



**KILLARK**®

HUBBELL INCORPORATED (Delaware)  
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## INSTRUCTIONAL DATA SHEET

### FOR DRILLING & TAPPING OF CONDUIT OPENINGS IN U.L. LISTED, CSA CERTIFIED, CAST ALUMINUM BOXES WITH THREADED JOINTS, FOR HAZARDOUS LOCATIONS

#### GENERAL INSTRUCTIONS & REQUIREMENTS FOR DRILLING & TAPPING IN FIELD.

**NOTE:** The following requirements must be met in order to comply with U.L. #886 standards and/or the National Electrical Code and maintain the U.L. Listing / Classification and CSA certification of the enclosure.

- 1.) Standard NPT threads (with a 3/4" per foot taper) **must** be used for all conduit openings. After tapping, all NPT conduit openings **must** gage +1/2 to +3-1/2 turns beyond nominal.
- 2.) Field drilling and tapping of the side and back walls of blank boxes may be done, provided the location of conduit openings meets the specifications of Chart 1, and minimum wall thickness meets the dimensions shown on Charts 2 & 3. Use Chart 1 to determine the maximum quantity and size of conduit openings permitted.

**CAUTION:** If box has ribs, field drilling must **not** interfere with those ribs.

**NOTE:** 1/2" trade size is the minimum allowable size for any conduit opening. Refer to Chart 4 for maximum allowable conduit sizes.

- 3.) **CLASS I, DIVISION 1 & CLASS II LOCATIONS** require boxes with a wall thickness sufficient to provide a minimum of five (5) full threads. (See Chart 2)

- 4.) **CLASS II LOCATIONS, WHEN THE BOX IS NOT SUPPORTED BY THE CONDUITS** require a wall thickness sufficient to provide a minimum of 3-1/2 full threads. (See Chart 3)
- 5.) After the size of conduit openings has been determined for specific enclosures, measure the wall thickness and refer to the specific chart per the following steps:
  - A.) 5 Full Thread Reference Chart 2.
  - B.) 3-1/2 Full Thread Reference Chart 3.
- 6.) If insufficient wall thickness is encountered, consult the factory.

#### INSTALLATION PRECAUTIONS

- 1.) Before installing cover, clean the threads of the cover and the box with a stiff bristle (or wire) brush to remove dirt particles and fillings. Then apply a thin coating of Killark "LUBT" lubricant to the threads and install the cover tightly.

**CAUTION: To prevent ignition of Hazardous Atmospheres, Disconnect from the Supply Circuit Before Opening Enclosure. Keep Tightly Closed when Circuits are Alive.**

**REMEMBER TO SAVE ONE OF THESE SHEETS  
FOR MAINTENANCE PERSONNEL.**

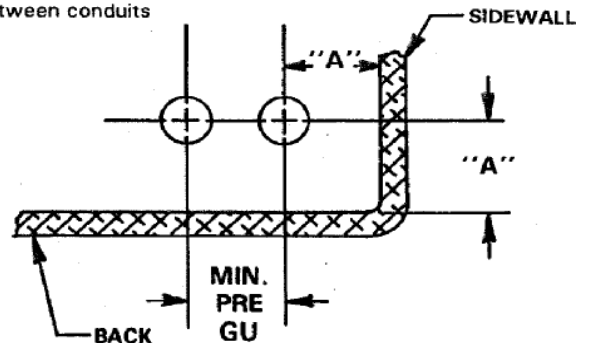
Chart 1: Minimum Centers for Drilled & Tapped Openings for Conduits.  
(Allows for locknut, bushing & union clearance)

SIZE	FORM	½	¾	1	1¼	1½	2	2½	3	3½	4
½	(1) MIN	1 <sup>3</sup> / <sub>16</sub>									
	(2) PRE	1 <sup>3</sup> / <sub>8</sub>									
	(3) GU	1 <sup>5</sup> / <sub>8</sub>									
¾	(1) MIN	1 <sup>3</sup> / <sub>8</sub>	1½								
	(2) PRE	1½	1 <sup>5</sup> / <sub>8</sub>								
	(3) GU	1¾	1 <sup>13</sup> / <sub>16</sub>								
1	(1) MIN	1½	1¾	1 <sup>13</sup> / <sub>16</sub>							
	(2) PRE	1¾	1 <sup>7</sup> / <sub>8</sub>	2							
	(3) GU	1 <sup>7</sup> / <sub>8</sub>	2	2 <sup>1</sup> / <sub>8</sub>							
1¼	(1) MIN	1 <sup>11</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>16</sub>						
	(2) PRE	1 <sup>15</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	2¼	2½						
	(3) GU	2 <sup>1</sup> / <sub>16</sub>	2¼	2 <sup>5</sup> / <sub>16</sub>	2½						
1½	(1) MIN	1 <sup>15</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	2½	2 <sup>5</sup> / <sub>8</sub>					
	(2) PRE	2 <sup>1</sup> / <sub>8</sub>	2¼	2 <sup>3</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>8</sub>	2¾					
	(3) GU	2 <sup>3</sup> / <sub>16</sub>	2 <sup>9</sup> / <sub>32</sub>	2 <sup>7</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>8</sub>	2¾					
2	(1) MIN	2¼	2 <sup>3</sup> / <sub>8</sub>	2 <sup>9</sup> / <sub>16</sub>	2 <sup>13</sup> / <sub>16</sub>	2 <sup>15</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>				
	(2) PRE	2 <sup>3</sup> / <sub>8</sub>	2½	2¾	3	3 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>				
	(3) GU	2½	2 <sup>19</sup> / <sub>32</sub>	2¾	3	3 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>				
2½	(1) MIN	2 <sup>7</sup> / <sub>16</sub>	2 <sup>9</sup> / <sub>16</sub>	2¾	3	3 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>			
	(2) PRE	2 <sup>5</sup> / <sub>8</sub>	2¾	3	3¼	3 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	4			
	(3) GU	3 <sup>1</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>32</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>9</sup> / <sub>16</sub>	3 <sup>11</sup> / <sub>16</sub>	4	4 <sup>5</sup> / <sub>8</sub>			
3	(1) MIN	2 <sup>13</sup> / <sub>16</sub>	2 <sup>15</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>16</sub>	3¾	4	4 <sup>5</sup> / <sub>16</sub>		
	(2) PRE	3	3 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	3¾	4	4 <sup>3</sup> / <sub>8</sub>	4¾		
	(3) GU	3 <sup>9</sup> / <sub>16</sub>	3 <sup>21</sup> / <sub>32</sub>	3 <sup>13</sup> / <sub>16</sub>	4	4 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	5½		
3½	(1) MIN	3 <sup>1</sup> / <sub>8</sub>	3¾	3 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	3¾	4 <sup>1</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>8</sub>	4 <sup>15</sup> / <sub>16</sub>	
	(2) PRE	3 <sup>3</sup> / <sub>8</sub>	3½	3 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	4	4 <sup>3</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	5	5 <sup>5</sup> / <sub>8</sub>	
	(3) GU										
4	(1) MIN	3 <sup>7</sup> / <sub>16</sub>	3 <sup>9</sup> / <sub>16</sub>	3 <sup>11</sup> / <sub>16</sub>	3 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	4 <sup>15</sup> / <sub>16</sub>	5¼	5 <sup>5</sup> / <sub>16</sub>
	(2) PRE	3¾	3 <sup>7</sup> / <sub>8</sub>	4	4¼	4 <sup>3</sup> / <sub>8</sub>	4¾	5	5¼	5 <sup>5</sup> / <sub>8</sub>	6
	(3) GU										
Approx. O.D. of:	LOCKNUT	1¼	1 <sup>1</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	3	3 <sup>7</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>16</sub>	4 <sup>13</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>
	BUSHING	1	1¼	1½	1 <sup>15</sup> / <sub>16</sub>	2 <sup>13</sup> / <sub>64</sub>	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>32</sub>	3 <sup>7</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>16</sub>	5
	CONDUIT	7 <sup>8</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>8</sub>	3½	4	4½

- (1) Minimum spacing required to provide clearance over locknuts and bushings.
- (2) Preferred - More liberal spacings between centers of conduits to be used whenever possible.
- (3) GU - When Listed "GU" series unions (½" thru 3") are used, additional spacing between conduits will be required, as specified above.

Conduit Size	½	¾	1	1¼	1½	2	2½	3	3½	4
Dim. "A" *	1	1	1 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	1½	1¾	2 <sup>1</sup> / <sub>8</sub>	2½	2 <sup>7</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>

\* Note: If Listed "GU" series unions are being used (½" thru 3"), additional space for clearance may be required. Check dimensions of fittings being used.



**Chart 2: Required wall thickness for five (5) full threads engagement per U.L. 886 Standards.**

Class I, Division I  
Class II Supported by Conduit

CONDUIT SIZE	MINIMUM NUMBER OF FULL THREADS	MINIMUM WALL THICKNESS
½" & ¾"-14	5 (1)	29/64"
1", 1¼", 1½" & 2"-11½	5 (1)	7/16"
2½", 3", 3½" & 4"-8	5 (1)	5/8"

(1) A box used may have thicker walls than required. For thicker walled boxes, the inner end of each conduit opening shall be smooth and well-rounded, as shown below.

**Chart 3: Required wall thickness for 3-1/2 full threads engagement.**

Class II Locations Not Supported by Conduit

CONDUIT SIZE	MINIMUM NUMBER OF FULL THREADS	MINIMUM WALL THICKNESS
½" & ¾"-14	3½ (1)	¼"
1", 1¼", 1½" & 2"-11½	3½ (1)	5/16"
2½", 3", 3½" & 4"-8	3½ (1)	7/16"

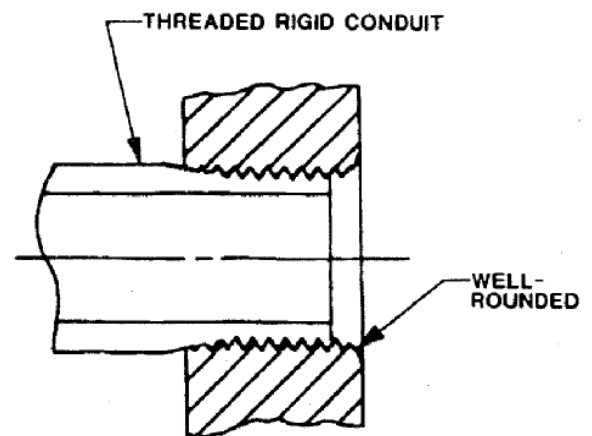
(1) Same as shown for Chart 2.

**NOTE:**

- 1) Conduit openings must be tapped to a depth which allows the conduit to be fully engaged.
- 2) Do not over-tap conduit openings; the conduit must tighten fully without bottoming-out on the unthreaded area of the conduit.
- 3) Conduit opening gaging requirement: "+1/2 to +3-1/2 turns deeper than nominal".

**RECOMMENDED TAP DRILL**

TAPPED HOLE SIZE - NPT	TAP DRILL SIZE (DIA.)
1/2" - 14 3/4" - 14	23/32" 59/64"
1" - 11-1/2 1-1/4" - 11-1/2 1-1/2" - 11-1/2 2" - 11-1/2	1-5/32" 1-1/2" 1-47/64" 2-7/32"
2-1/2" - 8 3" - 8 3-1/2" - 8 4" - 8	2-5/8" 3-1/4" 3-3/4" 4-1/4"



CONDUIT OPENING WITHOUT CONDUIT STOP

CHART 4: MAXIMUM CONDUIT SIZE.

GR SERIES	MAXIMUM CONDUIT SIZE								
	CAT. NO.	1/2"	1"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"
GRB			●						
2GRB			●						
4GRB			●						
GRE				●					
GRH									●
4GRH									●
8GRH									●
GRHA									●
4GRHA									●
8GRHA									●
GRHC									●
4GRHC									●
8GRHC									●
GRK						●			
4GRK						●			
GRL							●		
GRM							●		
3GRM							●		
5GRM							●		

The Catalog Numbers of boxes in this section (except for GRHA) may be provided with the following suffixes: L, WL, P or Y, referring to sheetmetal pans mounted inside the box.

● Maximum Conduit Size