WIREMOLD®

Walker® Infloor Systems

Wallduct Bodies & Fittings

INSTALLATION INSTRUCTIONS

Installation Instruction No.: 1 002 623 – January 2003

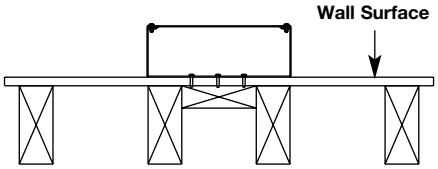
Walker® electrical systems conform to and should be properly grounded in compliance with requirements of the current National Electrical Code or codes administered by local authorities.

All electrical products may present a possible shock or fire hazard if improperly installed or used. Walker electrical products may bear the mark as UL Listed and/or Classified and should be installed in conformance with current local and/or the National Electrical Code.

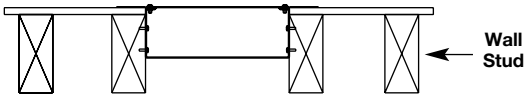
IMPORTANT – PLEASE READ ALL INSTRUCTIONS BEFORE BEGINNING.

Products Covered: *Steel and aluminum raceway bodies, fittings, and accessories with catalog numbers beginning with the following prefix: WD, AWD, CP, ACP, VA, or AVA.*

Raceway and fittings may be mounted directly to a wall/ceiling surface, or mounted within the wall/ceiling so that the cover plate is flush with the mounting surface (see illustration below).



Thru Surface Wallduct



Thru Flush Wallduct

Mounting means and hardware are not provided. Raceway and fittings must be secured to the mounting surface at intervals not exceeding 4 feet [1.2m] when wall mounted vertically or horizontally with a minimum of 4 drywall screws with a length of 2.00" [5.08cm] with a coarse thread pattern. A spacing of 2 feet [.610m] is recommended. The portion of the fastener that resides inside the raceway must be free of sharp edges or any surfaces that may abrade the internal cabling. Mounting holes must be field drilled into the raceway and fittings. Make sure screws applied meet your specific load applications and that the mounting surface material will support the load of the raceway and fittings, and the additional load of the internal cabling. When mounting from a ceiling, consult manufacturer of support means to make sure load applied can be properly supported. In order to do this you must calculate the wire and duct weight over the desired distance between supports.

When assembling adjacent sections of raceway and fittings together using the coupling angles and hole locations provided, screws must be tightened to a torque of 35 inch-pounds [3.953 Nm]. Use a #18 drill, diameter of .170" [4.31mm] for field drilled hole locations where #10-32 taptite screws are being used. Suggested torque value for taptite screws is 25 inch-pounds [2.823Nm]. For coverplates or other locations where palnut clips are to be used, a hole of 9/32" [7.143mm] is required. Cover plates must be secured to the raceway and fittings with the screws provided to a torque value of 30 inch-pounds [3.388 Nm].

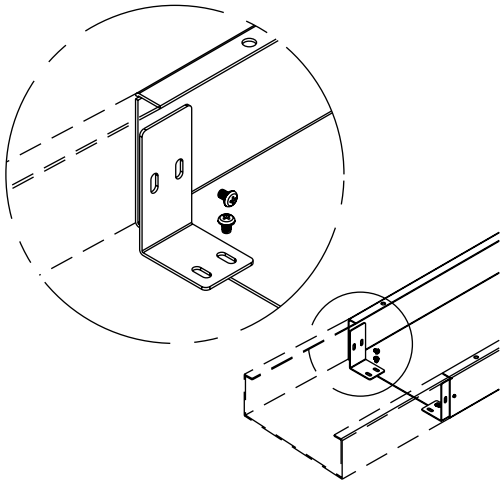
All field cut edges or corners must be filed smooth or a grommet added to prevent damage to internal cabling and personal injury. The installer must take special care when installing internal tunneling and partitions to prevent any gaps or openings greater than 1/16" [1.59mm] in width.

Raceway and fittings must be grounded in accordance to the NEC and any other local codes that apply. Any paint that is applied to the raceway must be removed in the locations where the grounding means (not provided by Walker Systems, Inc.) is attached. Raceway system is intended for power conductors 4/0 or smaller and circuits operating at potentials not exceeding 600 volts between conductors.

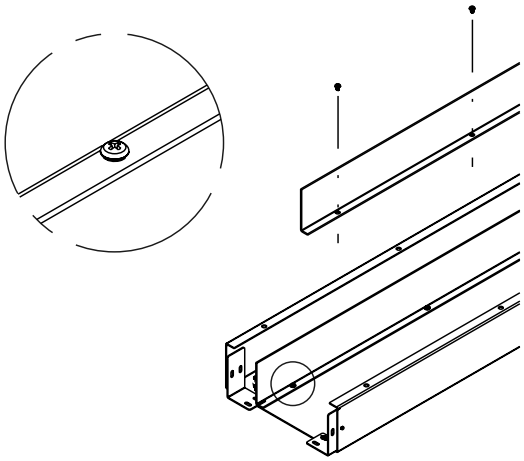
SPECIFIC INSTRUCTIONS: STRAIGHT BODIES AND THEIR COMPONENTS

Follow the instructions on page 1 for surface mounting application. Bodies are supplied from factory with wire retainers, coupling angles, and necessary fasteners. Fasteners to mount bodies to wall are supplied by installer. Access cover plates not shown here are installed similar as described for cover plates shown below. Apply supplied grommet to access cover plates.

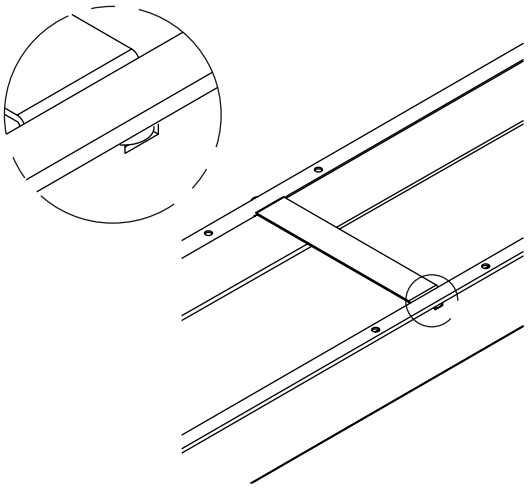
Step 1 Bodies need to be butted together using coupling angles provided and #10-32 "taptite" screws. All screws are required for proper electrical bonding between bodies and attachment to wall.



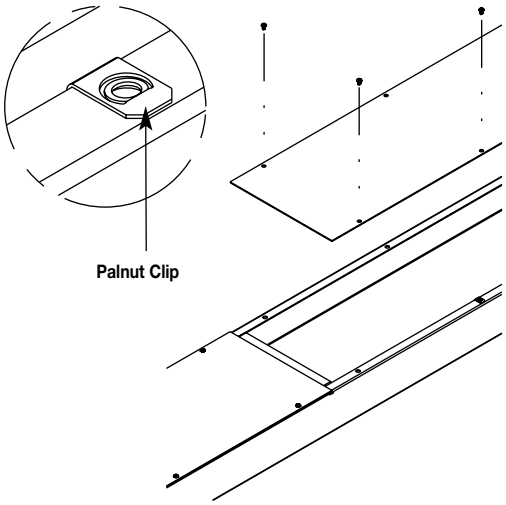
Step 2 With bodies connected and mounted to wall with screws, place partitions into duct as necessary making sure wire fill requirements are followed as per NEC (Wire fill information is also located onlast page of instruction sheet).



Step 3 Place wires into duct and then slide wire retainers into place (wires not shown for clarity). The wire retainer fits in slots located at the end of each duct body and in the middle of a 60" [1,524mm] body.



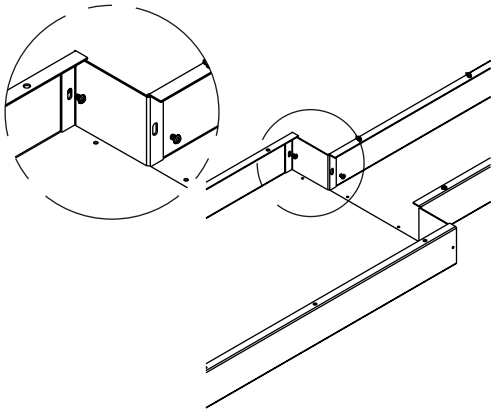
Step 4 To attach cover, place palnut clip over holes on top side of duct as shown. Position cover and secure into place using #10-32 machine screws provided.



SPECIFIC INSTRUCTIONS: REDUCER COUPLINGS, END CLOSURES, FLANGED CABINET CONNECTORS, AND VA RISERS.

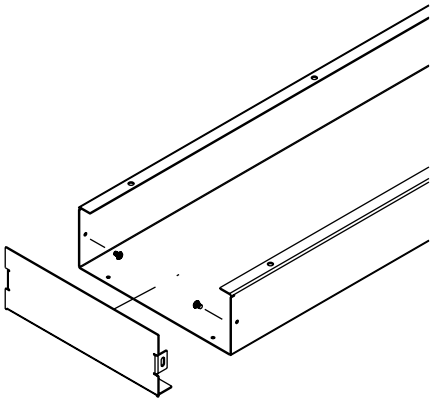
Reducer couplings are used for transitions from a larger to a smaller width duct of the same depth. End closures are used to close end of duct. Both are attached using #10-32 taptite screws. Flanged cabinet connectors connect duct bodies to cabinets of various sizes. VA Riser transition trenchduct to wallduct. All screws are required for proper electrical bonding.

Step 1 **For Reducer Couplings** – Place one reducer onto the inside of the duct and attach as you would a coupling angle. Repeat for the other reducer coupling as necessary.



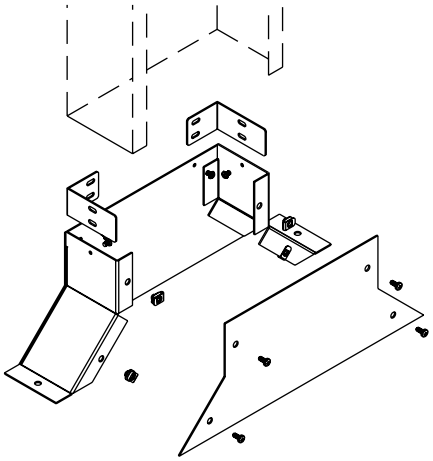
NOTE: When transitioning from a larger duct body to a smaller duct body, follow all wire fill requirements according to UL and the last page of this instruction sheet.

Step 1 **For End Closures** – Fasten closure to body of duct using screws provided. The closure should be attached just like a coupling angle.

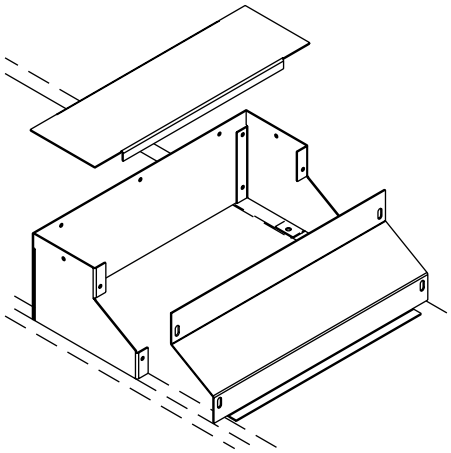


NOTE: This should be done prior to installation of any wires, coverplates, and wire retainers.

Step 1 **For Flanged Cabinet Connectors** – Connect flanged cabinet connector using coupling angles and screws provided (similar to connecting two pieces of straight wallduct). Attach to cabinet using holes provided and approporiate screws (provided by others).



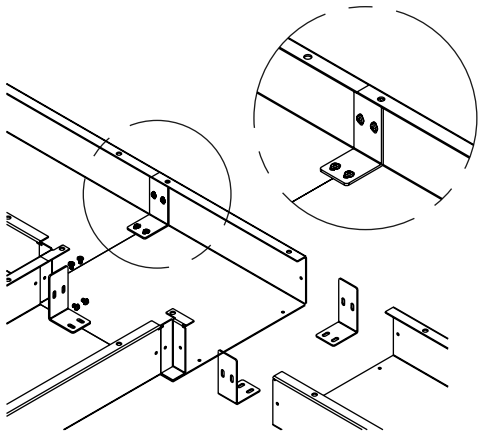
Step 1 **For VA Risers** – Attach riser to duct body using coupling angles provided with duct body and attach to trench body using screws provided through tabs provided with the VA body.



SPECIFIC INSTRUCTIONS: T-UNITS, X-UNITS, ELBOWS, AND COMPARTMENT TUNNELS

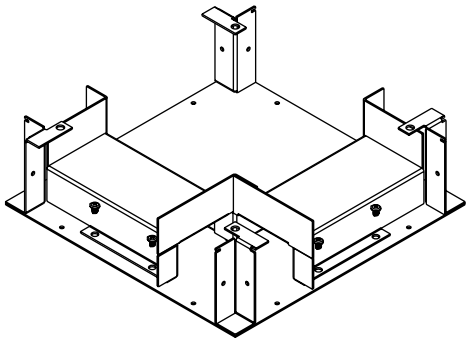
T-Units, X-Units, and Elbows are used for multiple runs of duct that come together in the same location or to make a sharp turn at the end of one run and the beginning of another. Compartment tunnels are used to run different feeds (power and communication, ex.) through the same duct bodies. Internal, external, and sweep elbows not shown here are installed similar to T-Units shown below.

Step 1 For T-Units, X-Units, and Elbows – Unit attaches with coupling angles similar to standard wallduct bodies (page 2). Make sure to use proper screw torque when connecting bodies.



NOTE: Make sure to follow all bend radius requirements when installing wires into duct.

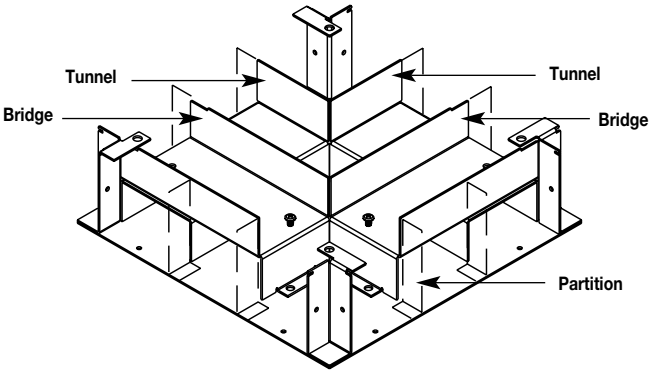
Step 1 For 2 Compartment X-Units Tunnels – Position tunnel in X-Unit as shown before wiring is installed. Using holes in the tunnel flange as a guide, drill .170" dia. (#18 drill, [4.318mm]) holes through the bottom of the X-Unit.



Step 1 For 3 Compartment X-Unit Tunnels – Follow previous instructions for X-unit tunnels. If the partition of the adjoining wallduct sections have not been installed prior to the assembly of the X-unit tunnels / bridges, cut the partition long enough to extend into the X-Unit and abut the tunnel/bridges as shown.

If the partitions of the adjoining Wallduct sections have been installed prior to the assembly of the X-unit tunnels/bridges, cut the partition pieces from excess straight body partitions, as shown below. These pieces are required to fit between the straight body partitions and the tunnel / bridges of the X-unit.

When bridges overlap tunnels, secure the bridge to the tunnel with a 3/16" pop rivet (provided by others). Use the hole(s) located in the bridge as a guide to drill a 13/64" [5.16 mm] diameter hole for the pop rivet. Select a pop rivet length suitable for the tunnel material thickness installed.

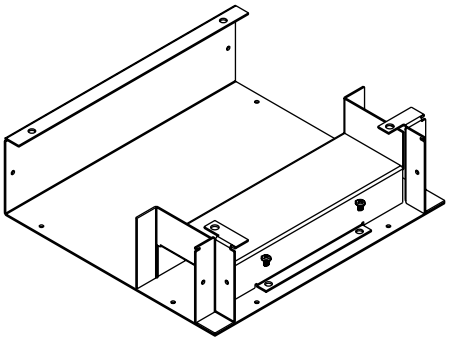


NOTE: Using tunnels reduces your overall wire fill capacity by 50% due to reduced area for wires in the system as a whole.

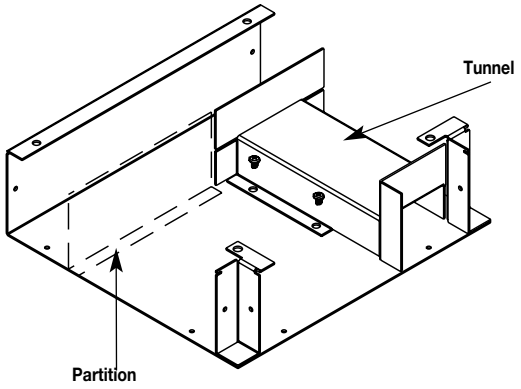
SPECIFIC INSTRUCTIONS: T-UNIT TUNNELS

Three and four compartment tunnels are used where duct bodies come together. Compartment tunnels are used to run different feeds (power and communication) through the same duct bodies. Installation is similar for both three and four compartment tunnels as shown below in detail.

Step 1 For 2 Compartment T-Unit Tunnels – Position T-Unit as shown before wiring is installed. Using holes in the tunnel flange as a guide, drill .170" dia. (#18 drill, [4.318mm]) holes through the bottom of the T-Unit. Mount the tunnel with the #10-32 self tapping screws provided.

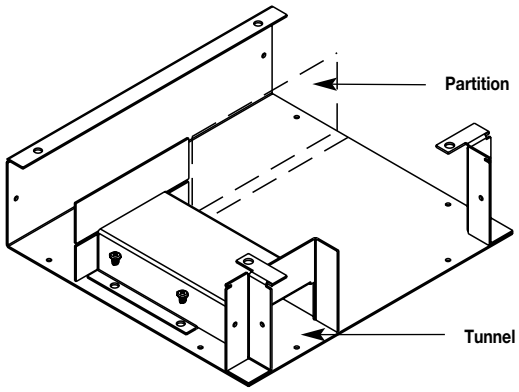


Step 2 For 2 Compartment T-Unit Tunnels – If the partition of the adjoining Wallduct sections have not been installed prior to the assembly of the T-unit tunnels/bridges, cut the partition long enough to extend into the T-Unit and abut the tunnel/bridges as shown.

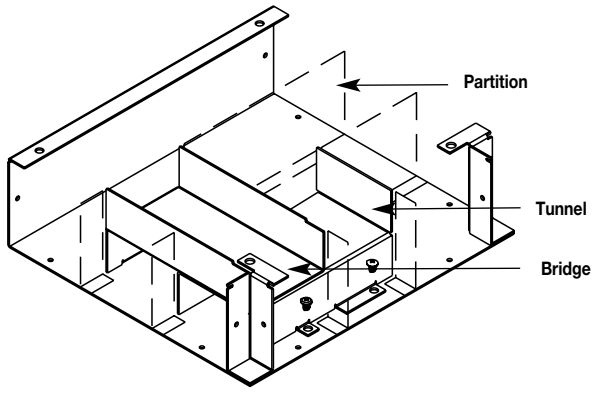


NOTE: Using tunnels reduces your overall wire fill capacity by 50% due to reduced area for wires in the system as a whole.

Step 3 For 2 Compartment T-Unit Tunnels – If the partitions of the adjoining Wallduct sections have been installed prior to the assembly of the T-unit tunnels/bridges, cut the partition pieces from excess straight body partitions, as shown below. These pieces are required to fit between the straight body partitions and the tunnel/bridges of the T-unit.



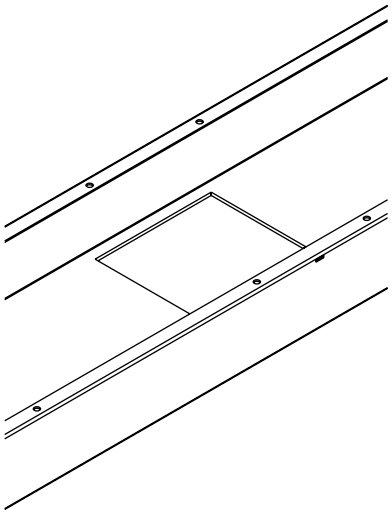
Step 1 For 3 Compartment T-Unit Tunnels – Follow steps 1 through 3 above. When bridges overlap tunnels, secure the bridge to the tunnel with a 3/16" pop rivet. Use the hole(s) located in the bridge as a guide to drill a 13/64" [5.16 mm] diameter hole for the pop rivet. Select a pop rivet length suitable for the tunnel material thickness installed.



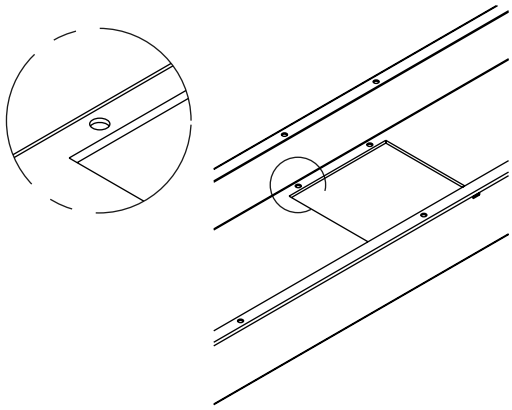
SPECIFIC INSTRUCTIONS: CEILING DROP OUT UNITS

Ceiling drop outs are intended for use with 10" [254mm] wide wallduct. The primary purpose is to allow wallduct to sit flush with ceiling. Grommet all sharp edges to prevent wires from being damaged.

Step 1 With desired location selected, cut a hole into bottom side (center) of duct body 8.75" [222.25mm] wide and 8.75" [222.25mm] long.

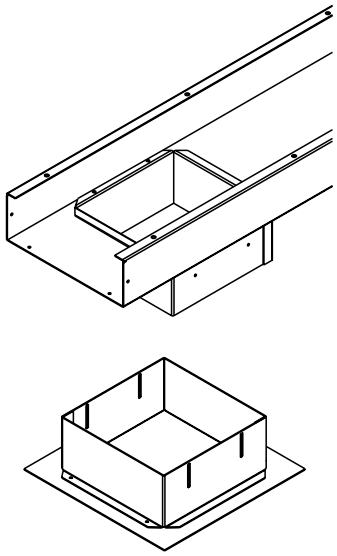


Step 2 Drill four holes with a diameter of 9/32" [7.144mm] to match with ceiling drop out mounting holes. This can be best achieved by placing the drop out onto duct body and marking with a marker or pencil. These are the locations for the palnut clips and machine screws.

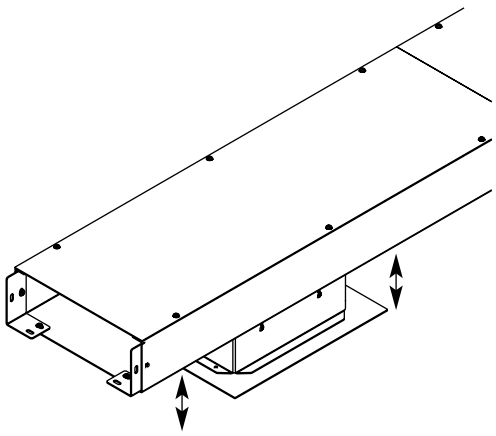


NOTE: File all sharp edges and burrs on the wallduct that may cut wire insulation.

Step 3 With cutout and holes made, place drop out unit into body from top and screw into place with palnut clips and #10-32 machine screws. This installation is similar to that of a coverplate.



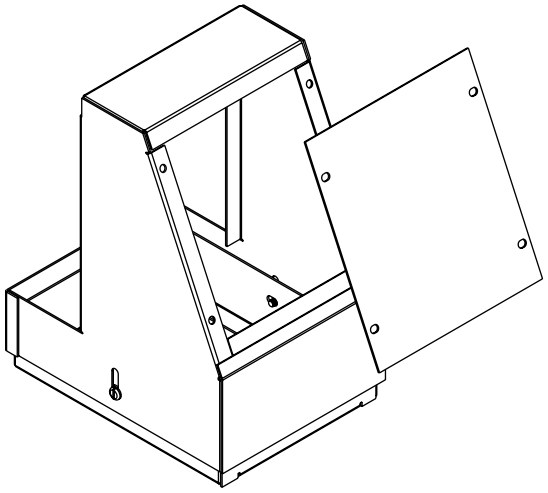
Step 4 Adjust depth of drop out by loosening and tightening the four #10-32 taptite screws on the side of the unit until it sits flush as desired. Cut desired hole size into drop out coverplate. Place grommet supplied around field cut hole.



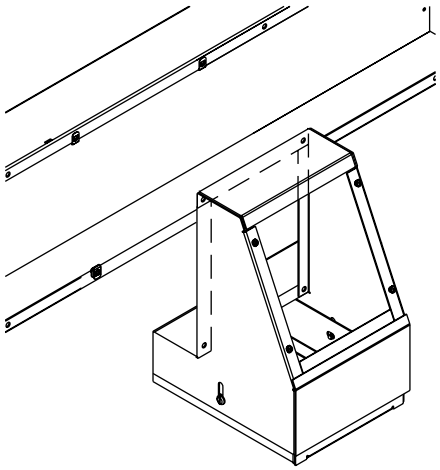
SPECIFIC INSTRUCTIONS: SWEEP CABINET CONNECTORS

Cabinet connectors are used for applications to connect wallduct to electrical cabinets such as those in MRI rooms.

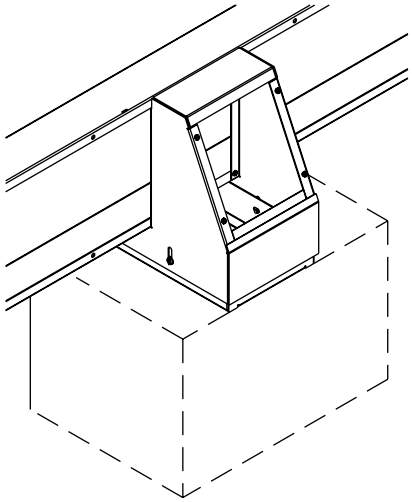
Step 1 **For Cabinet Connectors** – Remove cover from unit, retain all fasteners.



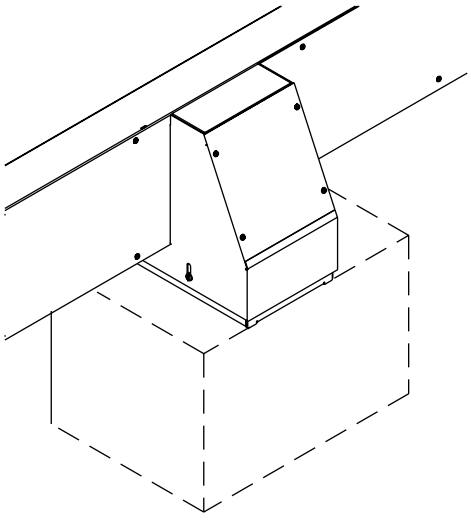
Step 2 Fasten unit to duct body. Holes for connection will need to be drilled in the straight body flanges as necessary using a 9/32" [7.14mm] diameter bit. Use the holes in the sweep cabinet connector as a guide to drill the holes. Place palnut clips over drilled holes. Re-position cabinet connector to line up with palnut clips. Secure into place using #10-32 machine screws provided.



Step 3 Attach cabinet connector to unit by adjusting bottom to sit flush with cabinet and then fasten with approporiate screws (provided by others).



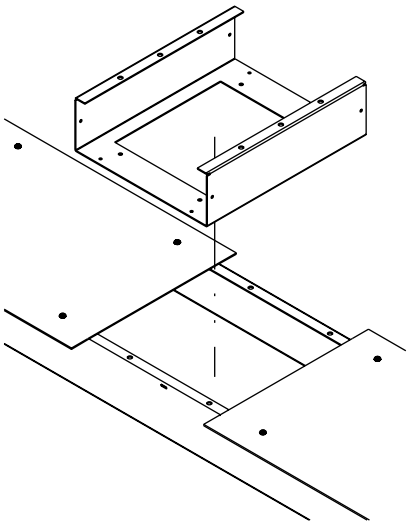
Step 4 Place wires and attach cover onto body with screws provided.



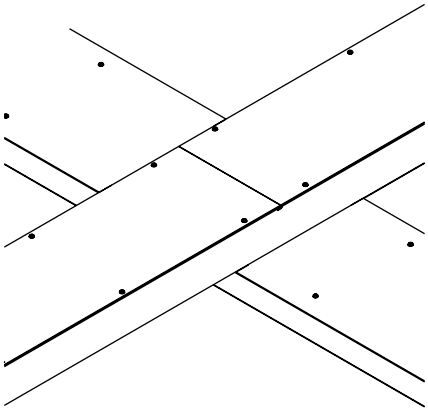
SPECIFIC INSTRUCTIONS: FLUSH TO SURFACE TRANSITIONS AND SWEEP TEES

Flush to Surface transitions are used for changing covers of duct bodies to a flush or surface application. Sweep tees are used for changing directions of the duct body or adding a perpendicular duct in the middle or at the end of a straight duct.

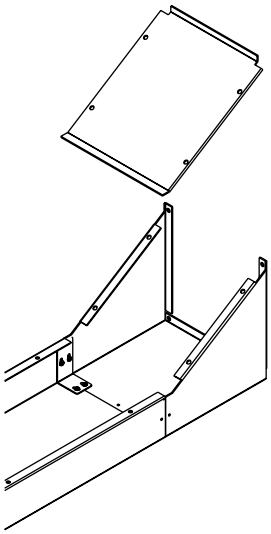
Step 1 **For Flush to Surface Transition** – In desired location, field cut cover to allow for transition to fit onto duct body. Refer to instructions shown in step 2 of previous page for attachment method.



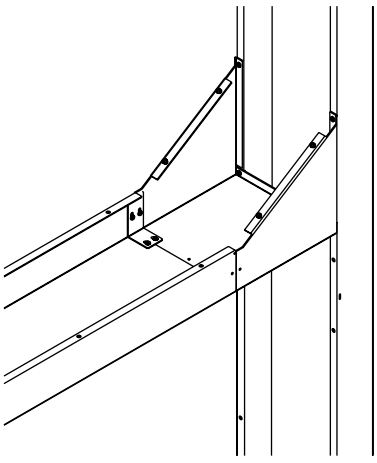
Step 2 **For Flush to Surface Transition** – With coverplate area prepared, apply grommet to all sharp edges, place wires and wire retainers, and attach transition with planut clips and #10-32 machine screws provided.



Step 1 **For Sweep Tees** – Remove cover of sweep tee unit and save screws. Attach unit to duct body using coupling angles and #10-32 taptite screws provided. Refer to page 2 for similar mounting methods.



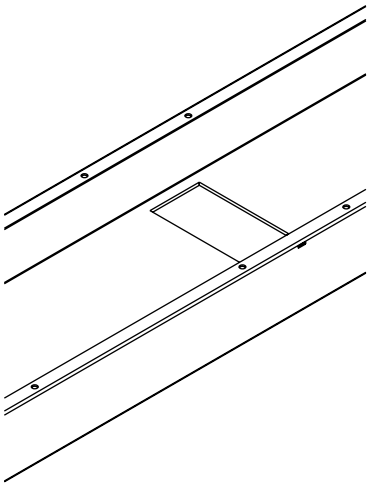
Step 2 **For Sweep Tees** – Attach unit to the other duct body using #10-32 machine screw and palnut clips provided. Refer to instructions shown in step 2 of previous page for attachment method.



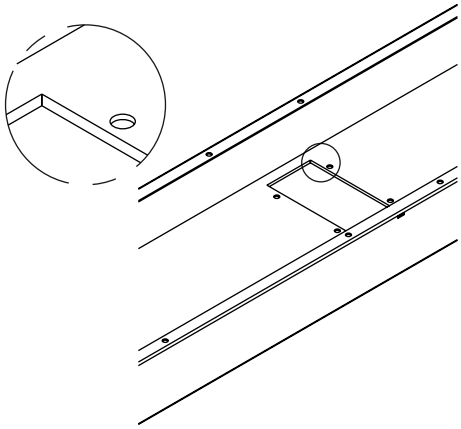
SPECIFIC INSTRUCTIONS: DROP OUT UNITS

Drop out units are to be used for transitioning to cabinet or a perpendicular duct run.

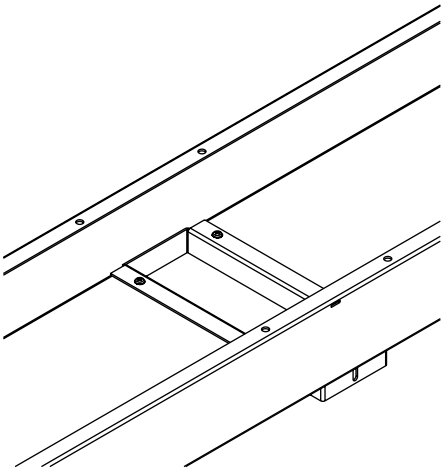
Step 1 With desired location selected, cut a hole into bottom side (center) of duct ceiling body 9 13/16" [249.24mm] wide and 3 3/16" [80.96mm] long for a standard 10" [254mm] wide by 3 1/2" [88.9mm] deep drop out. Adjust hole size accordingly for non-standard drop out units.



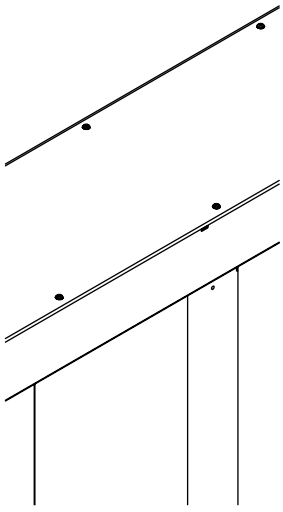
Step 2 Drill four holes with a diameter of 9/32" [7.144mm] to match with ceiling drop out mounting holes. This can be best achieved by placing the drop out onto duct body and marking with a marker or pencil. These are the locations for the palnut clips and machine screws.



Step 3 Place drop out unit into body and screw into place with palnut clips and #10-32 machine screws. Installation is similar to that of a coverplate.



Step 4 Attach the other duct body to drop out using screws and coupling angles provided. Run wires, wire retainers and close duct bodies as necessary.



WIREFILL AND IMPORTANT UL INFORMATION

Use these steps to determine Wirefill Capacity

Step 1: Determine the internal raceway area by multiplying the overall width by the overall depth (subtract material thickness).

Example: Assume you have a steel raceway 10" wide by 4" deep [254mm wide by 101.6mm deep]. Subtract the material thickness from each dimension (see Table 2). This results in an internal raceway dimensions of 9.844" [250mm] (10" – 0.156" [254mm – 3.96mm]) wide by 3.922" [100mm] (4" – 0.078" [101.6 – 1.98mm]). The internal area for this raceway size would be 38.6 sq.in. [249.03cm^2] (9.844" x 3.922").

Step 2: Determine the number of conductors allowed inside the raceway for a given type and size (types THHN and THWN are shown in Table 1) of conductor by multiplying the internal area (calculated in Step 1) by the number of conductors allowed per square inch (see Table 1).

Example: Assume you want to calculate how many No. 6 AWG (THHN) conductors you are allowed to place in the 10" by 4" [254mm x102mm] raceway in step 1 at 40% wire fill capacity. Multiply the internal area of the raceway by the maximum number of wires allowed per square inch, from Table 1. This results in 304 allowable cables (38.6 sq. in. x 7.89 [249.03cm^2 x 7.89]).

TABLE 1

THHN/THWN WIRE SIZE GAUGE NO.	APPROXIMATE OUTSIDE DIAMETER In.	[cm]	APPROXIMATE AREA In.^{2}	[cm^2]	20% FILL (Per In.^{2}) [6.45cm^2]	40% FILL (Per In.^{2}) [6.45cm^2]
14	0.111	[.2819]	0.0097	[.0625]	20.62	41.24
12	0.130	[.3302]	0.0133	[.0851]	15.04	30.08
10	0.164	[.4166]	0.0211	[.1361]	9.48	18.96
8	0.216	[.5486]	0.0366	[.2361]	5.46	10.93
6	0.254	[.6452]	0.0507	[.3271]	3.94	7.89
4	0.324	[.8230]	0.0824	[.5316]	2.43	4.85
3	0.352	[.8941]	0.0973	[.6278]	2.06	4.11
2	0.384	[.9754]	0.1158	[.7471]	1.73	3.45
1	0.446	[1.1328]	0.1562	[1.0077]	1.28	2.56
1/0	0.486	[1.2344]	0.1855	[1.1968]	1.08	2.16
2/0	0.532	[1.3513]	0.2223	[1.4343]	0.90	1.80
3/0	0.584	[1.4834]	0.2679	[1.7285]	0.75	1.49
4/0	0.642	[1.6307]	0.3237	[2.0885]	0.62	1.24

TABLE 2

MAXIMUM RACEWAY WIDTH (In.)	DEDUCT FOR MATERIAL THICKNESS (LEFT & RIGHT) Inches	[mm]	DEDUCT FOR MATERIAL THICKNESS (BOTTOM) Inches	[mm]
6" – 18" [15.2 – 45.7cm] Steel	0.156"	[3.962]	0.078"	[1.981]
20" – 30" [50.8 – 76.2cm] Steel	0.216"	[5.486]	0.108"	[2.7432]
6" – 18" [15.2 – 45.7cm] Aluminum	0.200"	[5.080]	0.100"	[2.540]
20" – 30" [50.8 – 76.2cm] Aluminum	0.250"	[6.35]	0.125"	[3.175]

A 20% fill should be used for systems utilizing fittings that have sharp 90º turns. The derating factors of NEC article 310.15(B)(2)(a) shall apply to conductors installed if the amount of current-carrying conductors exceeds 30 in number, or the sum of the cross-sectional area of all conductors exceeds 20 percent of the interior cross sectional area of the raceway. When tunnels are utilized, the internal cross sectional area must be further reduced by 50 percent. When partitions are utilized, the internal cross sectional area must be calculated for each individual compartment.

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