



## Walkerduct® Underfloor Duct ® Walkerduct Pro Series System INSTALLATION INSTRUCTIONS

Installation Instruction No.: 1B0161R3 – Updated May 2009

Wiremold/Legrand 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. Wiremold/Legrand 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.**

### OVERVIEW OF SYSTEM:

1. Review and become familiar with all duct components.
2. Keep material and cartons dry.
3. Be careful of sharp edges or burrs when handling any sheet metal parts.
4. All interior duct surfaces that can come into contact with wires shall be smooth.
5. On arrival, check the shipment for shortages or damage. Contact your local Wiremold/Legrand representative if there are any issues. File freight damage claims directly with your carrier.
6. Compare and coordinate the architectural and electrical drawings with Wiremold/Legrand installation drawings. Contact your local Wiremold/Legrand representative immediately if any details or dimensions are incorrect.
7. Advise all trades that underfloor duct is not to be used as a walkway or crosswalk. Install underfloor duct system in accordance with Article 390 of the latest National Electric Code.

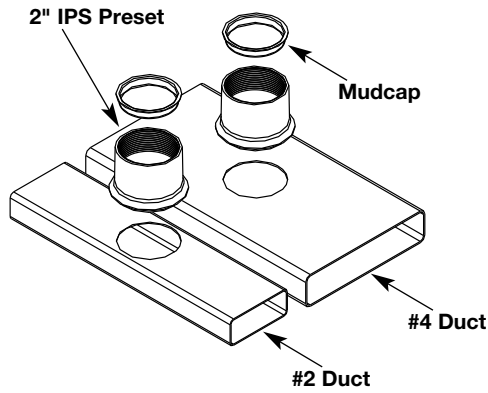
DUCT CABLE/WIRE SIZE FILL CHART							
	CABLE/WIRE SIZE	DIAMETER		AREA (In <sup>2</sup> )		40% FILL*	
		Inches	[mm]	Inches	[mm]	No. 2 DUCT	No. 4 DUCT
UNSHIELDED TWISTED PAIR	4-PAIR, 24 AWG, CAT 5	0.220	[5.6]	0.038	[24.5]	35	91
	4-PAIR, 24 AWG, CAT 6	0.250	[6.4]	0.049	[31.7]	27	71
TELEPHONE	2-PAIR, 24 AWG	0.140	[3.6]	0.015	[9.9]	86	226
	4-PAIR, 24 AWG	0.190	[4.8]	0.028	[18.1]	47	122
	25-PAIR, 24 AWG	0.410	[10.4]	0.132	[85.2]	10	26
COAXIAL	RG58/U	0.195	[4.9]	0.030	[19.4]	44	116
	RG59/U	0.242	[6.1]	0.046	[29.7]	29	75
	RG6/U	0.270	[6.8]	0.057	[36.8]	23	61
SHIELDED TWISTED PAIR	TYPE 1	0.390	[9.9]	0.119	[76.8]	11	29
	TYPE 2	0.465	[11.8]	0.170	[109.7]	7	20
	TYPE 3	0.245	[6.2]	0.047	[30.3]	28	74
FIBER OPTIC	2-STRAND	0.180	[4.6]	0.025	[16.1]	53	139
	4-STRAND	0.190	[4.8]	0.028	[18.1]	47	124
	6-STRAND	0.210	[5.3]	0.035	[22.6]	38	99
	FIBER ZIPCORD	0.110	[2.8]	0.010	[6.5]	133	348
THHN/THWN/ THWN-2	14 AWG	0.111	[2.8]	0.0097	[6.3]	137	359
	12 AWG	0.130	[3.3]	0.0133	[8.6]	100	262
	10 AWG	0.164	[4.2]	0.0211	[13.6]	63	165
	8 AWG	0.216	[5.5]	0.0366	[23.6]	36	95
	6 AWG	0.254	[6.5]	0.0507	[32.7]	26	68
	4 AWG	0.324	[8.2]	0.0824	[53.2]	16	42

\*40% cable fill is the maximum cable allowed by NEC.

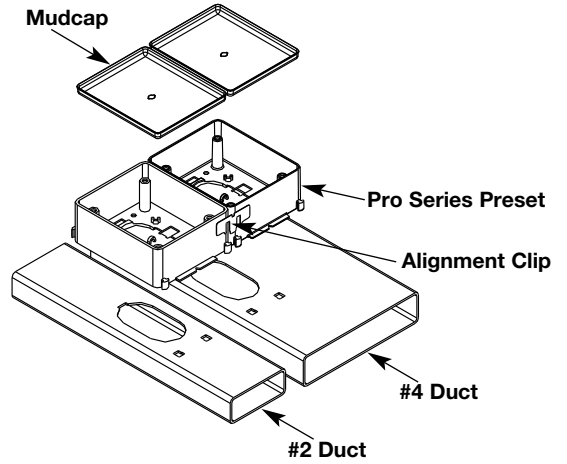
**DUCT:**

1. Duct is manufactured in two sizes and in two styles. 2" IPS round preset and Pro Series rectangular preset duct.
  - a. No. 2 Duct is 3 1/8" wide x 1 1/4" deep [79mm x 32mm] with a cross sectional area of 3.34 sq. in. [2155 sq. mm].
  - b. No. 4 Duct is 6 1/2" wide x 1 1/2" deep [165mm x 38mm] with a cross sectional area of 8.72 sq. in. [5626 sq. mm].
2. The largest conductor to be installed in either duct shall be 1/0.
3. Preset duct for distribution runs is standard 10' [3m] length with five presets spaced 12" [305mm] from each end and on 24" [610mm] centers. (Shown below).
  - a. Other insert spacing is available.
  - b. Blank duct (duct without preset inserts) is available for home runs, main system feeds and afterset applications.

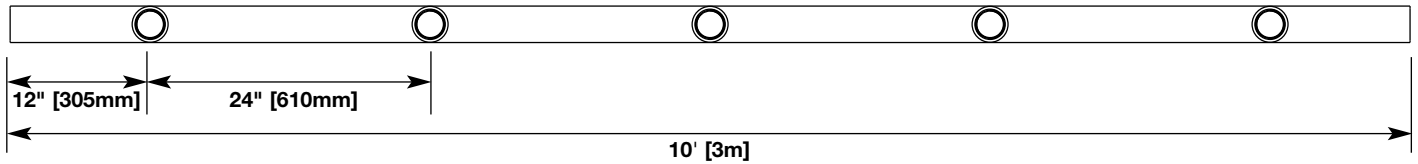
**2" IPS DUCT**



**PRO SERIES DUCT**

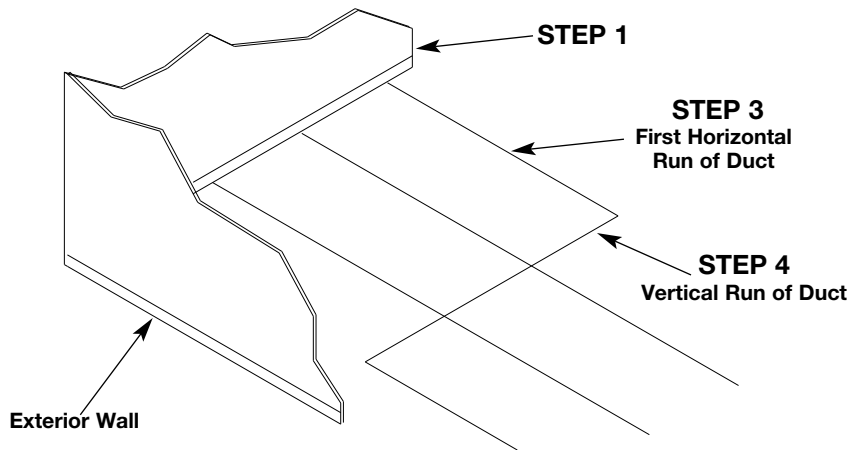


**2" IPS PRESETS SHOWN**



**JUNCTION BOX AND WALKERDUCT INSTALLATION LAYOUT:**

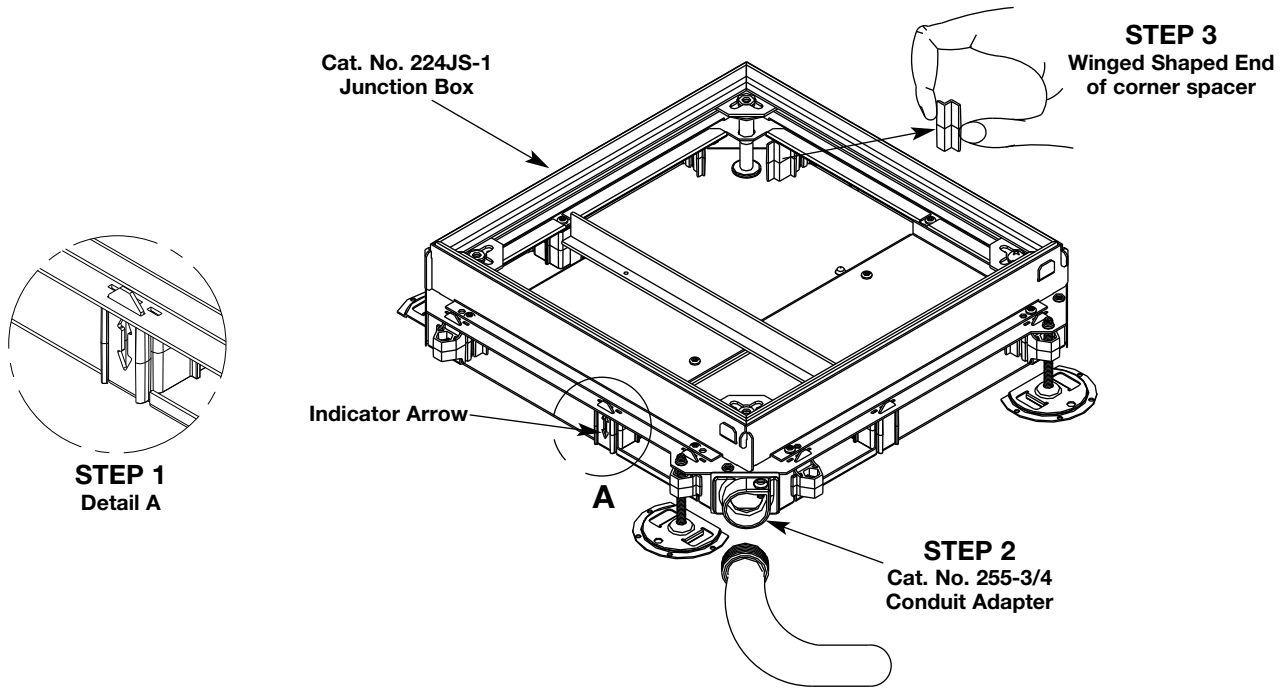
1. Secure bench marks at convenient locations on walls or columns wherever the underfloor duct system is to be installed. This will help establish the level of the finished concrete floor.



2. Obtain the location of the first duct run from the plans.
3. Stretch a base line, at finished floor level, that corresponds with the center of the duct run.
4. In the middle, and at right angles to the line created in Step 3, stretch another line.
5. These two lines should be used as measuring points for laying out the horizontal and vertical runs of duct.

**FOUR-WAY JUNCTION BOXES:**

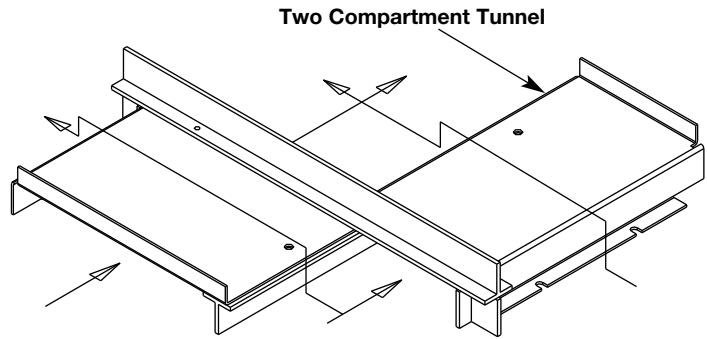
1. Arrows are located on opposing sides of each box to indicate the entrance for feeder raceways. Cables and conductors entering these sides of the junction box will be routed on the lower level to more easily pass through the junction box. To maintain proper segregation, all arrows must point in the same direction. (See Detail A)



2. Where the plans indicate a conduit feed coming into the corner of the junction box, use a Catalog Number 255 - (3/4", 1", 1 1/4", 1 1/2", 2" trade size) conduit adapter. For plastic conduit, install a threaded rigid steel nipple and plastic adapter. Install a grounding lug inside the junction box. Ground in accordance with the National Electric Code.
3. The wing shaped end of the plastic spacer at each corner can be removed (except at tunnel locations) to increase wire pulling area.

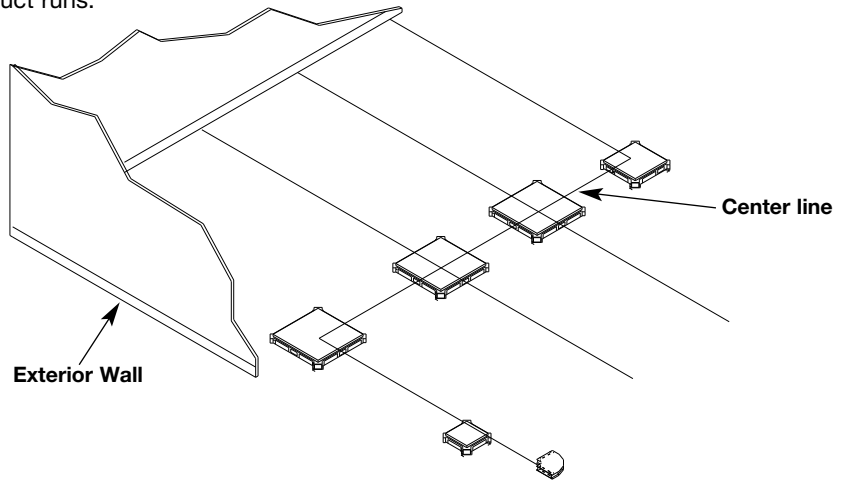
**CAUTION:**  
*The center duct cannot be fed with conduit from any of the box corners. The center duct may be fed through the center duct openings in any side of the junction box.*

4. Tunnels isolate each service in multiple duct boxes to create a continuous raceway through the box in both directions.



**LOCATE JUNCTION BOXES:**

Junction boxes are used at intersections of duct runs.



1. Locate along the horizontal base line the point where junction boxes are to be centered.
2. Junction boxes must be positioned correctly so that the duct arrangement will conform to the electrical drawings. After the correct position is established and power and telephone service have been assigned to specific duct runs, the arrow on the junction box side must be noted. **All junction boxes in any interconnecting area must be placed with arrow pointing in the same direction.** This establishes a consistent pattern for all inter-connecting duct runs. When Wiremold/Legrand layout drawings are provided, the arrows on the installed box must match drawings.

Junction Box Catalog Number	Distance Between Duct Ends Within Junction Box	
12JS, JR, HS, or HR	7"	[178mm]
14JS, JR, HS, or HR	11 1/8"	[283mm]
222JS, JR, HS, or HR	11 1/8"	[283mm]
224JS, JR, HS, or HR	15 1/4"	[387mm]
3222JS, JR, HS, or HR	15 1/4"	[387mm]
244JS, JR, HS, or HR	18 5/8"	[473mm]
3224JS, JR, HS, or HR	18 5/8"	[473mm]
42222JS, JR, HS, or HR	19 3/8"	[492mm]
3424JS, JR, HS, or HR	22"	[559mm]
3244JS, JR, HS, or HR	22"	[559mm]
522222JS, JR, HS, or HR	23 1/2"	[597mm]
3444JS, JR, HS, or HR	25 3/8"	[645mm]

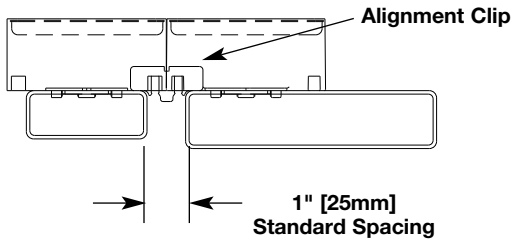
3. Proceed with other rows of boxes, making sure that centers are lined up vertical and horizontally with the first row of boxes. See chart above for dimension to allow for duct length between boxes.

**CAUTION:**  
*When field cutting duct to length, always butt factory cut end to factory cut end.  
 Install field cut end at the end of a given run. Maintains proper insert spacing.*

## INSTALLING THE DUCT:

1. After the junction boxes are roughed in, lay the duct in place and position, but do not fasten duct supports or hold down straps. (See page 8)
2. Begin at one corner of layout, insert duct into box opening and work toward the next box. Join each length of duct to the next with a duct support/coupling.

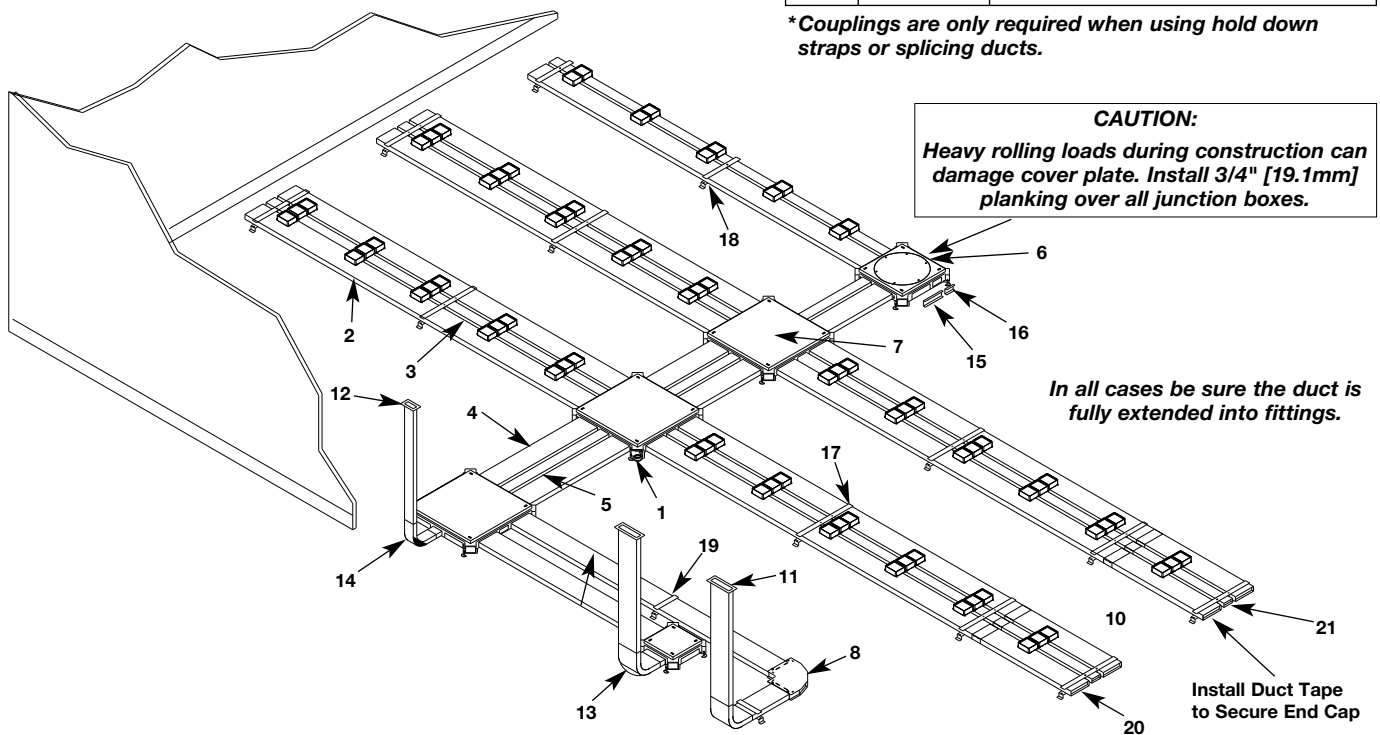
### PRO SERIES DUCT



**NOTE:** For Walkerdect Pro Series, alignment clips must be installed at first preset on each length of duct before supports/couplings are secured. All presets must be aligned within 1/8" [3.2mm]. Cut last length of duct as required to fit snugly into the next box opening.

ITEM	CAT. NO.	DESCRIPTION
1	255-3/4	Conduit adapter for 3/4" [19.1mm] conduit
2	D42410	No. 4 Duct w/1" [25mm] high presets
3	D22410	No. 2 Duct w/1" [25mm] high presets
4	4-0	No. 4 Blank duct
5	2-0	No. 2 Blank duct
6	224JR-1	Combination single level j-box (round)
7	3424JS-1	Combination single level j- box (square)
8	H338	No. 4 duct 90° horizontal elbow
9	H302	No. 4 Duct coupling*
10	302	No. 2 Duct coupling*
11	H334	No. 4 Duct cabinet connector
12	334UF	No. 2 Duct cabinet connector
13	H332	No. 2 Duct vertical elbow
14	332UF	No. 2 Duct vertical elbow
15	H203	Junction box closure for No. 4 duct
16	203UFD	Junction box closure for No. 2 duct
17	S3424-28	Duct support for one No. 2 & two No. 4
18	S224-28	Duct support for one No. 2 & one No. 4
19	S14-28	Duct support for one No. 4 duct
20	H304	No. 4 Duct end closure
21	304	No. 2 Duct end closure

\*Couplings are only required when using hold down straps or splicing ducts.



#### CAUTION:

A solid foundation of grout or concrete must be provided beneath the entire junction box to prevent excessive cover plate deflection and damage. Vibrate concrete at junction box and duct to insure that concrete completely fills underneath the system.

#### CAUTION:

A vapor barrier is recommended when duct is installed directly on grade to prevent ground moisture from reaching the underside of concrete slab.  
Prepour a work slab, pads, or sidewalk to protect vapor barrier from penetration of anchoring means.

#### CAUTION:

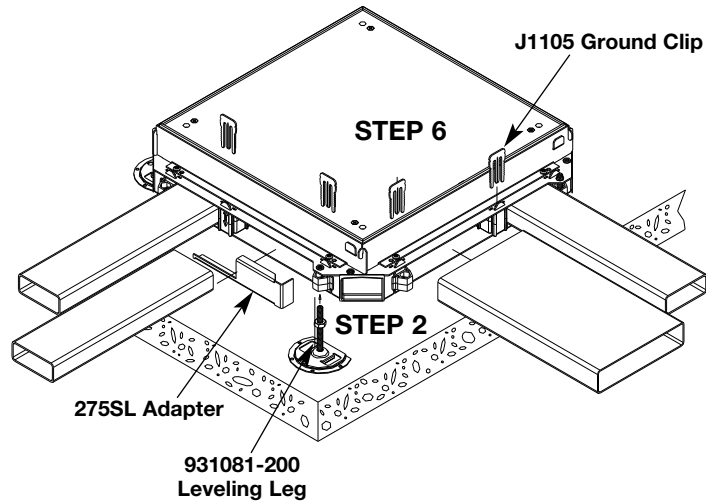
Do not use concrete additive containing chlorides. This will cause severe rusting of the duct system.

3. Whenever possible, begin each run of duct with a full piece. However, if a field cut section is needed, be sure that distance from the field cut end to the center of the first insert is proper length to maintain the uniform spacing between inserts.
4. Cutting of the duct is to be preformed in the field as required. All sharp edges must be removed.

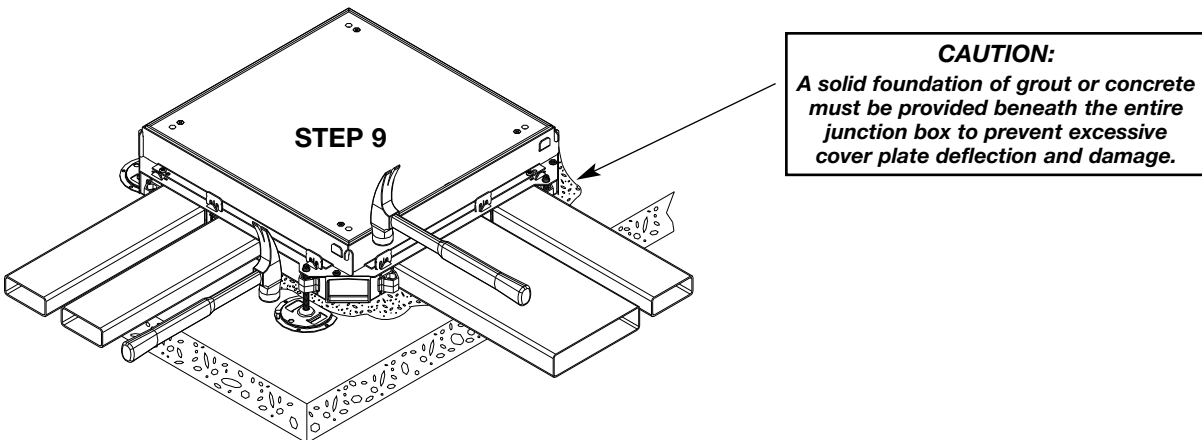
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## LEVELING JUNCTION BOXES PRIOR TO CONCRETE POUR:

1. Manufacturer suggests that boxes be installed on sidewalks or precast concrete blocks when on grade.



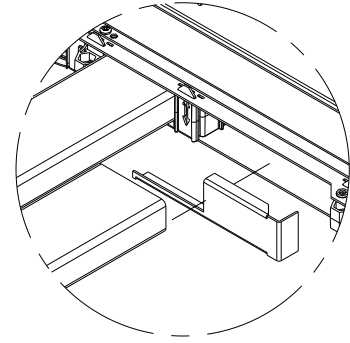
2. Install hex nuts to each of the four leveling feet.
3. Thread leveling feet into junction box as shown in Step 2 in above diagram.
4. Standard foot provides approximately 1 1/2" [38mm] upward adjustment.
5. Use leveling feet to adjust junction box top to the finished concrete screed level. Do not use the cover adjustment screws for leveling at this time.
6. Duct openings, which share a ground clip, must both be filled before the clip is driven in.



7. After all junction boxes have been leveled, care should be taken to insure that they will not be moved during concrete pour.
8. This is accomplished by driving studs or nails through the holes in the leveling feet.
9. When junction boxes and duct are correctly leveled and in final position, drive in ground clips on the junction boxes to secure duct and provide ground continuity.
10. **IMPORTANT:** Remove cover plate and adjust the height of any support studs within the box, so that the cover plate rests on the studs when in place.

### INSTALLING 275SR/275SL ADAPTER:

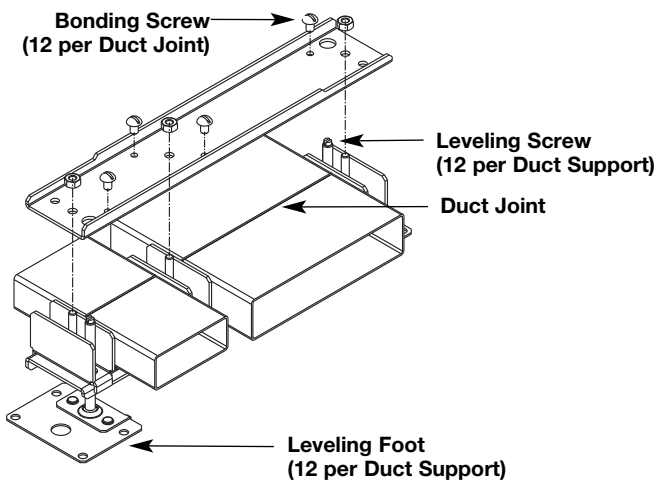
1. Position long narrow legs at 45° angle to box opening, insert end of narrow leg into box opening, and rotate part into opening.
2. Install adapter by striking part with hammer until fully inserted into opening.
3. Slide duct into opening until duct hits duct stop.
4. Install grounding clips as required.



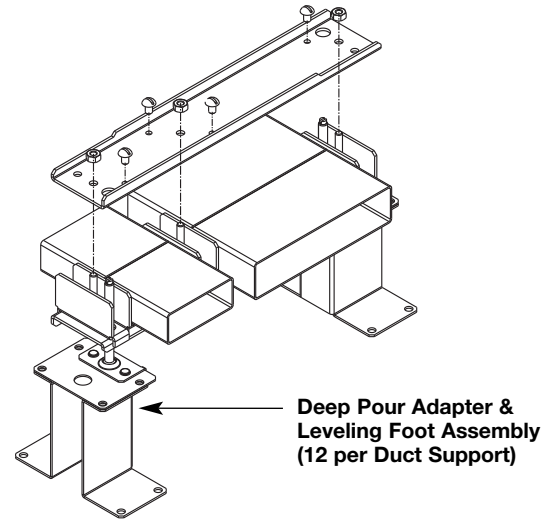
### INSTALLING SC SERIES ADJUSTABLE DUCT SUPPORTS:

1. SC Series Adjustable Duct Supports are used to hold the duct securely in place before and while the concrete is poured. They also can serve as a coupling to join two lengths of ducts.
2. Duct supports are designed to accommodate single or multiple ducts. Leveling screws, operated from above, provide vertical adjustment. Leveling screws of different heights are furnished to meet varying slab thickness. Bonding screws installed in top bridge member provide ground continuity across duct joints.
3. It is recommended that supports be used 5' [1.5m] from junction boxes and at 5' [1.5m] intervals.
4. After all duct supports are in place, line up the duct runs between the boxes and secure the duct supports to the slab or form by driving studs or nails through the holes in the duct support leveling feet. Nails or studs should be securely fastened to form or slab.

#### -18", -33", & -48" INSTALLATION

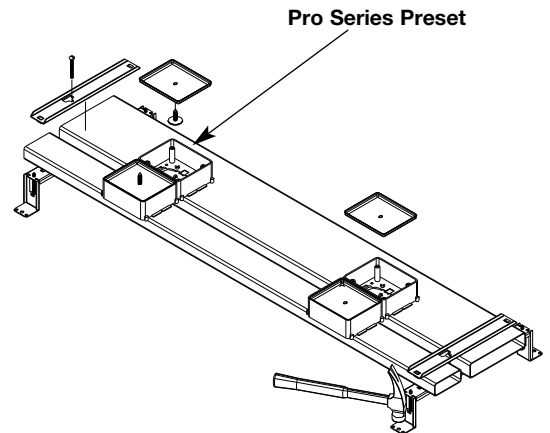


#### -58", -73", & -88" INSTALLATION



### INSTALLING ADJUSTABLE DUCT SUPPORT/COUPLINGS:

1. Either duct support/couplings or hold down straps are used to hold the duct securely in place as well as coupling ducts together before and while the concrete is poured.
2. Duct supports are designed to accommodate single or multiple ducts. Leveling screws, operated from above, provide vertical adjustment and legs of different heights are furnished to meet varying slab thickness. Duct support top member feature bonding screws to provide ground continuity across duct junctions.
3. It is recommended that supports be used 5' [1.5m] from junction boxes and at 5' [1.5m] intervals from couplings.
4. After all duct supports are in place, line up the duct runs between the boxes and secure the duct to the slab or form by driving studs or nails through holes in duct support feet. Nails or studs should be securely fastened to form or slab.



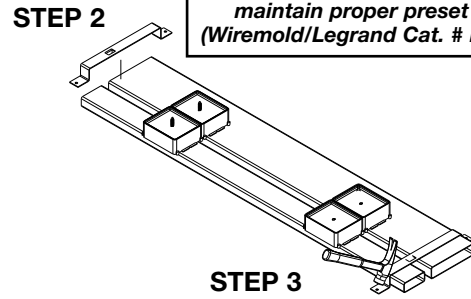
**Align Walkerdut Pro Series presets within 1/8" [3.2mm] before securing supports.**

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## INSTALLING HOLD DOWN STRAPS:

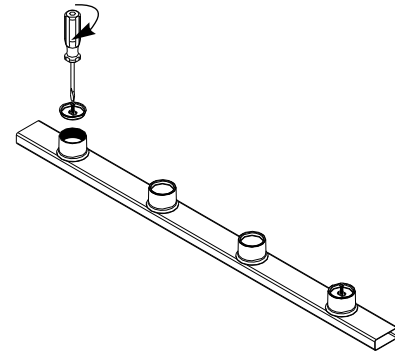
1. Hold down straps are used to fasten ducts to the slab in shallow concrete slabs in lieu of adjustable duct supports. When more than one duct is used, hold down straps maintain 1" [25mm] spacing between adjacent ducts.
2. Install couplings, Part # 302 for #2 duct, H302 for #4 duct are required when using hold down straps.
3. Install hold down straps over duct run, making sure tab is in place to maintain 1" [25mm] spacing between duct runs.
4. After all hold down straps and couplings are in place, line up the duct runs between the boxes and secure the duct to the slab of form by driving studs or nails through holes in hold down strap feet. Nails or studs should be securely fastened to form or slab.

**CAUTION:**  
When using hold down straps, 1/4" [6.35mm] steel shims should be placed under #2 duct to maintain proper preset height. (Wiremold/Legrand Cat. # Duct shim)



## INSTALLING MARKER CAPS:

1. Marker caps make it possible to find the start of a run after concrete has been poured. Marker caps should be installed on either side of a junction box, at end of duct runs, on either side of permanent walls and on either side of a change in direction.
2. Remove the standard blank mudcaps from insert and install marker caps. Make sure the screw inside the insert marker caps are turned all the way down before striking insert marker cap.
3. For Pro Series Marker Caps. Markers are plastic and protrude approximately 3" [76mm] above preset. Trim height to match screed line.



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## FINAL ADJUSTMENTS TO THE SYSTEM PRIOR TO THE CONCRETE POUR:

After all boxes, duct runs, and rough-in materials are in place, the following should be checked before concrete is poured. Please make sure you check off all questions before going to next step:

1. Are all openings in the junction boxes fitted with duct, conduit adapters or box closures.
2. Are the ends of the duct capped.
3. Do all inserts have insert caps.
4. Are all Walkerdect Pro Series inserts aligned within 1/8" [3.2mm], and alignment clips installed at first preset of each length of duct.
5. Are all presets leveled to the proper elevation. Tops of presets should be no closer than 1/8" [3.2mm] beneath finished floor. For heavy loads or bar or concrete floors additional concrete is recommended. Consult structural engineer.
6. Bring up all marker screws up to the finished floor level.
7. When the system is checked, leveled and ready for concrete pour, tighten all bonding screws or clips and all locking screws on junction boxes, duct supports and couplings.
8. Secure all joints against moisture and concrete with waterproof sealing compound or duct tape. (Example: Wiremold/Legrand Cat. No. 290G).



# JUNCTION BOX

## JR/JS and HR/HS Series

### FINAL SYSTEM ADJUSTMENTS- AFTER THE CONCRETE POUR:

#### Level the Junction Box Cover Plates:

1. Level all junction box tops to the finished floor level by means of the coverplate adjusting screws. Remove the 10/24 x 1" [25mm] flat head screws. Just below the large holes in the cover plate are four slotted or phillips 5/16-18 machine screws with a special washer that accommodates the hold down screw in four locations. These screws have 1/2" [12.7mm] upward adjustment.
2. Place a level across the adjusting frame and use the adjusting screws to bring the cover plate up to the finished floor level. Turning the adjusting screw no more than 1/4 [90°] turn in either direction will locate one of the four tapped holes for the corner hold down screw.
3. Once the junction box cover has been leveled, remove the cover plate and check the height of any support studs within the box so that the cover plate rests on the studs when in place.

### SQUARE COVER PLATE

#### Junction Box Detail (JS/HS)

##### Shipping/Carpet Position

1" [25mm] Standard. For Other Heights Order Side Rail Extension Kits

1/8" [3.2mm] Spacer (Remove for Tile Finish)

1" [25mm]

Cover Hold-Down Screw #10-24 x 1" [25mm] F.H.M.S.

Grout as Required to Prevent Tile from Cracking

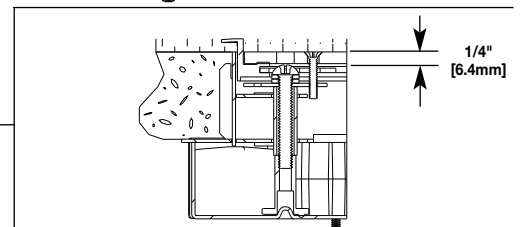
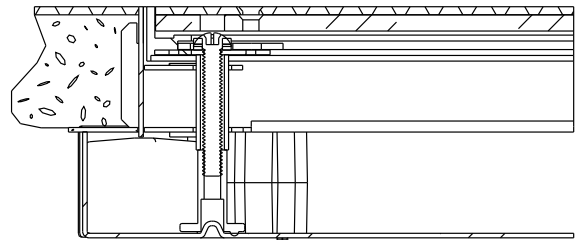
Coverplate Adjusting Screw 5/16-18 R.H.M.S. Slotted Head with Special Washer. (Washer Part #J11060) 1/2" [12.7mm] Max. Upward Adjustment.

##### Tile Position

NOTE: For Tile Floor Order Gasket #454038 (supplied in 100 ft. rolls) Order Escutcheon #442005

#10 Escutcheon

Adjust Aluminum Frame to meet Tile Finish



### ROUND COVER PLATE

#### Junction Box Detail (JR/HR)

##### Shipping/Carpet Position

1" [25mm] Standard. For Other Heights Order Side Rail Extension Kits

Cover Hold-Down Screw #10-24 x 1" [25mm] F.H.M.S.

Cover Hold-Down Screw #10-24 x 3/4" [19.1mm] F.H.M.S.

1" [25mm]

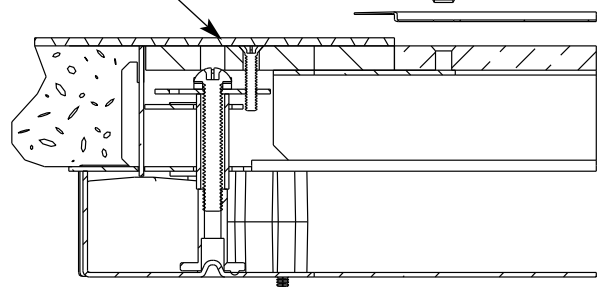
Grout as Required to Prevent Tile from Cracking

Coverplate Adjusting Screw 5/16-18 R.H.M.S. Slotted Head with Special Washer. (Washer Part #J1106) 1/2" [12.7mm] Max. Upward Adjustment.

##### Tile Position

Adjust Cover Plate up to Meet Tile Finish

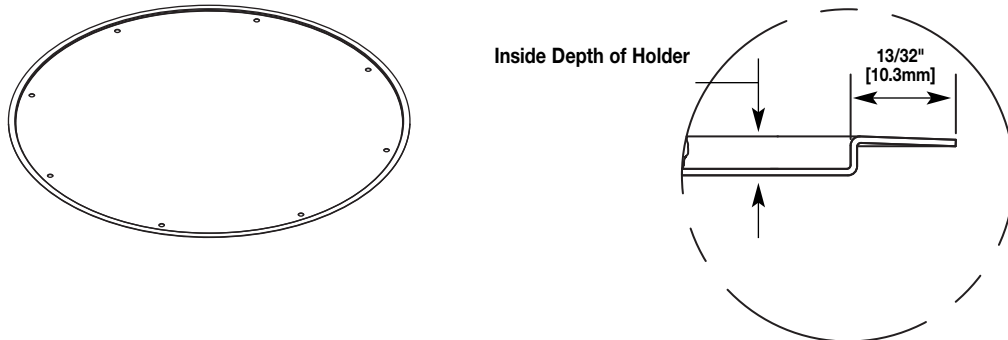
#10 Escutcheon Order Part #442005



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## TILE OR CARPET HOLDER INSTALLATION INSTRUCTIONS:

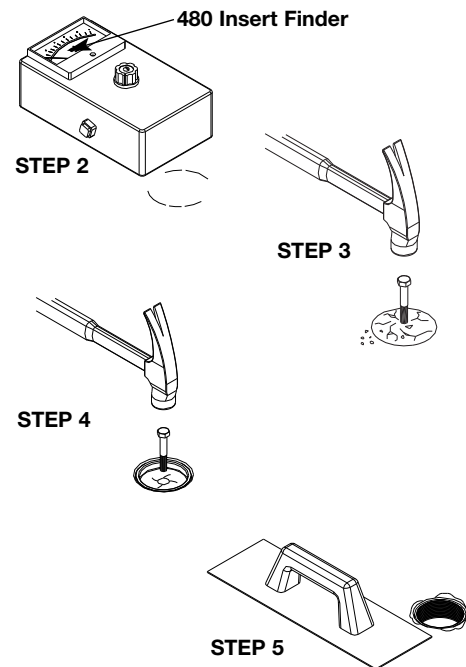
1. Holders are recessed to hold either carpet or tile and installed directly on top of the Junction Box Cover Plate.
2. **For Tile:** Drill 7/32 [5.5mm] clearance holes through tile after tile is glued to the Holder. Countersink the tile and use Escutcheons to install the assembly to the Junction Box
3. **For Carpet:** Install the Holder to the Junction Box just prior to installing the carpet. Carpet should be attached to the holder with double back tape to gain access to the hold screws for future removal of the Cover Plate.



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## INSERT LOCATION AND MUDCAP REMOVAL:

1. **For Walkerduct Pro Series, instructions for removing mudcaps are included with service fittings.**
2. Locate the proper insert using Electronic Insert Finder, Wiremold/Legrand Cat. No. 480, or by measuring from an insert marker cap.
3. Using a hammer and a 1/2" [12.7mm] or 3/4" [19.1mm] bolt to break the concrete on top of the insert cap. Remove all of the loose concrete.
4. When all the concrete has been removed from the top of the insert cap place the same bolt in the middle of the bottom of the insert cap. Strike two or three sharp blows with a hammer. That should loosen the insert cap so that it can be removed without damaging the threads on the side of the insert.  
**Alternative:** For 2" IPS round insert mudcaps, pierce center of mudcap with straight blade screwdriver. Rotate mudcap several times to loosen and remove. This will help reduce concrete chipping around insert.  
**Do not attempt** to pry the insert cap using a screwdriver or sharp instrument, this could damage the insert threads to the point where the service fitting will not thread into the insert.
5. Patch all broken concrete flush with the sides of the insert.



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## WORK SUBSEQUENT TO UNDERFLOOR DUCT INSTALLATION BY OTHER CONTRACTORS:

### 1. **Concrete Placement and Curing:**

- a. Reinforced concrete design shall be in accordance with American Concrete Institute Specifications for Structural Concrete for Buildings (ACI301-72) and ACI Building Code Requirements for Reinforced Concrete (ACI318-83). **Any mixture containing chloride salts such as calcium chloride shall not be used, as such mixtures have proven harmful to steel and steel finish.**
- b. Concrete placement shall follow proper and accepted industry practice and in accordance with ACI Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete (ACI304-73). **Concrete must be vibrated at all junction boxes and ducts to insure that the concrete completely fills underneath the system.** However, it is imperative that the concrete not be over vibrated. Over vibration causes segregation of material in the concrete mix which, in turn, leads to weakening of concrete.
- c. Concrete curing shall follow proper and accepted industry practice and be in accordance with ACI301-72.

### 2. **After the Concrete Pour:**

- a. When material or equipment loads that could deform junction box cover plates will be placed or moved over the cover plates, **install temporary planking that will transfer loads to the adjacent concrete.** Cover plates and underfloor duct that are damaged during construction must be replaced. This will not be the responsibility of Wiremold/Legrand.
- b. Excess moisture should be removed from inside the system within 48 hours of the concrete pour. Remove junction box cover plates where water may have entered to check for water accumulation or condensation. Depending on job site and weather conditions, cover plates removed on several boxes will help prevent condensation. If water is left in the system, it may freeze and cause severe damage to the underfloor duct, the junction boxes or the floor slab. Water or condensation will also cause galvanized coating to corrode.

### 3. **Floor Finishes:**

Various styles of cover plate trim or holders are available to accommodate tile and carpet. Contact your local Wiremold field sales representative for more information.

## PRESET INSERT INSTALLATION DETAILS

### To Field Installed Presets:

1. Be certain correct preset height is selected.
2. Position preset so that hooks on bottom of preset drop into openings on duct.
3. Push down evenly and slide forward. Knockout tab should snap into opening.

### To Remove Mudcap:

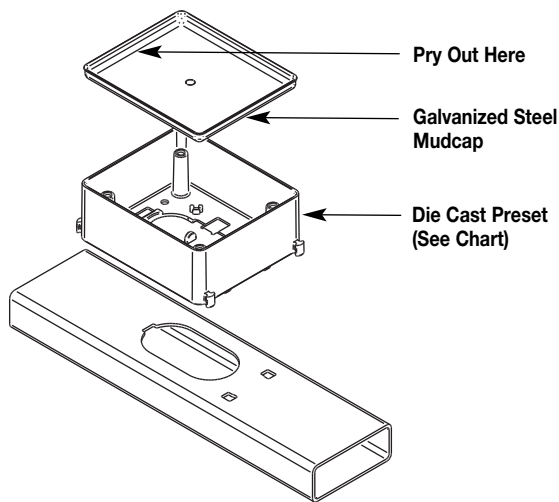
1. Strike a 1/4" flat blade screwdriver along the side of the mudcap to deflect the top edge.
2. Use a screwdriver to pry out mudcap.

### To Install Alignment Plates:

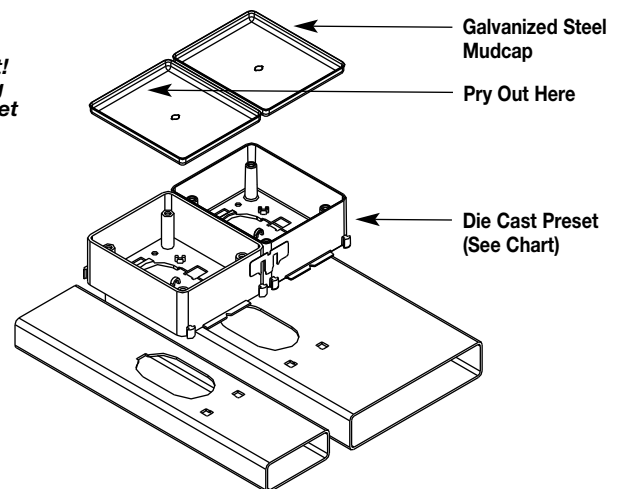
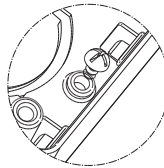
1. Install plates at first set of presets on each length of duct before securing supports and couplings.
2. All presets must be aligned within 1/8" [3.2mm].

#2 DUCT SYSTEMS ONLY			
S SYSTEM DEPTH	P PRESET HEIGHT	PRESET CATALOG NUMBER	CUBIC INCHES VOLUME
2 1/4" [57mm]	7/8" [22.2mm]	419-1	13.7
2 3/4" [70mm]	1 3/8" [34.0mm]	419-11/2	22.6
3 1/4" [83mm]	1 7/8" [47.0mm]	419-2	31.2
3 3/4" [95mm]	2 3/8" [61.0mm]	419-21/2	39.8
4 1/4" [73mm]	2 7/8" [73.0mm]	419-3	48.3

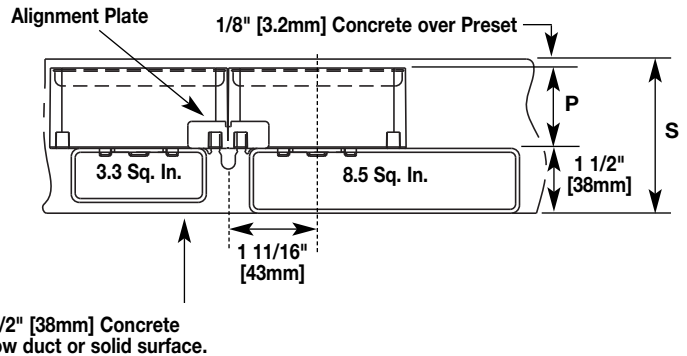
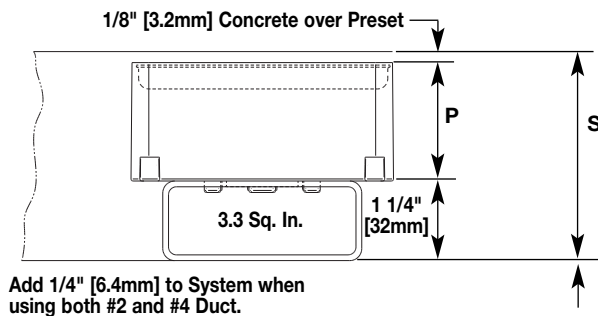
#4 DUCT SYSTEMS ONLY			
S SYSTEM DEPTH	P PRESET HEIGHT	PRESET CATALOG NUMBER	CUBIC INCHES VOLUME
2 1/2" [64mm]	7/8" [22.2mm]	419-1	13.7
3" [76mm]	1 3/8" [34.0mm]	419-11/2	22.6
3 1/2" [89mm]	1 7/8" [47.0mm]	419-2	31.2
4" [102mm]	2 3/8" [61.0mm]	419-21/2	39.8
4 1/2" [115mm]	2 7/8" [73.0mm]	419-3	48.3



**NOTE: Important!**  
Tighten Bonding Screw when Preset is activated.



**NOTE: Three Duct Systems are Similar.**



# WIREMOLD

legrand®

**Wiremold/Legrand**

U.S. and International:

60 Woodlawn Street • West Hartford, CT 06110

1-800-621-0049 • FAX 860-232-2062 • Outside U.S.: 860-233-6251

Canada:

570 Applewood Crescent • Vaughan, Ontario L4K 4B4

1-800-723-5175 • FAX 905-738-9721

