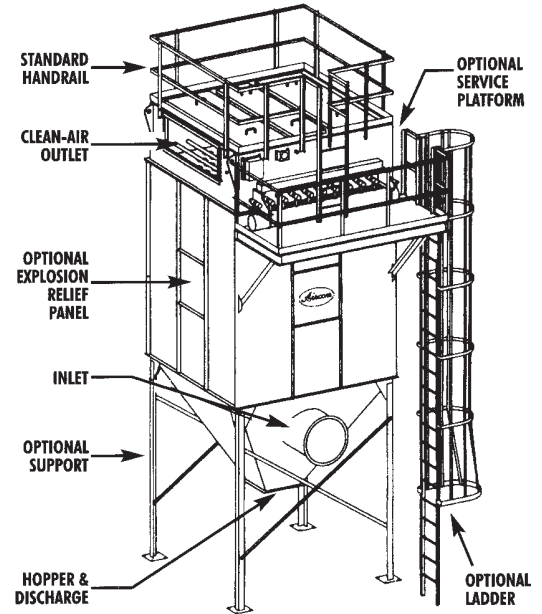
- 10 or 12 gauge steel bolted construction
- Lifting lugs on clean air plenum
- Handrail surrounding plenum
- 4" or 6" SCH 40 pipe header for compressed air reservoir
- Removable internal compressed air hard piping
- 3/4", 1" or 1 1/2" diaphragm valves
- NEMA 4 sequence timer enclosure
- Sprinkler coupling in plenum
- 3/4" NPT thermocouple coupling in plenum
- Magnehelic® differential pressure gauge mounted on plenum
- Unit painted Aircon gray with rust-inhibitive primer on both interior and exterior surfaces
- 16 oz. singled polyester top-removal, snap-in bags with copper ground wire
- Top-removal galvanized bag cages
- Top-removal plenum access doors
- 60° cone hopper flanged to housing
- Clean-out door and 1 1/4" level indicator coupling in hopper
- Installation & maintenance manuals

OPTIONAL FEATURES

- Inlet, outlet, and header orientation per job
- High-entry inlet (into lower body section)
- Explosion relief panels
- Structural steel support
- NEMA 9 explosion-proof solenoid valves, conduit, and enclosures
- Other types of filter media
- Epoxy paint or regular paint per specified color
- Thermocouple to monitor temperature of discharge air
- Sprinkler system installed in plenum
- Level indicator
- Caged ladder & header service platform
- Photohelic® differential pressure gauge
- Stainless steel or epoxy-coated (carbon steel) bag cages

OPERATING REQUIREMENTS

- 115 VAC, 60 Hz. single phase current for timer with adjustable on time (0.05 to 0.50 sec.) and off time (1.5 to 30 sec.)
- 90 to 100 PSIG clean, dry uncontaminated compressed air supply



| Model # | Number of Bags | Length of Bags | Filter Media Cloth Area (sq. ft) | Compressed Air Required (SCFM) | Shipping Wt. (w/o Options) (lbs.) | FILTERING CAPACITY (cubic feet air/min.) AIR TO CLOTH RATIO | | |
|------------|----------------|----------------|----------------------------------|--------------------------------|-----------------------------------|---|-------|-------|
| | | | | | | 6:1 | 8:1 | 10:1 |
| CAS 25-6 | 25 | 6' - 0" | 226 | 6.4 | 1480 | 1360 | 1810 | 2260 |
| CAS 25-8 | 25 | 8' - 0" | 301 | 6.4 | 1690 | 1810 | 2410 | 3010 |
| CAS 25-10 | 25 | 10' - 0" | 376 | 6.4 | 1900 | 2260 | 3010 | 3760 |
| CAS 36-6 | 36 | 6' - 0" | 325 | 7.7 | 2010 | 1950 | 2600 | 3250 |
| CAS 36-8 | 36 | 8' - 0" | 434 | 7.7 | 2270 | 2600 | 3470 | 4340 |
| CAS 36-10 | 36 | 10' - 0" | 542 | 7.7 | 2530 | 3250 | 4340 | 5420 |
| CAS 49-6 | 49 | 6' - 0" | 443 | 8.9 | 2500 | 2660 | 3540 | 4430 |
| CAS 49-8 | 49 | 8' - 0" | 590 | 8.9 | 2800 | 3540 | 4720 | 5900 |
| CAS 49-10 | 49 | 10' - 0" | 738 | 8.9 | 3100 | 4430 | 5900 | 7380 |
| CAS 64-8 | 64 | 8' - 0" | 771 | 10 | 3390 | 4620 | 6170 | 7710 |
| CAS 64-10 | 64 | 10' - 0" | 963 | 10 | 3740 | 5780 | 7710 | 9630 |
| CAS 64-12 | 64 | 12' - 0" | 1156 | 10 | 4090 | 6940 | 9250 | 11600 |
| CAS 81-8 | 81 | 8' - 0" | 975 | 18 | 4100 | 5850 | 7800 | 9760 |
| CAS 81-10 | 81 | 10' - 0" | 1219 | 18 | 4500 | 7320 | 9760 | 12200 |
| CAS 81-12 | 81 | 12' - 0" | 1463 | 18 | 4900 | 8780 | 11700 | 14600 |
| CAS 100-8 | 100 | 8 - 0" | 1204 | 20 | 4890 | 7230 | 9630 | 12000 |
| CAS 100-10 | 100 | 10' - 0" | 1505 | 20 | 5350 | 9030 | 12000 | 15100 |
| CAS 100-12 | 100 | 12' - 0" | 1806 | 20 | 5810 | 10800 | 14500 | 18100 |
| CAS 121-8 | 121 | 8' - 0" | 1457 | 22 | 5580 | 8740 | 11700 | 14600 |
| CAS 121-10 | 121 | 10' - 0" | 1821 | 22 | 6090 | 10900 | 14600 | 18200 |
| CAS 121-12 | 121 | 12' - 0" | 2168 | 22 | 6600 | 13100 | 17500 | 21900 |
| CAS 144-8 | 144 | 8' - 0" | 1734 | 24 | 6300 | 10400 | 13900 | 17300 |
| CAS 144-10 | 144 | 10' - 0" | 2168 | 24 | 6870 | 13000 | 17300 | 21700 |
| CAS 144-12 | 144 | 12' - 0" | 2601 | 24 | 7440 | 15600 | 20800 | 26000 |
| CAS 169-8 | 169 | 8' - 0" | 2035 | 26 | 7130 | 12200 | 16300 | 20400 |
| CAS 169-10 | 169 | 10' - 0" | 2544 | 26 | 7700 | 15300 | 20400 | 25400 |
| CAS 169-12 | 169 | 12' - 0" | 3053 | 26 | 8410 | 18300 | 24400 | 30500 |

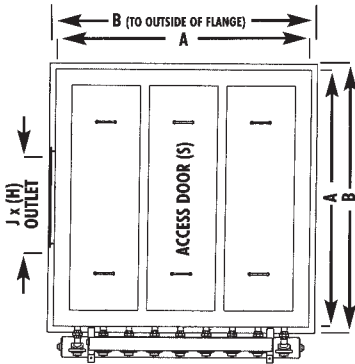


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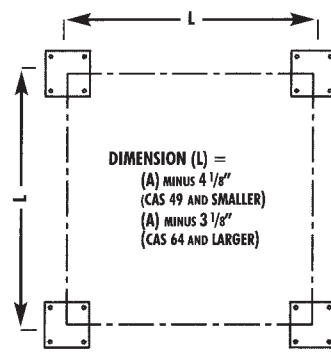
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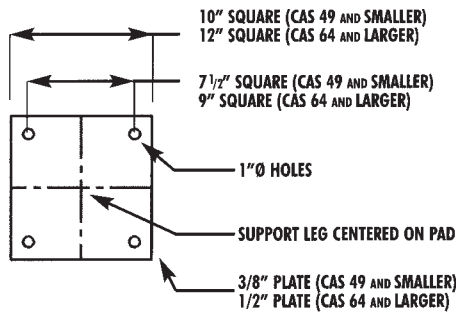
EFFECTIVE:
January 1, 2002
 SUPERSEDES: January 1, 2000



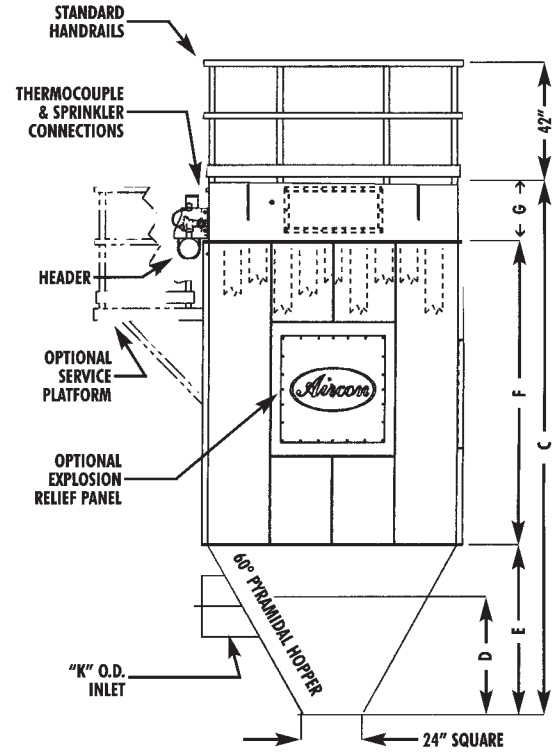
Top View



**FOOT PAD LAYOUT
 (NOT FOR CONSTRUCTION)**



Foot Pad Detail



Right Side View

| Model # | A | B | C | D | E | F | G | H | J | K |
|------------|----------|----------|-----------|-----|---------|----------|-----|-----|-----|-----|
| CAS 25-6 | 46" | 49" | 9' - 10" | 8" | 20" | 6' - 6" | 20" | 8" | 27" | 15" |
| CAS 25-8 | 46" | 49" | 11' - 10" | 8" | 20" | 8' - 6" | 20" | 8" | 27" | 15" |
| CAS 25-10 | 46" | 49" | 13' - 10" | 8" | 20" | 10' - 6" | 20" | 8" | 27" | 15" |
| CAS 36-6 | 56" | 59" | 10' - 8" | 14" | 28" | 6' - 6" | 22" | 10" | 31" | 18" |
| CAS 36-8 | 56" | 59" | 12' - 8" | 14" | 28" | 8' - 6" | 22" | 10" | 31" | 18" |
| CAS 36-10 | 56" | 59" | 14' - 8" | 14" | 28" | 10' - 6" | 22" | 10" | 31" | 18" |
| CAS 49-6 | 5' - 5" | 5' - 9" | 11' - 6" | 20" | 36" | 6' - 6" | 24" | 12" | 35" | 20" |
| CAS 49-8 | 5' - 5" | 5' - 9" | 13' - 6" | 20" | 36" | 8' - 6" | 24" | 12" | 35" | 20" |
| CAS 49-10 | 5' - 5" | 5' - 9" | 15' - 6" | 20" | 36" | 10' - 6" | 24" | 12" | 35" | 20" |
| CAS 64-8 | 6' - 2" | 6' - 6" | 14' - 4" | 26" | 44" | 8' - 6" | 26" | 14" | 48" | 24" |
| CAS 64-10 | 6' - 2" | 6' - 6" | 16' - 4" | 26" | 44" | 10' - 6" | 26" | 14" | 48" | 24" |
| CAS 64-12 | 6' - 2" | 6' - 6" | 18' - 4" | 26" | 44" | 12' - 6" | 26" | 14" | 48" | 24" |
| CAS 81-8 | 7' - 0" | 7' - 4" | 15' - 2" | 32" | 52" | 8' - 6" | 28" | 16" | 52" | 28" |
| CAS 81-10 | 7' - 0" | 7' - 4" | 17' - 2" | 32" | 52" | 10' - 6" | 28" | 16" | 52" | 28" |
| CAS 81-12 | 7' - 0" | 7' - 4" | 19' - 2" | 32" | 52" | 12' - 6" | 28" | 16" | 52" | 28" |
| CAS 100-8 | 7' - 9" | 8' - 1" | 16' - 0" | 36" | 5' - 0" | 8' - 6" | 30" | 18" | 58" | 32" |
| CAS 100-10 | 7' - 9" | 8' - 1" | 18' - 0" | 36" | 5' - 0" | 10' - 6" | 30" | 18" | 58" | 32" |
| CAS 100-12 | 7' - 9" | 8' - 1" | 20' - 0" | 36" | 5' - 0" | 12' - 6" | 30" | 18" | 58" | 32" |
| CAS 121-8 | 8' - 5" | 8' - 10" | 16' - 10" | 42" | 5' - 8" | 8' - 6" | 32" | 20" | 64" | 34" |
| CAS 121-10 | 8' - 5" | 8' - 10" | 18' - 10" | 42" | 5' - 8" | 10' - 6" | 32" | 20" | 64" | 34" |
| CAS 121-12 | 8' - 5" | 8' - 10" | 20' - 10" | 42" | 5' - 8" | 12' - 6" | 32" | 20" | 64" | 34" |
| CAS 144-8 | 9' - 2" | 9' - 7" | 17' - 8" | 48" | 6' - 4" | 8' - 6" | 34" | 22" | 68" | 38" |
| CAS 144-10 | 9' - 2" | 9' - 7" | 19' - 8" | 48" | 6' - 4" | 10' - 6" | 34" | 22" | 68" | 38" |
| CAS 144-12 | 9' - 2" | 9' - 7" | 21' - 8" | 48" | 6' - 4" | 12' - 6" | 34" | 22" | 68" | 38" |
| CAS 169-8 | 9' - 11" | 10' - 4" | 18' - 6" | 54" | 7' - 0" | 8' - 6" | 36" | 24" | 74" | 42" |
| CAS 169-10 | 9' - 11" | 10' - 4" | 20' - 6" | 54" | 7' - 0" | 10' - 6" | 36" | 24" | 74" | 42" |
| CAS 169-12 | 9' - 11" | 10' - 4" | 22' - 6" | 54" | 7' - 0" | 12' - 6" | 36" | 24" | 74" | 42" |