NOTICE TO USER

Thank you for purchasing a DuctSox product.

The SkeleCore® Fabric Tensioning System (FTS) uses an internal framework system to bring the DuctSox fabric into complete tension.

Review materials in box(es). Read and understand all instructions before beginning the installation. Failure to install the DuctSox product properly may void warranty.

Sections of fabric will be labeled, assembled, bagged, and boxed for shipping. Systems will include a drawing detail of the system identifying what is in each package and detailed dimensions of support locations.

Products may be covered by one or more patents:
www.ductsox.com/patents

Manufactured by DuctSox Corporation.

COMPONENTS

Top Zipper

Spacer Tube with Push Button (SCTUBE6 or CUTTUBE). SCCPIN comes installed by factory:

A spacer tube of 71 in (1,803 mm) between the IRs provides a standard spacing of 72 in (1,829 mm).

Cut spacer tubes are used between CTRs and IRs when non-standard spacing is needed. These tubes are factory cut and labeled as "Cut Tubes."

Shown: End of tube with push-button.

Tension Clips

Direct Hang Cable Drop

← Hook

← Gripple

← Hook

Cylindrical Tensioning Ring (CTR [SCUR## and SCT####]):

Used at both ends of each tensioned section. Available in diameters from 8 in to 60 in (203 mm to 1,524 mm) with 2 in (51 mm) increments.

NOTE: CTRs require assembly at the job site.

CTR 12:00 Hook (DROP## and SCRINGHK)

NOTE: Supplied with gripple.

S-Clip (SCCLAMP)

IR 12:00 Hook

Intermediate Ring (IR [SCUR## and SCURCON]):

Used at 6 in (1,829 mm) intervals in the interior of each tensioned section. Available in diameters from 8 in to 60 in (203 mm to 1,524 mm) with 2 in (51 mm) increments.

NOTE: IRs require assembly at the job site.

Hook Coupler (SCHKCOUPLER): Used to connect a spacer tube to the non-adjustable side of the CTR.

CTR Wrench: Used to adjust the CTR and apply tension to the fabric.

Spacer Tube Coupler (SCCOUPLER): When the last spacer tube of a tensioned section is longer than 6 ft (1,829 mm), a spacer tube coupler is required.

NOTE: Spacer tube couplers are supplied with labeled cut spacer tubes.

Figure 1

INSTALLATION

Steps Overview

1. Preparation.
2. Assemble FTS Rings.
3. Prepare metal inlet collar for fabric connection.
4. Install FTS framework and fabric.
5. Turn on AHU.
6. Balance airflow.

Step 1 – Preparation

Required Tools

Drill/driver and magnetic #2 Phillips driver bit
Level
Tape measure
Marker or pencil
Cable Cutter
Rivet Gun

Shipping/Receiving

The DuctSox support system could be delivered to the job site ahead of the DuctSox fabric sections. Depending on the size of a project or order, a DuctSox system will be shipped by common courier in a single brown box or several boxes. Larger orders will be shipped in crates by a common freight courier. Each DuctSox length should be packaged into individual plastic bags and labeled according to size and number of pieces. Complex systems may use other markings or labeling.

Verify all boxes are accounted for.

Unpacking

Empty the box(es), examine contents, and verify all pieces are accounted for. Note any missing or damaged pieces listed on the bill of lading.

Labeling

Each DuctSox section will be marked with the size and section number inside the belt of the inlet or on a tag inside the DuctSox (near the zipper). The marking shall be the diameter, section length and total length. If custom labeling has been used, locate an identification sheet that will be included with the delivery.
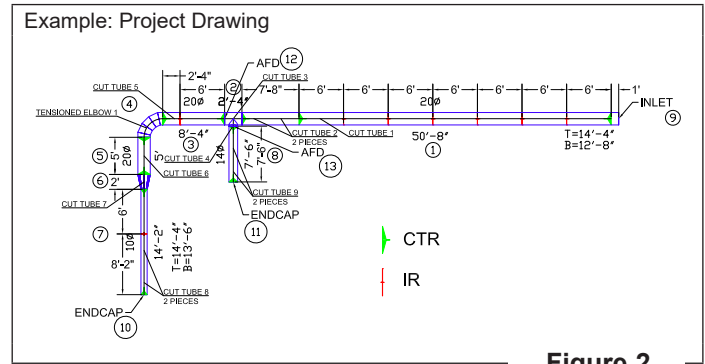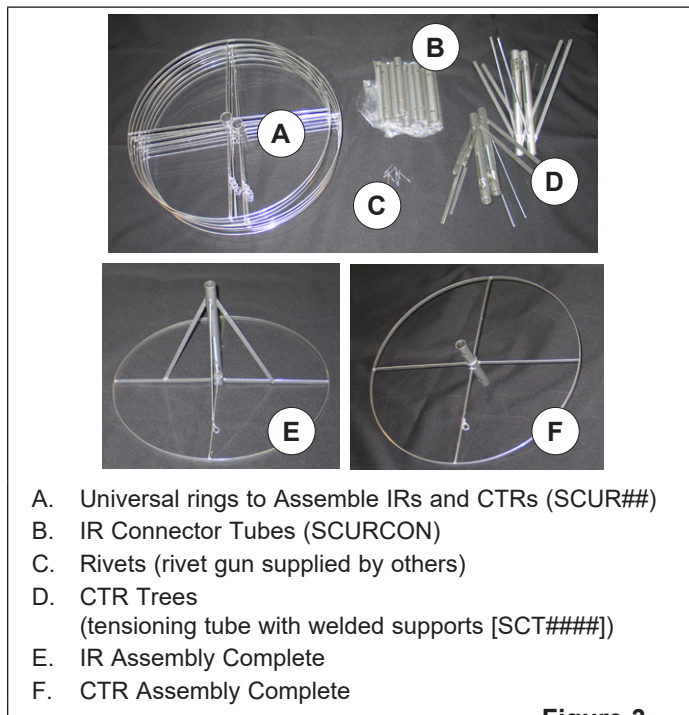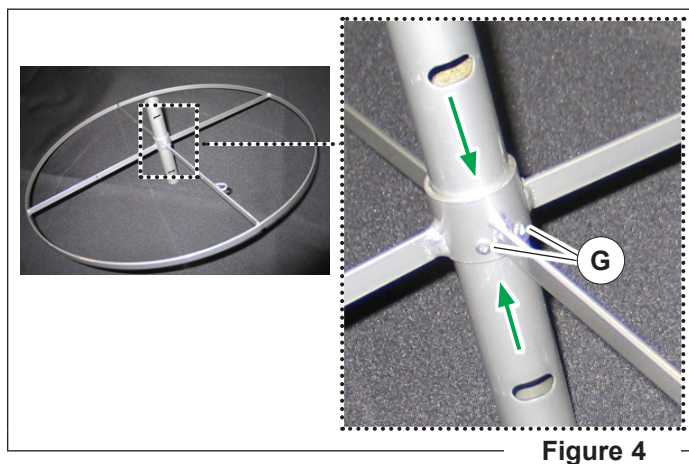

Figure 2

The project drawings (supplied) show where the cable drops/rings need to be hung for the DuctSox system to be installed properly.

INSTALLATION

Step 2 – Assemble FTS Rings

A. Universal rings to Assemble IRs and CTRs (SCUR##)
B. IR Connector Tubes (SCURCON)
C. Rivets (rivet gun supplied by others)
D. CTR Trees
   (tensioning tube with welded supports [SCT####])
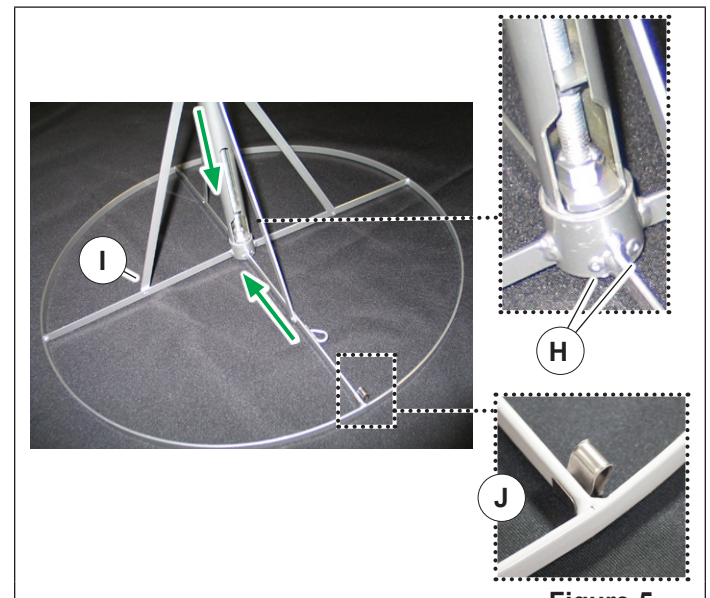E. IR Assembly Complete
F. CTR Assembly Complete

Figure 3

Figure 4

To assemble IRs:

1. Slide the connector tube inside the center ring.
   The 2 rivet holes (G) must line up.

2. Use 2 rivets to fasten together.

Figure 5

To assemble CTRs:

1. Align the thread window slot with the 12:00 hook loop spoke. The 2 rivet holes on the center tube must line up (H). Use 2 rivets to fasten together.

2. The tips of the SCT spokes (I) must line up with the UR spokes. Use 2 rivets to fasten together.

3. Attach S-Clip (J) to the top of the 12:00 spoke with the hook loop.

INSTALLATION

Step 3 – Metal Inlet

6 in – 10 in
(150 mm – 250 mm)

Edge Guard
(Supplied)
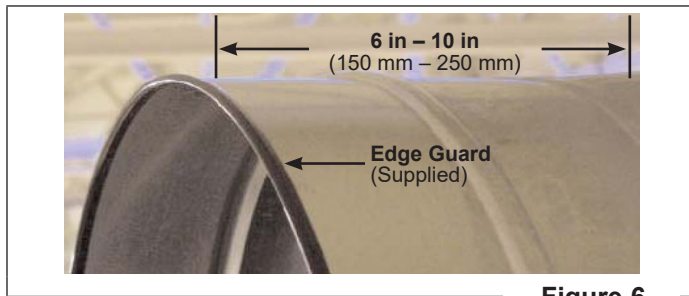
Figure 6

Prepare metal inlet collar for fabric connection:

• Confirm inlet air supply size and location.

• DuctSox inlets are manufactured 1/2 in (12 mm) larger than specified to fit over metal inlet collar.

• Metal collar length should be 6 in - 10 in (150 mm - 250 mm) for secure fabric attachment.

• Install edge guard (supplied) on the edge of the metal collar to reduce fabric wear from the metal edge.

Step 4 – Install FTS Framework and Fabric

Step 4 Overview:

A. Install fabric inlet belt onto metal collar.

B. Install CTR at inlet belt.

C. Use project drawing to mark placement of the balance of SkeleCore Rings (CTR and IR for straight sections and fittings). Identify where structure needs to be added (where cable drops will be secured).

D. Install SkeleCore FTS CTRs, IRs, cable drops, hook couplers, and spacer tubes.

E. Install SkeleCore FTS fabric onto installed framework.

F. Tension fabric.

G. Install endcap (as required).

H. Install fitting(s) (as required).

INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*

A. Install fabric Inlet Belt onto metal collar.

DuctSox inlet must be attached to the metal collar using screws (not supplied) through plastic inlet patches on the inlet belt. Make sure to locate the zipper start and seam at the 12:00 orientation for correct alignment.
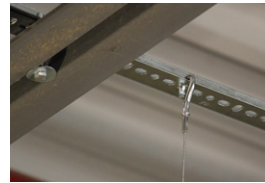
B. Install CTR at inlet belt.

1. Use 1 cable drop and a CTR.

2. From the 12:00 position of the inlet belt zipper, plumb directly to the building structure to locate and mark where the first CTR will be supported.

3. Connect the hook of the cable drop to the interior eyelet. Connect the cable drop to the spoke with an S-Clip. Next, thread the cable end directly above and into the gripple.

    NOTE: S-Clips are only supplied for installation on CTRs and elbows. **DO NOT** use S-Clips on IRs.

4. Connect the cable of the large hook to the gripple and then to the building structure.

5. Adjust the gripple so the CTR is at the correct elevation.

S-Clip

Gripple
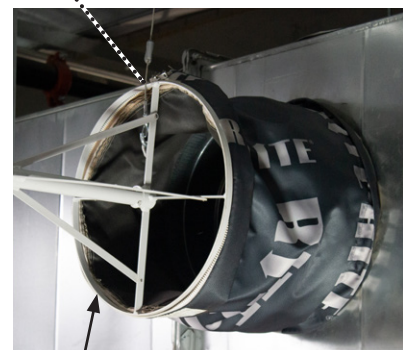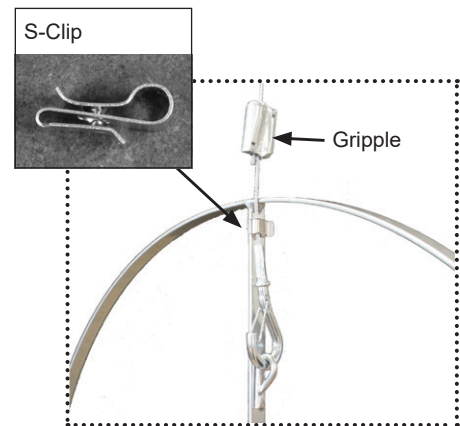
FTS Inlet

INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*

C. Use project drawing to mark the placement of all the SkeleCore rings (CTR and IR for straight sections and fittings). Identify where structure needs to be added (where cable drops will be secured).

NOTE: The last spacer tube of a tensioned section is often a cut tube (sized, cut, and labeled from the factory). This may be shorter or longer than 6 ft (1,829 mm). If it is longer than 6 ft (1,829 mm), a spacer tube coupler will be installed by the factory to create the correct length.

Tensioned sections are the areas between CTRs.

Examples of adding structure to secure cable drops:

Beam Clip

Perforated Angle

| CTR | IR | IR | IR | IR | IR | IR | CTR | CTR |

Example: Total Length 47 ft (14 m)

| 0 ft (0 m) | 6 ft (1.83 m) | 12 ft (3.66 m) | 18 ft (5.5 m) | 24 ft (7 m) | 30 ft (9 m) | 36 ft (11 m) | 42 ft (13 m) | 47 ft (14 m) |

Tensioned Section   Tensioned Section
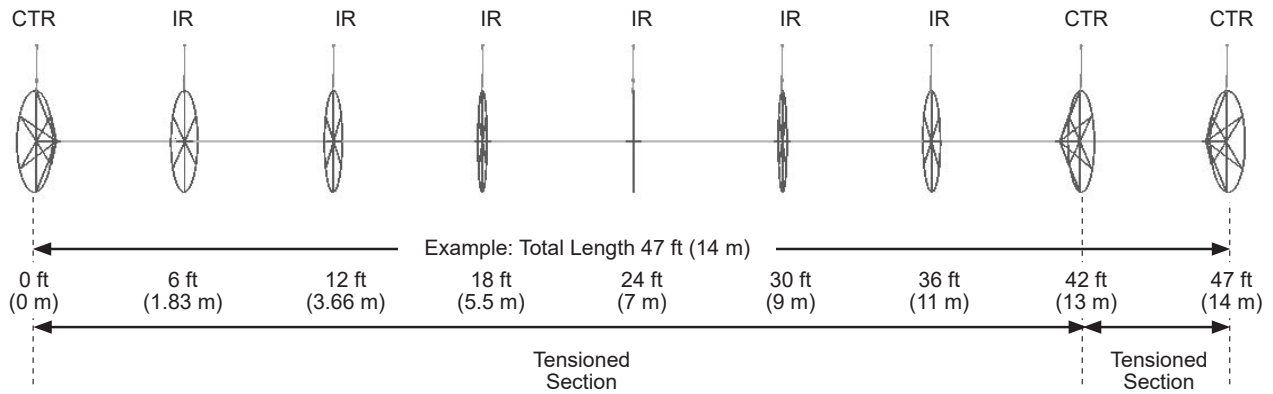
INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*

D. Install SkeleCore CTRs, IRs, cable drops, hook couplers, and spacer tubes.

NOTE: Start with the section that connects to the inlet.

1. Use the cable drops to hang the CTRs and IRs from the building structure. Use the gripple to adjust the rings to the correct elevation. Snap the spacer tubes between the rings.

   Add screws (A) (supplied by others) to the holes underneath the connector (SCURCON) of the IRs as spacer tubes (SCTUBE6 or CUTTUBE) are snapped in.
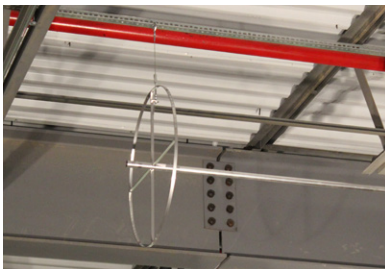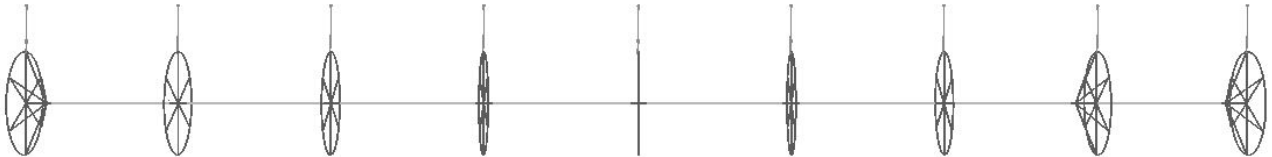
IR Hanging

CTR Hanging

Attach to Ceiling
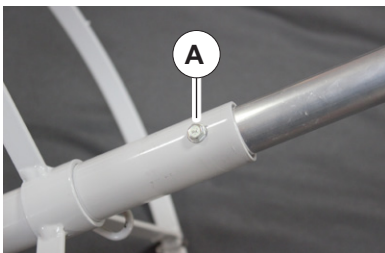
2. After installing the framework for a tensioned section go to Step E and F to install and tension the fabric for that section.

3. Then, repeat Step D to install the framework for the next tensioned section.

4. Use a hook coupler to connect tensioned sections.

Hook the hook coupler.

Attach hook coupler.

Snap reducer spacer tube into hook coupler.

INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*

E. Install SkeleCore FTS fabric onto installed framework.

1. Locate the midpoint on the framework section and the fabric section to install first.

    NOTE: Make sure hands are clean when handling fabric.

2. At the location you will be installing the fabric, unscrew 1 of the screws (added in **"Step 4-D" on page 8)** from the spacer tube (SCTUBE6 or CUTTUBE).

3. Handle the section of fabric by gathering the fabric over your arm. Make sure you have the correct orientation so the zipper at the start of the fabric section aligns with the zipper of the previous section, inlet belt, or fitting.

4. Detach the spacer tube from one of the IRs in the middle of your framework section. Transfer the fabric onto the spacer tube, then re-snap the spacer tube together.

    NOTE: If the section has an AFD Fitting, start installing the fabric section from that end instead of the middle.

5. Reinstall the screw that was removed when the fabric was transfered onto the spacer tube.

6. Advance the fabric 1 ring at a time towards the previous installed section, inlet belt, or fitting. This is done by disengaging the hook on the cable drop from the IR and pulling all of the fabric over the ring until the top zipper (12:00) aligns with the cable drop. Pass the cable drop through the zipper and attach it back to the IR.

    NOTE: Keep the top zipper fully open (E1) and continue to advance the fabric until you reach a CTR.

7. Attach the tension clips (E2) of the fabric to the CTR. Complete the connection by zippering the duct to the previous section, inlet belt, or fitting.

8. To complete the tensioned section, repeat the process going in the other direction, after you zipper the 2 sections of fabric together.

Open spacer tube.

Put fabric on tube.

String fabric over IR.
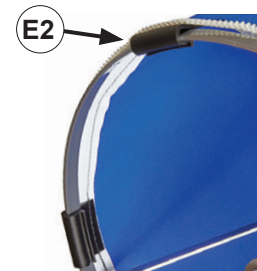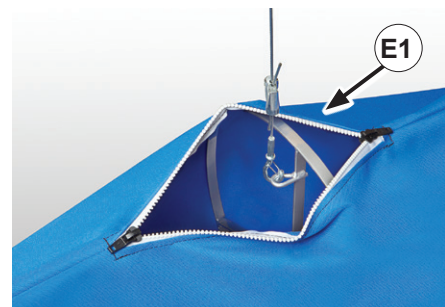
INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*
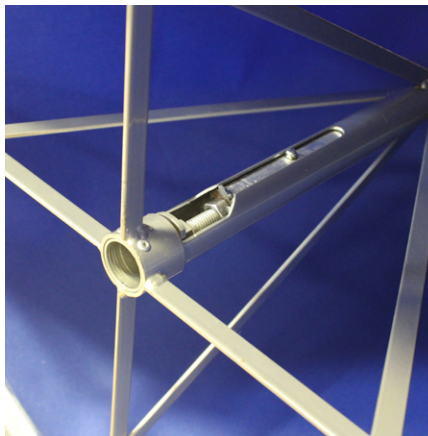
F. Tension Fabric.

1. Use the CTR wrench (supplied) to turn the nut on the CTR clockwise. Note the amount of travel the spacer tube makes in the center of the CTR as the nut is rotated.

    The amount of take-up will vary based on the length of the tensioned section. As the CTR wrench is used, adjust the DuctSox to evenly distribute fabric tensioning over entire length. Tension the fabric until the desired roundness and tautness of the fabric is achieved.

    NOTE: **DO NOT** use powered drivers to replace CTR wrench (supplied). The CTR wrench is used to avoid over-tightening.

Interior Section CTR Tensioning

CTR Tension Detail

Before Tensioning

After Tensioning

2. After tensioning a fabric section, close all top zippers of the tensioned section.
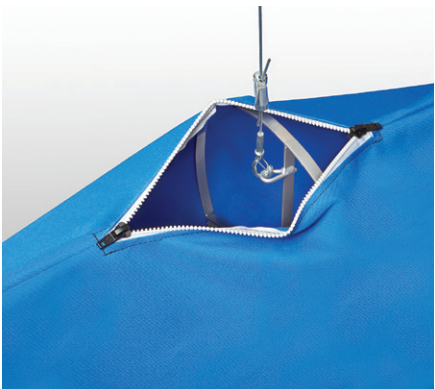
Top Zipper Open

Top Zipper Closed
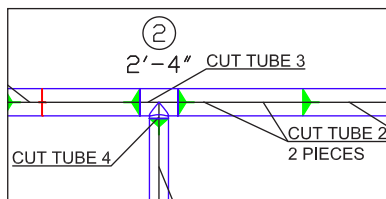
INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*

G. Endcaps

If the section ends with an endcap, follow these instructions.

NOTE: Before installing the endcap, insert a hoop into the flat of the endcap. Tuck the hoop under the fabric strip. Cinch the rope tight and slide the rope lock.

Hoop inserted into endcap.

Endcap complete.

Install the endcap on the CTR.

1. At 12:00, release the gripple from the lower cable.

2. Thread the lower cable through the endcap at 12:00 and reconnect to the gripple (G1).

3. Zip the endcap to the fabric section.
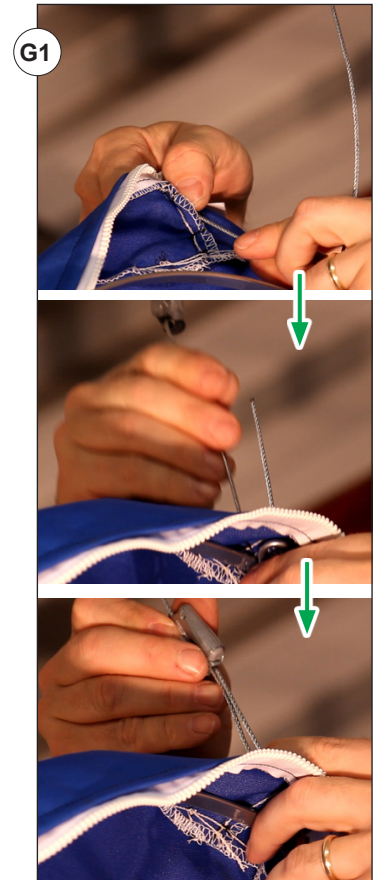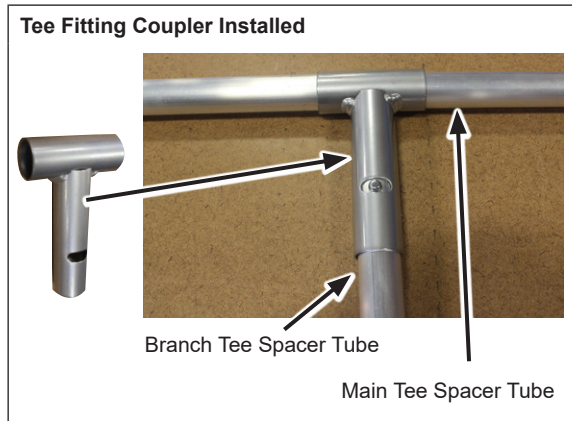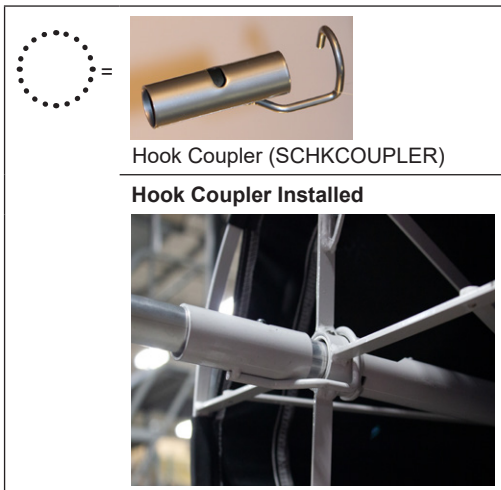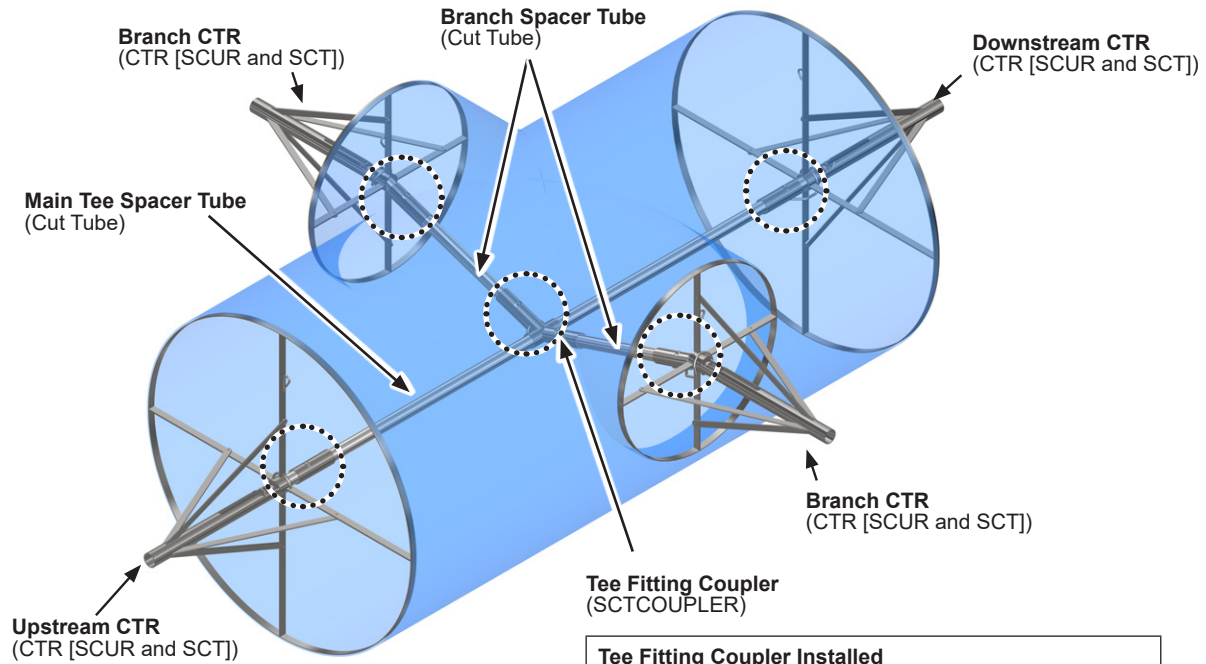
INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*

H-1. Fitting(s): Reducer
The reducer fitting is placed between 2 tensioned sections.

Reducer Spacer Tube
(Cut Tube)

Downstream CTR
(CTR [SCUR and SCT])

⑤   20∅   5'
⑥ 2'   CUT TUBE 6
CUT TUBE 7   6'

Example: Project Drawing Detail

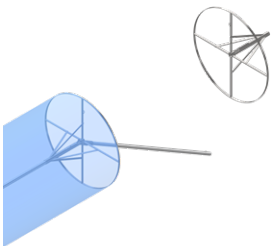**Hook Coupler** (SCHKCOUPLER)

Upstream CTR
(CTR [SCUR and SCT])
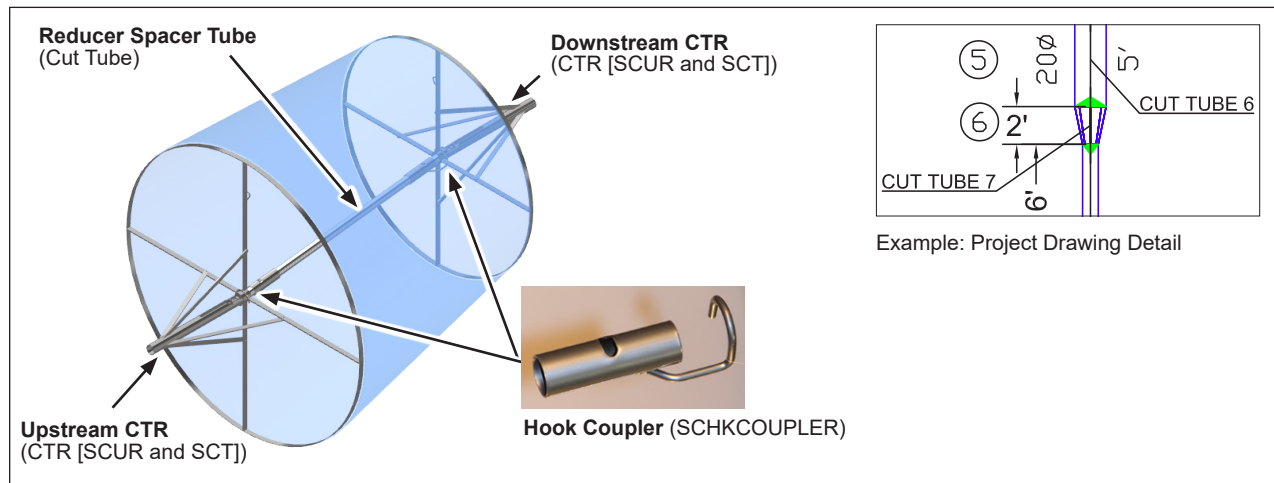
1. Locate the reducer fitting parts (spacer tubes will be labeled). Reference the project drawing to determine dimensions for installation of the downstream CTR.
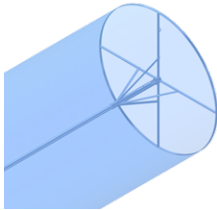
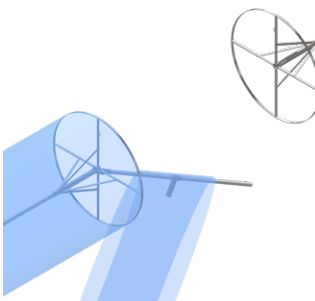2. Measure and install the downstream CTR.
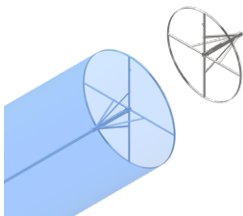
3. Attach 1 hook coupler onto the upstream CTR. Snap 1 end of the reducer spacer tube into this hook coupler.
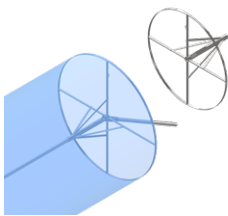
4. Slide the reducer fabric over the reducer spacer tube.
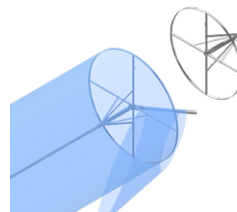
5. Attach a hook coupler to the downstream CTR. Snap the reducer spacer tube into this hook coupler.
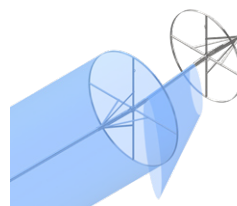
6. After adjacent fabric sections are tensioned, zip fabric fitting in place.
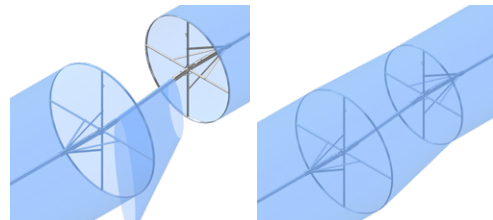
INSTALLATION

Step 4– Install FTS Framework and Fabric *Continued*

H-2. Fitting(s): Tee/Cross
The tee/cross fitting is placed between 2 tensioned sections.

Branch CTR
(CTR [SCUR and SCT])

Branch Spacer Tube
(Cut Tube)

Downstream CTR
(CTR [SCUR and SCT])

Main Tee Spacer Tube
(Cut Tube)

Upstream CTR
(CTR [SCUR and SCT])

Branch CTR
(CTR [SCUR and SCT])

Tee Fitting Coupler
(SCTCOUPLER)

=

Hook Coupler (SCHKCOUPLER)

Hook Coupler Installed

Tee Fitting Coupler Installed

Branch Tee Spacer Tube

Main Tee Spacer Tube

②
2'–4"　CUT TUBE 3

CUT TUBE 2
2 PIECES

CUT TUBE 4

Example: Tee Drawing Detail

# INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*

H-2. Fitting(s): Tee/Cross *Continued*

1. Locate the tee/cross fitting parts (spacer tubes will be labeled). Reference the project drawing to determine dimensions for installation of fitting CTRs.

2. Measure and install the downstream CTR.
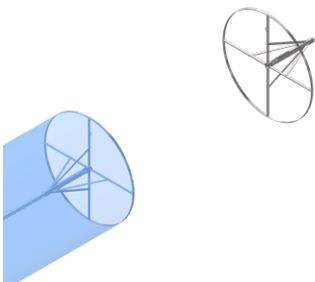
3. Attach 1 hook coupler onto the upstream CTR. Snap 1 end of your main tee spacer tube into this hook coupler.

4. Slide the tee fitting coupler and tee fabric onto the main tee spacer tube.

5. Attach another hook coupler to the downstream CTR. Snap the other end of your main tee spacer tube into this hook coupler.
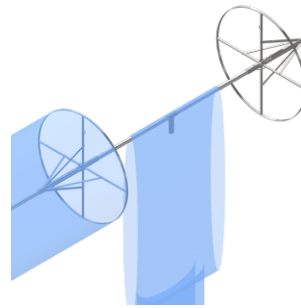
6. Snap one end of your branch tee spacer tube into the tee fitting coupler (if it is not already).
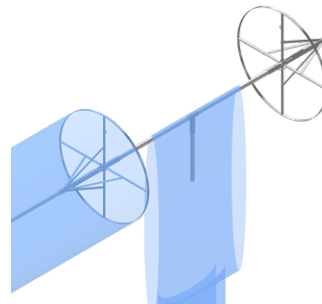
7. Measure and place the CTR of the branch.
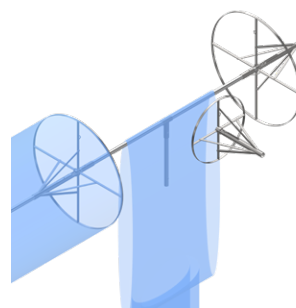
INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*

H-2. Fitting(s): Tee/Cross *Continued*

8. Attach a hook coupler to the branch CTR. Snap the free end of the branch tee spacer tube into this hook coupler.
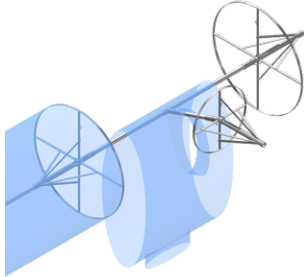

9. **CROSS ONLY**: Measure and place the CTR of the second branch. Attach a hook coupler to the CTR and to the tee fitting coupler. Snap the spacer tube into these hook couplers.
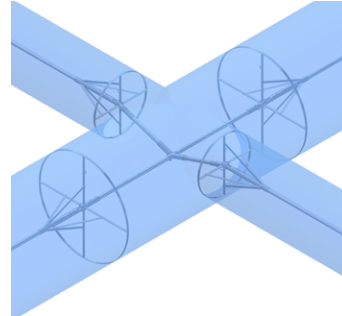
    NOTE: There is only 1 tube that will fit here, it has a shorter distance between the push button and the end of the tube. This tube will come attached to this hook coupler from the factory.
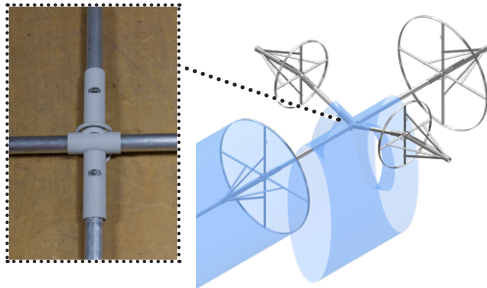
10. Zip fabric fitting in place after adjacent fabric sections are tensioned.
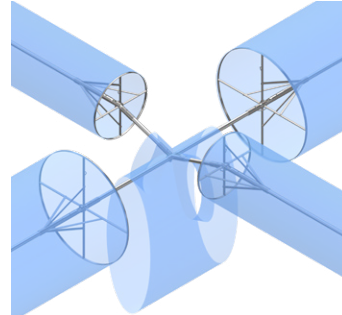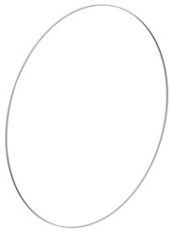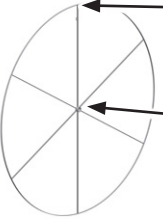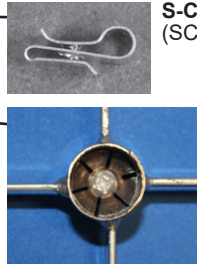

Shown: Assembly complete.
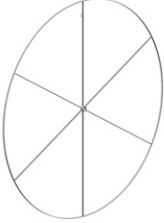
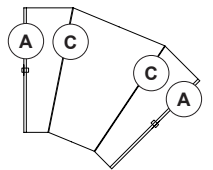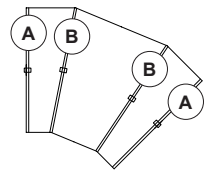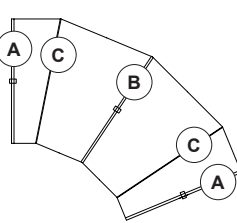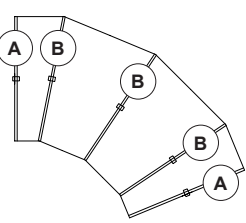# INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*
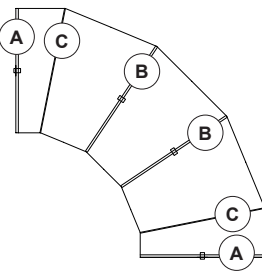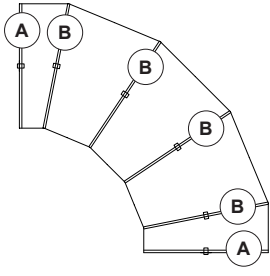
H-3. Fitting(s): Elbow

    1.   Locate the elbow fitting parts:

Fabric Elbow

Universal Rings (SCUR##) with Hollow Center

Internal Hoops (HOOP##)

Rod Clamps (RODFGCLAMP)

S-Clip (SCCLAMP)

Rod Stop (SCRODSTOP)

Universal Rings (SCUR##) with Rod Stops

Fiberglass Rods (RODFG##)
1 long rod
1 short rod
NOTE: If the elbow has a long radius there may be an additional rod.

Cable Components (DROP## and SCRINGHK) Gripple included.

2.   According to the diameter and number of gores in the elbow, determine:

- The placement of the rings.
- The number of rings and hoops needed.

3 GORE (30º – 45º)

8 in – 20 in Diameter

22 in – 60 in Diameter

4 GORE (46º – 59º)

8 in – 20 in Diameter

22 in – 60 in Diameter

5 GORE (60º – 90º)

8 in – 20 in Diameter

22 in – 60 in Diameter

A = Universal Ring with Rod Stop
B = Universal Ring with Hollow Center
C = Internal Hoop

INSTALLATION

Step 4– Install FTS Framework and Fabric *Continued*

H-3. Fitting(s): Elbow *Continued*

3. Assemble the elbow on a flat surface, before hanging.

   NOTE: Large elbows may need to be installed in place instead of on a flat surface.

   a. Install the universal rings with hollow centers and internal hoops. Begin from the middle of the elbow and work outwards. Attach the rings/hoops to the clips on the inside of the DuctSox. 1 ring/hoop attaches to 5 clips (located in-line with each other on a single sewn seam).


   NOTE: The clips are directional. Install clips over the top of the seam. **DO NOT** install clips away from the seam.

   b. Position the universal rings with rod stops at the ends of the elbow. Attach the universal rings with rod stops to the sewn in anchor clips.
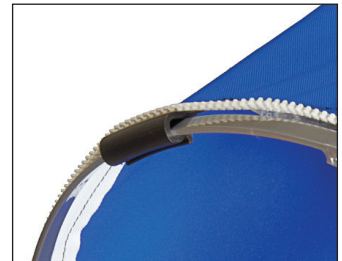
   c. Insert the long and small fiberglass rods into the elbow and through the centers of the universal rings with hollow centers (where applicable). Estimate the amount of tension required. Align the fiberglass rods and attach the rod clamps. Temporarily remove the fiberglass rods from the elbow and lock them together.
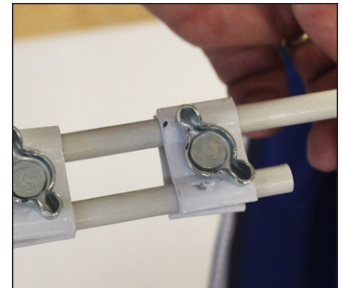
   d. Insert the fiberglass rod back into the elbow. Make sure it slides through all of the hollow center tubes. Bend the rod. Both ends of the rod must be in contact with the rod stops on the ends of the elbow.

   NOTE: For longer radius elbows, there may be 3 fiberglass rods that need to be clamped together.
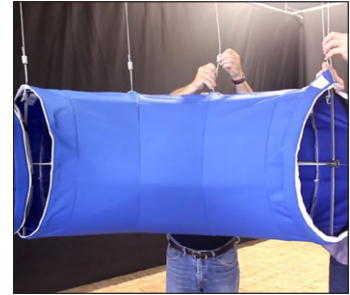
INSTALLATION

Step 4 – Install FTS Framework and Fabric *Continued*

H-3. Fitting(s): Elbow *Continued*

4. Raise the elbow up and secure the direct hang cable drops. Reference the project drawings for the locations of the cable drops.


a. For the center of the elbow, if there are 1 or more zippers located at the 12:00 position, hook 1 end to the ceiling and the other end to the corresponding ring.
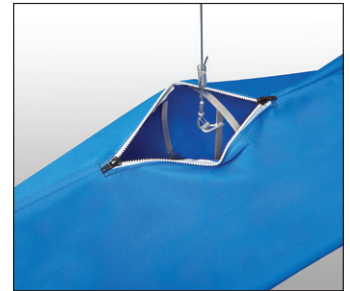
b. At the ends of the elbow, the direct hang cable drop should be inserted into the small slit located at the 12:00 position. Attach the hook to the eyelet on the ring. The cable should be attached to the ring spoke with an S-Clip and inserted into the gripple lock.

NOTE: Only use S-Clips on first and last rings in the elbow. There are not enough S-Clips to use on every ring. The other end of the cable drop should be hung from the ceiling.

Gripple

S-Clip
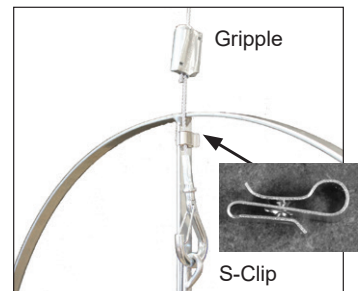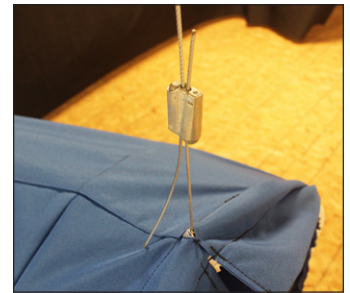
5. With the elbow secured, zipper the end of the elbow with the previous section, inlet belt, or fitting.

H-4. Fitting(s): Fitting to fitting connection

Use the details from the project drawings for fitting to fitting connections.

INSTALLATION

Step 5 – Turn on AHU

Turn on the AHU and inflate the DuctSox System.

Check that all:

• Sections are inflating properly.

• Cable drops are plumb.

• Top zippers are closed. If required, adjust top zippers to eliminate puckering at binding locations.

If lengths do not fit properly, double check all field measurements and compare to project drawings. If all measurements are correct, contact your DuctSox factory representative to discuss options.

Step 6 – Balance Airflow

System must be balanced to design CFM and static pressure immediately after installation.

Most DuctSox Systems include a zipper at the inlet location for easy access to monitor air flow.

If the fabric is fluttering after balancing, contact your DuctSox factory representative for solutions to create less turbulent airflow (adjusting the adjustable flow device (AFD), adding AFDs, etc).

MAINTENANCE

Launder fabric:

1. Record where each section that will be laundered is installed.

2. Unzip all sections and remove the DuctSox fabric from your system.

3. Follow the wash instructions located on the internal system tags for the DuctSox fabric or follow the remaining steps (that are safe for all DuctSox fabrics).

4. Launder with the most soiled side facing out.

5. Soak in cold water for 30 minutes.

6. Wash cold, gentle cycle.

7. Rinse thoroughly. Repeat laundering steps if water/DuctSox is still soiled.

8. Drip dry or no-heat tumble dry.

CUSTOMER SERVICE

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