Amount Paid	

PETITION FOR VARIANCE APPLICATION

Name of Owner Eric Hohol	Project Description Aspen UCS #3 Addition	Agent, architect, or engineering firm **Shive-Hattery**
Company (if applies) Danisco USA, Inc.		No. & St 316 W. Washington Ave
No. & Street 3322 Agriculture Drive	Tenant name (if any)	City, State, Zip Code Madison, WI 53703
City, Madison, WI. 53716	Building Address 3322 Agriculture Drive	Phone 608-318-7785
Phone 608-883-4033	Madison, WI 53716	Name of Contact Person Brad Hughes
e-mail Eric.Hohol@iff.com		e-mail bhughes@shive-hattery.com

1. The rule being petitioned reads as follows: (Cite the specific rule number and language. Also, indicate the nonconforming conditions for your project.)

    IBC 2603.4.1.3 requires that the maximum size of walk-in coolers or freezers in unsprinklered buildings shall be 400 square feet (SF) otherwise the walk-in cooler or freezer is required to be sprinklered. IFF is requesting that the proposed 4,966 SF -76°F freezer area be allowed to be unsprinklered.

2. The rule being petitioned cannot be entirely satisfied because:

    The freezer function requires a temperature of -76F which is well below typical fire protection equipment service rating. Reliability and effectiveness of systems at these temperatures is questionable and there are life safety concerns also.   See the attached document for additional information.

3. The following alternatives and supporting information are proposed as a means of providing an equivalent degree of health, safety, and welfare as addressed by the rule:

    See the attached document for additional information on the proposed approach. A similar variance was approved for the two existing ultra-cold freezers at this facility in approximately 2007 and 2010. A review of available fire protection technology did not identify new equipment/systems rated for use at the -76°F temperature.
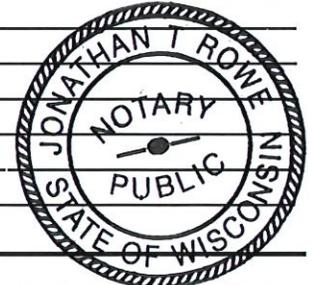
Note: Please attach any pictures, plans, or required position statements.

(Notary seal: JONATHAN T ROWE — NOTARY PUBLIC — STATE OF WISCONSIN)

VERIFICATION BY OWNER – PETITION IS VALID ONLY IF NOTARIZED AND ACCOMPANIED BY A REVIEW FEE AND ANY REQUIRED POSITION STATEMENTS.

Note: Petitioner must be the owner of the building. Tenants, agents, contractors, attorneys, etc. may not sign the petition unless a Power of Attorney is submitted with the Petition for Variance Application.

_Eric N. Hohol_____, being duly sworn, I state as petitioner that I have read the foregoing
Print name of owner

petition, that I believe it to be true, and I have significant ownership rights in the subject building or project.

Signature of owner *(signature)* PLANT Manager	Subscribed and sworn to before me this date: 26 February 2025
Notary public *(signature)* Jonathan T Rowe	My commission expires: 28 January 2029

NOTE: ONLY VARIANCES FOR COMMERCIAL CODES ARE REQUIRED TO BE NOTARIZED.

Danisco USA, Inc (IFF)
Petition For Variance

1. The rule petitioned reads as follows:

   IBC 2603.4.1.3 requires that the maximum size of walk-in coolers or freezers in unsprinklered buildings shall be 400 square feet (SF) otherwise the walk-in cooler or freezer is required to be sprinklered. IFF is requesting that the proposed 4,966 SF -76°F freezer area be allowed to be unsprinklered.

2. The rule being petitioned cannot be entirely satisfied because:

   The proposed freezer area is being used to inactivate bacteria cultures, which requires the temperature within the freezer to be maintained at -76°F. Typical fire protection equipment for freezer protection is rated for a service temperature around -40°F. This value takes into account FM Global's recommendation that the dew point of the air used in the dry sprinkler system be 30°F less than the freezer temperature. Air drying equipment is available to provide dew points of -100°F (approximately 30°F less than the freezer temperature), however, it is typically not provided and requires special engineering. Furthermore, questions regarding the reliability of the system due to ice plugs remain since most manufacturers of sprinkler equipment due not have considerable experience with operating equipment at these low temperatures. Also, if water is introduced into a dry pipe system during a fire condition and the fire area exceeds the operating head(s) the downstream water in the dry pipe may be frozen rendering the sprinkler system ineffective.

   Concerns also exist with regards to life safety at this temperature. If water is introduced into the space at the -76°F it could make egress difficult for occupants to due ice and could create the potential for exposure injuries. Firefighting efforts could be hampered due to the formation of ice prior to the deployment of hose streams due to a sprinkler system making it difficult to impossible for the fire department to extinguish a potential fire.

   The potential of accidental discharge of the sprinkler system creates a large business interruption liability. The accidental discharge of the sprinkler system in this freezer area would render millions of dollars of stored product unusable, create a loss of ultracold storage capacity that could exist for several months and potentially cost IFF millions of dollars in realized and potential lost revenue.

3. The following alternative(s) and supporting information are proposed as a means of providing an equivalent degree of health, safety or welfare as addressed by the rule:

   1) The sprinkler density above the freezer area and 15-ft beyond would be increased from 0.2 GPM/SF to 0.3 GPM/SF. The design density accounts for the presence of foam insulation as referenced in table 13.2.1 of NFPA 13 (2013 ed.) This foam insulation occupancy is defined as Extra Hazard Group One. Per NFPA 13 Figure 13.2.1, the occupancy design criteria is .30 GPM/2500 sq. ft.
   NFPA 13 section 11.2.3.1.4 (3) and All.2.3.1.4 (3) requires a minimum design area of 3000 sq. ft.

Therefore, the proposed design density for the sprinkler system, above the -76 degree cooler is 0.3 GPM/3000 sq. ft.

2) The surrounding building is constructed of non-combustible materials (metal liner panels and exposed steel structure).

3) Smoke detection would be added to the freezer area although not required by code. The system will consist of an air sampling fire detector system tested to -100°F.

4) Installation of heat detection within the freezer. The proposed freezer's temperature is currently monitored for maintenance purposes. This system would have two alarm set points: one that would notify maintenance and another that would notify the fire department through a central station.

5) The freezer areas exit access travel distances are less than 200 feet with a common path of egress travel less than 100 feet per the Wisconsin Commercial Building Code (SPS 362 – 2015 IBC).

6) Oxygen sensors with audible and visual alarms are proposed to be installed if the oxygen level drops to 19.5%.

7) Panic buttons interfaced with annunciation at all doors and remote corners will be installed.

8) Installation of emergency and exit lights within the freezer and with battery backup.

9) Employees will be equipped with man-down sensors that will alarm when no movement is detected over a finite period.

10) Employee training and procedure documentation to include entry by trained employees only.

The following list of attachments are part of the petitioner's statements and are included as part of this package.

A. Existing and proposed building addition drawings
B. Letter of support from IFF property insurance provider
C. Insulated metal panel information
D. Smoke detection information
E. Oxygen sensor information
F. Lone worker sensor information
G. Electrical equipment cut sheets (wire, lights, emergency lights, panic hardware)
H. Employee training and procedure guidelines

Attachment A.
Building Drawings Showing Proposed and Existing Are Provided in a Separate File

Attachment B.
Letter of Support From IFF Property Insurance Provider

Brad Hughes

Internal

Margo,

Marsh is not the authority having jurisdiction in this case. We are responsible for providing advice regarding loss control and fire protection matters as they relate to IFF's property insurance program.

In this case we have already advised on the existing ultra-cold storage warehouse and have opined that sprinkler protection was not necessary or advisable for property insurance purposes. We based that conclusion on the following factors:

- The ultra-cold storage warehouse is located in a sprinkler protected building. This acceptance is based on the fact that the protection over and adjacent to the cooler will be designed to protect a fire involving the foam insulated walls of the ultra-cold storage warehouse.
- The insulation will be fire rated PIR.
- There are limited ignition sources in the ultra-cold storage warehouse (only lighting).
- Any penetrations through the insulated walls for sprinkler piping would ultimately lead to problems maintaining the internal temperature and probably excessive condensation on the sprinkler piping as it transitions from the cold area to the hot.
- The combustible loading in the ultra-cold storage warehouse is relatively low.
- To our knowledge, there are no sprinkler heads that are approved for environments where the temperature is -76°F. Any sprinklers installed in that environment would therefore be in violation of the manufacture listing.
- The Madison fire department granted a variance on two prior occasions (2007 and 2009) based on certain caveats which we assume will be the same for this occasion

Since the new ultra-cold storage warehouse is to be the same as the existing, we would extend our acceptance of the lack of sprinklers on the same basis.

Just to confirm, this acceptance is for property insurance purposes only and does not address any personnel safety or regulator/AHJ issues.

Please reach out if you have any other questions.

Regards

Derek

Derek Waddington, Senior Vice President, Consulting Solutions/ Marsh Advisory
Marsh 3031 N. Rocky Point Drive West, Suite 700, Tampa, FL 33607
t: + 1 813 207 5100 | m: +1 860 597 2094
www.marsh.com | Follow Marsh on: Twitter | LinkedIn | Facebook | YouTube

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Internal

From: Dagpo, Kunga <Kunga.Dagpo@marsh.com>
Sent: Monday, November 11, 2024 11:35 AM
To: Margo Anderson <Margaret.Anderson@iff.com>
Cc: Waddington, Derek A <Derek.A.Waddington@marsh.com>
Subject: RE: Letter Supporting Fire Protection Variance

Hi Margo,

I am currently on a site visit this week so I have cc'ed here Derek Waddington who is the main project lead for IFF.

Derek, would you be able to take a look at this request from Margo?

Thank you.

Regards,

Kunga C. Dagpo – Senior Managing Consultant, Consulting Solutions, Marsh Advisory
1166 Avenue of the Americas, New York NY 10036
Office +1 212 345-0511 | Mobile +1 917 952-3332
www.marsh.com │ Follow Marsh on: Twitter | LinkedIn | Facebook | YouTube

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From: Margo Anderson <Margaret.Anderson@iff.com>
Sent: Monday, November 11, 2024 10:56 AM
To: Dagpo, Kunga <Kunga.Dagpo@marsh.com>
Subject: Letter Supporting Fire Protection Variance

> **CAUTION:** This email originated outside the company. Do not click links or open attachments unless you are expecting them from the sender.

Hello Kunga

Thank you for your work last year to provide an updated Property Risk Evaluation Report for the Madison Site. Your support is now needed to obtain a fire protection variance for an expansion project slated to begin Q2 of next year.

The proposed 11,000 sq ft addition will enable continued growth of the Dairy Cultures Business; it includes a 5,000 sq ft ultra-cold storage warehouse operating at -76°F similar to the others constructed in 2007 and 2010. The freezer will have smoke and heat detection; the main building will include sprinklers above and around the cold box. This expansion will attached to the west side of the existing Culture Plant Building as shown in the plan below.

I'm asking for a letter indicating your support for the variance; this will be attached to the application for variance submitted to the City of Madison.   Our first step in the permitting process begins Dec 13th therefore a letter of support is requested by that time. Please confirm if this is possible and if you need any detailed information to review such as engineered drawings.

Thanks for your continued support of the Madison Site and the Business.

FIRST FLOOR LIFE SAFETY PLAN
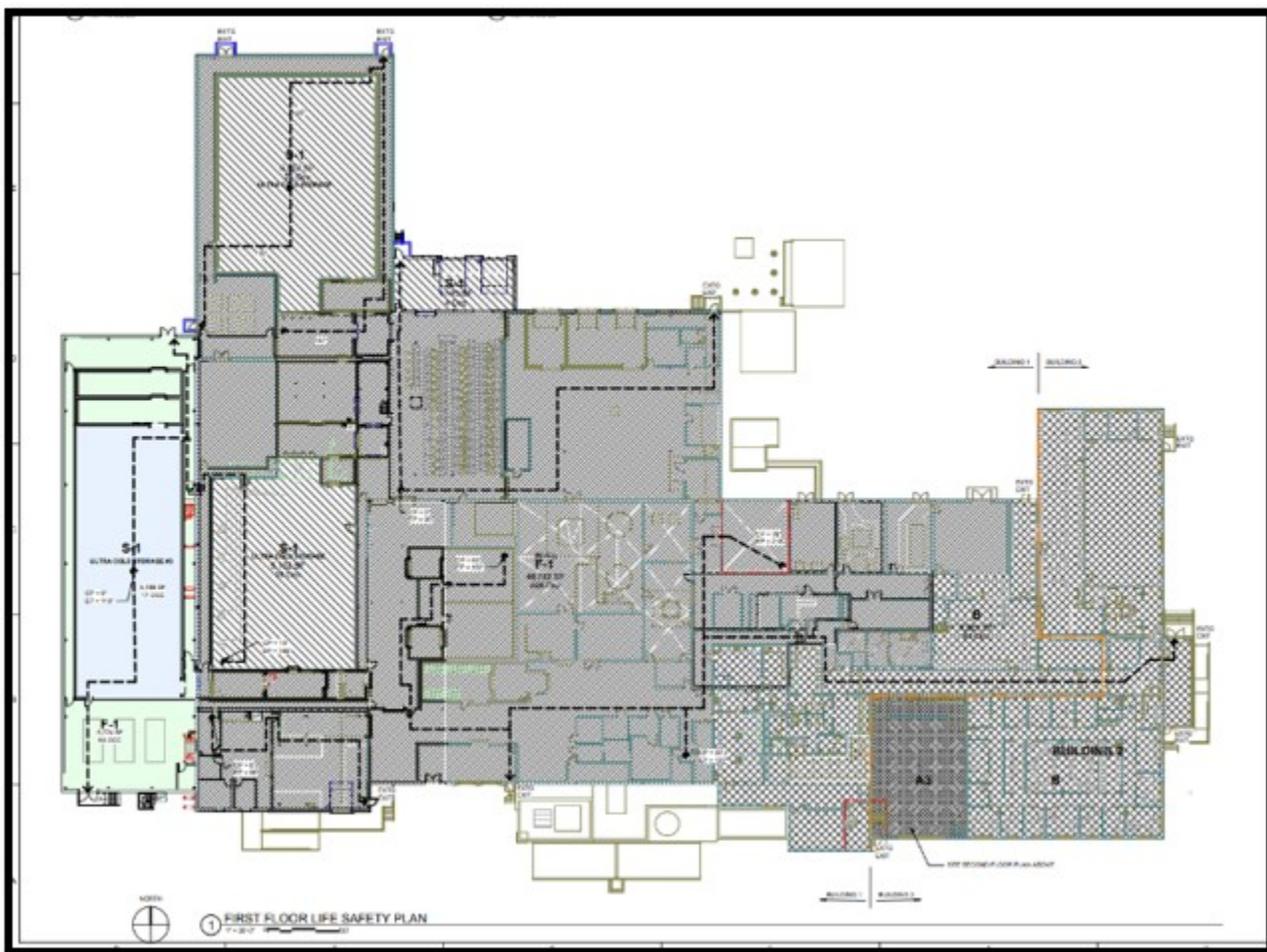
Margo Anderson
Project Manager
margaret.anderson@iff.com

phone (mobile) 815-209-8500

Attachment C.
Insulated Metal Panel Information

Controlled Environment Systems
North America

QuadCore®
KS Shadowline Interior
Data Sheet

1 Superior
FIRE
Protection

2 Unrivaled
THERMAL
Efficiency

3 Unmatched
HEALTH & WELLNESS
Certification

4 30-Year Thermal
PERFORMANCE
Warranty

POWERED BY
QuadCore®
TECHNOLOGY

Kingspan®

QuadCore® KS Shadowline Interior Data Sheet

Insulated Interior Wall and Ceiling Panel System

Product Specification

Insulation core:	QuadCore® Technology
Profile:	Exterior: Shadowline Interior: Shadowline
Embossing:	Exterior: Stucco or non-embossed Interior: Stucco or non-embossed
Gauge:	Exterior: 26, 24, 22 ga Interior: 26, 24, 22 ga
Width:	45 ³/₈"
Thickness:	2", 2 ³/₄", 3", 4", 5", 6", 8"
Length:	8' - 53'
Orientation:	Vertical
R-value:	≈ 8 per inch per ASTM C518 @ 75°F mean temperature ≈ 9 per inch per ASTM C518 @ 35°F mean temperature

Class-leading performance in thermal, fire resistance and health & wellness

Interior face — Shadowline
Exterior face — Shadowline
2" – 8"
45 ³/₈" coverage (1153mm)
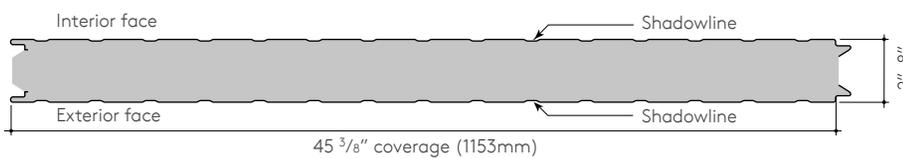
A premium engineered wall/ceiling system for interior applications. Specially designed to meet today's high performance standards in a wide variety of environments.

Applications

KS Shadowline Interior panels with QuadCore® are ideal for interior walls and ceilings in cold storage buildings, food and meat processing plants, critical temperature and controlled environment areas as well as in medical or pharmaceutical facilities. The superior engineered joint assures a tight, well designed vapor barrier in enclosures of any size.

Design Features

KS Shadowline Interior panels with QuadCore® utilize a superior joint design with a caulked seal provision that ensures a tight, well designed vapor barrier in enclosures of any size. Panels are produced in the attractive Shadowline stucco embossed or smooth profiles on both the exterior and interior face. Panel coverage is available in standard 45 ³/₈" width.

Customer Options

Choose from several stock colors and USDA approved finishes, or select a finish to match your needs. For interior heavy wash down environments, CLEAN*safe* 120 Antibacterial PVC as well as stainless steel facings are available.

Member

CEBA
Controlled Environment Building Association

QuadCore® KS Shadowline Interior Data Sheet

Insulated Interior Wall and Ceiling Panel System

Performance Testing and Approvals

Kingspan insulated panels featuring QuadCore® Technology meet specific building envelope performance criteria and requirements stipulated by US and Canadian building codes.

Test	Procedure	Results
Fire	FM 4880	Passed: Class 1 Fire Rating of Building Panels or Interior Finish Materials*
	FM 4882	Passed: Smoke Sensitive Occupancies Interior and Exterior Use*
	ASTM E84	Flame Spread: 25 or Less / Smoke Developed: 90 or Less
	CAN/ULC-S102	Flame Spread: 20, Smoke Developed: 45 for panel insulation core
	CAN/ULC-S138	Passed: Fire growth of foamed plastic insulated building panels in a full scale room configuration
	NFPA 259	Tested for potential heat of building materials
Structural	ASTM E72	Vacuum chamber tested. Panel load / span and deflection tables are available

Thermal Transmission — ASTM C518

Thermal Performance at 35°F mean temperature		Thermal Performance at 75°F mean temperature	
Thickness	R-Value	Thickness	R-Value
2	18	2	16
2.75	24.75	2.75	22
3	27	3	24
4	36	4	32
5	45	5	40
6	54	6	48
8	72	8	64

Test	Procedure	Results
Bond Strength	ASTM D1623	Panels tested for tensile bond strength of metal to foam
		Sample placed in an autoclave device and pressurized to 2 PSI at 218°F for 2½ hours
Skin Delamination		No skin delamination with direct pull off pressure up to 1188 psf
Regional Approvals	City of LA (LADBS)	CCRR 0567; FB 3080

*Thickness: 2"-8", Width: 45", Min. panel length: 8', Min. gauge: Exterior 26 ga, Interior 26 ga.
For FM compliance, systems must be installed in accordance with FM installation specifications as detailed on ApprovalGuide.com.
Please contact technical.NA@kingspanpanels.com for detailed information or refer to ApprovalGuide.com.

FM APPROVED

Contact Details

USA

DeLand, FL: 877-638-3266
Modesto, CA: 800-377-5110

info.NA@kingspanpanels.com
www.kingspanpanels.us

[Latest version here](#)

Canada

Caledon, ON: 866-442-3594
Langley, BC: 877-937-6562

info.NA@kingspanpanels.com
www.kingspanpanels.ca

[Latest version here](#)

For the most up to date version of this document, please scan the QR codes above or click the link.

Kingspan®

Attachment D.
Smoke Detection Information

VESDA-E VEP
VEP-A00-1P, VEP-A00-P, VEP-A10-P

◆ **xtralis**®

The VESDA-E VEP series of smoke detectors bring the latest and most advanced detection technology to provide very early warning and the best nuisance alarm rejection to a wide range of applications. Built on the Flair detection technology and years of application experience, VEP detectors achieve consistent performance over their lifetime via absolute calibration. In addition, the VEP delivers a range of revolutionary features that provide user value.

Flair Detection Technology

Flair is the revolutionary detection chamber that forms the core of the VESDA-E VEP, providing higher stability and increased longevity. Direct imaging of the sampled particles using a CMOS imager combined with multiple photo-diodes allows better detection and fewer nuisance alarms.

Installation, Commissioning and Operation

VESDA-E VEP is equipped with a powerful aspirator that enables use of a total of 130m (427ft) of sampling pipe in the one pipe model and 560m (1,837ft) of pipe in the four pipe model. Out of box operation is made possible with AutoConfig which allows airflow normalisation and AutoLearn Smoke and Flow to be initiated from within the detector. VEP is fully supported by the ASPIRE and Xtralis VSC software applications which facilitate ease of pipe network design, system commissioning and maintenance.

VESDAnet™

VESDA devices communicate on VESDAnet which provides a robust bi-directional communication network allowing continued redundant operation even during single point wiring failures. VESDAnet enables primary reporting, centralized configuration, control, maintenance and monitoring.

Ethernet connectivity

VESDA-E detectors offer connectivity to corporate networks via Ethernet, allowing for devices installed with Xtralis monitoring and configuration software to connect to the detector.

Backward Compatibility

VESDA-E VEP is compatible with existing VESDA installations. The detector occupies the same mounting footprint, pipe, conduit and electrical connector positioning as VESDA VLP. VEP is also compatible with existing VESDAnet installations allowing monitoring of both VESDA-E and legacy detectors via the latest VSC and VSM4 applications.

Features
- Suitable for Class 1 Division 2 applications - Groups A, B, C & D
- One and four pipe models for different applications
- Flair detection technology delivers reliable very early warning in a wide range of environments with minimal nuisance alarms
- Short wavelength laser-based detection:
  - High sensitivity from small particle light scattering
  - No drift compensation required since focused light directed at target gives low backgrounds
  - High stability with temperature and time
- Multi stage filtration and optical protection with clean air barriers ensures lifetime detection performance
- Four alarm levels and a wide sensitivity range deliver optimum protection for the widest range of applications
- Intuitive LCD icon display provides instant status information for immediate response
- Flow fault thresholds per port accommodate varying airflow conditions
- Smart on-board filter retains dust count and remaining filter life for predictable maintenance
- Extensive event log (20,000 events) for event analysis and system diagnostics
- AutoLearn™ smoke and flow for reliable and rapid commissioning
- Referencing to accommodate external environmental conditions to minimise nuisance alarms

- Backward compatible with VLP and VESDAnet
- Ethernet for connectivity with Xtralis software for configuration, secondary monitoring and maintenance
- USB for PC configuration, and firmware upgrade using a memory stick
- Two programmable GPIs (1 monitored) for flexible remote control
- Field replaceable sub-assemblies enable faster service and maximum uptime

Listings / Approvals
- CSFM
- FM
- VdS
- NF-SSI (www.marque-nf.com)
- CE
- UKCA
- ActivFire
- CCC
- EN 54-20, ISO 7240-20
  Four Pipe VEP
  - Class A (40 holes / Fire 1 = 0.028% obs/m)
  - Class B (80 holes / Fire 1 = 0.027% obs/m)
  - Class C (100 holes / Fire 1 = 0.056% obs/m)
  Classification of any configuration is determined using ASPIRE.

Regional approvals listings and regulatory compliance vary between product models. Refer to www.xtralis.com for the latest product approvals matrix.

VESDA-E VEP
TECHNICAL SPECIFICATIONS

Specifications

	One Pipe VEP	Four Pipe VEP			
Supply Voltage	18-30 VDC (24 V Nominal)				
Power Consumption @ 24VDC	VEP-A00-1P	VEP-A00-P		VEP-A10-P	
Aspirator Setting	Fixed	1	5	1	5
Power (Quiescent)	8.8 W	7.0 W	9.0 W	8.0 W	10.0 W
Power (In Alarm)	9.6 W	7.8 W	9.8 W	8.8 W	10.8 W
Dimensions (WHD)	350 mm x 225 mm x 135 mm (13.8 in x 8.9 in x 5.3 in)				
Weight	4.4 kg (9.7 lbs)	4.4 kg (9.7 lbs)		4.5 kg (9.9 lbs)	
Operating Conditions	Ambient: 0°C to 38°C (32°F to 100°F) Sampled Air: -20°C to 60°C (-4°F to 140°F) * Humidity: 5% to 95% RH, non-condensing *Sampled Air temperature shall reach Ambient Detector temperature upon entry into Detector. Refer to Xtralis Design Guides & Application Notes for sampled air pre-conditioning.*				
Area Coverage	1,000 m^2 (10,760 sq. ft)	2,000 m^2 (21,520 sq. ft)			
Min. airflow per pipe	15 l/m				
Pipe Length (Linear)	100 m (328 ft)	280 m (919 ft)			
Pipe Length (Branched)	130 m (427 ft)	560 m (1,837 ft)			
Pipe lengths depending on number of pipes in use	1 Pipe	1 Pipe	2 Pipe	3 Pipe	4 Pipe
	100 m (328 ft)	110 m (361 ft)	100 m (328 ft)	80 m (262 ft)	70 m (230 ft)
StaX	PSU				
No. of holes (A/B/C)	30/40/45	40/80/100			
Computer design tool	ASPIRE				
Pipe	Inlet: External diameter 25 mm or 1.05 in (3/4 in IPS) Exhaust: External diameter 25 mm or 1.05 in (3/4 in IPS) via adaptor				
Relays	7 programmable relays (latching or non-latching states) Contacts rated 2 A @ 30 VDC (Resistive)				
IP rating	IP40				
Cable access	4 x 26 mm (1.02 in) cable entries				
Cable termination	Screw Terminal blocks 0.2–2.5 sq mm (24–14 AWG)				
Measurement Range	0.000 to 32% obs/m (0.0000 to 11.09% obs/ft)				
Sensitivity Range	0.005 to 20% obs/m (0.0015% to 6.575% obs/ft)				
Threshold setting range	Alert: 0.005% to 2.0% obs/m (0.0015% to 0.614% obs/ft) Action: 0.005% to 2.0% obs/m (0.0015% to 0.614% obs/ft) Fire1: 0.010% to 2.0% obs/m (0.0030% to 0.614% obs/ft) Fire2: 0.020% to 20.0% obs/m (0.0061% to 6.575% obs/ft)				
Software features	Event log: Up to 20,000 events Smoke level, user actions, alarms and faults with time and date stamp AutoLearn: Detector learns Alarm Thresholds and Flow Fault thresholds by monitoring the environment.				

Spare Parts

VSP-956	VESDA-E Flow Sensor Manifold	VSP-964-03	VESDA-E Smoke Detection Chamber - MK3
VSP-956-04*	VESDA-E Flow Sensor Manifold	VSP-964-04 *	VESDA-E Smoke Detection Chamber - MK4
VSP-960	VESDA-E Mounting Bracket	VSP-965	VESDA-E Sampling Module
VSP-961	VESDA-E Exhaust adaptor US	VSP-968	VESDA-E VEP-A00-P/1P Front Cover - Plastic - LEDs
VSP-962	VESDA-E Filter	VSP-969	VESDA-E VEP-A10-P Front Cover - Plastic - LCD - 3.5" Display
VSP-962-20	VESDA-E Filter - 20 Pieces	VSP-969-04 *	VESDA-E VEP-A10-P Front Cover - Plastic - LCD - 3.5" Display
VSP-963	VESDA-E Aspirator		

Spare parts for GA4 only.

3.5" Display

LED	Description
	Fire 2
	Fire 1
▲	Action
△	Alert
▣	Disabled
!	Fault
I	Power

Home Page

Icon on Display	Description
	Smoke and Alarm Threshold Levels
✓	Detector OK
	Detector Fault
	Aspirator Fault
≈	Airflow Fault
	Power Fault
	Filter Fault
	Smoke Chamber Fault
	VESDAnet Fault
	StaX Module Fault

Ordering Information

Ordering Code	Description
VEP-A00-1P	VESDA-E VEP with LEDs, 1 pipe, Plastic Enclosure
VEP-A00-P	VESDA-E VEP with LEDs, 4 pipe, Plastic Enclosure
VEP-A10-P	VESDA-E VEP with 3.5" Display, 4 pipe, Plastic Enclosure

Approvals Compliance

Please refer to the Product Guide for details regarding compliant design, installation and commissioning.

Attachment E.
Oxygen Sensor Information

ULTIMA® X5000 Gas Monitor

The future looks bright.

MSA
The Safety Company

Simple retrofits have identical footprint and wiring to ULTIMA X Gas Monitor series.

Bluetooth® wireless technology allows mobile device to act as HMI screen and controller.

X/S Connect App

Reduce setup time by at least 50% with the X/S Connect App.

GET IT ON Google Play | Download on the App Store

Intuitive display features new design equipped with organic LED (OLED) display, with full word text in 9 languages. Bright green, yellow, and red status LEDs for extreme visibility.
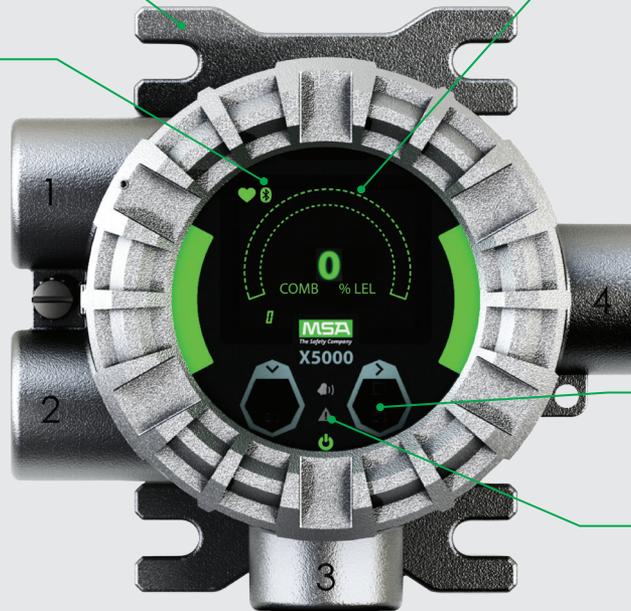
Industry-first, touch-button interface provides intuitive, tool-free user experience.

Instrument status indicators illuminate power, fault, and alarm conditions.

Advanced Sensor Technology

POWERED BY
XCell® SENSORS

WITH
TruCal® TECHNOLOGY

- Patented XCell H_2S and CO Sensors with TruCal technology extend calibration cycles for as long as 2 years, actively monitor sensor integrity, and compensate for environmental factors and electrochemical sensor drift.
  - **Diffusion Supervision** sends acoustic signal every 6 hours to check that sensor inlet isn't obstructed so gas can reach the sensor.
  - Worry-free operation—automatically self-checks four times per day.
- 3-year warranty and 5-year expected life for XCell Sensors.
- **Dual sensor capability** doubles sensing power with half the footprint of a single gas sensor transmitter.
- **SafeSwap** enables safe and quick XCell Sensor replacement without powering off gas detector.

SafeSwap®

Applications

- Chemical
- Oil and gas
- Petrochemical
- Utilities
- Wastewater
- General industry

WE KNOW WHAT'S AT STAKE.

				Response Time*				Operating Temperature					
Gas	Default Range	Selectable Full Scale Range	Resolution	T50	T90	Repeatability	Zero Drift	Min.	Max.	Sensor Type	Sensor Life	Warranty	Classification
Ammonia - 100	0 - 100 ppm	25 - 100 ppm	0.1 ppm	< 20 Sec	< 60 Sec	< ±1%	< 1% FS / Month	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 2
Ammonia - 1000	0 - 1000 ppm	190 - 1000 ppm	10 ppm	< 20 Sec	< 300 Sec	< ±15%	< 1% FS / Month	-30°C (-22°F)	50°C (122°F)	Echem	2 Years	1 Year	Div/Zone 2
Carbon Monoxide - 100	0 - 100 ppm	10 - 1000 ppm	1 ppm	< 3 Sec	< 9 Sec	< ±1%	< 1% FS / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Carbon Monoxide - 1000	0 - 1000 ppm	10 - 1000 ppm	1 ppm	< 3 Sec	< 9 Sec	< ±1%	< 1% FS / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Carbon Monoxide - 500	0 - 500 ppm	10 - 1000 ppm	1 ppm	< 3 Sec	< 9 Sec	< ±1%	< 1% FS / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Carbon Monoxide H_2 Resistant	0 - 100 ppm	10 - 1000 ppm	1 ppm	< 3 Sec	< 9 Sec	< ±1%	< 1% FS / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Chlorine - 5	0 - 5 ppm	1 - 20 ppm	0.1 ppm	< 5 Sec	< 12 Sec	< ±1%	< 1% FS / Month	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 2
Chlorine - 10	0 - 10 ppm	1 - 20 ppm	0.1 ppm	< 5 Sec	< 12 Sec	< ±1%	< 1% FS / Month	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 2
Chlorine - 20	0 - 20 ppm	1 - 20 ppm	0.1 ppm	< 5 Sec	< 12 Sec	< ±1%	< 1% FS / Month	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 2
Chlorine Dioxide	0 - 3 ppm	0.5-3.0 ppm	0.01 ppm	< 12 Sec	< 30 Sec	< +15%	< 1% FS / Month	-40°C (-40°F)	50°C (122°F)	XCell	5 Years	3 Years	Div/Zone 2
Ethylene Oxide	0 - 10 ppm	1 - 10 ppm	0.1 ppm	< 50 Sec	< 140 Sec	< ±15%	< 2% FS/Month	-20°C (-4°F)	40°C (104°F)	Echem	2 Years	1 Year	Div/Zone 2
Hydrogen	0 - 1000 ppm	250 - 1000 ppm	10 ppm	< 40 Sec	< 185 Sec	< ±10%	< 1% FS / Month	-30°C (-22°F)	50°C (122°F)	Echem	2 Years	1 Year	Div/Zone 1
Hydrogen Chloride	0 - 50 ppm	25 - 50 ppm	1 ppm	< 30 Sec	< 120 Sec	< ±35%	< 1% FS / Month	-30°C (-22°F)	40°C (104°F)	Echem	2 Years	1 Year	Div/Zone 2
Hydrogen Cyanide	0 - 50 ppm	25 - 50 ppm	1 ppm	< 8 Sec	< 30 Sec	< ±15%	< 1% FS / Month	-20°C (-4°F)	40°C (104°F)	Echem	2 Years	1 Year	Div/Zone 1
Hydrogen Fluoride	0 - 10 ppm	5 - 10 ppm	0.1 ppm	< 60 Sec	< 90 Sec	< ±15%	< 2% FS / Month	0°C (32°F)	50°C (122°F)	Echem	2 Years	1 Year	Div/Zone 2
Hydrogen Sulfide - 10	0 - 10 ppm	10 - 100 ppm	0.1 ppm	< 7 Sec	< 23 Sec	< ±1%	< 1% FS / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Hydrogen Sulfide - 50	0 - 50 ppm	10 - 100 ppm	0.1 ppm	< 7 Sec	< 23 Sec	< ±1%	< 1% FS / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Hydrogen Sulfide - 100	0 - 100 ppm	10 - 100 ppm	0.1 ppm	< 7 Sec	< 23 Sec	< ±1%	< 1% FS / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Hydrogen Sulfide - 500	0 - 500 ppm	20 - 500 ppm	1 ppm	< 20 Sec	< 60 Sec	< ±10%	< 1% FS / Month	-40°C (-40°F)	50°C (122°F)	Echem	2 Years	1 Year	Div/Zone 1
Nitrogen Dioxide	0 - 10 ppm	1.5 - 10 ppm	0.1 ppm	< 30 Sec	< 60 Sec	< ±10%	< 1% FS / Month	-40°C (-40°F)	50°C (122°F)	Echem	2 Years	1 Year	Div/Zone 2
Nitrogen Oxide	0 - 100 ppm	2.5 - 100 ppm	0.5 ppm	< 5 Sec	< 20 Sec	< ±15%	< 1% FS / Month	-30°C (-22°F)	50°C (122°F)	Echem	2 Years	1 Year	Div/Zone 1
Oxygen	0 - 25%	5 - 25%	0.10%	< 6 Sec	< 11 Sec	< ±1% Vol	< 0.2 % Vol / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Oxygen (FM)	0 - 25%	5 - 25%	0.10%	< 6 Sec	< 11 Sec	< ±1% Vol	< 0.2 % Vol / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Oxygen, Low	0 - 25%	2 - 25%	0.10%	< 10 Sec	< 30 Sec	< ±10%	< 1% FS / Month	-30°C (-22°F)	50°C (122°F)	Echem	2 Years	1 Year	Div/Zone 1
Sulfur Dioxide - 100	0 - 100 ppm	25 - 100 ppm	1 ppm	< 10 Sec	< 30 Sec	< ±15%	< 1% FS / Month	-30°C (-22°F)	50°C (122°F)	Echem	2 Years	1 Year	Div/Zone 2
Sulfur Dioxide - 25	0 - 25 ppm	5 - 25 ppm	0.1 ppm	< 3 Sec	< 6 Sec	< ±1%	< 1% FS / Month	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 2

*Typical response at standard temperature and pressure test conditions

ULTIMA X5000 Gas Monitor: Sensor Specifications

MSA
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XCell Catalytic Bead Sensors

Gas	Default Range	Selectable Full Scale Range	Resolution	Response Time*		Repeatability	Zero Drift	Operating Temperature		Sensor Type	Sensor Life	Warranty	Classification
				T50	T90			Min.	Max.				
Methane (5.0%)	0 - 100% LEL	20 - 100% LEL	1%	< 10 Sec	< 22 Sec	< ±1% LEL	< 5% LEL / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Propane (2.1%)	0 - 100% LEL	20 - 100% LEL	1%	< 10 Sec	< 22 Sec	< ±1% LEL	< 5% LEL / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Heptane (1.05%)	0 - 100% LEL	20 - 100% LEL	1%	< 10 Sec	< 22 Sec	< ±1% LEL	< 5% LEL / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Nonane (0.8%)	0 - 100% LEL	20 - 100% LEL	1%	< 10 Sec	< 22 Sec	< ±1% LEL	< 5% LEL / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Hydrogen (4.0%)	0 - 100% LEL	20 - 100% LEL	1%	< 10 Sec	< 22 Sec	< ±1% LEL	< 5% LEL / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Methane (4.4% EN)	0 - 100% LEL	20 - 100% LEL	1%	< 10 Sec	< 22 Sec	< ±1% LEL	< 5% LEL / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Propane (1.7% EN)	0 - 100% LEL	20 - 100% LEL	1%	< 10 Sec	< 22 Sec	< ±1% LEL	< 5% LEL / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Heptane (0.85% EN)	0 - 100% LEL	20 - 100% LEL	1%	< 10 Sec	< 22 Sec	< ±1% LEL	< 5% LEL / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1
Nonane (0.7% EN)	0 - 100% LEL	20 - 100% LEL	1%	< 10 Sec	< 22 Sec	< ±1% LEL	< 5% LEL / Year	-40°C (-40°F)	60°C (140°F)	XCell	5 Years	3 Years	Div/Zone 1

ULTIMA XIR Plus Infrared Sensors

Gas	Default Range	Selectable Full Scale Range	Resolution	Response Time*		Repeatability	Zero Drift	Operating Temperature		Sensor Life	Warranty	Classification
				T50	T90			Min.	Max.			
XIR+ 0-100% LEL Ethanol	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Ethylene Oxide	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Gasoline Hexane	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Hexane	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Isopropanol	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Methane (5%)	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Methyl Methacrylate	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Propane (2.1%)	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Ethanol EN	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Ethylene Oxide EN	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Gasoline Hexane EN	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Methane (4.4%) EN	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ 0-100% LEL Propane (1.7%) EN	0 - 100% LEL	20 - 100% LEL	1%	—	< 2 Sec	< ±1% LEL	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ Carbon Dioxide (2%)	0 - 2% Vol	0.4 - 2%	0.05%	< 3 Sec	< 6 Sec	< ±1%	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1
XIR+ Carbon Dioxide (5%)	0 - 5% Vol	1 - 5%	0.05%	< 3 Sec	< 6 Sec	< ±1%	N/A	-40°C (-40°F)	60°C (140°F)	10+ Years	10 Years	Div/Zone 1

*Typical response at standard temperature and pressure test conditions

ULTIMA® X5000 Gas Monitor

Specifications

Product Specifications		
COMBUSTIBLE GAS SENSOR TYPE	Catalytic Bead (XCell combustible) Infrared (XIR Plus)	
TOXIC GAS & OXYGEN SENSOR TYPE	**XIR PLUS**	Carbon Dioxide (CO_2)
	XCell Toxic	Ammonia (NH_3), Carbon Monoxide (CO), Carbon Monoxide (CO) H_2-resistant, Hydrogen Sulfide (H_2S), Chlorine (Cl_2), Chlorine Dioxide (ClO_2) Sulfur Dioxide (SO_2)
	XCell O_2	Oxygen (O_2)
	Electrochem.	Ammonia (NH_3), Ethylene Oxide (ETO) Hydrogen (H_2), Hydrogen Chloride (HCl), Hydrogen Cyanide (HCN), Hydrogen Fluoride (HF) Nitric Oxide (NO), Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2)
SENSOR MEASURING RANGES	**Combustible**	0-100% LEL
	CO_2	0-2%, 0-5% Vol
	CO	0-100, 0-500, 0-1000 ppm
	CO, H_2-resistant	0-100 ppm
	Cl_2	0-5, 0-10, 0-20 ppm
	ClO_2	0-3 ppm
	ETO	0-10 ppm
	H_2	0-1000 ppm
	HCl	0-50 ppm
	HCN	0-50 ppm
	HF	0-10 ppm
	H_2S	0-10, 0-50, 0-100, 0-500 ppm
	NH_3	0-100, 0-1000 ppm
	NO	0-100 ppm
	NO_2	0-10 ppm
	O_2	0-25%
	SO_2	0-25, 0-100 ppm
APPROVALS CLASSIFICATION	*Markings vary by component.* *See manual for specific component markings.*	
DIVISIONS (US/CAN)	Class I, II, III; Div 1 & 2, T4/T5/T6	
ZONES (GLOBAL)	Ex db nA IIC T5 Gb (Class I, Zone 1/Zone2) Ex tb IIIC T85°C Db (Class II, Zone 21)	
ENCLOSURE RATING	Type 4X, IP66	
WARRANTY	**X5000 transmitter**	2 years
	XIR PLUS	10 years source, 5 years electronics
	XCell Sensors	3 years
	Electrochemical Sensors	Varies by gas
APPROVALS	CSA, FM*, ATEX, IECEx, INMETRO, DNV-GL Marine, CE Marking. SIL 2 suitable. Complies with C22.2 No. 152, FM 6320	

Environmental Specifications		
OPERATING TEMPERATURE RANGE	**XCell**	-40°C to +60°C
	Electrochem.	*See page 2*
	XIR PLUS	-40°C to +60°C
RELATIVE HUMIDITY (NON-CONDENSING)	**XCell toxics & O_2**	10-95%
	XCell combustible	0-95%
	XIR PLUS	15-95%

Mechanical Specifications			
INPUT POWER	11 to 30 VDC, 3 wire		
SIGNAL OUTPUT	Dual 4-20 mA current source, HART		
BLUETOOTH (OPTIONAL)	Bluetooth Low Energy (BLE) v4.3 or higher		
RELAY RATINGS	5 A @ 30 VDC; 5 A @ 220 VAC (3X) SPDT - fault, warn, alarm		
RELAY MODES	Common, discrete, horn		
NORMAL MAX POWER		*Without Relays*	*With Relays*
	XIR PLUS	5.7 W	6.7 W
	XCell combustible	3.9 W	4.9 W
	XCell Toxic & O_2	1.8 W	2.8 W
	XIR PLUS & XCell combustible	9.9 W	10.9 W
	XIR PLUS & XCell toxic or O_2	6.0 W	7.0 W
	Dual XIR PLUS	10.6 W	11.6 W
	Dual XCell toxic & O_2	2.6 W	3.6 W
	Dual XCell combustible	9.6 W	10.6 W
	Dual XCell comb. & XCell toxic or O_2	4.3 W	5.3 W
EMC DIRECTIVE	Complies with EN 50270, EN 61000-6-4, EN 61000-6-3		
DISPLAY	Organic LED (multi-lingual) with contrast ratio of 2000:1 and view angle of 160°		
HART	HART 7, HART device description language available		
FAULTS MONITORED	Low supply voltage, RAM checksum error, flash checksum error, EEPROM error, internal circuit error, relay, invalid sensor configuration, sensor faults, general system		
CABLE REQUIREMENTS	3-wire shielded cable for single sensor and 4-wire shielded cable for dual sensor configurations. Accommodates up to 12 AWG or 4 mm2 *Refer to manual for mounting distances.*		

Dimensions	
HOUSING (W x H)	5.88" x 5.71" (150 x 145 mm)
W/XCELL SENSOR	5.88" x 10.15" (150 x 258 mm)
W/XCELL & XIR SENSORS	13.42" x 10.15" (341 x 258 mm)
LID (DEPTH)	
W/RELAY BOARD	4.86" (123 mm)
W/O RELAY BOARD	3.86" (98 mm)
WEIGHT	8.8 lb. (4 kg), 316 SS

See manual for FM approved sensors.

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XCell® **Oxygen (O₂) Sensor**

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Supplemental Technical Data Sheet

This information contained within this document is a supplement to the MSA transmitter user manual.

Applicable Product(s):

- ULTIMA® X5000 Gas Monitor
- General Monitors S5000 Gas Monitor

RANGE	**0–25% Vol.**
X5000 GAS CODE	16
S5000 GAS CODE	D16
DEFAULT SPAN VALUE	20.8
DEFAULT ALARM 1	19.5
DEFAULT ALARM 2	18.0
SENSOR DESIGN	Non-consuming Electrochemical Sensor
SAFESWAP	Sensor can be changed under power
WARRANTY/SHELF LIFE	3 years
SENSOR LIFE[2]	> 5 years
CALIBRATION	For greatest accuracy and zero stability, allow powered sensor 24 hours to acclimate before performing first calibration.
FREQUENCY	Every 3-6 months
REGULATOR	1 LPM
ZERO GAS	Not required
ACCURACY[1,4]	< ±1% of measured value
LINEARITY[1]	< ±2% of measured value
OPERATING TEMPERATURE RANGE	−40°C to 60°C (−40°F to 140°F)
OPERATING HUMIDITY RANGE	
INTERMITTENT	0% to 100 % relative humidity
CONTINUOUS	10% to 95% r.h. non-condensing
OPERATING PRESSURE RANGE	800–1200 mbar
TEMPERATURE EFFECT	
ZERO	No effect
SENSITIVITY	No effect
HUMIDITY EFFECTS	No effect
PRESSURE EFFECTS	No effect
ZERO DRIFT[1]	< 0.2% Vol/year
SPAN DRIFT[1]	< 0.2% Vol/year
RESPONSE TIME	
T_{50}[1]	< 6 seconds
T_{90}[1]	< 11 seconds
RECOVERY T_{90}[1]	< 13 seconds
GAS EXPOSURE LIMITATION[3]	Not intended for continuous inert monitoring
WARM-UP TIME (X5000, S5000)[1]	30 min.
	May require longer warm up times, see manual. For optimum sensor performance, allow sensor 24 hours to acclimate to conditions before performing first calibration.
ADDITIONAL CONSIDERATIONS	Lead-free design

[1] *All performance values are typical as applied to new sensors in ambient laboratory conditions.*
[2] *Individual results may vary based on individual sensor environmental exposure conditions.*
[3] *As tested per ISA standards.*
[4] *Does not account for variances in calibration gas accuracy.*

WE KNOW WHAT'S AT STAKE.

Why MSA XCell® O₂ Sensors?

Longer Life!

The electrochemical system in the MSA XCell O_2 Sensor uses a non-consuming chemical reaction. O_2 molecules entering the sensor react with the working electrode creating electron flow and water as a byproduct. At the counter electrode, water is converted back into O_2 molecules. The chemical reaction requires a low voltage, which is controlled by the application-specific integrated circuit (ASIC) in the XCell Sensor. Because nothing is consumed or "used up" as the sensor is functioning, the sensor has a longer lifespan. XCell O_2 Sensors have a typical life of more than four years.

This non-consuming chemical reaction also means that the sensor can have a much longer shelf-life. The chemical reaction in a traditional lead-based O_2 sensor starts the second the sensor is manufactured. At this time, the chemical process whereby the lead is converted to lead oxide begins and the finite sensor life begins. The MSA XCell O_2 sensor is designed to have a very long shelf-life. While the sensor sits un-powered, no chemical reactions with O_2 are taking place and no life is being depleted from the sensor.

Circuit Board
with ASIC

Electrolyte Reservoir

Counter Electrode

Reference Electrode

Sensing Electrode
(with catalyst)

Gas-Permeable
Membrane
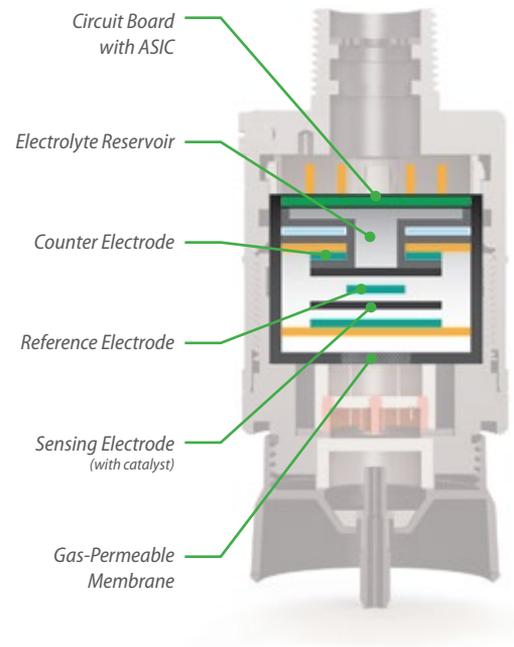
Our Mission

MSA's mission is to see to it that men and women may work in safety and that they, their families and their communities may live in health throughout the world.

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Attachment F.
Lone Worker Sensor Information

MS2000X
User Information

The MS2000X is an Emergency Signaling Monitoring System for Grace's worker safety products including SuperCELL®, LTX200, and TPASS®, WorkForce® and others. The MS2000X has several enhanced features including a simple interface to existing security and alarm systems. The MX2000X contains an optional audible horn and strobe light, activated upon receiving emergency alarm signals from Grace worker-safety devices.

The MS2000X must be mounted in an area where there is a clear, unobstructed path to the environment where worker-worn devices such as SuperCELL® or TPASS® may be used. A typical location for the MS2000X would be near an unobstructed office window or mounted just outside an office.

The MS2000X should also be located as far away as possible from other radio equipment antennas to minimize any interference. This includes cell phone boosters, wifi, and other 2-way radio equipment antennas. It is also recommended to keep the MS2000X a minimum of six inches away from metal surfaces.

A System Check of the MS2000X can be done by viewing the Receive LED located on the bottom surface of the MS2000X. When a SuperCELL® or TPASS® is turned On, Off, or by activating the Alarm, the radio signal will cause the Red Receive LED to flash several times - indicating signals are successfully being received by the MS2000X.

Once the MS2000X has been prepared for AC power, the unit may be plugged in. AC power connector is a screwless terminal rated for solid or stranded wire from 14-22AWG. Wire should be stripped at a 1/2". Wires should be inserted by using a small screwdriver to depress the lever and then inserting the wire.

When the unit is plugged in to AC Power, the Power Indicator LED glows (or flashes) Green - indicating the system has AC Power and is ready for operation. With loss of power, the Power Indicator glows (or flashes) Red - indicating the optional Backup-Battery System has been automatically activated, keeping the MS2000X ON and ready for operation.

POWER INDICATOR LED

- **Green Steady Glow:** AC Power, and battery is fully charged.
- **Optional Battery -B** *(see options list, pg. 5)*
  - **Red Steady Glow:** Running on battery backup
  - **Red Flashing:** Running on Low Battery.
  - **Red/Green Alternate Flashing:** Battery fault detected. Battery is either extremely discharged, open or shorted.
    If fault occurs at power-up, the indicators should clear in 4 - 6hrs. If fault continues after 12 hrs, the battery is failed (Open or Shorted).

TRANSMIT / RECEIVE LED

- **Green Flashing:** when MS2000X is transmitting a triggered message, Reset Acknowledgment, or repeating a signal.
- **Red Flashing:** when MS2000X is receiving a triggered message, Reset Acknowledgment, or repeating a signal.

IMPORTANT:

Always test MS2000X and worker-worn devices in area of planned use prior to implementation.

12 VDC Battery Backup

Terminal Blocks

Inside View of MS2000X

Connector for Phone Dialer

Transmit / Recieve LED
GREEN: Transmitting
RED: Receiving

Source Power Information Label

Conduit Connector

Power LED
GREEN: Running on AC Power
RED: Running on Battery
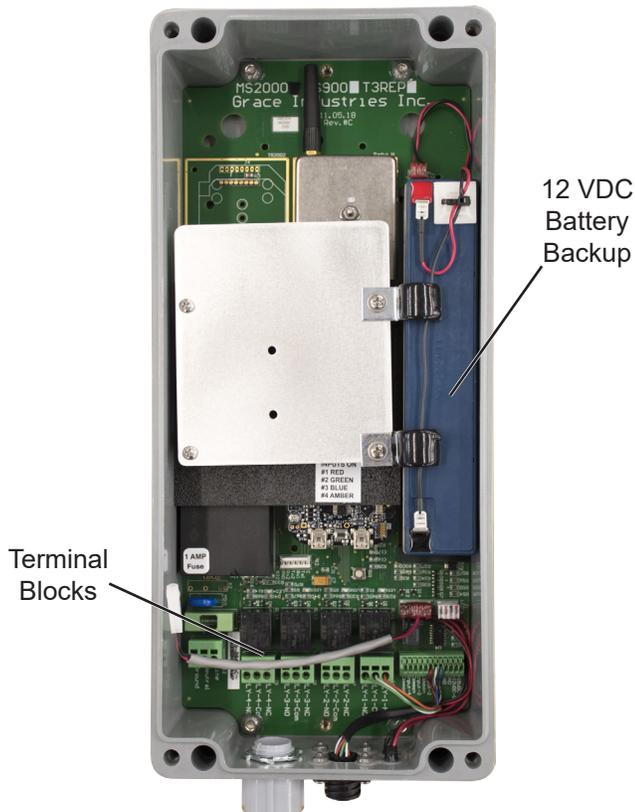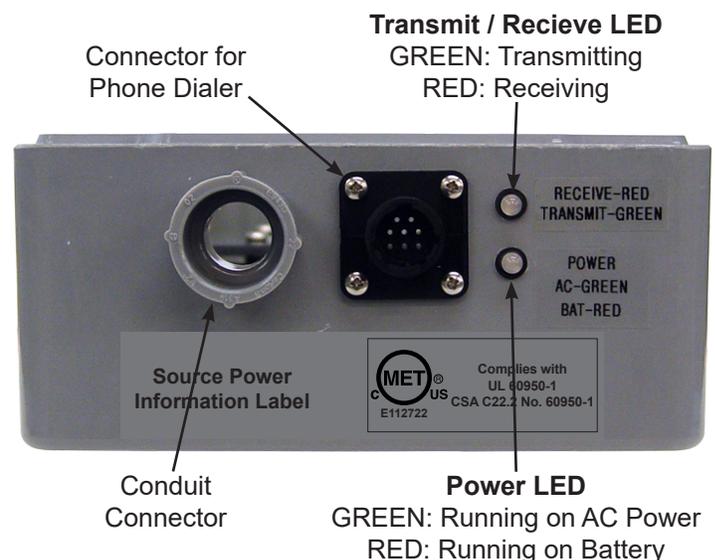
Terminal Block Labeling and Configuration

A. Inputs and Power:

1- 12-15VDC – In
2- +12VDC – Out
3- GND
4- GND
5- INPUT#1
6- Input Common
7- INPUT#2
8- Input Common
9- INPUT#3
10- Input Common
11- INPUT#4
12- Input Common

B. Power Terminals:

Line
Neutral
GND

C. Relay Terminals:

(4 Sets; Numbered 1 - 4)
Normally Open
Common
Normally Closed

MS2000X Factory Default Input Setting

Input #	Trigger	Repeat Time
1	Transmit Alarm	6 Seconds
2	Transmit Global Evac	6 Seconds
3	Transmit Canned Message (Message#) **	1 Hour
4	Transmit Free Form Message ("Input#4-MS2000") **	1 Hour
Loss of AC	Transmit Free Form Message ("AC LOSS-MS2000") **	1 Hour
Low Battery	Transmit Free Form Message ("Low Bat-MS2000") **	1 Hour

MS2000X Factory Default Relay Setting

Relay #	Trigger	Hold/Activation Time*
1	User Alarm or Input #1 Active (Transmit Alarm)	20 Seconds
2	Global Evac or Input #2 Active (Transmit Global Evac)	20 Seconds
3	Input #3 Active (Transmit Canned Message) **	3 Seconds
4	Loss of AC Detected	3 Seconds

Hold/Activation Time: How long relay contact will be maintained after last trigger message is received.

** *Canned and Free Form Messages will only be displayed on GraceWatch®, Super-CELL® SC500 Product Line, and WorkForce® WF2.*

State of Inputs

Configuration Port

Upgrade Port

Red LED Indicates Relay is Active
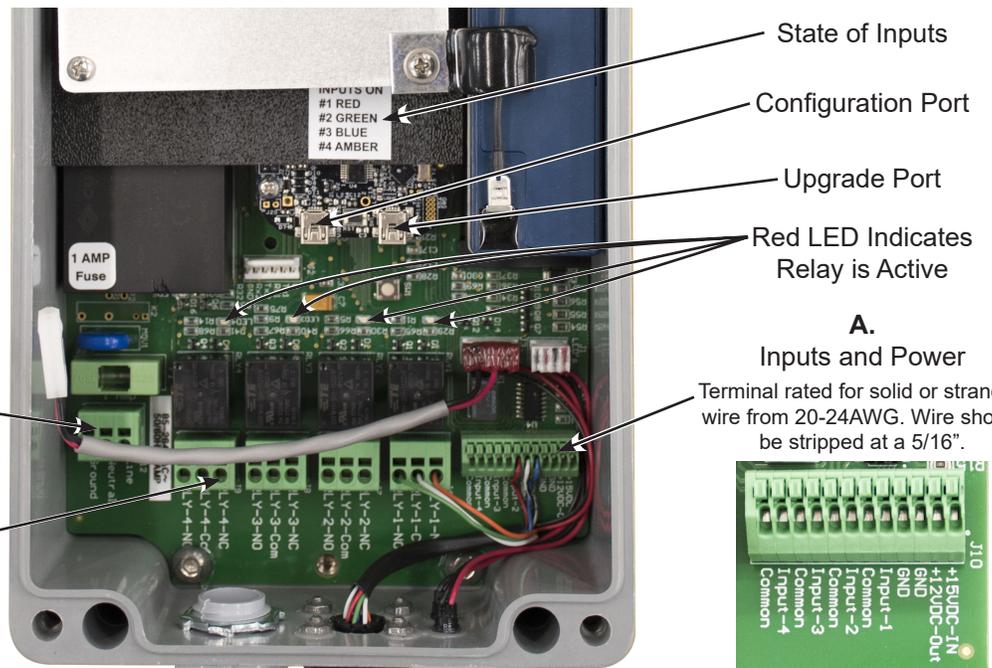
B. Power Terminals
Terminal rated for solid or stranded wire from 14-22AWG. Wire should be stripped at a 1/2".

C. Relay Terminals
Terminal rated for solid or stranded wire from 14-22AWG. Wire should be stripped at a 3/8".

A. Inputs and Power
Terminal rated for solid or stranded wire from 20-24AWG. Wire should be stripped at a 5/16".

Inside View of MS2000X with -AC, -B, and -LS Options Installed

Additional Notes:

- Except for the battery, all parts of the MS2000X are attached to the PCB.

- Connect the AC Power cable to the Line, Neutral, and Ground positions.

- When setting case lid in place, make sure the light siren cable is NOT pinched.
To securely seal MS2000X from intrusion of contaminants, secure the case lid by tightening all four (4) lid bolts until snug.

- Once Installation and Field Testing is complete, the MS2000X is ready for use.

Siren Settings - Tone Selection and Volume Level
(-LS Option)

Clear Bezel
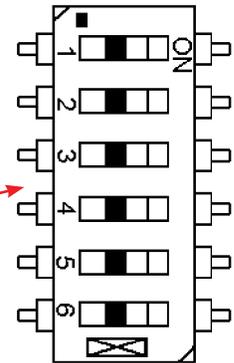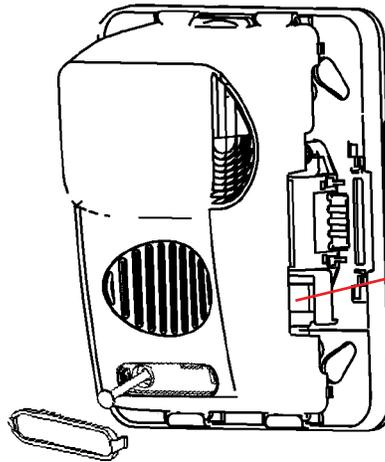
6 Position Switch

The Siren alarm tone and alarm volume can be selected via the 6 position switch found under the clear bezel.
To adjust the settings, remove the bezel by loosening the four screws and lifting the bezel off of the Light Siren.
To select an Alarm Tone and volume level, set the switch positions as defined by the tables below.
NOTE: Ensure switch positions one and two are both in the ON position.

Volume Level

High dBa	Switch Position 6-ON
Low dBa	Switch Position 6-OFF

Tone Selection

Tone	Switch Position		
Mechanical - Temporal 3	3-ON	4-ON	5-ON
Mechanical - Continuous	3-OFF	4-ON	5-ON
2400Hz - Temporal 3	3-ON	4-OFF	5-ON
2400Hz- Continuous	3-OFF	4-OFF	5-ON
Chime - Temporal 3	3-ON	4-ON	5-OFF
Chime - Continuous	3-OFF	4-ON	5-OFF
Whoop	3-ON	4-OFF	5-OFF
Whoop	3-OFF	4-OFF	5-OFF

MS2000X
AC Powered Micro Receiver System Specifications
(With Battery Backup)

Case: Rugged fiberglass

Dimensions: 6-1/2" wide by 15" high by 6-1/2" deep

Weight: 10 lb. (with battery backup and light-siren)

Power Input Requirement:
      AC Models: 85-264 VAC 50/60 Hz Single Phase 1Amp
      DC Models: 12-15 VDC ONLY, 0.5 Amp

Complies with: UL 60950-1, CSA C22.2 No. 60950-1

Battery (Option): 12 VDC, 2.9 Amp. Hr. (provides emergency, backup power for up to 24 hours)

Alarm Siren Audio Output (-LS Option): Adjustable volume. Maximum audio output of 92 dBA at 3 meters

Environmental Range: -40°C to +55°C (Heated system option recommended for environments below 32°F / 0°C)

Frequency Range: 902-928 MHz (frequency hopping spread spectrum)

FCC ID: J5MXHEM -- Meets FCC Part 15

IC: 5916A-MXHEM -- Complies with Canadian ICES-003

For Use With: Grace Telemetry Systems using the RadioH platform (SuperCELL®, LTX200, TPASS®, WorkForce®, and Micro Repeater).

Relay Closure: 4 form-c contact ratings 6A @ 28VDC, 6A @ 125VAC.

Cleaning / Decontamination: Units contaminated by chemical or radioactive materials must be disposed of or decontaminated in accordance with all applicable regulatory standards. DO NOT mark or apply paint to MS2000.

MS2000X BASE PACKAGE:

MS2000-H-X:
- 2-Way Micro-Transceiver System, two way signaling
- Indoor coverage of 200k Sq. Feet and 1 mile outdoor clear line of site.
  Indoor performance is subject to effects of building construction and RF noise.
- 4 Opto-Isolated 12VDC inputs (See Page 3 for default configuration)
- 4 Form C Relays (See Page 3 for default configuration)

OPTION LIST:

-CA
- AC powered models shipping to Canada require Canadian Electrical Inspection.

-DC
- 12-15VDC model (0.5 Amps).

-AC
- 85-264VAC 50/60Hz (1 Amps).

-B (Not Available on -DC models unless suppling +15VDC).
- Includes 12VDC, 2.9AH battery backup (Up to 24 hours).

-LS
- Includes Case mounted Adjustable Strobe with Light Siren (See Page 4 for LS setting).

-HT (Not Available on DC models)
- Heated system for use in environments below 32°F / 0°C.

-SP
- Custom I/O programming as requested at time of order.
- One or more of the Inputs or Outputs will be set other than at Factory Default values found on Page #3.

OPTIONAL EQUIPMENT
- PM2040 Mounting Assembly - Pole Mounted with 'C' Brackets -

Bolts and
Bracket Assembly

Bracket

Flat Washer

Bolt

Bracket
Clamp

Toothed
Washer

**MS2000X
Top View**

Pole

Pole

Bolts and
Bracket Assembly
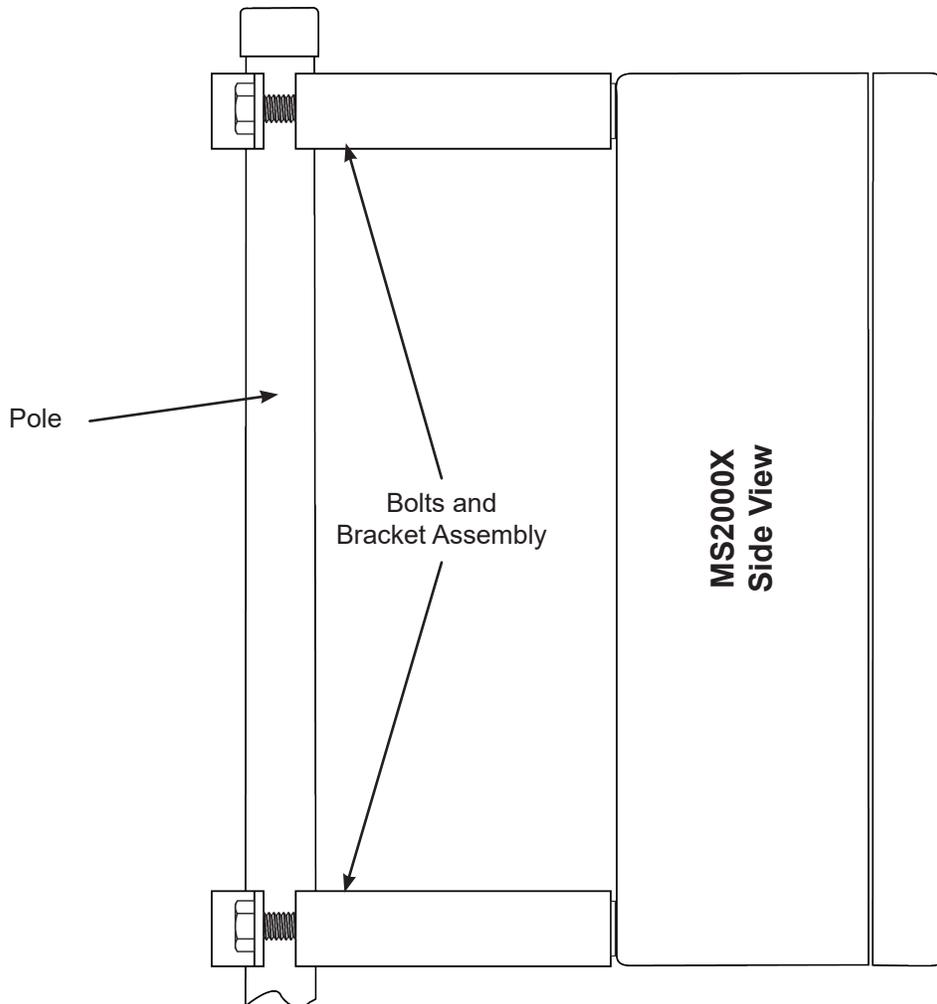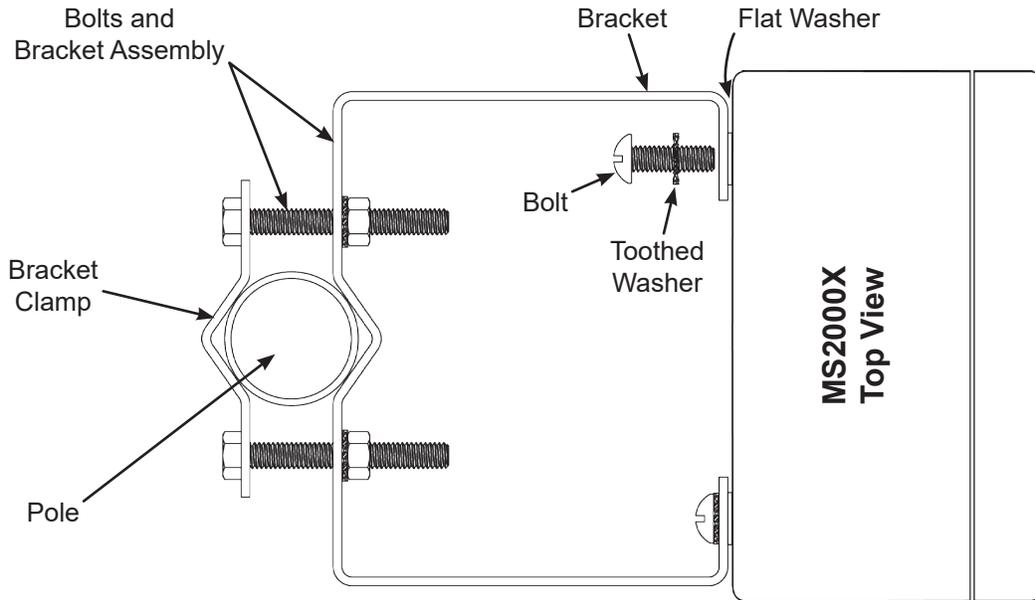
**MS2000X
Side View**

Improper Installation May Degrade Performance

BATTERY REPLACEMENT

Battery Wire Connector

Red Battery Terminal

Battery Clamps

Black Battery Terminal
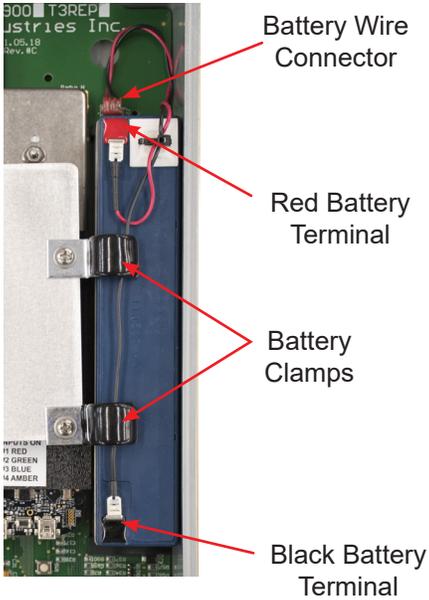
<u>WARNING</u>: Disconnect Power Supply before servicing MS2000.

To change battery, begin by disconnecting the external power supply.

Loosen the four lid screws and remove the lid.

Unhook battery wire from the battery terminals. Unhook battery wire connector from the board and set the battery wire aside.

Loosen the battery clamps enough to allow them to swing freely. **Do not completely remove them**. Rotate the clamps clear of the battery and remove the expired battery.

Carefully set the new battery in place. Rotate the battery clamps over the new battery and tighten them down until snug.

Connect the red wire to red battery terminal.

Thread the black wire through the battery clamps and connect the black wire to black battery terminal.

Attach the battery wire connector to the board.

Replace the lid and tighten all four screws until snug.

Reconnect power supply and test system for proper operation before field use.

OPTIONAL 10 Foot Cable with Connector
p/n: MS-CA-10

OPTIONAL PHONE DIALER
p/n: ATD

MS2000X with phone dialer has 8 pin connector to supply relay contact trigger and power to the external phone dialer.

Wiring

Pin 1	**GREEN**	**Normally Open**
PIn 2	WHITE	Contact Com.
Pin 3	**RED**	**+12VDC**
Pin 4	Blue	Input #1
Pin 5	**ORANGE**	**Normally Closed**
Pin 6	White/Black	Input Common
Pin 7	**BLACK**	**GND**
Pin 8	Red/Black	Input #2

CAUTION: *To avoid damaging mating pins, carefully match up connector keyways when attaching phone dialer connector.*

GRACE One (1) Year WARRANTY

Grace Industries Incorporated, of Fredonia PA 16124 USA, warrants products that it manufactures to be free from defects in workmanship and materials for a period of one (1) year from the original date purchase. This warranty does not apply to third party products sold by Grace Industries. Grace Industries will repair or replace, at their sole discretion, defective products free of charge. This warranty applies to products that Grace Industries deems defective in its sole discretion due to defects in material or workmanship under normal use and maintenance and where a defect was not caused by accident, misuse or abuse of the product and that no disassembly, repairs or parts replacement were made or attempted by other than Grace Industries' personnel. **GRACE INDUSTRIES, INCORPORATED SHALL NOT BE LIABLE FOR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL LOSS OR DAMAGE ARISING OUT OF THE USE OF THE PRODUCT OR FAILURE OF THE PRODUCT TO OPERATE.**

The sole and exclusive remedy under all guarantees or warranties, expressed or implied, is strictly limited to repair or replacement as herein provided. **ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF FITNESS AND MERCHANTABILITY, ARE HEREBY LIMITED IN DURATION TO A PERIOD OF ONE (1) YEAR FROM THE DATE OF ORIGINAL PURCHASE.** The warranty and liability set forth here are in lieu of all other warranties, expressed or implied, in law or in fact, including warranties of merchantability and fitness for a particular purpose.

Warranty claims process: 1) Obtain a Return Authorization Code or Number from Grace Industries corporate headquarters by calling phone number 724-962-9231, or by email correspondence to sales@graceindustries.com. 2) The product name, serial number, date and proof of purchase must be provided and 3) Return products including Return Authorization number, prepaid and accompanied by original proof of purchase that states the date and location of purchase to: Grace Industries, Inc., Repair Department, 305 Bend Hill Road, Fredonia, PA 16124, USA. Customer is responsible for all shipping costs, return shipping costs, handling, or any other fees associated with a warranty claim.

FCC Statements

Changes or modifi cations not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Statements

This Class A digital apparatus complies with Canadian ICES-003.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.(select the class for your device)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Grace Industries, Inc.
724-962-9231
305 Bend Hill Rd
Fredonia, PA 16124
service@graceindustries.com

Attachment G.
Electrical Equipment Cut Sheets

LITHONIA LIGHTING®

FEATURES & SPECIFICATIONS

INTENDED USE — Provides a minimum of 90 minutes illumination for the rated wattage upon loss of AC power to meet and exceed code required emergency lighting. Ideal for applications requiring attractive LED unit equipment with quick installation and unparalleled performance for mounting heights from 7.5' to 30'. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate.**
Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.

CONSTRUCTION — The housing is a standard white (black optional) thermoplastic with a compact and low-profile contemporary design. It is 5VA flame rated, impact-resistant, scratch-resistant and corrosion proof. The UV-stable resin resists discoloration from natural and man-made light sources. There is a low-profile, integrated and back-lit test switch with an easily visible multi-color LED status indicator. The back-plate contains a universal j-box mounting pattern to facilitate ease of installation on a wide variety of j-boxes and the front housing allows tool-less access for ease of maintenance.

The lamp heads have a unique track-and-swivel arrangement permitting full range of direction of optical aiming.

OPTICS — The ELM4L features two high-performance LEDs rated at 3.3 watts per lamp head and delivers a total of 640 lumens in a spot pattern (SP640L).

The ELM6L features three high-performance LEDs rated at 5.3 watts per lamp head and delivers a total of 1,100 lumens in a spot pattern (SP1100L).

The typical life of an LED is 10 years. The LED light sources typically never need to be replaced under normal conditions for normal off applications.

CCT: 5000K

ELECTRICAL — Orderable in multiple voltages (see ordering tree for specific voltages.)

Current-limiting charger maximizes battery life and minimizes energy consumption to provide low operating costs. Small battery chargers Certified in the CA Title 20 Appliance Efficiency Database.

Short-circuit protection — current-limiting charger circuitry protects printed circuit board from shorts.

Regulated charge voltage maintains a stable charge voltage over a wide range of line voltages.

Prevents over/undercharging that shortens battery life and reduces capacity. Filtered charger input minimizes charge voltage ripple and extends battery life.

BATTERY: Sealed, maintenance-free nickel-cadmium (ELM4L only) or Lithium Iron Phosphate battery. Optional High-Output (HO option) and Extra High Output (EHO option), LTP battery type only, provides a wide variety of remote capacities and/or extended run-times.

Automatic 24-hour recharge after a 90-minute discharge.

Advanced electrical design provides constant light output throughout the entire discharge period.

Brownout protection is automatically switched to emergency mode when supply voltage drops below approximately 80 percent nominal of 120, 220, 277 or 347. Other input voltages may vary.

AC/LVD reset allows battery connection before AC power is applied and prevents battery damage from deep discharge.

Self-Diagnostics: Continuously monitors AC functionality. Test switch and remote tester (RTKIT accessory) provide manual activation of 30-second diagnostic testing for on-demand visual inspection. Standard derangement monitoring will indicate disconnected battery, charger failure and displays green flashing indicator light while in emergency mode. Single multi-chromatic LED indicator to display two-state charging, test activation and three-state self-diagnostics.

SELF-DIAGNOSTICS and REMOTE TEST (SDRT and AELR option):

Self-diagnostic testing: Five minutes every 30 days and 90 minutes annually. Diagnostic evaluation of lamps, AC to DC transfer, battery charging and condition of microprocessor. Automatic test is easily postponed for eight hours by activating manual test switch or use of remote tester (RTKIT accessory).

AELR option: STAR (Self-testing Automated Reporting) radio transmits monthly and annual test results and diagnostics information for automated reporting requirements.
For more information visit AcuityBrands.com/STAR

INSTALLATION — Wall and ceiling mount standard. Blind-mate connector ensures easy installation and safe maintenance. 7/8" entrance provision at top of unit for standard 1/2" conduit entry. Tool-less removal of front cover from back-plate for ease of installation and maintenance.

LISTINGS — UL damp location listed standard and wet location listed when used with the WPVS accessory, all at 50-104°F (10-40°C). Meets or exceeds all applicable requirements for UL 924, NFPA 101 (current Life Safety code), NFPA 70 (NEC), NOM (Norma Oficial Mexicana), California Energy Commission Title 20 section 1605.3 (W)(4), FCC Title 47, Part 15, Subpart B and OSHA. List and labeled to comply with Canadian Standards C22.2 No. 141-10.

GOVERNMENT PROCUREMENT — BAA – Product with the BAA option qualifies as a domestic end product under the Buy American Act as implemented in the FAR and DFARS. Product with the BAA option also qualifies as manufactured in the United States under DOT Buy America regulations.
BABA – Build America Buy America: Product with the BAA option also qualifies as produced in the United States under the definitions of the Build America, Buy America Act.
Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY — 5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

NOTE: Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

† Small Battery Chargers Certified in the CA Title 20 Appliance Efficiency Database.

QUANTUM®

Contemporary Commercial LED Emergency Light

ELM4L
640 Lumens

ELM6L
1100 Lumens

**LITHIUM IRON PHOSPHATE
NICKEL CADMIUM**

LOCATED OUTSIDE THE UCS WITH EXTRA HIGH-CAPACITY BATTERY FOR REMOTE LAMP HEADS

MOUNTING

All dimensions are inches (centimeters) unless otherwise indicated.

5.93 (15.06)
13.37 (33.95)

5.93 (15.06)
3.70 (9.39)

3.70 (9.39)
13.37 (33.95)

5.93 (15.06)
11.26 (28.60)
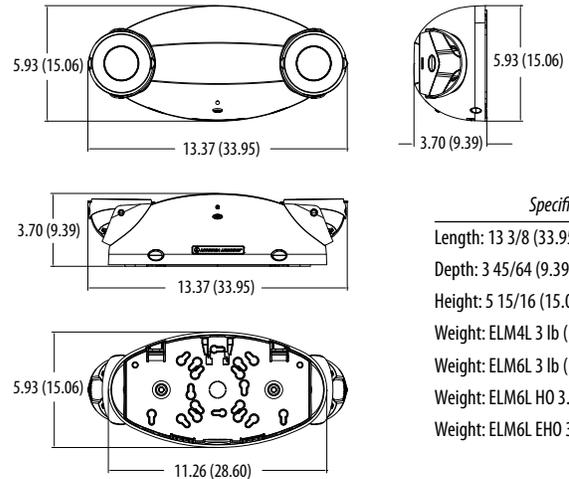
Specifications

Length: 13 3/8 (33.95)
Depth: 3 45/64 (9.39)
Height: 5 15/16 (15.06)
Weight: ELM4L 3 lb (1.4kg)
Weight: ELM6L 3 lb (1.4kg)
Weight: ELM6L HO 3.5 lbs (1.59 kg)
Weight: ELM6L EHO 3.75 lbs (1.7 kg)

design select

Items marked by a shaded background qualify for the Design Select program and ship in 15 days or less. To learn more about Design Select, visit www.acuitybrands.com/designselect.
*See ordering tree for details

NICKEL CADMIUM BATTERY MODELS

ORDERING INFORMATION For shortest lead times, configure product using **bolded options.**   **Example:** ELM4L

Series	Lamp Type	Housing Color	Voltage	Battery Type	Automatic Testing	Options	
ELM4L[1] 640 lumens, adjustable optics	**(blank)** SP640L 640 lumen, 6.6 watt, Spot Pattern, two lamp	**(blank)** White B Black	**(blank)** 120-277 VAC, 50/60Hz **UVOLT** 120 - 347 VAC, 50/60Hz	**(blank)** Nicad	**(blank)** None	**(blank)** none	
						WPVS	Wet protective vandal shield [2]
						BAA	Buy America(n) Act and/or Build America Buy America Qualified
						PM	Pendant Mount [3]

Notes

1 Does not support remote loads.

2 Must be ordered when using for wet location applications.. WPVS breaks out and ships separately and color will match (ex: WPVS LRG B). Decreases delivered lumens up to 20%. See spec sheet WPVS for more information.

3 Pendant mount option will include a 12" long 3/8-16 UNC threaded rod and hardware. Not available with any other lengths.

LITHIUM IRON PHOSPHATE BATTERY MODELS

ORDERING INFORMATION For shortest lead times, configure product using **bolded options.**   **Example:** ELM6L UVOLT LTP SDRT

Series[1]	Lamp Type	Housing Color	Voltage	Battery Type	Automatic Testing	Options	
ELM4L 640 lumens, adjustable optics	**(blank)** SP640L 640 lumen, 6.6 watt, Spot Pattern, two lamp	**(blank)** White B Black	**UVOLT** 120 - 347 VAC, 50/60Hz	**LTP** Lithium Iron Phosphate	**(blank)** none [2]	LLH	Less lamp heads [4]
ELM6L 1100 lumens, adjustable optics	**(blank)** SP1100L 1100 lumen, 10.6 watt, Spot Pattern, two lamp				SDRT Self-diagnostics, remote test	HO	High-output battery
					AELR Automated Emergency Lighting Reporting [3]	EHO	Extra High-output battery
						WPVS	Wet protective vandal shield [5]
						BAA	Buy America(n) Act and/or Build America Buy America Qualified
						PM	Pendant mount [6]

Other Accessories: *Order as separate catalog number.*

WPVS LRG W	Wet protective vandal shield, white (must be used for wet location applications)
WPVS LRG B	Wet protective vandal shield, black (must be used for wet location applications)
ELA WG1	Wireguard, 13 3/4"H x 15 1/4"W x 6"D (see spec sheet ELA-WG).
RTKIT	Remote test kit, up to 40' away (includes goggles, laser and battery)

Notes

1 Extended run-time or remote capacity is standard. New ELMRE and ELMRW style remotes are compatible with both SDRT and non-SDRT versions (see page 4).

2 Only available with ELM4L.

3 SDRT option required. AELR radio transmits monthly and annual test results and diagnostics information for automated reporting requirements. Only available with LTP battery type. Not available with BAA option.

4 ELM4L with LLH (less lamp heads) not available with SDRT. ELM6L with LLH only available with SDRT.

5 Must be ordered when using for wet location applications. WPVS breaks out and ships separately and color will match (ex: WPVS LRG B). Decreases delivered lumens up to 20%. See spec sheet WPVS for more information.

6 Pendant mount option will include a 12" long 3/8-16 UNC threaded rod and hardware. Not available with any other lengths.

ELM4L-ELM6L mounted inside the WPVS

Enabled with STAR

Emergency Lighting with Self-Testing Automated Reporting (STAR), enables self-testing and automated reporting to aid in life safety code compliance. Build your solution and choose your preferred deployment from Mobile STAR, where test data is logged in each individual unit and broadcast to the ClAIRity™+ app, or Connected STAR, where test data is logged in the STAR Gateway by IOTA® and emailed directly. **Leave the ladders, disruptions and written records behind with emergency lighting solutions with STAR!**

Life Safety Code NFPA 101 testing and reporting requirements for emergency lighting include:

Testing for 30 seconds every 30 days

Testing for 90 minutes once a year

Record keeping and to report to the authority having local jurisdiction

MOBILE STAR

EXIT

For small scale applications

CONNECTED STAR

EXIT

For large scale applications

REMOTES

BATTERY CAPACITY AND LOADING					
Battery Option (LTP Only)	Battery Voltage	Total Capacity 90 Minutes	LP220L (1.2 Watts each) Maximum # Remote Lamps[1]	SP640L (3.3 Watts each) Maximum # Remote Lamps[1]	SP1100L (5.3 Watts each) Maximum # Remote Lamps[1,2]
ELM4L LLH LTP	9.6V	11 watts	9	3	2
ELM4L LLH HO	9.6V	22 watts	18	6	4
ELM4L LLH EHO	12.8V	32 watts	26	9	6
ELM4L LTP	9.6V	11 watts	3	1	0
ELM4L LTP HO	9.6V	22 watts	12	4	2
ELM4L LTP EHO	12.8V	32 watts	21	7	6
ELM6L LTP	9.6V	11 watts	0	0	0
ELM6L LTP HO	9.6V	22 watts	9	3	2
ELM6L LTP EHO	12.8V	32 watts	17	6	4
ELM6L LLH LTP	9.6V	11 watts	9	3	2
ELM6L LLH LTP HO	9.6V	22 watts	18	6	4
ELM6L LLH LTP EHO	12.8V	32 watts	26	9	6

Notes
1   These are in addition to the lamp heads on the product.
2   ELMRW not available with SP1100L lamp type. For SP1100L wet location applications, order ELMRE with WPVS.

ELMRE Compatible Remotes[1,2]

LTP Compatible Remote Accessories: *Order as separate catalog number.*	
ELMRE LP220L SGL [1,2]	Single LED Indoor remote head, white.
ELMRE LP220L T [1,2]	Twin LED Indoor remote heads, white.
ELMRE SP640L SGL [1,2]	Single LED Indoor remote head, white.
ELMRE SP640L T [1,2]	Twin LED Indoor remote heads, white.
ELMRE SP1100L SGL [1,2]	Single LED Indoor remote head, white.
ELMRE SP1100L T [1,2]	Twin LED Indoor remote heads, white.
ELMRW LP220L DDBTXD SGL [1,3]	Single LED Wet Location remote head, dark bronze, 110 lumens
ELMRW LP220L DDBTXD T [1,3]	Twin LED Wet Location remote heads, dark bronze, 220 lumens
ELMRW SP640L DDBTXD SGL [1,3]	Single LED Wet Location remote head, dark bronze, 320 lumens
ELMRW SP640L DDBTXD T [1,3]	Twin LED Wet Location remote heads, dark bronze, 640 lumens

Notes
1   Compatible with SDRT and non-SDRT versions.
2   Order the WPVS accessory for wet location listing and vandal protection.
3   See ELMRW Spec sheet for color options. Available in aluminum glossy, white glossy, black glossy, and dark bronze textured.

ELMRE LP220L SGL

ELMRE LP220L T

ELMRE SP640L SGL

ELMRE SP640L T

ELMRE SP100L SGL

ELMRE SP1100L T

ELMRW LP220L DDBTXD SGL

ELMRW LP220L DDBTXD T

ELMRW SP640L DDBTXD SGL

ELMRW SP640L DDBTXD T

SPECIFICATIONS

ELECTRICAL

Primary Circuit

Type	Volts	Input amps	Watts
Nicad	120	0.032	3.15
	347	0.036	3.15
Lithium Iron Phosphate (SDRT)	120	0.028	2.78
	347	0.033	2.78
Lithium Iron Phosphate (HO option)	120	0.046	4.77
	347	0.046	4.77
Lithium Iron Phosphate (EHO option)	120	0.052	5.95
	347	0.045	5.95

BATTERY CAPACITY FOR EXTENDED RUN-TIMES

Battery Option	Total Capacity 2 hours	Remote Capacity 2 hours*	Total Capacity 4 hours	Remote Capacity 4 hours*
ELM4L - LTP	8.25 watts	NA	NA	NA
ELM4L - HO	16.5 watts	9.9 watts	8.25 watts	NA
ELM4L EHO	24 watts	17.4 watts	12 watts	5.4 watts
ELM6L - LTP	8.25 watts**	8.25 watts**	NA	NA
ELM6L HO	16.5 watts	5.9 watts	8.25 watts**	8.25 watts**
ELM6L EHO	24 watts	13.4 watts	12 watts	12 watts**

* Remote capacity left after using standard lamps shipped mounted on luminiare. ELM4L standard high performance LED lamp heads are rated at 3.3 watts each, delivering a total of 640 lumens. ELM6L standard high performance LED lamp heads are rated at 5.3 watts each, delivering a total of 1,100 lumens. These lamps are different in both wattage and performance from the LT24 compatible remotes.

** LLH option only

BATTERY

Nicad (6V)

Typical Shelf life[1]	Typical life[1]	Maintenance[2]	Temperature range[3,4]
3 years	6-8 years	none	50-104°F (10-40°C)

Lithium Iron Phosphate (standard and HO option) (9.6V)

Typical Shelf life[1]	Typical life[1]	Maintenance[2]	Temperature range[3,4]
1 year	6-8 years	none	50-104°F (10-40°C)

Lithium Iron Phosphate (EHO option) (12.8V)

Typical Shelf life[1]	Typical life[1]	Maintenance[2]	Temperature range[3,4]
1 year	6-8 years	none	50-104°F (10-40°C)

Notes

1. At 77°F ambient temperature, charge/discharge cycles and prolonged full discharge may reduce useful life.

2. All life safety equipment, including emergency lighting for path of egress must be tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required testing could jeopardize the safety of occupants and will void all warranties.

3. Temperature range where unit will provide capacity for 90 minutes. Higher and lower temperatures affect life and capacity.

4. Battery life is negatively impacted by many variables including temperature, charging rates, number of cycles and deep discharges due to long periods of time without AC power.

SPACING GUIDELINES

*Note: To see complete photometric report or download the .ies file for this product, visit Lithonia Lighting ELM4L and ELM6L home page.

Maximum Spacing Guidelines — ELM4L [1]		Single Luminaire		Multiple Luminaire		
Mounting Height	Illumination Level	3' Path of Egress	6' Path of Egress	3' Path of Egress	6' Path of Egress	Application Notes
7.5'	1FC Avg[1]	62'	58'	67'	60'	100'Corridor, 8' wide, and 12' high with 80/50/20 reflectances
10'	1FC Avg[1]	62'	58'	67'	60'	
7.5'	1FC Avg[1]	52'	40'	66'	58'	Retail open area: 200' X 15' X 30' with 80/50/20 reflectances
10'	1FC Avg[1]	52'	48'	64'	60'	
12'	1FC Avg[1]	52'	48'	62'	59'	
16'	1FC Avg[1]	52'	44'	61'	58'	
20'	1FC Avg[1]	44'	42'	60'	58'	
24'	1FC Avg[1]	34'	34'	42'	58'	

Maximum Spacing Guidelines — ELM6L [1]		Single Luminaire		Multiple Luminaire		
Mounting Height	Illumination Level	3' Path of Egress	6' Path of Egress	3' Path of Egress	6' Path of Egress	Application Notes
7.5'	1FC Avg[1]	76'	74'	98'	90'	100' Corridor, 8' wide, and 12' high with 80/50/20 reflectances
10'	1FC Avg[1]	76'	74'	98'	88'	
7.5'	1FC Avg[1]	60'	48'	77'	68'	Retail open area: 200' X 15' X 30' with 80/50/20 reflectances
10'	1FC Avg[1]	78'	56'	85'	82'	
12'	1FC Avg[1]	68'	66'	77'	74'	
16'	1FC Avg[1]	72'	68'	72'	74'	
20'	1FC Avg[1]	66'	64'	70'	68'	
24'	1FC Avg[1]	66'	56'	65'	62'	

Notes:
1. Also meets the additional illumination requirements of NFPA 101: 1FC minimum and max/min ration of 40:1.
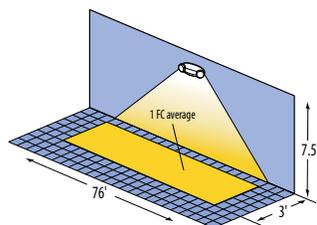
Example of single ELM6L illuminating a 3' path of egress
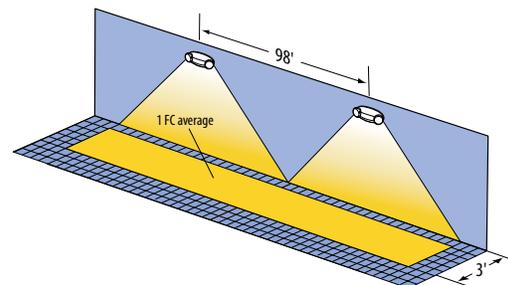
Example of multiple ELM6L units illuminating a 3' path of egress

EMERGENCY: One Lithonia Way, Conyers, GA 30012 Phone: 1-800-705-SERV (7378) techsupport-lighting@acuitybrands.com www.lithonia.com

ELM4L_ELM6L

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Pg. 5 of 5

LITHONIA LIGHTING®

Catalog Number
Notes
Type

FEATURES & SPECIFICATIONS

INTENDED USE — To be powered by Quantum series emergency units and any battery voltage system between 5VDC and 30VDC output and with adequate wattage capacity. Remote lamp head matches the appearance of the Quantum® ELM2LF, ELM2L, ELM4L, ELM6L series units, as part of an emergency lighting system providing light for the path of egress. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate. Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.**

CONSTRUCTION — Compact, low-profile contemporary design, available in white (standard) or black. Engineering-grade thermoplastic housing is impact-resistant, scratch-resistant and corrosion-proof.

UV stable resin resists discoloration from natural and man-made light sources. Strong, compact and corrosion-resistant with a UL94V-O flame rating.

Single or twin heads available.

Fully adjustable lamp heads to meet all aiming requirements.

Universal J-box mounting pattern. Tool-less access for maintenance. **US Patent No. D483,511.**

OPTICS — LED, available in: 1.2W (LP220L) or 3.3W (SP640L) lamps @ 5VDC-20VDC input, and 5.3W (SP1100L) lamps @ 7VDC-30VDC input. The typical life of the LED is 10 years.

LEDs provide nominal 70 CRI at 5000 K.

INSTALLATION — Wall or Ceiling mount standard. Flexible conduit entry provision on top of the unit. **US Patent No. D483,511.**

LISTINGS — UL damp location listed standard and wet location listed when used with the WPVS accessory, up to -22-104°F(-30 -40°C). Meets UL 924, NFPA 101 (current Life Safety Code). Meets NFPA 70 (NEC), C22.2 CSA. Meets all applicable FCC requirements. Meets NEC and OSHA illumination standards. Meets Mexican standards. Available for sale in California.

GOVERNMENT PROCUREMENT — BAA – Product with the BAA option qualifies as a domestic end product under the Buy American Act as implemented in the FAR and DFARS. Product with the BAA option also qualifies as manufactured in the United States under DOT Buy America regulations.
BABA – Build America Buy America: Product with the BAA option also qualifies as produced in the United States under the definitions of the Build America, Buy America Act.
Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY — 5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

NOTE: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

LOCATED INSIDE THE UCS UTILIZING BATTERY POWER FROM REMOTE HIGH-CAPACITY BATTERY OUTSIDE UCS ENCLOSURE

QUANTUM®

LED Thermoplastic Emergency Remote

ELMRE

ELMRE LP220L SGL   ELMRE SP640L SGL   ELMRE SP1100L SGL

ELMRE LP220L T   ELMRE SP640L T   ELMRE SP1100L T

LED   FC   NOM   BAA   BABA

MOUNTING

All dimensions are inches (centimeters) unless otherwise indicated.

ELMRE LP220L SGL / T
Specifications

Length: 6.87 (174)

Depth: 3.53(90)

Height: 4.67(119)

Weight of SGL: 0.75 lbs (0.34kg)

Weight of T: 0.8 lbs (0.36kg)

4.67 [119]
7.20 [183]
7.52 [191]
3.53 [90]
6.87 [174]

4" Square
4" Octagon
3-1/2" Round or Octagon
Single Gang Box
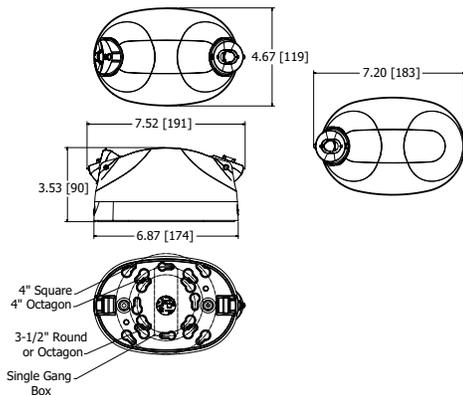
ELMRE SP640L SGL / T
ELMRE SP1100L SGL / T
Specifications

Length: 6.87 (174)

Depth: 3.69 (94)

Height: 4.67 (119)

Weight of SP640L SGL: 1.05lbs (0.48kg)

Weight of SP640L T: 1.55lbs (0.70kg)

Weight of SP1100L SGL: 1.2lbs (0.54kg)

Weight of SP1100L T: 1.65lbs (0.75kg)

4.67 [119]
7.40 [188]
7.92 [201]
4.81 [122]
3.69 [94]
6.87 [174]

4" Square
4" Octagon
3-1/2" Round or Octagon
Single Gang Box
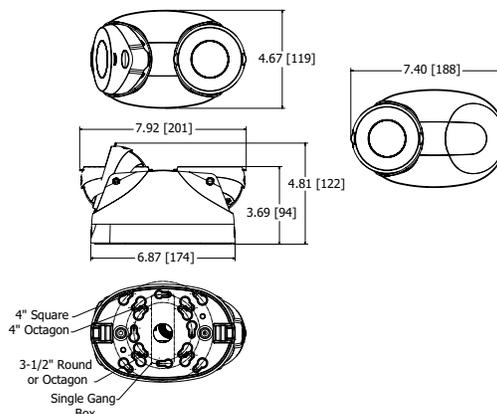
ELMRE Quantum® LED Thermoplastic Emergency Light

Example: ELMRE LP220L SGL

Series	Voltage	Lamp Type	Housing Color	Number of lamps	Options
ELMRE LED thermoplastic emergency remote	**(blank)** Universal DC voltage	**LP220L** 110 lumen, 1.2 watt, Linear pattern, 5VDC-20VDC input **SP640L** 320 lumen, 3.3 watt, Spot pattern, 5VDC-20VDC input **SP1100L** 550 lumen, 5.3 watt, Spot pattern, 7VDC-30VDC input	**(blank)** White B Black	**SGL** Single, aimable **T** Twin, aimable [1]	**BAA** Buy America(n) Act and/or Build America Buy America Qualified

Notes

1 For twin (T) remote, multiply lumens and watts by 2.

Accessories: *Order as separate catalog number.*
WPVS SML W   White, wet protective vandal shield (must be used for wet location applications. Decreases delivered lumens up to 20%. For black, change W to B. See spec sheet WPVS)
ELA WG1   Wireguard, 15" W x 13-1/2" H x 6" D (see spec sheet ELA-WG)

BATTERY CAPACITY AND LOADING					
Battery Option (LTP Only)	**Battery Voltage**	**Total Capacity 90 Minutes**	**LP220L (1.2 Watts each) Maximum # Remote Lamps[1]**	**SP640L (3.3 Watts each) Maximum # Remote Lamps[1]**	**SP1100L (5.3 Watts each) Maximum # Remote Lamps[1]**
ELM2L LTP	9.6V	4.8 watts	2	0	0
ELM2LF LTP	9.6V	4.8 watts	2	0	0
ELM4L LTP	9.6V	11 watts	3	1	NA
ELM4L LTP HO	9.6V	22 watts	12	4	2
ELM4L LTP EHO	12.8V	32 watts	21	7	6
ELM6L LTP	9.6V	11 watts	0	0	0
ELM6L LTP HO	9.6V	22 watts	9	3	2
ELM6L LTP EHO	12.8V	32 watts	17	6	4
ELM6L LLH LTP	9.6V	11 watts	9	3	2
ELM6L LLH LTP HO	9.6V	22 watts	18	6	4
ELM6L LLH LTP EHO	12.8V	32 watts	26	9	6

Notes

1 These are in addition to the lamp heads on the product.

LITHONIA LIGHTING

LEDRAYS
MASTERING LIGHT

LR-HBM-EXF-40S-HO-120L-50-LPSF-02-C

Applications

Ultra-Cold Storage - Walk-in Deep Freezers - Biochemical, Pharmaceutical, Medical & Testing facilities with controlled environments. Spiral Freezers - Food & Beverage preparation, processing and production.

Features

The HBM-EXF Series of Low Bay and High Bay LED luminaires are engineered specifically for Ultra-Cold applications where temperatures may reach -60°C/-76°F.

The main structure is made from forged aluminum, the LED carriers are thin film TCDL type on a Copper base, ceramic substrate with proprietary graphene film cooling technology to manage heat & cold. Developed specifically to function in extreme low temperatures with the ability to mitigate the effects of thermal shock through embedded pre-heating technology. The luminaire housing has a corrosion resistant hard anodized finish with available, optional Elastomeric Protection (EP) or Fluorocarbon Deposition (FD) for more corrosive environments.

The practically indestructible engineered polycarbonate lenses remove the requirement for wire guards and the molded synthetic polymer gaskets protect against particulate intrusion. Stainless Steel 304 type hardware ensures long term package reliability.

The HBM-EXF Series LED luminaires present a self shedding housing design allowing it to remain clean and uncontaminated providing for improved maintenance factor. With an ingress protection rating of IP65 and a low void design, the HBM-EXF Series of LED luminaires are capable of withstanding exposure to extreme atmospheres.
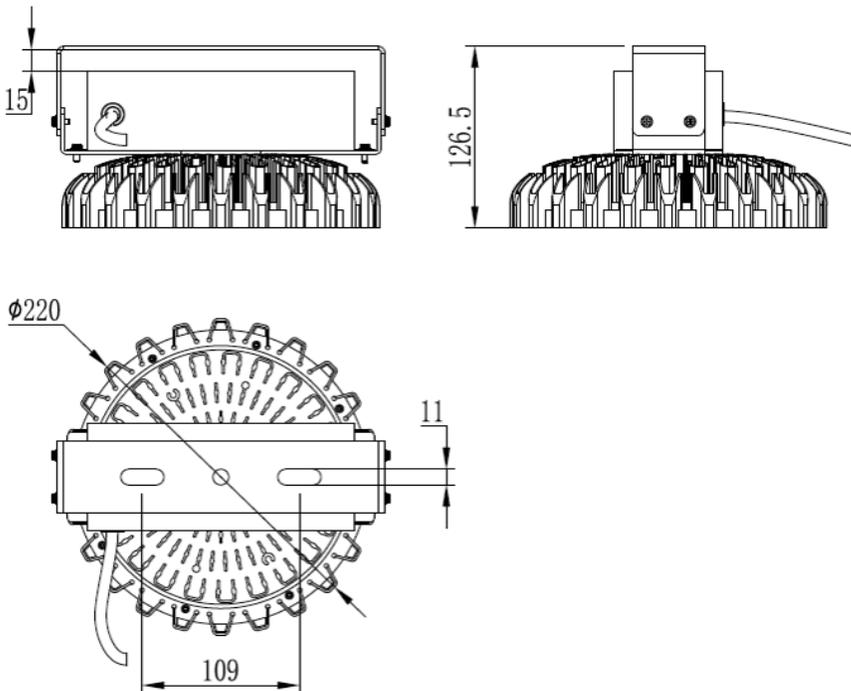
Dimensions
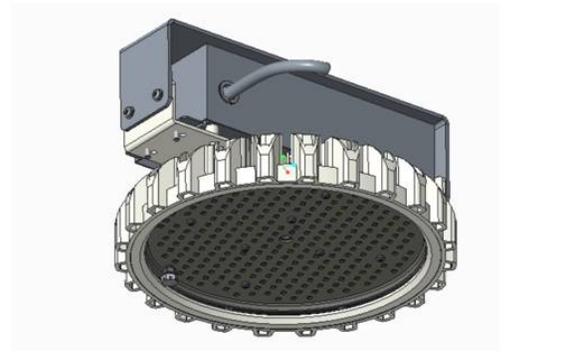
SPECIFICATION (Preliminary)	
Electrical	
Consumption	40W (Available 20W-100W)
Input voltage	95-310VAC (Available 180-528VAC, 135-410VDC)
THD	<10%
Surge Protection	Integrated LL 6kV, LG 10kV
Controls	0-10V Dim (pre-heat circuit)
LED & Output	
LED Type	Nichia
Efficacy	160Lm/W (Available 190Lm/W)
Lumen	6,400Lm
Distribution pattern	Symmetrical 120° (Available 70, 90°)
CCT	5000K (Available 2200K-6500K, Static colours, RGB/RGBW/RGBA)
CRI	80Ra (Available 90-95Ra)
Construction	
Housing	Forged Aluminum
Form Factor	Round
Finish	Corrosion resistant anodized finish
Installation	Surface mount, low profile bracket
Gaskets	Molded synthetic polymer
Lens	IK08 Impact resistant UV treated polycarbonate (Available Borosilicate flat lens)
IP Rating	IP65
Operating temp	-60°C ~ 55°C (-76°F ~ 131°F)
Dimensions	
Housing (incl mounting bracket)	Ø 220x 126.5 mm Ø 8.66 x 4.98 in
Weight	3.2Kg / 7.05lbs

ALLEGION

VON DUPRIN®

98/99
Series

Exit devices

204
LECTURE
HALL

204

Information and customer care

us.allegion.com

US   877.671.7011
Canada   800.900.4734

support@allegion.com
Exits_TechProdSupport@allegion.com

www.youtube.com/VonDuprinSafety/

Ordering

allegion_orders@allegion.com

eFax: 1.800.999.0328

Engineered for value and performance

Von Duprin® empowers its customers to embrace change by providing flexible solutions that can be modified over time, protecting your investment well into the future. Von Duprin 98/99 Series push pad devices have a universal center case design that is unique to the industry and provides superior flexibility—from adding trim, switching handing or adding new retrofit options, you can configure numerous variations in the field without replacing your device.

Von Duprin's exit devices offer durable solutions that are proven in the field to perform under heavy use and abuse and backed by a team of experts experienced in door hardware application and code compliance. Allegion stands behind every Von Duprin product we make with unparalleled customer support thanks to our team of experts based in the U.S. that average more than 15 years of experience, so you are assured to receive expert advice.

98 Series features smooth mechanism case

99 Series features grooved mechanism case
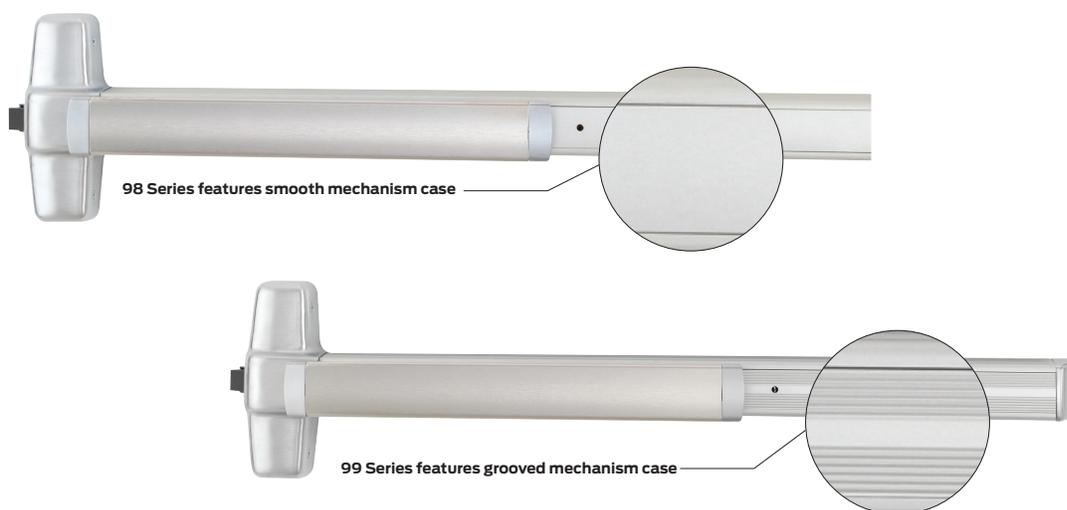
Von Duprin exit devices are available in two external surface styles, designated 98 and 99 Series.

Latch bolt
Deadlocking latch bolt provides security and improved performance at standard device cost.
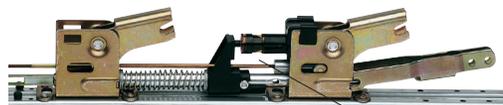
The Quiet One®
A fluid damper decelerates the push pad on its return stroke and eliminates most noise associated with exit device operations. Furnished on all 98/99™ Series exit devices.

Introduction

How to order

Device types

Trim options

Mechanical options

Electrified options

Accessories

Additional information

Nomenclature – how to order

Prefix	Device series/type		Trim/ rating		Suffix/ finish		Door width	Handing	Less bottom rod/cable	Trim options/ finish	Optional strike/finish	Accessories	Other information
1	2	3	4	5	6	7	8	9	10	11	12	13	14
QEL -	98 -	27 -	L -	F -	— -	626 -	3' -	RHR -	LBR -	996-06/626 -	299F/06 -	SNB -	HM

Detail

1 Prefixes

None	Standard
AX	Accessible device
CD	Cylinder dogging - panic only
CDSI	Cylinder dogging with security indicator
CI	Cylinder dogging indicator
CD-CX	Chexit cylinder dogging
CX	Chexit
DI	Dogging indicator
E	Electric locking mortise/lever
EL	Electric latch retraction
ESL	Emergency secure lockdown
HDSI	Hex dogging with security indicator
HH	Hurricane device
LD	Less dogging
LX	Latch bolt monitoring
LX-LC	Latch bolt monitoring, low current
LX-RX	Latch bolt monitoring, request to exit
LX-RX-LC	Latch bolt monitoring, request to exit low current
PL	Pullman latch
PN	Pneumatic latch retraction
QEL	Quiet electric latch retraction
QM	Quiet mechanical
RX	Request to exit
RX2	Double request to exit
RX-AUX	Request to exit, auxiliary
RX-LC	Request to exit, low current
SD	Special dogging -panic only
SS	Signal switch
WP-RX	Waterproof request to exit
WS	Windstorm (FEMA rated) surface vertical rod device
XP	Heavy protection - rim

2 Device series

98	Series 98-smooth
99	Series 99-grooved

3 Device type

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
50WDC	Concealed vertical cable wood door device
52	Rim device with remote trim input (pool exit hardware)
57	Three-point latch device
75	Mortise lock device

4 Trim functions

EO	For AD or CO locks, order the panic as Exit Only (EO)
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

5 Rating

F	Fire exit hardware
Blank	Panic exit hardware

6 Suffix

-2	Double cylinder (rim and mortise only)
-2SI	Double cylinder with security indicator (rim only)
CON	Connectors
WH	Weep holes

7 Finish

605	Bright Brass
606	Satin Brass
612	Satin Bronze
619	Satin Nickel
622/711	Matte Black/Matte Black, Anodized
625	Bright Chrome
626	Satin Chrome
626AM	Satin Chrome, Antimicrobial
628	Aluminum, Anodized
630	Satin Stainless
630AM	Satin Stainless, Antimicrobial
643e	Aged Bronze
693	Black Paint
710	Dark Brown, Anodized

8 Door width / Door thickness

Door width		Door thickness	
3'	Standard default	$1\,3/4$"	Standard
4'		$2\,1/4$"	Optional
2'	Vertical only		

9 Handing

LHR	Left hand reverse
RHR	Right hand reverse

10 Less bottom rod/cable

LBR	Less bottom rod
LBL	Less bottom latch
LBR-AFL	LBR with fire pin
LBL-AFL	LBL with fire pin

11 Trim options/finish

See trim options/finish for each device type

12 Optional strike/finish

06	Standard default (optional levers available

13 Accessories

CYL	Cylinder
GBK	Glass bead kit
SEC	Security screws
SLM	SLM blocking
SNB	Sex bolts

14 Other information

Touchbar options

BRAILLE	Vision impaired touchpad, raised letter, and braille
PUSH	Touchbar trim embossed 'PUSH'
RSS	Red silk-screened lettered touchbar trim
KN	Knurled touchbar
SG	Safety glow

Miscellaneous

CE	CE labeled
LCP	Less cover plate
IOWDA	#IOWDA cover plate
RAT REL	Ratchet release assy

Door material

AL	Aluminum door
HM	Hollow metal
WD	Wood door
CP	Composite door
INS2	Insulclad – $1/2$"
INS4	Insulclad – $1/4$"
SC	Steelcraft, HH device only

Door application

D	Double egress
P	Pair of doors
S	Single door

Note: Not all options are listed. See the specific device type pages for complete options available.

Introduction

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Trim options

Mechanical options

Electrified options

Accessories

Additional information

Device types

As the pioneer in the industry, Von Duprin continues to advance the industry through customer-centric innovation, which delivers solutions to the most challenging applications.

Backed by high quality standards, Von Duprin exit devices were among the first in the industry certified to ANSI/BHMA A156.3 (2014) Grade 1. Our exit devices are tested to the highest standards and proven in the field to perform under heavy use and abuse, giving you peace of mind both now and in the future.

The versatile design can be easily upgraded to connect to a larger electronic ecosystem, empowering you to adapt with flexible solutions. You can configure numerous variations in the field without replacing your device and protecting your investment. This makes upgrades easy and cost-effective.

Popular applications

Single door applications
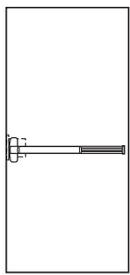
Single mortise lock device
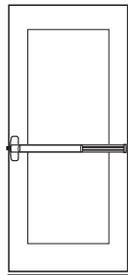
Single rim device
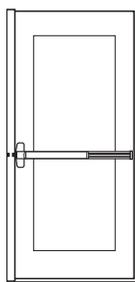
Single three-point latch device

Double door applications
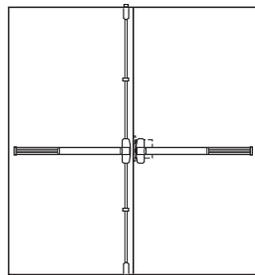
Mortise lock and surface mounted or concealed vertical cable/rod device combination—same direction
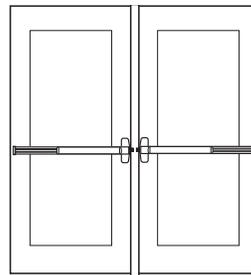
Two rim devices with mullion—same direction
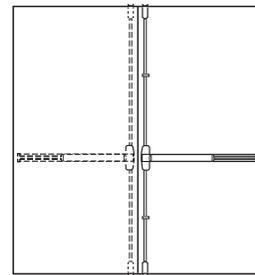
Two vertical rods—double egress Two surface/concealed rods or cables
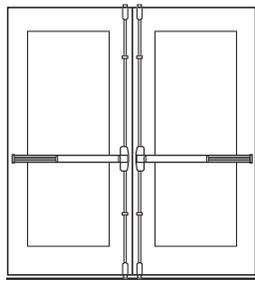
Two surface mounted vertical rod devices—same direction*
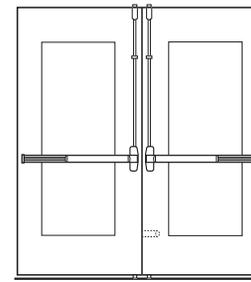
Two fire exit hardware vertical cables/rods with auxiliary fire latch-LBR option*
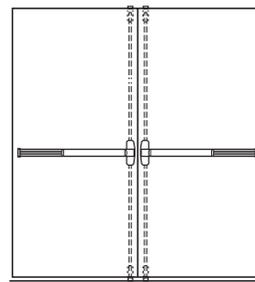
Two concealed vertical cables/rods*

* Do not use with overlapping astragals

Door handing

Left hand-reverse orientation

Right hand-reverse orientation

(Left hand-reverse)   Outside   (Right hand-reverse)

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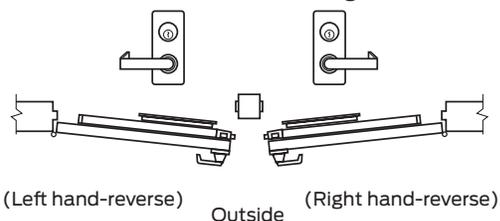
Device types

98/99 Rim exit device

98 and 99 rim exit devices for all types of single and double doors with mullion, UL listed for panic exit hardware. Devices are certified to ANSI/BHMA A156.3 2014, Grade 1. The 98 device has a smooth mechanism case and the 99 device has a grooved case. The rim device is non-handed except when the following device options are used: SD (special dogging), -2 (double cylinder) or SS (signal switch). Covers stock hollow metal doors with 86 or 161 cutouts on single doors (may cover cutouts on pairs — consult template).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^{13}/_{16}$" (1011mm) 39 $^{11}/_{16}$" (1008mm) with mullion
Center case	8" x 2 $^{3}/_{4}$" x 2 $^{3}/_{8}$" (203mm x 70mm x 60mm)
Mechanism case	2 $^{1}/_{4}$" x 2 $^{1}/_{4}$" (57mm x 57mm)
Projection	Pushbar neutral — 3 $^{13}/_{16}$" (97mm) Pushbar depressed — 3 $^{1}/_{16}$" (78mm)
Latch bolt	Deadlocking, $^{3}/_{4}$" (19mm) throw
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^{3}/_{4}$" (44mm) and 2 $^{1}/_{4}$" (57mm) thick metal or wood doors (Optional 425 SNB available, see page 66 for quantities)

Accessories

299 Strike
Ships standard,
optional strikes available.

Hex key dogging
Comes standard on
98/99 rim exit devices.

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
AX	Accessible device
GBK	Glass bead kit
PN	Pneumatic latch retraction
QM	Quiet mechanical
SNB	Sex bolts
SEC	Security screws
WH	Weep holes
XP	Extra protection

Dogging feature

Hex key dogging standard

Dogging options

CD	Cylinder dogging
CD-CX	Chexit cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes

299 – Dull black

98-F/99-F Rim exit device 🔥

98-F and 99-F Rim fire exit devices are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL fire exit hardware label and door opening size information. The 98-F device has a smooth mechanism case and the 99-F device has a grooved case. The rim device is non-handed except when the following device options are used: -2 (double cylinder) or SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	3' 2'4" to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^{13}/_{16}$" (1011mm) 39 $^{11}/_{16}$" (1008mm) with mullion
Center case	8" x 2 $^{3}/_{4}$" x 2 $^{3}/_{8}$" (203mm x 70mm x 60mm)
Mechanism case	2 $^{1}/_{4}$" x 2 $^{1}/_{4}$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97mm) Pushbar depressed – 3 $^{1}/_{16}$" (78mm)
Latch bolt	Deadlocking, $^{3}/_{4}$" (19mm) throw
Finishes	605, 606, 612, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^{3}/_{4}$" (44mm) and 2 $^{1}/_{4}$" (57mm) thick metal or wood doors; Optional 425 SNB available for metal doors; 425 and 825 SNB required on wood doors without SLM blocking (See page 66 for quantities)

Accessories

299F Strike
Ships standard, optional strikes available

499F Strike
With 9854/9954 mullion

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
AX	Accessible device
GBK	Glass bead kit
PN	Pneumatic latch retraction
QM	Quiet mechanical
SNB	Sex bolts
SEC	Security screws
SLM	Special laminate material blocking
WH	Weep holes
XP	Extra protection

Dogging option
No mechanical dogging;
QEL options available

Strikes
299F – Dull black, 499F with mullions

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XP98/99 Rim exit device

XP98/99 Rim exit devices are designed for single and double doors with mullion that require increased security. The "smart" latch changes shape when subjected to external forces. This design enables the exit door to withstand an external attack and remain secure. Additionally, the patented latch bolt design provides greater, longer-lasting latch bolt to strike contact which is not easily affected by the twisting motion of a weakened frame, resulting in an opening that will remain strong. Devices are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for panic exit hardware. The rim device is non-handed except when the following device options are used: SD (special dogging) or -2 (double cylinder). Covers stock hollow metal doors with 86 or 161 cutouts on single doors (may cover cutouts on pairs – consult template).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	3' 2'4' to 3' (711mm to 914mm) door size 4' 2'10" to 4' (864mm to 1219mm) door size
Device centerline from finished floor	39 $^{13}/_{16}$" (1011mm) 39 $^{11}/_{16}$" (1008mm) with mullion
Center case	8" x 2 $^{3}/_{4}$" x 2 $^{3}/_{8}$" (203mm x 70mm x 60mm)
Mechanism case	2 $^{1}/_{4}$" x 2 $^{1}/_{4}$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97mm) Pushbar depressed – 3 $^{1}/_{16}$" (78mm)
Latch bolt	Deadlocking, $^{3}/_{4}$" (19mm) throw
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^{3}/_{4}$" (44mm) and 2 $^{1}/_{4}$" (57mm) thick metal or wood doors (Optional 425 SNB available, see page 66 for quantities)

Features and options

Electrified options

LX-LC	Latch bolt monitor switch, low current
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
AX	Accessible device
GBK	Glass bead kit
SNB	Sex bolts
SEC	Security screws
WH	Weep holes

Dogging feature
Hex key dogging standard

Dogging options

CD	Cylinder dogging
CD-CX	Chexit cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes
909 – Dull black

Accessories

909 Strike
Ships standard for single or double doors.

XP latch
Provides increased security with its two piece design.

Hex key dogging
Comes standard on 98/99 rim exit devices.

XP98-F/99-F Rim exit device 🔥

XP98/99 Rim fire exit devices are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL fire exit hardware label and door opening size information. These are designed for single and double doors with 9954-XP mullion that require increased security. The "smart" latch changes shape when subjected to external forces. This design enables the exit door to withstand an external attack and remain secure. Additionally, the patented latch bolt design provides greater, longer-lasting latch bolt to strike contact which is not easily affected by the twisting motion of a weakened frame, resulting in an opening that will remain strong. The rim device is non-handed except when the following device option is used: -2 (double cylinder). Covers stock hollow metal doors with 86 or 161 cutouts on single doors (may cover cutouts on pairs – consult template).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^{13}/_{16}$" (1011mm) 39 $^{11}/_{16}$" (1008mm) with mullion
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97 mm) Pushbar depressed – 3 $^1/_{16}$" (78 mm)
Latch bolt	Deadlocking, $^3/_4$" (19mm) throw
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) and 2 $^1/_4$" (57mm) thick metal or wood doors. Optional 425 SNB available for metal doors. 425 and 825 SNB required on wood doors without SLM blocking (See page 66 for quantities)

Features and options

Electrified options

LX-LC	Latch bolt monitor switch, low current
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
AX	Accessible device
GBK	Glass bead kit
SNB	Sex bolts
SEC	Security screws
SLM	Special laminate material blocking
WH	Weep holes

Dogging option

No mechanical dogging;
QEL options available

Strikes

909 – Dull black, fire rated single doors
954 – Dull black, fire rated double doors

Accessories

909 Strike
Ships standard
for single doors.

XP latch
Provides increased
security with its
two piece design.

954 Strike
For fire rated
double doors and
9954XP mullion.

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9875/9975 Mortise lock device

9875/9975 Mortise lock device for all types of single or double doors, UL listed for panic exit hardware. Devices are certified to ANSI/BHMA A156.3 2014, Grade 1. Fits stock hollow metal doors with 86 cutout and door stiles as narrow as 4 ³⁄₄" (121mm). The 9875 device has a smooth mechanism case and the 9975 device has a grooved case. The mortise lock device is non-handed except when the following device options are used: -2 (double cylinder) or SS (signal switch).

The 7500 Mortise lock is equipped with a ³⁄₄" (19mm) anti-friction latch bolt which is field reversible without removing the lock from the door. It has a non-handed auxiliary bolt for deadlocking and a faceplate with an adjustable bevel.

Specifications

Device functions	Device ships setup for EO/DT/NL functions. Instructions show how to set up the device in the field for use with TP, K, and L classroom function trims.
Device lengths	3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 ⁵⁄₈" (1006mm)
Center case	8" x 2 ³⁄₄" x 2 ³⁄₈" (203mm x 70mm x 60mm)
Mechanism case	2 ¹⁄₄" x 2 ¹⁄₄" (57mm x 57mm)
Projection	Pushbar neutral – 3 ¹³⁄₁₆" (97mm) Pushbar depressed – 3 ¹⁄₁₆" (78mm)
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 ³⁄₄" (44mm) and 2 ¹⁄₄" (57mm) thick metal or wood doors. (Optional 425 SNB available, see page 66 for quantities)

Features and options

Electrified options

RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim/mortise lock
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
WH	Weep holes

Dogging feature

Hex key dogging standard

Dogging options

CD	Cylinder dogging
CD-CX	Chexit cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes

575 – Dull black

Accessories

7500 Mortise lock

575 Strike

Hex key dogging
Comes standard on 9875/9975 mortise lock exit devices.

9875-F/9975-F Mortise lock fire exit device

9875-F/9975-F Fire exit mortise lock devices are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL listed fire exit hardware label and door opening size information. Fits door stiles as narrow as 4 $3/4$" (121mm). The 9875-F device has a smooth mechanism case and the 9975-F device has a grooved case. The mortise lock device is non-handed except when the following device options are used: -2 (double cylinder) or SS (signal switch) devices.

The 7500 Mortise lock is equipped with $3/4$" (19mm) anti-friction latch bolt which is field reversible without removing the lock from the door. It has a non-handed auxiliary bolt for deadlocking and a faceplate with an adjustable bevel.

Specifications

Device functions	Device ships setup for EO/DT/NL functions. Instructions show how to set up the device in the field for use with TP, K, and L classroom function trims.
Device lengths	3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $5/8$" (1006mm)
Center case	8" x 2 $3/4$" x 2 $3/8$" (203mm x 70mm x 60mm)
Mechanism case	2 $1/4$" x 2 $1/4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $13/16$" (97mm) Pushbar depressed – 3 $1/16$" (78mm)
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $3/4$" (44mm) and 2 $1/4$" (57mm) thick metal or wood doors. Optional 425 SNB available for metal doors. 425 and 825 SNB required on wood doors without SLM blocking. (See page 66 for quantities)

Accessories

7500 Mortise lock

575 Strike

Features and options

Electrified options

RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim/mortise lock
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
SLM	Special laminate material blocking
WH	Weep holes

Dogging option

No mechanical dogging;
QEL options available

Strikes

575 – Dull black

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9827/9927 Surface mounted vertical rod device
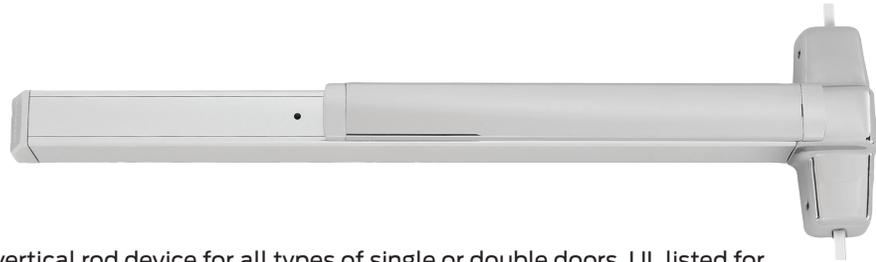
9827/9927 Surface mounted vertical rod device for all types of single or double doors, UL listed for panic exit hardware. Devices are certified to ANSI/BHMA A156.3 2014, Grade 1. Covers stock hollow metal doors with 86 or 161 cutouts. The 9827 device has a smooth mechanism case and the 9927 device has a grooved case. The surface vertical rod device is non-handed except when the following device options are used: SD (special dogging), SS (signal switch) or WS (tornado/hurricane). Vertical rod and latch guards are available to protect the bottom rod of the exit device from damage by impacts of carts or gurneys passing through doors.

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	2' 2' (610 mm) Door size
	3' 2'4' to 3' (711mm to 914mm) Door size
	4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^5/_8$" (1006 mm)
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral — 3 $^{13}/_{16}$" (97mm)
	Pushbar depressed — 3 $^1/_{16}$" (78mm)
Latch bolt	Deadlocking anti-friction top and bottom bolt, $^5/_8$" (16mm) throw
Door undercut	$^1/_4$" (7mm) recommended
Top and bottom latch case	4 $^1/_2$" x 2 $^1/_8$" x 1 $^1/_2$" (114mm x 54mm x 38mm)
Vertical rods	$^1/_2$" square tubing, standard rods accommodate 7' (2134mm) doors. Top rod length: 34 $^{15}/_{16}$" (887mm); Bottom rod length: 31 $^1/_2$" (794mm). Extension rods available in 3' (914mm) for doors over 7'; One piece top rod is available for 8' (2438mm) and 10' (3048mm) doors
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) to 2 $^1/_4$" (57mm) thick metal or wood doors, and 325 SNB for top and bottom latch. (Optional 425 SNB available)

Accessories

299
Top strike

248L4
Bottom strike
For use with flat threshold

Top latch

Bottom latch

304L
Bottom strike

Hex key dogging
Comes standard on 9827/9927 devices.

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
AX	Accessible device
GBK	Glass bead kit
LBR	Less bottom rod
PL	Pullman latch
PN	Pneumatic latch retraction
QM	Quiet mechanical
SNB	Sex bolts
SEC	Security screws
WH	Weep holes
WS	Tornado and hurricane tested

Dogging feature

Hex key dogging standard

Dogging options

CD	Cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes

Top — 299 — Dull black
Bottom — 248L4 and 304L — Unfinished

9827-F/9927-F Surface mounted vertical rod fire device 🔥

9827-F/9927-F Fire exit surface mounted vertical rod device are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL fire exit hardware label and door opening size information. The 9827-F device has a smooth mechanism case and the 9927-F device has a grooved case. The surface vertical rod device is non-handed except when the following device options are used: SS (signal switch), and WS (tornado/hurricane). Vertical rod and latch guards are available to protect the bottom rod of the exit device from damage by impacts of carts or gurneys passing through doors. Rod and latch guards can be used on hollow metal or tin clad composite fire doors.

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	2' 2' (610 mm) Door size
	3' 2'4' to 3' (711mm to 914 mm) Door size
	4' 2'10" to 4' (864 mm to 1219 mm) Door size
Device centerline from finished floor	39 $^5/_8$" (1006 mm)
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97 mm)
	Pushbar depressed – 3 $^1/_{16}$" (78 mm)
Latch bolt	Deadlocking anti-friction top and bottom bolt, $^5/_8$" (16mm) throw
Door undercut	$^1/_4$" (7mm) recommended
Top and bottom latch case	4 $^1/_2$" x 2 $^1/_8$" x 1 $^1/_2$" (114mm x 54mm x 38mm)
Vertical rods	$^1/_2$" square tubing, standard rods accommodate 7' (2134mm) doors. Top rod length: 34 $^{15}/_{16}$" (887mm); Bottom rod length: 31 $^1/_2$" (794mm). Extension rods available in 3' (914mm) for doors over 7' One piece top rod is available for 8' (2438mm) and 10' (3048mm) doors
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) to 2 $^1/_4$" (57mm) thick metal or wood doors, and 325 SNB for top and bottom latch (Optional 425 SNB available)

Accessories

299F Top strike

499F Top strike LBR

Top latch

Bottom latch

304L Bottom strike

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
AX	Accessible device (LBR only)
GBK	Glass bead kit
LBR	Less bottom rod
PL	Pullman latch
PN	Pneumatic latch retraction
QM	Quiet mechanical
SNB	Sex bolts
SEC	Security screws
SLM	Special laminate material blocking
WH	Weep holes
WS	Tornado and hurricane tested

Dogging option

No mechanical dogging;
QEL options available

Strikes

Top – 299F –(499F LBR) Dull black
Bottom – 304L – Unfinished

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9857/9957 Three-point latching device

9857/9957 Three-point latching device for all types of single or double doors, UL listed for panic exit hardware. Devices are ANSI A156.3 – 2008 Grade 1. Covers stock hollow metal doors with 86 or 161 cutouts. The 9857 device has a smooth mechanism case and the 9957 device has a grooved case. The three-point latching device is non-handed except when the following device options are used: SD (special dogging), SS (signal switch), or WS (windstorm). Vertical rod and latch guards are available to protect the bottom rod of the exit device from damage by impacts of carts or gurneys passing through doors.

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device.
Device lengths	3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^{13}/_{16}$" (1011mm)
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97mm) Pushbar depressed – 3 $^1/_{16}$" (78mm)
Latch bolt	Deadlocking anti-friction top and bottom bolt, 5/8" (16mm) throw; Deadlocking rim bolt, $^3/_4$" (19mm) throw
Door undercut	$^1/_4$" (7mm) recommended
Top and bottom latch case	4 $^1/_2$" x 2 $^1/_8$" x 1 $^1/_2$" (114mm x 54mm x 38mm)
Vertical rods	$^1/_2$" square tubing, standard rods accommodate 7' (2134mm) doors. Top rod length: 34 $1^5/_{16}$" (887mm); Bottom rod length: 31 $^1/_2$" (794mm). Extension rods available in 3' (914mm) for doors over 7'. One piece top rod is available for 8' (2438mm) and 10' (3048mm) doors.
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) to 2 $^1/_4$" (57mm) thick metal or wood doors, and 325 SNB for top and bottom latch (Optional 425 SNB available)

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
PL	Pullman latch
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
WH	Weep holes
WS	Tornado and hurricane tested

Dogging feature

Hex key dogging standard

Dogging options

CD	Cylinder dogging
CD-CX	Chexit cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes

Top and middle – 299 – Dull black
Bottom – 248L4 and 304L – Unfinished

Accessories

299 Top and middle strike

Top latch

304L Bottom strike

248L4 Bottom strike For use with flat threshold

Bottom latch

Hex key dogging Comes standard on 9857/9957 three point latching devices.

9857-F/9957-F Three-point latching fire exit device 🔥

9857-F/9957-F Fire exit three-point latching device are UL listed for fire exit hardware. See page 69 for detailed information on UL listed fire exit hardware label and door opening size information. Devices are ANSI A156.3 – 2008 Grade 1. The 9857-F device has a smooth mechanism case and the 9957-F device has a grooved case. The three-point latch device is non-handed except when the following device option is used: SS (signal switch) or WS (windstorm). Vertical rod and latch guards are available to protect the bottom rod of the exit device from damage by impacts of carts or gurneys passing through doors.

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	3' 2'4" to 3' (711mm to 914mm) Door size
	4' 2'10" to 4' (864 mm to 1219mm) Door size
Device centerline from finished floor	39 $^{13}/_{16}$" (1011mm)
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97mm)
	Pushbar depressed – 3 $^1/_{16}$" (78mm)
Latch bolt	Deadlocking anti-friction top and bottom bolt, $^5/_8$" (16mm) throw; Deadlocking rim bolt, $^3/_4$" (19mm) throw
Door undercut	$^1/_4$" (7mm) recommended
Top and bottom Latch case	4 $^1/_2$" x 2 $^1/_8$" x 1 $^1/_2$" (114mm x 54mm x 38mm)
Vertical rods	$^1/_2$" square tubing, standard rods accommodate 7' (2134mm) doors. Top rod length: 34 $^{15}/_{16}$" (887mm); Bottom rod length: 31 $^1/_2$" (794mm). Extension rods available 3' (914mm) for doors over 7'. One piece top rod is available for 8' (2438mm) and 10' (3048mm) doors.
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) and 2 $^1/_4$" (57mm) thick metal or wood doors, and 325 SNB for top and bottom latch. (Optional 425 SNB available for metal doors; 825 SNB required on wood doors without SLM blocking)

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
SLM	Special laminate material blocking
WH	Weep holes
WS	Tornado and hurricane tested

Dogging option
No mechanical dogging;
QEL options available

Strikes
Top and middle – 299F – Dull black
Bottom – 304L – Unfinished

Accessories

299F Top and middle strike

Top latch

304L Bottom strike

499F Rim strike For mullion applications

Bottom latch

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9847/9947 Concealed vertical rod device

9847/9947 Concealed vertical rod device for use on single or double metal doors, UL listed for panic exit hardware. These are certified to ANSI/BHMA A156.3 2014, Grade 1. The 9847 device has a smooth mechanism case and the 9947 device has a grooved case. The concealed vertical rod device is non-handed except when the following device options are used: SD (special dogging), or SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device.
Device lengths	2' 2' (610mm) Door size
	3' 2'4' to 3' (711mm to 914mm) Door size
	4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^5/_8$" (1006 mm) Standard Adjustable from 35 $^5/_8$" (905mm) to 49 $^5/_8$" (1260mm)
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97mm)
	Pushbar depressed – 3 $^1/_{16}$" (78mm)
Latch bolt	Deadlocking top and bottom bolt, $^5/_8$" (16mm) throw
Door undercut	$^1/_4$" (7mm) recommended
Top and bottom latch case	4 $^1/_2$" x 2 $^1/_8$" x 1 $^1/_2$" (114mm x 54mm x 38mm)
Vertical rods	Round 2-piece adjustable rods – Top rod adjustable from 6'8" (2027mm) to 8'4"(2533mm). Bottom rod adjustable 35 $^5/_8$" (905mm) to 49 $^5/_8$" (1260mm). Extension rod kits available for doors over 8'4" (2533mm).
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) to 2 $^1/_4$" (57mm) thick metal doors (Optional 425 SNB available)

Accessories

338 Top strike

Top latch

Bottom latch

Accessories

385A Bottom strike

Hex key dogging Comes standard on 9847/9947 concealed vertical rod devices

Features and options

Electrified options
LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options
-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
LBR	Less bottom rod
PL	Pullman latch
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
WH	Weep holes

Dogging feature
Hex key dogging standard

Dogging options
CD	Cylinder dogging
CD-CX	Chexit cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes
Top – 338 – Unfinished
Bottom – 385A – Unfinished

9847-F/9947-F Concealed vertical rod fire exit device 🔥

9847-F/9947-F Fire exit concealed vertical rod device are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL fire exit hardware label and door opening size information. The 9847-F device has a smooth mechanism case and the 9947-F device has a grooved case. The concealed vertical rod device is non-handed except when the following device option is used: SS (signal switch) devices.

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	2' 2' (610 mm) Door size 3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $5/8$" (1006 mm) Standard Adjustable from 35 $5/8$" (905mm) to 49 $5/8$" (1260mm)
Center case	8" x 2 $3/4$" x 2 $3/8$" (203mm x 70mm x 60mm)
Mechanism case	2 $1/4$" x 2 $1/4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $13/16$" (97mm) Pushbar depressed – 3 $1/16$" (78mm)
Latch bolt	Deadlocking top and bottom bolt, $5/8$" (16mm) throw
Door undercut	$1/4$" (7mm) recommended
Top and bottom latch case	3 $3/4$" x 1 $1/2$" x 1" (95mm x 38mm x 25mm)
Vertical rods	Round 2-piece adjustable rods – Top rod adjustable from 6'8" (2027mm) to 8'4"(2533mm). Bottom rod adjustable 35 $5/8$" (905mm) to 49 $5/8$" (1260mm) Extension rod kits available for doors over 8'4" (2533mm)
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $3/4$" (44mm) to 2 $1/4$" (57mm) thick metal doors (Optional 425 SNB available)

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
LBR	Less bottom rod
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
SLM	Special laminate material blocking
WH	Weep holes

Dogging option

No mechanical dogging;
QEL options available

Strikes

Top – 338 – Unfinished
Bottom – 385A – Unfinished

Accessories

338
Top strike

Top latch

Bottom latch

385A
Bottom strike

9848/9948 Concealed vertical rod device

9848/9948 Concealed vertical rod device for use on single or double metal doors, UL listed for panic exit hardware. These are certified to ANSI/BHMA A156.3 2014, Grade 1. Covers stock hollow metal doors with 86 or 161 cutouts. The 9848 device has a smooth mechanism case and the 9948 device has a grooved case. The concealed vertical rod device is non-handed except when the following device options are used: SD (special dogging), or SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	2' 2' (610 mm) Door size 3' 2'4" to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $5/8$" (1006 mm) Standard Adjustable from 35 $5/8$" (905mm) to 49 $5/8$" (1260mm)
Center case	8" x 2 $3/4$" x 2 $3/8$" (203mm x 70mm x 60mm)
Mechanism case	2 1/4" x 2 1/4" (57mm x 57mm)
Projection	Pushbar neutral – 3 $13/16$" (97 mm) Pushbar depressed – 3 $1/16$" (78mm)
Latch bolt	Deadlocking top bolt, $5/8$" (16mm) throw Deadlocking bottom bolt, 1 $1/2$" (38mm) throw
Door undercut	$3/4$" (19mm) maximum, more than $1/4$" minimum
Top and bottom latch case	4 $1/4$" x 1 $1/2$" x 1 $1/8$" (107mm x 38mm x 28mm)
Vertical rods	Round 2-piece adjustable rods – Top rod adjustable from 6'8" (2027mm) to 8'4"(2533mm). Bottom rod adjustable 35 $5/8$" (905 mm) to 49 $5/8$" (1260 mm). Extension rod kits available for doors over 8'4" (2533mm).
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $3/4$" (44mm) to 2 $1/4$" (57mm) thick metal doors (Optional 425 SNB available)

Accessories

338
Top strike

Top latch

Bottom latch

385A
Bottom strike

Hex key dogging
Comes standard on 9847/9947 concealed vertical rod devices

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
WH	Weep holes

Dogging feature
Hex key dogging standard

Dogging options

CD	Cylinder dogging
CD-CX	Chexit cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes
Top – 338 – Unfinished
Bottom – 385A – Unfinished

9848-F/9948-F Concealed vertical rod fire exit device 🔥

9848-F/9948-F Concealed vertical rod device are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL listed fire exit hardware label and door opening size information. The 9848-F device has a smooth mechanism case and the 9948-F device has a grooved case. The concealed vertical rod device is non-handed except when the following device option is used: SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	2' 2' (610mm) Door size 3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^5/_8$" (1006mm) Standard Adjustable from 35 $^5/_8$" (905mm) to 49 $^5/_8$" (1260mm)
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97mm) Pushbar depressed – 3 $^1/_{16}$" (78mm)
Latch bolt	Deadlocking top bolt, $^5/_8$" (16mm) throw Deadlocking bottom bolt, 1 $^1/_2$" (38mm) throw
Door undercut	$^3/_4$" (19mm) maximum, more than $^1/_4$" minimum
Top and bottom Latch case	4 $^1/_4$" x 1 $^1/_2$" x 1 $^1/_8$" (107mm x 38mm x 28mm)
Vertical rods	Round 2-piece adjustable rods – Top rod adjustable from 6'8" (2027mm) to 8'4"(2533mm). Bottom rod adjustable 35 $^5/_8$" (905mm) to 49 $^5/_8$" (1260 mm). Extension rod kits available for doors over 8'4" (2533mm).
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) to 2 $^1/_4$" (57mm) thick metal doors. (Optional 425 SNB available)

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
SLM	Special laminate material blocking
WH	Weep holes

Dogging option

No mechanical dogging;
QEL options available

Strikes

Top – 338 – Unfinished
Bottom – 385A – Unfinished

Accessories

338
Top strike

Top latch

Bottom latch

385A
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9849/9949 Concealed vertical cable device

9849/9949 Concealed vertical cable device for use on single or double metal doors, UL listed for panic exit hardware. These are certified to ANSI/BHMA A156.3 2014, Grade 1. The 9849 device has a smooth mechanism case and the 9949 device has a grooved case. The concealed vertical cable device is non-handed except when the following device options are used: SD (special dogging), or SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device.
Device lengths	2' 2' (610 mm) Door size
	3' 2'4' to 3' (711mm to 914mm) Door size
	4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^5/_8$" (1006 mm)
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral — 3 $^{13}/_{16}$" (97mm)
	Pushbar depressed — 3 $^1/_{16}$" (78mm)
Latch bolt	Deadlocking top and bottom bolt, $^1/_2$" (13mm) throw
Door undercut	$^3/_4$" (19mm) maximum
	(24231516 spacer block kit needed for $^3/_4$" undercut)
Top and bottom latch case	5 $^{13}/_{16}$" x 1 $^1/_4$" x 1 $^7/_{16}$" (147mm x 32mm x 37mm)
Vertical cable	$^7/_{32}$" (6mm) Diameter stainless steel cables
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) to 2 $^1/_4$" (57mm) thick metal doors (Optional 425 SNB available)

Features and options

Electrified options

LX*	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
AX	Accessible device
GBK	Glass bead kit
LBL	Less bottom latch
PN	Pneumatic latch retraction
SG	Safety glow
SNB	Sex bolts
SEC	Security screws
WH	Weep holes

Dogging option

No mechanical dogging;
QEL options available

Dogging options

CD	Cylinder dogging
CD-CX	Chexit cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes

Top — 249 – Unfinished
Bottom — 349 – Unfinished

*For 98/9949 devices, LX switch monitors trim input or electric dogging of EL/QEL devices. LX switch does not monitor latch bolt condition.

9849/9949 Concealed vertical cable device

Accessories

249 Top strike

349 Bottom strike

338 Filler plate
(retrofit bracket)

Top latch

Center slide

Bottom latch

Cable detail

Hex key dogging
Comes standard on 9849/9949 concealed vertical cable devices

Nominal door opening height		Top cable part number	Bottom cable part number
72" - 82"	6'0" - 6'10"	47250398	47250403
*82" - 96"	***6'10" - 8'**	**47250175**	**47250178**
>96" - 110"	>8'0" - 9' 2"	47250176	47250179
>110" - 120"	>9'2" - 10'	47250177	47250180

*Default door opening height. Specify door opening height if other than the default. For door heights less than 6'0" and greater than 10', contact our Customer Care department to discuss your specific application needs.

Door opening height
is distance from bottom of frame header to finished floor.

See table on left for standard offering.

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9849-F/9949-F Concealed vertical cable fire exit device 🔥

98/9949-F Concealed vertical cable devices are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL listed fire exit hardware label and door opening size information. The 9849 device has a smooth mechanism case and the 9949 device has a grooved case. The concealed vertical cable device is non-handed except when the following device options are used: SD (special dogging), or SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	2' 2' (610 mm) Door size 3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^5/_8$" (1006 mm) Standard
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97mm) Pushbar depressed – 3 $^1/_{16}$" (78mm)
Latch bolt	Deadlocking anti-friction top and bottom bolt, $^5/_8$" (16mm) throw
Door undercut	$^3/_4$" (19mm) maximum (24231516 spacer block kit needed for $^3/_4$" undercut)
Top and bottom Latch case	5 $^{13}/_{16}$" x 1 $^1/_4$" x 1 $^7/_{16}$" (147mm x 32mm x 37mm)
Vertical cable	$^7/_{32}$" (6mm) Diameter stainless steel cables
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) to 2 $^1/_4$" (57mm) thick metal doors (Optional 425 SNB available)

Features and options

Electrified options

LX*	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
AX	Accessible device
GBK	Glass bead kit
LBL	Less bottom latch
PN	Pneumatic latch retraction
SG	Safety glow
SNB	Sex bolts
SEC	Security screws
WH	Weep holes

Dogging feature

Hex key dogging standard

Dogging options

CD	Cylinder dogging
CD-CX	Chexit cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes

Top – 249 – Unfinished
Bottom – 349 – Unfinished

*For 98/9949 devices, LX switch monitors trim input or electrified dogging of EL/QEL devices. LX switch does not monitor latch bolt condition.

9849-F/9949-F Concealed vertical cable fire exit device 🔥

Accessories

249 Top strike

Top latch

Cable detail

349 Bottom strike

Center slide

Hex key dogging
Comes standard on 9849/9949 concealed vertical cable devices

338 Filler plate (retrofit bracket)

Bottom latch

Nominal door opening height		Top cable part number	Bottom cable part number
72" - 82"	6'0" - 6'10"	47250398	47250403
*82" - 96"	***6'10" - 8'**	**47250175**	**47250178**
>96" - 110"	>8'0" - 9' 2"	47250176	47250179
>110" - 120"	>9'2" - 10'	47250177	47250180

*Default door opening height. Specify door opening height if other than the default. For door heights less than 6'0" and greater than 10', contact our Customer Care department to discuss your specific application needs.

Door opening height
is distance from bottom of frame header to finished floor.

See table on left for standard offering.

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9847WDC/9947WDC Wood door concealed vertical rod device

9847WDC/9947WDC Concealed vertical rod device for use on single or double wood doors, UL listed for panic exit hardware. Devices are certified to ANSI/BHMA A156.3 2014, Grade 1. The 9847WDC device has a smooth mechanism case and the 9947WDC device has a grooved case. The concealed vertical rod device is non-handed except when the following device options are used: SD (special dogging), or SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	2' 2' (610 mm) Door size 3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $^5/_8$" (1006mm) Standard Adjustable from 35 $^5/_8$" (905mm) to 49 $^5/_8$" (1260mm)
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97mm) Pushbar depressed – 3 $^1/_{16}$" (78mm)
Latch bolt	Deadlocking top bolt, $^5/_8$" (16mm) throw
Door undercut	$^1/_4$" (7mm) maximum
Top and bottom Latch case	3 $^3/_4$" x 1 $^1/_2$" x 1" (95mm x 38mm x 25mm)
Vertical rods	Round 2-piece adjustable rods – Top rod adjustable from 6'8" (2027mm) to 8'4"(2533mm). Bottom rod adjustable 35 $^5/_8$" (905mm) to 49 $^5/_8$" (1260 mm). Extension rod kits available for doors over 8'4" (2533mm).
Scalp plate[1]	Device is furnished standard with an 8" (203mm) long scalp plate for easy access to rods
Finishes	605, 606, 612, 625, 626, 628 and 710 (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) to 2 $^1/_4$" (57mm) thick wood doors. (425 SNB required on wood doors without SLM blocking)

1. Do not use on pair of doors with 9875/9975.

Accessories

338 Top strike

Top latch

Bottom latch

385A Bottom strike

283 Top strike
For use with wood frames
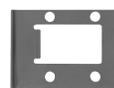
Hex key dogging
Comes standard on 9847/9947 wood door concealed vertical rod devices

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
LBR	Less bottom rod
PL	Pullman latch
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
WH	Weep holes

Dogging feature

Hex key dogging standard

Dogging options

CD	Cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes

Top – 338 – Unfinished
Bottom – 358A – Unfinished

9847WDC-F/9947WDC-F Wood door concealed vertical rod fire device 🔥

9847WDC-F/9947WDC-F Fire exit concealed vertical rod devices are certified to ANSI/ BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL listed fire exit hardware label and door opening size information. The 9847WDC-F device has a smooth mechanism case and the 9947WDC-F device has a grooved case. The concealed vertical rod device is non-handed except when the following device options are used: SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	2' 2' (610 mm) Door size 3' 2'4" to 3' (711mm to 914 mm) Door size 4' 2'10" to 4' (864 mm to 1219 mm) Door size
Device centerline from finished floor	39 $^5/_8$" (1006 mm) Standard
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $^{13}/_{16}$" (97 mm) Pushbar depressed – 3 $^1/_{16}$" (78 mm)
Latch bolt	Deadlocking top and bottom bolt, $^5/_8$" (16mm) throw
Door undercut	$^1/_4$" (7mm) maximum
Top and bottom Latch case	3 $^3/_4$" x 1 $^1/_2$" x 1" (95mm x 38mm x 25mm)
Vertical rods	Round 2-piece adjustable rods – Top rod adjustable from 6'8" (2027mm) to 8'4"(2533mm). Bottom rod adjustable 35 $^5/_8$" (905 mm) to 49 $^5/_8$" (1260 mm). Extension rod kits available for doors over 8'4" (2533mm).
Scalp plate[1]	Device is furnished standard with an 8" (203mm) long scalp plate for easy access to rods
Finishes	605, 606, 612, 625, 626, 628, 710 (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^3/_4$" (44mm) to 2 $^1/_4$" (57mm) thick wood doors. (425 SNB required on wood doors without SLM blocking)

1. Do not use on pair of doors with 9875-F/9975-F.

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
GBK	Glass bead kit
LBR	Less bottom rod
PL	Pullman latch
PN	Pneumatic latch retraction
SNB	Sex bolts
SEC	Security screws
WH	Weep holes

Dogging option
No mechanical dogging;
QEL options available

Strikes
Top – 338 – Unfinished
Bottom – 385A – Unfinished

Accessories

338
Top strike

Top latch

Bottom latch

385A
Bottom strike

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9850WDC/9950WDC Wood door concealed vertical cable device

9850WDC/9950WDC Concealed vertical cable device for use on single or double wood doors, UL listed for panic exit hardware. Devices are certified to ANSI/BHMA A156.3 2014, Grade 1. The 9850WDC device has a smooth mechanism case and the 9950WDC device has a grooved case. The concealed vertical cable device is non-handed except when the following device options are used: SD (special dogging), or SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	2' 2' (610mm) Door size 3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to1219 mm) Door size
Device centerline from finished floor	39 $^{5}/_{8}$" (1006mm) Standard
Center case	8" x 2 $^{3}/_{4}$" x 2 $^{3}/_{8}$" (203mm x 70mm x 60mm)
Mechanism case	2 $^{1}/_{4}$" x 2 $^{1}/_{4}$" (57mm x 57mm)
Projection	Pushbar neutral — 3 $^{13}/_{16}$" (97mm) Pushbar depressed — 3 $^{1}/_{16}$" (78mm)
Latch bolt	Deadlocking top and bottom bolt. 1 $^{1}/_{2}$" (38mm) throw
Door undercut	$^{3}/_{4}$" (19mm) maximum
Top and bottom Latch case	5 $^{13}/_{16}$" x 1 $^{1}/_{4}$" x 1 $^{7}/_{16}$" (147mm x 32mm x 37mm)
Vertical cables	$^{7}/_{32}$" (6mm) Diameter stainless steel cables
Scalp plate[1]	Device is furnished standard with a 15" (381mm) long scalp plate for easy access to cables
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $^{3}/_{4}$" (44mm) to 2 $^{1}/_{4}$" (57mm) thick wood doors.

1. Do not use on pair of doors with 9975 devices.

Features and options

Electrified options

LX*	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
RX996L	Trim monitor switch
RX-LC	Request to exit low current
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

AX	Accessible device
GBK	Glass bead kit
LBL	Less bottom latch
PN	Pneumatic latch retraction
SG	Safety glow
SNB	Sex bolts
SEC	Security screws
WH	Weep holes

Dogging feature

Hex key dogging standard

Dogging options

CD	Cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes

Top — **150** — Unfinished
Bottom — **450** — Unfinished

*For 98/9950WDC devices, LX switch monitors trim input or electrified dogging of EL/QEL devices. LX switch does not monitor latch bolt condition.

9850WDC/9950WDC Wood door concealed vertical cable device

Accessories

150 Top strike

Top latch

Hex key dogging
Comes standard on 9850/9950 concealed vertical cable devices

450 Bottom strike

Center slide

338 Filler plate (retrofit bracket)
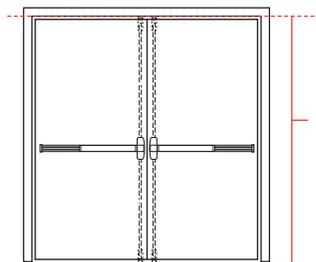
Bottom latch

Door opening height
is measured from finished floor to frame rabbet on door side.

See table for standard offering.

Standard door opening height

Feet	Cable tolerance
6'8" – 7'	72" – 84"
7'1" – 8'	85" – 96"
8'1" – 9'	97" – 108"
9'1" – 10'	109" – 120"

Note: Non-standard sizes available with extended lead time.
Consult Customer Care for more information 1-877-671-7011.

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9850WDC-F/9950WDC-F
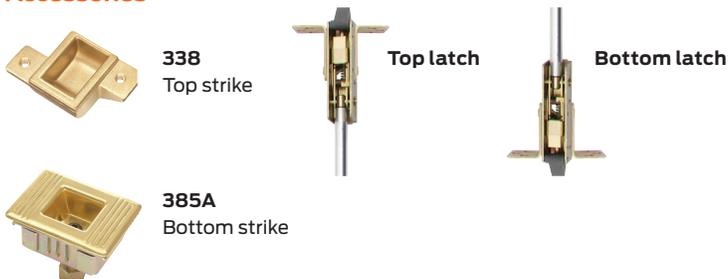# Wood door concealed vertical cable fire device 🔥

9850WDC-F/9950WDC-F Fire exit concealed vertical cable devices are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL listed fire exit hardware label and door opening size information. The 9850WDC-F device has a smooth mechanism case and the 9950WDC-F device has a grooved case. The concealed vertical cable device is non-handed except when the following device options are used: SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device.
Device lengths	2' 2' (610mm) Door size 3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 $5/8$" (1006mm) Standard
Center case	8" x 2 $3/4$" x 2 $3/8$" (203mm x 70mm x 60mm)
Mechanism case	2 $1/4$" x 2 $1/4$" (57mm x 57mm)
Projection	Pushbar neutral – 3 $13/16$" (97mm) Pushbar depressed – 3 $1/16$" (78mm)
Latch bolt	Deadlocking top and bottom bolt, 1 $1/2$" (38mm) throw
Door undercut	$3/4$" (19mm) maximum
Top and bottom Latch case	5 $13/16$" x 1 $1/4$" x 1 $7/16$" (147mm x 32mm x 37mm)
Vertical cables	$7/32$" (6mm) Diameter stainless steel cables
Scalp plate[1]	Device is furnished standard with a 15" (381mm) long scalp plate for easy access to cables
Finishes	US3, US3A, US4, US4A, US10, US26, US26D, US26D-AM, US28, 313, 315 and 643e (US15 and US32D available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 $3/4$" (44mm) to 2 $1/4$" (57mm) thick wood doors

1. Do not use on pair of doors with 9975 devices.

Accessories

150 Top strike   **450 Bottom strike**   **Top latch**   **Bottom latch**

Center slide

338 Filler plate (retrofit bracket)

Features and options

Electrified options
LX*	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
RX996L	Trim monitor switch
RX-LC	Request to exit low current
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options
AX	Accessible device
GBK	Glass bead kit
LBL	Less bottom latch
PN	Pneumatic latch retraction
SG	Safety glow
SNB	Sex bolts
SEC	Security screws
SLM	Special laminate material blocking
WH	Weep holes

Dogging option
No mechanical dogging; QEL options available

Strikes
Top – 150 – Unfinished
Bottom – 450 – Unfinished

*For 98/9950 devices, LX switch monitors trim input or electric dogging of EL/QEL devices. LX switch does not monitor latch bolt condition.
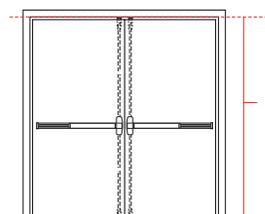
Door opening height is measured from finished floor to frame rabbet on door side.

See table for standard offering.

Standard door opening height	
Feet	**Cable tolerance**
6'8" - 7'	72" - 84"
7'1" - 8'	85" - 96"
8'1" - 9'	97" - 108"
9'1" - 10'	109" - 120"

Note: Non-standard sizes available with extended lead time. Consult Customer Care for more information 1-877-671-7011.

98/9952 Rim with remote trim input (pool exit hardware)

Openings beyond the interior often have additional functional requirements that go beyond the limits of standard door hardware. Von Duprin offers the safety of panic hardware for pool enclosures, tested to withstand corrosive cleaners typically used in outdoor pool environments. Both the device and trim are built with weather resistant components that can withstand the harsh conditions of various climates. Understanding that hardware solutions need to be flexible and configurable, the Von Duprin 98/9952 with 252L trim is designed to meet the very specific needs of outdoor pool areas.

Engineered to be installed easily, the 98/9952 device can be mounted within the required range by the model codes and accessibility standards, while the 252L trim is mounted at least 54" from finished floor or concrete. Gate poles must have at least 3" stile width by 2" depth for ideal installation.

Compliance
- Listed with UL for panic exit hardware (UL 305)
- Certified to ANSI/BHMA A156.3 2014, Grade 1
- Meets International Building Code for pool enclosures
- Compliant with the 2010 ADA Standards for Accessible Design

Features and benefits
- Patent-pending design built to meet code requirements for pool enclosures
- Weather-resistant components ideal for outdoor applications
- Easy installation and maintenance
- Simple to operate
- UL listed for panic exit hardware (UL305)

Specifications

Device functions	EO, L, L-BE
Dogging	LD – Less dogging
Device lengths	3' , 4'
Center case	8" x 2 $^3/_4$" x 2 $^3/_8$" (203mm x 70mm x 60mm)
Mechanism case	2 $^1/_4$" x 2 $^1/_4$" (57mm x 57mm)
Latch bolt	Deadlocking $^3/_4$" (19mm) throw
Trims	252-L, 252-LBE
Strike	699 roller strike
Finishes	626, 710
Options	WH – Weep holes

Accessories

699 Roller strike

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Trim functions

Von Duprin protects your investment by empowering you to adapt with flexible solutions and modular options. The 98/99 Series features numerous trim options to serve your different needs. Designed with flexibility in mind, our solutions offer ease of adding new options as they are developed.

With Von Duprin, you can be confident that as the needs of your facility change, our products can be upgraded easily to meet your needs, especially as the mechanical and electronic technology converge. Von Duprin's versatile design enables you to add functionality to existing devices in a cost-effective way, protecting your investment well into the future.

A variety of device trim lock type functions such as key lock and unlock, latch bolt retraction with key and no cylinder designs for an "always operable" function are available in levers, knobs, latches, thumbpiece and thumbturn designs.

EO   No outside trim
- Exit only

DT   Dummy trim
- Pull when dogged (not recommended for fire device)

NL   Night latch
- Key retracts latchbolt
- Rim and 1 ¼" mortise cylinder

NLOP Night latch
- Key retracts latchbolt, pull required

TP   Thumbpiece
- Key locks and unlocks
- Rim and 1 ¼" mortise cylinder

TPBE Thumbpiece, blank escutcheon
- Blank escutcheon always operable (no cylinder, use with DT trim)

L   Lever

K   Knob
- Key locks and unlocks
- Rim and 1 ¼" mortise cylinder
- Handed, reversible lever
- Electrified lever operation available

LDT   Lever, dummy trim

KDT   Knob, dummy trim
- Pull when dogged

LNL   Lever, night latch

KNL   Knob, night latch
- Key retracts latchbolt
- Rim and 1 ¼" mortise cylinder
- Handed, reversible lever

LBE[1]   Lever, blank escutcheon

KBE   Knob, blank escutcheon
- Always operable (no cylinder)

TL   Turn lever
- Key locks and unlocks (use with DT trim)
- 1 ¼" mortise cylinder

TLBE   Turn lever, blank escutcheon
- Blank escutcheon always operable (no cylinder, use with DT trim)

TLOP Turn lever, optional pull

HL   Hospital latch
- Key locks and unlocks
- 1 ¼" mortise cylinder

No trim

Trim description

Nomenclature	EO	110NL-MD 110NL-WD
Trim function	No outside trim	Night latch optional pull
Function description	Exit only	Key retracts latch bolt, optional pull required
ANSI function	01	03

Device compatibility

98/99/ XP98/XP99 Rim	■	■
98/99/ XP98/XP99 Rim-F	■	■
98/9927/27-F	■	■
98/9947/47-F	■	■
98/9947WDC/WDC-F	■	■
98/9948/48-F	■	■
98/9949/49-F	■	■
98/9950WDC/50WDC-F	■	■
98/9952†	■	
98/9957/57-F	■	■
98/9975/75-F	■	

Dimensions

Escutcheon plate size	—	—
Pull center to center	—	—
Projection	—	—

Handing

	—	—

Cylinder type

Rim or vertical device	—	Rim
Mortise lock device	—	—

† Default trim is 252L /L-BE. Must be ordered as EO when paired with
other trims (ordered separately).

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996 trim

Trim description

Nomenclature	996EO	996L*	996L-NL*	996L-BE*	996L-DT
Trim function	Exit only plate	Lever	Lever-night latch	Lever-blank escutcheon	Lever-dummy trim
Function description	Exit only plate	Key locks and unlocks	Key retracts latch bolt	Always operable, no cylinder	Pull when dogged
ANSI function	01	08	03	14	02

Device compatibility

	996EO	996L*	996L-NL*	996L-BE*	996L-DT
98/99 Rim/Rim-F	■	■	■	■	■
XP98/XP99 Rim/Rim-F	■	■	■	■	■
98/9927/27-F	■	■	■	■	■
98/9947/47-F	■	■	■	■	■
98/9947WDC/WDC-F	■	■	■	■	■
98/9948/48-F	■	■	■	■	■
98/9949/49-F	■	■	■	■	■
98/9950WDC/50WDC-F	■	■	■	■	■
98/9952†	†	†	†	†	†
98/9957/57-F	■	■	■	■	■
98/9975/75-F	■	■	■	■	■

Dimensions

	996EO	996L*	996L-NL*	996L-BE*	996L-DT
Escutcheon plate size		2 3/4" x 10 3/4" x 27/32" (70 x 273 x 21mm)			
Pull center to center	—	—	—	—	—
Projection	—	2 7/8" (73mm)	2 7/8" (73mm)	2 7/8" (73mm)	2 7/8" (73mm)

Handing

	996EO	996L*	996L-NL*	996L-BE*	996L-DT
	—	Handed/reversible	Handed/reversible	Handed/reversible	Handed/reversible

Cylinder type

	996EO	996L*	996L-NL*	996L-BE*	996L-DT
Rim or vertical device	—	Rim	Rim	—	—
Mortise lock device	—	1 1/4" mortise	1 1/4" mortise	—	—

* Specify R/V if used for rim and vertical devices, M for mortise device. Example, 996L-R/V or 996L-M.

† Default trim is 252L /L-BE. Must be ordered as EO when paired with other trims (ordered separately).

996 trim

Trim description

Nomenclature	996K*	996K-NL*	996K-BE*	996K-DT
Trim function	Knob	Knob-night latch	Knob- blank escutcheon	Knob - dummy trim
Function description	Key locks and unlocks	Key retracts latch bolt	Always operable, no cylinder	Pull when dogged
ANSI function	**08**	**03**	**14**	**02**

Device compatibility

	996K*	996K-NL*	996K-BE*	996K-DT
98/99/ XP98/XP99 Rim	■	■	■	■
98/99/ XP98/XP99 Rim-F	■	■	■	■
98/9927/27-F	■	■	■	■
98/9947/47-F	■	■	■	■
98/9947WDC/WDC-F	■	■	■	■
98/9948/48-F	■	■	■	■
98/9949/49-F	■	■	■	■
98/9950WDC/50WDC-F	■	■	■	■
98/9952†				
98/9957/57-F	■	■	■	■
98/9975/75-F	■	■	■	■

Dimensions

	996K*	996K-NL*	996K-BE*	996K-DT
Escutcheon plate size	2 3/4" x 10 3/4" x 27/32" (70 x 273 x 21mm)			
Pull center to center	—	—	—	—
Projection	3 1/4" (83mm)	3 1/4" (83mm)	3 1/4" (83mm)	3 1/4" (83mm)

Handing

	996K*	996K-NL*	996K-BE*	996K-DT
	—	—	—	—

Cylinder type

	996K*	996K-NL*	996K-BE*	996K-DT
Rim or vertical device	Rim	Rim	—	—
Mortise lock device	1 1/4" mortise	1 1/4" mortise	—	—

* Specify R/V if used for rim and vertical devices, M for mortise device. Example, 996K-R/V or 996K-M.

† Default trim is 252L /L–BE. Must be ordered as EO when paired with other trims (ordered separately).

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990 trim

Trim description

Nomenclature	990EO	990DT	990NL*	990TP*	990TP-BE*
Trim function	Exit only plate	Dummy trim	Night latch	Thumbpiece	Thumbpiece blank escutcheon
Function description	Exit only plate	Pull when dogged	Key retracts latch bolt	Key locks and unlocks	Always operable, no cylinder
ANSI function	01	02	03	05	15

Device compatibility

	990EO	990DT	990NL*	990TP*	990TP-BE*
98/99 Rim/Rim-F	■	■	■	■	■
XP98/XP99 Rim/Rim-F	■	■	■	■	■
98/9927/27-F	■	■	■	■	■
98/9947/47-F	■	■	■	■	■
98/9947WDC/WDC-F	■	■	■	■	■
98/9948/48-F	■	■	■	■	■
98/9949/49-F	■	■	■	■	■
98/9950WDC/50WDC-F	■	■	■	■	■
98/9952†					
98/9957/57-F	■	■	■	■	■
98/9975/75-F	■	■	■	■	■

Dimensions

	990EO	990DT	990NL*	990TP*	990TP-BE*
Escutcheon plate size			3" x 14 $^3/_{16}$" x $^3/_{32}$" (76 x 360 x 2mm)		
Pull center to center	—	5 $^1/_2$" (140mm)	5 $^1/_2$" (140mm)	5 $^1/_2$" (140mm)	5 $^1/_2$" (140mm)
Projection	—	2" (51mm)	2" (51mm)	2" (51mm)	2" (51mm)

Handing

	990EO	990DT	990NL*	990TP*	990TP-BE*
	—	—	—	—	—

Cylinder type

	990EO	990DT	990NL*	990TP*	990TP-BE*
Rim or vertical device	—	—	Rim	Rim	—
Mortise lock device	—	—	1 $^1/_4$" mortise	1 $^1/_4$" mortise	—

* Specify R/V if used for rim and vertical devices, M for mortise device. Example, 990NL-R/V or 990NL-M.

† Default trim is 252L /L-BE. Must be ordered as EO when paired with other trims (ordered separately).

696 trim

Trim description

	696DT	696NL*	696TP*	696TP-BE*
Nomenclature	696DT	696NL*	696TP*	696TP-BE*
Trim function	Dummy trim	Night latch	Thumbpiece	Thumbpiece blank escutcheon
Function description	Pull when dogged	Key retracts latch bolt	Key locks and unlocks	Always operable, no cylinder
ANSI function	02	03	05	15

Device compatibility

	696DT	696NL*	696TP*	696TP-BE*
98/99/ XP98/XP99 Rim	■	■	■	■
98/99/ XP98/XP99 Rim-F	■	■	■	■
98/9927/27-F	■	■	■	■
98/9947/47-F	■	■	■	■
98/9947WDC/WDC-F	■	■	■	■
98/9948/48-F	■	■	■	■
98/9949/49-F	■	■	■	■
98/9950WDC/50WDC-F	■	■	■	■
98/9952†				
98/9957/57-F	■	■	■	■
98/9975/75-F	■	■	■	■

Dimensions

	696DT	696NL*	696TP*	696TP-BE*
Escutcheon plate size	— 1 5/8" x 13 1/2" x 3/16" (41 x 343 x 5mm)			
Pull center to center	5 1/2" (140mm)	5 1/2" (140mm)	5 1/2" (140mm)	5 1/2" (140mm)
Projection	2 1/6" (52mm)	2 1/6" (52mm)	2 1/6" (52mm)	2 1/6" (52mm)

Handing

	696DT	696NL*	696TP*	696TP-BE*
	—	—	—	—

Cylinder type

	696DT	696NL*	696TP*	696TP-BE*
Rim or vertical device	—	Rim	Rim	—
Mortise lock device	—	1 1/4" mortise	1 1/4" mortise	—

* Specify R/V if used for rim and vertical devices, M for mortise device. Example, 696NL-R/V or 696NL-M.

† Default trim is 252L /L-BE. Must be ordered as EO when paired with other trims (ordered separately).

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Trim options

697 trim

Trim description

Nomenclature	697DT	697NL*	697TP*	697TP-BE*
Trim function	Dummy trim	Night latch	Thumbpiece	Thumbpiece blank escutcheon
Function description	Pull when dogged	Key retracts latch bolt	Key locks and unlocks	Always operable, no cylinder
ANSI function	02	03	05	15

Device compatibility

	697DT	697NL*	697TP*	697TP-BE*
98/99 Rim/Rim-F	■	■	■	■
XP98/XP99 Rim/Rim-F	■	■	■	■
98/9927/27-F	■	■	■	■
98/9947/47-F	■	■	■	■
98/9947WDC/WDC-F	■	■	■	■
98/9948/48-F	■	■	■	■
98/9949/49-F	■	■	■	■
98/9950WDC/50WDC-F	■	■	■	■
98/9952†				
98/9957/57-F	■	■	■	■
98/9975/75-F	■	■	■	■

Dimensions

	697DT	697NL*	697TP*	697TP-BE*
Escutcheon plate size	1 $\frac{5}{8}$" x 13 $\frac{1}{2}$" x $\frac{3}{16}$" (41 x 343 x 5mm)			
Pull center to center	5 $\frac{1}{2}$" (140mm)	5 $\frac{1}{2}$" (140mm)	5 $\frac{1}{2}$" (140mm)	5 $\frac{1}{2}$" (140mm)
Projection	3" (76mm)	3" (76mm)	3" (76mm)	3" (76mm)

Handing

	697DT	697NL*	697TP*	697TP-BE*
	—	—	—	—

Cylinder type

	697DT	697NL*	697TP*	697TP-BE*
Rim or vertical device	—	Rim	Rim	—
Mortise lock device	—	1 $\frac{1}{4}$" mortise	1 $\frac{1}{4}$" mortise	—

* Specify R/V if used for rim and vertical devices, M for mortise device. Example, 697NL-R/V or 697NL-M.

† Default trim is 252L /L-BE. Must be ordered as EO when paired with other trims (ordered separately).

374 Control x DT and 376 Control x DT trim

Trim description	**374 Control x DT**			**376 Control x DT**		
Nomenclature	374T x 990DT	374T-BE x 990DT	374T-NL x 990DT	376T x 990DT	376T-BE x 990DT	376T-NL x 990DT
Trim function	Thumbturn	Thumbturn - blank escucheon	Thumbturn - night latch	Thumbturn	Thumbturn - blank escucheon	Thumbturn - night latch
Function description	Key locks and unlocks, use with DT trim	Always operable, no cylinder, use with DT trim	Insert key to unlock, remove key to lock	Key locks and unlocks, use with DT trim	Always operable, no cylinder, use with DT trim	Insert key to unlock, remove key to lock
ANSI function	11	16	12	11	16	12
Device compatibility						
98/99/ XP98/XP99 Rim						
98/99/ XP98/XP99 Rim-F						
98/9927/27-F	■	■	■			
98/9947/47-F				■	■	■
98/9947WDC/WDC-F						
98/9948/48-F				■	■	■
98/9949/49-F						
98/9950WDC/50WDC-F						
98/9952†						
98/9957/57-F	■	■	■			
98/9975/75-F						
Dimensions						
Escutcheon plate size	TL: 1 ¹¹/₁₆" x 7 ¹/₂" x ⁷/₈" (43 x 191 x 22mm)					
	DT: 3" x 14 ³/₁₆" x ³/₃₂" (76 x 360 x 2mm)					
Pull center to center	—	—	—	—	—	—
Projection	2" (51mm)	2" (51mm)	2" (51mm)	2" (51mm)	2" (51mm)	2" (51mm)
Handing						
	—	—	—	—	—	—
Cylinder type						
Rim or vertical device	1 ¹/₄" mortise	—	1 ¹/₄" mortise	1 ¹/₄" mortise	—	1 ¹/₄" mortise
Mortise lock device	—	—	—	—	—	—

† Default trim is 252L /L-BE. Must be ordered as EO when paired with other trims (ordered separately).

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376 T-WDC Control x DT and 252 trim

Trim description	376 T-WDC Control x DT			252 Trim	
Nomenclature	376T-WDC x 990DT	376TWDC-BE x 990DT	376TWDC-NL x 990DT	252L	252L-BE
Trim function	Thumbturn	Thumbturn - blank escucheon	Thumbturn - night latch	Lever	Lever - blank escutcheon
Function description	Key locks and unlocks, use with DT trim	Always operable, no cylinder, use with DT trim	Insert key to unlock, remove key to lock	Key locks and unlocks	Always operable, no cylinder
ANSI function	11 or 12	16	04	08	14
Device compatibility					
98/99 Rim/Rim-F					
XP98/XP99 Rim/Rim-F					
98/9927/27-F					
98/9947/47-F					
98/9947WDC/WDC-F	■	■	■		
98/9948/48-F					
98/9949/49-F					
98/9950WDC/50WDC-F					
98/9952†				■	■
98/9957/57-F					
98/9975/75-F					
Dimensions					
Escutcheon plate size	TL: 1 $^{11}/_{16}$" x 7 $^{1}/_{2}$" x $^{7}/_{8}$" (43 x 191 x 22mm) DT: 3" x 14 $^{3}/_{16}$" x $^{3}/_{32}$" (76 x 360 x 2mm)			3" x 6 $^{3}/_{8}$" x $^{15}/_{16}$" (76 x 162 x 24mm)	
Pull center to center	—	—	—	Handed/reversible	
Projection	—	2" (51mm)	2" (51mm)	2 $^{5}/_{8}$" (67mm)	2 $^{5}/_{8}$" (67mm)
Handing					
	—	—	—	—	—
Cylinder type					
Rim or vertical device	1 $^{1}/_{4}$" mortise	—	1 $^{1}/_{4}$" mortise	1 $^{1}/_{4}$" mortise	—
Mortise lock device	—	—	—	—	—

† Default trim is 252L /L-BE. Must be ordered as EO when paired with other trims (ordered separately).

Optional trim

Schlage® HL6 quiet hospital push/pull latch

Von Duprin and Schlage® have collaborated on an exit device trim that provides both accessibility and performance. In combination, the 98/9975 mortise lock device along with the newly designed Schlage HL6 quiet hospital push/pull latch delivers an exit device with mortise lock durability that utilizes an easy to use, ADA compliant push/pull trim. The HL6 is now 50% quieter through dampened paddle action, reducing the noise associated with lock operation providing healthcare organizations a reliable solution for noise reduction initiatives. The 98/9975HL device is available in most standard architectural finishes, including antimicrobial options. Consult the HL Series catalog or data sheet for complete product information.

392-7 Offset pull

The 392-7 Offset pull is $^3/_4$" round stainless steel, with a 7" center to center which matches the 98/99 center case. Often used with a night latch operation. 3 $^1/_2$" (89mm) offset with 1 $^1/_2$" (38mm) clearance.

Vandal resistant trim:
Ives VR910 and VR914 Series

VR910 black grip for softer touch and resilience to temperature extremes. VR914 grip in all stainless steel. Grip designed for comfortable operation.

Features

- Stainless steel construction, 11 gauge (0.120" thick); 630 finish only
- Thru-bolts and rugged mounting screws for maximum fastening strength
- Built-in lock protector prevents vandalism to mortise latch bolt (available on certain models)
- Extra-tough stainless steel cylinder collar prevents pipe wrench or similar tool from damaging cylinder; tapered design prevents side impacts from transferring directly to cylinder; collar spins freely.
- Furnished with mounting screws for door thicknesses of 1 $^3/_4$" to 2 $^1/_4$"
- 1 $^1/_2$" (38mm) clearance from grip to door, total projection 1 $^7/_8$" (48mm)
- Consult the Ives catalog for more information

Order the exit device Exit Only (EO) and the VR trim separately from Ives.

Model	For use with	Size
VR910DT and VR914DT	98/99 Rim or vertical rod device	5 $^1/_2$" x 11" (133mm x 279mm)
VR910NL and VR914NL	98/99 Rim or vertical rod device	5 $^1/_2$" x 11" (133mm x 279mm)
VR910M-DT and VR914M-DT	9875/9975 Mortise device	7 $^1/_4$" x 11" (184mm x 279mm)
VR910M-NL and VR914M-NL (handing required)	9875/9975 Mortise device	7 $^1/_4$" x 11" (184mm x 279mm)

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Electronic locks from Schlage

AD Series

The AD Series was designed to be the right choice for today, and is ready to adapt to whatever the future holds.

There are a variety of options that allow you to select the AD Series electronic lock that's right for you, and a wide selection of features that can be configured in the field to further customize each opening. When your needs change in the future, the innovative modular design of the AD Series allows you to easily upgrade the credential reader or networking option, and adapt to emerging technologies using your existing chassis – all without taking the lock off the door. This means that you can be confident that your choice of the AD Series is right for today, and that your investment will be protected into the future.

Credential reader options

AD Series electronic locks are compatible with many different credential types.

- Multi-technology (reads 125 kHz prox and 13.56 MHz smart)
- Smart - iClass compatible
  + KEYPAD

- Magnetic stripe (insertion)
  + KEYPAD

- Magnetic stripe (swipe)
  + KEYPAD

- Keypad

Communication options

Networked

In facilities where increased monitoring and control are needed, a networked solution is essential. The AD Series networked options feature:
- Open architecture platform
- Reliable 900 MHz communicationon wireless locks
- Real-time monitoring

The AD Series networked lock is available in either a wireless or hardwired configuration to fit your application needs.
- **AD-300** Networked hardwired locks
- **AD-302** Networked hardwired FIPS 201-2 integration-ready locks
- **AD-400** Networked wireless locks
- **AD-402** Networked wireless FIPS 201-2 integration-ready locks

Standalone

Standalone locks are a cost-effective solution for doors that do not require real-time monitoring. The AD Series standalone solution provides:
- Option for future upgrade to networked wireless
- Improved credential management
- Audit trail reports

Schlage offers two AD Series standalone solutions to fit your environment:
- **AD-200** Access rights are stored on the lock
- **AD-250** Access rights are stored on the magnetic stripe credential

Chassis
- Cylindrical
- Mortise
- Mortise deadbolt
- Exit trim[1]

Locking functions[2]
- Classroom/storeroom
- Office
- Privacy
- Apartment

Certifications
- ANSI/BMHA A156.25
- ANSI/BHMA Grade 1
- UL 294 listed
- UL 10C
- ADA
- FCC part 15
- RoHS

Complete your system

Complete your AD Series system with readers, credentials, system components, and other wireless accessories.

1. See AD Series exit trim compatibility data sheet for complete list of compatability by manufacturer.
2. Lock function capability varies depending on Physical Access Control Software (PACS) OEM integration design.

CO Series

In the world of standalone electronic locks, CO Series offers simple solutions for access control. These easy-to-use, versatile locks can be applied anywhere there is a need to control access without distributing keys. The popular CO-100 is a simple lock that momentarily unlocks with a valid PIN code entry. It can be used indoors or out and allows administrators a variety of command options. The Series also includes CO-200, the CO-220 classroom lock, and the CO-250. These computer programmable locks can provide audit trails and feature dual credential options (card+PIN) that provide an even greater level of security.

Compatibility

The CO Series offers a wide range of applications and can be used alongside other Schlage electronic locks. They feature expanded cylinder, exit device, and credential compatibility.

Electronic locks from Schlage

Exit device compatibility[1]

	Rim	SVR[2]	CVR/CVC	Mortise
Von Duprin 98/99 and 98/99 XP	✔	✔	✔	✔
Von Duprin 22/22F	✔	✔		
Falcon 25	✔			

1. See CO Series exit trim compatibility datasheet for complete list of compatability by manufacturer.
2. CO-220 is not compatible with surface vertical rod (SVR) devices.

Note: Exit device must be ordered as Exit Only (EO).

Credential compatibility

The CO Series is compatible with many different credential types. For customers with an installed base of iButtons®, a combo proximity keyfob with iButton option is available to make an easy transition to proximity technology.

Class

CO-100
- Manually programmable
- Keypad only
- User rights stored on the lock
- Remote release, outdoor use and occupancy indication options

CO-200
- Computer or manually programmable
- Keypad, magnetic stripe (+PIN), proximity (+PIN)
- User rights stored on the lock
- Ability to provide schedules and audits

CO-220
- Computer or manually programmable
- Keypad, magnetic stripe (+PIN), proximity (+PIN)
- User rights stored on the lock
- Ability to provide schedules and audits
- Classroom lockdown function via fob

CO-250
- Computer programmable
- User rights stored on the card

Chassis
- Cylindrical
- Mortise
- Mortise deadbolt
- Exit trim

Functions
- Classroom/storeroom
- Office
- Privacy

Power
- 4 standard (AA) batteries

Reliability

When it comes to securing your facility, you can't afford to take chances. CO Series locks are tested to the highest quality and reliability standards in the industry, including:
- ANSI/BHMA A156.25 and ANSI/BHMA Grade 1
- UL 294
- UL 10C
- ADA

Lever styles and finishes for AD and CO Series

Lever options

Athens   Boardwalk   Broadway   Latitude   Longitude   Rhodes   Sparta   Tubular

Finish options							
Color	Bright brass	Satin brass	Satin bronze	Satin nickel	Bright chrome	Satin chrome	Aged bronze
ANSI/BHMA number	605	606	612	619	625	626/626AM	643e

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Dogging options

Cylinder dogging (CD)

Cylinder dogging is available on all 98/99 Panic exit devices to replace the standard hex key dogging. Unit requires a standard 1¼" (32mm) mortise cylinder with an inverted straight cam. When ordering, reference Schlage cylinder 20-001, 1¼", XQ11-949. This provides the L583-477 cam inverted at the factory.

To order, specify: Use prefix, CD, example CD99L

Less dogging (LD)

Less dogging is available in all 98/99 Panic exit devices to remove the dogging option.

To order, specify: Use prefix LD, example LD99L

Special center case dogging (SD)

Special cylinder dogging in the center case is available for Chexit, EL, QEL, ALK panic devices to allow for mechanical push/pull operation. With this option, the latch bolt is held retracted and pushbar is still operable. Specify handing—RHR or LHR.

SD requires 1¼" (32mm) mortise cylinder with an inverted straight cam. When ordering, reference Schlage cylinder 20-001, 1¼", XQ11-949. This provides the L583-477 cam inverted at the factory.

Note: Available on rim and vertical panic exit devices only.

To order, specify:
1. Prefix SD, example SD99L and Handing.
2. Not for 98/9975 Devices.

Cylinder dogging kit* (CDK)

For field conversion, from hex key dogging, conversion kit is available.

To order, specify: 99CDK or 98CDK, specify finish.

*Cannot be added to fire exit hardware.

Hex key dogging kit* (HDK)

For field conversion, from cylinder dogging, conversion kit is available.

To order, specify: 99HDK or 98HDK, specify finish.

*Cannot be added to fire exit hardware.

Dog keys

Dog key (old style)

←—2 ³/₁₆" (56mm)—→

⁷/₃₂" (6mm) hex

Dog key (standard)

←—2 ³/₄" (70mm)—→
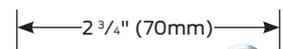
⁵/₃₂" (4mm) hex

Dogging indicator (CI/DI)

- Red indicator light blinks every 5 seconds when not dogged, visible from over 75 feet away
- Available in a hex or cylinder dogging format
- Designed for battery life over one year
- Available as a factory option or field retrofit kit
- Designed for device with mechanical dogging built after 1997

To order, specify:
As device option:
1. DI99EO 3' 630 (hex dogging)
2. CI98EO 4' 628 (cylinder dogging)

As retrofit kit:
1. DI Retrofit Kit 3' 662 (hex dogging)
2. CI Retrofit Kit 4' 613 (cylinder dogging)

Classroom security/security indicators

Designed for high use and abuse institution environments, such as schools and hospitals, these Von Duprin products are recommended for the following applications.

Visual verification

Reduce the time it takes to tour your facility and ensure each door is secure by installing the Von Duprin security indicator to provide at-a-glance visual verification.

Lockdown

Lock down high occupancy areas such as auditoriums, cafeterias and gymnasiums, from inside the room with the Von Duprin security indicator that provides positive visual confirmation.

Features and benefits
- Lockdown solution that meets fire and life safety codes for free egress
- Modular conversion kits allow you to quickly and easily upgrade your existing devices

-2SI security indicator with double cylinder
- Pad-printed lock/unlock directional indicators provide a clear direction of rotation to secure opening
- Available for 98/99 Series devices

CDSI/HDSI dogging indicator
- Hex or cylinder dogging options
- Visual indication of whether the exit device is dogged or undogged
- Available for 98/99 & 33A/35A Series panic devices

Dogging security indicators (CDSI/HDSI)

The CDSI/HDSI dogging indicator provides an at-a-glance verification of the status of the door from inside of the room. Visible "LOCKED" and "UNLOCKED" indicators show whether the device is undogged or dogged. This feature can be used with hex key (HDSI) or cylinder dogging (CDSI) options on various device types—rim, mortise and vertical systems.

CDSI

HDSI

To order, specify:
1. Cylinder dogging security indicator: Prefix CDSI.
2. Hex dogging security indicator: Prefix HDSI.
3. Above options cannot be used with fire-rated devices and are recommended for use in combination with the following trim functions: DT, K-DT, L-DT, EO, NL, K-NL, L-NL, NL-OP.

Double cylinder with security indicator (-2SI)

The -2SI Security Indicator provides an at-a-glance verification of the LOCKED/UNLOCKED status of the door from inside of the room. This option can be ordered as a new product or as a retrofit conversion kit to an existing 98/99 device.

To order, specify:
1. Suffix: -2SI double cylinder with security indicator.
2. Specify device type, available with L and L-BE functions.
3. Specify handing and finish.

Cylinders are sold separately. Schlage rim cylinders 20-021 (keyed), XB11-979 and XB13-379 (thumbturns) are recommended.

Double cylinder

Double cylinder features an inside key cylinder which locks or unlocks the outside trim from inside a room. Clear lock/unlock icons provide directional indication to secure opening. This option can be ordered as a new product or as a retrofit conversion kit to an existing 98/99 device.

To order, specify:
1. Suffix -2 double cylinder.
2. Specify device type, available with L and L-BE functions.
3. Specify handing and finish.

Note: Cylinders are sold separately. Schlage rim cylinders 20-021 (keyed), XB11-979 and XB13-379 (thumbturns) are recommended.

WARNING: Double cylinder options (2/2SI) are ideal for fire exit hardware and panic hardware that is not equipped with the dogging feature. **Combining a double cylinder option with the dogging feature is not recommended,** as the hardware could be in the dogged (unlatched) position when the indicator states a locked position.

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Environmental options

Quiet Mechanical (QM)

The QM option controls motion to reduce operational noise. It is available for the 996 trim, as well as 98/99 and 33A/35A rim and surface vertical rod devices. The QM trim solution provides a damper-controlled lever return. Likewise, the QM rim device option provides damper-controlled re-latching.

Features and benefits

- Controlled motion to reduce operational noise
- 996 damper-controlled lever return
- 98/99 and 33/35A damper controlled re-latching
- Available pre-installed from factory or as a retrofit kit
- Compatible with QEL, AX, RX, CD and HD

Pneumatic (PN) controlled exit devices

The PN feature provides remote latch bolt retraction in hazardous areas where electrically operated devices would not be permitted. The pneumatic solenoid will retract the latch bolt for momentary or prolonged periods. PN exit devices are particularly suited for use with automatic door operators. The PN feature is available on both Panic and fire exit hardware devices.

The PN feature includes a special actuating linkage that gives building owners the option of mechanically or pneumatically dogging the exit device. If manual hex-key dogging is required, specify HD-PN (Dogging the device, whether mechanically or pneumatically, makes the device function as a push/pull unit and reduces the wear on its moving parts.) If cylinder dogging is required, the standard cylinder dogging is not available, but special center case dogging is available, specify SD-PN. SD-PN is not available on the 9875 or 9975 devices.

When activated pneumatically, the latch bolt(s) of the exit device retract in $1/2$ to $1\,1/2$ seconds. This pneumatic operation uses air pressure ranging from 50 to 100 pounds per square inch.

This product will function only when it is part of a pneumatic system (air compressor, air lines, pneumatic system, etc.) Contact LCN for correct control boxes.

To order, specify:

- Standard — Use prefix PN, example PN99NL
- Hex key dogging — Use prefix HD-PN, example HD-PN99NL
- Special center case dogging (handing is required, specify RHR or LHR) — Use prefix SD-PN, example SD-PN99NL

Pneumatic transfer (PNT)
Pneumatic controls

PNT-1 is available for pneumatic latch retraction exit devices. Appearance and dimensions are identical to EPT models.

Weatherized options

Windstorm (WS) surface vertical rod two-point and three-point exit devices

WS Multi-point exit devices for tornado application devices WS98/9927 (two-point) and WS98/9957 (three-point) surface vertical rod exit devices are designed, tested and certified to comply with the Federal Emergency Management Agency's publication FEMA 361- Design and Construction Guidance for Community Safe Rooms.

Features and benefits

- Uniquely designed center case
- Vertical rods designed to reinforce the strength of the door
- Reinforced top and bottom latch housing with strengthening strap
- Stamped end cap mounting bracket
- Top soffit latch with reinforced ratchet release bracket
- Cast latch covers
- Stronger latch mounting screws
- Thru-bolted attachment points

UL Listing — panic hardware UL 305; and fire exit hardware UL 10C

WS98/9927:

> 3 hour pairs of doors double egress, 90 minutes swinging same direction, 8'0" x 8'0" BHMA Grade 1, ANSI A156.3-2001

WS98/9957:

> 3 hours single doors, 4'0" x 8'0" BHMA Grade 1, ANSI A156.3-2001

Windstorm ratings

WS98/9927:

- Door applications 8'0" x 8'0" (2438mm x 2438mm) pairs (swinging same direction); 4'0" x 8'0" (1219mm x 2438mm) single (non-fire rated only) flush hollow metal
- Florida Building Code Compliance Compliance to TAS 201, TAS 202, TAS 203; design load rating +150/-150 PSF (245 mph wind zone); Enhanced Hurricane Protection (EHPA) ASTM E1996; ANSI/ICC 500 (245 mph wind zone)
- UL-FEMA 361 Compliance to TAS 201, TAS 202, TAS 203; design load rating +150/-150 PSF (245 mph wind zone); Enhanced Hurricane Protection (EHPA) ASTM E1996; ANSI/ICC 500 (245 mph wind zone)

WS98/9957:

- Door applications 4'0" x 8'0" (1219mm x 2438mm) single (panic and fire rated) flush hollow metal
- UL-FEMA 361 Certified 4'0" x 8'0" (1219mm x 2438mm) single (panic and fire rated) flush hollow metal

- These devices are listed with Steelcraft Paladin™ Doors for tornado listing and Steelcraft H and HE Series doors for hurricane listings

To order, specify: WS prefix, example WS9927-F

Specifications	
Device functions	Device ships EO/DT; Field selectable; For TP, K or L remove NL drive screw from device.
Device lengths	3': 2'4" to 3' (71mm to 914mm) door size 4': 2'10" to 4' (864mm to 1219mm) door size
Strikes	Bottom — 304L Unfinished
Dogging feature	Hex key dogging standard (Panic)
Dogging options	**CD** Cylinder dogging **LD** Less dogging
Electrical options	**LX** Latch bolt monitor switch **RX** Request to exit **RX-2** Double request to exit **ALK** Alarm exit kit **SS** Signal switch **QEL** Quiet electric latch
Fasteners and sex bolts (SNB)	Includes 1 $3/4$" (44mm) metal doors SNB furnished for top and bottom latches and device (required)
Device centerline from finished floor	39 $1/2$" (1003mm)
Door undercut	$1/4$" (7mm)
Center case dimensions	8" x 2 $3/4$" x 2 $3/8$"
Mechanism case dimensions	2 $1/4$" x 2 $1/4$" (57mm x 57mm)
Top and bottom latch case	4 $1/2$" x 2 $1/2$" x 1 $7/8$" (114mm x 64mm x 48mm)
Vertical rods	$1/2$" (13mm) round tubing, standard rods accommodate 7' (2134mm) door Top rod length is 36 $1/4$" (921mm) Bottom rod length is 31 $3/4$" (806mm)
Projection	Pushbar neutral — 3 $13/16$" (97mm) Pushbar depressed — 3 $1/16$" (78mm)
Finishes	605, 606, 612, 625, 626, 628, 710, 711 and 630* *630 available on WS9827 and WS9857 devices only

Weep holes (WH)

WH is available for all 98/99 Series exit devices. Weep holes are ideal for devices that are mounted to exterior doors that can be exposed to rain and other elements. Hole spacing on 3' and 4' devices devices are every 6" on center. A 3 foot device will have 5 holes, a 4 foot device will have 7 holes.

To order, specify: Suffix WH, 99EO-WH.

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Hurricane rated exit devices and mullions

Hurricane resistant openings are designed to withstand storm conditions for long periods of time while maintaining the structural and functional integrity of the opening. The primary purpose is to not only prevent debris and wind from penetrating the assembly but also to maintain functionality after the storm.

Hurricane codes and applications

Florida was the first state to develop hurricane codes. As a result, the requirements set by the Florida Building Code (FBC) may be adopted by jurisdictions in other states where hurricane protection is a necessity. The appropriate hurricane solution depends on the specific requirements for the application. Contact your local Allegion representative for the specific requirements in your state.

Hurricane rated devices

Wind and Impact

FBC TAS 201, 202, 203
[Wind and Impact zone (HVHZ) ASTM E1886, ASTM E1996, ASTM E330]
Exterior door assemblies certified for installation within the Florida High Velocity Hurricane Zone (coastal region of the state) are subject to specific tests for both wind speed and flying debris called out in the TAS protocols of the Florida Building Code. Impact, structural, and cyclic tests must be conducted on full assemblies (e.g., exit device and door) as part of the standard.

Wind-Only

ANSI-ASTM E330 [Wind-Only (non-impact zone)]
Exterior door assemblies certified for installation in non-impact regions (typically inland regions) are tested for structural integrity in accordance with ASTM E330 for wind-only applications. These doors are subject to a structural test load equal to 1.5 times their actual design pressure rating, and they must remain operable with no breakage of glazing panels.

To order, specify:
1. Use prefix "HH" for wind and impact or "HW" for wind-only. If application is unknown, specify HH device, which will satisfy both applications.
2. Model number and description
3. Door mode: SGL (single) or PR (pair)
   Example: CD HH99NL 3' 626 PR

Note: Many hurricane rated devices use standard device components. Devices will be furnished with the proper strikes and components if HH or HW is specified. All HH devices will include through bolts. Pricing will be adjusted accordingly. See Von Duprin price book for details.

Hurricane rated mullions

Wind and Impact
- Designed for use with these HH (Wind and Impact) rated devices:
  – HH98/99 (specify devices with 499F strikes)
  – HH98/9957 (specify devices with 499F strikes)
  – HH-XP98/99 (specify devices with 909 or 954 strikes)
  – HH88-F (specify devices with 468 strikes)
- Steel mullion
- Furnished for 8' doors; cut in field as needed
- No KR or electrified options available
- Furnished blank (no strike prep)
- Mullion tube and fittings are unique from are not interchangeable with 9954

Panic and fire-rated applications
- HH9954

To order, specify:
1. HH9954 x Finish (689 or 695)

Wind-Only
- Designed for use with HW (Wind-Only) rated devices
- Identical to standard mullions, except for hurricane rated bottom fitting mounting hardware

Panic applications
- Steel - 1654, 4954, 4954-XP
- Aluminum - 5654, 5654-XP, 5754

Fire-rated applications
- 9954, 9954-XP

To order, specify:
1. Use KR if keyed removable option is desired (steel mullions)
2. HW
3. Model number
4. Height of opening
5. Finish
6. Strikes, when required, should be ordered with device
   Example: KR-HW9954 7' 689

Mechanical options

Application	Model	Single door	Double door	
		Standard strike	Mullion	Standard strike
HH (Wind and Impact Rated) All impact rated devices require mounting with through bolts	98/99	299F	HH9954	499F
	98-F/99-F	299F	HH9954	499F
	XP98/99	909	HH9954	909
	XP98-F/99-F	909	HH9954	954
	9827/9927	Top: 299F Bottom: 304L	-	Top: 299F Bottom: 304L
	9827-F/9927-F	-	-	Top: 299F Bottom: 304L
	WS9827/9927	Top: Soffit latch Bottom: 304L	-	Top: Soffit latch Bottom: 304L
	WS9827-F/9927-F	-	-	Top: Soffit Latch Bottom: 304L
	HH9847/9947*	Top: 338 Bottom: 304L	-	Top: 338 Bottom: 304L
	9847-F/9947-F	-	-	Top: 338 Bottom: 304L
	9849/9949	Top: 249 Bottom: 349	-	Top: 249 Bottom: 349
	9849-F/9949-F	-	-	Top: 249 Bottom: 349
	9857/9957	Top: 299F Middle: 299F Bottom: 304L	HH9954	Top: 299F Middle: 499F Bottom: 304L
	9857-F/9957-F	Top: 299F Middle: 299F Bottom: 304L	HH9954	Top: 299F Middle: 499F Bottom: 304L
	9875/9975	575	-	-
			-	-
	9875-F/9975-F	575	-	-
HW (Wind-Only)	98/99	299	4954 or KR4954	299
			1654 or KR1654	1606
			5654	299
			5754	1408
	98-F/99-F	299F	9954 or KR9954	499F
	XP98/99	909	4954XP or KR4954XP	909
			5654XP	909
	XP98-F/99-F	909	9954XP or KR9954XP	954
	9827/9927	Top: 299 Bottom: 304L	-	Top: 299 Bottom: 304L
	9827-F/9927-F	-	-	Top: 299F Bottom: 304L
	9847/9947	Top: 338 Bottom: 304L	-	Top: 338 Bottom: 304L
	9847-F/9947-F	-	-	Top: 338 Bottom: 304L
	9849/9949	Top: 249 Bottom: 349	-	Top: 249 Bottom: 349
	9849-F/9949-F	-	-	Top: 249 Bottom: 349
	9857/9957	Top: 299 Middle: 299 Bottom: 304L	4954 or KR4954	Top: 299 Middle: 299 Bottom: 304L
			1654 or KR1654	Top: 299 Middle: 1606 Bottom: 304L
			5654	Top: 299 Middle: 299 Bottom: 304L
			5754	Top: 299 Middle: 1408 Bottom: 304L
	9857-F/9957-F	Top: 299F Middle: 299F Bottom: 304L	9954 or KR9954	Top: 299F Middle: 499F Bottom: 304L
	9875/9975	575	-	-
	9875-F/9975-F	575	-	-

* HH98/9947 is furnished with double latch brackets and requires template #10319.

Accessibility options

Accessible device (AX)

The AX device is a UL certified exit device designed to meet the progressive requirements of the California Building Code for accessible openings. This device meets the 5 lbs of operating force requirement called for in chapter 11B-309.4. The AX device also exceeds ANSI/BHMA requirements. Available devices include: AX98/99, AX98/99-F, AX98/9927LBR, AX98/9927-F LBR, AX98/9949LBL, AX98/9949-FLBL, AX98/9949-F LBLAFL, AX98/9950LBL, AX98/9950-FLBL. Additionally, all AX devices will be shipped with a new UL label clearly stating "Meets California building Code (2013) Sec. 11B-309.4" and an "AX" identifier label on device center case. See images for reference.

AX option is not available on 2' exit devices. (SVR/CVR/CVC only, R & M not available in 2' sizes.)

Latches

Less bottom rod, panic and fire rated (LBR)

LBR option is available on panic-rated devices by eliminating the bottom rod, latch, and strike.

LBR option is available on fire rated devices using a spring loaded auxiliary latch using a spring-loaded auxiliary latch bolt installed in the lower door edge. When exposed to heat the auxiliary latch bolt releases, keeping the doors in alignment and closed during a fire. UL listed 3 hours on hollow metal doors double egress, 90 minute swinging same direction, and 20 minutes wood doors (consult wood door manufacturer). Fits door stiles as narrow as $3^5/_8$".

Fire rated LBR devices must be ordered in pairs or must be used in conjunction with an approved automatic or constant latching flush bolt.

Pullman latch (PL)

When PL is specified the standard latches are replaced with pullman style latches. Pullman latches are always extended and are most commonly used in conjunction with electric strikes and LBR-less bottom rod application. Not available with Fire rated devices.

Not recommended where security is of the utmost importance since latches do not deadlock.

Push pads

Dummy push pad

The 330 dummy push pad is designed as a companion unit for all 99 devices. The 350 dummy push pad is a companion unit for all 98 devices. The push pad is rigid or nonfunctioning. A push/pull operation can be accomplished by using 990DT, 996DT trim or any Ives Pull.

The 330/350 can be equipped with a functional push pad and will accommodate an RX or WP-RX switch. Specify RX-330.

May also be equipped with the RX2, double RX switch.

To order, specify:
1. 330 or 350.
2. Size 3' or 4' (914mm or 1219mm)
3. Finish – 605, 606, 612, 625, 626, 628, 710 and 622/711. (630 – 350 only)
4. Specifiy RX, WP-RX or RX-2 if desired.

Safety glow (SG)

Self-illuminating touchpad defines the location of the exit door in dark or smoke-filled area. The safety glow coating is a special powder coat finish that glows brightly during low or no light conditions. This coating was developed to meet MEA standards where luminescent exit door markings are required in commercial facilities. There are no batteries or electronics, the coating is charged when exposed to light.

To order, specify: Suffix SG, EL 9927L-SG

Red silk screen (RSS)

Red silkscreen lettering on touchpad trim - "Emergency Exit Only, Push To Open And Sound Alarm". This comes standard on RSS devices.

To order, specify: Suffix RSS, 9927L-RSS RHR

Braille, embossed and knurled touchpads

* Image shown is a special order.

Braille touchpad embossed with the standard message "CAUTION STAIRWELL" in braille and raised letters provides assistance to persons with impaired vision. Letters are $1/2$" (13mm) high and braille is #2, raised height is $3/32$" (2mm). Other messages are available on special order, limited to 20 characters per line.* **To order, specify:** Suffix BR, EL9927L-BR.

Embossed touchpad is embossed with the word "PUSH". **To order, specify:** Suffix EMB, EL9927L-EMB.

Knurled touchpad is to provide warning to persons with impaired vision. **To order, specify:** Suffix PBKN, EL9927L-PBKN.

*Consult factory for availability.

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Latch retraction

Quiet electric latch retraction (QEL)

Quiet electric latch retraction (QEL) provides electronic control of an exit device for environments where limited operational noise is desired. These devices always provide mechanical egress. The electrified latch retraction can also be activated by an access system or building automation system to unlatch the exit device momentarily. Often the QEL is used with a credential reader and access control system to unlock the door momentarily for authorized users.

The QEL can also be configured to electronically retract the latch for an extended period of time to allow free entry. This is a convenient alternative to mechanical dogging. If manual dogging is required, the hex dogging option is available, to order specify HD-QEL. Special center case dogging is also available for 98/99 rim and vertical systems, specify SD-QEL.

The standard default QEL feature will retract the latch bolt and pushpad. If an active pushpad is required utilize the QEL-L option. This option will retract the latch bolt and maintain an active pushpad.

In some applications an audible indication of pushpad retraction is desired. The QEL-B (B-buzzer) option is a feature that can be added to QEL devices that will send an audible notification of initial latchbolt retraction.

The QEL option is available on panic devices and fire rated devices. UL approved for Class II circuit applications.

The QEL option does not include the power transfer from door to frame, the power supply, or the control operator. Refer to EPT-2 power transfer and the PS902 or 914 power supply.

The PS902/914 with the 2RS, 4RL or 4R board is the minimum required. Other option boards available for other functions, see PS902/914 power supply for additional information.

The QEL has a low in rush current, so it can be used with standard Schlage power supplies. Calculate the peak current draw of all devices in the system to determine the required amperage of the supply.

The -2RS option board is designed to control two electric latch retraction devices and provide time delay between the firing of outputs is required. The power transfer is also sold separately.

To order, specify:
1. Standard — use prefix QEL, example QEL99L.
2. Special center case dogging — use prefix SD-QEL, example SD-QEL99L

Note: Baseplate and modular QEL Conversion kits are available for field retrofit. Please see parts/service manual for part numbers.

Schlage PS902	Schlage PS904	Schlage PS906
Up to 2 amps	Up to 4 amps	Up to 6 amps

QEL Electrical load

Voltage	24VDC
Current	1.0 A Inrush (0.5 sec.) / 0.14 A Holding

Minimum door opening widths*

Application	Surface vertical	Concealed vertical	Mortise	Rim
Min. door opening	28 $1/4$"	28 $1/4$"	28 $3/4$"	29 $1/4$"

* For 3' devices. For 4' devices, add 6".
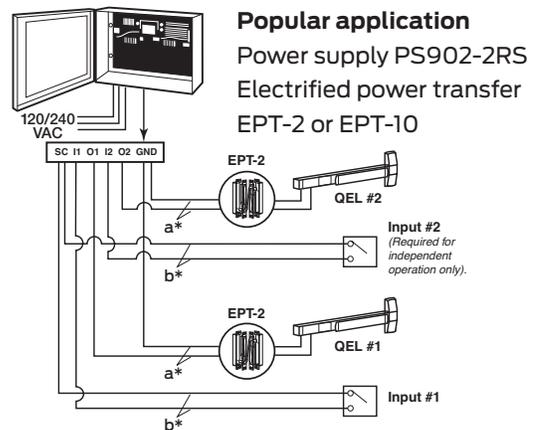
Popular application
Power supply PS902-2RS
Electrified power transfer
EPT-2 or EPT-10

a*

Distance (one-way)	Wire gauge
200 '	18 AWG
320 '	16 AWG
500 '	14 AWG
800 '	12 AWG

b*

Wire selection	Switch wire size
1200 ft. Max.	18 gauge standard

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Latch retraction

Electric latch retraction (EL)

The Electric latch retraction (EL) option provides electronic control of an exit device using a powerful, continuous duty solenoid. If manual dogging is required, special center case dogging is also available for 98/99 rim and vertical systems, specify SD-EL. SD-EL is not available on 9875 or 9975 devices. UL approved for Class II circuit applications.

The EL option does not include the power transfer from door to frame, the power supply, or the control operator. Refer to EPT-2 power transfer and the PS914 power supply.

The PS914 with the 9002RS option card is the minimum option card required. Other option cards available for other functions, see PS914 power supply for additional information.

Solenoid specifications:
Continuous duty – 24 VDC
Current inrush – 16 amps
Current holding – 0.3 amps

Solenoid resistance:
-grn-yel 1.2 – 2.2 OHMS
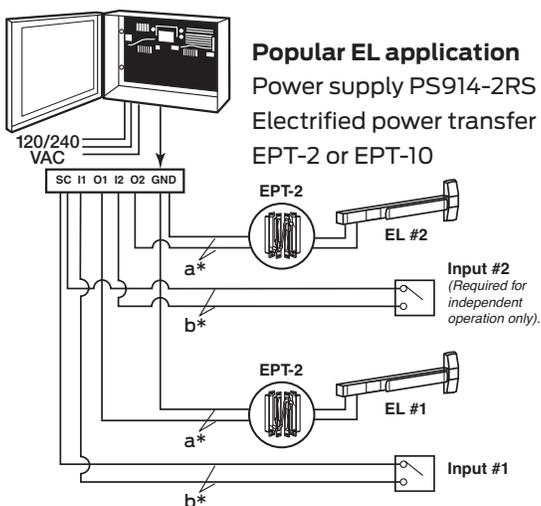-grn-org 100 – 150 OHMS

To order, specify:
1. Standard – Use prefix EL, example EL99L.
2. Special center case dogging – Use prefix SD-EL, example SD-EL99L

Note: Baseplate and EL Conversion kits are available for field retrofit. Please see parts/service manual for part numbers.

Minimum door opening widths*

Application	Surface vertical	Concealed vertical	Mortise	Rim
Min. door opening	28 $\frac{1}{4}$"	28 $\frac{1}{4}$"	28 $\frac{3}{4}$"	29 $\frac{1}{4}$"

* For 3' devices. For 4' devices, add 6".

Popular EL application
Power supply PS914-2RS
Electrified power transfer
EPT-2 or EPT-10

Von Duprin exit device		EL Wire length (feet)[1]	Wire gauge (AWG)
a*	EL 98/99 Rim	0-500	12
		0-300	14
		0-200	16
	All other 98/99EL device types	0-250	12
		0-150	14
		0-100	16
b*	Control switch	0-1200	18

1. Wire lengths include an EPT, Door loop, electric hinge or pivot and are measured one way between the PS914/option board and the device.

Note: Table is applicable to devices that have shipped after August 2012.

Emergency secure lockdown (ESL)

The emergency secure lockdown (ESL) option is ideal for high-occupancy spaces, such as auditorium-style classrooms with access control

Occupants can turn the thumb turn (or cylinder key) of the ESL option installed, interrupting the power to the QEL motor, and electronically undogging to secure pull side of the door as well as sends a signal to the access control system. The visual indication assures the occupant the exit device has been put into secure lockdown mode.
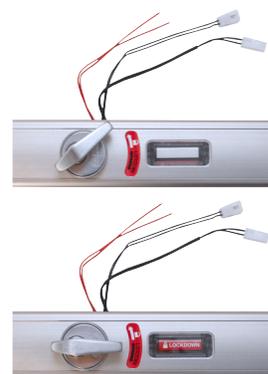
To order, specify:
1. Suffix: ESL Emergency secure lockdown.
2. Specify device type and length with the ESL option.

Specify handing and finish

Note: ESL requires PS902-4R for single door (add -FA if fire rated), or PS904-4R-4R for double door (add FA to both -4R boards if fire rated).

Delayed egress

The Chexit® (CX) (with motor driven blocking actuator)*

The Von Duprin Chexit device is designed for controlled egress applications. It meets both life safety and security needs, as well as the requirements of NFPA 101 for "Special Locking Arrangement" and IBC "Special Egress-Control Devices". All control inputs, auxiliary locking, local alarm and remote signaling outputs are self-contained in the Chexit assembly. Numerous configurable options allow the device to be customized for the specific code or application requirements. The standard Chexit device sounds an alarm and keeps the door secured for 15 seconds following an exit attempt with immediate release upon fire.

The Chexit device includes a 6" x 20" decal for application on door. "PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 SECONDS"

Chexit typical applications
Chexit single door with options — The Chexit is used as an access control device. The card reader allows access. Also shown in this application is an external horn and door position switch. The auxiliary horn is used for increased volume in remote locations. Using a door position switch gives added security to the opening in case the door is not reclosed.

With the Chexit disarmed, the opening functions as a normal exit device. If card readers are required on both sides of the door, the normally closed contacts of the readers should be wired in series.
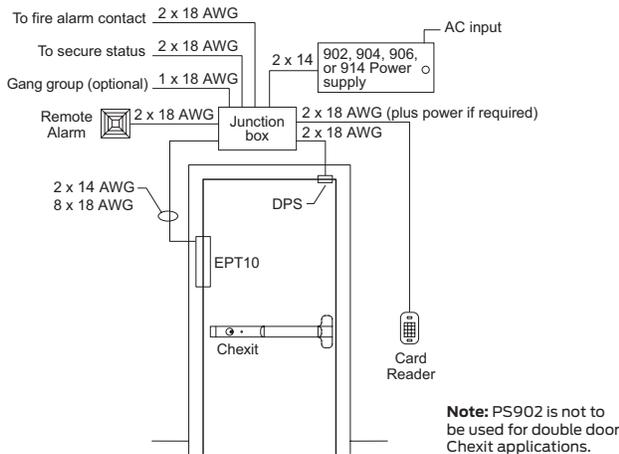
Figure 1. Riser diagram, single door

Note: PS902 is not to be used for double door Chexit applications.

Minimum door opening sizes for CX devices
(Consult factory for other size requirements)

Device	3' (914mm) Length	4' (1219mm) Length
CX98/98-F/99/99-F	2'10 $^3/_4$" (883mm)	3'4 $^3/_4$" (1035mm)
CX-XP98/XP98-F/XP99/XP99-F	2'10 $^3/_4$" (883mm)	3'4 $^3/_4$" (1035mm)
CX9827/9827-F/9927/9927-F	2'10 $^1/_4$" (870mm)	3'4 $^1/_4$" (1022mm)
CX9847/9847-F/9947/9947-F	2'10 $^1/_4$" (870mm)	3'4 $^1/_4$" (1022mm)
CX9848/9848-F/9948/9948-F	2'10 $^1/_4$" (870mm)	3'4 $^1/_4$" (1022mm)
CX9849/9849-F/9949/9949-F	2'10 $^1/_4$" (870mm)	3'4 $^1/_4$" (1022mm)
CX9850/9850WDC-F/ 9950/9950WDC-F	2'10 $^1/_4$" (870mm)	3'4 $^1/_4$" (1022mm)
CX9857/9857-F/9957/9957-F	2'10 $^1/_4$" (870mm)	3'4 $^1/_4$" (1022mm)
CX9875/9875-F/9975/9975-F	2'10 $^1/_4$" (870mm)	3'4 $^1/_4$" (1022mm)

Specifications / Power supply requirements[1]

Input voltage – 24VDC	
Input current inrush – 1.25A	
Input current holding – 390mA	
Alarm relay and Secure relay contact ratings – 24VDC, 1A	
Fire alarm, Inhibit and Door position switch inputs require normally closed dry contacts.	

Power supply information for CX devices with motor driven blocking actuator[1]

Power supply	Maximum number of devices
PS902 (up to 2 amps)	1 Chexit device
PS904 (up to 4 amps)	3 Chexit devices
PS906 (up to 6 amps)	4 Chexit devices
PS914 (up to 4 amps)	4 Chexit devices

Note: When powering multiple components, verify that the amperage requirements of all components combined does not exceed the power supply output rating, see table above for output ratings. Consult Installation Instructions for proper wire gauge and wire run requirements. Exceeding the recommended devices and/or not following Installation Instructions may void your warranty. Call Customer Care at 877-671-7011 or visit the Allegion website for more information - www.us.allegion.com.

To order, specify:
1. Prefix product description number "CX". Example: CX99L
2. Specify option (see options on page 53). Example: CX-RCM or CD-CX
3. Door size other than 3' (914mm).
4. Door thickness other than 1 $^3/_4$" (45mm).
5. Finish.
6. Handing, LHR or RHR. Required with "CD" option.

1. Chexit devices built after August 24, 2015 are built using motor driven blocking actuators that have decreased power supply and operating requirements. The information listed in this catalog references the power supply and operating requirements that are needed for the new products with motor driven blocking actuators. For information on devices built previous to August 24, 2015, please contact Customer Care at 877-671-7011.

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Chexit, RCM and DE5300 features

The Chexit, remote chexit module (RCM) or DE5300 devices have several features and options available to fit your applications. See below for more information.

Inputs and outputs

Fire alarm input
This input releases the door immediately upon a fire alarm allowing immediate egress. The internal alarm can be silenced during a fire input via an onboard switch setting.

Inhibit input (access control)
This optional input is provided to allow authorized egress or entry when the device is armed using an external card reader, key switch, etc. It also allows remote reset of the Chexit, RCM or DE5300 in an alarmed condition. The ability to reset alarms with the inhibit input can be disabled via an onboard switch setting.

Door position switch input
An optional door position switch (DPS) can provide door position status to Chexit, RCM or DE5300 for additional security, ensuring that the door is closed, and can cause alarm when the door is left or forced open.

Gang bus
The gang bus allows a Chexit, RCM or DE5300 device to signal other Chexit, RCM or DE5300 devices when it enters the release delay, allowing multiple doors to release at the same time in an emergency. Up to 8 devices may be connected to the gang bus.

Alarm relay contacts
The alarm relay contacts are provided as a means to control a remote alarm, such as a horn or lamp, or signal an external monitor. The contacts can be configured with a jumper as normally open or normally closed, and become active upon entering an alarmed condition.

Secure relay contacts
The secure relay contacts are provided as a means to signal an external monitor. The contacts can be configured as normally open or normally closed with a jumper, and become active when the dps indicates the door is closed and the push pad is locked.

Delays

Release delay
When the push pad is pushed and the nuisance delay expires, the Chexit, RCM or DE5300 enters the release delay with alarm. During the release delay, the internal alarm sounds, the alarm relay activates, and the Chexit/RCM keeps the push pad or DE5300 magnetic lock, locked for 15 seconds (less any time already elapsed during the nuisance delay). Once started, the release delay sequence will not stop and the devices will unlock.

Nuisance delay
When a Chexit, RCM or DE5300 is located in a public area, it can be desirable to limit false releases when the push pad is accidently pushed. The nuisance delay is the brief time a push pad can be accidently pushed before the release delay sequence starts. If the nuisance time is set to 0 seconds the Chexit, RCM or DE5300 will enter release delay as soon as the push pad is pushed (when armed). Setting the nuisance time to 1, 2, or 3 seconds allows the push pad to be pressed for 1 to 3 seconds before the Chexit, RCM or DE5300 goes into release delay. If the nuisance audio and nuisance delay are both on, the internal alarm will pulse during the nuisance delay. The alarm relay does not activate during the nuisance delay. If the push pad is released before the nuisance delay expires, the Chexit, RCM or DE5300 will remain armed.

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Chexit, RCM and DE5300 features (continued)

Rearm delay
The rearm delay is the amount of time after the key switch or inhibit input is deactivated to when the device rearms. It is designed to give someone time to pass through the door before rearming occurs. The rearm time can be changed via the onboard switch settings from 0 and 28 seconds in 2 second increments. If the rearm time is set to 30 seconds and a DPS is used, if the door is opened and the rearm time expires, there will be no alarm. The Chexit, RCM or DE5300 will rearm after the door is closed. If the door never opens, the Chexit, RCM or DE5300 will rearm after 30 seconds. If not using a DPS, the Chexit, RCM or DE5300 will always rearm in 30 seconds.

DPS delay
If the DPS detects that the door closed during the rearm delay, the Chexit, RCM or DE5300 ends the rearm delay and allows 2 seconds for the latch to clear the strike before rearming.

Interface

Key switch
The Key Switch provides the means to Arm or Disarm/Reset the Chexit, RCM or DE5300. Turning the Key Switch clockwise initiates the Rearm Delay, and turning the Key Switch counter-clockwise Disarms/Resets the Chexit, RCM or DE5300. The Key Switch allows the key to be removed in either the Arm or the Disarm/Reset position.

Status indicator
The red Status Indicator displays the status of the Chexit, RCM or DE5300. The Status Indicator flashes slow if the Chexit, RCM or DE5300 is armed, flashes fast in an alarmed mode, is off when inhibited and on solid during Rearm Delay.

Internal alarm
The Internal Alarm sounds the status of the Chexit, RCM or DE5300. The Internal Alarm sounds continuously during and after a fire alarm or a Release Delay, pulses fast during the Nuisance Delay or a tamper and pulses slow during Disarmed Powerup mode.

Settings

Armed powerup
When set to OFF, a power disruption and power return will put the Chexit, RCM or DE5300 in a disarmed, unlocked alarm mode.

Trim fail safe / fail secure (FS/FSE)
The trim input power can be set to FS (Fail Safe; locked when energized, unlocked when deenergized or during power failure) or FSE (Fail Secure; unlocked when energized, locked when deenergized or during power failure).

The trim must be bought or modified to physically function as FS or FSE. This on board setting only selects the trim input power.

Trim operation overview
Rim and vertical application: Trim will not function when Chexit is armed.
Mortise application: Trim will function when Chexit is armed.

Chexit requiring pull side operation

	Mechanical trim	Electric Trim
Rim and vertical	Access control disarms Chexit. Rotate lever to enter.	Access control disarms Chexit and unlocks electric trim. Rotate lever to enter.[1]
Mortise	a) Use key to unlock lever. Rotate lever to enter.[2] b) Use RX996L-M to disarm Chexit. Rotate lever to enter.[3]	Access control disarms Chexit and unlocks electric trim or electric mortise lock. Rotate lever to enter.

1. Fail Secure Trim recommended. For Fail Safe applications, contact technical support to review application.
2. Do not use Door Position Switch with Chexit in this application.
3. Allows free ingress at all times.

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Remote Chexit Module (RCM)

Designed to provide the concept of the Chexit delayed exit system for door sizes smaller than the standard Chexit device can accommodate. The Chexit module is installed in a control box and mounted in a remote location. Features and functions of the standard Chexit exit device are available on the Remote Chexit Module.

RCM Module

Minimum door opening sizes for RCM devices
(Consult factory for other size requirements)

Device	3' (914mm) Length	4' (1219mm) Length
CX-RCM 98/98-F/99/99-F	2'5" (737mm)	2'11" (889mm)
CX-RCM XP98/XP98-F/XP99/XP99-F	2'5" (737mm)	2'11" (889mm)
CX-RCM 9827/9827-F/9927/9927-F	2'4 $1/2$" (724mm)	2'10 $1/2$" (876mm)
CX-RCM 9847/9847-F/9947/9947-F	2'4 $1/2$" (724mm)	2'10 $1/2$" (876mm)
CX-RCM 9848/9848-F/9948/9948-F	2'4 $1/2$" (724mm)	2'10 $1/2$" (876mm)
CX-RCM 9849/9849-F/9949/9949-F	2'4 $1/2$" (724mm)	2'10 $1/2$" (876mm)
CX-RCM 9850/9850WDC-F/9950/9950WDC-F	2'4 $1/2$" (724mm)	2'10 1/2" (876mm)
CX-RCM 9857/9857-F/9957/9957-F	2'4 $1/2$" (724mm)	2'10 $1/2$" (876mm)
CX-RCM 9875/9875-F/9975/9975-F	2'5 $1/2$" (743mm)	2'11 $1/2$" (902mm)

Specifications / Power supply requirements*

| |
|---|
| Size – 3.75" x 5.57" x 2.50" |
| Input voltage – 24VDC |
| Input current inrush – 1.25A |
| Input current holding – 390mA |
| Alarm relay and Secure relay contact ratings – 24VDC, 1A |
| Fire alarm, Inhibit and Door position switch inputs require normally closed dry contacts. |

*RCM modules built after August 24, 2015 are built using motor driven blocking actuators that have decreased power supply and operating requirements.

Note: The information listed in this catalog references the power supply and operating requirements that are needed for the new products with motor driven blocking actuators. For information on devices built previous to August 24, 2015, please contact Customer Care at 877-671-7011.

Cylinder dogging (CD)

Special center case cylinder dogging option is available to allow push/pull operation of the Chexit, when disarmed and used in a heavy traffic area. Prefix device with "CD" and specify handing.

1-1/16" (27 mm) Maximum
X
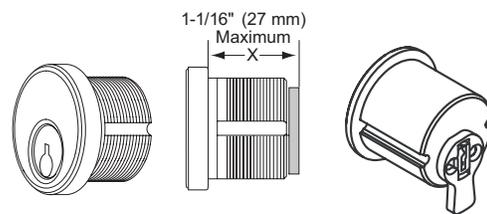
Cylinders

Cylinders are not furnished with the Chexit device and must be specified when ordering. Use 1 $1/4$" mortise cylinder with compression ring 36-083 with straight cam and orient cam as shown. Schlage cylinder 20-001-114 recommended for the device and the CD cylinder dogging option. See Schlage Price book for additional information.

To order, specify*:

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Delayed egress system

DE5300 system

Designed for controlled egress applications when used in conjunction with a magnetic lock. It meets both life safety and security needs, as well as the requirements of NFPA for "Special Locking Arrangement" and IBC "Special Egress-Control Devices". All control units, auxiliary locking, local alarm and remote signaling outputs are self-contained in the DE5300 assembly.

DE5300 Module

The DE5300 is commonly used on narrow stile doors where a standard or narrow stile Chexit is not practical. DE5300 Delayed Exit System uses a Chexit logic board and a Von Duprin RX-LC (low current request to exit) panic device to control a Schlage Electronics Direct Hold Magnetic Lock.

The Chexit module for the DE5300 is installed in a control box and mounted in the wall adjacent to the door. Features and functions of the standard Chexit exit device are available on the DE5300.

The DE5300 device includes a 6" x 20" decal for application on door.

"PUSH UNTIL ALARM SOUNDS.
DOOR CAN BE OPENED IN 15 SECONDS"

Cylinders

Cylinders are not furnished with the DE5300 and must be specified when ordering. Use 1 $\frac{1}{4}$" mortise cylinder with compression ring 36-083 with straight cam and orient cam as shown. Schlage cylinder 20-001-114 recommended for the device and the CD cylinder dogging option. See Schlage Price book for additional information.

1-1/16" (27 mm)
Maximum
X

Standard cam configuration
(Shown with key removed)
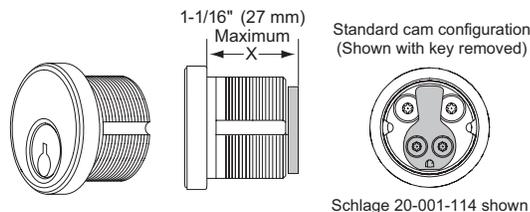
Schlage 20-001-114 shown

Specifications / Power supply requirements

Size - 3.75" x 5.57" x 2.50"
Input voltage — 24VDC
Input current — 1A
Alarm relay and Secure relay contact ratings — 24VDC, 1A
Fire alarm, Inhibit and Door position switch inputs require normally closed dry contacts.

To order, specify:

1. DE5300
2. M420/P, M450/P, or M490/P magnetic lock (order direct from Schlage Electronics).
3. RX-LC 22/33A/35A/98/99 device.
4. PS900 Series
5. EPT-2/10

To fire alarm contact — 2 x 18 AWG
To secure status — 2 x 18 AWG
Remote Alarm — 2 x 18 AWG
902, 904, 906, or 914 Power supply — AC input
2 x 18
Junction box
2 x 18 AWG (plus power if required)
5 x 18 AWG
Magnetic Lock
15 x 18 AWG
2 x 18 AWG — EPT2/10
DE5300
RXLC Exit Device
Card Reader

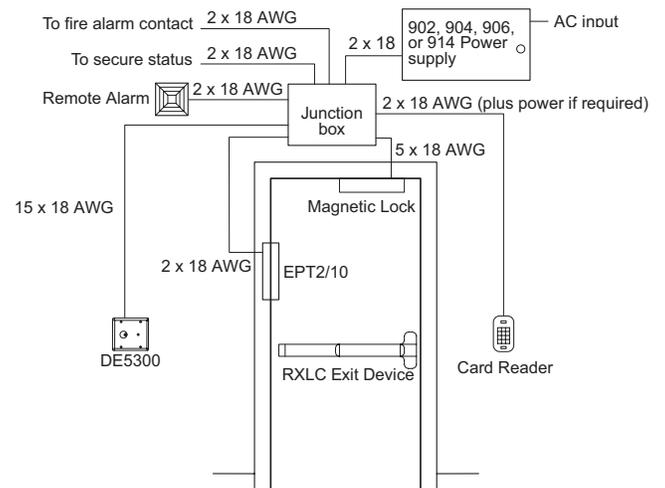**Figure 1. Riser diagram, single door**

Switches

Request to exit (RX)

The RX feature is used to signal the use of an opening. This device is equipped with one internal SPDT switch which monitors the push pad. The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply. The RX switch option should not be used to control a load, but as a signalling switch (2 amps resisitive maximum). The RX switch is available in a low current (LC) 50ma max. Most commonly used to signal low-current access control inputs.

To order, specify:

- Standard – use prefix RX, example RX99EO
- Low Current – use prefix RX-LC, example RX-LC98EO

Double request to exit (RX2)

The RX2 feature uses two RX switches.

To order, specify:

- Standard – Use prefix RX2, example RX299EO

Waterproof request to exit (WP-RX)

- Switch rated to IP67 – protected from contact with harmful dust and from immersion in water with a depth of up to 1 meter (3.3 feet) for up to 30 minutes

Note: All in-field electrical connections should be in compliance with IP67 to ensure trouble free operation.

Latch bolt monitoring (LX)

The LX feature is used to signal the use of an opening. This device is equipped with one internal SPDT switch which monitors the latch bolt.

The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

The LX switch option should not be used to control a load, but as a signalling switch (2 amps resistive maximum).

The LX switch is available in a low current (LC) switch. Most commonly used in computer operated monitoring systems.

To order, specify:

- Standard – Use prefix LX, example LX99EO
- Low Current – Use prefix LX-LC, example LX-LC98EO

Electrical rating for all switches

- Standard – 2 amp maximum @ 24VDC
- Low Current (LC) - below 50 Milliamps @ 24VDC

Note: All switches can be either factory or field installed

Signal switch (SS)

Monitors push pad and latch bolt. The SS feature is used to signal the unauthorized use of an opening. This device is equipped with two internal SPDT switches. One switch monitors both the push pad and the latch bolt assembly, making the latch bolt tamper resistant, for positive security. An additional SPDT switch is connected to the $1\frac{1}{4}$" (32mm) mortise cylinder with straight cam for alarm "bypass." (Schlage cam reference L583-477). The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

Push pad reads: "Emergency Exit ONLY – Push To Open And Sound Alarm." Push pad is only available in US32D finish with red silk-screened lettering.

The SS mortise lock device is furnished with both the signal switch device and the SS7500 mortise lock. The SS7500 mortise lock has the versatility and advantages of the 7500 lock with the addition of signalling functions to monitor latch bolt operation and the trim locking function. The SS7500 mortise lock is supplied standard with the SS mortise lock device.

To order, specify:

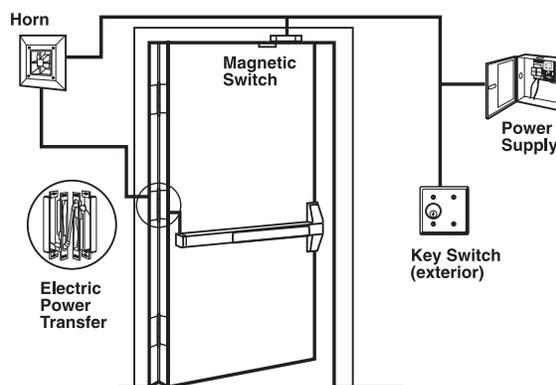- Prefix SS, example SS99L.
- Handing required, LHR or RHR.

Electrical ratings

- Up to 2.0 amps @ 24VDC

Popular SS application

Unauthorized use of this opening will activate the local horn. The key switch permits inhibiting this system for

authorized entry.

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Remote monitoring and remote undogging

Remote monitoring
Remote monitoring, RM, provides visibility to request to exit (RX), latch bolt monitor (LX) and door position switch (DPS). RM is available as a modular kit that can be added to any existing Von Duprin 98/99 or 33A/35A series device. RM provides power source flexibility and can be battery powered or has the ability to be hard-wired.

For customers desiring real time monitoring, RM is designed to connect to Allegion's Software Alliance Members via IP. The RM can also be used with RSI connection to the ENGAGE™ gateway for daily schedule reporting. For more information about RM system capabilities and compatibilities, contact your local electronic sales engineer.

Remote undogging
Remote undogging, RU, option is a battery powered wireless solution that enables remote undogging and door status monitoring. The door status monitoring provides visibility to request to exit (RX), latch bolt monitor (LX) and door position switch (DPS). It enhances perimeter security by providing electronic override of mechanical dogging for emergency facility lockdown. RU provides power source flexibility and can be battery powered or has the ability to be hard-wired.

RU is available as a modular kit that can be added to any existing Von Duprin 98/99 or 33A/35A Series device. For customers desiring real time lockdown and monitoring, RU is designed to connect to Allegion's Software Alliance Members via IP. The RU can also be used with RSI connection to the ENGAGE™ gateway for daily schedule reporting. For more information about RU system capabilities and compatibilities, contact your local electronic sales engineer.

Alarm kit

Alarm kit (ALK) is a simple yet effective way to deter unauthorized use of an opening. While the exit device is still a means of egress, the ALK kit contains an internal horn. When the touch bar is depressed, the horn sounds to provide an audible means of signaling that the opening has been violated. The alarm kit can be armed or disarmed by key thus allowing the exit device to be set in an armed or disarmed mode. The horn is rated at 85 decibels.

For hardware applications
The assembly includes both a 24VDC Input and External Inhibit standard. The External Inhibit provides remote arming and dis-arming.

The key switch uses a standard $1^1/_4$" (32mm) mortise cylinder with a straight cam (Schlage 20-001, L583-477 cam). The unit operates on one standard 9-volt alkaline battery. When the battery is weak, the horn will emit an intermittent low battery alert signal.

Auto reset (AR) option is available with this kit. This kit allows the device to resume the alarm option after a preset time. Preset times can be field selected at 1.5, 3, or 4.5 minutes.

Alarm kits are available with a choice of two switch kits, RX or LX. RX monitors the touchpad and is furnished standard. LX optional latch bolt monitoring is recommended for use with surface vertical rod exit devices or when alarm needs to sound from both the exit device and trim side of the door. Specify ALK-LX.

Note: For latch bolt monitoring on a 98/9975 with ALK, specify a SS7500 lock. LX switch not available for 98/9975 devices.

The ALK is available in two styles, 99ALK, grooved cover and 98ALK, smooth cover.

The ALK includes a 6" x 20" decal for application on door "EMERGENCY EXIT ONLY. ALARM WILL SOUND." RSS push bar trim can be used instead of the door decal, specify RSS push bar trim when ordering the device.

When the ALK is used, standard dogging is removed. If cylinder dogging is required, there are two choices. Special center case dogging (SD) is available. Or, as an engineered special, the ALK can be moved to the hinge side of the device, and standard cylinder dogging (CD) can be added. Note size restrictions on the following page.

To order, specify:
1. Standard, 98 ALK
2. Special center case dogging, SD98 ALK
3. Cylinder dogging, CD98 ALK

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Minimum door opening sizes on ALK applications

Device	3' (914mm) Length	4' (1219mm) Length
98/98-F/99/99-F	2'10" (864mm)	3'4" (1016mm)
9875/9875-F/9975/9975-F	2'10" (864mm)	3'4" (1016mm)
9827/9827-F/9927/9927-F	2'10" (864mm)	3'4" (1016mm)
9857/9857-F/9957/9957-F	2'10" (864mm)	3'4" (1016mm)
9847/9847-F/9947/9947-F	2'9" (838mm)	3'3" (991mm)
9848/9848-F/9948/9948-F	2'9" (838mm)	3'3" (991mm)

Electrified mortise and electrified trim

The electric mortise lock device has all the versatility and advantages of the standard mortise lock device, plus the advantage of being electrically controlled by a remote switching device, an access control system or an automatic fire alarm system. The device features the E7500 mortise lock. The E7500 controls the locking of the outside trim. When unlocked, the door remains latched, preserving the fire rating of the door and making it particularly useful where codes permit locking but require unlocking during a fire emergency. The outside trim cylinder retracts the latch bolt for mechanical override, night latch function. Only available with TP, K or L functions.

The E7500 lock contains a SPDT signal to monitor the outside trim condition (locked or unlocked) and a second SPDT signal switch to monitor the latch bolt.

Standard features
- Field reversible handing
- 24 VDC continuous duty solenoid

Optional features
- Fail safe (locked when energized, unlocked when de-energized or during power failure). Specify with suffix "FS."
- Fail secure (unlocked when energized, locked when de-energized or during power failure). Specify with suffix "FSE"
- 24 VAC (with SO option)*
- 12 VDC
- 12 VAC (with SO option)*

Note: Some Fire codes will require "Fail Safe" (FS) operation for stairwell doors. Be sure to specify the correct operation for your application.

* SO (silence operation) not recommended for continuously-powered devices.

Electrical specifications
- Solenoid — .60 amps @ 12VDC
  .30 amps @ 24VDC
- Each switch — Up to 2.0 amps @ 24VDC Maximum

The E option does not include the power transfer from door to frame, the power supply or the control operator (Refer to EPT-10 and PS902 or PS914 power supply).

To order, specify:
1. Use prefix "E," example E9975
2. FS or FSE
3. Voltage

Electric mortise lock device
Adaptable for openings where continuous latching is required while the trim may be electrically locked or unlocked from a remote location—stairwells, exterior doors, etc.

Minimum system requirements
- PS902
- EPT-10 or electric hinge

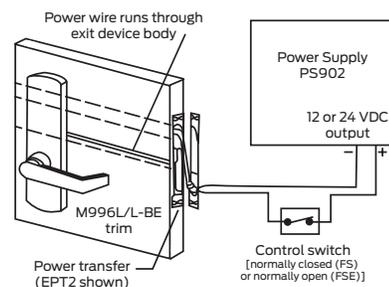### M996L/L-BE Motor driven electrified trim
M996L/L-BE motor driven electrified breakaway lever trim provides remote locking and unlocking capabilities while incorporating the patented vandal-resistant trim design. The motor can be energized from a distant controller, thus allowing access control of the opening. The control of stairwells in high-rise buildings is a common application for this trim. M996 is furnished fail safe (FS) and convertible to fail secure (FSE) via dip switch. The M996 key bypass options are M996L (key functions as night latch mechanical override) or M996L-BE (no key override, blank escutcheon).

Specification
Dual voltage – up to 1.12 amps @ 12 VDC,
Up to .59 amps @ 24 VDC.

To order, specify:
1. Use "M" prefix, example M996L.
2. Device type, R/V (rim/surface or concealed vertical rod/cable) or M (mortise)
3. FS or FSE
4. Lever style (06 lever is furnished standard) Other levers, no extra charge.
5. Handing and finish
6. Allegion Connect specify CON

Power wire runs through exit device body

Power Supply PS902

12 or 24 VDC output

M996L/L-BE trim

Power transfer (EPT2 shown)

Control switch [normally closed (FS) or normally open (FSE)]

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E996L Electrified lever trim

E996L Electrified lever trim provides remote locking and unlocking. Available in either fail safe (FS) or fail secure (FSE) condition, but can also be field converted where allowed. E996L is furnished standard with cylinder operation for nightlatch (NL) function, or with blank escutcheon (BE).

Specification

Solenoid – 0.6 amps @ 12 VDC, 0.22 amps @ 24 VDC.

To order, specify:

1. Use "E" prefix, example E996L. When ordering with the exit device specify trim series with prefix "E", example 9927L-BE 3' US26D E996.
2. Device type, R/V (rim/surface vertical rod/ concealed vertical rod) or M (mortise).
3. RHR furnished standard if not specified, field reversible.
4. Lever style (06 lever furnished standard). Other levers, no extra charge.
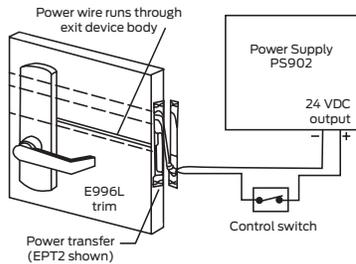
RX option

RX option available for 996 trim to monitor lever trim operation (available as L or L-BE). To order, add RX prefix to trim description.

Note: The RX switch option should not be used to control a load, but as a signaling switch only.

Power supplies

PS900 Series power supplies

The PS900 Series is a consolidated line of power supplies and accessories that offer enhanced flexibility and functionality specific to the changing needs of the access control market. The PS900 Series can be used in a variety of applications to convert high voltage AC power into the regulated low voltage DC outputs required by most access control devices. The PS900 Series protects devices downstream by providing Class 2[1], filtered and regulated power. The full line is UL294 certified.

Features

- Constant output rating at both 12VDC or 24VDC provides superior performance; includes field selectable jumper
- Flat mounting of option boards provides easier access to terminal blocks for connection of electrified devices
- High voltage protective cover
- Battery back-up board auto-selects voltage
- Fire alarm relay can be configured to provide either switched or un-switched outputs from a power supply
- PS914 designed with high inrush current for powering electrified panic devices
- Universal 120-240 VAC input
- Low voltage DC, regulated and filtered
- Electronic power limiting foldback circuit for AC current overload protection
- Fused primary input
- AC status monitor- isolated SPDT contacts
- AC input and DC output LED status indicators
- Cover mounted AC input indication
- Hinged cover with lock down screws
- Optional keylock

Certifications

- UL 294 certified—the standard for access control
- Class 2 rated[2]

PS900 Series power supplies

The PS900 Series offers a variety of distribution options, including basic fuse protection, simple relay, and advanced logic providing complex sequencing and timing functions.

Connectors on the power supply

Product	Schlage PS902	Schlage PS904	Schlage PS906	Von Duprin PS914
Amperage	2 amps	4 amps	6 amps	4 amps with 16 amp inrush
Distribution boards	1	2	3	2
Battery back-up board	1	1	1	1
EL Compatible	No	No	No	Yes

Applications

The PS900 Series of power supplies works with many electrified devices including Schlage electromagnetic locks, Schlage AD Series hardwired locks, Schlage electrified mechanical locks, Von Duprin electrified strikes, Von Duprin exit devices and many other brands.

Accessories

The PS900 Series features seven option boards for use in a variety of applications. All PS900 Series power supplies option boards are UL 294 certified.

Option boards

- **900-4R:** 4 relay controlled output board to power multiple devices
- **900-4RL:** 4 relay distribution board with logic is field configurable for time delay function, auto operator, security interlock
- **900-8F:** Provides 8 individually fuse-protected outputs, giving the flexibility to power multiple devices and provide another layer of protection
- **900-8P:** Provides 8 individually fuse-protected outputs, giving the flexibility to power multiple devices and provide another layer of protection
- **900-FA:** Emergency interface relay integrates with fire alarm and is used to cut power in case of emergency[2]
- **900-BB:** Battery backup
- **900-2RS:** 2 relay control board for electric latch panic devices (EL or QEL), electric strikes or electrified trim
- **900-BBK:** Battery backup kit includes two 7A/hr batteries and provides up to four hours of backup power when cycled every 5 minutes at full load

1. PS906 can provide Class 2 rated outputs when used with 900-8P distribution board.
2. Except PS906, output rating exceeds Class 2 power limits.
3. PS906, output rating exceeds Class 2 power limits, but can provide Class 2 rated outputs when used with 900-8P distribution board.

Electrical and pneumatic power transfers

Electrical power transfer (EPT) Pneumatic transfer (PNT)

Electrical Power Transfer provides a means of transferring electrical power from a door frame to the edge of a swinging door. The units are completely concealed when the door is in the closed position, and are ideal for installations involving abuse or heavy traffic.

Two models are available; EPT-2, two 18 gauge wires and EPT-10, ten 24 gauge wires. The EPT-2 and EPT-10 are U/L listed as "miscellaneous door accessory". UL Listed for use on fire doors.

Door applications

Degree of opening	Hinge type	Door thickness
0-180	Up to 5" butt hinges	1 3/4"
0-180	Up to 3/4" offest pivots	1 3/4"
0-130	5 1/2" butt hinges	1 3/4"
0-110	6" butt hinges	1 3/4"
0-90	Swing clear hinges	1 3/4"

Finishes

- 622 - Powder coated matte black
- 689 - Powder coated aluminum
- 695 - Powder coated bronze

Dimensions

Housing	9" x 1 1/4" x 1 5/8" (229mm x 32mm x 38mm)
EPT-2	Two 18 gauge wires, up to 2 amps @ 24VDC, with a 16 amps maximum surge
EPT-10	Ten 24 gauge wires, up to 1 amps @ 24VDC, with a 16 amps maximum surge
PNT-1	5/32" Tubing

To order, specify:
1. EPT-2 ,EPT-10 or PNT-1
2. Finish, 622, 689, 695

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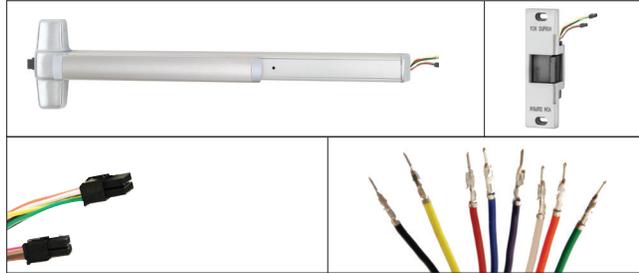
Allegion Connect

Allegion Connect features common interconnect components for many cross-category electrified options. Allegion Connect is a quick and easy way to connect power sources. There is no wire cutting; reducing installation and maintenance time ultimately cutting cost. After installation, Allegion Connect continues to provide benefits throughout the lifetime of the opening by offering a service kit for repairs or modifications in the future.

Features and benefits
- Quick: common connections reducing installation time
- Perfect Connections: these factory installed connectors ensure the right wires match up every time
- Protective: the connectors protect the connection points throughout the installation process and lifetime of the opening
- Interchangeable: all Allegion Connect products utilize the same connectors
- Maintenance: you no longer need to cut away wire to disconnect Allegion products, also available is a service kit specifically for Allegion Connect products.

Harness length	Connectors on both ends	Connectors on one end, crimped pins on the other end
6 Inches	CON-6	CON-6P
12 Inches	CON-12	CON-12P
26 Inches	CON-26	CON-26P
32 Inches	CON-32	CON-32P
38 Inches	CON-38	CON-38P
44 Inches	CON-44	CON-44P
50 Inches	CON-50	CON-50P
192 Inches	CON-192	CON-192P

Power supply wire harness = connectors on one end, stripped leads on the other end.

6 Inches	CON-6W - wire extension to power supply

Consult door manufacturer for harness length requirements.

Note: You will need to purchase a separate wiring harness to go from exit device to hinge/EPT and an additional harness to go from hinge/EPT to power supply or access control system. Harness part numbers with ordering information can be located in the Schlage, Von Duprin and Falcon price books. A service kit is available for order in the Schlage, Von Duprin and Falcon price books. Included in this kit are male end plugs, female end plugs and pins to customize harnesses to your application.

Note: Must be ordered with exit devices and locks

To order, specify:
1. Specify CON for Connect electronic options
   Example: QEL-99-EO-CON
   (99 Series quiet electric latch retraction exit only with Connect connectors)
2. Specify harness length; Consult door manufacturer for harness length
3. Specify Von Duprin EPT10-CON or Ives electrical thru-wire hinge

Wire run options
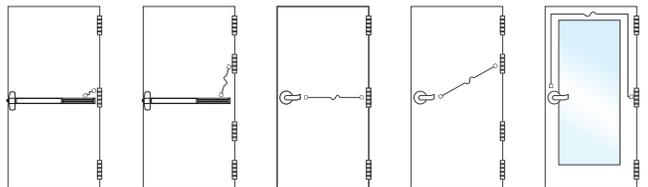
Strikes

Strikes for rim devices

264
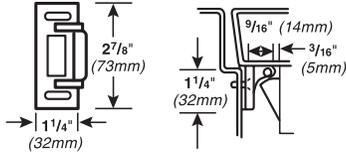
Projection 9/16" (14mm)

299
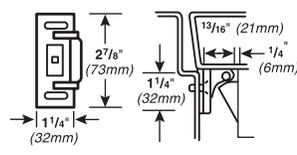
Projection 13/16" (21mm)

299F
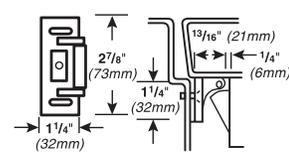
Projection 13/16" (21mm)

499F

Hook
Strike
Mullion
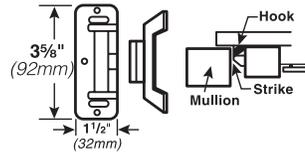
Projection 15/16" (24mm)

1408
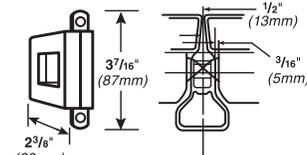
One per pair of doors

1439—Blade stop
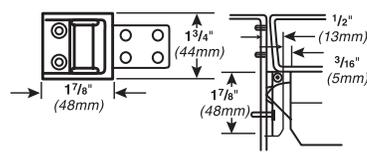
Projection 1/2" (13mm)

1410—Integral stop
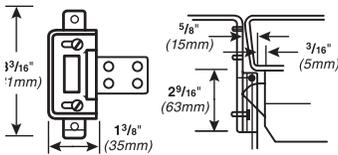
Projection 1/2" (13mm)

1606
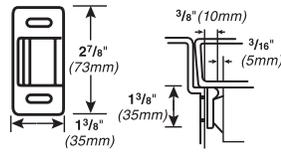
Projection 3/8" (10mm)
(Panic devices only)

1609
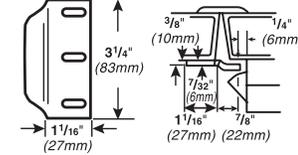
- Requires coordinator
- For panic exit application only, not fire rated

XP Strikes for rim devices

909
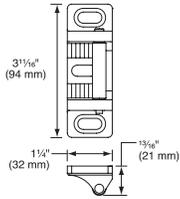
Projection 13/16" (21mm)

954
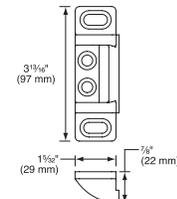
Projection 7/8" (22mm)
(For fire rated double door applications)

Strikes for vertical cable devices

249 - Top strike
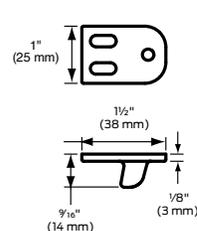
Projection 9/16" (14mm)

349 - Bottom strike
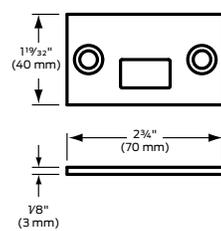
Projection 1/8" (3mm)

Strikes for 98/9950WDC devices

150

450
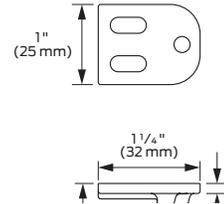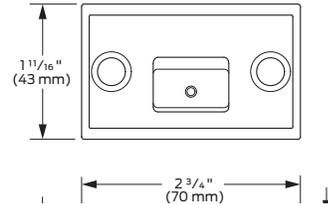
Projection 9/16" (14mm)   Projection 1/8" (3mm)

Strikes

Strikes for vertical rod devices

248L-4	260U-Flush transom panic only 260U-F-Flush transom fire only	299	299F	499F

248L-4	260U	299	299F	499F
2¹/₂" (64mm) 9/16" (14mm)	2¹/₂" (64mm) 1⁵/₈" (41mm)	2⁷/₈" (73mm) 1¹/₄" (32mm) 1¹/₄" (32mm) ¹³/₁₆" (21mm) ³/₁₆" (5mm)	2⁷/₈" (73mm) 1¹/₄" (32mm)	3⁵/₈" (92mm) 1¹/₂" (32mm)
Projection ³/₈" (10mm)	Projection ³/₈" (10mm)	Projection ¹³/₁₆" (21mm)	Projection ¹³/₁₆" (21mm)	Projection ¹⁵/₁₆" (24mm)

304L	338	385A	283

304L	338	385A	283
1⁷/₈" (48mm) 1⁷/₈" (48mm)	1⁵/₈" (41mm) 1⁷/₈" (48mm)	2" (51mm) 2³/₄" (70mm)	¹⁹/₁₆" (40mm)
Projection ¹³/₁₆" (21mm)	Mortise ⁵/₈" (16mm)	Mortise 2¹/₂" (64mm)	For use with WDC devices when used with wood frames

Strikes for mortise lock devices

575	575-2	576A	576B

575	575-2	576A	576B
1⁵/₃₂" (27mm) 4⁷/₈" (124mm) 1¹/₄" (32mm)	⁷/₈" (23mm) 4⁷/₈" (124mm) 1¹/₄" (32mm)	1³/₄" 1³/₄" (44mm) 4⁷/₈" (124mm) 1¹/₄" (32mm)	2¹/₄" 2¹/₄" (57mm) 4⁷/₈" (124mm) 1¹/₄" (32mm)
For use on 1³/₄" (44mm) or 2¹/₄" (57mm) Single door and 2¹/₄" (57mm) double door with coordinator.	For use on 1³/₄" (44mm) thick double door with coordinator and astragal.	Open back strike for 1³/₄" (44mm) thick double doors without coordinator.	Open back strike for 2¹/₄" (57mm) thick double doors without coordinator.

– Not for use with astragals
– For use on wood doors, contact door manufacturer

– Acceptable for 90 minute pair of hollow metal doors

Cylinders

Cylinders are not furnished with device or trim and must be specified when ordering.
Refer to trim pages for cylinder type.

Dogged (inverted) cam

For CD, CDSI, CI and SD

Mortise — 3215
(Schlage 20-001, L583-477 cam)

A 1⁵/₃₂" (29mm)
B 1¹/₄" (32mm)
5/16 – 3/8" (8 – 9mm)
11/16 – 3/4" (17 – 19mm)

**Undogged cam
(standard operations)**

For ALK, CX, DE5300, RCM, SS and all 98/99 Series mortise cylinder trims and controls

Rim — 3216
(Schlage 20-022)

A 1⁵/₃₂" (29mm)
B 1¹/₄" (32mm)
5/64" max. (2mm)
1/4" max. (6mm)
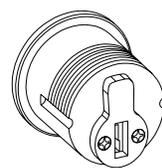
Door kits

Rod guard

Vertical rod and latch guard (RG-27)

Series RG-27 Vertical rod and latch guards protect the bottom rods of exit devices from the damaging impacts of carts or gurneys passing through doors. (If bottom rods become damaged, the exit device will not function as intended and can jeopardize the ability to exit safely during an emergency.)

In addition to protecting the vertical rod, the guard provides a smooth, unobstructed surface so the door can be pushed open easily with the bumpers of a wheelchair. The latch guard portion is 10" high. The standard latch guard features a 45º ramp. The extended latch guard offers a continuous ramp for 3' or 4' doors.

All stainless steel construction in 630 finish. Latch guards can cover latches as large as $1\frac{1}{4}$"W x 10"H x $1\frac{7}{8}$" projection.

Latch guard

Extended latch guard

3' or 4'
(3'=33 $\frac{1}{8}$"
4'=45 $\frac{1}{8}$")
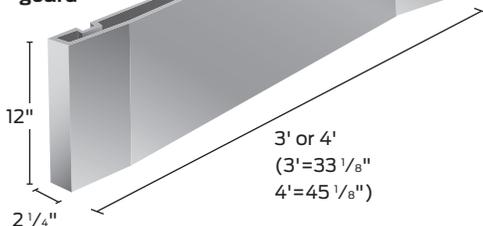
Models

RGO	Rod guard only (projection $1\frac{3}{16}$")
RG-27	Rod and latch guard
RG-27-3	3' (914mm) Rod guard and extended latch guard
RG-27-4	4' (1219mm) Rod guard and extended latch guard
LGO	Latch guard only
LGO-3	3' (914mm) Extended latch guard only
LGO-4	4' (1219mm) Extended latch guard only
WS-LGO-3	3' (914mm) Extended latch guard only for windstorm (WS) devices
WS-LGO-4	4' (1219 mm) Extended latch guard only for windstorm (WS) devices

When using on wood fire doors, high density block is required.

To order, specify:
1. Model number.*
2. Handing (except on RGO).
3. Door material if other than hollow metal.
4. Optional sex bolt mounting available.

* RGO/RG-27 includes one rod guard only, which accommodates bottom or top rod up to 7' door. For longer top rods, specify rod guard quantity required. Also available are the WS-LGO-3; and WS-LGO-4' extended latch guards for use with WS98/9927/57 devices.

997 Cover plate kit

For 98/99 rim device, kit contains inside and outside plates for hinge stile cutouts, an inside plate for the lock stile, and necessary screws. Plates are designed to cover cutouts required by most existing exit device installations. Specify finish.
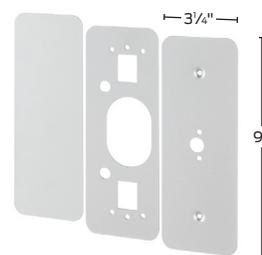
Wood door applications cover plate kit (WDA)

For wood door applications, used to cover up door preparations for control, also prevents the control from boring into the wood door. Finished to match control.

#10WDA Cover plate kit for 370 series controls
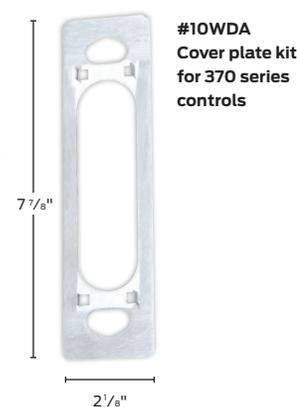
Glass bead kit (GBK)

Glass bead conversion kits are available for all 98/99 Series devices for use on doors with raised glass beads. Each kit consists of $\frac{1}{4}$" (6mm) shim sets. GBK for surface vertical rod ships with $\frac{1}{8}$" shims for rod guides.

To order, specify:
1. Device model.
2. GBK.
3. Device type (rim, mortise, surface rod, concealed rod, concealed cable).
4. Wood door (when used with concealed rod or concealed cable device).
5. Specify if using with 499F or 954 strike.
6. Finish.

Example: XP98 GBK Rim 954 SP28

Note: For 330/350 dummy pushbar, order hinge stile shim #971010, quantity 2.

Sex bolts

Sex bolts provide secure mounting by mating with machine screws furnished with devices. Sex bolts are either optional or required, as shown in quantity chart below. Sex bolts ordered separately are not furnished with screws. If screws are required, order device mounting packages.

An alternative to sex bolt mounting is the use of UL or WH approved high density blocking material for wood fire-rated doors. Specify device with SLM (special laminate material) mounting package.

To order sex bolts
1. If ordering devices with sex bolts, specify SNB (sex nuts and bolts) in device description.
2. If ordering sex bolts separately, specify:
   - Sex bolt model number
   - Package quantity (sold as package of 2)
   - Finish

325

425

825

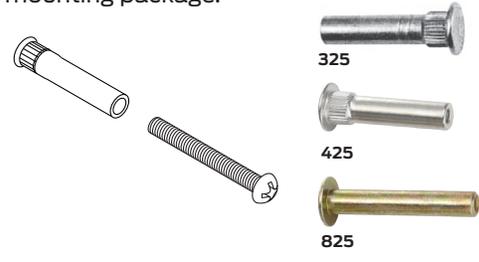| Device type	Function	Sex bolts						
		425			**325 for 499F hook**		**325 for latches**	**825**
		Required Included in device price	Required Added to device price	Optional Added to device price	Required Added to device price	Optional Added to device price	Required Included in device price	Required Added to device price
98/99/XP98/XP99 Rim	EO, NL-OP			6				
	DT, K, L, NL, TP, VR, 392, 696/697			2				
98/99/XP98/XP99 Rim-F, single door, metal door	EO, NL-OP			6				
	DT, K, L, NL, TP, VR, 392, 696/697			2				
98/99/XP98/XP99 Rim-F, double door, metal door	EO, NL-OP			6		2		
	DT, K, L, NL, TP, VR, 392, 696/697			2		2		
98/99/XP98/XP99 Rim-F, single door, wood door	EO, NL-OP, 392, 696/697*		6					
	DT, K, L, NL, TP, VR		2					2
98/99/XP98/XP99 RIM-F, double door, wood door	EO, NL-OP, 392, 696/697*		6		2			
	DT, K, L, NL, TP, VR		2		2			2
(HH)98/99/XP98/XP99 Rim panic and fire, single or double metal door	EO, NL-OP, 392, 696/697*		6			2		
	DT, K, L, NL, TP, VR		2			2		
98/9927/57/-F	EO, NL-OP, TL-OP			6			4	
	DT, K, L, NL, TP, TL, VR, 392, 696/697			2			4	2†
98/9927LBR/57LBR	EO, NL-OP, TL-OP			6			2	
	DT, K, L, NL, TP, TL, VR, 392, 696/697			2			2	
98/9927LBR-F, metal door	EO, NL-OP, TL-OP			6		2	2	
	DT, K, L, NL, TP, TL, VR, 392, 696/697			2		2	2	
98/9927LBR-F, wood door	EO, NL-OP, TL-OP			6	2		2	
	DT, K, L, NL, TP, TL, VR, 392, 696/697			2	2		2	
HH98/9927/57/-F	EO, NL-OP, TL-OP, 392, 696/697*		6		2		4	
	DT, K, L, NL, TP, TL, VR		2		2		4	
WS98/9927/57/-F	EO, 392	6					12	
	DT, L, VR	2					12	
98/9947/47WDC/48/49/50/-F, standard or LBR/LBL	EO, NL-OP, TL-OP			6				
	DT, K, L, NL, TP, TL, VR, 392, 696/697			2				
HH98/9947/49/-F	EO, NL-OP, TL-OP, 392, 696/697*		6					
	DT, K, L, NL, TP, TL, VR		2					
98/9952	EO			6				
	L, L-BE			2				
98/9975/-F	EO, NL-OP			6				
	DT, HL, K, L, NL, TP, 392, 696/697			2				
HH98/9975/-F	EO, NL-OP, 392, 696/697*		6					
	DT, HL, K, L, NL, TP		2					

98/99/XP98/XP99 Rim-F, single or double door, SLM blocking	
98/9927/57-F, SLM blocking	No sex bolts, all applications; special laminate material (SLM) blocking mounting package added to price
98/9947WDC/50-F, standard or LBR/LBL, SLM blocking	
98/9975-F, SLM blocking	

* 696/697 must be milled on the back to sit flush against required 425 sex bolts

† These 825 sex bolts are only required for 98/9957-F on fire-rated wood doors with outside trim.

Mullions

Removable steel mullions provide single door performance in double door openings with rim devices. Mullions are easily removed by loosening bottom set screw and removing top fitting cover. The top mullion fitting is attached to the frame and is concealed by the fitting cover.

- Steel mullions are 2" (51mm) wide and 3" (76mm) deep, with a wall thickness of $^1/_8$" (3mm) (except the HH9954 which has thicker walls).

- Mullions are shipped with mounting screws and prepared for strikes. (Strikes are not included except where indicated.)

- Steel mullions are available in SP28 and SP313 finishes. (Consult factory for other powder coat finish options.)

Keyed removable steel mullions (KR)

KR mullions make removal faster and easier by a single operation of the mortise cylinder. Once mullion is removed, large equipment or furniture can freely pass through the opening. The unit will self lock when re-installed, without the use of the cylinder key. Uses a $1^1/_4$" mortise cylinder with a straight cam (Schlage cam reference L583-477). Cylinders are sold separately. Prefix mullion model with "KR". (KR is not available on HH9954 or aluminum mullions.)

Removable aluminum mullions are $1^1/_{16}$" (27mm) wide on face closest to the door and $2^3/_8$" (60mm) at the

widest point. The depth is $3^1/_8$" (79mm) with a wall thickness of $^1/_8$" (3mm).

Aluminum mullions are available in 606, 612, 628, 710 and 622/711 finishes. Consult factory for other powder coat finish options. Aluminum mullions are not available keyed removable.

Stock hollow metal applications for devices mounted to cover ANSI 161 cutouts are higher than the standard mullion strike location. Consult the factory for special strike preparation or order a blank mullion. See below.

Blank mullions
Blank mullions are furnished without strike preparation. They are used to mount devices at a strike height different from the standard mullion preparation.

To order, specify:
1. For keyed removable option on steel mullions, prefix model number with "KR"
2. Model number
3. Height of opening
4. Finish
5. Handing if required
6. Centerline deviation (refer to device template for standard centerline)
7. Strikes, when required, should be ordered with device
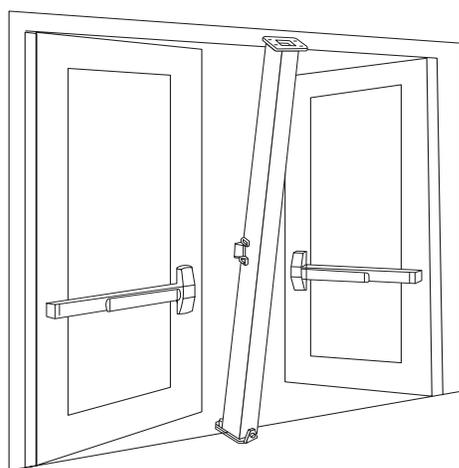
Removable mullions

Keyed removable steel mullions

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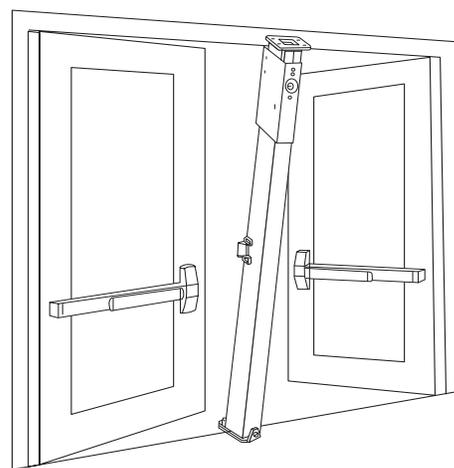
Steel and aluminum mullions

Steel mullions

1654 Prepared for two 1606 strikes. If 1606 strikes are not specified on the order, two per mullion will be added. Additional charges apply.

4954 Prepared for 264 or 299 strikes. For use with all Von Duprin Panic rim devices.

4954-XP Prepared for two 909 strikes, for XP device.

9954 Prepared for and must be used with two 268 strikes (88-F device), or two 499F (22-F, 98-F, 99-F devices). UL fire labeled mullion for up to 3 hour opening using Von Duprin fire exit rim devices. This mullion is not easily removed due to special fittings. 98-F and 99-F devices are rated up to 10'0" (3048 mm).

9954-XP Prepared for two 954 strikes, for XP device.

HH9954 Heavy-duty mullion for use in impact-rated hurricane assembly.

Note: If 268 or 499F strikes are not specified on the order, two per mullion will be added. Additional charges apply.

UL fire labeled up to 3 hour opening. These applications are hurricane approved to 8'0" x 8'0" with this mullion: HH88-F (468 strike), HH98/99-F (499F strike), HH-XP98/99-F (954 strike), and HH98/9957-F (499F middle strike).

4754 Prepared for two 4263 monitor strikes.

4854 Prepared for one 299 and one 6111 electric strike. Indicate handing for electric strike.

9854 Prepared for one 268 or 499F strike and one 6111 electric strike. Indicate handing for electric strike. UL fire labeled mullion for up to 3 hour openings up to 8' x 8' (2438mm x 2438mm) using Von Duprin fire exit rim devices.

Aluminum mullions

5654 Prepared for two 299 strikes.

5654-XP Prepared for two 909 strikes, for XP device.

5754 Prepared for 1408 double strike.

UL Listing for fire exit hardware

UL Listed fire exit hardware label and opening size
Check with door manufacturers to confirm listing compatibility.

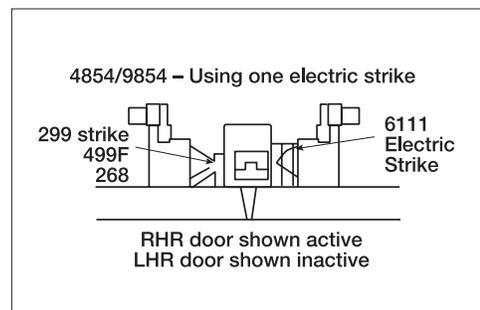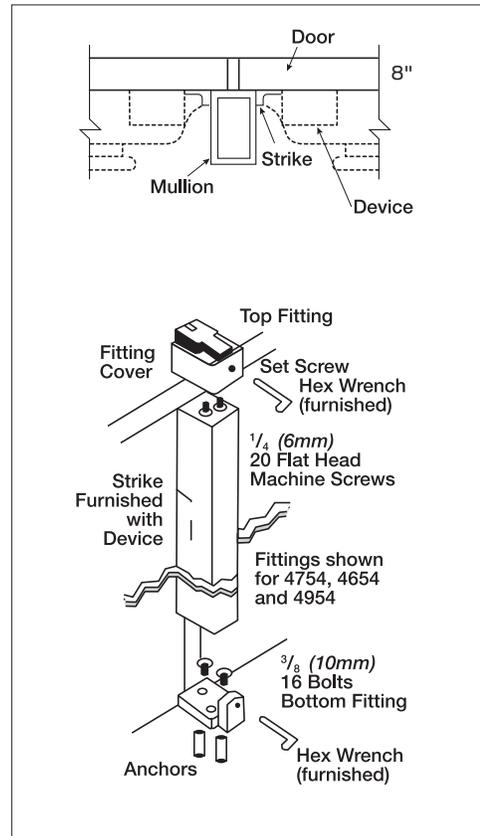| Exit device	Door material	Single door	Double door						
			With 9954 mullion	With 9854 mullion[4]	With KR9954 mullion	With KR9854 mullion[4]	V x V same direction[1]	V x Mortise same direction[3]	V x V double egress
98-F 99-F	Metal, composite (wood or plastic covered)	3 Hour 4' x 10'	3 Hour 8' x 10'	90 Min 8' x 8'	3 Hour 8' x 8'	90 Min 8' x 8'	—	—	—
98-F/99-F with 1439 Strike	Metal, composite (wood or plastic covered)	3 Hour 4' x 8'	—	—	—	—	—	—	—
XP98-F XP99-F	Metal, composite (wood or plastic covered)	3 Hour 4' x 10'	3 Hour 8' x 10'	90 Min 8' x 8'	3 Hour 8' x 8'	90 Min 8' x 8'	—	—	—
9827-F 9927-F	Metal, composite (wood or plastic covered)	—	—	—	—	—	3 Hour 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9827LBR-F 9927LBR-F	Metal, composite (wood or plastic covered)	—	—	—	—	—	3 Hour 8' x 8'	3 Hour 8' x 8'	3 Hour 8' x 8'
9827LBR-F[2] 9927LBR-F[2]	Wood core	—	—	—	—	—	20 Min no hose 8' x 8'	20 Min no hose 8' x 8'	20 Min no hose 8' x 8'
9847-F 9947-F	Metal, composite (wood or plastic covered)	—	—	—	—	—	3 Hour 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9847LBR-F 9947LBR-F	Metal, composite (wood or plastic covered)	—	—	—	—	—	3 Hour 8' x 9'	3 Hour 8' x 9'	3 Hour 8' x 9'
9847WDC-F 9947WDC-F	Composite (wood or plastic covered)	—	—	—	—	—	90 Min 8' x 9'3"	—	90 Min 8' x 9'3"
9847WDC-LBR-F 9947WDC-LBR-F	Composite (wood or plastic covered)	—	—	—	—	—	90 Min 8' x 9'3"	—	90 Min 8' x 9'3"
9847WDC-LBR-F[2] 9947WDC-LBR-F[2]	Wood core	—	—	—	—	—	20 Min no hose 8' x 9'3"	—	20 Min no hose 8' x 9'3"
9848-F 9948-F	Metal, composite (wood or plastic covered)	—	—	—	—	—	3 Hour 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9849-F 9949-F	Metal, composite (wood or plastic covered)	—	—	—	—	—	3 Hour 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9849LBL-F 9949LBL-F	Metal, composite (wood or plastic covered)	—	—	—	—	—	3 Hour 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9850-F 9950-F	Metal	—	—	—	—	—	90 Min 8' x 8'	—	90 Min 8' x 8'
9850WDC-F 9950WDC-F	Composite (wood or plastic covered)	—	—	—	—	—	90 Min w/ edge wrap 1 Hour w/o edge wrap 8' x 8'	—	—
9850WDC-LBL-F[2] 9950WDC-LBL-F[2]	Composite (wood or plastic covered)	—	—	—	—	—	20 Min w/ or w/o edge wrap, no hose 8' x 8'	—	—
9857-F 9957-F	Metal	3 Hour 4' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 8'	3 Hour 8' x 8'	—	—	—
9857-F/9957-F with 1439 Strike	Metal	3 Hour 4' x 8'							
9875-F 9975-F	Metal, composite (wood or plastic covered)	3 Hour 4' x 10'	—	—	—	—	—	3 Hour See vertical row	—
WS9827-F WS9927-F	Metal, composite (wood or plastic covered)	—	—	—	—	—	3 Hour 8' x 8'	3 Hour 8' x 8'	3 Hour 8' x 8'
WS9857-F WS9957-F	Metal, composite (wood or plastic covered)	3 Hour 4' x 8'	—	—	—	—	—	—	—

1 Fire-rated metal door flush bolts may be substituted on one leaf of a pair in these columns. Substitute two-point flush bolt for vertical devices; or substitute top flush bolt with auxiliary fire bolt for vertical rod LBR/LBL-AFL devices. The opening will carry the fire listing (# hours and opening size) of the least rated component.
2 Not listed for Canada.
3 For Vertical x Mortise opening sizes, see applicable vertical rod/cable device rows.
4 Hourly limitation due to 6111 electric strike listing.

Notes:
Check with door manufacturers to confirm listing compatibility.
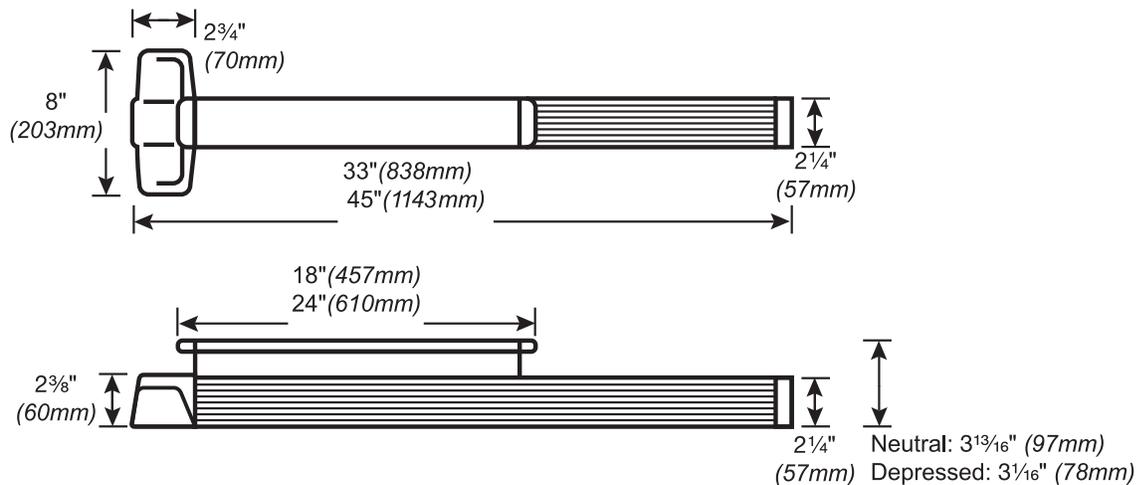Overlapping astragal may not be used on pairs swinging same direction with vertical rods or cables on both leaves.

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Function, grade and type options

ANSI Function, grade and type

Function	Grade 1, type 1	Grade 1, type 2	Grade 1, type 3	Grade 1, type 7	Grade 1, type 7	Grade 1, type 8	Grade 1, type 8	Grade 1, type 8	Grade 1, type 9
1	98EO/-F 99EO/-F	9827EO/-F 9927EO/-F	9875EO/-F 9975EO/-F	9847WDCEO/-F 9947WDCEO/-F	9850WDCEO/-F 9950WDCEO/-F	9847EO/-F 9947EO/-F	9848EO/-F 9948EO/-F	9849EO/-F 9949EO/-F	9857EO/-F 9957EO/-F
2	98DT 99DT	9827DT 9927DT	9875DT 9975DT	9847WDCDT 9947WDCDT	9850WDCDT 9950WDCDT	9847DT 9947DT	9848DT 9948DT	9849DT 9949DT	9857DT 9957DT
3	98NL/-F 99NL/-F	9827NL/-F 9927NL/-F	9875NL/-F 9975NL/-F	9847WDCNL/-F 9947WDCNL/-F	9850WDCNL/-F 9950WDCNL/-F	9847NL/-F 9947NL/-F	9848NL/-F 9948NL/-F	9849NL/-F 9949NL/-F	9857NL/-F 9957NL/-F
3	98K-NL/-F 99K-NL/-F	9827K-NL/-F 9927K-NL/-F	9875K-NL/-F 9975K-NL/-F	9847WDCK-NL/-F 9947WDCK-NL/-F	9850WDCK-NL/-F 9950WDCK-NL/-F	9847K-NL/-F 9947K-NL/-F	9848K-NL/-F 9948K-NL/-F	9849K-NL/-F 9949K-NL/-F	9857K-NL/-F 9957K-NL/-F
3	98L-NL/-F 99L-NL/-F	9827L-NL/-F 9927L-NL/-F	9875L-NL/-F 9975L-NL/-F	9847WDCL-NL/-F 9947WDCL-NL/-F	9850WDCL-NL/-F 9950WDCL-NL/-F	9847L-NL/-F 9947L-NL/-F	9848L-NL/-F 9948L-NL/-F	9849L-NL/-F 9949L-NL/-F	9857L-NL/-F 9957L-NL/-F
5	98TP/-F 99TP/-F	9827TP/-F 9927TP/-F	9875TP/-F 9975TP/-F	9847WDCTP/-F 9947WDCTP/-F	9850WDCTP/-F 9950WDCTP/-F	9847TP/-F 9947TP/-F	9848TP/-F 9948TP/-F	9849TP/-F 9949TP/-F	9857TP/-F 9957TP/-F
7	98TP-2/-F 99TP-2/-F		9875TP-2/-F 9975TP-2/-F						
8	98K/-F 99K/-F	9827K/-F 9927K/-F	9875K/-F 9975K/-F	9847WDCK/-F 9947WDCK/-F	9850WDCK/-F 9950WDCK/-F	9847K/-F 9947K/-F	9848K/-F 9948K/-F	9849K/-F 9949K/-F	9857K/-F 9957K/-F
8	98L/-F 99L/-F	9827L/-F 9927L/-F	9875L/-F 9975L/-F	9847WDCL/-F 9947WDCL/-F	9850WDCL/-F 9950WDCL/-F	9847L/-F 9947L/-F	9848L/-F 9948L/-F	9849L/-F 9949L/-F	9857L & F 9957L/-F
10	98K-2 /-F 99K-2/-F		9875K-2/-F 9975K-2/-F						
10	98L-2/-F 99L-2/-F		9875L-2/-F 9975L-2/-F						
11/12		9827TL/-F 9927TL/-F		9847WDC/-F 9947WDC/-F	9850WDC/-F 9950WDC/-F	9847TL/-F 9947TL/-F	9848/-F 9948/-F	9849/-F 9949/-F	9857TL/-F 9957TL/-F
14	98K-BE/-F 99K-BE/-F	9827K-BE/-F 9927K-BE/-F	9875K-BE/-F 9975K-BE/-F	9847WDCK-BE/-F 9947WDCK-BE/-F	9850WDCK-BE/-F 9950WDCK-BE/-F	9847K-BE/-F 9947K-BE/-F	9848K-BE/-F 9948K-BE/-F	9849K-BE/-F 9949K-BE/-F	9857K-BE/-F 9957K-BE/-F
14	98L-BE/-F 99L-BE/-F	9827L-BE/-F 9927L-BE/-F	9875L-BE/-F 9975L-BE/-F	9847WDCL-BE/-F 9947WDCL-BE/-F	9850WDCL-BE/-F 9950WDCL-BE/-F	9847L-BE/-F 9947L-BE/-F	9848L-BE/-F 9948L-BE/-F	9849L-BE/-F 9949L-BE/-F	9857L-BE/-F 9957L-BE/-F
16		9827TL-BE/-F 9927TL-BE/-F		9847WDC/-F 9947WDC/-F	9850WDC/-F 9950WDC/-F	9847TL-BE/-F 9947TL-BE/-F	9848/-F 9948/-F	9849/-F 9949/-F	9857TL-BE/-F 9957TL-BE/-F

Dimensions

2¾" (70mm)

8" (203mm)

33"(838mm)
45"(1143mm)

2¼" (57mm)

18"(457mm)
24"(610mm)

2⅜" (60mm)

2¼" (57mm)

Neutral: 3¹³⁄₁₆" (97mm)
Depressed: 3¹⁄₁₆" (78mm)

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Stile information

Device type	Standard single door			Standard double door			Optional single door			Optional double door		
	Strike	Trim/stile		Strike w/mullion*	Trim/Stile		Strike	Trim/stile		Strike w/mullion*	Trim/Stile	
		990/996	696/697		990/996	696/697		990/996	696/697		990/996	696/697
98/99	299	4¹/₂" (114mm)	4³/₈" (111mm)	299 x 4954	4⁷/₈" (124mm)	4³/₄" (121mm)	1439 or 1410	3¹³/₁₆" (97mm)	3¹³/₁₆" (97mm)	299 x 5654	4⁷/₁₆" (113mm)	4¹/₄" (108mm)
										1408 x 5754	3¹³/₁₆" (97mm)	3¹³/₁₆" (97mm)
							1606	4¹/₁₆" (103mm)	3¹⁵/₁₆" (100mm)	1606 x 1654	4³/₈" (112mm)	4¹/₄" (108mm)
XP 98/99	909			909 x 4954-XP			—	—	—	—	—	—
98-F/99-F	299F	4¹/₂" (114mm)	4³/₈" (111mm)	499F x 9954	4⁷/₈" (124mm)	4³/₄" (121mm)	—	—	—	499F x 9854 KR9954	—	—
XP98-F/ XP99-F	909			954 x 9954-XP			—	—	—	—	—	—
9875 9975	575	4³/₄" (121mm)	4³/₄" (121mm)	575-2	—	—	—	—	—	576A-576B	4³/₄" (121mm)	4³/₄" (121mm)
9875-F 9975-F	575	4³/₄" (121mm)	4³/₄" (121mm)	575-2	—	—	—	—	—	576A-576B	4³/₄" (121mm)	4³/₄" (121mm)
9857 9957	299 (Top) 299 (Middle) 304L/248L-4 (Bottom)	4¹/₂" (114mm)	4³/₈" (111mm)	299 x 4954	4⁷/₈" (124mm)	4³/₄" (121mm)	1439 or 1410	3¹³/₁₆" (97mm)	3¹³/₁₆" (97mm)	299 x 5654	4⁷/₁₆" (113mm)	4¹/₄" (108mm)
										1408 x 5754	3¹³/₁₆" (97mm)	3¹³/₁₆" (97mm)
							1606	4¹/₁₆" (103mm)	3¹⁵/₁₆" (100mm)	1606 x 1654	4³/₈" (112mm)	4¹/₄" (108mm)
9857-F 9957-F	299F* (Top) 299F (Middle) 304L (Bottom)	4¹/₂" (114mm)	4³/₈" (111mm)	299F 499F x 9954 304L	4⁷/₈" (124mm)	4³/₄" (121mm)	—	—	—	—	—	—

	Strike	Optional strike	Application	Trim/stile	
				990/996	696/697
9827 9927 Latch retraction	299 (Top) 304L/248L-4 (Bottom)	260U (Top) 385A (Bottom)	Single door	3¹¹/₁₆" (94mm)	3⁵/₈" (92mm)
PL9827/PL9927 Pullman latch	299 (Top) 304L/248L-4 (Bottom)		Two vertical rod devices	3¹¹/₁₆" (94mm)	3⁵/₈" (92mm)
9827-F 9927-F	299F* (Top) 304L (Bottom)	260U (Stainless) 385A (Bottom)			
9847 9947 9848 9948	338 (Top) 385A (Bottom)	304L (Bottom)	Vertical rod with Mortise lock device	4³/₄" (121mm)	4³/₄" (121mm)
9847-F 9947-F 9848-F 9948-F	338 (Top) 385A (Bottom)	304L (Bottom)	Two vertical rods	4¹/₄" (108mm)	4¹/₈" (105mm)
			Vertical rod with Mortise lock device	4³/₄" (121mm)	4³/₄" (121mm)
9847WDC 9947WDC	338 (Top) 385A (Bottom)	304L (Bottom)	Single door	4¹/₄" (108mm)	4¹/₄" (108mm)
			Two vertical rod devices	4¹/₄" (108mm)	4¹/₄" (108mm)
9847WDC-F 9947WDC-F	338 (Top) 385A (Bottom)	304L (Bottom)	Two vertical rod devices	4¹/₄" (108mm)	4¹/₄" (108mm)
9849 9949 9849 9949	249 (Top) 349 (Bottom)	—	Vertical cable with Mortise lock device	4³/₄" (121mm)	4³/₄" (121mm)
9849-F 9949-F 9849-F 9949-F	249 (Top) 349 (Bottom)	—	Two vertical cable	4¹/₄" (108mm)	4¹/₈" (105mm)
			Vertical cable with Mortise lock device	4³/₄" (121mm)	4³/₄" (121mm)
9850WDC 9950WDC	150 (Top) 450 (Bottom)	—	Single door	4³/₄" (121mm)	4³/₄" (121mm)
			Two vertical Cable devices	4³/₄" (121mm)	4³/₄" (121mm)
9850WDC-F 9950WDC-F	150 (Top) 450 (Bottom)	—	Two Vertical Cable Devices	4³/₄" (121mm)	4³/₄" (121mm)

*499F strike is the top strike for LBR applications.

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Lever styles and finishes

Decorative levers

M51 [2] **M52** [2] **M53** **M54** **M55**

M56 **M57** [1] **M61** [3] **M62** [1, 3] **M63** [3]

M81 [2] **M82** **M83** **M84** **M85** [3]

ME1 [2, 3, 4] **ME2** [2, 3, 4] **ME3** [2, 3]
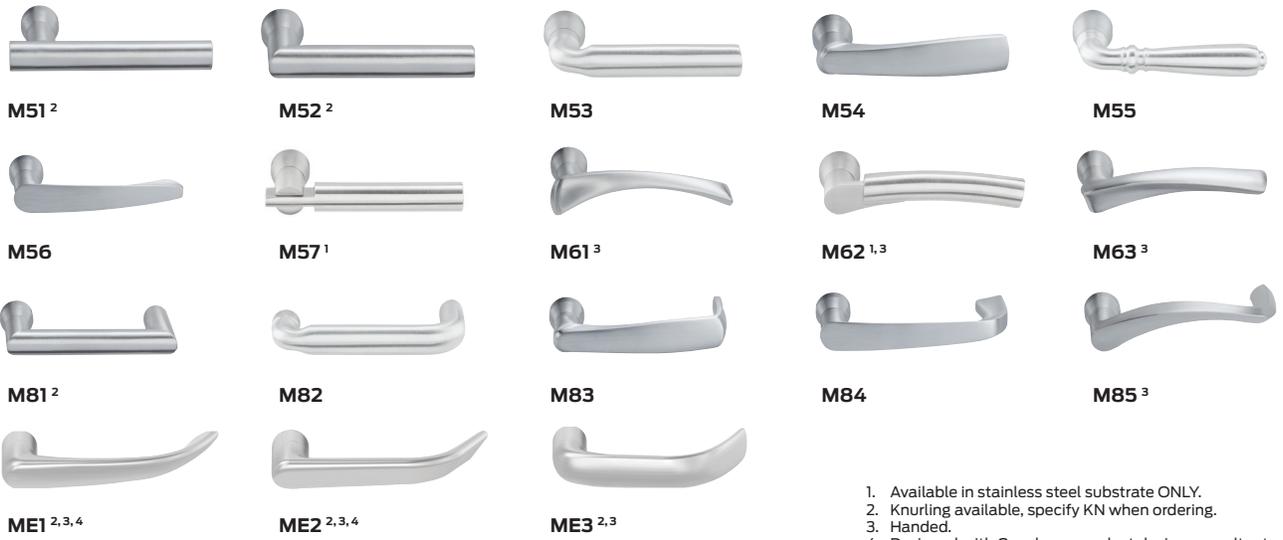
1. Available in stainless steel substrate ONLY.
2. Knurling available, specify KN when ordering.
3. Handed.
4. Designed with Gensler as product design consultant.

Standard levers

01 **02** [2] **03** [1, 2] **05** **06** [1,2] (Default lever)

07 [2] **12** [3] **16** - Omega **17** [1, 2] **18**

ACC - Accent [3] **AST** - Asti [3] **MER** - Merano [3] **LAT** [1] - Latitude **LON** [1] - Longitude
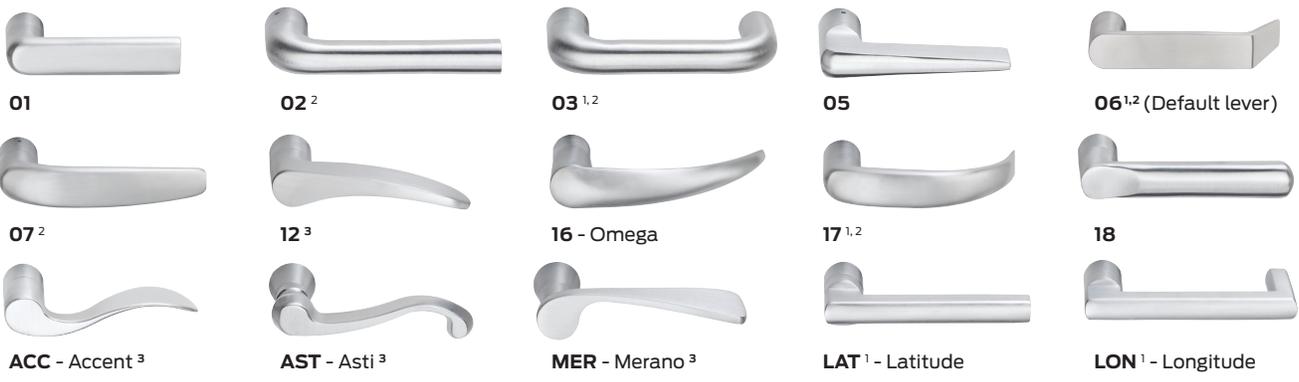
1. Available in Stainless Steel - specify SS when ordering.
2. Knurling available, specify KN when ordering.
3. Handed.

Finish options*						
Color	Bright Brass	Satin Brass	Satin Bronze	Satin Nickel	Matte Black/ Anodized	Bright Chrome
ANSI/BHMA number	605	606	612	619	622/711	625

Finish options*						
Color	Satin Chrome	Aluminum, anodized	Satin Stainless	Aged Bronze	Black Paint	Dark Brown, Anodized
ANSI/BHMA number	626/626AM†	628	630/630AM†	643e	693	710

* Durable powder coated finishes available at special request. Please contact factory.
† AM = Antimicrobial

Device finish options

A. Center case cover

B. Touch bar end cap

C. Touch bar trim

D. Cover plate

E. Mechanism end cap

F. Mechanism case
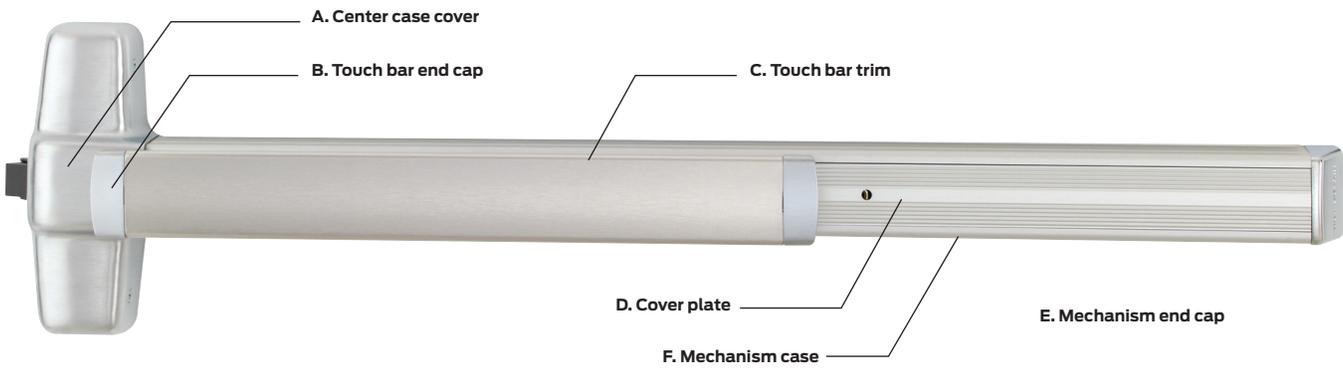
Finishes

Color	BHMA number	A, B, E	C	D and F
Bright brass	605	Bright brass	Bright brass, 605	Buffed anodized
Satin brass	606	Satin brass	Satin brass, 606	Anodized
Satin bronze	612	Plated	Satin bronze, 612	Anodized
Satin bronze, oil-rubbed	613	Oil rubbed bronze	Oil rubbed bronze, 613	Powder coat
Bright chrome	625	Plated	Bright stainless steel, 629	Buffed anodized
Satin chrome	626	Plated	Satin stainless steel, 630	Anodized
Satin stainless steel*	630	Stainless steel	Satin stainless steel, 630	Anodized
Aluminum, anodized	628	Powder coat	Satin stainless steel, 630	Anodized
Duranodic dark bronze	710	Powder coat	Powder coat	Powder coat
Black	622	Powder coat	Powder coat	Powder coat
Aged bronze	643e	Relieved aged bronze	Relieved aged bronze	Aged bronze, no relief

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About Allegion

Allegion (NYSE: ALLE) is a global pioneer in seamless access, with leading brands like CISA®, Interflex®, LCN®, Schlage®, SimonsVoss® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion secures people and assets with a range of solutions for homes, businesses, schools and institutions.

For more, visit **www.allegion.com**

KRYPTONITE ▪ **LCN** ▪ *SCHLAGE* ▪ **STEELCRAFT** ▪ **VON DUPRIN**

ALLEGION™

SIM*pull* XHHW-2®
Copper XHHW Wire & Cable

600 Volts & 1000 Volts (see below). Copper Conductor. Cross-Linked Polyethylene (XLPE) Insulation. High-Heat and Moisture Resistant. SIM Technology® for easier pulling. Sizes 14 through 10 AWG also rated SIS.

APPLICATIONS

Southwire® SIM*pull* XHHW-2® copper conductors are primarily used in conduit, Cable Tray or other recognized raceways for services, feeders, and branch circuit wiring, as specified in the National Electrical Code. SIM*pull* XHHW-2® copper conductors may be used in wet or dry locations at temperatures not to exceed 90° C. **Voltage rating for XHHW-2 conductors is 600 volts for all sizes and 1000 volts for sizes 8 AWG and larger.** Suitable for use in Health Care Facilities per Section 517.160 of the National Electrical Code where a dielectric constant of less than 3.5 maybe specified. This cable is designed to be installed without the application of pulling lubricant.

STANDARDS & REFERENCES

Southwire® SIM*pull* XHHW-2® copper conductors comply with the following:
• ASTM- B3, B8 (7, 19, 37, 61 Strands), B787 (19 Strands)
• UL Standard 44
• NOM-ANCE 90° C
• Federal Specification A-A059544
• CT Rated Sizes 1/0 AWG and Larger
• Gas and Oil Resistant II sizes 8 AWG and larger
• Sunlight (UV) Resistant – S 8 AWG and larger
• National Electrical Code, NFPA 70
• NEMA WC 70 Construction Requirements
• FT4/IEEE 1202- Sizes 350 KCMIL and Larger
• RoHS/ REACH Chemical Limit Compliant

CONSTRUCTION

Southwire® SIM*pull* XHHW-2® copper conductors are annealed (soft) copper. Insulation is an abrasion, moisture, and heat resistant thermoset cross-linked polyethylene (XLPE). Conductor sizes 8 AWG and larger are marked sunlight resistant. Colors are available and may be subject to economic order quantity.

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Conductor			Nominal O.D. (mils)	Approx. Net Wt. Per 1000' (lbs.)	Allowable Ampacities+			Standard Package
Size (AWG or kcmil)	No. of strands	Insulation Thickness (mils)			60°C	75°C	90°C	
14*	7	30	130	18	15	15	15	AC
12*	1	30	141	24	20	20	20	AC
10*	1	30	147	26	30	30	30	AC
12*	7	30	162	37	20	20	20	AC
10*	7	30	171	40	30	30	30	AC
8	7	45	232	65	40	50	55	ABCD
6	7	45	268	96	55	65	75	ABCD
4	7	45	311	147	70	85	95	ABCD
3	7	45	337	183	85	100	115	BC
2	7	45	367	227	95	115	130	ABCD
1	19	55	435	291	110	130	145	ABCD
1/0	19	55	477	363	125	150	170	ABCD
2/0	19	55	521	453	145	175	195	ABCD
3/0	19	55	571	565	165	200	225	ABCD
4/0	19	55	627	706	195	230	260	ABCD
250	37	65	695	835	215	255	290	ABCD
300	37	65	748	995	240	285	320	C
350	37	65	798	1155	260	310	350	AB
400	37	65	843	1314	280	335	380	ABC
500	37	65	927	1633	320	380	430	ABC
600	61	80	1033	1965	350	420	475	ABC
700	61	80	1102	2282	385	460	520	N/A
750	61	80	1135	2440	400	475	535	A
1000	61	80	1284	3229	455	545	615	N/A

*Sizes 14 - 10 AWG not available with patented SIM Technology® No Lube® jacket. + Allowable ampacities shown are for general use as specified by the National Electrical Code, sections 310.15 and 240.4(D). Unless the equipment is marked for use at higher temperatures, the conductor ampacities shall be limited to the following per NEC 110.14(C). 60° C When terminated to equipment for circuits rated 100 amperes or less or marked for 14 - 1 AWG conductors. 75° C When terminated to equipment for circuits rated over 100 amperes or marked for conductors larger than 1 AWG.

Package Code
A - 2500' Reel
B - 1000' Reel
C - 500' Spool
D - 5000' Reel

RECOMMENDED SAMPLE SPECIFICATIONS:
Conductors shall be UL-listed SIM*pull* XHHW-2® copper conductors, **suitable for operation at 600 volts or less (1000 volts or sizes 8 AWG & larger) in wet or dry locations, at temperatures not to exceed 90°C. Conductors shall be annealed copper, as manufactured by Southwire Company or approved equal.**

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Conductor		Stock Numbers
Size (AWG or kcmil)	No. of strands	
14*	7	**Standard XHHW CU Stock #: BK:112920, WE:370924, RD:370932, BE:370940, GN:370965, YW:370957, OE:370973, BN:370981, PE:370999, GY:371005**
12*	1	**Standard XHHW CU Stock #: BK:550220, WE:550221, RD:550222, GN:550223, BE:550224, YW:550225, OE:550226, BN:550227**
10*	1	**Standard XHHW CU Stock #: BK:137240, WE:550212, RD:550213, GN:550214, BE:550215, YW:550216, OE:550217, BN:550218**
12*	7	**Standard XHHW CU Stock #: BK:112938, WE:371021, RD:371039, BE:371047, GN:371062, YW:371054, OE:371070, BN:371088, PE:371096, GY:371104**
10*	7	**Standard XHHW CU Stock #: BK:112946, WE:371120, RD:371138, BE:371146, GN:371161, YW:371153, OE:371179, BN:371187, PE:371195, GY:371203**
8	7	**SIM*pull* XHHW-2® CU Stock #: BK:112953, WE:952721, RD:952713, BE:553059, GN:952739, YW:553062, OE:550361, BN:553060, GY:553063**
6	7	**SIM*pull* XHHW-2® CU Stock #: BK:112961, WE:678607, RD:952705, BE:959916, GN:553230, YW:553067, OE:683391, BN:683383, GY:553068**
4	7	**SIM*pull* XHHW-2® CU Stock #: BK:112979, WE:678599, RD:952697, BE:553846, GN:558627, YW:553849, OE:553848, BN:553847, GY:553850**
3	7	**SIM*pull* XHHW-2® CU Stock #: BK:267278, BK/RD:278085, BK/WE:278093, GN:890469**
2	7	**SIM*pull* XHHW-2® CU Stock #: BK:112987, WE:218107, RD:218115, BE:553087, GN:474122, YW:553090, OE:553089, BN:553088, GY:553091**
1	19	**SIM*pull* XHHW-2® CU Stock #: BK:112995, WE:550808, RD:550761, BE:550762, GN:550766, YW:553856, OE:553855, BN:553854, GY:553857**
1/0	19	**SIM*pull* XHHW-2® CU Stock #: BK:113001, WE:553858, RD:553860, BE:553861, GN:553862, YW:553865, OE:553864, BN:553863, GY:553866**
2/0	19	**SIM*pull* XHHW-2® CU Stock #: BK:113019, WE:553870, RD:553871, BE:553872, GN:552070, YW:553876, OE:553874, BN:553873, GY:553877**
3/0	19	**SIM*pull* XHHW-2® CU Stock #: BK:113027, WE:553880, RD:553881, BE:553882, GN:553884, YW:553887, OE:553886, BN:553885, GY:553888**
4/0	19	**SIM*pull* XHHW-2® CU Stock #: BK:113035, WE:553077, RD:553078, BE:553079, GN:552071, YW:553083, OE:553082, BN:553080, GY:553084**
250	37	**SIM*pull* XHHW-2® CU Stock #: BK:113043, WE:553892, RD:553893, BE:553894, GN:553895, YW:553898, OE:553897, BN:553896, GY:553899**
300	37	**SIM*pull* XHHW-2® CU Stock #: BK:113050, YW:561131, OE:561130, BN:561129, GY:584039**
350	37	**SIM*pull* XHHW-2® CU Stock #: BK:113068, WE:553902, RD:553903, BE:553904, GN:553905, YW:553908, OE:553907, BN:553906, GY:553910**
400	37	**SIM*pull* XHHW-2® CU Stock #: BK:113076, WE:561132, RD:561701, BE:561702, GN:558666, YW:561113, OE:561112, BN:561111, GY:561703**
500	37	**SIM*pull* XHHW-2® CU Stock #: BK:113084, WE:553071, RD:550369, BE:550261, GN:553072, YW:550259, OE:550262, BN:550260, GY:553074**
600	61	**SIM*pull* XHHW-2® CU Stock #: BK:113092, WE:553913, RD:553914, BE:553915, GN:553916, YW:553920, OE:553919, BN:553918, GY:553921**
700	61	**SIM*pull* XHHW-2® CU Stock #: BK:586272**
750	61	**SIM*pull* XHHW-2® CU Stock #: BK:113100, WE:553926, RD:553927, BE:553930, GN:553929, YW:553932, OE:553931, BN:553930, GY:553934**
1000	61	**SIM*pull* XHHW-2® CU Stock #: BK:113134**

Color Abbreviations

BK-Black WE-White RD-Red BE-Blue GN-Green
YW-Yellow OE-Orange BN-Brown GY-Grey PE-Purple

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Attachment H.
Employee Training and Procedure Guidelines

From:	Vance Grube
Sent:	Friday, February 14, 2025 10:12 AM
To:	Margo Anderson
Subject:	UCS Training

Internal

Hi Margo,

As discussed, operators will receive the following training:

-Pass Panic (See attached)....This is currently being used in both UCS 1 and UCS 2.

📄 HSE-WI-224 Use of TPass Man Down Alarm.PDF

-Pallet Jack Operator Evaluation

📄 HSE-F-207 Pallet Jack Operator Evaluation.PDF

-Walked through all emergency exits
-Lights will stay on in the new UCS....(Current UCS has occupied buttons in order to activate the light systems)
-Operation of new doors
-Alarm Training

-Refrigeration equipment will be operated/maintained by maintenance.

	Approved
	Work Instruction

Document #:	HSE-WI-224 (8743)	Revision:	2
Originator:	Lamberty, Todd	Review Date:	Jul 18, 2026
Approved By:	Peterson, Todd	Effective Date:	Jul 18, 2023
QA Approved By:	Nepal, Kripa		
Location:	IFF : NUTRITION AND HEALTH : Madison : CULTURES, PROBIOTICS, FOOD PROTECTION, HMO & FIBERS		
Title:	**Use of TPass Man Down Alarm**		

All approvals are maintained in the Document Control System. Draft, archived, and obsolete revisions are not to be used. Refer to the Document Control System for the current controlled revision and approval records.

1.0   PURPOSE

This work instruction describes the use of the TPass "Man Down" alarms.

2.0   SCOPE

This work instruction applies to the TPass "Man Down" alarms used in the plant facility.
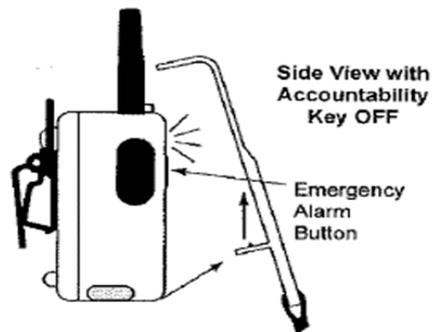
3.0   DEFINITIONS

3.1   EHS: Environmental Health and Safety
3.2   TPass: Name brand of safety alarm used at the site
3.3   UCS: Ultra Cold Storage

4.0   RESPONSIBILITIES

4.1   Operator is responsible for using the alarm as required by operating procedures and following the proper use listed in this work instruction.
4.2   Manager is responsible for ensuring compliance to all operating procedures and work instructions.
4.3   Quality Assurance is responsible for controlling and maintaining all documentation in compliance with the management system.
4.4   EHS Department is responsible for training emergency response team on response to the TPass alarms.

5.0   PROCEDURE

5.1   To turn on the alarm, remove the accountability key from the unit and it will automatically activate into sensing mode.

	Approved
![iff logo]	Work Instruction

Document #:	HSE-WI-224 (8743)	Revision:	2
Originator:	Lamberty, Todd	Review Date:	Jul 18, 2026
Approved By:	Peterson, Todd	Effective Date:	Jul 18, 2023
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Location:	IFF : NUTRITION AND HEALTH : Madison : CULTURES, PROBIOTICS, FOOD PROTECTION, HMO & FIBERS		
Title:	**Use of TPass Man Down Alarm**		

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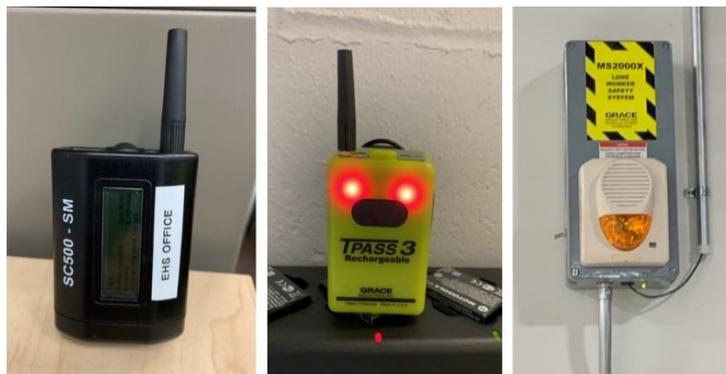
5.2 To turn off the alarm, replace the accountability key and then press both side buttons simultaneously. The TPass cannot be turned off unless both actions are done. If not turned off properly, the alarm will sound.

Press buttons on either side of unit.

Accountability Key in place

5.3 The TPass will alarm if the user pushes the emergency alarm button on the front of the unit. The TPass will also alarm if there is no motion detected. A pre-alarm sound will notify the user of no movement at approximately 45 seconds.

5.4 **Alarm indicators include:**
    5.4.1 A rapid pulsing of the two front LED's on the TPass and a loud audio alarm,
    5.4.2 The horn strobe on the strobe station outside of the Receiving and Culture Plant Supervisor Office.
    5.4.3 The audio alarm on the supervisor's and manager's black SC500 units,
    5.4.4 Notification by the security company who will call the plant on the overhead ring line.

	Approved
![iff logo]	Work Instruction

Document #:	HSE-WI-224 (8743)	Revision:	2
Originator:	Lamberty, Todd	Review Date:	Jul 18, 2026
Approved By:	Peterson, Todd	Effective Date:	Jul 18, 2023
QA Approved By:	Nepal, Kripa		
Location:	IFF : NUTRITION AND HEALTH : Madison : CULTURES, PROBIOTICS, FOOD PROTECTION, HMO & FIBERS		
Title:	**Use of TPass Man Down Alarm**		

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5.5 **Resetting the Alarm:** The alarm shall be reset after an event has been investigated and determined it is ok. To reset the alarm simultaneously press the side buttons on the alarming TPass unit. This will reset the TPass and the horn strobe station outside of the Receiving and Culture Plant Supervisor Office.

Push this button on either side to reset.

Simultaneously press the side buttons on the SC500 units.

	Approved
	Work Instruction

Document #:	HSE-WI-224 (8743)	Revision:	2
Originator:	Lamberty, Todd	Review Date:	Jul 18, 2026
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5.6 **TPass Assigned Area:** Each TPass is assigned an area; it is important to only use the TPass alarm for a designated area. When an alarm sounds, the area to which the TPass is assigned shows up on the supervisor's and manager's SC500 Units. This allows for a quicker and focused search for a potentially down coworker.

Area the TPass is assigned to shows up on screen when alarm occurs.

6.0 **REFERENCES**

None

7.0 **ASSOCIATED FORMS**

None

8.0 **ATTACHMENTS**

None

		Approved
	iff	Form
Document #:	HSE-F-207 (310)	Revision:	4
Originator:	Lamberty, Todd	Review Date:	Aug 24, 2026
Approved By:	Peterson, Todd	Effective Date:	Aug 24, 2023
QA Approved By:	Nepal, Kripa		
Location:	IFF : NUTRITION AND HEALTH : Madison : CULTURES, PROBIOTICS, FOOD PROTECTION, HMO & FIBERS		
Title:	**Pallet Jack Operator Evaluation**		

All approvals are maintained in the Document Control System. Draft, archived, and obsolete revisions are not to be used. Refer to the Document Control System for the current controlled revision and approval records.

Topics Covered:

Pre start safety inspection and filling out inspection log

Battery recharging

The location of truck's nameplate that shows the capacities, lift heights, and load center distances.

How to safely mount and dismount the truck, how to adjust the seat and use the seat belt on lift trucks with a seat.

How to start the truck and read any gauges or instruments after the truck is powered.

How to engage the forward/reverse gears and the operation of the service and emergency brake.

The operation of the steering mechanism.

How to adjust the width of the forks or how to operate any required attachments.

The operation of the lift/tilt/reach and drum hauler mechanisms

How to safely park the truck and shut off the machine.

Load stability, proper stacking and load manipulation

Narrow aisles and pedestrian traffic in the plant

Sloped surfaces in the plant that could affect the vehicle's stability.

Hazardous conditions in the plant that could affect safe operation (wet floors – need to slow down).[Insert Contents of Form]

Operation of drum clamp on drum-hauler.

Inspecting the clamping pads on the drum-hauler to ensure they are in good condition (tacky not slick)

Types of drum the drum-hauler can be used for (metal drums only)

Installing and using the small clamp adapter on the drum hauler for smaller drums

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Pallet Jack Operator Evaluation

Operator Name		Evaluator Name	
Date of Evaluation		Equipment Operated	

Operator Behaviors	Safe	At Risk	NA	Comments
Pre-use Inspection				
1. Follows the inspection checklist				
2. Looks for damage				
3. Documents all findings on checklist				
Picking Up a Load				
1. Square up on the center of the load.				
2. Move under the load as far as possible.				
3. Clear personnel from the area near the load				
4. Raise the load until it is high enough for good floor clearance but low enough for stability.				
5. Keep hands & feet away from pinch points				
6. On high lift machines, go slowly when carrying a load with forks raised				
7. On high lift machines move the machine out far enough so the load can clear the rack when the forks are lowered.				
8. The load is lifted to a height necessary for proper clearance				
Traveling				
1. Position for the best visibility, backward or forward				
2. Maintain safe speed.				
3. Observe all traffic rules, warning signs, floor load limits, and overhead clearances				
4. Face the direction of travel.				
5. Allow for wide swings around corners.				
6. Slow down when cornering.				
7. Use the horn to alert others at blind spots, corners and doors.				

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Operator Behaviors	Safe	At Risk	NA	Comments
8. Stop smoothly.				
9. Stop before raising or lowering the load				
10. On the drum hauler operator uses the turtle function appropriately in tight areas				
11. On the drum hauler operator should be on the downhill side when going up and down ramps				

Operator Behaviors	Safe	At Risk	NA	Comments
Putting Down a Load				
1. Steer the load into place with both hands on the controls				
2. After the load is in place, glance behind to make sure it is clear.				
3. Watch for clearance				
4. Carefully reverse direction				
Fueling and Battery Recharging				
1. Engine off.				
2. Fire extinguisher nearby.				
3. Proper personal protective Equipment				
4. Safe battery recharging procedures followed.				
Using the Drum-Hauler				
1. Opening the clamp on the drum hauler				
2. Centering the clamp on the middle of the drum				
3. Closing the clamp on the drum appropriately				
4. Operator verifies that the drum is clamped correctly				
5. Installing and using the small clamp adaptor				

☐ I have reviewed any at risk items with the operator and based on my evaluation, the operator **has successfully completed the evaluation** and is qualified to operate this equipment.

☐ Based on my evaluation the operator **has not demonstrated competencies** in operating this equipment.

Evaluator Signature   **Operator Signature**

_____   _____