Lehigh University IDEAL Department
Access Control and Door Hardware Standards

General Conditions

- All Exterior doors need to be monitored by the card access system for perimeter security.
- An electronic master key box needs to be installed I all buildings.
- Doors and frames must meet the requirements of the standard equipment below so hardware prep is accurate.
- Most glass doors will not work with our access control standards please discuss before any glass doors are used.
- Lehigh ID's are required by all personnel working on campus.
- Construction keys will be signed out to select contractors and they are responsible for returning them to the IDEAL department.
- During construction, all exterior doors must be secured each day if the building contains Lehigh property.
- All locking hardware and access control equipment must be reviewed and approved by IDEAL prior to ordering and installing.
- All permanent and construction keys and cores are to be supplied and installed by the IDEAL department. A key meeting needs to be scheduled in-house by LU project manager to review lock functions and key layout needed by building and department prior to hardware being ordered.
- Cameras are managed by LUPD, please review with LUPD prior to ordering and installing. Installed by JCI
- Panic buttons managed by IDEAL and LUPD, Training and approval done by LUPD. Installed by JCI.

Standard Access Control Door Hardware

Exit Devices

Von Duprin 98 Series

- Rim Exit Devices are preferred over vertical hardware. Must use reusable center mullions when possible.
- Wide Style (Narrow Style when approved by IDEAL)
- (LX) Latch Bolt (Residential Only)
- (RX) Request to Exit
- (QEL) Quiet Latch Retraction
- (LD) Less Dogging.

Card Access Exit Devices

- **Exterior Door with or without card access**

    VD - QEL-LX-RX-98-(Device type Rim preferred, Vertical Rod)-NL-06-(2', 3', 4' Door Size)-626 - (LHR or RHR Handing)
- **Interior Door with card access**

    VD - QEL-LX-RX-98-(Device type Rim preferred, Vertical Rod)-NL-06 - (Fire Option?) - (2', 3', 4' Door Size)-626-(LHR or RHR Handing) Or Von Duprin 6211 series electric strike.

Non-Card Access Exit Devices

- VD - 98-(Device type Rim preferred, Vertical Rod)-BE-06- (Fire Option?) - (2', 3', 4' Door Size)-626 - (LHR or RHR Handing)

Above are some part number examples, but the details based on each specific door, need to be noted.

Nomenclature – how to order

EL 99 27 -L -16 -F LBR 3' US3 RHR

Code	Description
None	Standard
SD	Special dogging R/VR - panic only
CD	Cylinder dogging - panic only
CX	Chexit
E	Electric locking mortise/lever
QEL	Quiet electric latch retraction
EL	Electric latch retraction
LX	Latch bolt monitoring
RX	Request to exit
RX2	Double request to exit
SS	Signal switch
AX	Accessible device
PL	Pullman latch
PN	Pneumatic latch retraction
WS	Surface vertical rod exit device
XP	Heavy protection - rim
WS	Tornado & hurricane tested

> **Electronic options, QEL is Standard and E is used only for failsafe applications. Always include LX,RX**

Code	Description
98	Series 98-smooth
99	Series 99-grooved

Code	Description
None	Rim device
27	Surface mounted vertical rod device
47	Concealed vertical rod device
47WDC	Concealed vertical rod wood door device
48	Concealed vertical rod device
49	Concealed vertical cable device
49WDC	Concealed vertical cable wood door device
57	Three-point latch device
75	Mortise lock device

> **RIM device preferred for single and double doors, use removable center mullion when possible over vertical hardware**

Code	Description
AD	AD Trim (to come from client)
DT	Dummy trim
EO	Exit only
HL	Hospital pull trim
K	Knob
K-BE	Knob - blank escutcheon
K-DT	Knob, rigid - dummy trim
K-NL	Knob, rigid - night latch
L	Lever (classroom)
L-BE	Lever - blank escutcheon
L-DT	Lever, rigid - dummy trim
L-NL	Lever, rigid - night latch
NL	Night latch
NL-OP	Night latch cylinder assembly, optional pull
TL	Turn lever
TL-BE	Turn lever - blank escutcheon
TP	Thumbpiece
TP-BE	Thumbpiece - blank escutcheon

Code	Description
XX	Lever style 06 standard Optional 01, 02, 03, 05, 07, 12 (Handed), 16 (Omega), 17, 18, Accent, Asti, Merano, St. Annes

996L Breakaway™ lever

Code	Description
F	Fire exit device

Code	Description
-2	Double cylinder (rim & mortise only)
LBR	Less bottom rod
LBL	Less bottom latch
SG	Safety glow (luminescent) touchpad
ALK	Alarm kit
ALK-AR1	Auto-reset 1½ minute alarm kit
ALK-AR3	Auto-reset 3 minute alarm kit
ALK-AR6	Auto-reset 4½ minute alarm kit
CON	Allegion Connect

06
Default lever
Knurling available*

Code	Description
2'	2' Device (2' door size) 27, 47 or 49 only
3'	3' Device (2' 4"– 3' door size)
4'	4' Device (2' 10"– 4' door size)

Finishes	
Finishes	US3, US4, US10, US26, US26D, US28, 313, 315 US32D – 98 ONLY -AM Antimicrobial (available US26D and US32D)

Code	Description
-LHR	Left hand reverse
-RHR	Right hand reverse

Wireless Locks (Interior only when approved by IDEAL)
- Salto Systems Offline Locks

Standalone Keypad Lock (Managed electronically by department)
- Yale NTB610-NR BAU 626 SFIC PUSH BUTTON

Electric Strikes (Used for Interior Door Card Access Only)
- Von Duprin 6200 Series
- HES-9600 (when approved by IDEAL)

Magnetic Locks - Not Accepted (Can be approved by IDEAL for interior only)

Hinges (Electric Transfer)
- Von Duprin EPT-10 – **no substitutes**
- McKinney "QC" ElectorLynx Hinge (When approved by IDEAL)
- Securitron EL-CEPT (When approved by IDEAL)

Center Mullion required on all exterior double doors (vertical hardware only when needed).
- Must be keyed removeable center mullion
- Von Duprin

Card Reader – Mifare Card Reader Allegion AptiQ model MT11 or MT15: ADA Mounting height 48/15 (43")
- Double Doors - Mounted on the wall closest to the door on the right.
- Single Door – Mounted on the wall closest to the strike side of the door
- MT15 Full Size (LU Standard)
- MT11 Mullion size only when needed

Exterior Door Cabling - A complete cable bundle shall be pulled to each exterior door regardless of function.
- Lock & Sounder Power - 16-4 Stranded Plenum
- Card Reader - 18-6 Stranded Plenum Shielded
- Door Contact, REX, Junction Box, Spare - 22-12 Stranded Plenum
- Cat 6 Ethernet cable

Interior RM Door Cabling
- Lock Power - 16-4 Stranded Plenum
- Communication Data – 18-4 Stranded Plenum Shielded

Sounder (Door Prop Alert) – no substitutes
- Mallory Sonalert P/N SCE028LD3SU2S
- Slow speed-up pulser, 2900 Hz, 16 to 28 VDC

Door Sensor Controls
- Sentrol, Inc.
- George Risk Industries (G.R.I.)

Motion Intrusion Detector
- Bosch DS160
- Bosch Tritech

Wireless Panic Buttons (Training and approval done by LUPD)
- Inovonics

Cable Splice Junction Box (Enclosure for interconnection of security system cable bundle to door-specific wiring) - Location: In vicinity of each door
- 5" x 5" x 2-7/8" with 1" and 1-1/4" side knockouts
- Manufacturer: Randl Industries P/N T-55017
- Tyco RM Junction Box

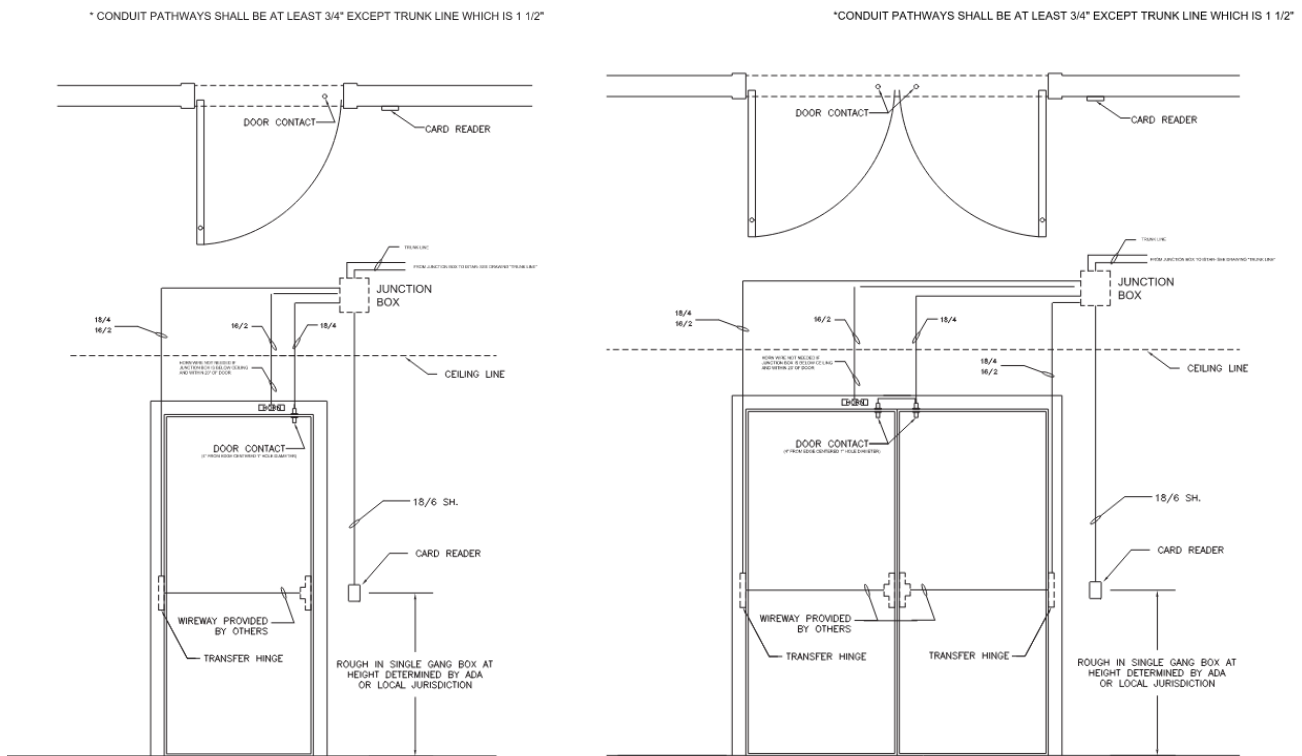**Barrier Strip** (Interconnection of security system cabling)
- Mount on rear of Randl T-55017 box cover plate; see detail drawing
- Manufacturer: Kulka P/N 799 GP 07 KT34 KT35 KT36 or approved equal
- Digikey ED3000-ND, 12 position terminal strips

Pathways
- Conduit and pathway from every access control door to the panel location
- All locations are to the secure side on the door, RM/Junction Box 12"x 12" boxes will be supplied by JCI to run conduit to and from

- All door devices will need clear path to RM/Junction Box 12"x 12" box at door
- Devices are but not limited to
  - Door contacts (each door), Motion/REX, Sounder
  - Reader-This will require a single gang back box (ADA height) (AptiQ and Salto)
  - Crash bar (each door), Strike or Mag
  - Power Transfer Hinge
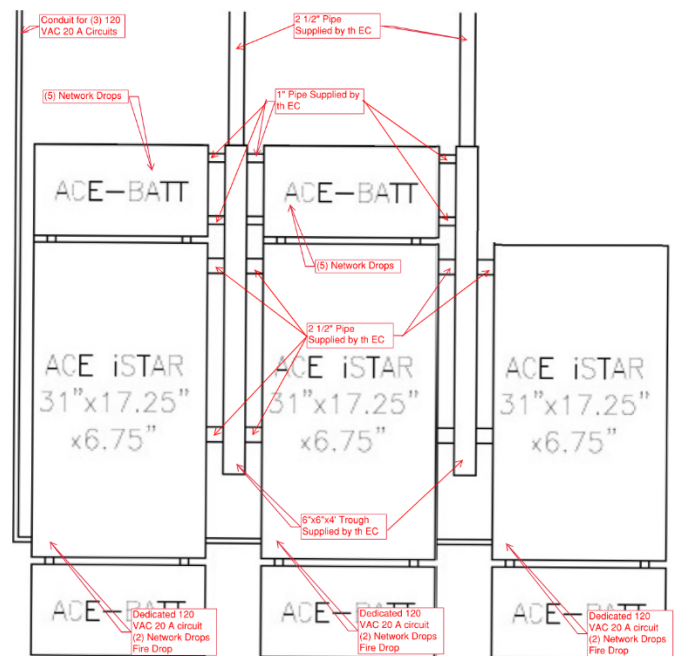 - Auto door buttons, Pedestals
  - Key Boxes, Intercoms

Door Typical

Istar Access Panels

- Each panel gets its own 120VAC 20 Amp Circuit, Fire alarm Drop and Network Drop inside the panel
- There is a trough for thruway between panels and for wiring (6"x6"x4')
- The boxes on top of the Istar get up to 5 network drops each inside the enclosure
- Dimensions per Istar Ace panel 31"x17.25"x6.75"
- Dimensions per Ace – Batt 9.25x17.25x5.25
- Dimensions per RM/Junction Box 12"x12"
- Plywood installed on wall for all equipment

Example with 2 Full Panels and 1 Expansion Panel

Salto Hotspot Readers (Installed inside all main entry doors for Salto Infrastructure)

- Back boxes for readers (single gang) are to be supplied at all Salto reader locations (ADA Height)
- This pathway goes directly back to the Istar (no 12"x 12" box above)
- Salto reader dimensions 141mm x 95.5mm x 29.5mm

Elevator

- Meeting with elevator company need to be established early to make sure access integration is discussed and planned properly
- Reader installed in cab of car
- Restriction of all floors except the egress floor
- Wall space in elevator mechanical room for access equipment

Master Key Box

- 8 key, master key boxes with access control installed in every building
- Installed in common area for easy access

ACCESS CONTROL DETAILS

Terms & Definitions

Access Control System (ACS) – the system used by Lehigh University to control movement in and out of buildings on campus Software House C-Cure 9000 (SWH) – the software used to program the ACS Workstation – a local computer used to run and manage the SWH software. Small Format Interchangeable Core (SFIC) - An interchangeable core that is a specific "small format" figure-eight shape Best Cormax Cores (BE \ 1CX-7-X2-X1- uncombinated)
Software Package (Already Installed) – Software House C-Cure 9000
Access Control Integrator – no substitutes • Johnson Controls

Access Control Panels

- -Istar Ultra Panel Custom design for Lehigh University
- -Must be keyed according to the University Access Control Panel Key System
- -Must audibly and visually report a Panel Tamper Alarm to the Access Control Monitoring System
- -Must audibly and visually report a Power Loss Alarm to the Access Control Monitoring System
- -Must audibly and visually report a Low Battery Alarm to the Access Control Monitoring System
- -All Inputs must be Supervised

Event Programming

Each door shall be equipped with a minimum of 4 events, details below. Held events to trigger the 2nd Extended Held function. The door held and the latch bolt held will trigger the extended held.

Held Door

-Point A first timing functions will be set to 30 seconds Via shunt time (loading door option available when approved shunt set to 900 seconds = 15 mins), at which time only the Sounder at the door will be energized until the door is closed. When the door closes the sounder will de-energize.

~~Latch Bolt Held~~

~~-Point B first timing functions will be set to 30 seconds, at which time only the Sounder at the door will be energized until the door is closed. When the Latch bolt restores the sounder will de-energize.~~

(Latch Bolts are currently not used for monitoring but will still be installed on residential buildings)

Extended Held Door

-The second function will be set for 120 seconds after the first timing function A or B energizes. The Sounder will continue to be energized at the door.

-A visual as well as an audible alarm will be displayed in the Software House Monitoring Station.

-The audible alarm at the door and at the Monitoring Station will be reset by closing the door, but the visual extended held alarm can only be reset by acknowledging the alarm at the Monitoring Station.

Forced Door

-No audible alarm will be energized at the door it will be a silent alarm.

-A visual and audible alarm will be displayed immediately in the Software House Monitoring Station and can only be reset by acknowledging the alarm in the software.

Junction Box Tamper

- Monitors a tamper switch mounted in the door wiring junction box above each door.

- A visual and audible alarm will be displayed immediately in the Software House Monitoring Station and can only be reset by acknowledging the alarm in the software.

Types of Access Control Applications

Exterior Reader Door (electromechanical device and a card reader)

1. -Allegion AptiQ Card Reader (model MT11 or MT15)
2. -Door Status Indicator
3. -Sounder
4. -Electromechanical Rim Exit Device should include options below
   - Include option for Latch Monitoring (Residential Only)
   - Include option for Request to Exit
   - Include option for Less Dogging
   - Include option for a keyed exterior trim with a Small Format Interchangeable Core (SFIC)
   - Exterior trim shall be Night Latch Function - Outside lever is always locked

Exterior Controlled Door (electromechanical device with no card reader)

1. -Door Status Indicator
2. -Sounder
3. -Electromechanical Rim Exit Device should include options below
   - Include option for Latch Monitoring (Residential Only)
   - Include option for Request to Exit
   - Include option for Less Dogging
   - Include option for a keyed exterior trim with a Small Format Interchangeable Core (SFIC)
   - Exterior trim shall be Night Latch Function - Outside lever is always locked

Exterior Monitored Door (no electromechanical device, no card reader)

1. -Door Status Indicator
2. -Request to Exit in Exit Device or (Bosch DS160 must be approved by IDEAL)
3. -Sounder
4. -Rim Exit Device
   - Include option for Latch Monitoring (Residential Only)
   - Include option for Request to Exit

- Include option for Less Dogging
- Include option for a keyed exterior trim with a Small Format Interchangeable Core (SFIC)
- Exterior trim shall be Night Latch Function - Outside lever is always locked

Interior Reader Door (electromechanical device with a card reader)

5. -Allegion AptiQ Card Reader (model MT11 or MT15)
6. -Door Status Indicator
7. -Request to Exit Motion (Bosch DS160)
   - Electronic Door Strike
   - Electronic handset should include a Rex option (when approved by IDEAL)
   - Include option for a keyed exterior trim with a Small Format Interchangeable Core (SFIC)
   - Include option for Less Dogging

Interior Wireless or Offline Reader Door (electromechanical device with a card reader)

1. -Salto Offline Electronic Lock, integrated to CCure 9000
   - Include option for a keyed exterior trim with a Small Format Interchangeable Core (SFIC)
   - Exterior trim to be storeroom function
   - Audit history stored on ID card and loaded into the Ccure 9000 database when ID is updated on Salto online reader
   - Revalidation time is set for 5 days for residential and academic buildings

ADA Reader Door Operation

- Outside push plate will be disabled while the building is locked, a valid card reader will enable the push plate operation
- Timing controlled by access system using a BR3-X logic module
- Door lock power supplied by the access control system
- All equipment should be hardwired, Wireless push plates are not approved
- Push plates should be wired to existing working auto operator and a 18/4 is run to the to the access control junction box from push plates but not connected.

Locksets

OAK SECURITY OR BEST 9K
- Cylindrical
- Mortise (when approved by IDEAL)
- All to be 2 3/4" Backset unless otherwise noted

Cylinders
- Rim – Oak or 3216 (Schlage 20-002 cam)
- Mortise – Oak or 3215 (Schlage 20-001, B502-191 cam)

Keying & Cores
- Provided by Lehigh University
- Keyed trim suited to receive a Small Format Interchangeable Core (SFIC)

Classroom Function Locks are not approved and should not be used.

CYLINDRICAL LOCK Rm Type	Function Nomenclature to be used
Classroom	OAK 1CL3-DO-1-H2-A-626 or BEST 9K37T15DS3626
Bathroom	Push/Pull or OAK 1CL3-PR-0-H2-A-626 or BEST 9K30L 15DS3626
Exterior Entry	OAK 1CL3-ST-1-H2-A-626 or BEST 9K37D15DS3626
Office	OAK 1CL3-EN-1-H2-A-626 or BEST 9K37AB15DS3626
Conference Room	OAK 1CL3-DO-1-H2-A-626 or BEST 9K37T15DS3626
Mechanical Room	OAK 1CL3-ST-1-H2-A-626 or BEST 9K37D15DS3626

MORTISE LOCK Rm Type (when approved by IDEAL)	Function Nomenclature to be used
• Classroom	OAK 1ML-CSD-1-HF2-CL-626 (w/Inside Thumb Turn)
• Bathroom	Push/Pull or OAK 1ML-PCL-1-HF2-CL-626-IND
• Exterior Entry	OAK 1ML-STL-1-HF2-CL-626
• Office	OAK 1ML-END-1-HF2-CL-626
• Conference Room	OAK 1ML-DCD-1-HF2-CL-626
• Mechanical Room	OAK 1ML-STL-1-HF2-CL-626

Non-Electronic Door Hardware

Hinges
- McKinney
- Hager

Hinges Continuous
- Select
- Pemko

Hinges Spring
- Hager
- Ives

Manual Flush Bolts
- Hager
- Ives
- Don-Jo

Automatic and Self-Latching Flush Bolts
- Hager
- Ives

Push Plates, Pulls, Push Bars
- Hager
- Ives
- Rockwood
- Don-Jo

Kick Plates
- Hager
- Ives
- Rockwood
- Don-Jo

Wall Stops, Holders
- Hager
- Ives
- Rockwood
- Don-Jo

Floor Stops
- Hager
- Ives
- Rockwood
- Don-Jo

Items Managed by Facilities
(Could directly affect IDEAL hardware, review door hardware before door specs are selected to ensure compatibility)
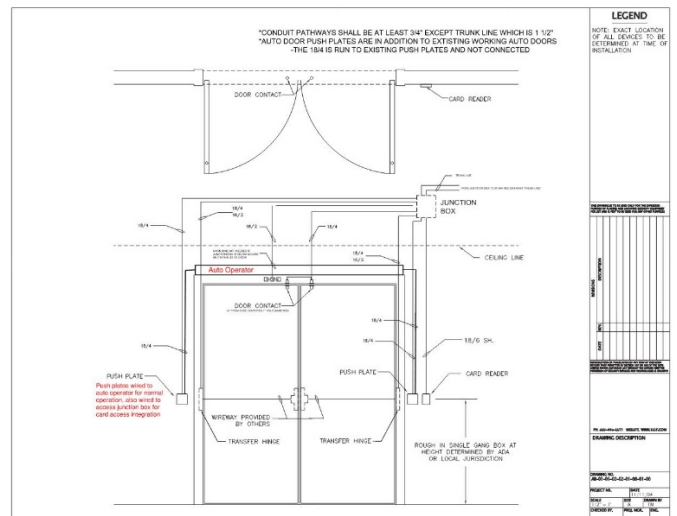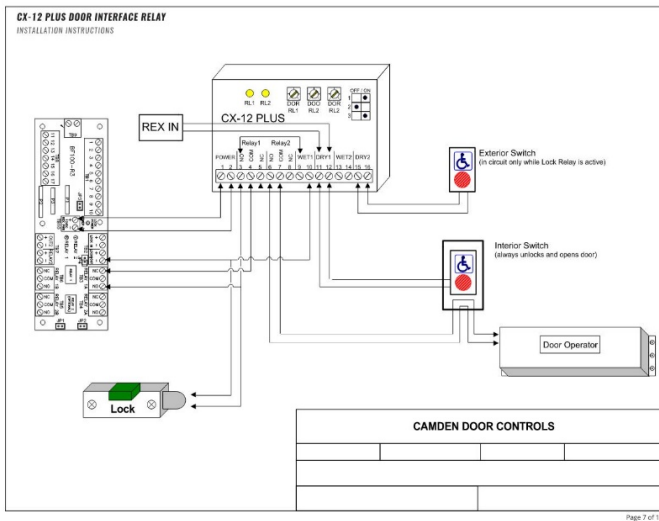
Doors and Frames (must be compatible with Lehigh standard hardware please confirm)
- Hollow metal
- Aluminum

- Storefront
- All Glass (Not approved for exterior doors or access control applications)
- Partial Glass door with header and footer (must have optional SFIC housing for mechanical keying, **proprietary hardware** not approved)

ADA Auto door Closers and Operators
- LCN- 9550 Senior Swing with key switch control (example)
- All equipment should be hardwired, (Wireless push plates are not approved)
- If Access Control is installed, door lock power will be supplied by the access control system
- Outside push plate will be disabled while the building is locked, a valid card reader will enable the push plate operation
- Timing controlled by access system using a BR3-X logic module
- If Access Control is installed, push plates should be wired to existing working auto operator and a 18/4 is run to the to the access control junction box from push plates but not connected.

Closers (Door) – no substitutes
- LCN

Closers (Floor) – no substitutes must be approved by facilities
- Rixson

Magnetic Hold Opens
- LCN

Weather stripping
- ?

Hardware Finish
- US26D – 626 (Chrome) **Standard**
- US11 – 643e (Aged Bronze)
- US10B – 613 (Oil rubbed Bronze)

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