

Roton Continuous Geared Hinges



General Information

DOOR AND FRAME PREPARATION

All Roton Continuous Geared Hinges are surface-applied. Cutout design and spacing coordination is thereby eliminated in both new construction and restoration work. Reinforcement plates are not required in doors or frames except where the gauge is too thin for the fasteners in relation to the door weight or where abusive operation is anticipated.

Blank frames may be ordered with strike prep only or with a strike prep furnished on both sides to eliminate handing with any Roton model that will cover the frame rabbet. Doors should always be ordered without cutouts except for use in labeled openings in which the tested door assembly may have manufacturing restrictions. Continuous frame mortar guards are desirable for masonry walls to avoid screw fastener interference with the mortar. An effective mortar guard made from an ordinary 1" (25.4 mm) x 2" (51 mm) stud, fastened to the back side of the frame can also be used. Check with both the frame supplier and the contractor for the best method.

The main cause of door and frame breakdown is "kickback shock" transferred to conventional butt hinges or pivots. Roton bonds the door frame into a single, integrated unit, dissipating impact loads harmlessly.

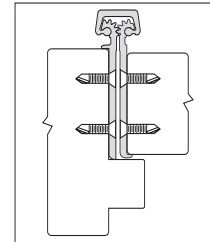
Door Closers

Conventional surface or concealed sliding closers may be used with Roton. (Note: Pivot type floor closers with a fixed, conflicting pivot point may not be used). Closers will last considerably longer, adjust to operating requirements more readily and show consistent settings due to the reduced operating forces of Roton hinging.

ROTON TYPES

Concealed

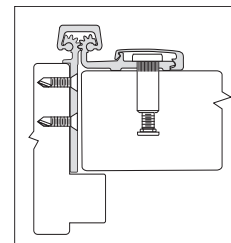
These models have leaves which are concealed between the rabbet of the frame and the hinge edge of the door.



Models available: 500-048, 780-041, 780-041HD, 780-110, 780-110HD, 780-111, 780-111HD, 780-112, 780-112HD, 780-112LL, 780-224, 780-224HD, 780-224LL, 780-226, 780-226HD, 780-226LL, 1200-600, 1200-650

Half Surface

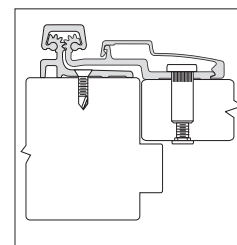
These models have the frame leaf concealed between the rabbet of the frame and the edge of the door. The door leaf is mounted to the face of the door with sex bolts (thru-bolts) or screws.



Models available: 500-200, 780-045, 780-045HD, 780-046, 780-046HD, 780-053, 780-053HD, 780-054, 780-054HD, 780-211HD, 780-300HD

Full Surface

These models have the frame leaf mounted to the face of the frame. The door leaf is mounted to the face of the door with sex bolts (thru-bolts).



Models available: 500-220, 780-057, 780-057HD, 780-157, 780-157HD, 780-210, 780-210HD, 780-257HD



Roton Continuous Geared Hinges

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PROCESS FOR CHOOSING THE CORRECT ROTON MODEL

Determine	Select
Door and frame application (i.e. flush door and frame, inset door, door thickness, door height, etc.)	Roton model
Frequency of door cycling and weight of door	Light, Standard, Heavy or Extra Heavy Duty, or Lead Lined
Door and frame material	Fasteners
Door opening finish	Roton finish
Fire rating requirements, if needed	With stud or without stud

Checking the Load

To assist in the selection of an appropriate Roton Continuous Geared Hinge Series, divide the door weight including the weight of the hardware by the number of bearings in the Roton Continuous Geared Hinge under consideration, then use the following guideline, with a maximum 4'0" wide door:

500 Series:	4" Centers	
750 Series:	5 1/8" Centers	(Typical 7' door: 16 bearings)
780 Series:	5 1/8" Centers	(Typical 7' door: 16 bearings)
780 HD & LL:	2 9/16" Centers	(Typical 7' door: 32 bearings)
1200 Series:	2 1/2" Centers	(Typical 7' door: 33 bearings)

Frequency	Load
Low frequency interior doors	20 lbs. per bearing
Low frequency, very heavy doors (lead lined x-ray doors, ballistics doors, high security doors) with double rows of fasteners	30 lbs. per bearing
Medium frequency interior doors	15 lbs. per bearing
Medium frequency exterior doors	10 lbs. per bearing
High frequency exterior doors	7.5 lbs. per bearing
Very high frequency doors	5 lbs. per bearing

FIRE RATINGS

Underwriters Laboratories, Inc.

Fire Rating/File #R14627

780 Series Roton Continuous Geared Hinges are approved for use on 4'x10' swing type door

- Hollow metal, tin-clad, sheet-metal and steel covered composite type rated up to and including 3 hours
- Wood composite doors rated up to and including 1 1/2 hours
- Wood core doors rated up to 20 minutes without hose stream, non-studded



Fire Rated Roton	Fully Concealed	Half Surface	Full Surface
20 Minute Fire Rated Wood Core Door x Fire Rated Hollow Metal Frame	U/L — FF	U/L — FF	U/L — FF
20 Minute Fire Rated Metal Door x Fire Rated Hollow Metal Frame	U/L — FF	U/L — FF	U/L — FF
30 Minute Fire Rated Wood Composite Door x Fire Rated Hollow Metal Frame	U/L — FF	U/L — FF	U/L — FF
30 Minute Fire Rated Metal Door x Fire Rated Hollow Metal Frame	U/L — FF	U/L — FF	U/L — FF
45 Minute Fire Rated Wood Composite Door x Fire Rated Hollow Metal Frame	U/L — FF	U/L — FF	U/L — FF
45 Minute Fire Rated Metal Door x Fire Rated Hollow Metal Frame	U/L — FF	U/L — FF	U/L — FF
90 Minute Fire Rated Wood Composite Door x Fire Rated Hollow Metal Frame	U/L — Stud	U/L — Stud	U/L — Stud
90 Minute Fire Rated Metal Door x Fire Rated Hollow Metal Frame	U/L — FF	U/L — FF	U/L — FF
3 Hour Fire Rated Hollow Metal Door x Fire Rated Hollow Metal Frame	U/L — Stud	U/L — Stud	U/L — Stud

- 780 Series Roton Continuous Geared Hinges meet requirements for positive pressure UL10C, UL10B and UBC7-2 Part 1
- 780 Series Roton Continuous Geared Hinges are approved for ANSI A156.26 Grade 1 for 150 lb. doors
- 780 Series Roton heavy duty hinges are approved for ANSI A156.26 Grade 1 for 300 lb. doors
- 780-112 Roton Continuous Geared Hinge is Warnock-Hersey certified in accordance with ANSI A250.13 Severe Windstorm Resistant Components

Roton Continuous Geared Hinges



General Information

Standard Lengths

Roton Continuous Geared Hinge standard lengths are for 6'8" doors – 79", for 7' doors – 83", for 7'2" doors – 85", for 8' doors – 95" and for 10' doors – 119", for convenience in application to nominal doors. This provides for threshold clearance, head clearance and door height allowances for carpeting. Other lengths may be ordered as non-standard items.

Roton Continuous Geared Hinges are always installed flush with the top edge of the door. No more than 1/16" (1.5 mm) to 3/32" (2 mm) head clearance is recommended.

Where many net heights are likely to appear on the same job, group the sizes to 1/2" (13 mm) increments to be consistent in appearance. Generally, up to 1/2" (13 mm) of door heel exposure is acceptable, but all Roton Continuous Geared Hinges should be within 1" (25.4 mm) of the net door height.

Field Modifications

While Roton Continuous Geared Hinges can be field cut, any product modifications may void all warranties. Should in-the-field modifications be required, cut only from bottom of hinge. Do not cut through bearings or screw holes. When cutting electric hinges it is extremely important to clamp both hinge leaves securely to prevent hinge "chatter" which can damage the hinge's internal wiring. Consult the St. Louis technical team before proceeding.

Template Hinges

Hager Companies has developed templated hole patterns for Roton Continuous Geared Hinge models in standard lengths. Drawings are available upon request by contacting Hager Companies Customer Service or accessing the Hager Companies website at www.hagerco.com. Due to normal variances inherent in the manufacturing process, Roton custom length hinges are deemed by Hager Companies to be non-templated.

Standard Finishes

Roton Continuous Geared Hinges are available in either clear satin anodized aluminum Alcoa 202-R1 (similar to US28) or in a dark bronze exterior anodized coating Alcoa 204-R1.

Special Anodizing

Hager Companies can supply unfinished materials to selected finishers for special projects which require unusual colors, but will require that final assembly be completed by Hager Companies. Because of special non-removable metal coatings applied to all hinges during assembly, users are cautioned against attempting to refinish any Roton product. Roton Continuous Geared Hinges are available in various special colors including black, gold, and other special anodized finishes with fasteners to match. All hinges ordered in special colors should be ordered at the same time to guarantee finish uniformity. Supply color chip for best match.

Painted Hinges

Hager Companies can supply unfinished materials to selected finishers for special projects which require unusual colors or coatings, but will require that final assembly be completed by Hager Companies. Because of special non-removable metal coatings applied to all hinges during assembly, users are cautioned against attempting to refinish any Roton product.

Painted Cover Channels

Painted Roton Cover Channels in Bone White are offered as a standard stock color option. This is only available on the standard Roton cover channel.

Polished Cover Channels

Any Roton Continuous Geared Hinge may be ordered with a polished clear cover channel (similar to US26) to complement clear anodized hinge leaves or a polished gold cover channel (similar to US3) to complement satin gold anodized hinge leaves.

Special Cover Channels

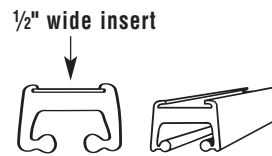
Special covers for rounded, fluted or decorative effects may be ordered. Not available for hinges with electrical modifications



Rounded Back



Fluted Back



Decorative Back

Roton Cover Channel Compatibility

Hinge Model	Flat FBCC	Rounded RBCC	Fluted FLCC	Decorative DBCC
750-134	•	•	•	•
750-138	•	•	•	•
780-041	•	•		
780-045	•	•		
780-046	•	•		
780-053	•	•		
780-054	•	•		
780-057	•	•		
780-110	•	•	•	•
780-111	•	•	•	•
780-112	•	•	•	•
780-113	•	•	•	•
780-114	•	•		
780-155	•	•		
780-157	•			
780-208	•		•	•
780-210	•	•		
780-211	•	•		
780-213	•	•		
780-224	•	•	•	•
780-226	•	•	•	•
780-235	•	•	•	•
780-257	•			
780-259	•	•		
780-300	•			



Roton Continuous Geared Hinges

General Information

Extra Long Hinges

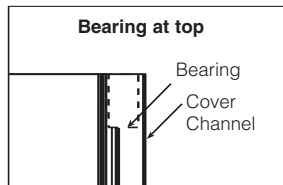
Hager Companies manufactures hinges over 119" long as two separate lengths with a staggered joint for onsite connection. Roton will select hinge segment lengths from standard sizes for best economics in relation to quantity required. Handing specifications are required to position the cuts inconspicuously and to finish symmetrical pairs in double door applications.

Dutch Door Hinges

Hager Companies will prepare any of its hinge models for a dutch door application. The frame leaf is furnished as a continuous extrusion and the door leaf is cut to fit the dutch door heights specified. Upper and lower door leaves are prepped for extra screws. Handing, overall net door height, amount of clearance between the top and bottom doors, their individual heights and door and frame materials should be clearly specified.

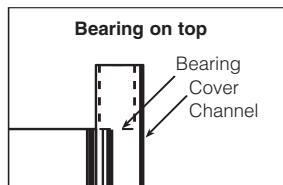
Bearing At Top

This application allows for the bearing to be set at the very top of the channel cover. The cover channel is flush with the top of the geared hinge, preventing any obstructions or debris to be inserted in the top channel.



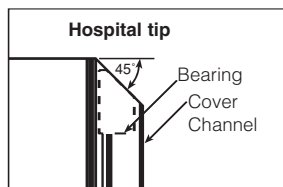
Bearing On Top

This application allows for the bearing to be set at the very top of the extended channel cover. The cover channel is extended the depth of the bearing and projects beyond the top edge of the hinge by the thickness of the bearing. This modification prevents any obstructions or debris from being inserted in the top of the channel.



Hospital Tip

Concealed models only can be prepared with a cover channel tapered at 45° angle at the top of the hinge. These are ideal for use in hospitals and correctional facilities to help provide a clean and safe environment. Please consult the sales office for available models.



Tamper Resistant Hinge

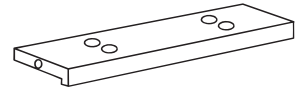
This application is intended for use in hospital psychiatric areas and places of high security. The hinge is prepared with a hospital tip (concealed models only) and every other bearing is supplied with a set screw to lock against the inside of the cover channel for additional security.

Bearing Replacement Kits

Available in standard or heavy duty and in Clear Anodized or Dark Bronze Anodized finish for 780 and 1200 Series Roton.

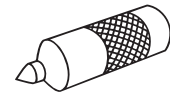
Special Holes

Any hinge may be ordered with special hole locations for unusual frame or door conditions. Please provide specifications for each leaf.



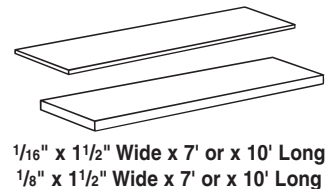
Marking Jigs

Marking jigs are available to locate the centers of the top end frame screws. These jigs must be ordered at the same time as the hinges to ensure fabrication accuracy.



Center Punches

Self-Centering punches are available for #12 countersunk screws that are supplied. To make sure screw heads seat properly, accurate center punching is required.



Shim Stock

For clearance between the door and frame that may be excessive, a continuous shim is helpful (applied behind the frame leaf only). Anodized aluminum extrusions are supplied with no holes.

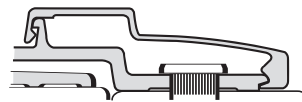
Item Marking

Marking and special packaging for job-site identification.

Replacement Moldings

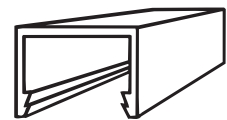
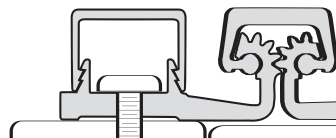
780-210M

Replacement door leaf molding for 780-210, 780-210HD, 780-211,



780-211HD, 780-213, 780-213HD, 780-045, 780-045HD, 780-046, 780-046HD. Furnished with Allen head set screw and wrench. Shipped in standard lengths for trimming in the field.

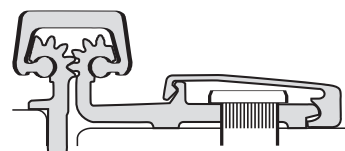
780-247M



Replacement frame leaf molding for 780-157, 780-157HD, 780-257, 780-257HD. Shipped in standard lengths for trimming in the field.

780-052M

Replacement door leaf molding for 780-053, 780-053HD, 780-054, 780-054HD, 780-155, 780-155HD, 780-057, 780-057HD, 780-157, 780-157HD, 780-257, 780-257HD, 780-259, 780-259HD. Furnished with Allen head set screw and wrench. Shipped in standard lengths for trimming in the field.





Fasteners

Hager Companies uses custom made, carefully engineered, and thoroughly tested fasteners exclusively. Each fastener is designed for ease of use as well as durability. Appropriate fasteners are furnished with each hinge, together with installation instructions for typical metal or wood doors and frames. **The standard screw pack includes self-drilling screws; if wood screws are required, please specify in the ordering process.**

Fasteners for use with hinges in the 750 and 780 Series Metal Doors or Frames (Undercut Head Phillips Countersunk Screws): Two types of screws are available for metal doors and frames: the self-drilling screw (with drill point tip) and the thread forming screw (no tapping necessary). The #12-24 x 1¹/₁₆" self-drilling screw has a machine thread in the screw shank. The #12-24 x 1³/₃₂" thread-forming screw has a machine thread in the screw shank.

The standard screw pack contains #12-24 self-drilling machine thread. This screw has a hardened steel drill point built into the end of the screw, allowing it to be installed without a pre-drilled hole if the metal thickness is no more than 1/8" (3.2 mm). It forms its own threads as the screw is drilled into the door or frame. It is longer than most screws of the type because of the built-in drill point.

When installing the self-drilling screw, make certain that the installer is familiar with the proper use and torque settings of a screw gun. Proper center-punching is extremely important with self-drilling screws. If center-punching is omitted or incorrectly done, the screw will "walk" in the same way as a drill bit, resulting in cocked screw heads and improperly closing hinge leaves.

The optional self-threading screw is typically used on grout filled frames to prevent bowing of the frame. This screw has a short tapered section at the tip. A drilled pilot hole (Range: 0.173" to 0.185") is required prior to tapping.

Either of these screws may be used for the attachment of Roton Continuous Geared Hinges to metal doors or frames, generally without reinforcement except in thin aluminum or with doors of very heavy weight or anticipated abuse. Both types require centerpunching to ensure that the screw seats properly in the hinge leaf. Self-centering countersinking center-punches are available.

In all cases, care should be taken to ensure that no drill chips build up behind the hinge. It is best to premark the holes and drill for self-threading screws with the hinge removed, or hold the hinge very tightly against the door or frame when using the self-drilling screws.

Hinges normally requiring sex bolts will be furnished with suitable mounting holes. Blank leaves, special countersinking or door fastening with pan-head screws are available upon request.

If special fasteners are required, customers must supply them except upon prior agreement. Please consult the factory for alternate fastener recommendations.

Sex Bolts (Thru-Bolts)

On all applicable surface-mounted hinges, sex bolt sets are furnished in the hardware package together with a transfer punch for accurate marking of the 3/8" (10 mm) drilled holes required. The 1/4"-20 bolt has a 3/8" (10 mm) shoulder under a 9/16" (14 mm) pan head so that it can be reversed for exterior in-swing doors or for additional security.

Roton sex bolts are intentionally designed to be shorter than the door thickness for proper clamping action with doors of slightly varying thickness and gauge in the 1" to 2 1/2" (63.5 mm) range. Unless otherwise requested, bolts suitable for the 1 3/8" (35 mm) to 1 3/4" (45 mm) range will be shipped. Shorter or longer bolts may be requested. Bolts which are outside the door thickness range of 1" (25.4 mm) to 2 1/2" (63.5 mm) must be provided by the installer.



Roton Continuous Geared Hinges

General Information

DOOR AND FRAME DIMENSIONING

Half Surface Models

780-045, 780-045HD, 780-046, 780-046HD, 780-053, 780-053HD, 780-054, 780-054HD, 780-155, 780-155HD, 780-211HD, 780-213, 780-213HD, 780-259, 780-259HD, 780-300HD (Leaf thickness clearance not required for 780-300HD)

Designed primarily for work involving new doors and frames, one leaf concealed and one leaf surface mounted. They can also be used on retrofit work where a new door can be ordered to fit an existing frame, the existing door is made of wood and can be reduced in size to accommodate the 1/8" (3.2 mm) leaf thickness, or the frame is to be replaced and can be furnished with an oversized header.

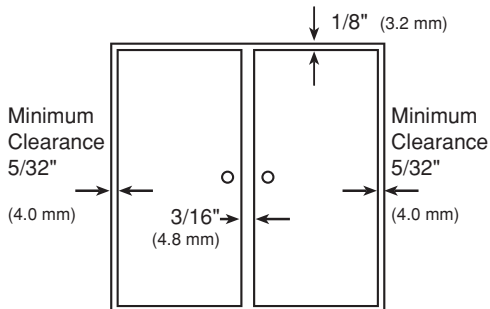
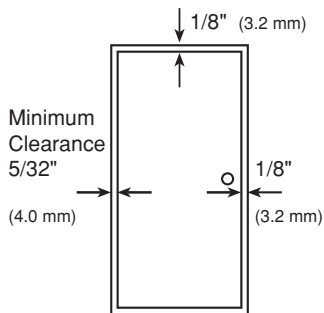
Clearance required as follows:

Single Doors (Square and Beveled Edge)

A. Leaf thickness	1/8"	3.2 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance for single door	1/8"	3.2 mm
Total	9/32"	7.2 mm

Pairs of Doors (Square and Beveled Edge)

A. Leaf thickness	1/8"	3.2 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Edge to edge clearance (recommended)	3/16"	4.8 mm
D. Second allowance for frame irregularities	1/32"	0.8 mm
E. Second leaf thickness	1/8"	3.2 mm
Total	1/2"	12.8 mm



DOOR AND FRAME DIMENSIONING

Full Surface Models

780-057, 780-057HD, 780-157, 780-157HD, 780-210, 780-210HD, 780-257HD

The above models are designed for retrofit applications and require no special dimensioning. Full Surface models are designed to be mounted to the exposed surface of the door and frame. No additional clearance is required except for door and frame painting.

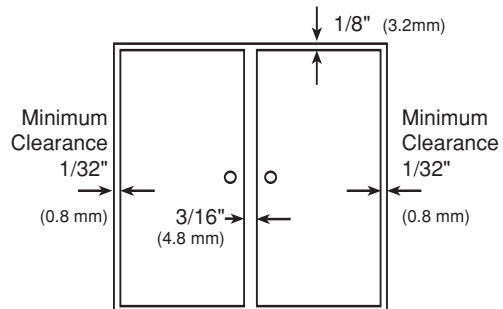
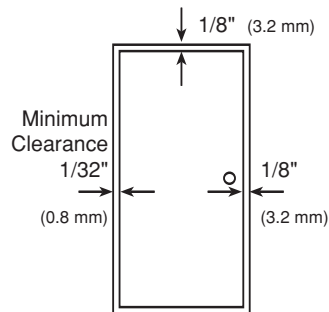
Clearance required as follows:

Single Doors (Square and Beveled Edge)

A. Additional allowance for frame irregularities	1/32"	0.8 mm
B. Lockside clearance for single door	1/8"	3.2 mm
Total	5/32"	4.0 mm

Pairs of Doors (Square and Beveled Edge)

A. Additional allowance for frame irregularities	1/32"	0.8 mm
B. Edge to edge clearance (recommended)	3/16"	4.8 mm
C. Second allowance for frame irregularities	1/32"	0.8 mm
Total	1/4"	6.4 mm



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DOOR AND FRAME DIMENSIONING

Concealed Models

750-134, 750-138, 780-110, 780-110HD, 780-111, 780-111HD, 780-111LL, 780-112, 780-112HD, 780-112LL, 780-224, 780-224HD, 780-224LL, 780-226, 780-226HD, 780-226LL, 780-235HD. **The following are not recommended for doors with beveled edged applications – 780-041, 780-041HD and 780-041LL.**

Designed primarily for work involving new doors and frames, these models have parallel, fully concealed leaves. They can also be used on retrofit work where a new door can be ordered to fit an existing frame, the existing door is made of wood and can be reduced in size to accommodate the 5/16" (7.9 mm) hinge thickness, or the frame is to be replaced and can be furnished with an oversized header.

Clearance required as follows:

Single Doors (Square Edged)

A. Hinge thickness*	5/16"	7.9 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance for single door	1/8"	3.2 mm
Total	15/32"	11.9 mm

Single Doors (Beveled Edged)

A. Hinge thickness*	5/16"	7.9 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance for single door	1/8"	3.2 mm
D. Allowance for beveled edge	1/32"	0.8 mm
Total	1/2"	12.7 mm

Pairs of Doors (Square Edged)

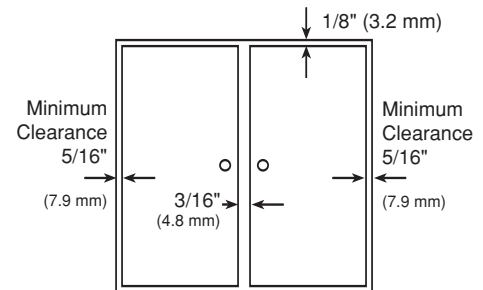
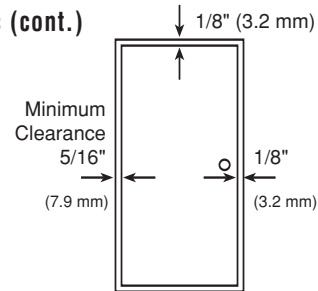
A. Hinge thickness*	5/16"	7.9 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Edge to edge clearance (recommended)	3/16"	4.8 mm
D. Second allowance for frame irregularities	1/32"	0.8 mm
E. Second hinge thickness*	5/16"	7.9 mm
Total	7/8"	22.2 mm

Pairs of Doors (Beveled Edged)

A. Hinge thickness*	5/16"	7.9 mm
B. Allowance for beveled edge	1/32"	0.8 mm
C. Additional allowance for frame irregularities	1/32"	0.8 mm
D. Edge to edge clearance (recommended)	3/16"	4.8 mm
E. Second allowance for frame irregularities	1/32"	0.8 mm
F. Second allowance for beveled edge	1/32"	0.8 mm
G. Second hinge thickness*	5/16"	7.9 mm
Total	15/16"	23.8 mm

* See exceptions

Concealed Models (cont.)



Concealed Model Exceptions

780-113, 780-113HD

Single Doors (Square Edged)

A. Hinge thickness	13/16"	20.6 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance for single door	1/8"	3.2 mm
Total	31/32"	24.6 mm

Single Doors (Beveled Edged)

A. Hinge thickness	13/16"	20.6 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance for single door	1/8"	3.2 mm
D. Allowance for beveled edge	1/32"	0.8 mm
Total	1"	12.8 mm

Pairs of Doors (Square Edged)

A. Hinge thickness	13/16"	20.6 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Edge to edge clearance (recommended)	3/16"	4.8 mm
D. Second allowance for frame irregularities	1/32"	0.8 mm
E. Second hinge thickness	13/16"	0.6 mm
Total	17/8"	47.6 mm

Pairs of Doors (Beveled Edged)

A. Hinge thickness	13/16"	20.6 mm
B. Allowance for beveled edge	1/32"	0.8 mm
C. Additional allowance for frame irregularities	1/32"	0.8 mm
D. Edge to edge clearance (recommended)	3/16"	4.8 mm
E. Second allowance for frame irregularities	1/32"	0.8 mm
F. Second allowance for beveled edge	1/32"	0.8 mm
G. Second hinge thickness	13/16"	20.6 mm
Total	115/16"	49.2 mm



Roton Continuous Geared Hinges

General Information

DOOR AND FRAME DIMENSIONING

Concealed Model Exceptions (cont.)

780-114, 780-114HD

Single Doors (Square Edged)

A. Hinge thickness	15/16"	23.8 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance for single door	1/8"	3.2 mm
Total	13/32"	27.8 mm

Pair of Doors (Square Edged)

A. Hinge thickness	15/16"	23.8 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Edge to edge clearance (recommended)	3/16"	4.8 mm
D. Second allowance for frame irregularities	1/32"	0.8 mm
E. Second hinge thickness	15/16"	23.8 mm
Total	21/8"	54.0 mm

1200-600XHD, 1200-650XHD

Single Doors (Square Edged)

A. Hinge thickness	15/32"	11.9 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance	1/8"	3.2 mm
Total	5/8"	15.9 mm

Single Doors (Beveled Edged)

A. Hinge thickness	15/32"	11.9 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance for single door	1/8"	3.2 mm
D. Allowance for beveled edge	1/32"	0.8 mm
Total	21/32"	16.7 mm

Pair of Doors (Square Edged)

A. Hinge thickness	15/32"	11.9 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Edge to edge clearance (recommended)	3/16"	4.8 mm
D. Second allowance for frame irregularities	1/32"	0.8 mm
E. Second hinge thickness	15/32"	11.9 mm
Total	13/16"	30.2 mm

Pair of Doors (Beveled Edged)

A. Hinge thickness	15/32"	11.9 mm
B. Allowance for beveled edge	1/32"	0.8 mm
C. Additional allowance for frame irregularities	1/32"	0.8 mm
D. Edge to edge clearance (recommended)	3/16"	4.8 mm
E. Second allowance for beveled edge	1/32"	0.8 mm
F. Second hinge thickness	15/32"	11.9 mm
Total	11/4"	31.8 mm

780-208, 780-208HD

Single Doors (Square Edged)

A. Hinge thickness	1/2"	2.7 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance for single door	1/8"	3.2 mm
Total	21/32"	16.7 mm

Single Doors (Beveled Edged)

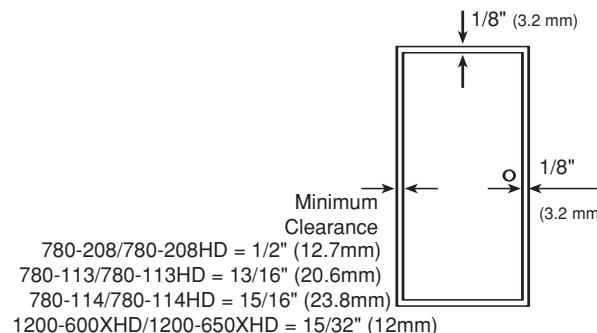
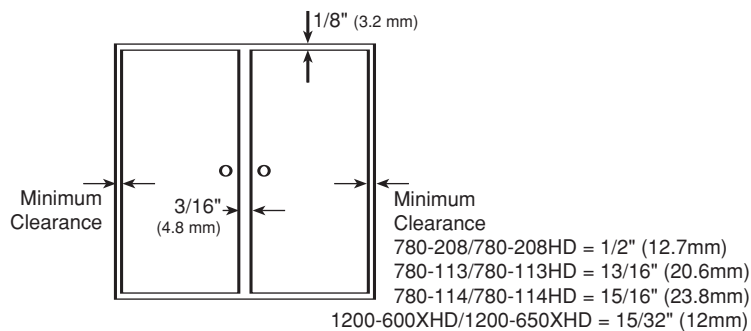
A. Hinge thickness	1/2"	12.7 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Lockside clearance for single door	1/8"	3.2 mm
D. Allowance for beveled edge	1/32"	0.8 mm
Total	11/16"	17.5 mm

Pair of Doors (Square Edged)

A. Hinge thickness	1/2"	2.7 mm
B. Additional allowance for frame irregularities	1/32"	0.8 mm
C. Edge to edge clearance (recommended)	3/16"	4.8 mm
D. Second allowance for frame irregularities	1/32"	0.8 mm
E. Second hinge thickness	1/2"	12.7 mm
Total	11/4"	31.8 mm

Pair of Doors (Beveled Edged)

A. Hinge thickness	1/2"	12.7 mm
B. Allowance for beveled edge	1/32"	0.8 mm
C. Additional allowance for frame irregularities	1/32"	0.8 mm
D. Edge to edge clearance (recommended)	3/16"	4.8 mm
E. Second allowance for frame irregularities	1/32"	0.8 mm
F. Second allowance for beveled edge	1/32"	0.8 mm
G. Second hinge thickness	1/2"	2.7 mm
Total	15/16"	33.3 mm





ELECTRIC HINGE MODIFICATIONS

Exposed Electric Contacts:

- Transfers power to door in closed position
- To order, use symbol “E” plus the number of contacts required as a suffix
- Must have at least two (2) contacts to transfer power
- Example: 780-112HD 85" Clear E4
- Specify handing and the dimension from the top edge of the door to the centerline of the electric contact location
- Templates regarding location of contacts available upon request

Exposed Electric Switches:

- Miniature push button switch is incorporated in the hinge frame leaf to monitor position of the door
- Three 12" wire leads
- To order, use symbol “E1S” as a suffix
- Each monitoring hinge only needs one E1S switch
- Example: 780-112HD 85" Clear E1S
- Specify handing and the dimension from the top edge of the door to the centerline of the electric switch location
- Templates regarding location of contact switch available upon request

Concealed Electric Through-Wire:

- Transfers power discreetly from building to door hardware
- Four, six, eight or ten wire continuous electric conductors
- To order, use symbol “ETW” plus the number of wire leads, 12" per side required as a suffix
- Example: 780-112HD 85" Clear ETW - 4
- Specify handing and the dimension from the top edge of the door to the centerline of electric through-wire location
- Templates regarding location of through-wires available upon request

Removable Electric Through-Wire:

- Transfers power discreetly from building to door hardware
- 4" removable ETW module can easily be removed for adjustment or service
- To order, use symbol “RETW”
- Available on heavy duty models only
- Example: 780-112HD 85" Clear RETW
- Specify handing and the dimension from the top edge of the door to the centerline of electric monitoring location
- To order 4" removable module only, use component number
- Templates regarding location of module available upon request

Concealed Electric Monitoring:

- Miniature switch is incorporated into the frame leaf
- Three 12" wire leads
- To order, use symbol “EMN”, as a suffix
- Example: 780-224HD 119" Bronze EMN
- Specify handing and the dimension from the top edge of the door to the centerline of electric monitoring location
- Templates regarding location of monitoring switch available upon request

Concealed Electric Through-Wire and Monitoring:

- This combines the continuous electric conductors and the miniature switch to provide both power transfer and monitoring
- Four, six, eight or ten continuous electric conductors
- Miniature switch is incorporated into the frame leaf
- To order, use symbol “ETM” plus the number of wires required as a suffix
- Example: 780-224LL 85" Bronze ETM - 4
- Specify handing and the dimension from the top edge of the door to the centerline of each electric modification location
- Templates regarding location of monitoring switch, available upon request

Von Duprin EPT 2 or EPT 10 Electric Power Transfer Preparation

- Hinge leaf cutout to accommodate power transfer device
- Specify handing and the dimension from the top edge of the door to the centerline of the power transfer location

Special Electric Modifications and EPT locations may require additional charges if screw holes have to be moved. Contact Hager Companies Customer Service for charges. Please feel free to contact the Hager Companies technical team for further information pertaining to electric modifications.

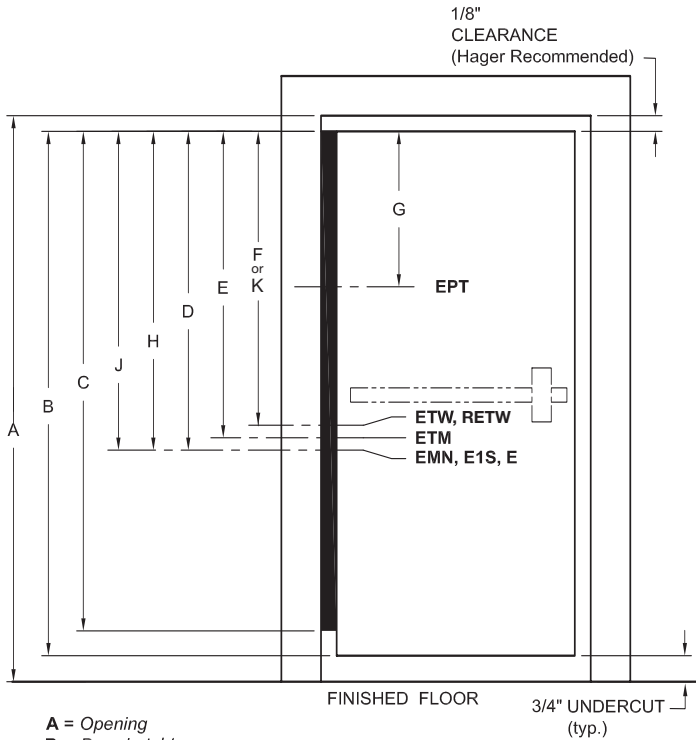
Mortar Box - 430

- Serves as a mortar shield
- Overall dimensions: 9" (229 mm) length with tabs, 7" (178 mm) inside, 1 3/4" x 1 3/4" (45 x 45 mm) inside dimension
- Galvanized steel 0.040" (1 mm)
- Top and bottom knockouts for standard conduit fittings



Roton Continuous Geared Hinges

General Information



- A = Opening
- B = Door height
- C = Actual hinge length
- D = C.L. of EMN (electric monitor)
- E = C.L. of ETM (electric through-wires & monitor)
- F = C.L. of ETW (electric through-wires)
- G = C.L. of EPT (electric power transfer)
- H = C.L. of E1S (exposed switch)
- J = C.L. of E (exposed contact)
- K = C.L. of RETW (removable electric through-wires)

ELECTRIC HINGE MODIFICATIONS

	A	B	C	D	E	F	G	H	J	K
79 SD	80"	79 1/8"	78 11/16"	42 1/2"	41 1/4"	40"	24 1/2"	42 1/2"	42 1/2"	-
79 HD	80"	79 1/8"	78 11/16"	42 1/2"	40 5/8"	38 3/4"	24 1/2"	42 1/2"	42 1/2"	41 7/8"
83 SD	84"	83 1/8"	83"	46 1/2"	44 5/8"	42 3/4"	28 7/16"	46 1/2"	46 1/2"	-
83 HD	84"	83 1/8"	83"	46 1/2"	45 1/4"	44"	28 7/16"	46 1/2"	46 1/2"	44 1/16"
85 SD	86"	85 1/8"	85"	48 1/2"	47 1/4"	46"	30 7/16"	48 1/2"	48 1/2"	-
85 HD	86"	85 1/8"	85"	48 1/2"	46 5/8"	44 3/4"	30 7/16"	48 1/2"	48 1/2"	45 1/16"
95 SD	96"	95 1/8"	95 1/16"	59 3/4"	57 7/8"	56"	40 1/2"	59 3/4"	59 3/4"	-
95 HD	96"	95 1/8"	95 1/16"	59 3/4"	57 7/8"	56"	40 1/2"	59 3/4"	59 3/4"	56 1/2"
119 SD	120"	119 1/8"	119"	83 3/4"	81 7/8"	80"	64 3/8"	83 3/4"	83 3/4"	-
119 HD	120"	119 1/8"	119"	83 3/4"	81 7/8"	80"	64 3/8"	83 3/4"	83 3/4"	80"

For ease of ordering, Hager Companies has established standard locations for power transfer cutouts. All standard location dimensions are referenced from the top edge of the door to the centerline of the power transfer cutout. Please specify handing.

PART NUMBER	VON DUPRIN EPT 2 OR EPT 10 POWER TRANSFER PREPARATION	EXPOSED ELECTRIC CONTACTS	EXPOSED ELECTRIC SWITCHES	CONCEALED ELECTRIC THROUGH-WIRE	CONCEALED ELECTRIC MONITORING	CONCEALED ELECTRIC THROUGH-WIRE AND MONITORING	REMOVABLE ELECTRIC THROUGH-WIRE
750-134							
750-138							
780-041							
780-041HD							
780-041LL							
780-045	•						
780-045HD	•						
780-046	•						
780-046HD	•						
780-053	•						
780-053HD	•						
780-054	•						
780-054HD	•						
780-110	•		•	•			
780-110HD	•		•	•			
780-111	•	•	•	•	•	•	
780-111HD	•	•	•	•	•	•	•
780-111LL	•	•	•	•	•	•	
780-112	•	•	•	•	•	•	
780-112HD	•	•	•	•	•	•	•
780-112LL	•	•	•	•	•	•	
780-155							
780-155HD							
780-211HD							
780-224	•	•	•	•	•	•	
780-224HD	•	•	•	•	•	•	•
780-224LL	•	•	•	•	•	•	
780-226	•	•	•	•	•	•	
780-226HD	•	•	•	•	•	•	•
780-226LL	•	•	•	•	•	•	
780-235HD		•	•	•	•		