

WIREMOLD



Flushduct® Duct & Junction Boxes

INSTALLATION INSTRUCTIONS

Installation Instruction No.: IBO169R1 – Updated May 2006

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.

GENERAL:

1. Review and become familiar with all flushduct components. Be careful of sharp edges or burrs when handling any sheet metal parts. All interior surfaces that can be touched by a wire shall be smooth.
2. Compare and coordinate the architectural and electrical drawings with the Wiremold/Legrand installation drawings. Contact your local Wiremold field sales representative immediately if any dimensions or details are incorrect.
3. On arrival, check the shipment for shortages or damage. Contact your local Wiremold field sales representative immediately if there are any problems. File a freight claim for any damage directly with the carrier. Keep material and cartons dry.
4. Install duct and related components in accordance with Article 354 of the latest issue of the National Electrical Code.
5. **Wiremold/Legrand recommends a vapor barrier be provided when duct is installed directly on grade.** This barrier prevents ground moisture from reaching the underside of the concrete slab through capillary action. This barrier would be placed below any infloor distribution system.

DUCT:

1. Flushduct is manufactured in three sizes:
 - a. Single – 3 1/8" [79mm] wide and 1 1/4" [32mm] deep.
 - b. Double – 2 single ducts welded side by side 6 1/4" [159mm] wide and 1 1/4" [32mm] deep.
 - c. Triple – 3 single ducts welded side by side 9 3/8" [238mm] wide and 1 1/4" [32mm] deep.
2. The largest conductor to be installed in either duct shall be 1/0.

WIRE FILL CAPACITY CHART		
	Approx. Area Sq. In.	Allowable Number of Wires/Cables* #2 Duct
Tele/Data Cables		
2 pr. phone, Area	= .0154	86
4 pr. phone, Area	= .0380	35
Type 1 shielded twisted pr., Area	= .1194	11
Coaxial, Area	= .0460	29
25 pr. phone, Area	= .1320	10
Power Conductors		
#12 THHN, Area	= .0133	100
#10 THHN, Area	= .0211	63
# 8 THHN, Area	= .0366	36
1/0 Cable, Area	= .1855	7

* Capacities based on 40% wire fill allowed by the National Electrical Code. At the 40% fill, duct will be crowded and wire pulling may be difficult. When transiting through junction boxes, around turns, and through inserts, wires will take up more space. A 20% wire fill at these locations will allow easier fishing and pulling of cables.

3. Factory punched openings are threaded 1 5/8-18. For installation of screw plugs only. Only 455F Series can be installed in this opening, or also in 1 5/8 straight through holes cut in the field..

FLUSHDUCT JUNCTION BOX:

1. Single Flushduct — Cat. No. 12FB

This box accommodates a single Flushduct on each side. The box has corner conduit openings.

Where the plans indicate a conduit feed coming into the corner of a junction box, use a box corner adapter Cat. No. 255-3/4, -1, -1 1/4, -1 1/2 to connect the conduit. Each junction box opening is to be connected to the duct so as to form a continuous raceway for wire circuits.

2. Double Flushduct — Cat. No. 222FB

- This junction box accommodates a double duct Flushduct raceway on each side. Partitions within the box isolate each duct run and create a continuous raceway through the box in both directions. When a double Flushduct box is located with the arrow pointing up, the two conduit corner entrances on the left can be used for home runs or for branch conduit feeds from the left hand vertical duct run and/or the bottom horizontal duct run. Both conduit corner entrances on the right side of the box can be used to feed the upper horizontal duct run and the right hand vertical duct run.
- Where the plans indicate a conduit feed coming into the corner of a junction box, use a corner adapter Cat. No. 255-3/4, -1, -1 1/4, -1 1/2 to connect the conduit.
- Each junction box opening is to be connected to duct so as to form a continuous raceway for wire circuits.

NOTE: *If a multiple duct junction box is given a quarter turn, the direction of the duct passages within the box is completely changed.*

3. Triple Flushduct — Cat. No. 3222FB

- This junction box accommodates a triple duct Flushduct raceway on each side. Partitions within the box isolate each duct run and create a continuous raceway through the box in both directions.
- The box corner entrances will feed the ducts in exactly the same manner as they do in a double Flushduct box. The center duct cannot be fed from any of the box corners. They may be fed through the center duct openings in any side of the junction box.
- Where the plans indicate a conduit feed coming into the corner of a junction box, use a box corner adapter Cat. No. 255-3/4-1, -1 1/4, -1 1/2 to connect the conduit.
- Each junction box opening is to be connected to duct so as to form a continuous raceway for wire circuits.

NOTE: *If a multiple duct junction box is given a quarter turn, the direction of the duct passages within the box is completely changed.*

JUNCTION BOX & WALKERDUCT INSTALLATION:

1. Layout

- 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.
- Obtain the location of the first duct run from the plans. Stretch a base line, at finished floor level, to correspond with the center of the duct run. In the middle of and at right angles to this line, stretch another line. These two lines should be used as measuring points for laying out the horizontal and vertical lines of duct.
- If the project is a renovation and existing floors will be cut, the cut-out must be accurate. Cut-outs should be a minimum of 2" [51mm] wider than the couplings/supports. Example: A triple duct system is 9 3/8" [238mm] wide and would require a 13 3/4" [349mm] cut-out to clear the 11 3/4" [299mm] wide coupling support. Since concrete or grout must flow beneath the duct system, the width of the cut-out may need to be increased. If couplings/supports are not being used, the cut-out should be a minimum of 4" [102mm] wider than the duct system. The bottom of the duct system must rest on a solid surface.

2. Locate Junction Boxes

- Junction boxes are used at the intersections of duct runs.
- Locate along the horizontal base line the points where junction boxes are to be centered.
- Junction boxes must be positioned correctly so that the duct arrangement will conform to 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 one interconnecting area must be placed with the arrow pointing in the same direction.** This establishes a consistent pattern for all interconnecting duct runs. When Wiremold/Legrand layout drawings are provided, the arrows on the installed box must match the drawings.
- Proceed with other rows of boxes, making sure that centers are lined up vertically and horizontally with the first row of boxes. See chart below for dimension to allow or duct length between boxes.

3. Installing the Duct

- a. After the junction boxes are roughed in, position duct supports or couplings and lay the duct in place (See Steps 5 & 6).
- b. Begin at one corner of the layout, insert duct in a box opening and work toward the next box. Join each length to the next with a duct coupling, butting the ends tightly and tighten the grounding screws. Cut last length of duct as required to fit snugly into the next box opening.
- c. Whenever possible, begin each run of duct with a full piece. However, if a field cut section of duct is needed, be sure that the distance from the field cut end to the center of the first opening is the proper length to maintain the uniform spacing between openings. Cutting of duct is to be performed in the field as required. All sharp edges must be removed on all field cut sections of duct.
- d. The distance between duct ends varies within each junction box for different systems. The table on the next page shows the correct distance for each junction box:

Junction Box Cat. No.	Distance Between Duct Ends Within Junction Box	
12FB	8 5/16"	[211mm]
222FB	11 1/4"	[286mm]
3222FB	14 3/4"	[375mm]

- e. In all cases where the duct is to be fitted into a casting, be sure the duct is fully extended into the fitting.

3. Leveling Junction Boxes

- a. Junction boxes feature four exterior leveling feet for leveling and height adjustment prior to the concrete pour. After all junction boxes are in place, use these leveling feet to level the tops to the finished concrete screed level. Standard foot provides approximately 1 1/2" [38mm] upward adjustment.
- b. After all junction boxes have been leveled, care should be taken to insure that they will not be moved during the concrete pour. This is accomplished by driving studs or nails through the holes in the leveling feet. Grouting the box firmly in place before final pour will prevent movement during the pour.
- c. **A solid foundation of grout or concrete must be provided beneath the entire junction box to prevent excessive cover plate deflection and damage.**

5. Installing Duct Supports or Couplings

Couplings:

Couplings/Supports or combination couplings/adjustable supports are used to hold flushduct securely in place before the concrete is poured.

"Couplings" have no vertical adjustment. "Couplings/Supports" have 1" [25mm] vertical adjustment. "Combination Couplings" have various adjustment ranges – up to 5" [127mm] from the bottom of the duct to the top of the slab or form. Install duct supports 5'-0" [1524mm] from each junction box and on 5'-0" [1524mm] maximum centers throughout the system. Sufficient space must be provided below the duct to allow for the flow of grout or concrete that will support the duct system. All supports should be firmly attached to the form or slab.

6. Final Adjustments to the System Prior to the Concrete Pour

- a. After all the boxes, duct runs, and roughing-in material are in place, the following should be checked before concrete is poured:
 1. All openings in the junction boxes are fitted with duct, conduit adapters or box closures.
 2. The ends of all duct runs are capped.
 3. All openings have screw plugs.
 4. All openings have plugs.
- b. Just prior to concrete pour or grouting, be certain that all ducts are tightly joined and grounding screws are securely tightened. All openings must be sealed with sealing compound or duct tape and the entire system must be flush with the existing floor or leveled to the screed surface. Advise the general contractor that concrete or grout must be placed flush with the top surface of the duct and boxes.

7. Work Subsequent to Underfloor Duct Installation by Other Contractors

a. **Concrete Placement and Curing**

1. 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 admixture containing chloride salts such as, but not limited to, calcium chloride shall not be used, as such admixtures have proven harmful to steel and steel finish.**
2. Concrete placement shall follow proper and accepted industry practice and be 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 strength.
3. Concrete curing shall follow proper and accepted industry practice and be in accordance with ACI301-72.

b. **After the Concrete Pour**

When material or equipment loads that could deform junction box cover plates will be placed on 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.

- c. 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.

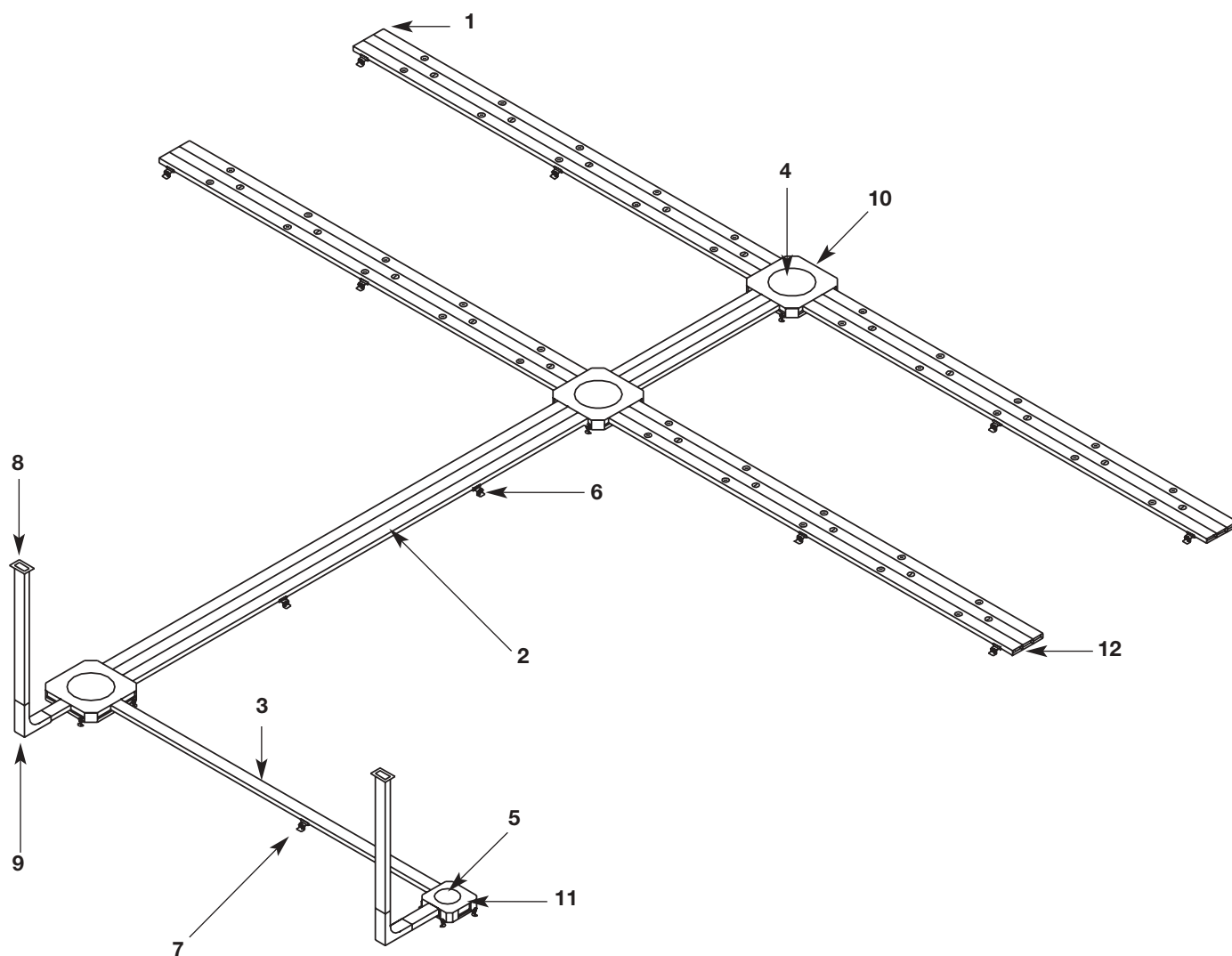
d. **Floor Finishes**

Stainless Steel or Brass Pans, recessed to hold vinyl Tile or Carpet, are installed on top of the Junction Box Cover Plate.

For Tile Holders: Install Tile in recess, then drill and countersink holes through Tile. Install Escutcheons and Hold Down Screws furnished with the Pan.

For Carpet Holders: Attach Holder on top of Cover Plate with Hold Down Screws before inserting Carpet. Use double back tap around perimeter of Holder to secure Carpet and gain future access to Hold Down Screws.

FLUSHDUCT SYSTEM LAYOUT



ITEM	CAT. NO.	DESCRIPTION
1	3222FST	Triple Flushduct w/1 5/8" [41mm] staggered openings on 24" centers
2	3222F-O	Triple Blank Flushduct
3	12F-O	Single Blank Flushduct
4	3222FB	Junction Box for Triple Flushduct
5	12FB	Junction Box for Single Flushduct
6	3222FCSA	Combination Coupling and Support for Triple Flushduct
7	12FCSA	Combination Coupling and Support for Single Flushduct
8	342F	Single Flushduct Terminal Bushing – connects Duct to Cabinet
9	332F	Single Flushduct Vertical 90° Elbow
10	3222F-WS	Single Flushduct Junction Box End Closure
11	12F-WS	Single Flushduct Junction Box End Closure
12	304	Flushduct End Closure

WIREMOLD



Wiremold / Legrand

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