Installation, Operation & Maintenance

LSD

Linear Sectored Slot Diffusers

Last Revision 2016-08

EFFECTIV HVAC™

INTRODUCTION

EffectiV HVAC manufactures and supplies high quality, top-performing air distribution products and other HVAC products. EffectiV 's unique ceiling air diffusers allow Engineers, Designers to answer specific architectural and performance needs. EffectiV diffusers effectively address common comfort issues and help improve the overall energy efficiency of HVAC systems. We provide new solutions to old problems and ultimately facilitate building operators' task of keeping everyone happy.

EffectiV HVAC Inc. is the exclusive supplier of MADEL® products in the US and Canada. We have adapted some of MADEL® 's most amazing products to North American standards and we keep them in stock in our Montreal, Canada facility. Other MADEL® products can also be ordered as needed.

We thrive on supplying only the best quality products to help improve comfort, performance, interior design and energy efficiency. We fully stand behind our products performance and quality.

WE WANT TO HEAR FROM YOU

You love our products, or maybe there's something you don't like? You have an idea of how to improve installation or usability?

Whether you have a question, suggestion or comment, we'd love to hear from you!

Installers and Operators' input is very valuable to us. Please call us at 1-844-375-3885 (Toll Free) or email us at info@effectiv-hvac.com to give us your feedback.

1. RECEIVING MATERIALS

Diffusers and plenums must be inspected for shipping damage on delivery. The diffuser faces are individually wrapped and packed multiple faces per box. Any damaged box should be inspected and its content unpacked. If any shipping damage is found, report it immediately to the carrier and make sure it appears in writing on the bill of lading.

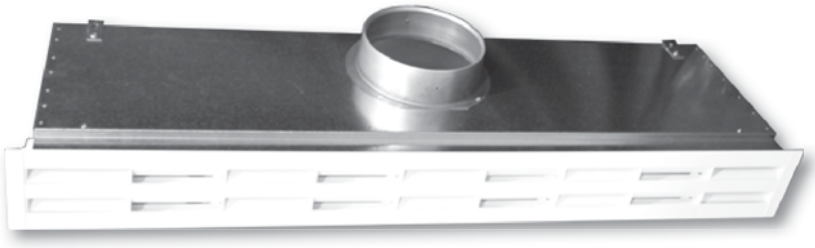
Diffusers and plenums should be stored in a dry and clean indoor location and multiple pallets should not be stacked.

Boxes and pallets should be handled gently in order to avoid unrepairable bends, bumps and scratches.

2. INSTALLATION
LSD Linear Sectored Slot Diffusers

LSD Face must normally be assembled with PLSD Plenum. LSD Series can be installed in false ceilings (square diffusers only), drywall and open ceilings.

2.1. PLSD Plenum and PL Mounting

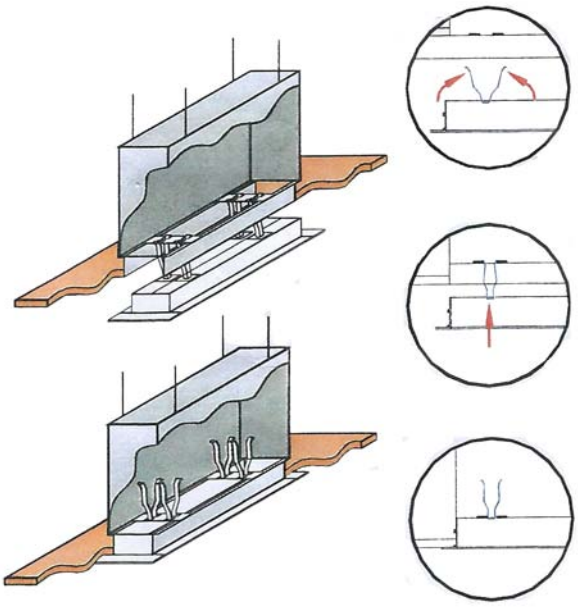


PLSD Plenum with PL mounting kit for LSD diffuser allow for quick and secure installation in drywall or open ceilings and even in false ceilings. LSD diffuser is attached to the plenum by means of spring clips and hooks. The diffuser can be removed and re-installed in just a few seconds for cleaning or balancing purposes.

2.1.1. Apply pressure on the spring clips to align both arms with the holes in the plenum's support clips.

2.2.2. Insert both arms of the spring clips in the holes.

2.2.3. Push all the way until the diffuser's flange is flush with the plenum's edge or with drywall.



2.2. Installation in False Ceiling (T-Bar Lay-In)

2.2.1. Attach the plenum to the building structure with four metal cables, using the attachment holes (anti-seismic tabs) located on both side of the plenum. The base of the plenum should lay on the t-bar.

2.2.2. Connect the diffuser's to the plenum by inserting the neck of the diffuser into the plenum's opening. It is recommended to use the PL mounting system, however simply letting the plenum lay on the diffuser may work for some applications.

2.2.3. Make sure that the suspended ceiling is firmly anchored and that it matches the diffuser's face dimension.

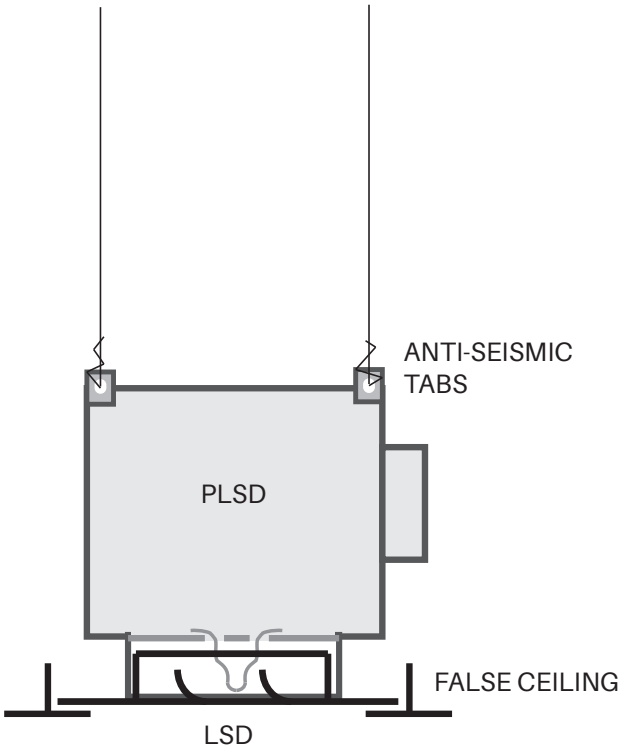
The overall length is the diffuser is 1 27/64" longer than the listed length of the diffuser. Make sure it will fit in the t-bar. i.e. for LSD-100 46 2 the listed size is 46" therefore the overall length will be 47 27/64".

The overall width depends on the number of slots, please this use table:

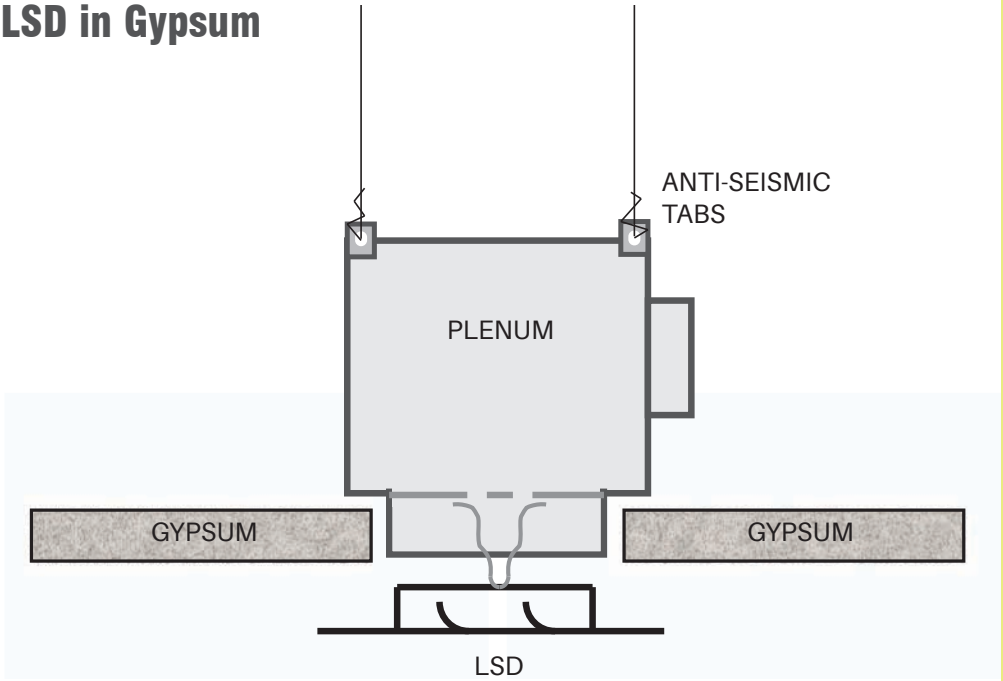
Nb of Slots	Width
1	2 43/64"
2	4 7/32"
3	5 49/64"
4	7 5/16"

2.2.4. Gently pull down the assembled diffuser and let it lay in the t-bar.

NOTE: Some damper systems may require additional installation steps. For more information, refer to section 4. Balancing of Air Volume.



2.3. Installation of LSD + PLSD in Gypsum



2.3.1. Cut a hole in the gypsum 5/8" larger than the listed length of the diffuser.

i.e. for LSD-100 48 2 the listed size is 48" therefore you need to cut a hole 48 5/8".

The hole's width depends on the number of slots, please this use table:

Nb of Slots	Hole Width
1	2 11/64"
2	3 47/64"
3	5 9/32"
4	6 13/16"

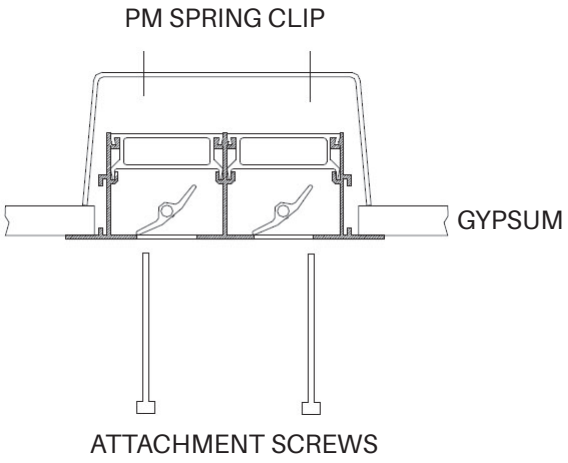
2.3.2. Attach the plenum to the building structure with four metal cables, using the attachment holes (anti-seismic tabs) located at each corner of the top of the plenum. The base or flange of the plenum should be 1/8" higher than the base of the gypsum.

2.3.3. Attach the diffuser's face to the plenum using the PL mounting system provided with diffuser and plenum and push completely until the the diffuser is perfectly flush with the ceiling.

NOTE: Some damper systems may require additional installation steps. For more information, refer to section 4. Balancing of Air Volume.

2.4. Installation of LSD in Gypsum Using PM Mounting Kit (No Plenum)

The PM Mounting Kit is constituted of large spring clips with long screws for installation without plenum, directly into the gypsum or drywall.



2.4.1. Cut a hole in the gypsum 5/8" larger than the listed length of the diffuser.

i.e. for LSD-100 48 2 the listed size is 48" therefore you need to cut a hole 48 5/8".

The hole's width depends on the number of slots, please use this table:

Nb of Slots	Hole Width
1	2 11/64"
2	3 47/64"
3	5 9/32"
4	6 13/16"

2.4.2. It is recommended to reinforce the back of the gypsum with sheet metal or a frame before installing the diffuser in order to prevent damaging of the gypsum.

2.4.3. Attach the PM spring clip to the LSD diffuser using the long attachment screws provided with the kit. Do not tighten the screws all the way, only enough so that the clip is loosely attached to the diffuser.

2.4.4. Press both side of the spring clips while inserting the diffuser in the gypsum's hole. Gently release the clip sides, both clips should now be larger than the hole, maintaining the diffuser into the ceiling.

2.4.5. Tighten the long screws until the diffuser's frame lays flush with the ceiling.

NOTE: Some damper systems may require additional installation steps. For more information, refer to section 4. Balancing of Air Volume.

2.5. Multiple Sections Continuous Linears

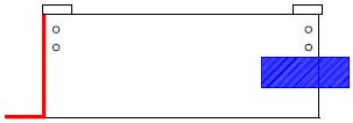
LSD slot diffusers can be ordered in sections with or without End Borders to form continuous linear slot diffusers of virtually any length.

The maximum length for one section is 6' 6" (2m).

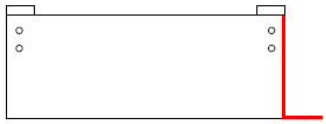
Left, Right and Interior sections are supplied with alignment strips (sometimes also called pull pins) to ensure easy, well aligned and stable joining of sections together.

The same system applies to 90 degree inactive angles.

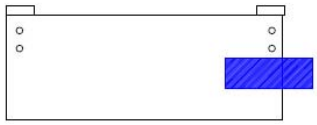
LSD-ARI



LSD-ARD



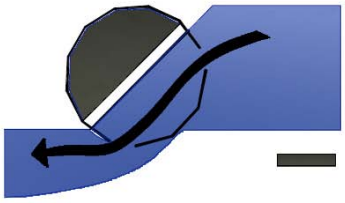
LSD-INT



3. AIRFLOW CONFIGURATION

LSD Blades Positioning

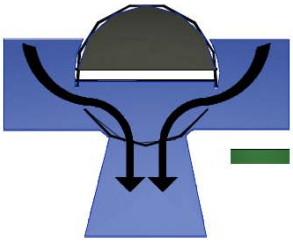
Horizontal Airflow



A

B

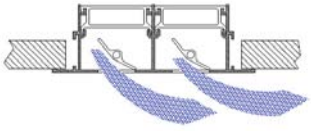
Vertical Airflow



C

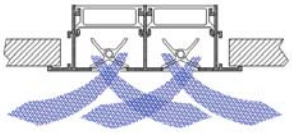
Airflow Balancing

Independently adjustable sectored vanes allow for multiple air diffusion patterns. The standard (factory) configuration is 2 Way Alternate and provides optimal performance and comfort in most applications.



1 Way
All A or all B

2 Way
Full row(s) A and
Full row(s) B



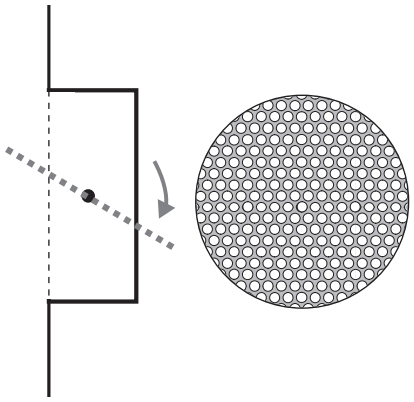
2 Way Alternate (Default)
Each row has alternance of A and B

Vertical
All C

4. BALANCING OF AIR VOLUME

PLSD plenums come with a choice of five integrated air balancing systems.

4.1. Perforated Swivel Damper / Air Equalizer (R)



Simply rotate the perforated plate between a 0 degree and a 90 degree angle to obtain the desired free area and required volume of air.

0 degree or 180 degree angles (flat with the collar opening) are fully closed and will allow for approximately 50% of air flowing through.

A 90 degree angle (perpendicular to the collar opening) is fully open and will allow for 100% of air flowing through.

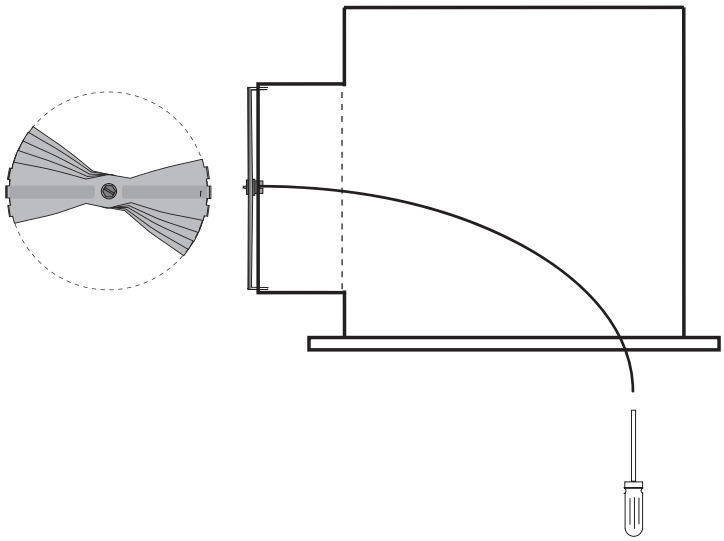
Any in-between will allow between 50% and 100% of airflow.

IMPORTANT: the perforated damper also acts as an air equalizer. Therefore if there is an angle in the duct entering the plenum, please make sure that the flat part of the damper is facing the angle of the duct when possible. This will help ensure optimal air equalizing.

4.2. Cable-Operated Damper Through Face (MRT)

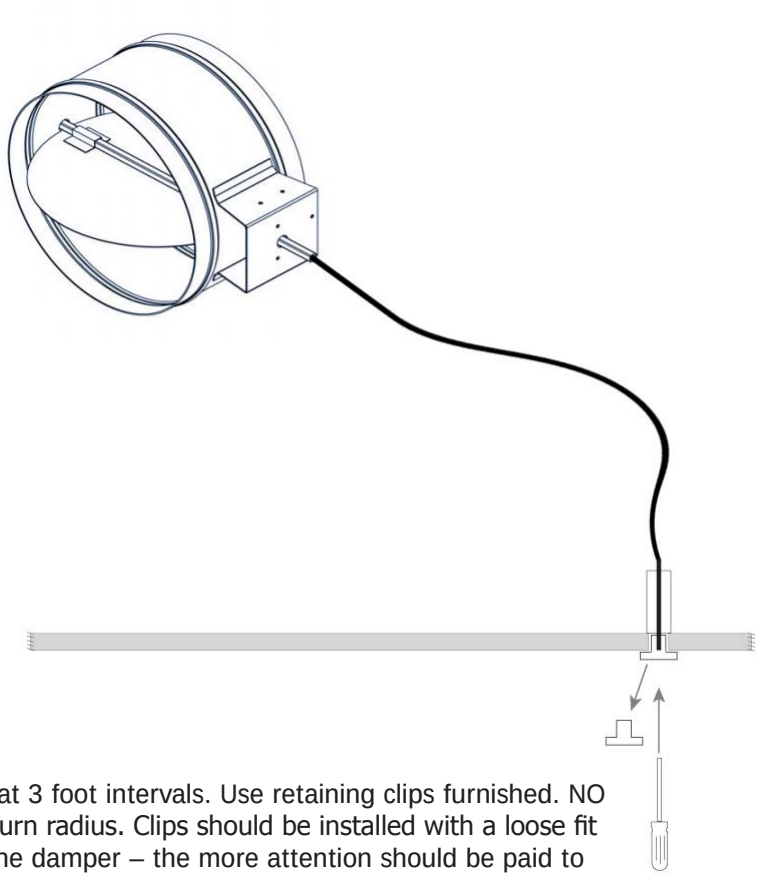
Dampers may be adjusted by applying a Square Nut driver or a ¼" hex socket to the male square adjustment end of the cable. Once set, dampers will hold their settings up through the design velocity limits.

For aesthetical reasons the cable may be pushed back through the diffusion vane and hidden behind the face after balancing. It is however recommended to mark the diffusion vane behind which the cable is hidden in order to facilitate future balancing.



4.3. Cable-Operated Damper Through Drywall or Tile (MRT2)

DAMPER INSTALLATION



MRT2 cable dampers ship separately from the plenum and must be properly installed.

1. Prior to installing damper in duct, check to make sure blades operate freely with no binding or restriction.

2. Screw or rivet damper to plenum. Make sure that fasteners do not interfere with blade operation and that damper is not racked.

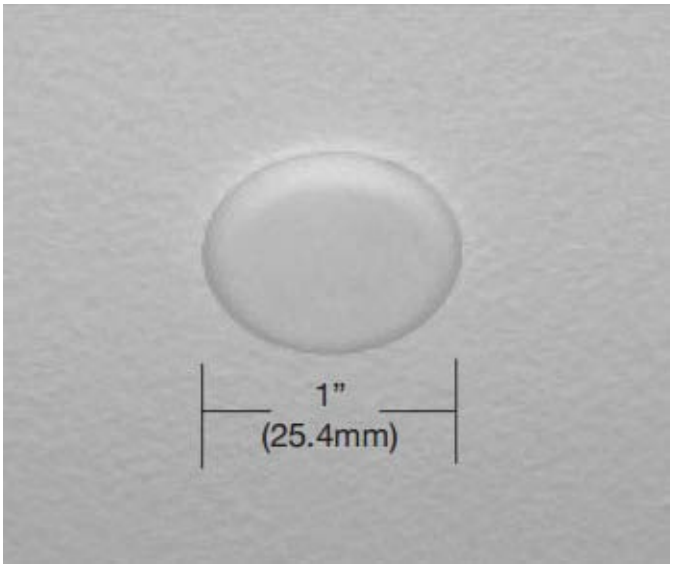
3. Adjust worm gear rotation so that set screws will be accessible when in position. Align square shafts so as to catch set screws directly on flats. Set screws are 90′ opposed.

4. Slip worm gear assembly over shaft. Tighten (2) set screws onto damper shaft with 1/8" Allen key, then secure to plenum. Assembly mounts horizontally or vertically as required for best cable run. Test for free operation by rotating cable. Do not attempt to rotate worm gear by pushing on damper blade.

5. Support cables as required at all changes in direction and at 3 foot intervals. Use retaining clips furnished. NO DRAPING – cables should be taut or nearly so. 4″ minimum turn radius. Clips should be installed with a loose fit to allow cable rotation. The longer the cable and the larger the damper – the more attention should be paid to cable support.

6. Attach the mounting bracket to the structural member so that the bottom of the bracket is flush with the underside of the ceiling.

7. Drill a 1/2" diameter hole in the ceiling location that lines up with the centerline of the cable. (23/32" [18mm] from stud). Install ceiling drywall.



8. Select the appropriate RT-CCM cap for the cover (.500" to .750" or .760" to 1.25" ceiling thickness) and attach to exposed cable.

9. TEST individual damper operation to evaluate cable support scheme prior to ceiling close-up. NOTE: Use cable to operate the damper, DO NOT attempt to rotate cable by pushing on damper blade.

OPERATION

Damper may be adjusted with a quality ¼' nut driver or hex socket wrench. (Thin blade screwdriver if ordered.) Often cable end may be pulled out several inches to ease adjustment.

Worm gear has a 20-1 ratio; therefore a 90 degree blade rotation requires five (minimum) complete rotations.

Damper will hold set position. Gear design will not allow reverse movement from the damper end.

4.4. Electro-Balanced Damper With Remote Control, Cable Through Face (EB)

INSTALLATION

Electro-Balanced Cable Damper with remote control and cable through face comes pre-installed on PLSD plenums.

All you have to do is pull the cable through a diffusion vane before fixing the face to the plenum. Once the face is installed and air balancing is done, gently push the cable back through the diffusion vane to hide it behind the face. It is however recommended to mark the diffusion vane behind which the cable is hidden in order to facilitate finding the cable when re-balancing is needed.

OPERATION

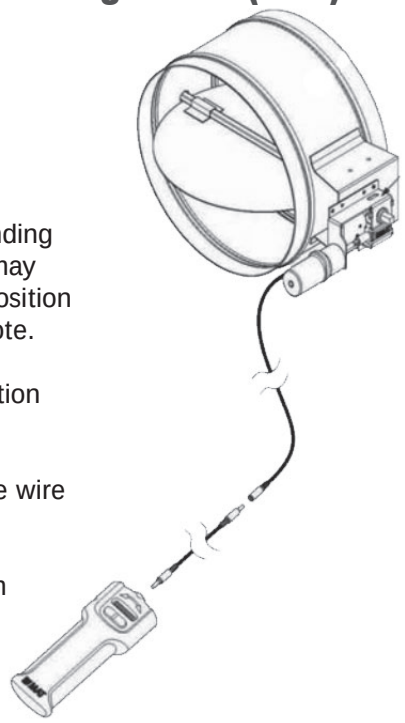
Dampers are adjusted by connecting the grey male-to-male wire tether (supplied with the remote) to the hand held remote control and the damper motor connector. Turn on the remote using the slide switch on the side of the housing. The green on/off LED will illuminate. Press the rocker switch on the remote control to operate the damper. Right toggle opens the damper, left toggle closes the damper.

If the LED array blinks alternating red and green, there is an open connection. Check to make sure the remote control male connectors are pushed all the way in.

The LED array will indicate approximate blade position for dampers with 90° open/close cycles. To use this feature, the damper must first be set to a full open or closed position. Then as you operate the remote, the LEDs will light up in sequence. There are 10 LEDs. If five are lit, the damper is 50% open.

The on/off LED will flash to indicate low battery condition. The remote will continue to operate the damper but battery replacement will be needed soon. The Duracell 9V battery can be replaced by removing the battery cover on the back of the remote housing. It is not necessary to remove the belt clip to replace the battery.

4.5. Electro-Balanced Damper With Remote Control, Cable Through Wall (EB2)



DAMPER INSTALLATION

EB2 cable dampers ship separately from the plenum and must be properly installed.

1. Prior to installing damper in duct, check to make sure blades operate freely with no binding or restriction. Blade interference or damper shaft interference with blade stop hardware may falsely signal to the remote control that the damper blade is in a full open or full closed position (in contact with the blade stop). This will result in the motor being turned off by the remote.

2. Secure the damper to duct. Make sure that fasteners do not interfere with blade operation and that damper is not racked.

3. Route wiring to the connector termination point. Excess cable can be bundled using the wire tie provided.

4. Before closing the ceiling, TEST the unit to verify smooth damper operation and system connectivity:

4.1. Connect the damper drive connector to the hand held remote control using the grey male-tomale connector cable supplied with the remote.

4.2.Turn on the remote using the slide switch on the side of the housing. The green on/off LED will illuminate.

4.3. Operate the rocker switch on the remote control to ensure smooth damper operation through the open/close cycle. Right toggle opens the damper, left toggle closes the damper.

- If the LED array on the remote control flashes red then green, connectivity has been broken. Check for sliced wiring or a loose connection at the motor. NOTE: If wiring or connectors are damaged in the field, they can be replaced quickly. Contact your sales rep for replacement components.

- If your damper has blade stops, the remote will turn off the motor when the damper blade contacts the stops. If the remote control turns the damper drive off prior to the damper reaching a full open or full closed position, check to make sure that there are no fasteners interfering with damper blade operation.

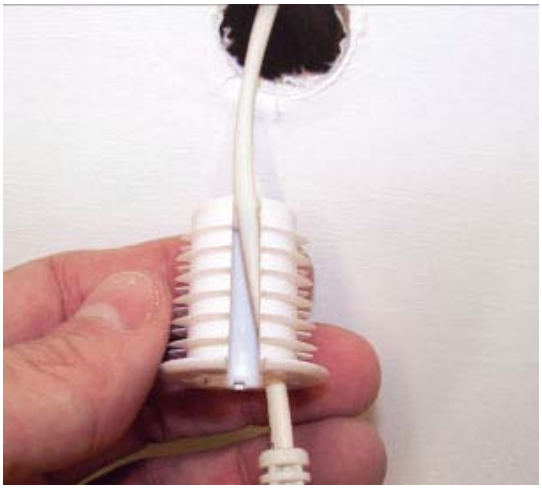
5. The LED array will indicate approximate blade position for dampers with 90° open/close cycle. To use this feature, the damper must first be set to a full open or closed position. Then as you operate the remote, the LEDs will light up in sequence. There are 10 LEDs. If five are lit, the damper is 50% open.

6. The universal damper drive connectors can be terminated in a wall or ceiling using various surface termination fixtures: See separate installation instructions for these items below.

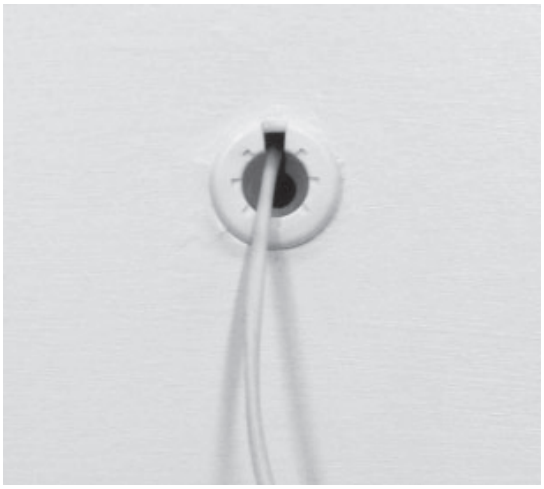
SINGLE PORT WALL PLATE INSTALLATION

a. Drill a 7/8” dia. hole in the wall.

b. Drop connector thru the wall to room side.



c. Slide wiring into “Part B” through the slot opening along the side of the part.



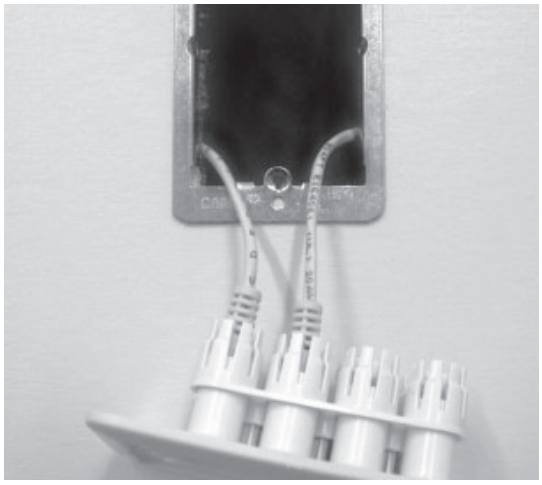
d. Push Part B into the wall opening until the flange is flush with the wall.

e. Place the connector into Part A and locate the ribs so they are aligned with the slot in Part B.

f. With connector pushed all the way into Part A, push Part A into the opening until it snaps into place.

MULTI (8) PORT WALL PLATE INSTALLATION

a. Use attached caddy instructions to prep the wall opening and install the mounting plate.



b. Route all connectors through the wall opening (paying attention to identify the connectors by location). Push connector into designated wall plate port until it snaps into place.

c. Label the connector locations on the back side of the wall plate cover.

d. Push excess cable back into wall opening and insert wall plate. Secure with screws included.

e. Install cover.

OPERATION

Dampers are adjusted by connecting the grey male-to-male wire tether (supplied with the remote) to the hand held remote control and the damper motor connector. Turn on the remote using the slide switch on the side of the housing. The green on/off LED will illuminate. Press the rocker switch on the remote control to operate the damper. Right toggle opens the damper, left toggle closes the damper.

If the LED array blinks alternating red and green, there is an open connection. Check to make sure the remote control male connectors are pushed all the way in.

The LED array will indicate approximate blade position for dampers with 90° open/close cycles. To use this feature, the damper must first be set to a full open or closed position. Then as you operate the remote, the LEDs will light up in sequence. There are 10 LEDs. If five are lit, the damper is 50% open.

The on/off LED will flash to indicate low battery condition. The remote will continue to operate the damper but battery replacement will be needed soon. The Duracell 9V battery can be replaced by removing the battery cover on the back of the remote housing. It is not necessary to remove the belt clip to replace the battery.

5. MAINTENANCE

LSD High Induction Linear Sectored Slot Diffusers require no periodic maintenance other than standard cleaning. Soft cloth or duster are recommended in order to remove dust without scratching the diffuser's paint.

To clean the diffusion vanes, gently brush in the direction of the vanes.

IMPORTANT: When cleaning the face of the diffuser, be careful not to change the direction of the vanes.

If the vanes are rotated by mistake while cleaning he diffuser, it is crucial to replace them in the exact original position in order to ensure optimal performance of the diffuser.

A technician qualified in air balancing air should be mandated to restore the vanes to their initial adjustment. In order to do this, access to initial engineering plans and specifications will be required.