

# Product Manual

## *Lorain County Passenger Rail Platforms & Pedestrian Bridge*



**Design Development Submittal**  
December 18, 2015



Presented to:  
**Lorain County  
Commissioners**

By:



**BOWEN**  
RICHARD L. BOWEN + ASSOCIATES INC.



**LORAIN COUNTY COMMISSIONERS**  
**PASSENGER RAIL PLATFORMS & PEDESTRIAN BRIDGE**

40 EAST AVENUE  
ELYRIA, OH 44035  
RLBA #8258.01

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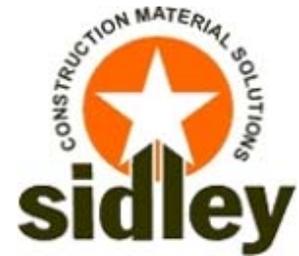
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# Sidley Precast Group

*One company for all your Precast needs*

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## Architectural Precast Concrete



### The Cleveland Clinic Foundation John Sherwin Research Building

Architect - Kaczmar Architects, Inc.  
Cleveland, OH

Contractor - The Krill Company, Inc.  
Valley View, OH

Owner - The Cleveland Clinic Foundation  
Cleveland, OH

Sidley Precast Group works directly with architects, engineers and owners to create a wide range of Architectural Precast products. With an extensive variety of aggregates, pigments and surface textures, all architectural components are custom produced to meet our customer's exact design requirements.

- Unmatched flexibility and design control of the final form.
- Limitless finish options.
- Sustainable building method that withstands the test of time.
- Sidley produces a high quality product by closely monitoring production.
- Proven economy from initial cost throughout the buildings life-cycle.



## Structural Precast Concrete



### Cleveland Browns Stadium

Architect - HOK Sports, Inc.  
Kansas City, MO

Contractor - Huber, Hunt & Nichols, Inc.  
Indianapolis, IN

Owner - City of Cleveland, OH

Sidley Precast offers a wide range of structural precast components including columns, double tees, hollowcore, I-beams, lite walls, raker beams, seat/risers, stairs/landing and vomitory walls. These components are utilized in many commercial building structures such as airports, arenas, office and industrial structures, parking garages, schools and stadiums.

- Provides **economical construction** by shortened construction periods.
- **Superior weathering**, resists corrosion, not effected by mold, termites or dry rot.
- **Low maintenance costs** over the structures entire life-cycle.
- **Withstands impact** and abuse.
- Sidley's **forty years of expertise** in the precast industry with our reputation built on honesty, integrity and quality workmanship.



## Total Precast System

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### Hinton Technology Center

Architect - DLH, PLLC.,  
Lewisburg, WV

Contractor - Swope Construction Company  
Bluefield, WV

Owner - City of Hinton, WV

Building Method - Total Precast System

Sidley Precast Group's Total Precast System combines the advantages of architectural and structural precast into one building method that is beneficial to owners, architects and contractors. The combination of architectural exterior walls with structural precast framing can produce an open, attractive, fire resistant and economical building solution. Considering all the benefits that a Total Precast System offers, is it any wonder why it is one of the most flexible solutions for building today.

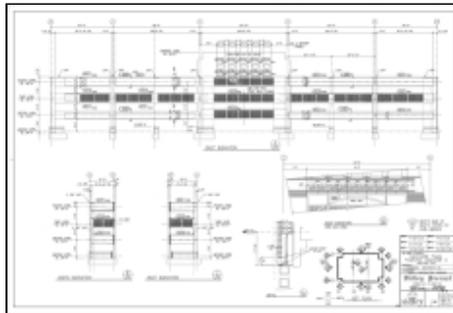
- Developers appreciate the increased speed to market allowing them to realize a **quicker ROI**.
- **Lower insurance costs** compared to other building systems
- Environmentally-friendly **Green Building** methods that help attain valuable LEED [Leadership in Energy & Environmental Design] points.
- **Large column free interior areas** permitting greater design flexibility in space planning.
- Naturally **fire resistant** structures.
- Thermal mass of Precast helps to **reduce daily temperature**

swings and reduces the demand on energy.

- Designers aesthetic vision can be fulfilled, since almost any architectural style imaginable can be expressed.



## Design & Engineering



### Crocker Park Parking Garages

Architect - Kaczmar Architects, Inc.  
Cleveland, OH

Contractor - The Albert M. Higley Co.  
Cleveland, OH

Owner - Stark Enterprises - Woodmere, OH

Contract Format - Design-Build

At Sidley Precast Group we take a team approach to design and work closely with our clients through the crucial design and engineering phase of projects. This permits us to assist our clients with critical decisions such as panel size, panelization of the structure, repetition of a piece to maximum economy, finish options, transportation considerations and erection issues.

- Benefit from Sidley's years of **Precast experience**.
- Architects need only provide us with their **intent for building loads**.
- Sidley's engineer will **design all connections**.
- **Design-build** contracts lend themselves to Precast construction.



## Transportation

**Buyers Products**



Contractor - Osborne Building Company  
Mentor, OH

Owner - Buyers Products - Mentor, OH

Transportation - R. W. Sidley, Inc.  
Madison, OH

At Sidley we have our own fleet of specialized tractor trailers for hauling Precast which gives us complete logistical control over the delivery schedule. Our dedicated fleet is time sensitive to the scheduling demands of Precast erection and understand that time is money.

- Transportation costs maintained under same contract.
- Dock on the Ohio River in Waverly, WV
  - 100 feet wide x 152 feet long and extends 31 feet above the river.
  - 1,200,000 pound capacity.
  - Permits large components to be shipped down the river.



## Erection



### West General Robinson Street Garage

Architect - Perfido Weikopf Wagstaff & Geottel/Walker Parking Consultants,  
Pittsburgh, PA

Contractor - Mascaro Construction Co., LP  
Pittsburgh, PA

Owner - Sports & Exhibitions Authority of  
Pittsburgh & Allegheny County  
Pittsburgh, PA

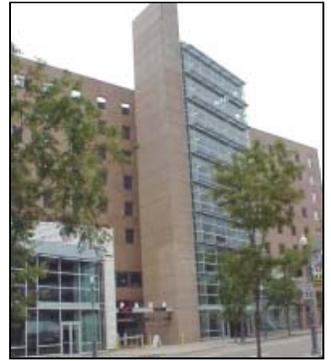


With single source responsibility all Precast work is maintained under one contract. Precast erections are completed by Sidley's PCI Certified Erection crews. All erectors are highly skilled and experienced in the erection of Precast concrete. At Sidley's we erect 95% of our own product. With Sidley, you have the peace of mind to know that a company with proven stability and longevity can engineer, produce and deliver product at a competitive price.

#### To contact us:

phone: 440.298.3232  
toll free: 800.536.3232  
fax: 440.951.1921  
info@sidleyprecast.com

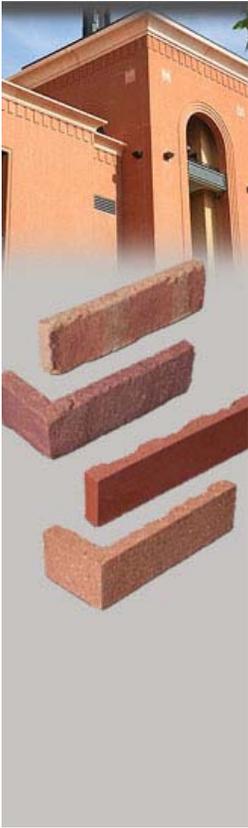
- **All weather erection** reduces overall construction schedule.
- Additional savings over traditional masonry which requires tenting and temporary heating in winter months.
- Faster enclosure means other trades can begin working sooner, and faster occupancy.
- Low noise levels.
- No onsite debris or waste.







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Home - Thin Brick

# Thin Brick

Add the classic beauty of genuine brick to your home without adding the weight, mess and cost of concrete footings. Thin brick can be applied to virtually any existing interior or exterior wall.

Thin brick is the perfect selection to enhance the interior or exterior of your home with applications such as brick siding, a brick fireplace or a kitchen backsplash.

Intended for long-term replacement of other siding materials and easy to install, it's clear to see why thin brick has become a popular choice for homeowners.

Available in 3/4" or 5/8" real brick tiles, thin brick are designed to replace tile, vinyl siding, wood or aluminum siding. We also offer pre-blended packaging to match face brick and thin brick together on the same project for various methods of installations or applications.

Belden Brick offers quality products for your projects and has been a trusted source for brick distributing with a solid reputation built on years of satisfaction. Contact Us to learn more about thin bricks and about how Belden Brick can help you with your next project and browse our available colors and dimensions.

WHITE CREAM GRAY TAN BUFF PINK RED BROWN BLACK

## COLOR CATALOG

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The Belden Brick

Company

PO Box 20910

Canton, Ohio 44701-0910

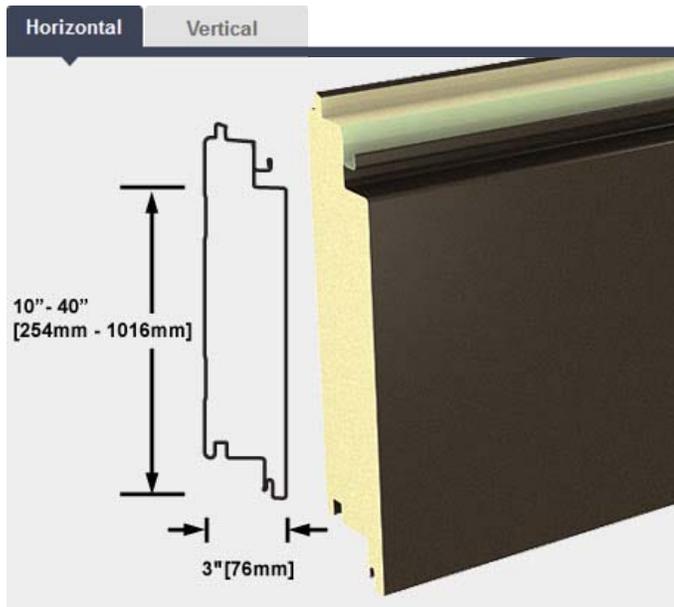
Phone: 330-451-2031

[Contact Us](#)





Belden Brick No. 9 Blend



**NOTE:** The documents below are in pdf format. To download the Word document, click [here](#) to login to the e-CENTRIA Portal

[Product Specifications](#)   [Load Span Tables](#)   [Green / Sustainability](#)

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[Tech Data Sheets](#)

[FWDS - Integrated Specification](#)

[FWDS - Integrated Specification - doc](#)

## Formawall Dimension Series 3"-T (76mm) Horizontal Flat

Formawall Dimension Series 3"-T Horizontal Flat panel provides outstanding aesthetics and value, along with maximum thermal performance and moisture control – all in a single component. The Formawall Dimension Series 3"-T Horizontal Flat panel is part of the [Smart-R Wall Solution](#).



### Features:

- **Substrate & Core:**
  - Standard – 22/26 gage G-90 galvanized steel face and liner with polyisocyanurate foam-insulated core
  - Optional gages available – consult CENTRIA
  - Optional stainless steel face sheet, 304 stainless steel, 22 or 20 gage, smooth, embossed or striated\*

\*Length restrictions apply, please consult CENTRIA

- **Joinery**
  - Horizontal oriented panel – Rainscreen, pressure-equalized and drainable joinery, 1/2" [13mm] nom. joint – standard
  - [Formawall IMV insulated metal vertical joint](#) 5/8" [16mm] joint – standard. Optional 1", 2" and 3" Reveal Width
- **Surface Finish**
  - Exterior
    - Non-directional embossed flat, striated or variable striated
    - Smooth flat, striated or variable striated
  - Interior
    - Non-directional embossed planked flat
    - Smooth planked
- **Coatings and Colors**
  - Fluorofinish advanced PVDF, metallic and mica color coatings in standard & custom colors
  - Allura - premium field-proven fluoropolymer coating featuring a matte, low-gloss finish with a subtle aggregate texture
  - Allusion - pre-finished metal print coating system that accurately simulates expensive natural finishes Duragard & Duragard Plus premium high build architectural coatings
  - Duracast<sup>®</sup> – a natural appearing textured finish
  - Versacor<sup>®</sup> Elite Premium Multi-Layered Coating System
  - Kolorshift<sup>™</sup> Iridescent Coating System
- **Panel Width:** 10" to 40" [254mm to 1016mm]
- **Panel Length**
  - Embossed striated – 1' [305mm] min. to 37' [11.28m] max.
  - Smooth or Embossed – 1' [305mm] min. to 37' [11.28m] max.
  - Duracast – 1' [305mm] min. to 28' [8.53m] max.
- **Panel Thickness/Depth of Reveal**
  - 3" [76mm] with 1-3/16" [30mm] deep reveal
- **"R" Value**
  - 3" [76mm] panel with 1/2" [13mm] reveal – R22

\*R-Values are based on ASTM C1363 Testing. Air films are included.  
Panel Weight – 3.25 lbs./sq.ft (22/26 ga.)

### Research Reports

- Fire Tests
  - UL Tunnel Test, Subject 723, ASTM E84

- Flame Spread 25 max
- Smoke Developed, 450 max.
- UL Room Corner Test, UL 1715
- Factory Mutual Approval: FM 4880; 50' High Large Scale Corner Test for Unlimited Height Approval for Walls and Ceilings
- SwRI: ASTM E108 Fire Test
- SwRI: Multistory Fire Test, UBC 26-4
- ASTM D2015; BTU Content Test
- ASTM D 1929; Ignition Properties
- UL Fire Wall Designs: 1 hr., 2 hr., 3 hr., U017, U617, U040, U645, U605

CENTRIA Formawall Dimension Series panels have been tested in accordance with requirements of the IBC Uniform Building Codes. Contact CENTRIA for more information.

Consult CENTRIA for test reports.

Patent No.: US 6,253,511; 6,627,128; 6,968,659; Canada 2,351,846

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### Snug Seam ■■

Snug Seam has evolved into the most highly regarded custom architectural panel system available today. Its precision construction and assembly allows architects and engineers true flexibility to design multiple panel configurations without compromising on weather tightness or performance.

Alply's patented 9/16" Snug Seam joint is dry-sealed and uses an extruded silicone gasket and vapor barrier, providing a double stop against air and water penetration. Gaskets are virtually indestructible and available in a full range of colors.

Explore size, shape, material, color and finish in three-dimensions! Alply's custom insulated metal panels are designed with innovation in mind. Employing advanced fabrication technologies, Alply invites architects' most original conceptualizations.

Make your design possibilities a reality with panels that are:

- Available in widths up to 60" wide and 20' long
- Flat in appearance with no reliance on embossing necessary
- Curved and angled to virtually any shape
- Dry jointed to eliminate the need for rod and caulk
- Offered in aluminum, steel and a variety of exotic metals such as copper
- Integrated with window systems as desired

Invented by Alply, the Snug Seam panel system uses specially designed aluminum extrusions that provide unsurpassed joint integrity and wonderfully consistent joint appearance. Panels can be curved and angled with almost unlimited possibilities, providing architects ultimate design flexibility. The dry gasket system allows for a faster, easier and cleaner installation. With Snug Seam panels, water cannot penetrate the joint, so the building stays dry.

Snug Seam panels are supplied with a coil-coated Kynar®\* finish. A full range of standard and custom colors are offered – providing uncompromised quality and color retention for the life of the building.

\*Kynar is a registered trademark of Arkema, Inc.



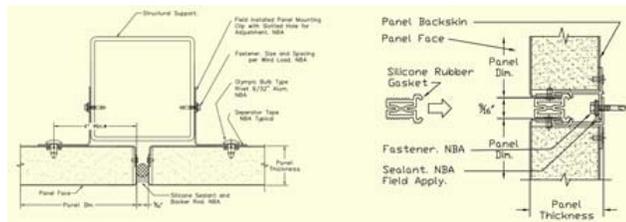
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#### ALPLY Model Specifications

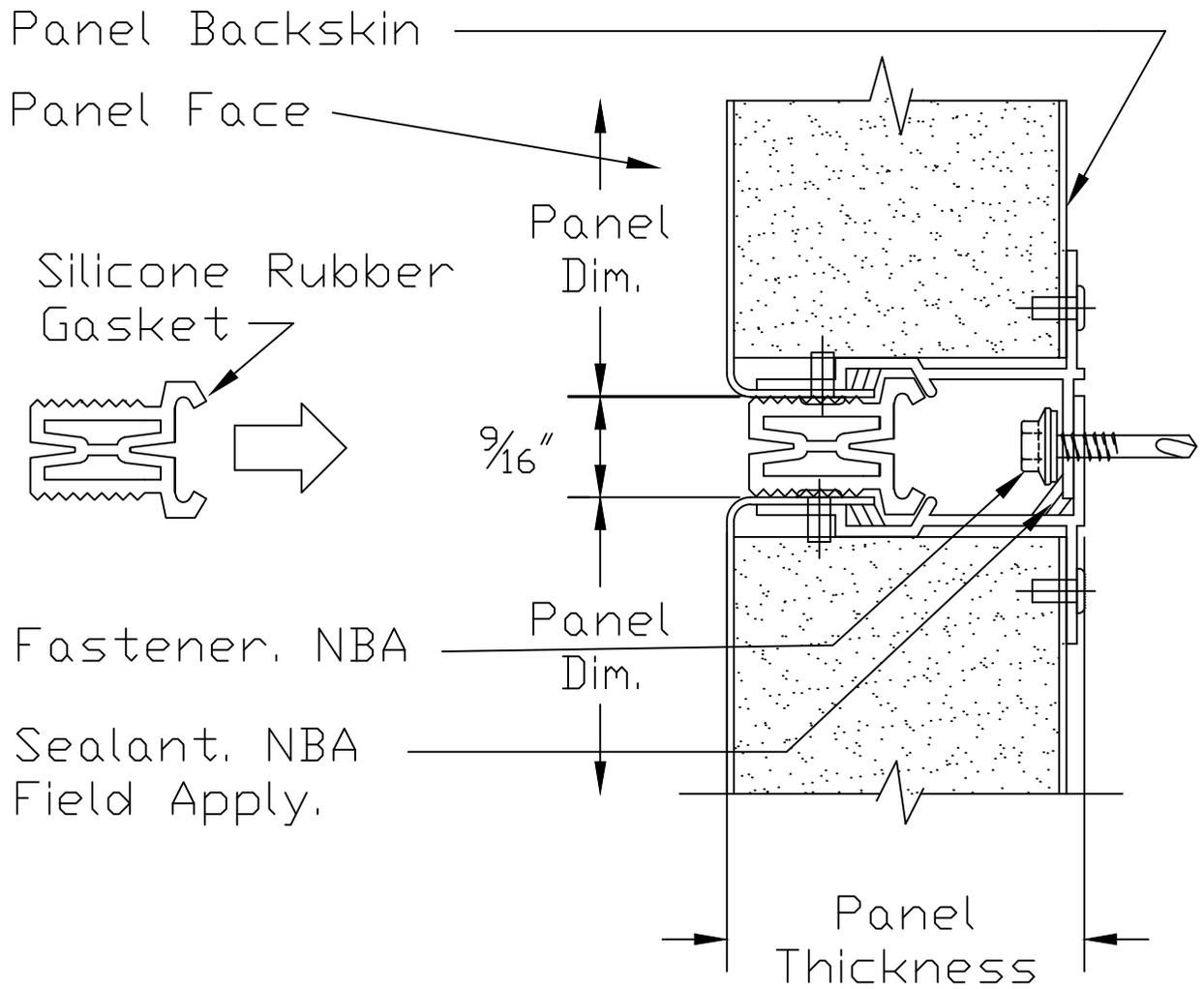
- Snug Seam
- Classic Wall
- Tech Wall 2000
- Tech Wall 2002
- CSI Data



[Gallery 4](#)



# Sketch 1



**Snug Seam horizontal joint with gasket**

# RubberGard™ MAX EPDM Roofing Systems

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## RubberGard™ MAX EPDM Roofing Systems

### For More Strength, Rely on MAX

RubberGard™ MAX (reinforced) EPDM membrane is an internally reinforced cured single-ply roofing membrane that is designed to combat roof tears and punctures and provides superior resistance to wind forces. Available in 45-, 60-, and 75-mil, if you are looking for added strength to what is already the longest lasting roofing system, RubberGard MAX is your choice!



### Features and Benefits

#### ■ Features

- Internally reinforced cured single-ply roof membrane.

#### ■ Benefits

- Combats roof tears and punctures.
- Provides superior strength against wind force.

### Applications

- Commercial
- Government
- Hospitals and Universities

## Complementary Products

▪ [Insulation](http://firestonebpc.com/roofing/insulation/) (<http://firestonebpc.com/roofing/insulation/>)

▪ [Accessories](http://firestonebpc.com/roofing/epdm-roofing-systems/quickseam-accessories/) (<http://firestonebpc.com/roofing/epdm-roofing-systems/quickseam-accessories/>)



- [Literature](#) (#literature)
- [SDS](#) (#sds)
- [TIS](#) (#tis)
- [Warranty](#) (#warranty)

### File Name

### Size

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RubberGard™ MAX EPDM Membrane – TIS 104

226  
kB

[http://firestonebpc.com/assets/2013/03/tis-104\\_rubbergard-epdm-max-120511-pdf.pdf](http://firestonebpc.com/assets/2013/03/tis-104_rubbergard-epdm-max-120511-pdf.pdf)

RubberGard™ MAX Fire Retardant (FR) EPDM Membrane – TIS 105

243  
kB

[http://firestonebpc.com/assets/2013/03/tis-105\\_rubbergard-epdm-max-fr.pdf](http://firestonebpc.com/assets/2013/03/tis-105_rubbergard-epdm-max-fr.pdf)

RubberGard™ MAX PT Pre-Applied Tape Panels – TIS 110

365  
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## Latest Information

[ESR-3422 Firestone Metal Roofing Panels](http://firestonebpc.com/assets/2014/05/esr-3422-firestone-metal-roofing-panels.pdf) (<http://firestonebpc.com/assets/2014/05/esr-3422-firestone-metal-roofing-panels.pdf>)

12/14/15

[Blue Ridge STRUCTODEK® HD High Density Wood Fiber Insulation – TIS 953](http://firestonebpc.com/assets/2014/11/tis-953-structodek-high-density-fiberboard-roof-insulation.pdf)

(<http://firestonebpc.com/assets/2014/11/tis-953-structodek-high-density-fiberboard-roof-insulation.pdf>)

12/14/15

[UltraPly TPO General Purpose Sealant SDS](http://firestonebpc.com/assets/2013/03/ultraply-tpo-general-purpose-sealant.pdf) (<http://firestonebpc.com/assets/2013/03/ultraply-tpo-general-purpose-sealant.pdf>)

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[AG RubberGard™ EPDM SA Application Guide](http://firestonebpc.com/assets/2015/04/rubbergard-epdm-sa-application-guide.pdf) (<http://firestonebpc.com/assets/2015/04/rubbergard-epdm-sa-application-guide.pdf>)

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[ISO 95+™ GL Insulation – TIS 901](http://firestonebpc.com/assets/2013/03/901-iso95-gl-flat-tapered.pdf) (<http://firestonebpc.com/assets/2013/03/901-iso95-gl-flat-tapered.pdf>)

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## RubberGard™ Max FR (Fire Retardant) EPDM Membrane

### Product Information

#### Description:

Firestone RubberGard MAX FR EPDM is a cured single-ply roofing membrane that features 9 x 9, 1,000 denier polyester weft inserted scrim reinforcement for increased puncture resistance.

#### Preparation of Substrate:

1. Substrates must be clean, dry, smooth, and free of sharp edges, fins, loose or foreign materials, oil, grease, and other materials that may damage the membrane.
2. All roughened surfaces that can damage the membrane shall be repaired as specified to offer a smooth substrate.
3. All surface voids greater than 1/4" (6.3 mm) wide shall be properly filled with an acceptable fill material.

#### Method of Application:

RubberGard MAX FR EPDM Membrane must be installed in accordance with current RubberGard specifications, details and workmanship requirements.

#### Storage:

- Store away from sources of punctures and physical damage.
- Assure that structural decking will support the loads incurred by material when stored on rooftop. The deck load limitations should be specified by the project designer.
- Store away from ignition sources as membrane will burn when exposed to open flame.

#### Precautions:

- Take care when moving, transporting, handling, etc. to avoid sources of punctures and physical damage.
- Assure that structural decking will support the loads incurred by material when stored on rooftop. The deck load limitations should be specified by the project designer.
- Isolate waste products, such as petroleum products, greases, oils (mineral and vegetable) and animal fats from the RubberGard membrane.
- Refer to Safety Data Sheets (SDS) for safety information.

#### LEED® Information:

Post Consumer Recycled Content: 0%  
Post Industrial Recycled Content: 0%  
Manufacturing Location: Prescott, AR



## RubberGard™ Max FR (Fire Retardant) EPDM Membrane

### Typical Properties

Property	ASTM Standard	Units	Performance Minimum	Typical Values- 45 mil	Typical Values- 60 mil
Thickness, minimum Sheet-overall	D751	In. (mm)	0.0405 (1.016) 0.0504 (1.372)	0.043 (1.092)	0.059 (1.499)
Coating over Scrim	D751	In. (mm)	0.015 (0.381)	0.015 (0.381)	0.022 (1005)
Breaking Strength, minimum	D751 Grab Method	Lbf(N)	90 (400)	240 (1068)	226 (1005)
Elongation, Ultimate, minimum	D412 Die C	%	250 <sup>a</sup>	400 <sup>a</sup>	-
Tensile Strength, minimum	D751 Tongue Tear	Lbf(N)	10 (45)	60 (267)	79 (351)
Brittleness Point, maximum	D2137	° F (° C)	-49 (-45)	-65 (-54)	-49 (-45)
Ozone Resistance, no cracks	D1149	-	-	Pass	Pass
Heat Aging: Breaking Strength, minimum Elongation, ultimate, minimum Linear Dimensional change, maximum	D573 D751 Grab Method D412 Die C D1204	- Lbf(N) % %	- 80(356) 200 <sup>a</sup> ±1.0	- 275 (1223) 300 <sup>a</sup> -0.7	- 284 (1263) - -.37
Water Absorption, maximum, mass %	D471	%	+8,-2 <sup>a</sup>	+1.8 <sup>a</sup>	+2.64 <sup>a</sup>
Weather Resistance: Visual Inspection	D518	-	Pass	Pass	Pass

<sup>a</sup> Specimens to be prepared from coating rubber compound, vulcanized in a similar method to the reinforced products.

RubberGard MAX FR EPDM membrane meets or exceeds the minimum requirements set forth by ASTM D 4637 for Type II scrim-reinforced EPDM single-ply roofing membranes.

### Packaging

Property	Widths <sup>1</sup>	Lengths	Weights
.045" MAX FR	10' (3 m)	100' (30.5 m)	0.32 lb/sf (1.5 kg/m <sup>2</sup> )
.060" MAX FR	10' (3 m)	100' (30.5 m)	0.42 lb/sf (2.1 kg/m <sup>2</sup> )

<sup>1</sup>Available sizes vary by product. Contact your Firestone Customer Service Representative for availability and packaging information.



Please contact your Firestone Building Systems Advisor at 1-800-428-4511 for further information.

*This sheet is meant to highlight Firestone products and specifications and is subject to change without notice. Firestone takes responsibility for furnishing quality materials which meet published Firestone product specifications. Neither Firestone nor its representatives practice architecture. Firestone offers no opinion on and expressly disclaims any responsibility for the soundness of any structure. Firestone accepts no liability for structural failure or resultant damages. Consult a competent structural engineer prior to installation if the structural soundness or structural ability to properly support a planned installation is in question. No Firestone representative is authorized to vary this disclaimer.*

## General Installation Instructions for Pipe-Style Snow Guard Accessories

All of our pipe-style snow guard accessories fit all of our pipe snow guards for through fastened or clamp to seam applications. Ice Flags and Ice Screen must be installed on a system with at least two pipes. Accessories are available in aluminum or brass, the aluminum accessories can be powder coated. Internal couplings are not painted or powder coated. Ice Screen is available in stainless steel only.

### End Collars (PP65)

The purpose of the End Collar is to keep the pipes from sliding through the snow guard brackets. An End Collar is required for each end of each pipe on each run of snow guards. A run should not exceed 100' to allow for heat expansion. See installation details below for required End Collar placement.

1. If using on a system with **PP84 External Coupling**: End Collars (PP65) should be placed over the end of each run of pipe, on the inside of the outermost brackets (Figure 1). As the last pipe in the run is installed, the End Collar should be installed. The End Collars should be installed 1/2" from the brackets.

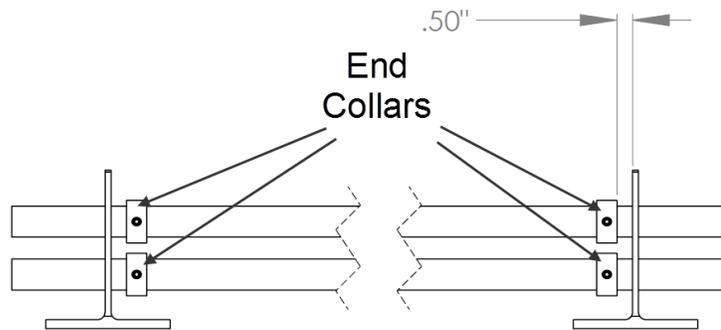


Fig. 1

Note: on some three-pipe or hi-hole systems using the **PP84 External Coupling**, it may be necessary to place one End Collar further inside the other End Collars (Figure 2)

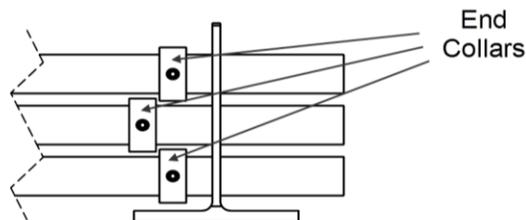


Fig. 2



- If using on a system with **PP86 Internal Coupling**: End Collars (PP65) should be placed over each end of each run of pipe (Figure 3). Place the End Collar over the pipe and tighten the set screw until it no longer slides. The End Collar should be within 1" of the snow guard bracket, spacing is 1/8" for every 10' of pipe. For example, if the run of snow guards is 80' then the End Collar should be 1" outside the bracket.

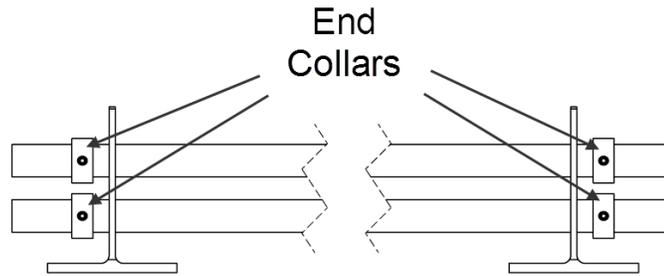


Fig. 3

Note: on some three-pipe or hi-hole systems using the **PP86 Internal Coupling**, it may be necessary to place one End Collar inside the bracket and the others outside (Figure 4)

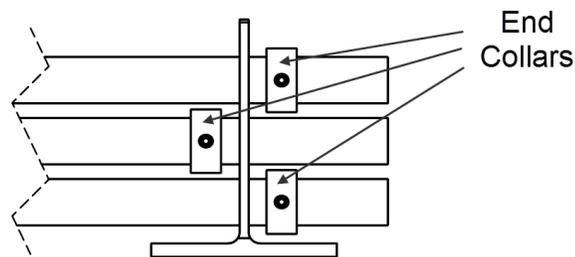


Fig. 4

## End Caps (PP56)

End Caps keep moisture and insects from getting inside of the pipes.

- Install the End Cap by pressing it into the end of the pipe (Figure 5).

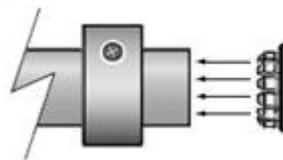


Fig. 5





## Ice Flags (PP95)

Ice Flags hang from the pipe between the brackets to help keep ice and snow from sliding underneath (Figure 4). **Note: Ice Flags should not touch the roof surface.**

1. The Ice Flags should be placed over the top pipe in two-pipe or three-pipe systems. The long leg rests against the uphill side of the pipes. Use the bolt and nut to hold the flag in position. Silicone or adhesive may be applied (optional) between the Ice Flag and the pipe to keep the flag from sliding. See illustrations on the following pages for placement.

a. The Ice Flag for the model ASG3000 sits between the pipes (Figure 6).

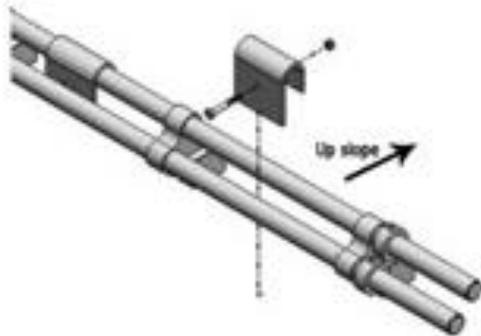


Fig. 6: ASG3000

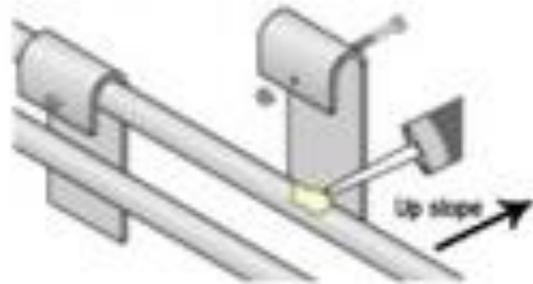


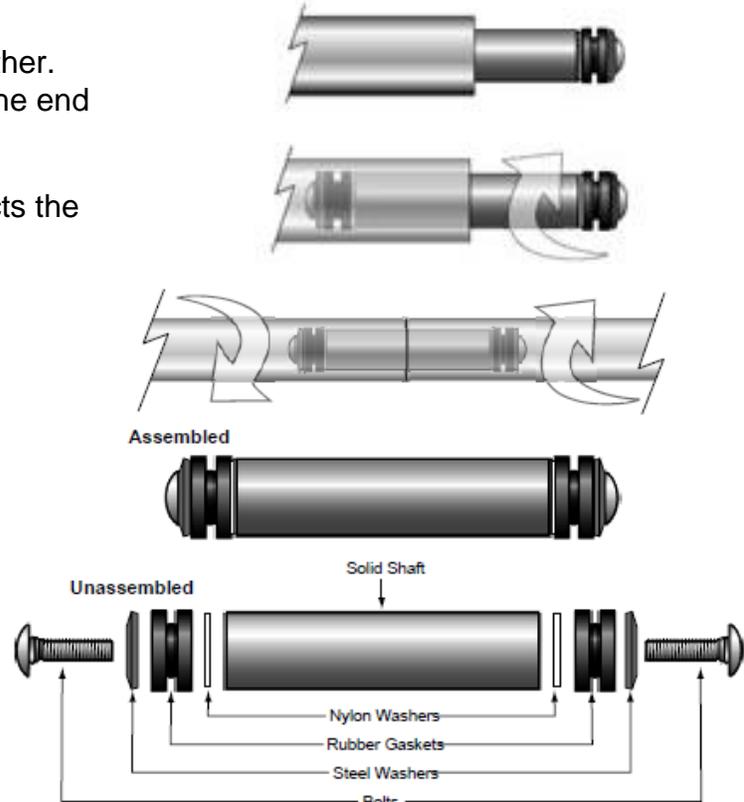
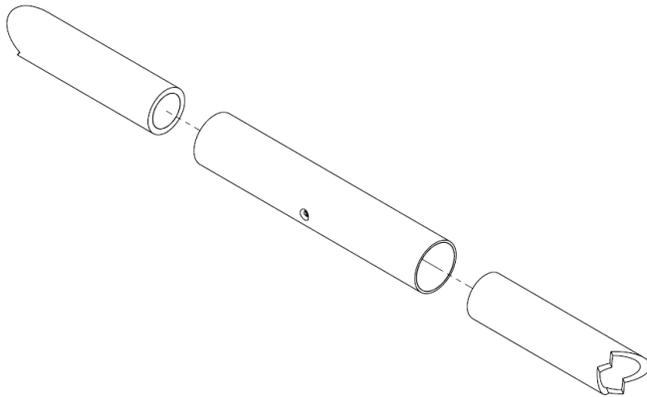
Fig. 7: All other models



### External Coupling

The External Couplings are used to join pipes together.

1. Install pipe and slide external coupling over the end until the pipe end contacts the dimple.
2. Install the next pipe, sliding it in until it contacts the dimple.



### Internal Coupling (PP86)

The Internal Couplings are used to join pipes together.

1. Insert assembled coupling into the end of one pipe so that half of the solid aluminum shaft is inserted
2. Begin twisting the exposed half of the coupling in a clockwise motion until the rubber gasket engages the pipe. Continue to tighten until the coupling cannot be easily pulled out of the pipe.
3. Slide the next section of pipe over the exposed half of the coupling. Twist the tube in a clockwise motion until the rubber gasket engages the pipe. Continue tightening until the tubing cannot be easily pulled apart.
4. If the system needs to be unassembled, simply turn the pipe counter-clockwise until the pipes can be pulled apart.

Internal Couplings come assembled and ready for installation. If they come apart or loosened during shipment assemble per the detail. **Do Not Over-Tighten** prior to inserting the coupling into the PP75 pipe. Over tightening the bolt will cause the gasket to expand and make installation of the coupling difficult.

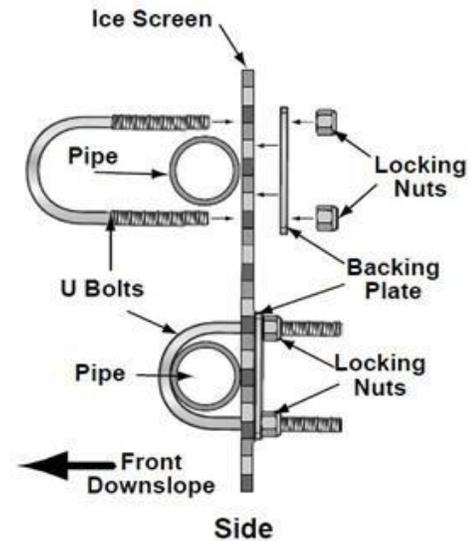




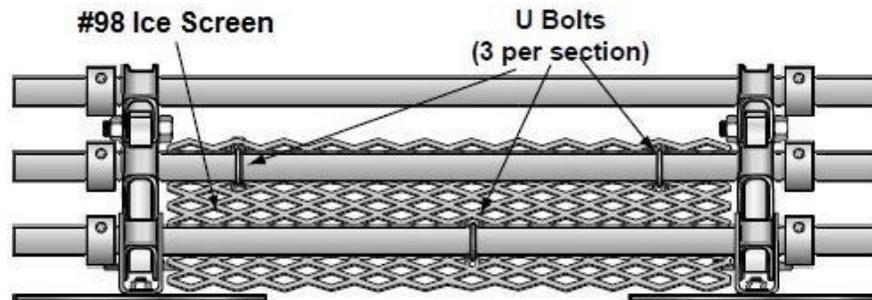
### Ice Screen (PP98)

Ice Screen comes in 4' lengths, 5" high; for most installations it will need to be cut to size to fit between the snow guard brackets.

1. Place the Ice Screen behind (upslope) the installed pipes.
2. Place a U-bolt on the pipe and fit it through the openings in the Ice Screen.
3. Place the backing plate behind the Ice Screen and insert the ends of the U-bolt through the slotted openings.
4. Tighten the supplied locking nuts.

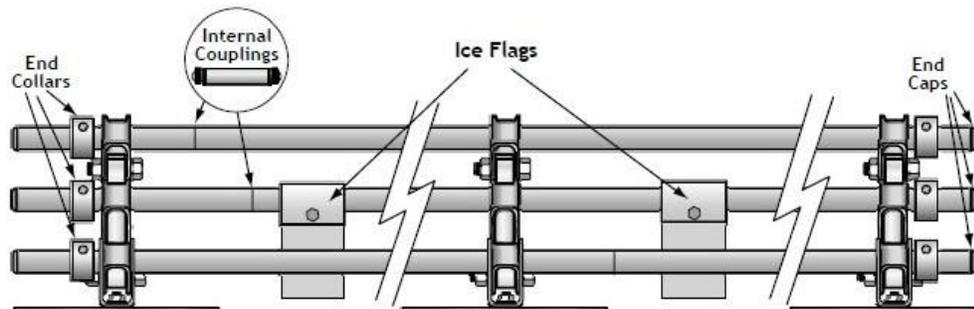


Each length of Ice Screen includes 3 U-bolts, 3 slotted back plates and 6 locking nuts. Ice screen should be attached behind the bottom two pipes in a three-pipe installation or on both pipes of a two-pipe installation.



### Typical Installation

The illustration below shows the PP225 with End Caps, End Collars, Internal Couplings & Ice Flags installed. For fixed three-pipe brackets (PP115, PP117, PP145, PP314, PP315, PP325) the Ice Flag should be installed on the top pipe. For adjustable three-pipe brackets (PP215, PP225, PP235, PP503), the Ice Flag should be installed on the middle pipe. For all two-pipe snow guards the Ice Flag is installed on the top pipe.

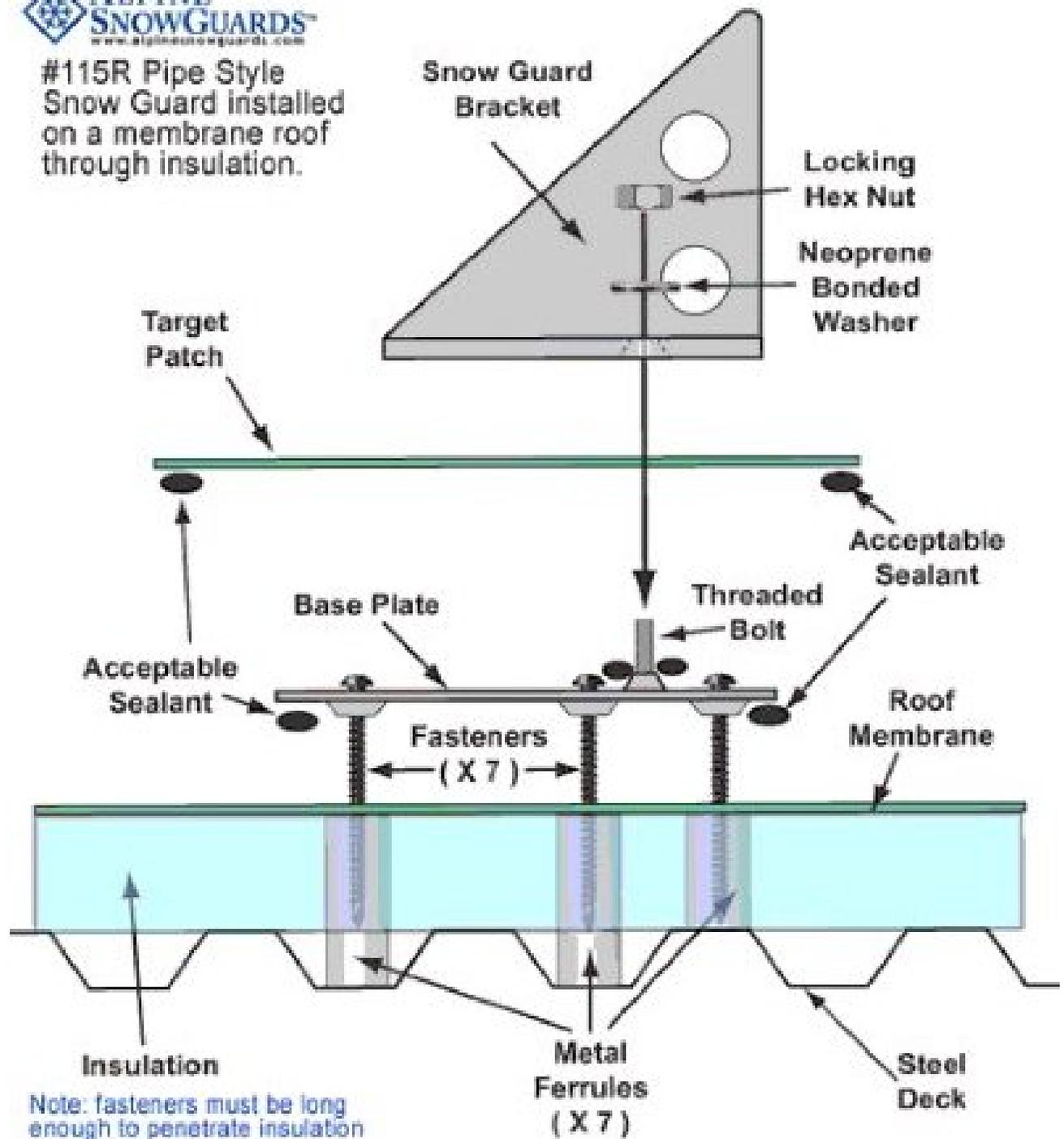


Document version 04.29.2015





#115R Pipe Style  
Snow Guard installed  
on a membrane roof  
through insulation.



## Composite

CURRIES offers a complete line of composite type hollow metal doors in face sheet gauges ranging from 20 to 14. All CURRIES 607 and 707 Series doors are insulated as standard with fully bonded, durable polystyrene (optional polyurethane) cores. The 727 Series Temperature Rise doors offer the maximum in fire and life safety as they feature either 250°F (121°C) or 450°F (232°C) ratings. Fire ratings are available from 20 minutes through 3 hours. CURRIES composite type doors have been tested to out-perform all test criteria available for physical endurance. The combined durability and economy of these doors make them a popular choice for a variety of uses.



### 607 Series

- Insulated Polystyrene Core
- 1-3/4 Inches Thick
- 18 Gauge Top & Bottom Channels
- 20 or 18 Gauge Face Skins
- Available sizes from 2068 to 4070
- Fire Rated up to 3 Hours
- Rugged Perimeter Channel Construction

### 707 Series

- Available with Embossed Panels
- Insulated Polystyrene Core (optional Polyurethane Core)
- 1-3/8 or 1-3/4 Inches Thick
- Polystyrene R-Factor - 6.37
- Polyurethane R-Factor - 10.04
- 16 Gauge Top & Bottom Channels
- 20, 18, 16 or 14 Gauge Face Skins
- Fire Rated up to 3 Hours
- Rugged Perimeter Channel Construction
- Sizes from 2068 to 50100
- Versatile and Dependable

### 727 Series

- Temperature Rise Rated (250 degrees)
- Insulated
- 1-3/4 Inches Thick
- 12 Gauge Top Channel
- 16 Gauge Bottom Channel
- Mineral Fire Door Core
- 18 or 16 Gauge Face Skins
- Fire Rated up to 3 Hours
- Sizes from 2068 to 4080
- Rugged Perimeter Channel Construction

### 737 Series

- Bullet Resistant Level 2
- Insulated
- 1-7/8 Inches Thick
- 16 Gauge Top & Bottom Channels
- Polystyrene Core
- 16 or 14 Gauge Bullet Resistant Plated Face Skin
- Fire Rated up to 3 Hours
- Sizes up to 40100 Max
- Rugged Perimeter Channel Construction

## 747 Series

- Steel Stiffened
- 16 Gauge Top & Bottom Channels
- 1-3/4 Inches Thick
- 22 Gauge Stiffeners (20, 18, 16, 14 gauge optional)
- Fiberglass Insulation between Stiffeners
- 18, 16 or 14 Gauge Face Skins
- 6" Stiffener Spacing
- Fire Rated up to 3 Hours
- Sizes from 2068 to 50100
- Rugged Perimeter Channel Construction

## 757 Series

- STC 38, 41, 41 for pairs, 43 & 46 Rated - Steel Stiffened Core
- STC 32 - Honeycomb Core
- 1-3/4 Inches Thick
- 16 Gauge Top & Bottom Channels
- Fiberglass Insulated between Stiffeners
- 6" Stiffener Spacing
- 14 or 16 Gauge Face Skins
- Fire Rated up to 90 Minutes
- Sizes from 2068 to 4080

## 777 (Trio) and 777E (Trio-E) Series

- Steel Stiffened Laminated Core
- Standard Fiberglass Insulation (777)
- Standard Polyurethane Insulation (777E)
- 16 Gauge Top & Bottom Channels
- 1-3/4 Inches Thick
- 22 Gauge Stiffeners
- 18, 16 or 14 Gauge Face Skins
- 5" Stiffener Spacing
- Fire Rated up to 3 Hours
- Sizes from 2068 to 4080
- Interlock Seam Construction

## 847 Series

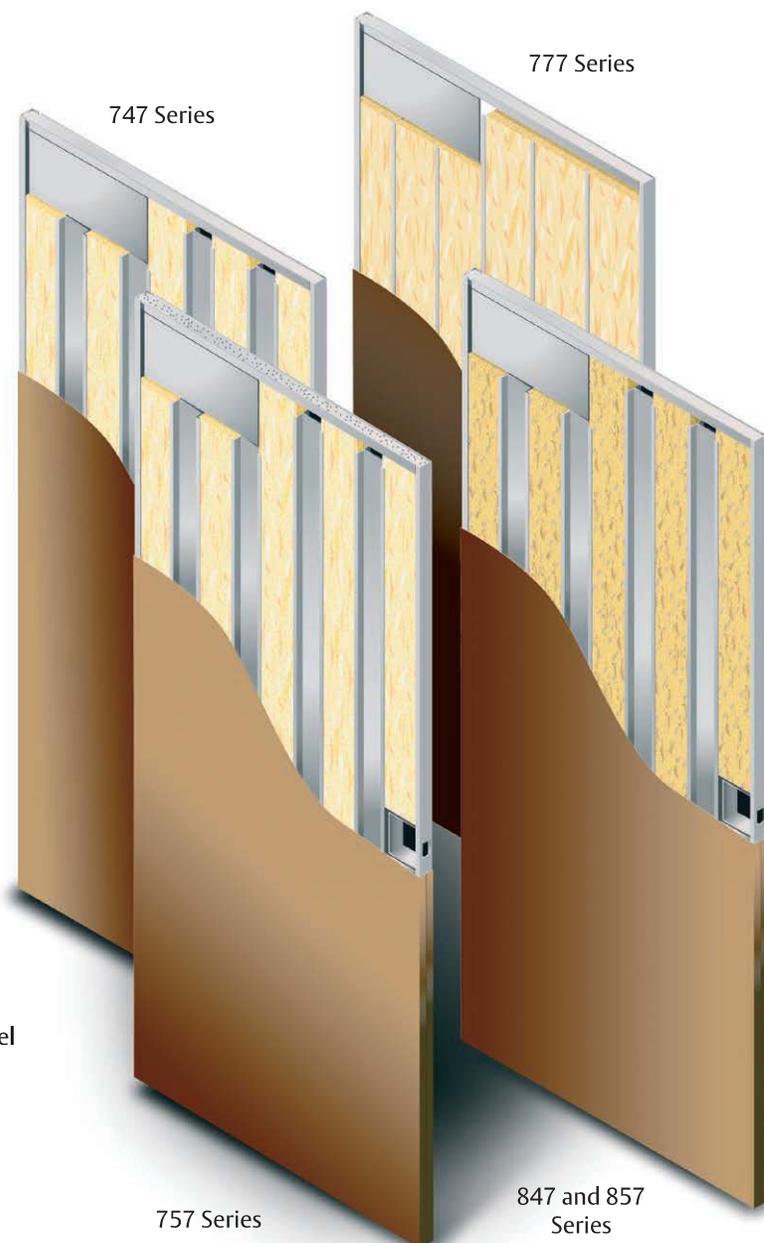
- Meets Commercial Security Specifications
- Steel Stiffened Core
- 1-3/4 Inches Thick
- 18 Gauge stiffeners (16 gauge optional)
- 16 Gauge Top & Bottom Channels
- Fiberglass Insulated Between Stiffeners
- 4" Stiffener Spacing
- 14 Gauge Face Skins
- Fire Rated up to 3 Hours
- Sizes from 2068 to 50100
- Rugged Perimeter Channel Construction

## 857 Series

- Meets Commercial Security Specifications
- 2 Inches Thick
- 18 Gauge stiffeners (16 gauge optional)
- Steel Stiffened Core
- 14 Gauge / Plus Flush Prep or 16 Gauge Top Channel
- 14 Gauge Bottom Channel
- Fiberglass Insulated Between Stiffeners
- 4" Stiffener Spacing
- 14 Gauge Face Skins
- Fire Rated up to 3 Hours
- Sizes from 2068 to 4080
- Rugged Perimeter Channel Construction

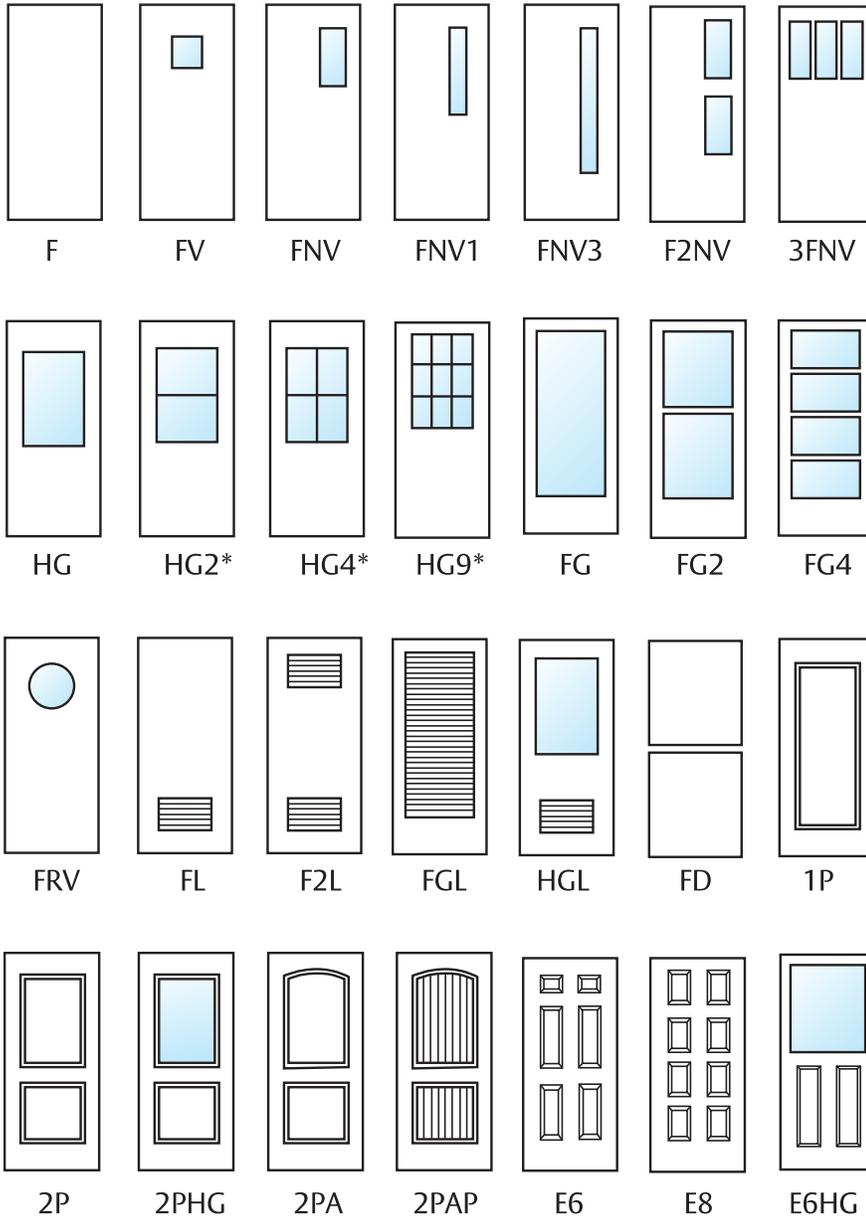
## Steel Stiffened

CURRIES steel stiffened doors are designed with the combination of perimeter steel channels and core stiffeners to offer the industry's largest selection and most reliable and durable construction. They are used in areas where optimum security and susceptibility to vandalism or break-in are of paramount concern. Face sheets are available in gauges from 18 to 14, with door thicknesses of both 1-3/4" (44) and 2" (51). CURRIES 747, 757, 777 (Trio), 777E (Trio-E), 847, and 857 Series doors offer a range of products suited for commercial security uses. Trio and Trio-E, the latest innovations from CURRIES, is a fusion of composite and steel stiffened core to create a new patent pending laminated core. 777 (Trio) contains all of the aesthetic and insulating benefits of a CURRIES composite core door but with the added strength of being steel stiffened. 777E (Trio-E) is a new patent pending door design that delivers superior insulated values and strength plus, provides aesthetic qualities desired in today's commercial building applications. The "E" is for energy efficiency and Trio-E has the lowest U-Factor (0.29) for a steel stiffened door in the market today.



# Door Details

## Door Selection Faces



\*1/4" (6) glass only.



2PA



2PAP



## Masonry Flush Frames

CURRIES offers a complete line of flush frames that are available in 18, 16, 14, and 12 gauge cold-rolled or galvanized steel and also in 16 or 14 gauge stainless steel. Frames can be knocked down or welded at the miters and ground smooth. The 12 gauge frames are saw miter welded or butt end welded corner construction only. They are available for either 1-3/8" (35) or 1-3/4" (44) thick doors. CURRIES frames are manufactured for all wall conditions such as masonry, steel stud, wood stud, and poured concrete.

## Frame Face Variables

- CURRIES offers pre-engineered, knock-down (KD) flush frames with face dimensions of 1" (25) through 4" (102) in 1/8" (3) increments
- Frame return variables from 7/16" (11) through 1" (25)
- Non-door rabbet variables from 5/8" (16) through 6" (152)
- Standard and non-standard frame sizes are available to match door sizes in any combination of singles or pairs

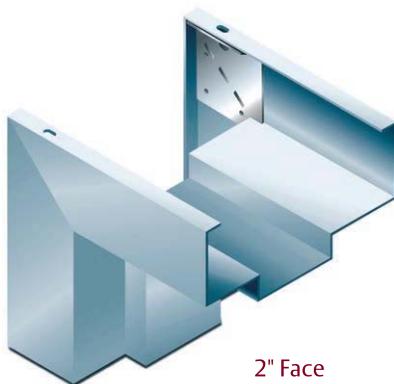
## Overview

### Specifications

The frames are manufactured by CURRIES in Mason City, Iowa. They need to be M Series and fabricated of either cold-rolled or galvanized steel (as specified) in 18, 16, or 14 gauge.

The joints need to be die-mitered with integral tabs for reinforcement and interlocking of the jambs to the head. The 12 gauge frames are saw miter or butt end corner construction and shall be welded. Frames shall be thoroughly cleaned and receive an iron phosphate treatment prior to receiving one coat of baked-on prime paint. Frames are to be reinforced only for surface mounted hardware, and the drilling and tapping to be done by others in the field. Metal plaster guards are to be provided for all mortise cutouts. Minimum requirements for hardware reinforcements are to be as follows:

Hinge Reinforcing-7 gauge  
Lock Strike Reinforcing-14 gauge and conforming to template requirements  
Closer reinforcing-14 gauge





## Drywall Frames

CURRIES Drywall frames are available in 18, 16, or 14 gauge cold-rolled steel or galvanized steel. The frames are constructed with a rigid corner providing clean, sharp lines along with fine miter lines on all joints. They are designed to go into an opening after the wall is in place, accommodating virtually any wall thickness. Frames receive a factory baked-on coat of rust inhibitive primer but are also available with factory baked-on enamel. The color match is available upon request. The frames can be used in drywall construction using steel studs, wood studs, or laminated boards. Frames are available for either 1-3/8" (35) or 1-3/4" (44) thick doors with a 2" (51) face.

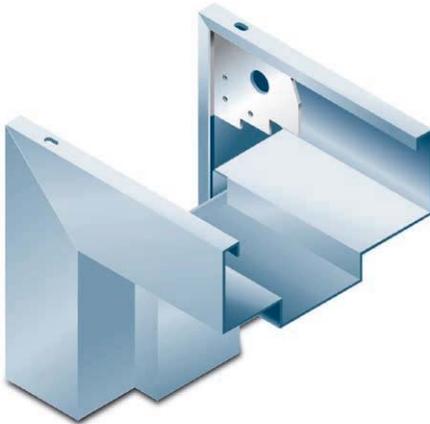
- Narrow Face Frames: CURRIES offers pre-engineered, knock-down (KD) drywall frames with face dimensions of 1-1/2" (38) or 1-3/4" (44).
- Frame sizes are available to match door sizes in any combination of singles or pairs. Non-standard width or height frames are available on special order. Double-rabbit profiles are available with 4" (102) face heads.

## C Series Drywall Frames

### Specifications

The frames are manufactured by CURRIES in Mason City, Iowa. The frames shall be C Series and fabricated of either cold rolled or galvanized steel (as specified) in 18, 16, or 14 gauge. Frames shall be knockdown and double return back bend (to prevent cutting into the wall), flush hairline seam miter at the corner of the head and the jamb, and the corner reinforced with a concealed clip. Each jamb is to have one compression anchor to securely hold the frame between the studs and also maintain proper alignment. Frames shall be thoroughly cleaned and receive an iron phosphate treatment prior to receiving one coat of baked-on prime paint. Frames are to be reinforced only for surface mounted hardware, with drilling and tapping to be done by others in the field. Minimum requirements for hardware reinforcements are to be follows:

Hinge Reinforcing-7 gauge  
Lock Strike Reinforcing-14 gauge, conforming to template requirements  
Closer reinforcing-14 gauge.



## CM Series Frames

### Specifications

The frames are manufactured by CURRIES in Mason City, Iowa. The frames shall be CM Series and fabricated of either cold rolled or galvanized steel (as specified) in either 18, 16, or 14 gauge. Frames shall be welded corner construction and double return back bend (to prevent cutting into the wallboard). Frames are available with standard anchors and no compression anchor. Frames shall be thoroughly cleaned and receive an iron phosphate treatment prior to receiving one coat of baked-on prime paint. Frames are to be reinforced only for surface mounted hardware, with drilling and tapping to be done by others in the field. Metal plaster guards are to be provided for all mortise cutouts. Minimum requirements for hardware reinforcements are to be as follows:

Hinge Reinforcing-7 gauge  
Lock Strike Reinforcing-14 gauge, conforming to template requirements  
Closer reinforcing-14 gauge.



Home &gt; Products &amp; Solutions &gt; 2508C Series Captured Curtain Wall System

## 2508C Series Captured Curtain Wall System

Curtain Wall

Frame Depth (inches)

**Description** 8¼" depth captured curtain wall**Applications**

Commercial

Air Infiltration (cfm/ft2)	Water Resistance (psf)	Design Pressure Positive (psf)	Uniform Load Structural (psf)	U-Value
0.01	15	60	90	0.49
CRF				
72				



### Standard Features

- Outside glazed, captured curtain wall systems
- Split male-female mullion which allows factory assembly and sealing to reduce cost and improve quality control
- 1/4" glazing gaskets with 3/8" thick thermal insulator
- Accommodates 1/4" to 1 1/8" infill material depending on model
- Infill material secured by screw applied pressure plate
- Snap-on cover conceals pressure plate screws and allows dual colors
- Engineering assistance with custom applications
- Superior craftsmanship and exceptional technical expertise

## Technical Data

### Product Literature

[2508C Series Catalog](#)

### Additional Resources

[2508C All CAD Drawings - ZIP File](#)

### CAD Files

Description	AutoCAD	PDF
Product Description	2508C Product Description.dwg	2508C Product Description.pdf
Typical Elevation	2508C Typical Elevation.dwg	2508C Typical Elevation.pdf
Detail A	2508C-1.dwg	2508C-1.pdf
Detail B	2508C-2.dwg	2508C-2.pdf
Detail C	2508C-3.dwg	2508C-3.pdf
Detail D	2508C-4.dwg	2508C-4.pdf
Detail E	2508C-5.dwg	2508C-5.pdf

## 2508S Series Structurally Glazed Curtain Wall System

Curtain Wall

**Frame Depth (inches)**
**Description** 8¼" depth structurally glazed curtain wall

**Applications**

Commercial

Air Infiltration (cfm/ft2)	Water Resistance (psf)	Design Pressure Positive (psf)	Uniform Load Structural (psf)	U-Value
0.01	15	60	90	0.39
CRF				
72				



### Standard Features

- Outside glazed with vertical structural, butt glazed joints
- Glass secured to vertical with 1/4" x 1/2" structural silicone seal
- Split male-female mullion which allows factory assembled and sealing to reduce cost and improve quality control
- 1/4" glazing gaskets with 3/8" thick thermal insulator at the horizontals
- Accommodates 1/4" to 1 1/8" infill material depending on model
- Infill material secured at the horizontals by screw applied pressure plate
- Snap-on covers at horizontals conceal pressure plate screws and allows dual colors
- Engineering assistance with custom applications
- Superior craftsmanship and exceptional technical expertise

## Technical Data

### Product Literature

[2508S Series Catalog](#)

### Additional Resources

[2508S All CAD Drawings - ZIP File](#)

### CAD Files

Description	AutoCAD	PDF
Product Description	2508S Product Description.dwg	2508S Product Description.pdf
Typical Elevation	2508S Typical Elevation.dwg	2508S Typical Elevation.pdf
Detail A	2510C-1.dwg	2510C-1.pdf
Detail B	2510C-2.dwg	2510C-2.pdf
Detail C	2510C-3.dwg	2510C-3.pdf
Detail D	2510C-4.dwg	2510C-4.pdf
Detail G	2510C-5.dwg	2510C-5.pdf
Detail K	2510C-6.dwg	2510C-6.pdf



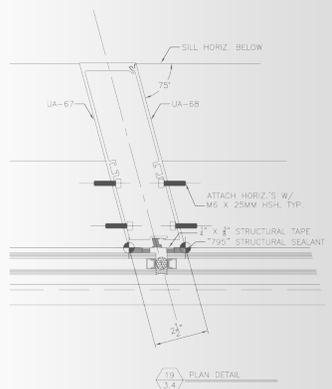
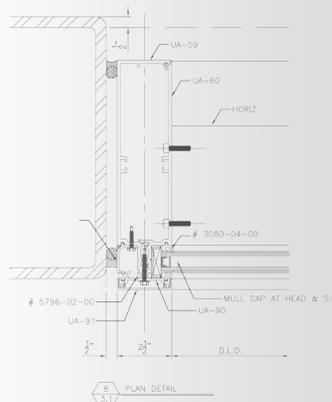
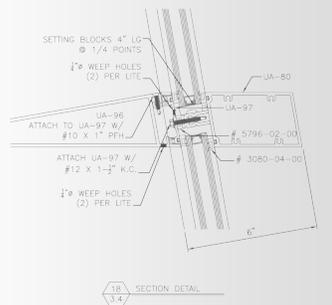
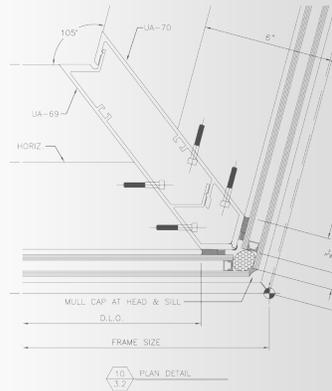
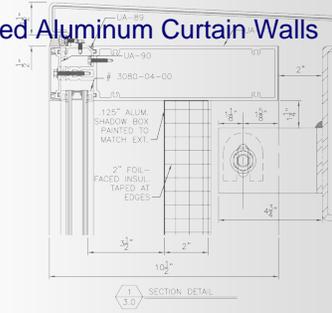
# United Architectural Metals, Inc

CUSTOM DESIGNED GLAZING SYSTEMS

084413 Glazed Aluminum Curtain Walls

## UAM UNITIZED SYSTEM FEATURES

- Oversize Thermal Barrier for dramatically increased Thermal Performance
- Narrow 2 3/4" mullion sight lines
- Dual finish capabilities
- Water control and drainage at each unit
- Pressure-equalized rain screen design
- Unitized construction accelerates installation, reducing field labor costs
- Engineered to meet typical high-rise spans and wind load requirements
- Glazing and sealing in a controlled factory environment
- Interlocking frame design accommodates seismic, live load and thermal building movements
- Accepts up to 5/8" total vertical movement
- Captured, two-side or four-side structural glazed
- Provision for easy hoisting and handling
- "jacking- bolt" anchors for acceptance of up to 1" vertical building tolerances
- Zero-Sightline multi-lock vent inserts available
- Exterior sun shades and interior light shelves available
- Recycled aluminum framing available



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p. 330.433.9220 info@UnitedArchitectural.com f. 330.433.9250

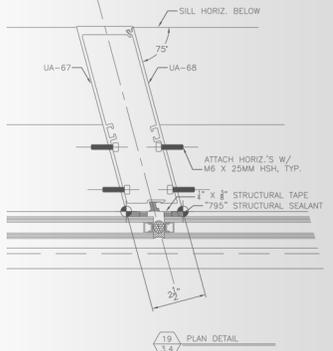
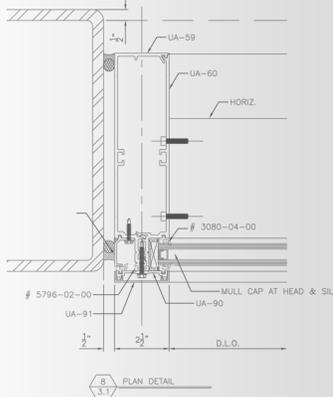
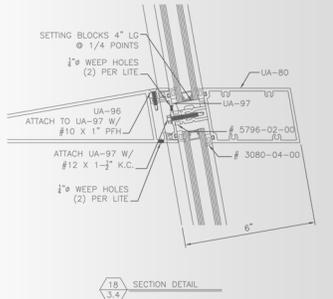
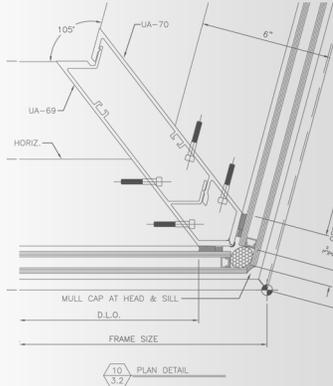
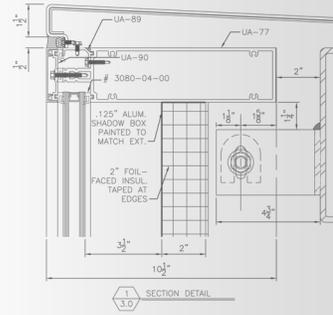
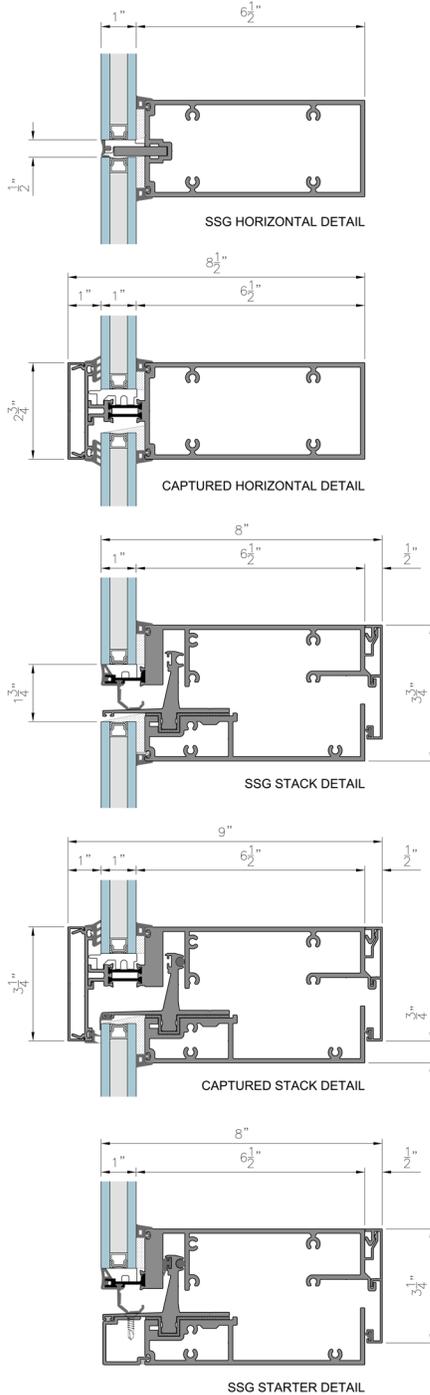
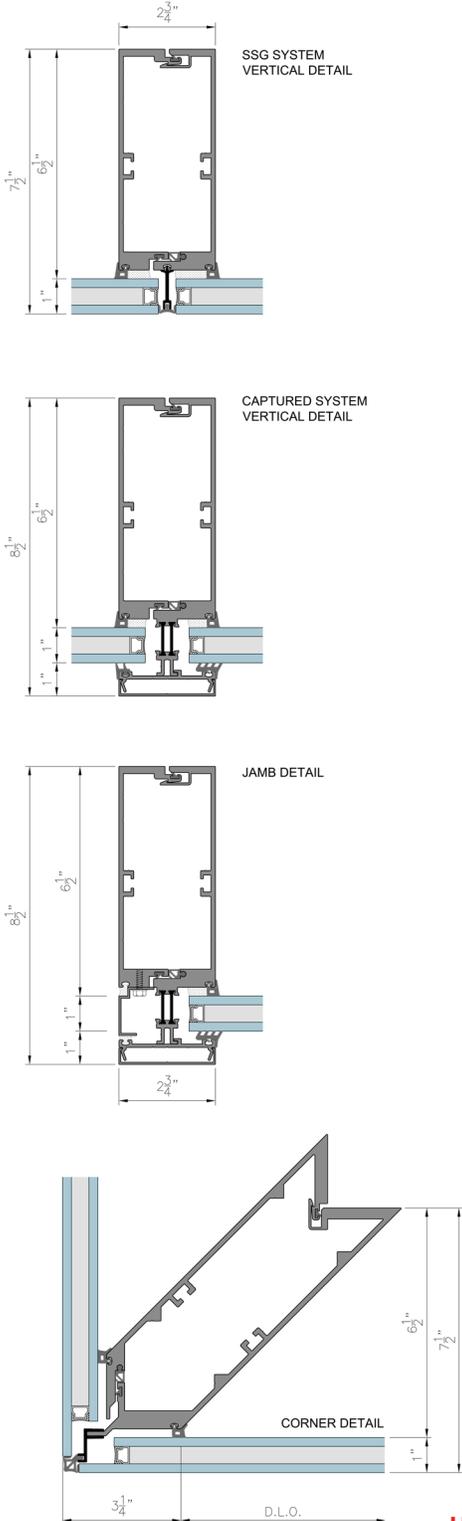


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## CUSTOM DESIGNED GLAZING SYSTEMS

### UAM UNITIZED

### 275-850



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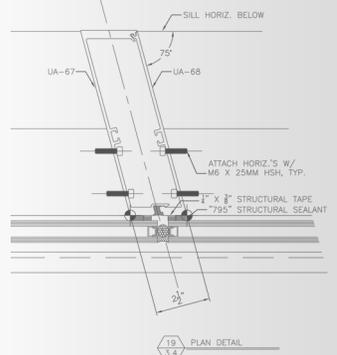
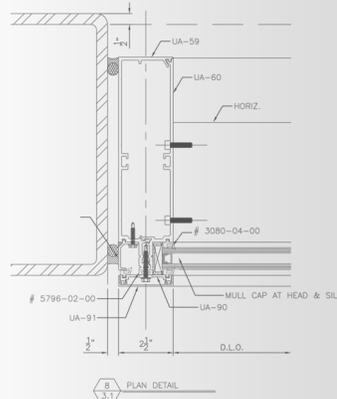
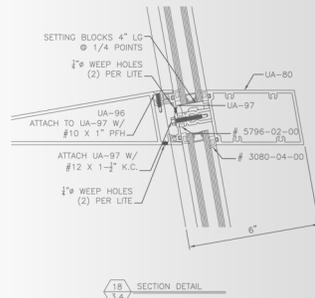
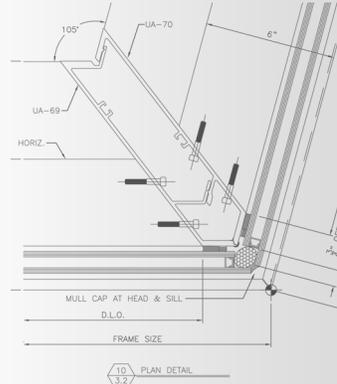
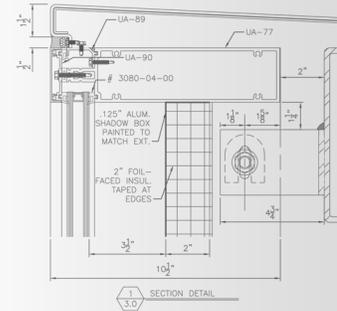
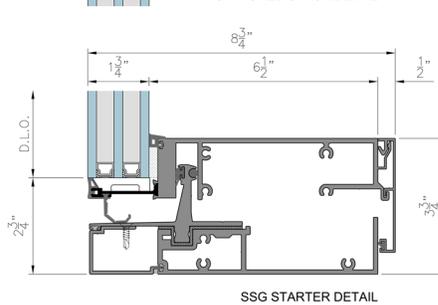
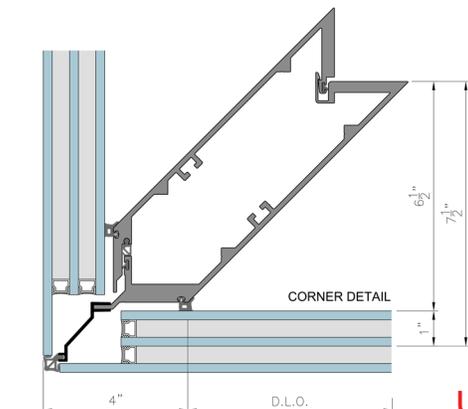
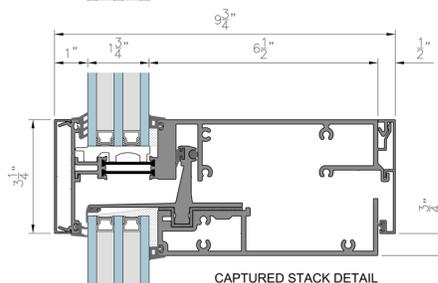
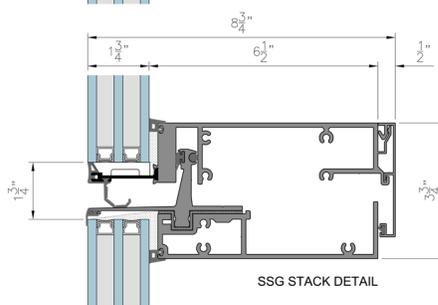
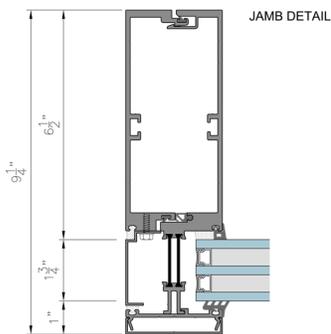
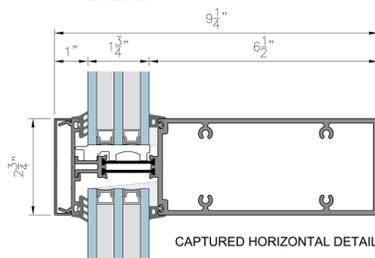
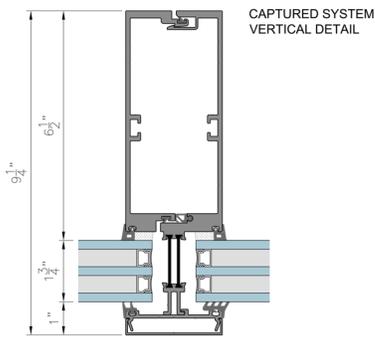
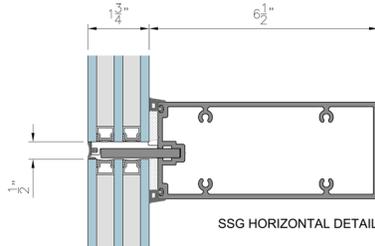
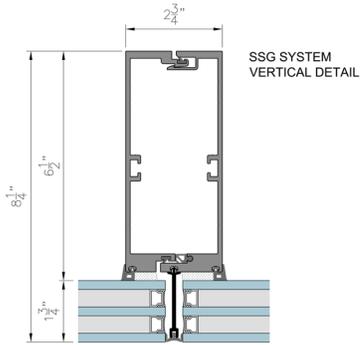
7830 Cleveland Ave NW North Canton, Ohio 44720  
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# United Architectural Metals, Inc

CUSTOM DESIGNED GLAZING SYSTEMS

## UAM UNITIZED

## 275-925 TRIPLE



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088000 Glazing

## Gray and Bronze Tinted Glasses



### *Victory Building*

*Location: Little Rock, AK*

*Products: Solargray®/Solarban® 60 Glass*

*Architect: Cromwell Architects Engineers*

*Glazing Contractor: Ace Glass*

*Glass Fabricator: Trulite Glass and Aluminum Solutions*

### **Aesthetic Description**

Gray and bronze tinted glasses have long been popular with architects because of their ability to harmonize with other building materials and add sleekness to building profiles. PPG offers three distinct gray tints with varying levels of visible light transmittance (VLT), including ultra-neutral, light-gray **Optigray**® glass, cool-gray **Solargray**® glass and dark-gray **Graylite**® II glass – along with classic **Solarbronze**® glass, which architects have specified for commercial buildings for more than 40 years.

For a broader aesthetic palette, some PPG gray and bronze tinted glasses are available with reflective **Solarcool**® glass coating.

### **Performance Characteristics**

Versatile gray and bronze tinted glasses are available with **Solarban**® solar control, low-e glasses or combined in insulating glass with **Sungate**® passive low-e glasses to fulfill a wide range of performance demands.

### **Fabrication and Availability**

Gray and bronze tinted glasses, as well as **Solarban**® and **Sungate**® low-e glasses, provide maximum processing flexibility and can be easily laminated, tempered or heat-strengthened to satisfy increased strength or safety glazing requirements. Tinted and **Sungate**® glasses are available from hundreds of PPG-qualified glass fabricators in the U.S., Canada and throughout the world. **Solarban**® low-e glasses are available through the **PPG Certified Fabricator**® Network.



**Additional Resources**  
**Ecological Solutions from PPG™**



encompass a number of environmentally sustainable architectural glass products, including uncoated gray and bronze tinted glasses, and those with **Solarcool®**, **Solarban®** and **Sungate®** glass coatings. For more information, or to obtain samples of any PPG tinted glass product, call **888-PPG-IDEA (774-4332)** or visit [www.ppgideascesapes.com](http://www.ppgideascesapes.com).

PPG is the first U.S. float glass manufacturer to have its products recognized by the **Cradle to Cradle Certified™** program, and offers more C2C-certified architectural glasses than any other float glass manufacturer.

Glass Type (Coating if Any (Surface) Glass) Outdoor Lite: + Indoor Lite:	Transmittance <sup>2</sup>			Reflectance <sup>2</sup>		U-Value <sup>3</sup> NFRC (BTU/hr•ft <sup>2</sup> •F)		European U-Value <sup>4</sup> EN 673 (W/m <sup>2</sup> •°C)	Shading Coeffi- cient <sup>5</sup>	Solar Heat Gain Coeffi- cient <sup>6</sup>	Light to Solar Gain (LSG) <sup>7</sup>
	Ultra- violet %	Visible %	Total Solar Energy %	Exterior Light %	Interior Light %	Winter Night- time	Summer Day- time				
<b>Monolithic (6mm)</b>											
OPTIGRAY	33	63	51	6	6	1.02	0.93	5.2	0.74	0.64	0.98
SOLARGRAY	24	44	42	6	6	1.02	0.93	5.8	0.67	0.58	0.76
SOLARBRONZE	25	53	50	6	6	1.02	0.93	5.8	0.73	0.63	0.84
GRAYLITE II	2	9	8	4	5	1.02	0.93	5.8	0.41	0.36	0.25
<b>Insulating Vision Unit Performance Comparisons 1-inch (25mm) units with 1/2-inch (13mm) airspace and two 1/4-inch (6mm) lites</b>											
<b>OPTIGRAY GLASS</b>											
SOLARBAN 70XL (2) OPTIGRAY + Clear	4	47	18	8	12	0.28	0.26	1.5	0.28	0.24	1.96
SOLARBAN 67 (2) OPTIGRAY + Clear	6	38	17	12	15	0.29	0.27	1.5	0.27	0.24	1.58
SOLARBAN 60 (2) OPTIGRAY + Clear	10	50	23	8	11	0.29	0.27	1.5	0.35	0.30	1.67
SOLARBAN R100 (2) OPTIGRAY + Clear	6	29	13	18	13	0.29	0.27	1.5	0.22	0.20	1.45
OPTIGRAY + SOLARBAN 70XL (3)	3	45	17	9	11	0.28	0.26	1.5	0.33	0.29	1.55
OPTIGRAY + SOLARBAN 67 (3) Clear	6	38	17	10	18	0.29	0.27	1.5	0.36	0.32	1.19
OPTIGRAY + SOLARBAN 60 (3) Clear	10	50	23	8	9	0.29	0.27	1.5	0.40	0.35	1.43
OPTIGRAY + SUNGATE 400 (3) Clear	16	54	34	9	12	0.32	0.31	1.8	0.52	0.46	1.17
<b>SOLARGRAY GLASS</b>											
SOLARBAN 70XL (2) + SOLARGRAY + Clear	3	34	13	6	12	0.28	0.26	1.5	0.23	0.20	1.70
SOLARBAN 67 (2) SOLARGRAY + Clear	5	27	13	8	15	0.29	0.27	1.6	0.23	0.20	1.35
SOLARBAN 60 (2) SOLARGRAY + Clear	8	35	18	6	10	0.29	0.27	1.6	0.29	0.25	1.40
SOLARBAN R100 (2) SOLARGRAY + Clear	5	21	10	12	13	0.29	0.27	1.6	0.19	0.17	1.24
SOLARGRAY + SOLARBAN 70XL (3)	2	32	13	7	11	0.28	0.26	1.5	0.27	0.24	1.33
SOLARGRAY + SOLARBAN 67 (3) Clear	5	27	13	8	18	0.29	0.27	1.6	0.30	0.26	1.04
SOLARGRAY + SOLARBAN 60 (3) Clear	8	35	18	7	9	0.29	0.27	1.6	0.33	0.29	1.21
SOLARGRAY + SUNGATE 400 (3) Clear	12	38	27	7	12	0.32	0.31	1.8	0.44	0.43	0.97
<b>SOLARBRONZE GLASS</b>											
SOLARBAN 70XL (2) SOLARBRONZE + Clear	3	40	15	7	12	0.28	0.26	1.5	0.25	0.21	1.90
SOLARBAN 67 (2) SOLARBRONZE + Clear	5	32	15	10	15	0.29	0.27	1.6	0.25	0.22	1.45
SOLARBAN 60 (2) SOLARBRONZE + Clear	8	42	21	7	11	0.29	0.27	1.6	0.32	0.28	1.50
SOLARBAN R100 (2) SOLARBRONZE + Clear	5	25	11	15	13	0.29	0.27	1.6	0.21	0.18	1.39
SOLARBRONZE + SOLARBAN 70XL (3)	3	38	15	8	11	0.28	0.26	1.5	0.30	0.26	1.46
SOLARBRONZE + SOLARBAN 67 (3) Clear	5	32	15	9	18	0.29	0.27	1.6	0.33	0.29	1.10
SOLARBRONZE + SOLARBAN 60 (3) Clear	8	42	21	7	9	0.29	0.27	1.6	0.37	0.32	1.31
SOLARBRONZE + SUNGATE 400 (3) Clear	12	46	32	8	12	0.32	0.31	1.8	0.50	0.44	1.05
<b>GRAYLITE II GLASS</b>											
GRAYLITE II + SOLARBAN 70XL (3)	0	6	3	4	10	0.28	0.26	1.5	0.13	0.11	0.55
GRAYLITE II + SOLARBAN 67 (3) Clear	0	5	3	4	18	0.29	0.27	1.6	0.14	0.12	0.42
GRAYLITE II + SOLARBAN 60 (3) Clear	1	7	4	4	8	0.29	0.27	1.6	0.14	0.13	0.54
GRAYLITE II + SUNGATE 400 (3) Clear	1	8	5	4	11	0.32	0.31	1.8	0.17	0.15	0.53

All performance data calculated using LBNL Window 6.3 software and represents center of glass performance data. European U-values are calculated using WinDat version 3.0.1 software. For detailed information on the methodologies used to calculate the aesthetic and performance values in this table, please visit [www.ppgideascesapes.com](http://www.ppgideascesapes.com) or request our Architectural Glass Catalog.

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Printed in U.S.A.  
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# Technical Bulletin

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ATS-169  
2013-01-15

## Pilkington **Activ**<sup>™</sup> Self-Cleaning Glass Glazing Guidelines

### **Summary**

Pilkington **Activ**<sup>™</sup> Self-Cleaning Glass has a thin, clear, permanent, pyrolytic Titanium Oxide coating on one of its surfaces. The coating has a hydrophilic property which makes raindrops spread out, or sheet, across the surface to wash away dirt particles. It also acts as a catalyst, when activated by daylight, to break down organic dirt into water vapor and CO<sub>2</sub> gas.

Pilkington **Activ**<sup>™</sup> must be glazed with the coating on the #1 (outboard) surface. It should be located where it will receive daylight because the coating utilizes the sun's ultra violet light, either direct or diffuse indirect, to activate its self-cleaning action and destroy organic material on its surface. There is sufficient indirect UV light to activate the coating, even on a north elevation (in the northern hemisphere), underneath overhanging roof eaves and behind an insect screen.

When glazed beside a light of clear, non-coated glass the Pilkington **Activ**<sup>™</sup> Glass will appear slightly brighter.

### **RECOMMENDED GLAZING GUIDELINES**

Wet glazing tapes, such as "preshim" with a neoprene rod core enclosed in a high viscosity butyl, are designed to remain pliable and flexible over their design lifetime. These tapes may contain a significant percentage of oil that can migrate onto the glass surface. This oil can sometimes be seen on the coated surface and can be difficult to remove without damaging the coating.

Silicone sealants can exude silicone oil or plasticisers while they cure and long afterwards. If rain contacts this oil it can carry it onto the glass surface. This very thin layer of silicone oil is very difficult to remove from glass or coatings. It is too thin to be visible when dry but is usually visible when the glass is wet; even then it is only noticeable by the different water

**Pilkington North America, Inc.**

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Telephone 800 221 0444 Fax 419 247 451

droplet formation of rain when compared to non-contaminated, clean glass. The oil can cover the coating in a transparent band a few inches wide around the glass edge and effectively inhibit the self-cleaning action resulting in a "picture frame" effect.

Neoprene glazing gaskets are often coated with extrusion oil or a lubrication liquid to assist installation. These lubricants will usually be removed during the first glass cleaning. Care must be taken to ensure such lubricating liquids do not contain Silicone.

It is for these reasons that the following glazing materials are deemed compatible with Pilkington **Activ**<sup>™</sup> Glass:

1. Use a clean, oil-free, dry gasket system against the Pilkington **Activ**<sup>™</sup> surface.
2. Use silicone oil-free, one or two component curing, glazing sealants such as polysulfides and urethanes.
3. DOW CORNING 757 "Weatherproofing Sealant". One component, neutral cure, low modulus. Specially developed for self-cleaning glass.
4. SMX 505 by Soudal Inc. Contact: Mr. Glen Kallgren, National Sales Manager. 682 553 1173. [gkallgren@soudal-inc.com](mailto:gkallgren@soudal-inc.com) 8888 Governors Row, Dallas, Texas 75247
5. Manusbond 35MP by Manus Products, 866 Industrial Blvd., West Waconia, MN 55387. Contact: Mr. Brian Henjum, Dir. Sales, Tel 952 442 3323 [brianh@manus.net](mailto:brianh@manus.net)
6. Sonolastic 150 by Sonnerborn. Supplied by Chemrex, MN. 800 433 9517 (Avoid direct UV exposure)

Follow the manufacturers' recommendations and insure that the sealants have adequate UV and weathering stability.

Other European source compatible glazing materials are listed at:

<http://www.pilkingtonselfcleaningglass.co.uk/trade/compatible-products/index.html>

### Identifying the Pilkington **Activ**<sup>™</sup> Coated Surface

The coated glass surface should be identified by the location of a label on the non-coated glass side. A hand-held coating detector is available from EDTM, Toledo, Ohio, tel. 419 861 1030, [www.edtm.com](http://www.edtm.com) to positively identify the coated surface.

The fine scale roughness of the coating can be detected by the additional friction felt when it is rubbed with finger tips or finger nails.

Note: the coating emittance is the same as non-coated glass and so standard Low-E detectors cannot be used to identify the coated surface.

#### **Pilkington North America, Inc.**

811 Madison Avenue, Toledo, Ohio 43604-5684

Telephone 800 221 0444 Fax 419 247 4517

## Maintenance and Cleaning Pilkington **Activ**<sup>™</sup> Glass

See ATS Bulletin #166 for details. It is on the web at:

<http://www.pilkington.com/north-america/usa/english/building+products/technical+bulletins/default1.htm>

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The information contained in this bulletin is offered for assistance in the application of Pilkington North America Inc. flat glass products, but **IT DOES NOT CONSTITUTE A WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.** Actual performance may vary in particular applications.

**Pilkington North America, Inc.**

811 Madison Avenue, Toledo, Ohio 43604-5684

Telephone 800 221 0444 Fax 419 247 4517



## MENU

ABOUT US

HISTORY

NEWSROOM

CAREERS





# TF5101

Offer seating while deterring damage with single built-in divider bar.

**ITEM NUMBER:**

TF5101

**DIMENSIONS**

2" x 18" x 19"

**WEIGHT:**

150 lbs.

**ADDITIONAL FEATURES:**

Feature: optional deterrent

**MATERIAL:**

<http://www.wausaumade.com/products/benches-chairs/ff5101>

Concrete

**SHAPE:**

Rectangle

**REINFORCEMENT:**

Yes

**BACK TYPE:**

Without Back

**ARM TYPE:**

Without Arms

**ANCHORING:**

4) 1/2" Dia. threaded inserts

GET A QUOTE

- COLORS

STANDARD WEATHERSTONE



B1 Gray



B15 White



B18 Weather  
Charcoal



B19 Souldard  
Green



B2 French Gray



B3 Sand



B4 Buff



B5 Cream



B6 Brown

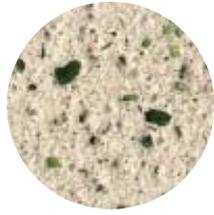


B7 Brick Red

PREMIUM WEATHERSTONE GLASS



C14



C16



C2



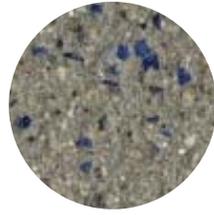
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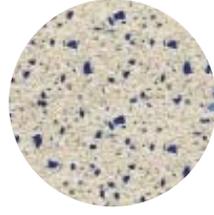
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C4



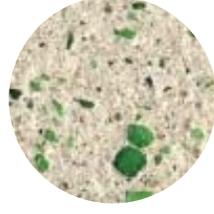
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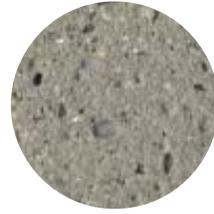
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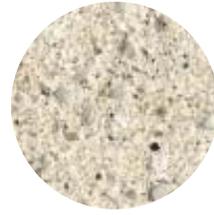
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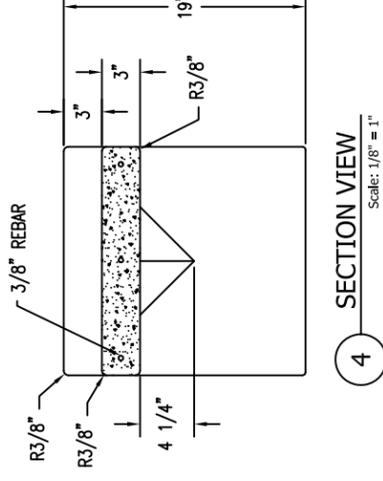
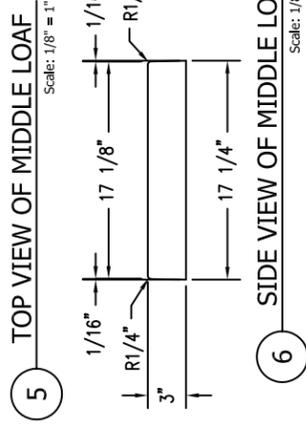
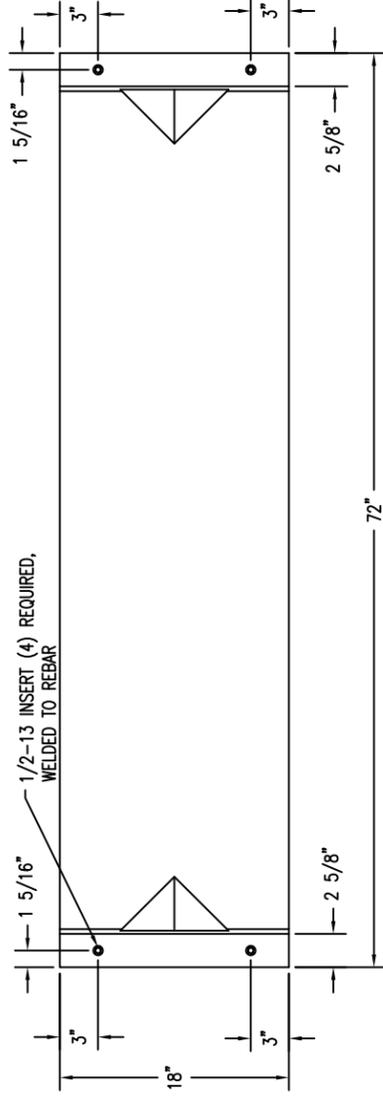
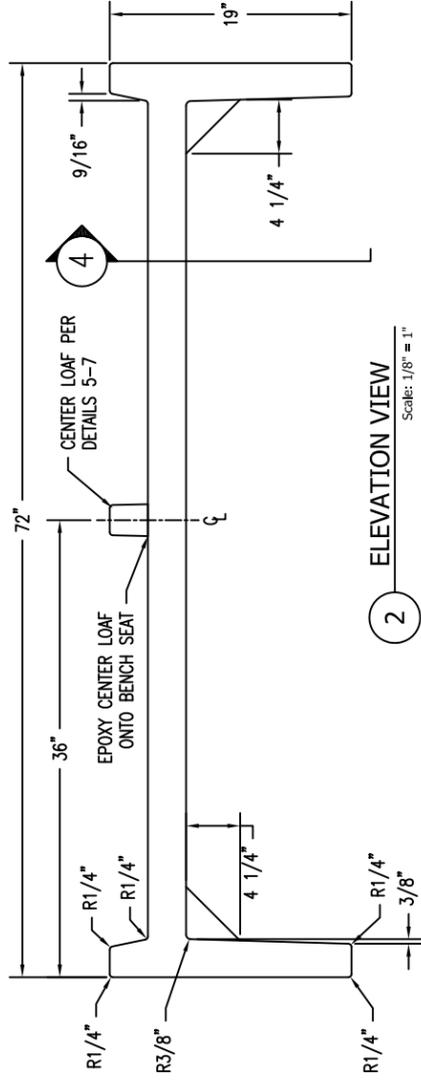
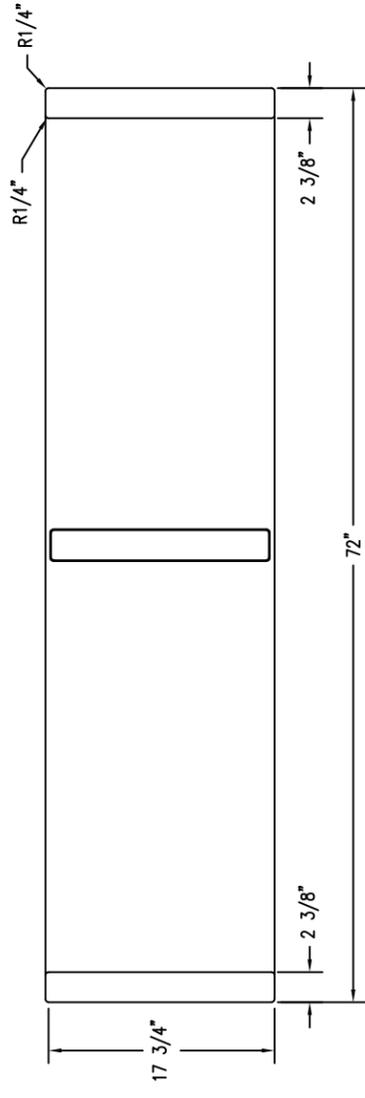
C56



C67



C69



**WAUSAU TILE SITE FURNISHINGS**

P.O. BOX 1520 WAUSAU, WISCONSIN 54402-1520 800/288-8728  
E-MAIL: WTL@WAUSAUTILE.COM  
WEB SITE: WWW.WAUSAUTILE.COM

REVISIONS		DRAWN BY		JOB		MATERIAL	
NO.	DATE	BY	NO.	DATE	LOCATION	WEIGHT	CONCRETE
1	11/19/10	ASP	4				
2	12/9/10	PMW	5				
3			6				

JOB		DATE		ITEM NO.	
SCALE	AS NOTED	DATE	11/19/10	ITEM NO.	TF5101
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ± 1/8"					
FINISH OPTIONS					

DATE: 11/19/10  
ITEM NO.: TF5101  
DWG. NO.: 1 OF 1





Create a timeless moment.®



## CBF-12

Strongly symmetrical, curved castings that enhance the site and delight the eye.

4, 6 or 8 ft (1.2, 1.8 or 2.4 m) lengths. Horizontal steel slats. Surface mount.

### STANDARD

All fabricated metal components are steel shotblasted, etched, phosphatized, preheated and electrostatically powder-coated with TGIC polyester powder coatings.

**All ductile iron castings come with a 10-year warranty against breakage.**

### OPTIONS

Intermediate armrests.

RETURN TO STANDARD VIEW

### MATERIAL

**Ductile-Iron Casting**

**Recycled Solid Steel Bar**

### LENGTH

**4 ft (1.2 m)**

**6 ft (1.8 m)**

**8 ft (2.4 m)**

## COLORS

### Standard



### Optional RAL



## COORDINATING PRODUCTS



FC-6

compare



FC-12

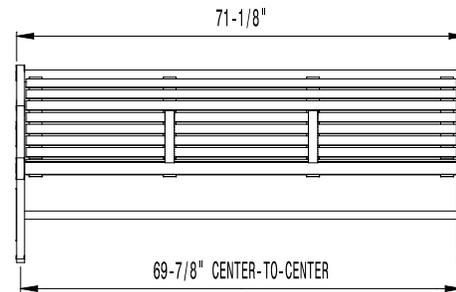
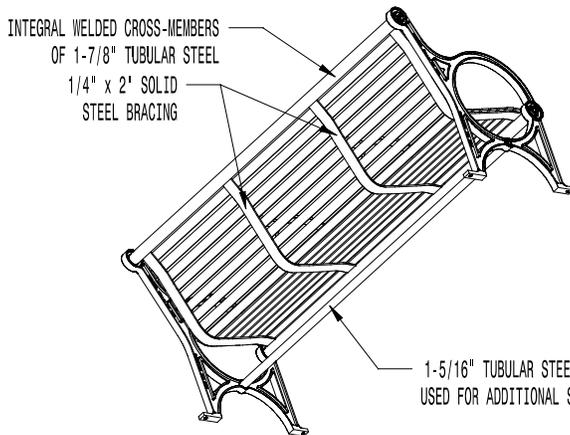
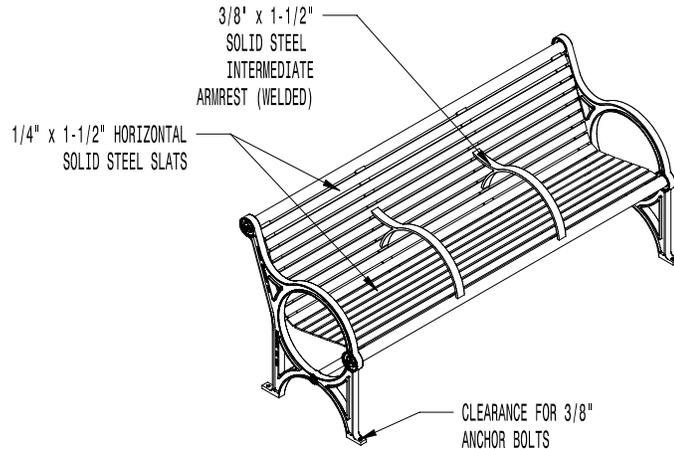
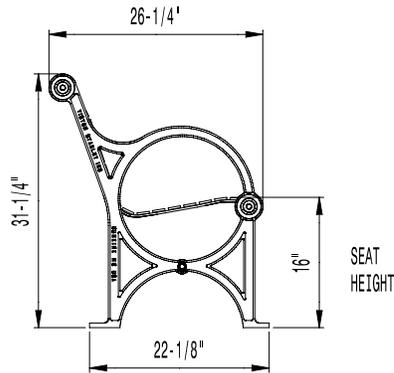
compare



**VICTOR STANLEY, INC.®**  
*-Manufacturers of Quality Site Furnishings since 1962-*

P.O. DRAWER 330 - DUNKIRK, MD 20754 USA  
 TOLL FREE: (800) 368-2573 (USA & CANADA)  
 TEL (301) 855-8300 - FAX (410) 257-7579  
 WEB SITE: HTTP://WWW.VICTORSTANLEY.COM

\* ALL DIMENSIONS ARE IN INCHES \*



CENTER-TO-CENTER DISTANCE ARE APPROXIMATE  
 (VARIATIONS IN CASTINGS ARISE FROM DIFFERENT RATES OF COOLING)

**AVAILABLE OPTIONS:**

**POWDER COATING**

10 STANDARD COLORS, 2 OPTIONAL METALLIC COLORS,  
 CUSTOM COLORS (INCLUDING THE RAL RANGE)

**INTERMEDIATE (WELDED)**

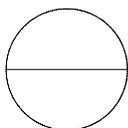
4', 6', & 8' AVAILABLE WITH OPTIONAL ARMRESTS

**LENGTHS**

STANDARD 4'  
 STANDARD 6' (AS SHOWN)  
 STANDARD 8'

**NOTES:**

1. DUCTILE IRON CASTINGS COME WITH A TEN YEAR WARRANTY AGAINST BREAKAGE.
2. DRAWINGS NOT TO SCALE. DO NOT SCALE DRAWINGS.
3. ALL FABRICATED METAL COMPONENTS ARE STEEL SHOTBLASTED, ETCHED, PHOSPHATIZED, PREHEATED, AND ELECTROSTATICALLY POWDER-COATED WITH T.G.I.C. POLYESTER POWDER COATINGS. PRODUCTS ARE FULLY CLEANED AND PRETREATED, PREHEATED AND COATED WHILE HOT TO FILL CREVICES AND BUILD COATING FILM. COATED PARTS ARE THEN FULLY CURED TO COATING MANUFACTURER'S SPECIFICATIONS. THE THICKNESS OF THE RESULTING FINISH AVERAGES 8-10 MILS (200-250 MICRONS).
4. IT IS NOT RECOMMENDED TO LOCATE ANCHOR BOLTS UNTIL BENCH IS IN PLACE. THIS VICTOR STANLEY, INC. PRODUCT MUST BE PERMANENTLY AFFIXED TO THE GROUND. CONSULT YOUR LOCAL CODES FOR REGULATIONS.
5. ANCHOR BOLTS NOT PROVIDED BY VICTOR STANLEY, INC.
6. FOR HIGH SALT ABUSIVE CLIMATES, HOT-DIP GALVANIZING BEFORE POWDER COATING IS AVAILABLE. HOT-DIP GALVANIZING IS PERFORMED FOR VICTOR STANLEY, INC. BY AN EXPERIENCED QUALIFIED FIRM TO WHICH PRODUCTS ARE SHIPPED FOR GALVANIZING. HOT-DIP GALVANIZING INCLUDES AN AGGRESSIVE PRE-TREATMENT AND IMMERSION IN A TANK OF CHARGED LIQUID ZINC AT OR AROUND 860°F (460°C). THE RESULTING SURFACE IS RESISTANT TO RUST BUT HAS SOME UNEVENNESS RESULTING FROM THE BONDING OF THE ZINC TO THE STEEL SURFACE. AS A RESULT, THE POWDER-COATING SURFACE FINISH OVER THAT GALVANIZED SURFACE MAY EXHIBIT BUMPS, UNEVENNESS, AND MAY NOT BE AS SMOOTH AS THE STANDARD FINISH; THIS UNEVEN AND INCONSISTENT FINISH IS NORMAL FOR GALVANIZING. CONTACT MANUFACTURER FOR DETAILS.
7. ALL SPECIFICATIONS ARE SUBJECT TO CHANGE. CONTACT MANUFACTURER FOR DETAILS.
8. THIS PRODUCT IS SHIPPED FULLY ASSEMBLED.

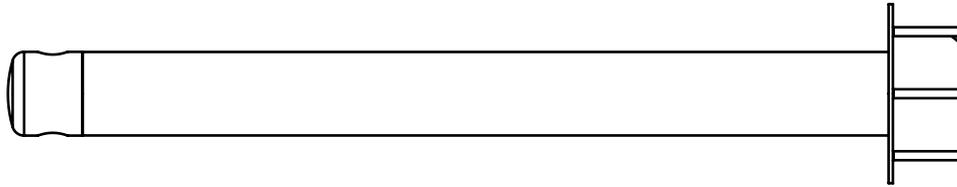
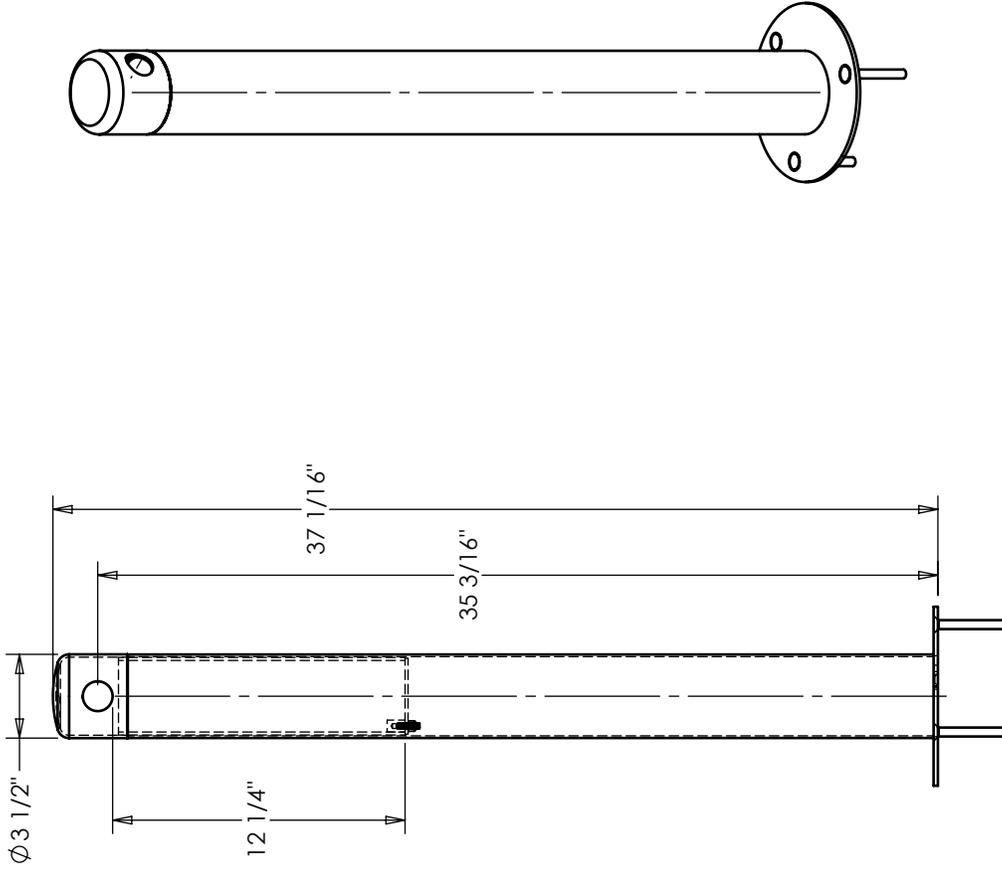
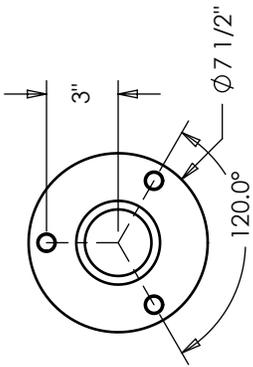


**CBF-12**

CITY SITES SERIES™

BENCH WITH DUCTILE IRON END FRAMES  
 SHOWN: STANDARD 6-FOOT LENGTH  
 OPTIONAL (2) INTERMEDIATE ARMRESTS (WELDED)





**WAUSAU TILE SITE FURNISHINGS** P.O. BOX 1520, WAUSAU, WI 54402  
 P.O. BOX 967, BANNING, CA 92220

REVISIONS			DATE	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	WEIGHT
NO.	DATE	BY	NO.	ANGLE $\pm 0.5^\circ$	SCALE
1			4	2-PL $\pm 0.01$ 3-PL $\pm 0.005$	1:8
2			5		FINISH
3			6		NUMBER
				<b>ALUM <math>\phi 3.5</math>" SNUFFER POST</b>	<b>MF4012</b>

DRAWN BY  
DLS

DATE  
10-23-2012

MATERIAL  
2-PL  $\pm 0.01$  3-PL  $\pm 0.005$

FINISH

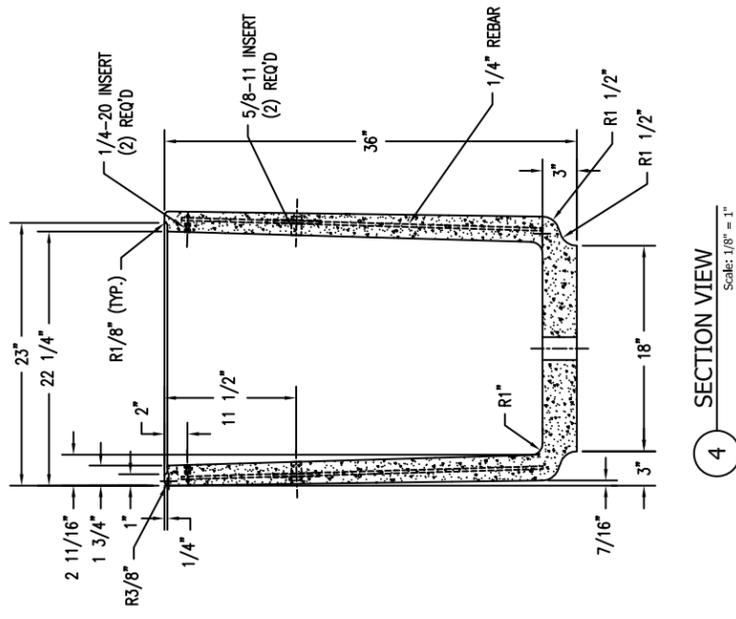
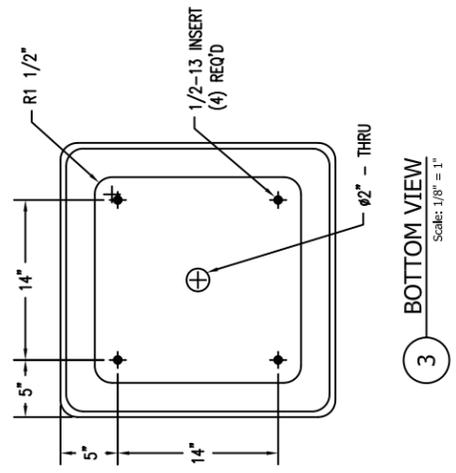
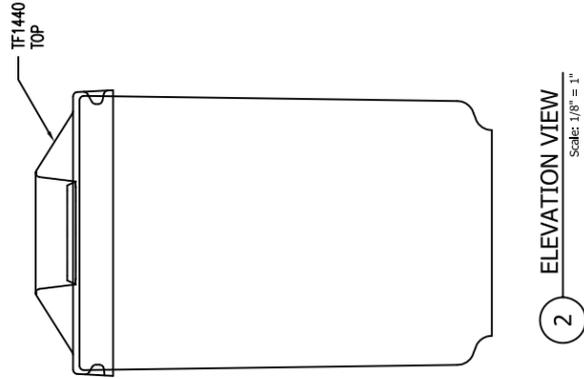
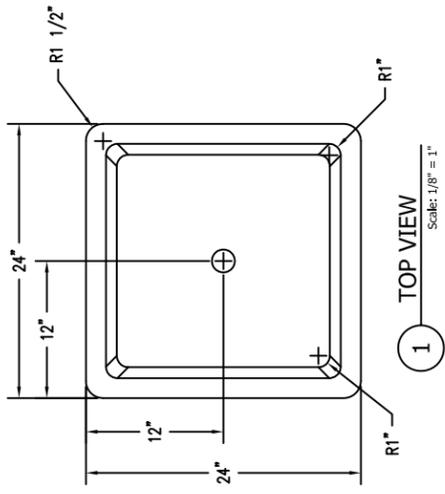
SCALE  
1:8

WEIGHT

TITLE

**ALUM  $\phi 3.5$ " SNUFFER POST**

**MF4012**



REVISION	DESCRIPTION	DRAWN BY	DATE	FINISH OPTIONS	SCALE	AS NOTED	DATE	ITEM NO.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ±1/8"	CHECKED	DWG. NO.
4											1 OF 1
3											
2											
1											

<b>WAUSAU TILE</b>		P.O. BOX 1520 WAUSAU, WISCONSIN 54402-1520 800/298-8728 E-MAIL: <a href="mailto:WTL@WAUSAUTILE.COM">WTL@WAUSAUTILE.COM</a> WEB SITE: <a href="http://WWW.WAUSAUTILE.COM">WWW.WAUSAUTILE.COM</a>	
DRAWN BY	JPZ	JOB	CONCRETE
JOB NO.		LOCATION	WEIGHT 615 LBS
SCALE	AS NOTED	DATE	11/11/11
FINISH OPTIONS		ITEM NO.	TF1025
		CHECKED	
		DWG. NO.	1 OF 1

# Schindler 3300 MRL Traction Elevator

## General Purpose

142100 Electric Traction Elevators

Standard Speeds: 100, 150 fpm (0.5, 0.75 m/s)

Openings: 8 front, 7 rear

Travel: Up to 98'-5" (30.0 m)



# Schindler 3300 MRL Traction Elevator

## General Purpose

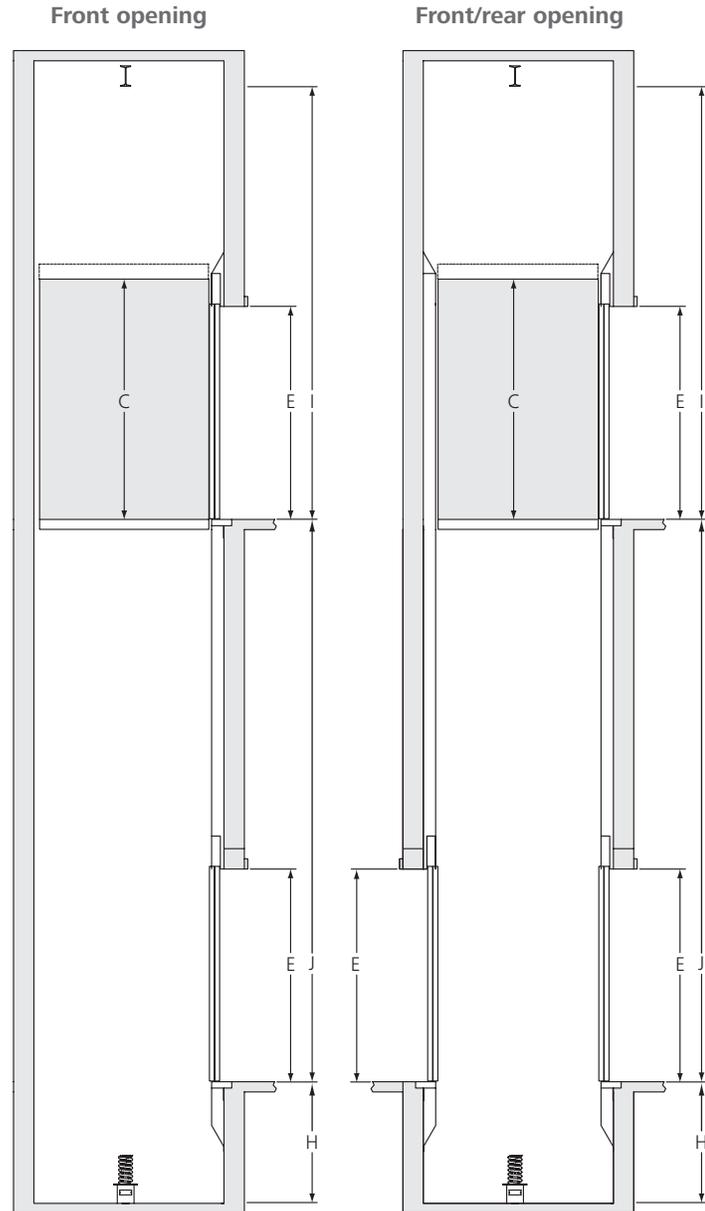
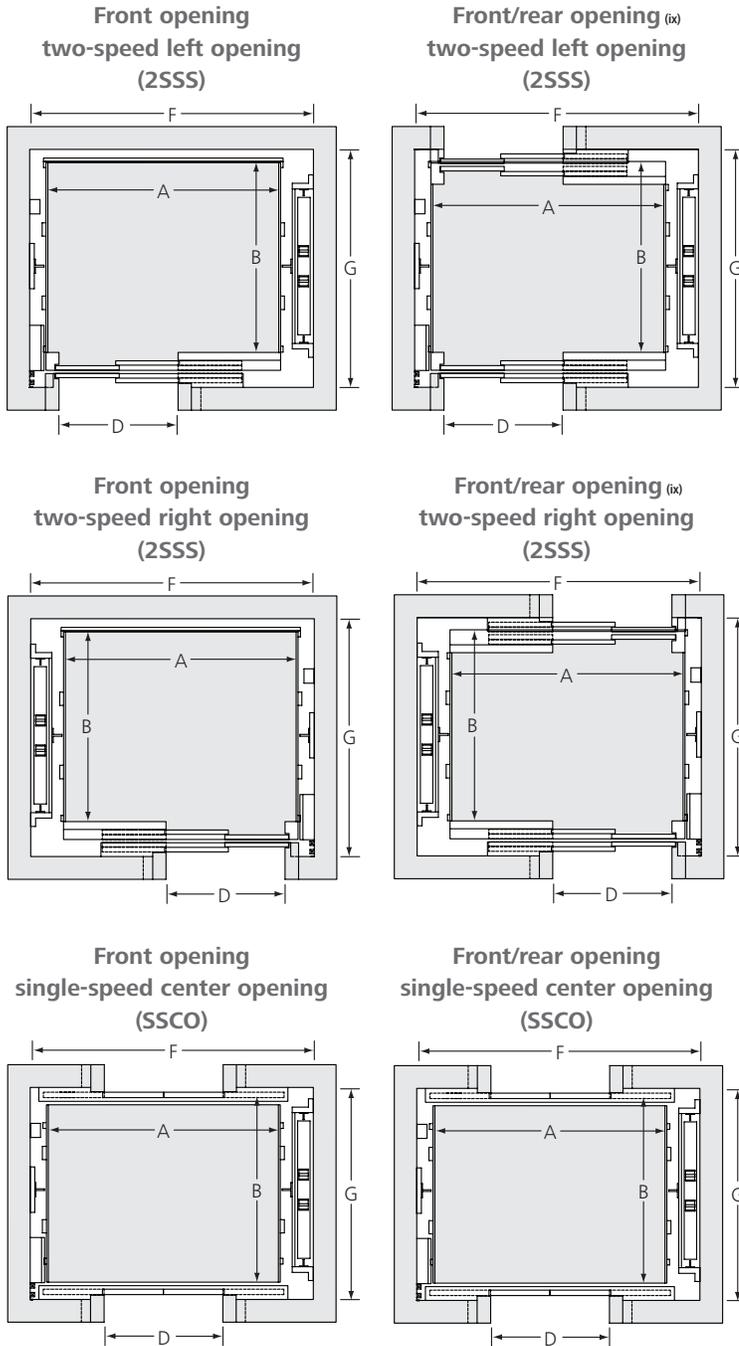
Standard Speeds: 100, 150 fpm (0.5, 0.75 m/s)

Openings: 8 front, 7 rear

Travel: Up to 98'-5" (30.0 m)

### Hatch plans

### Hoistways



## Machine room-less traction elevator with frequency-controlled drive

### Capacity 2100 – 3500 lbs, 14 – 23 passengers

Capacity  lbs (kg)	Passengers max.	Speed  fpm (m/s)	Number of stops max.	Available entrances max.	Car (Inside)			Door		Shaft (Inside)				Travel height max.  J (vi) ft (m) / FPM (m/s)	
					A in (mm)	B in (mm)	C in (mm)	Door type	D in (mm)	E in (mm)	F (iii)(vii) ft (mm)	G ft (mm)	H (vii) ft (mm)		I (iv) ft (mm)
2100 (950)	14	100/150 (.5/.75)	8	8 Front	5'-9 3/8"	4'-4 7/8"	7'-9"	2SSO	3'-0"	7'	7'-4" (vii) (2235)	5'-9"	5'-0"	12'-7"	59' (17.7) / 100 (.5)
			8/7	8 Front 7 Rear	(1761)	(1343)	(2366)				7'-4" (vii) (2235)	6'-5 5/8"	5'-0"	12'-7"	98'-5" (30.0) / 150 (.75)
2500 (1135)	17	100/150 (.5/.75)	8	8 Front	6'-9 3/8"	4'-4 7/8"	7'-9"	2SSO/ SSCO	3'-6"	7'	8'-4" (vii) (2540)	5'-9"	5'-0"	12'-7"	59' (17.7) / 100 (.5)
			8/7	8 Front 7 Rear	(2066)	(1343)	(2366)				8'-4" (vii) (2540)	6'-5 5/8"	5'-0"	12'-7"	98'-5" (30.0) / 150 (.75)
3000 (1360)	20	100/150 (.5/.75)	8	8 Front	6'-9 3/8"	4'-10 7/8"	7'-9"	2SSO/ SSCO	3'-6"	7'	8'-4" (vii) (2540)	6'-3"	5'-0"	12'-7"	59' (17.7) / 100 (.5)
			8/7	8 Front 7 Rear	(2066)	(1495)	(2366)				8'-4" (vii) (2540)	6'-11 5/8"	5'-0"	12'-7"	98'-5" (30.0) / 150 (.75)
3500 (1590)	23	100/150 (.5/.75)	8	8 Front	6'-9 3/8"	5'-6 7/8"	7'-9"	2SSO/ SSCO	3'-6"	7'	8'-4" (vii) (2540)	6'-11"	5'-0"	12'-7"	59' (17.7) / 100 (.5)
			8/7	8 Front 7 Rear	(2066)	(1699)	(2366)				8'-4" (vii) (2540)	7'-7 5/8"	5'-0"	12'-7"	82'-0" (25.0) / 150 (.75)
					<b>A</b> Inside cab width <b>B</b> Inside cab depth <b>C</b> Inside cab height to underside of roof is above. Inside cab height to finished ceiling is 7'-5 3/16" (2265).	<b>D</b> Door Width <b>E</b> Door Height			<b>F</b> Shaft width <b>G</b> Shaft depth <b>H</b> Pit depth <b>I</b> Overhead						

- Notes:**
- (i) 2SSO doors available with right or left opening.
  - (ii) Duplex operation available.
  - (iii) For areas in seismic zone 2 or greater, provide additional 2" (50 mm) on the F dimension.
  - (iv) Clear overhead is defined as the lowest point below any obstruction such as: hoist beam(s), building beams, or roof structure.
  - (v) Where permitted by code, no control closet is required. A 3-phase and 110v disconnect must be located in both the hoistway overhead and a location in the building outside of the hoistway. The latter is not required to be an elevator-dedicated space.
  - (vi) Travel height max. varies depending on speed (FPM) and capacity (lbs).
  - (vii) Schindler recommends 8'-6" (2500 – 3500 lbs) and 7'-6" (2100 lbs), providing additional hoistway tolerances.
  - (viii) Please contact your Schindler Sales Representative for options less than 5'-0".
  - (ix) Please contact your Schindler Sales Representative for additional hatch options such as diagonal entrances.

# Schindler 3300 MRL Traction Elevator

## General Purpose

Standard Speeds: 100, 150 fpm (0.5, 0.75 m/s)

Openings: 8 front, 7 rear

Travel: Up to 98'-5" (30.0 m)

### General requirements

Requirements for installation vary by type of equipment selected. These general requirements assist you in preparing your building for the installation of Schindler elevators. All designs, clearances, construction, workmanship and materials, unless specifically excepted, shall be in accordance with the requirements of the latest published ASME A17.1 Code for electric traction elevators plus applicable building code and local codes. State or local requirements must be used if more stringent.

**Items to be provided** — A complete installation includes the following items not included in the elevator contract:

1. Clear, plumb hoistway, with variations on a minimum dimension hoistway not to exceed -0" and +1" (25.4 mm) per side at any point. Tolerance may increase to variations not to exceed -1" (-25.4 mm) and +1" (25.4 mm) per side at any point when an additional 2" (50.8 mm) is provided on the hoistway width dimension.
2. Two-hour fire resistance of hoistway walls or rating to meet applicable local codes. 75° bevel guards on all projections, recesses or setbacks over 4" (102 mm) except on side used for loading or unloading. The overhead machinery space temperature at top of hoistway to be maintained between 41° F (5° C) and 104° F (40° C) and < 95% relative humidity, non-condensing.
3. Supports for rail brackets at pit, each floor and one or two locations above top floor in the overhead (application dependent). Divider beams between hoistways at each floor level and one or two locations above top floor in the overhead for guide rail bracket supports. Locate per layout. For masonry block hoistway construction, Schindler will provide rail bracket inserts for installation by others, located per the Schindler final layout drawings. Where inserts are not used, hollow masonry blocks are not acceptable for bracket fastening. Provide 125 mm (5") concrete belt around hoistway or other acceptable support at each floor, in overhead, and intermediate levels (if required). For max. rail bracket vertical spacing, contact your local sales representative.
4. Supply hoist/safety beam for elevator construction and service work. Beam to run across the width of the elevator shaft. Locate per layout. Hoist beam to be left in place after elevator installation.
5. A temporary work platform is required for installation. It is to be constructed at the top floor of each elevator. It must comply with applicable governing codes and regulations. The platform shall be securely fastened to the building structure. Erection, maintenance, and removal are by others. (Reference Schindler drawing TD440.)
6. Lighting, light switch and duplex receptacle (GFCI) for each elevator, in the center of hoistway pit and in the elevator overhead/machinery space, as indicated by Schindler. The pit light switch located adjacent to access door.
7. Recesses, supports, and patching, as required, to accommodate hall button boxes, signal fixtures, etc. (if required).
8. All barricades outside elevator hoistways or between elevators inside hoistways.
9. Dry pit reinforced to sustain normal vertical forces from rails and buffers.
10. Drains & sumps in elevator pits, where provided, shall comply with the plumbing code, and shall be provided with a positive means to prevent water, gases and odors from entering the hoistway. The cover must be secured and level with the pit floor and located to clear elevator equipment. (Cannot be connected directly to storm drain or sewer.)
11. Pit ladders shall be provided where required.

### Inspection and test panel

12. A switch placed adjacent to the jamb-mounted inspection and test panel enclosure shall control lighting in front of the panel. Minimum lighting to be 200 lux (19 fc).
13. A lockable, 13 1/2" x 15 1/2" x 3 1/2" (minimum), metal cabinet with group-1 key to house required electrical schematics and maintenance history documents, shall be wall mounted, adjacent to the disconnect switch, by others, at the top landing. The supplier, location, and mounting of the cabinet shall be coordinated with Schindler.
14. Provide, preferably on the same floor as the elevator inspection and test panel, a lockable panel with a fused disconnect switch or circuit breaker suitable for 3-phase power for the elevator control, and a fused disconnect switch or circuit breaker for car lighting for each elevator in a separate lockable panel adjacent to the 3-phase panel or within the 3 phase panel. The panel(s) must be accessible to qualified personnel only (NEC NFPA req. 620.51[C]) with a Group 2 key (ASME A17.1 req. 8.1.3). Alternative locations for the panel(s) can be considered, provided they are located in accessible areas without obstructions to qualified personnel in compliance with NEC NFPA req. 620.51(C). Locate and mark the panels and disconnects with appropriate signage, (NEC NFPA 70 req. 620-22 and 620-51, or CSA C22.1-02 sections 38-022 and 38-053). The disconnects or circuit breakers may also be located without panels in a Group 2 key-secured room identified and dedicated to elevator apparatus only, and in all cases must be capable of being locked in the open position with a lock that cannot be removed from the devices or panel(s). FOR DRIVE IN HOISTWAY CONFIGURATION ONLY: Electrical contractor to supply an additional lockable auxiliary non-fused disconnect in the hoistway at the location of the drive (motor controller), along with wiring from the main disconnect to the auxiliary disconnect (see also NEC NFPA 70 - 2008 req. 620.51[C](1)). This disconnect must also be lockable in the open position with a secured lock that cannot be removed from the device.

U.S. Headquarters. Morristown, New Jersey

Tel. 973.397.6500

[www.us.schindler.com](http://www.us.schindler.com)

Canada Headquarters. Toronto, Ontario

Tel. 416.332.8280

[www.ca.schindler.com](http://www.ca.schindler.com)

15. For ALL power circuits:

- a. If a sprinkler head is located in the hoistway or other disconnect location, any disconnect served by that sprinkler head must be NEMA 3 compliant. Sprinklers shall be located at the top and bottom of the hoistway per NFPA 12-2010 requirement 8.15.5.6 (see also 8.15.5.3) and A.8.15.5.3).
- b. In U.S. jurisdictions ONLY, when a sprinkler head is located in the hoistway, the building shall provide shunt trip activation of a) JH, the main disconnect or b) the feed to the main disconnect, triggered by contacts of the fire recall initiating devices (as defined by NFPA). These devices, located in the hoistway or other disconnect location, shall provide independent disconnection of electrical power to both main and auxiliary power circuits prior to sprinkler activation (ASME A17.1-2007/CSA B44-07 rule 2.8.3.3. and/or local code).

**Control spaces (When specified in lieu of an Inspection and Test Panel, a partial or full body entry space/room shall be provided.)**

16. Enclosed and protected control space at top landing adjacent to the hoistway wall closest to the elevator hoist machine. Two-hour fire rating of control space walls or rating to meet applicable local codes.
17. Provide fire-rated, self-closing, self-locking door. Door must be capable of opening 180 degrees for access to control space.
18. 42" (1067 mm) minimum clear space is required in hallway in front of control space door and top hoistway entrance for service barriers. Additional hallway width may be required, subject to local building, fire and ADA codes.
19. The temperature in front of the control space must be maintained between 32° F (0° C) and 104° F (40° C) and less than 95% relative humidity, non-condensing, for proper operation of equipment.
20. Disconnects for each elevator must be provided per National Electrical Code (NFPA No. 70) and located inside the elevator control space.

### Other wiring

21. Suitable copper feeder, ground and branch wiring circuits for signal system and power operated door. Feeder and branch wiring circuits for car light and fan.
22. Telephone outlet provided at the inspection and test panel or in control closet (where applicable).
23. All conduit and wire runs remote from either the control space or hoistways (if required).
24. Heat, smoke or products of combustion-sensing devices connected to elevator control space terminals when such devices are required. Sprinklers shall be located at the top and bottom of the hoistway per NFPA 13-2010 requirement 8.15.5.6 (see also 8.15.5.3 and A.8.15.5.3). Shunt trip circuit breaker shall also be installed when sprinklers are present in the hoist way.

### Emergency provisions

25. Elevator Firefighter's and other emergency services, depending on height of the building or number of landings, per ASME A17.1 Rule 2.27.3 and local codes.
26. Elevator Firefighter's and other emergency services' wiring and interconnections to automatic sprinkler systems or heat and smoke-sensing devices furnished by others.
27. When emergency/standby power operation of elevators is required, the Electrical Contractor should coordinate with Schindler for operation requirements.
28. Provisions for earthquake protection, dictated by building code, are required in various sections of the country.

### Entrances

29. Hoistway walls must have a fire rating per ASME A17.1 Rule 2.1.1.1.
30. Furnishing, installing and maintaining the required fire rating of elevator hoistway walls, including the control spaces and also the penetration of fire wall by elevator fixture boxes (if applicable), is not the responsibility of the elevator contractor.
31. The interface of the elevator wall with the hoistway entrance assembly shall be in strict compliance with the elevator contractor's requirements.
32. Entrance wall and finished floor are not to be constructed until after door frames and sills are in place.
  - a. Where front walls are of reinforced concrete, the concrete openings must be minimum 16" (406 mm) wider [8" (203 mm) on each side] and 8" (203 mm) higher than the clear opening.
  - b. Where drywall or sheet rock construction is used for front walls, it shall be of sufficient strength to maintain the doors in true lateral alignment. Drywall contractor to coordinate with the elevator contractor.  
Note: A support member must be provided for floor heights greater than 15'-0" (4572 mm) to support entrance header struts.
  - c. Door frames are to be anchored to walls and properly grouted in place to maintain legal fire rating (masonry construction).
33. Filling and grouting around entrance by others.
34. Where openings occur, all walls and sill supports must be plumb.



Schindler is a member organization of the U.S. Green Building Council.



Schindler has received renewal to ISO 14001:2004 and ISO 9001:2008 certificates.

ISO 9001 | ISO 14001



Schindler prints with vegetable-based ink on paper containing post-consumer waste fiber.

# Technology advanced Perfection attainable

## Drive system

The Schindler 3300 requires a small hoist machine and inverter. This saves more space compared to previous drive systems; it is installed directly in the overhead and does not require a separate machine room. The system stops the car with precision. Cab and landing floor line up very accurately to ensure that passengers get in and out safely. The system is economical in energy consumption and causes minimal noise due to the material of the suspension traction media (STM) in the elevator and in the entire building. Real comfort.

## Suspension Traction Media (STM)

The STM consists of thin metal cables sheathed in a non-circular polyurethane jacket. They replace conventional steel cables, weigh less, require less space and run quieter. Thanks to the STM, there is room for the machine and drive directly in the elevator hoistway, allowing hydraulic-sized shafts to be utilized.

## Inspection and test panel

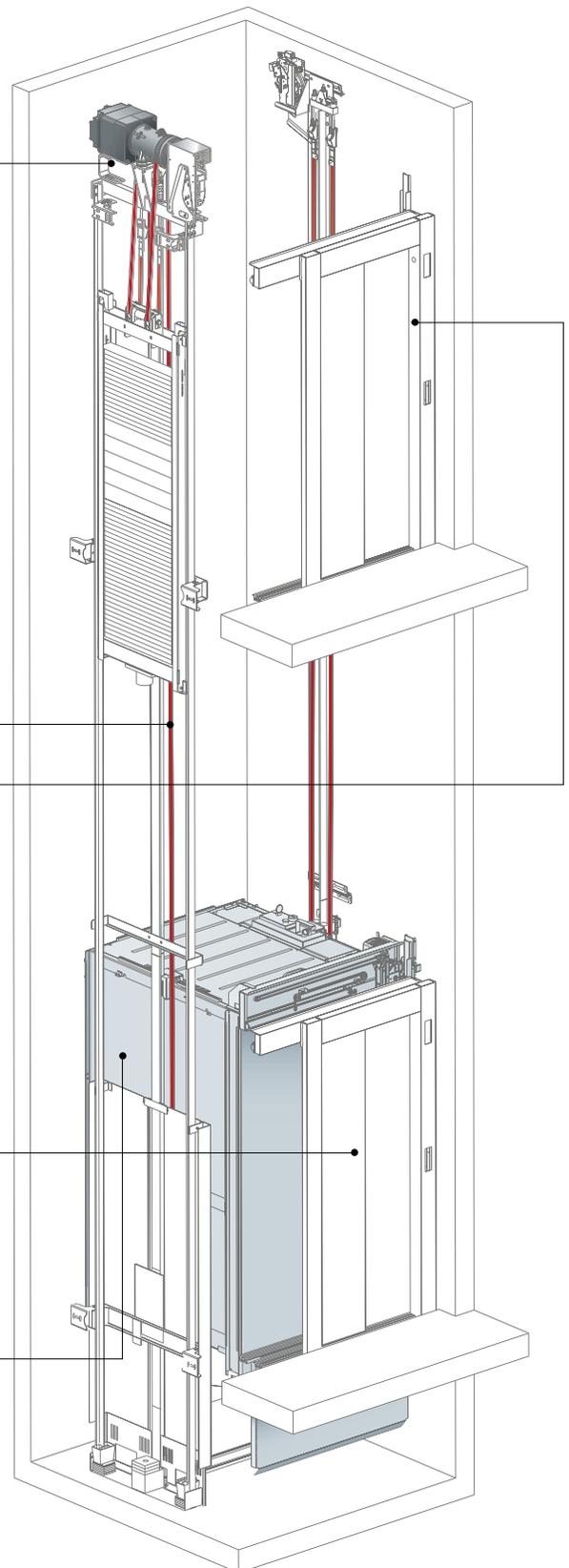
In the Schindler 3300, the inspection and test panel is built directly into a standard door frame at the top landing. This highly functional solution is a vital achievement. It simplifies elevator installation, provides practical handling and saves space. Optional remote control space available as well.

## Doors

Doors are equipped with a frequency-controlled drive for fast and reliable operations. Two-speed side-opening doors opening to the left or right, as well as single-speed center-opening doors are available.

## Cab

Technology does not take much space in the Schindler 3300. This is an obvious benefit that allows hydraulic elevator-sized shafts to be utilized while providing a larger cab interior. This is a striking advantage.

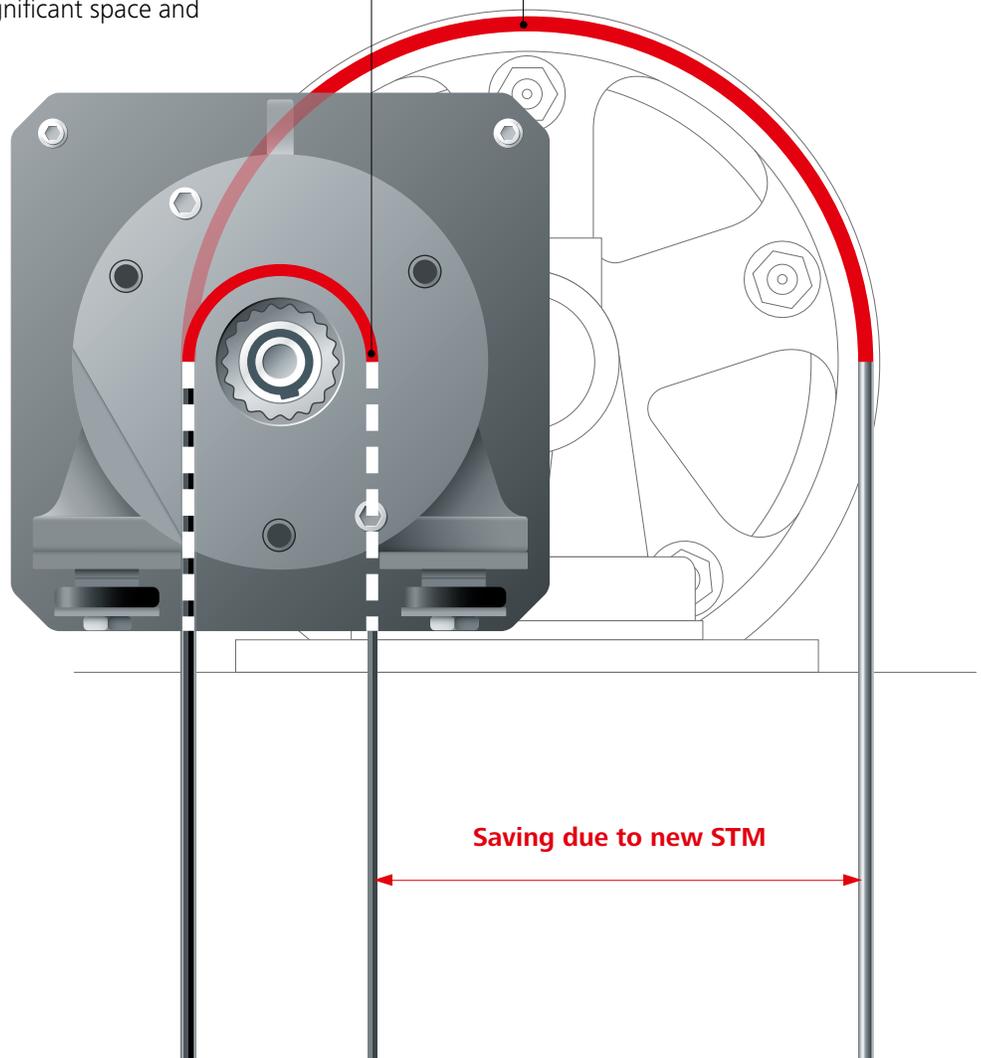


**Previously: steel cables**

Steel cables are relatively inelastic. They need a traction sheave diameter of at least 12 inches with the cable diameters required for elevators. The complete conventional motor, including drive gears, must be large enough to match. A system that requires space.

**New: Suspension Traction Media (STM)**

Suspension traction media are flexible. They use a traction pulley that is only 5.9" in diameter. A much smaller sheave also means the system requires a smaller motor resulting in a significant space and energy savings.



# We put a premium on design, without charging a premium

All around the world, architects and designers are discovering a new creative outlet. Conceptualized by an Italian designer, the Schindler 3300's sleek cab design is impressive yet understated. Simple, yet refined, with design palettes to suit any style or building décor.

- Cab walls are available in stainless steel, powder coat or a choice of plastic laminates.
- The unique ceiling design is available in a choice of brushed stainless steel or silver-metallic powder coat.
- Ceiling lighting is refined, yet illuminating, with compact fluorescent light fixtures.
- The elegant curved handrail is available in painted, brushed or polished aluminum finishes.
- Landing doors are available in brushed stainless steel, various colors of durable powder coat or primer. Doors are available in center-opening or side-opening configurations, with left-hand or right-hand openings.
- Hall fixtures are composed of tempered safety glass panels, back-printed in white, to give the Schindler 3300 a contemporary, modern look.

Note: For more information on the high fashion details we designed into the Schindler 3300, be sure to ask for a copy of our Deco brochure, which includes all décor and accessory options. The car specifications, options and colors in this brochure are representative only and are subject to change. Sample shown may vary from the original in color and material.



Laminate – Long Beach Blue



Brushed stainless steel



Landing doors - Available in 11 powder coat colors or stainless steel



Hall fixtures



Painted



Brushed



Polished

Handrails



Ceiling lighting

# The perfect fusion of people-centered design and technology

The features and components of the Schindler 3300 are smartly designed to enhance the rider experience, improve safety and minimize downtime. From the low-energy multiprocessor controls to the stylish, tempered safety glass operating panels, you'll find the latest technological advances.

## Control

The control system is based on low-energy multiprocessor technology. The compact main inspection and test panel of the decentralized system is integrated in the door frame.

## Control functions

- Miconic® NX microprocessor
- On-board diagnostics, self testing
- Light curtain
- Overload detection
- Two-way, hands-free emergency communication
- Firefighter's Service operation
- Independent service
- Automatic car light
- Automatic evacuation to nearest floor.

## Schindler Remote Monitoring™

Supports Schindler predictive maintenance, anticipating difficulties before they occur and allowing rapid response to service calls.

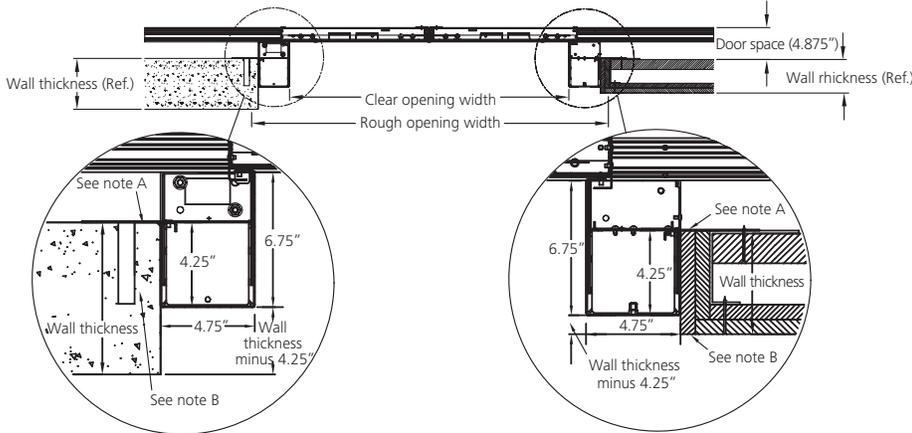
## Fixtures

The stylish, tempered safety glass panels are back-printed in white to give the elevator a contemporary, modern look while meeting all applicable codes. Please refer to our deco brochure for more information on all decor and accessory options.

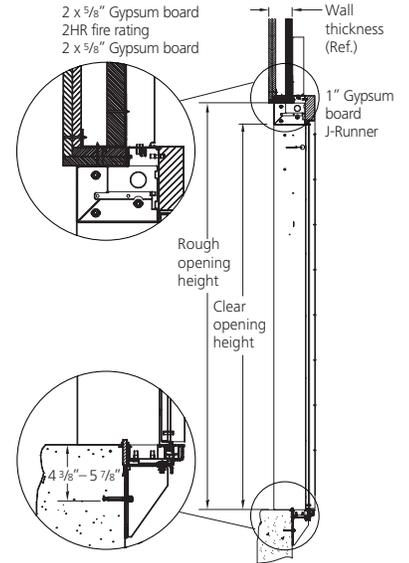


# Schindler 3300 MRL Traction Elevator Entrance details

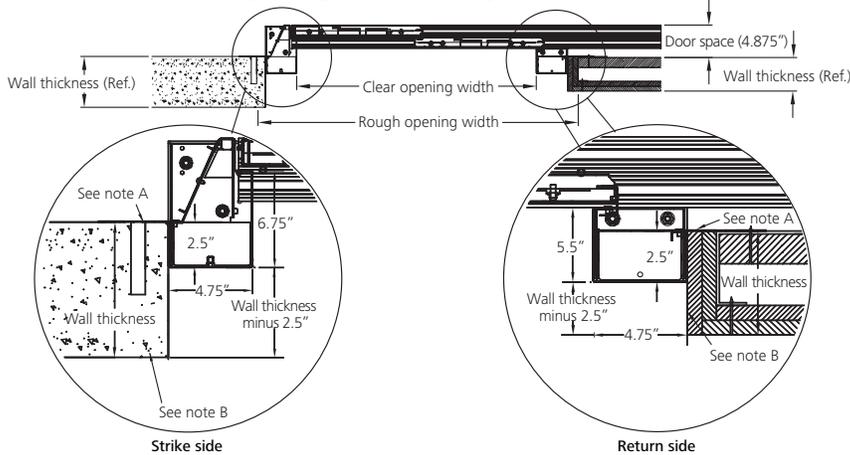
## Single-speed center opening (SSCO) side jamb



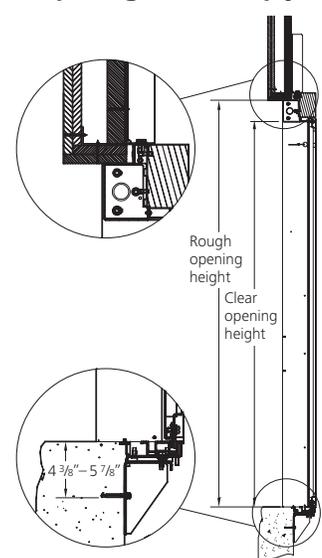
## Single-speed center opening (SSCO) top jamb



## Two-speed side opening (2SSO) side jamb



## Two-speed side opening (2SSO) top jamb



Note A: Fire rating is maintained by the interface at this area only.

Note B: Finished wall by others. No fire rating at this point. Wall thickness can vary, as jamb thickness remains constant.

## Dimensions

	Capacity lbs (kg)	Door Type	Clear Opening Width x Height ft (mm)	Rough Opening Width x Height ft (mm)
	2100 (950)	2SSO	3'-0" x 7'-0" (915 x 2134)	4'-4" x 7'-8" (1321 x 2337)
	2500 (1135)	2SSO	3'-6" x 7'-0" (1067 x 2134)	4'-10" x 7'-8" (1473 x 2337)
		SSCO	3'-6" x 7'-0" (1067 x 2134)	4'-10" x 7'-8" (1473 x 2337)
General Purpose	3000 (1360)	2SSO	3'-6" x 7'-0" (1067 x 2134)	4'-10" x 7'-8" (1473 x 2337)
		SSCO	3'-6" x 7'-0" (1067 x 2134)	4'-10" x 7'-8" (1473 x 2337)
	3500 (1590)	2SSO	3'-6" x 7'-0" (1067 x 2134)	4'-10" x 7'-8" (1473 x 2337)
		SSCO	3'-6" x 7'-0" (1067 x 2134)	4'-10" x 7'-8" (1473 x 2337)



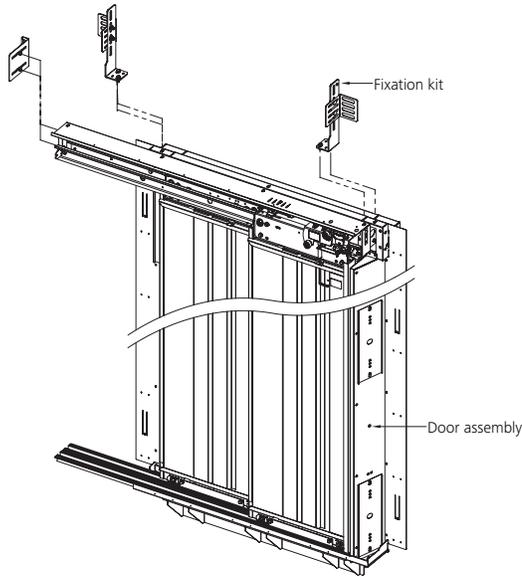
**Schindler**

# Schindler 3300 MRL Traction Elevator

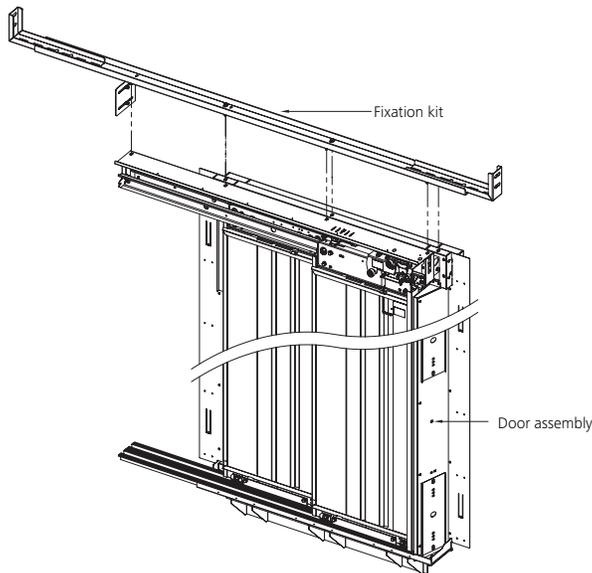
## Entrance details

### Landing door mounting options

Landing doors



Landing door overview



### General requirements

Requirements for installation vary by type of equipment selected. These general requirements will serve as a guide to assist you in preparing your building for the installation of Schindler elevators. All designs, clearances, construction, workmanship and materials, unless specifically excepted, shall be in accordance with the requirements of the latest published ASME A17.1 Code for electric traction elevators (refer to Part 2) plus applicable building code and local codes. State or local requirements must be used if more stringent.

**Items to be provided** — To complete the installation, the following items must be considered, which are not included in the elevator contract:

### Entrances

1. Hoistway walls are to have a fire-resistance rating, per ASME A17.1 Rule 2.1.1.1.
2. Furnishing, installing and maintaining the required fire rating of elevator hoistway walls, including the control spaces and also the penetration of fire wall by elevator fixture boxes (if applicable), is not the responsibility of the elevator contractor.
3. The interface of the elevator wall with the hoistway entrance assembly shall be in strict compliance with the elevator contractor's requirements.
4. Entrance wall and finished floor are not to be constructed until after door frames and sills are in place. All sill supports must be in place prior to material delivery.
  - a. Where front walls are reinforced concrete, concrete openings must be minimum 16" (406 mm) wider [8" (203 mm) on each side] and 8" (203 mm) higher than the clear opening.
  - b. Where drywall or sheet rock construction is used for front walls, it shall be of sufficient strength to maintain the doors in true lateral alignment. Drywall contractor to coordinate with the elevator contractor.
  - c. Door frames are to be anchored to walls and properly grouted in place to maintain legal fire rating (masonry construction).
5. Filling and grouting around entrance by others.
6. Where openings occur, all walls must be plumb, and sill supports must be level and flush with hoistway walls.

### Approvals

Project \_\_\_\_\_  
 Location \_\_\_\_\_  
 Contract # \_\_\_\_\_  
 Approved \_\_\_\_\_  
 Date \_\_\_\_\_

### Schindler 3300 entrance frame and door finish

- #4 Brushed stainless steel at floors \_\_\_\_\_  
 Baked enamel (color) \_\_\_\_\_  
 at floors \_\_\_\_\_

### Schindler 3300 door opening front

- Left-hand       Right-hand       Center

### Schindler 3300 door opening rear

- Left-hand       Right-hand       Center.

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Schindler prints with vegetable-based ink on paper containing post-consumer waste fiber.





Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

**PUMP COMPANY**

Zoeller Family of Water Solutions™

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 SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961  
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[www.zoeller.com](http://www.zoeller.com)

**COMPARE THESE FEATURES**

- Non-clogging bronze vortex impeller design
- Durable cast construction. Cast iron switch case, base, motor and pump housing
- Castings - Cast iron class 30 (30,000# tensile strength). Impeller, bronze class C89833
- Corrosion-resistant powder coated epoxy finish
- 20 ft. UL Listed 3-wire neoprene cord and plug. Longer cords available in lengths of 25-35-50 feet.
- Motor - 60 Hz, 3450 RPM, oil-filled, hermetically sealed, automatic reset thermal overload protection (1 Ph only).
- Upper & lower ball bearings running in bath of oil.
- Carbon and ceramic shaft seal
- Maximum temperature for effluent or dewatering, 130°F - 54°C (ED 140°F - 60°C).
- Major width 12¾" Height 19<sup>5</sup>/<sub>16</sub>" (Single seal pumps)
- No screens to clog.
- Square Ring & Gasket - Neoprene
- Stainless steel screws, bolts, float rod, handle guard, arm and seal assembly
- Passes ¾" spherical solids
- 1½" NPT discharge with 2" or 3" flange available
- Automatic units available with float operated, submersible (NEMA 6) 2-pole mechanical switch. On point 14¾" - Off point 5"
- Available in single or double seal designs.
- 100% of units are computerized tested.

**MODELS 4161-4163-4165**

**DOUBLE SEAL PUMPS (Nonauto only)**

- Protects motor from seal leaks
- Improved bearing lubrication
- Helps eliminate seal and bearing damage from dry runs
- Major width 12¾" Height 21<sup>3</sup>/<sub>16</sub>"

**Note:** The sizing of effluent systems normally requires variable level float(s) controls and properly sized basins to achieve required pumping cycles or dosing timers with nonautomatic pumps.

**AUTOMATIC UNITS NOT RECOMMENDED FOR USE IN EFFLUENT SYSTEMS.**

**161 - 163 - 165 Single Seal Series**  
**4161 - 4163 - 4165 Double Seal Series**  
 (For Pump Prefix Identification see News & Views 0052)



**HIGH HEAD**  
**"FLOW-MATE"**

FOR SEPTIC TANK • LOW PRESSURE PIPE (LPP)  
 AND ENHANCED FLOW STEP SYSTEMS

**EFFLUENT**

OR DEWATERING PUMP • SUBMERSIBLE

1½" NPT DISCHARGE STANDARD • 2" AND 3" NPT FLANGE AVAILABLE



**SINGLE SEAL PUMP**



**DOUBLE SEAL PUMP**



**MODELS AVAILABLE**

• Automatic (Single Seal Only) or Nonautomatic

**161-163 and 4161-4163 Series**

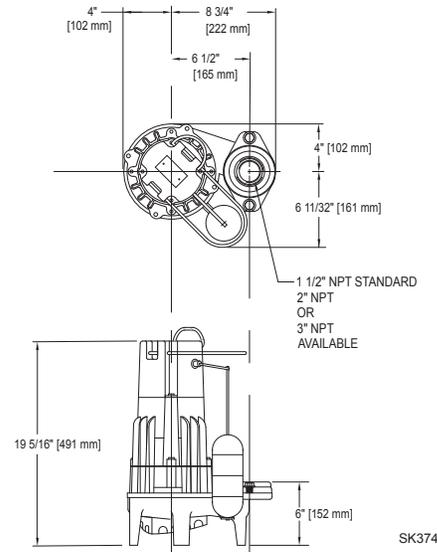
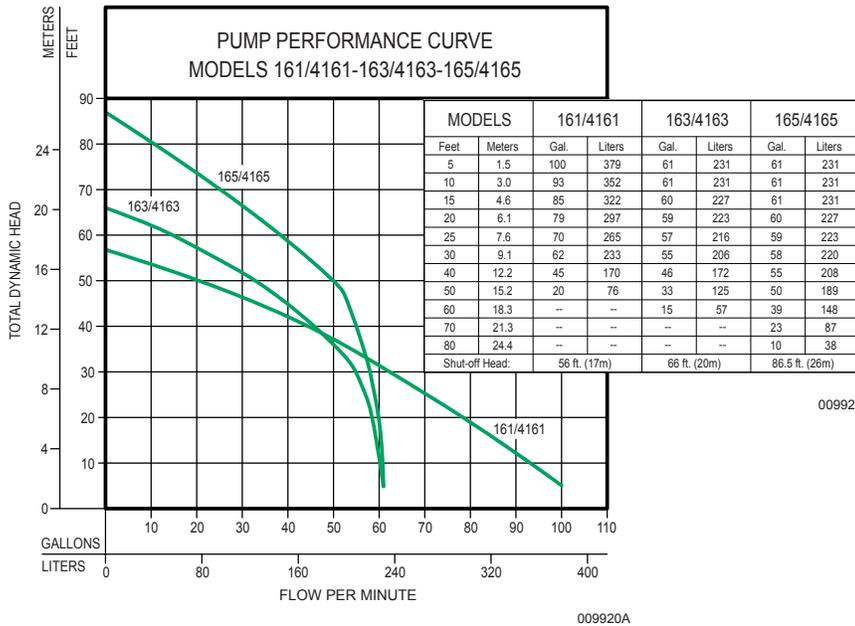
- ½ HP, 1 Ph, 115V, 200-208V or 230V
- ½ HP, 3 Ph, 200-208V, 230V, 460V or 575V

**165 and 4165 Series**

- 1 HP, 1 Ph, 200-208V or 230V
- 1 HP, 3 Ph, 200-208, 230V, 460V or 575V

\* NOTE: No UL listing or approval for 200-208V 1Ph or Extra Duty (ED) pumps. See back page for UL & CSA Listings.

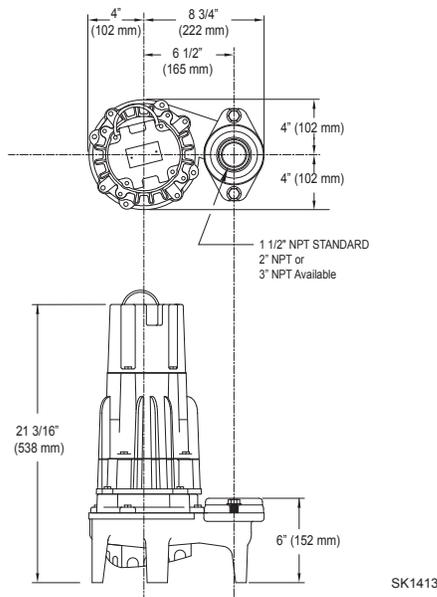
**Single Seal Automatic Design  
Weight 80 lbs.**



**Standard all models - 20 ft. cord - 1/2 HP**

161 MODELS	4161 MODELS	Control Selection						Listings	
Single Seal	Double Seal	Volts	Ph	Mode	Amps	Simplex	Duplex	cCSAus	UL
M161	-----	115	1	Auto	15.5	1	-----	Y	Y
N161	N4161	115	1	Non	15.5	2 or 3 & 5	4 & 5	Y	Y <sup>(1)</sup>
D161	-----	230	1	Auto	7.5	1	-----	Y	Y
E161	E4161	230	1	Non	7.5	2 or 3 & 5	4 & 5	Y	Y
* H161	-----	200-208	1	Auto	8.8	1	-----	Y	N
* I161	* I4161	200-208	1	Non	8.8	2 or 3 & 5	4 & 5	Y	N
* J161	* J4161	200-208	3	Non	6.4	3 & 5	4 & 5	Y	Y
* F161	* F4161	230	3	Non	5.2	3 & 5	4 & 5	Y	Y
* G161	* G4161	460	3	Non	2.9	3 & 5	4 & 5	Y	Y
* BA161	* BA4161	575	3	Non	2.4	3 & 5	4 & 5	Y	N

**Double Seal Design  
Weight 87 lbs.**



**Standard all models - 20 ft. cord - 1/2 HP**

163 MODELS	4163 MODELS	Control Selection						Listings	
Single Seal	Double Seal	Volts	Ph	Mode	Amps	Simplex	Duplex	cCSAus	UL
M163	-----	115	1	Auto	15.0	1	-----	Y	Y
N163	N4163	115	1	Non	15.0	2 or 3 & 5	4 & 5	Y	Y <sup>(1)</sup>
D163	-----	230	1	Auto	7.5	1	-----	Y	Y
E163	E4163	230	1	Non	7.5	2 or 3 & 5	4 & 5	Y	Y
* H163	-----	200-208	1	Auto	8.5	1	-----	Y	N
* I163	* I4163	200-208	1	Non	8.5	2 or 3 & 5	4 & 5	Y	N
* J163	* J4163	200-208	3	Non	6.0	3 & 5	4 & 5	Y	Y
* F163	* F4163	230	3	Non	4.8	3 & 5	4 & 5	Y	Y
* G163	* G4163	460	3	Non	2.9	3 & 5	4 & 5	Y	Y
* BA163	* BA4163	575	3	Non	2.4	3 & 5	4 & 5	Y	N

**Standard all models - 20 ft. cord - 1 HP**

165 MODELS	4165 MODELS	Control Selection						Listings	
Single Seal	Double Seal	Volts	Ph	Mode	Amps	Simplex	Duplex	cCSAus	UL
D165	-----	230	1	Auto	10.2	1	-----	Y	Y
E165	E4165	230	1	Non	10.2	2 or 3 & 5	4 & 5	Y	Y
* H165	-----	200-208	1	Auto	12.6	1	-----	Y	N
* I165	* I4165	200-208	1	Non	12.6	2 or 3 & 5	4 & 5	Y	N
* J165	* J4165	200-208	3	Non	7.5	3 & 5	4 & 5	Y	Y
* F165	* F4165	230	3	Non	7.4	3 & 5	4 & 5	Y	Y
* G165	* G4165	460	3	Non	3.7	3 & 5	4 & 5	Y	Y
* BA165	* BA4165	575	3	Non	3.0	3 & 5	4 & 5	Y	N

**SELECTION GUIDE**

1. Integral float operated mechanical switch, no external control required.
2. For automatic use single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
3. See FM1228 for correct model of simplex control panel.
4. See FM0712 for correct model of duplex control panel.
5. Variable level control switch 10-0743 used as control activator, specify simplex (3) float or duplex (3) or (4) float system. (Refer to FM0526)

**CAUTION**

All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electric Code (NEC) and the Occupational Safety and Health Act (OSHA).

\* No Molded Plug  
(1) UL Listed unit available with 20 Amp plug.

For information on additional Zoeller products refer to catalog on Piggyback Variable Level Float Switches, FM0477; Electrical Alternator, FM0486; Mechanical Alternator, FM0495; Alarm Package, FM0732; and Sump/Sewage Basins, FM0487.

**RESERVE POWERED DESIGN**

For unusual conditions a reserve safety factor is engineered into the design of every Zoeller pump.

# General Data

## HP-1

**Table 1. General data — 12½ - 20 tons**

	12½ Tons Downflow & Horizontal Units	15 Tons Downflow & Horizontal Units	20 Tons Downflow & Horizontal Units
	WS*150E3,4,W	WS*180E3,4,W	WS*240E3,4,W
<b>Cooling Performance<sup>(a)</sup></b>			
Gross Cooling Capacity	148,000	177,000	249,000
EER <sup>(b)</sup>	10.6	10.6	9.7
Nominal Airflow/ARI Rated Airflow (CFM)	5000	6000 / 5300	8000 / 6400
ARI Net Cooling Capacity	146,000	170,000	240,000
IEER <sup>(c)</sup> (One Speed Fan / Two or Variable Speed Fan)	12/13.5	12/13.5	11.5/12.0
System Power (kW)	13.77	16.04	25.47
<b>Heating Performance<sup>(a)</sup></b>			
High Temp. Btuh Rating	136,000	170,000	210,000
COP	3.2	3.2	3.2
System Power (kW)	12.46	15.57	19.23
Low Temp. Btuh Rating	75,000	90,000	120,000
COP	2.1	2.1	2.1
System Power (kW)	10.47	12.56	16.75
<b>Compressor</b>			
Number/Type	2 / Scrolls	2 / Scrolls	2 / Scrolls
<b>ARI Sound Rating (BELS)<sup>(d)</sup></b>			
	9.2	9.2	9.4
<b>Outdoor Coil — Type</b>			
Refrigerant Control	Hi-Performance Expansion Valve	Hi-Performance Expansion Valve	Hi-Performance Expansion Valve
Tube Size (in.) OD	0.3125	0.3125	0.3125
Face Area (sq. ft.)	35.20	35.20	42.53
Rows/FPI	3 / 16	3 / 16	3 / 16
<b>Indoor Coil — Type</b>			
Tube Size (in.) ID	Hi-Performance 0.3125	Hi-Performance 0.3125	Hi-Performance 0.3125
Face Area (sq. ft.)	26.00	26.00	31.42
Rows/FPI	3 / 15	4 / 15	4 / 15
Refrigerant Control	Short Orifice	Short Orifice	Short Orifice
Drain Connection Number/Size (in.)	1/1.00 NPT	1/1.00 NPT	1/1.00 NPT
<b>Outdoor Fan — Type</b>			
Number Used/Diameter (in.)	Propeller 2 / 26	Propeller 2 / 26	Propeller 2 / 28
Drive Type/No. Speeds	Direct / 1	Direct / 1	Direct / 1
CFM	11,100	10,800	14,800
Number Motors/HP	2 / 0.5	2 / 0.5	2 / 1.0
Motor RPM	1,100	1,100	1,125



General Data

HP-1 (Cont.)

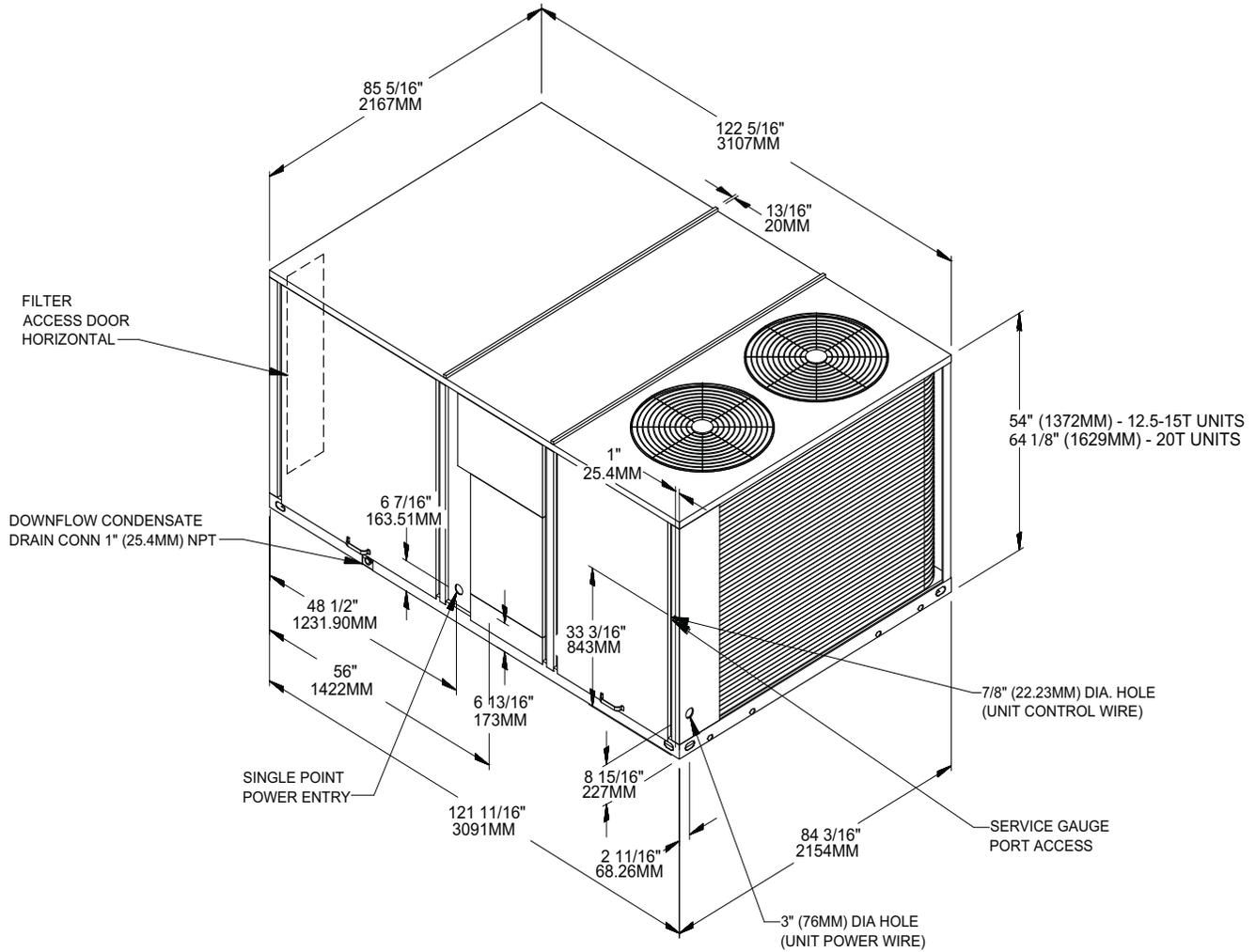
Table 1. General data – 12½ - 20 tons (continued)

	12½ Tons Downflow & Horizontal Units	15 Tons Downflow & Horizontal Units	20 Tons Downflow & Horizontal Units
	WS* 150E3,4,W	WS* 180E3,4,W	WS* 240E3,4,W
<b>Indoor Fan - Type</b>	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)	1 / 18x18	1 / 18x18	1 / 18x18
Drive Type/No. Speeds	Belt / 1	Belt / 1	Belt / 1
Number Motors	1	1	1
Motor HP (Standard/Oversized)	3.0 / 5.0	3.0 / 5.0	5.0 / 7.5
Motor RPM (Standard/Oversized)	1740 / 3,450	1740 / 3,450	3450 / 3,470
Motor Frame Size (Standard/Oversized)	145T / 145T	145T / 145T	145T / 184T
<b>Filters - Type Furnished</b>	Throwaway	Throwaway	Throwaway
Number Size Recommended			
Downflow	(4)20x20x2	(4)20x20x2	(8)20x20x2
Horizontal	(4)20x25x2	(4)20x25x2	(4)20x16x2
	(8)20x25x2	(8)20x25x2	(12)20x20x2
<b>Refrigerant Charge Pounds of R-410A<sup>(e)</sup></b>			
Downflow	14 / 14.5	16.5 / 15.9	20.0 / 20.7
Horizontal	13.2 / 13.3	17 / 15.9	

(a) Cooling Performance is rated at 35°C (95°F) ambient, 26.7°C (80°F) entering dry bulb, 19.4°C (67°F) entering wet bulb. Heating Performance is rated at 20°C (68°F) ambient, 8.3°C (47°F) entering dry bulb, 6.1°C (43°F) entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal airflow. Rated in accordance with ARI Standard 210/240 or 340/360.  
 (b) EER is rated at ARI conditions and in accordance with DOE test procedures.  
 (c) Integrated Energy Efficiency Ratio (IEER) is rated in accordance with AHRI standard 210/240 or 360.  
 (d) Sound Rating shown is tested in accordance with ARI Standard 270 or 370.  
 (e) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

# Dimensional Data

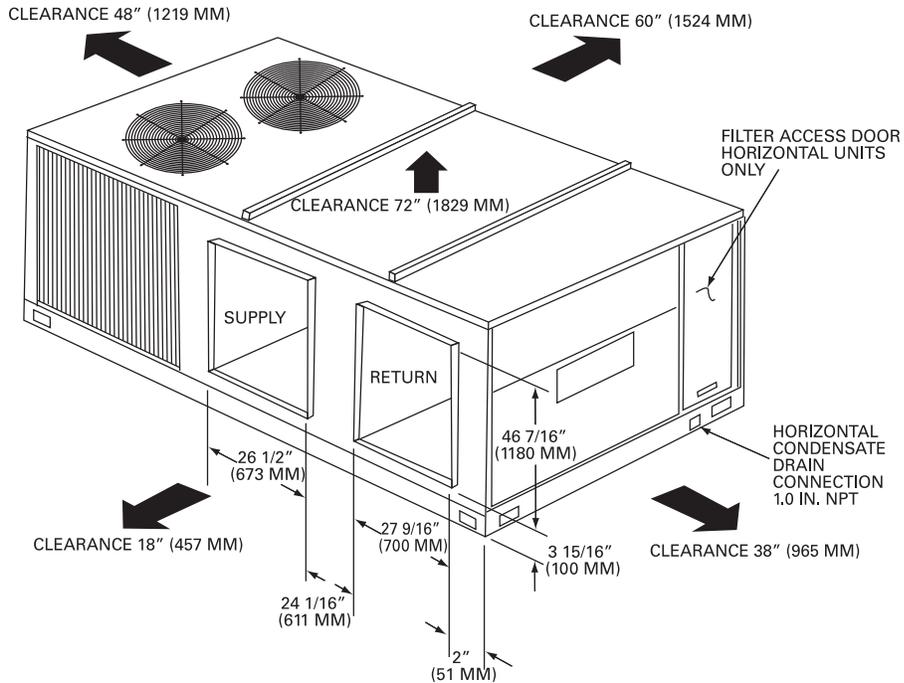
Figure 2. Heat pump models - 12½ - 20 tons



\* All dimensions are in inches/millimeters.

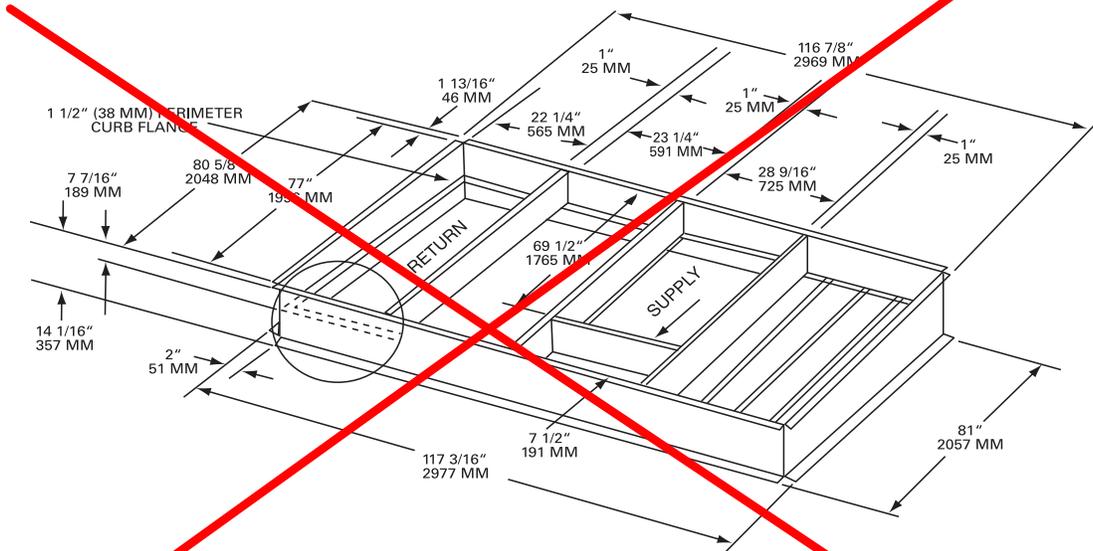
## Dimensional Data

**Figure 3. Heat pump models - 12½ - 20 tons**



\* All dimensions are in inches/millimeters.

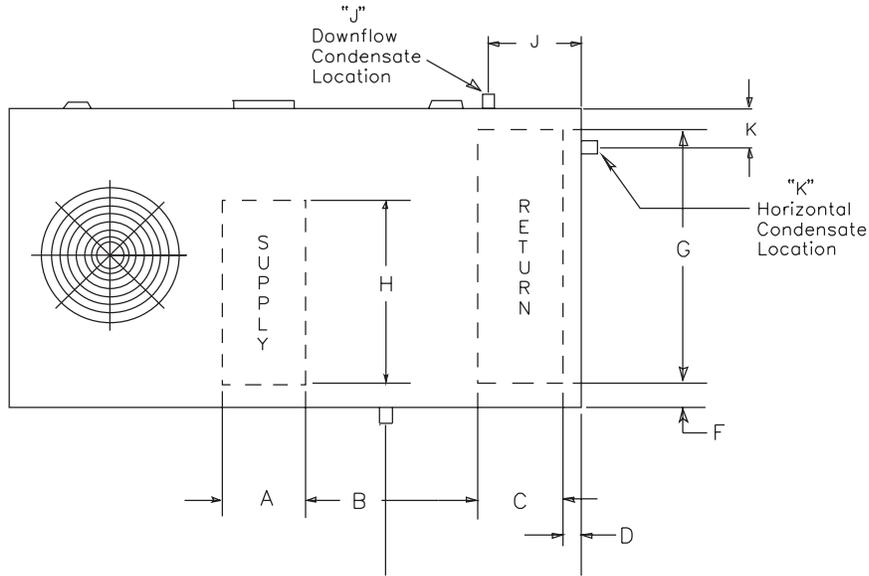
**Figure 4. Heat pump models - 12½ - 20 tons**



\* All dimensions are in inches/millimeters.

## Dimensional Data

**Figure 7. Downflow & horizontal condensate locations**



**Table 26. Heat pump units**

Tons	Downflow Only							Condensate Drain Size	Condensate Drain Location	
	A	B	C	D	F	G	H		Downflow	Horizontal
									J	K
12½, 15, 20	26 7/16	28 3/4	19 15/16	4 1/4	4 1/4	76 5/16	68 11/16	1 NPT	26 3/4	5 3/8

**Table 27. Swing clearances**

Unit Model #	A	B	C	D	E
<del>WSD 150-240</del>	<del>29 1/2</del>	<del>50</del>	<del>60 1/2</del>	<del>18 1/2</del>	<del>N/A</del>
WSH 150-240	29 1/2	N/A	38 1/2	18 1/2	14

**Note:** All dimensions are in inches.

TOP VIEW SHOWING THROUGH THE BASE  
ELECTRICAL UTILITY LOCATIONS AND ACCESS PANEL SWING CLEARANCES.

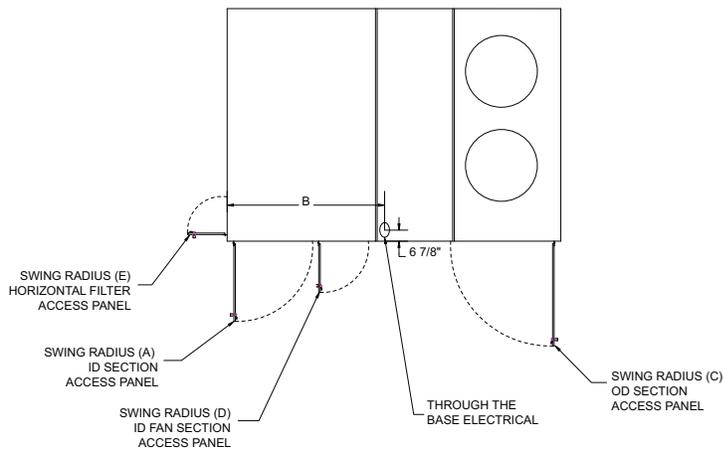


Figure 8. Fresh air hood (horizontal units)

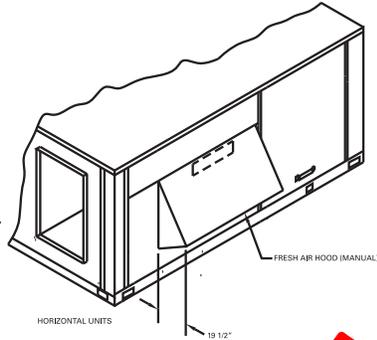


Figure 9. Fresh air hood (downflow units)

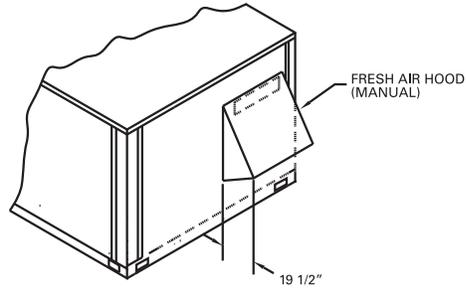


Figure 10. Power exhaust - downflow economizers

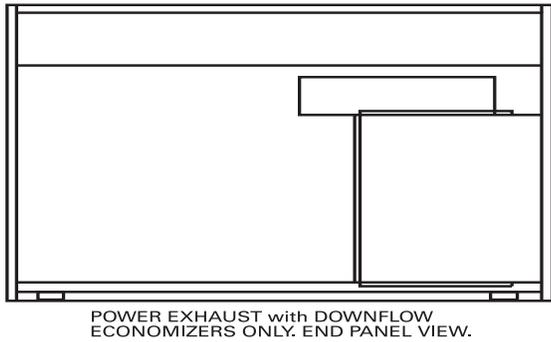


Figure 11. Power exhaust - downflow economizers - side view

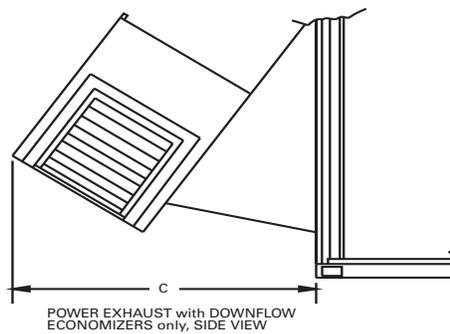


Figure 12. Economizer - horizontal units

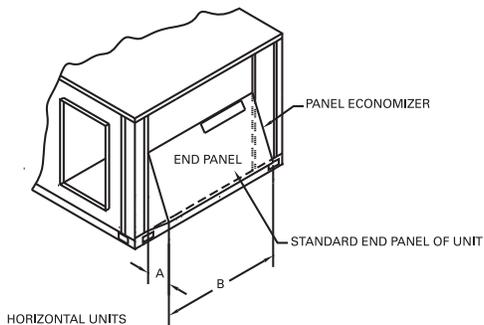
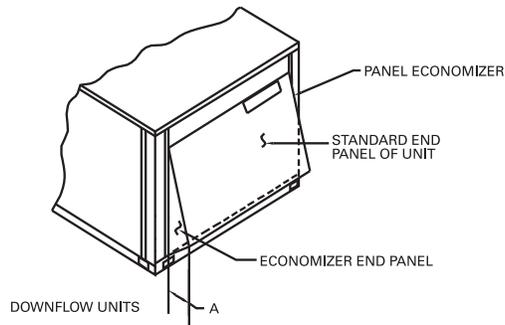


Figure 13. Economizer - downflow units



**Note:** When applying economizer to horizontal units, connected ductwork must be run full size to allow proper operation of economizer damper.

Table 28. Power exhaust dimensions

Unit Model #	A	B(a)	C(b)
WS* 150-240	19½	64¾	39

(a) Horizontal dimension only. Downflow economizer is width of end panel.

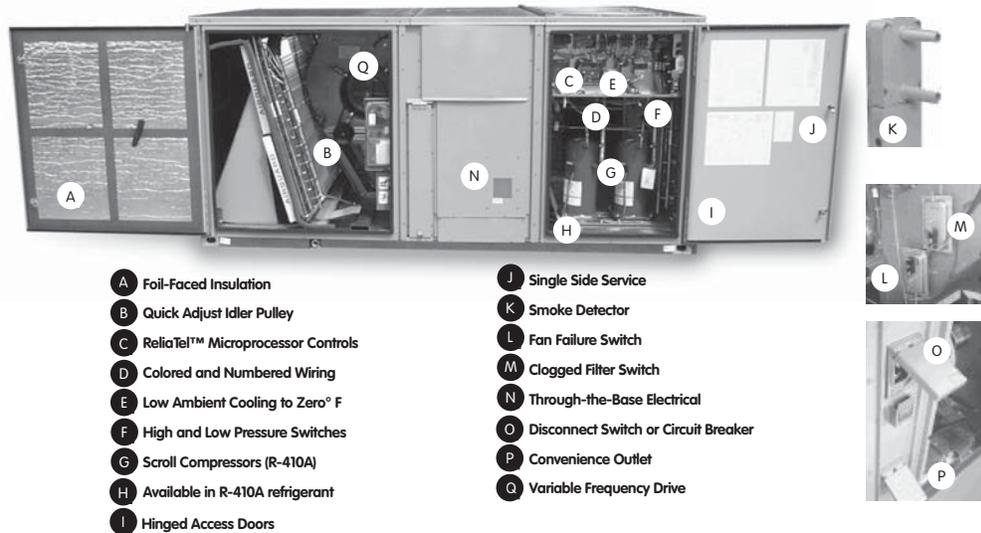
(b) Power exhaust is applied on downflow economizer only.



# Features and Benefits

Voyager has the features and benefits that make it first class in the light commercial rooftop market. Designed with input from field contractors and engineers, its U-shaped airflow performance is outstanding.

**Figure 1. Voyager features**



## Standard and Optional Features at a Glance

### Standard Features

- 2" throwaway filters
- 5 year Limited Compressor Warranty
- 1 year Limited Parts Warranty
- Anti-Short Cycle Timer
- Belt Drive Motors
- Colored and Numbered Wiring
- Crankcase Heaters
- Dedicated Airflow
- Easy Access Low Voltage Terminal Board (LTB)
- Foil-Faced and Edge Captured Insulation
- High Pressure Cutout
- IAQ Sloped Condensate Drain Pan
- Liquid Line Refrigerant Drier
- Low Ambient Cooling to 0°F
- Operating Charge of R-410A
- Patented Hybrid Condenser Coil for Easy Cleaning
- Phase Monitor
- Quick Access Panels
- Quick Adjust Idler Arm Pulley
- ReliaTel™ Microprocessor Controls
- Single Point Power
- Single Side Service
- Standardized Components

- U-shaped Airflow Pattern
- Variable Frequency Drive (Multispeed Indoor Fan and Single Zone VAV)

### Factory Installed Options

- 2" MERV 8 or MERV 13 Filters<sup>5</sup> with Filter Removal Tool
- Black Epoxy Pre-Coated Coils
- CO<sub>2</sub> Sensor Wiring (Wiring Only)<sup>15</sup>
- Condensate Overflow Switch
- Fault Detection & Diagnostics (FDD)
- High Efficiency Motors<sup>5</sup>
- High Short Circuit Current Rated (SCCR) Electrical Subsystem<sup>16</sup>
- Hinged Access Doors
- Human Interface - 5 inch Color Touchscreen
- Multi-Speed Fan
- Powered or Unpowered Convenience Outlet<sup>4</sup>
- Single Zone Variable Air Volume (SZVAV)
- Stainless Steel Drain Pan
- Supply and/or Return Air Smoke Detector<sup>2, 9</sup>
- Through the Base Electrical with Circuit Breaker<sup>10, 11</sup>
- Through the Base Electrical With Disconnect Switch<sup>6, 10, 11</sup>
- Through the Base Utilities Access

### Factory or Field Installed Options

- BACnet™ Communication Interface<sup>1</sup>
- Barometric Relief<sup>1</sup>
- Clogged Filter/Fan Failure Switch<sup>2, 5</sup>
- Discharge Air Sensing Kit<sup>2, 5</sup>
- Economizer - Standard, Downflow<sup>1</sup>
- Electric Heaters<sup>5, 7, 11</sup>
- Froststat™<sup>2, 5</sup>
- Indoor Fan Motor Shaft Grounding Ring<sup>14</sup>
- LonTalk® Communications Interface<sup>5</sup>
- Low Leak Economizer - Downflow
- Oversized Motors<sup>5</sup>
- Reference or Comparative Enthalpy<sup>3, 5</sup>
- ReliaTel Options Module<sup>8</sup>
- Tool-less Hail Guards<sup>5</sup>
- Trane Communications Interface (TCI)<sup>5, 13</sup>

### Field Installed Options

- CO<sub>2</sub> Sensor
- Digital Display Zone Sensor
- Dual Thermistor Remote Zone Sensor
- Economizer - Standard, Horizontal
- High Static Drive
- Low Leak Economizer - Downflow & Horizontal
- Manual Outside Air Damper
- Motorized Outside Air Dampers
- Powered Exhaust
- Roof Curb (Downflow only)
- Remote Potentiometer

## Features and Benefits

---

- Ventilation Override Accessory<sup>2</sup>
- Zone Sensors and Remote Zone Sensors

**Note:** Explanation of Note<sup>1</sup> - Note<sup>16</sup> located in “Model Number Description,” p. 19.

### Other Benefits

- Cabinet Design Ensures Water Integrity
- Ease of Service, Installation and Maintenance
- Mixed Model Build Enables “Fastest in the Industry” Ship Cycle Times
- Outstanding Airflow Distribution
- ReliaTel Controls Benefits
- Rigorous Testing
- Unmatched Product Support
- Varitrac

## Outstanding Standard Features

### Anti-Short Cycle Timer

Provides a 3 minute minimum “ON” time and 3 minute “OFF” time for compressors to enhance compressor reliability by assuring proper oil return.

### Colored and Numbered Wiring

Save time and money tracing wires and diagnosing the unit.

### Compressors

Voyager contains the best compressor technology available to achieve the highest possible performance. Dual compressors are outstanding for humidity control, light load cooling conditions and system back-up applications. Dual compressors are available on all models.

### Condenser Coil

Voyager boasts a patent-pending 1+1+1 condenser coil (pictured right), permanently gapped for easy cleaning.



### Controls—ReliaTel

ReliaTel microprocessor controls provide unit control for heating, cooling and ventilating utilizing input from sensors that measure indoor and outdoor temperature and other zone sensors. ReliaTel also provides outputs for building automation systems and expanded diagnostics. For a complete list of ReliaTel offerings, refer to “Other Benefits,” p. 13.

### Conversion-less Units

The dedicated design units (either downflow or horizontal) require no panel removal or alteration time to convert in the field — a major cost savings during installation. Horizontal units come complete with duct flanges so the contractor doesn’t have to field fabricate them. These duct flanges are a time and cost saver.

### Crankcase Heaters

These band or insertion heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions. These are standard on all Voyager models.

### Discharge Line Thermostat

A bi-metal element discharge line thermostats installed as a standard feature on the discharge line of each system. This standard feature provides extra protection to the compressors against high discharge temperatures in case of loss of charge, extremely high ambient and other conditions which could drive the discharge temperature higher.

### Easy Access Low Voltage Terminal Board    Foil Faced Insulation



Voyager's Low Voltage Terminal Board is external to the electrical control cabinet. It is extremely easy to locate and attach the thermostat wire and test operation of all unit functions. This is another cost and time saving installation feature.



All panels in the evaporator section of the unit have cleanable foil-faced insulation. All edges are either captured or sealed to ensure no insulation fibers get into the airstream.

### Low Ambient Cooling

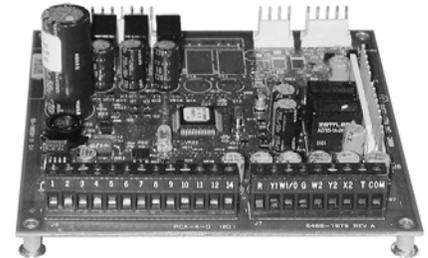
All Voyager microprocessor units have cooling capabilities down to 0°F as standard.

### Low Voltage Connections

The wiring of the low voltage connections to the unit and the zone sensors is as simple as 1-1, 2-2, and 3-3. This simplified system makes it easy for the installer to wire.

### Motors

All indoor fan motors are belt drive as standard.



### Pressure Cutouts

Low and high pressure cutouts are standard on all Voyager models.

### Phase Monitor

The phase monitor provides 100% protection for motors and compressors against problems caused by phase loss, phase imbalance, and phase reversal. It is also equipped with an LED that provides an ON or FAULT indicator.

### Quick-Access Panels

Remove three or fewer screws for access to the standardized internal components and wiring.

## Features and Benefits

---

### Quick-Adjust Idler Arm

With the Quick-Adjust Idler Arm (pictured right), the belt and sheaves can be quickly adjusted without moving the mounted fan motor. The result is a major savings in time and money.



### Single Point Power

A single electrical connection powers the unit.

### Single Side Service

Single side service is standard on all units.

### Sloped Drain Pans

Standard on every unit.

### Standardized Components

Components are placed in the same location on all Voyager units. Familiarize yourself with one Voyager and you are familiar with every Voyager. Due to standardized components throughout the Voyager line, contractors/owners can stock fewer parts.

### U-Shaped Airflow Pattern

The U-shaped airflow allows for improved static capabilities.

### Variable Frequency Drives - VFD (Multispeed Indoor Fan and SZ VAV Only)

Variable Frequency Drives are factory installed and tested to provide supply fan motor speed modulation, as well as modulating gas heat. VFDs on the supply fan, as compared to inlet guide vanes or discharge dampers, are quieter, more efficient, and are eligible for utility rebates. All VFDs are designed to allow bypass if required. Bypass control will simply provide full nominal airflow in the event of drive failure. Modulating gas heat models with VFDs allow tighter space temperature control with less temperature swing.

## Variety of Options

### Factory Installed Options

#### **Black Epoxy Pre-Coated Coils**

The pre-coated coils are an economical option for protection in mildly corrosive environments.

#### **CO<sub>2</sub> Sensor Wiring**

This unit wiring for field installed CO<sub>2</sub> sensors. Factory-installed CO<sub>2</sub> sensor wiring saves time and ensures proper unit connections for the field installed CO<sub>2</sub> sensor kits.

#### **Condensate Overflow Switch**

A condensate overflow switch is available to shut the unit down in the event that the condensate drain line becomes clogged. This option protects the unit from water overflowing from the drain pan and entering the base of the units.

#### **Fault Detection & Diagnostics (FDD)**

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the

~~following faults. Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.~~

### → High Efficiency Filtration

Voyager units offer a variety of high efficiency filtration options. MERV 8 and MERV 13 filters provide additional filtration beyond the capabilities of typical 2" throwaway filters. Also, when MERV 8 or MERV 13 filters are ordered, units come equipped with a filter removal tool.

### → High Efficiency Motors

This option is available with efficiency ratings from 86.5 up to 91.0. It is not available for all models.

### High Short Circuit Current Rating (SCCR)

Voyager rooftop units now have an optional high short circuit current rated electrical subsystem for units with an MOP above 60A. This option is a perfect fit for applications that need protection against high potential fault currents. This option also includes individual over current protection for each compressor and the indoor fan, as well as a dedicated over current protection to the condenser fan motor(s). When the high SCCR is ordered, the control box will have components separated into two sections - high and low voltage components.

### → Hinged Access Doors

These doors permit easy access to the filter, fan/heat, and compressor/control sections. They reduce the potential roof damage from screws or sharp access door corners.

### → Human Interface

The 5 inch Color Touchscreen Human Interface provides an intuitive user interface to the rooftop unit that speeds up unit commissioning, shortens unit troubleshooting times, and enhances preventative maintenance measures. The human interface includes several features such as:

- Data trending capabilities by means of time series graphs
- Historical alarm messages
- Real-time sensor measurements
- On board system setpoints
- USB port that enables the downloading of component runtime information as well as trended historical sensor data
- Customizable reports



### → Multi-Speed Indoor Fan System

Multi-speed indoor fan system is designed for use in applications for meeting the minimum requirement of CA Title 24. This system incorporates a multi-speed fan control to change the speed of the fan to 67% of full airflow based off compressor stages.

### → Powered or Unpowered Convenience Outlet

This option is a GFCI, 120V/15amp, 2-plug, convenience outlet, either powered or unpowered. This option can only be ordered when Through the Base Electrical with either the Disconnect Switch or Circuit Breaker option is ordered. This option is available on all models.

## Features and Benefits

---

### Single Zone VAV - One Zone Variable Air Volume Mode

**Note:** Single Zone VAV is designed to be used with a zone sensor. If a unit is configured for Single Zone VAV operation but is connected to a thermostat, the control will revert to multi-speed (2-Speed) indoor fan control. (See "Multi-Speed Indoor Fan System" above.)

Single Zone VAV is designed for use in single zone applications like gymnasiums, auditoriums, manufacturing facilities, retail box stores, and any large open spaces, where there is a lot of diversity in the load profile. Single Zone VAV (SZ VAV) is an ideal replacement to "yesterday's" constant volume (CV) systems, by reducing operating costs while improving occupant comfort. SZ VAV systems combine Trane application, control and system integration knowledge to exactly match fan speed with cooling and heating loads, regardless of the operating condition. Trane algorithms meet/exceed ASHRAE 90.1- 2010, SZ VAV energy-saving recommendations, and those of CA Title 24. The result is an optimized balance between zone temperature control and system energy savings. Depending on your specific application, energy savings can be as much as 20%.

**Note:** Building system modeling in energy simulation software like TRACE is recommended to evaluate performance improvements for your application.

SZ VAV is fully integrated into the ReliaTel Control system and is available today. It provides the simplest and fastest commissioning in the industry through proven factory installed, wired, and tested system controllers. All control modules, logic and sensors are factory installed, and tested to assure the highest quality and most reliable system available. This means no special programming of algorithms, or hunting at the jobsite for sensors, boards, etc. that need to be installed in the field. Single Zone VAV is a quick and simple solution for many applications and is available from your most trusted rooftop VAV system solution provider- Trane.

### Stainless Steel Drain Pan

For excellent corrosion and oxidation resistance, the optional stainless steel drain pan provides a cleanable surface that complement other IAQ solutions such as high efficiency filtration (MERV 8 or 13), and demand control ventilation (CO<sub>2</sub>).

### Supply, Return, and Plenum Air Smoke Detector

With this option (pictured right) installed, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. Return Air Smoke Detectors require minimum allowable airflow when used with certain models.

Supply and/or Return Smoke Detectors may not be used with the Plenum Smoke Detector.



### Through the Base Electrical/Horizontal Side Access with Circuit Breaker

This option is a factory installed thermal-magnetic, molded case, HACR Circuit Breaker with provisions for through the base electrical connections.

### Through the Base Electrical/Horizontal Side Access with Disconnect Switch

Factory installed 3-pole, molded case, disconnect switch with provisions for through the base electrical connections are available.

### Through the Base Utilities Access

An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through the base of the unit. This option will allow for field installation of liquid-tight conduit and an external, field-installed disconnect switch.

### Factory or Field Installed Options

? **BACnet™ Communications Interface**

The BACnet communications interface allows the unit to communicate directly with a generic open protocol BACnet MS/TP Network Building Automation System Controls.

? **Barometric Relief**

Designed to be used on downflow units, barometric relief is an unpowered means of relieving excess building pressure.

→ **Clogged Filter/Fan Failure Switch**

A dedicated differential pressure switch is available to achieve active fan failure indication and/or clogged filter indication.

? **Discharge Air Sensing Kit**

Provides true discharge air sensing in heating models. The kit is functional only with the ReliaTel™ Options Module.

**Economizer - Standard, Downflow**

Economizers are equipped with either dry bulb, reference, or comparative enthalpy sensing. These economizers provide free cooling as the outdoor temperature and/or humidity decreases. Correctly installed, they offer a valuable energy savings. Factory-installed economizers save time and ensure proper installation.

*Note: Factory-installed economizers require some field set-up.*

**Economizer - Low Leak, Downflow**

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (3 cfm/ft<sup>2</sup>@1" wg exterior air, 4 cfm/ft<sup>2</sup>@1" wg return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. This option can be paired with or without Fault Detection & Diagnostics (FDD) to meet current mandatory CA Title 24 requirements. Available on downflow units only. The economizers come with three control options, dry bulb and reference or comparative enthalpy (optional).

→ **Electric Heaters**

Electric heat modules are available within the basic unit. If ordering the Through the Base Electrical option with an Electrical Heater, the heater must be factory installed.

**Froststat™**

This capillary bulb embedded in the face of the evaporator coil monitors coil temperature to prevent evaporator icing and protect the compressor. Recommended for applications with low leaving air temperatures, low airflow and/or high latent load applications.

**Indoor Fan Motor Shaft Grounding Ring**

Shaft grounding rings are used on all VFD driven motors to provide a conductive discharge path away from the motor bearings to ground. Bearing Protection Rings shall be maintenance free circumferential rings of conductive micro fibers that discharge voltages to ground.

**LonTalk® Communications Interface**

The LonTalk communications interface allows the unit to communicate as a Tracer™ LCL-V device or directly with generic LonTalk Network Building Automation System Controls.

? **Oversized Motors**

Factory or field installed oversized motors are available for high static applications.

## Features and Benefits

---

### ~~Reference or Comparative Enthalpy~~

~~Measures and communicates humidity while maximizing comfort control.~~

### ~~ReliaTel Options Module (RTOM)~~

~~The RTOM monitors the supply fan proving, clogged filter, supply air temperature, exhaust fan setpoint, dehumidification setpoint, supply air tempering, Froststat™ and smoke detector.~~

### → Tool-less Hail Guards

Tool-less, hail protection quality coil guards (pictured right) shall be either factory or field-installed for condenser coil protection. This option protects the condenser coil from vandalism and/or hail damage.



### Trane Communication Interface (TCI)

Available factory or field installed. This module when applied with the ReliaTel™ easily interfaces with Trane's Integrated Comfort™ System.

## Field Installed Options

### ~~CO<sub>2</sub> Sensor - Demand Control Ventilation (DCV)~~

~~Demand-controlled ventilation (DCV) is a control strategy that responds to the actual demand (need) for ventilation by regulating the rate at which the HVAC system brings outdoor air into the building. A CO<sub>2</sub> sensor measures the concentration (parts per million, ppm) of CO<sub>2</sub> (Carbon Dioxide) in the air. As the CO<sub>2</sub> concentration changes, the outside air damper modulates to meet the current ventilation needs of the zone. The CO<sub>2</sub> sensor kit is available as a field installed accessory. Two field installed kits are offered; CO<sub>2</sub> sensor and wiring or CO<sub>2</sub> sensor only. The CO<sub>2</sub> Sensor only kit should be ordered with factory installed CO<sub>2</sub> sensor wiring. Factory installed CO<sub>2</sub> sensor wiring saves set-up time and ensures proper unit connections for the CO<sub>2</sub> sensor.~~

### → Dampers

0–25 percent manual or 0–50 percent motorized outside air dampers are available.

### ~~Digital Display Zone Sensor~~

~~The Digital LCD (Liquid Crystal Display) zone sensor has the look and functionality of standard zone sensors.~~

### ~~Economizer - Standard, Horizontal~~

~~Economizers are equipped with either dry bulb or reference or comparative enthalpy sensing. These economizers provide free cooling as the outdoor temperature and/or humidity decreases. Correctly installed, they offer a valuable energy savings.~~

### ~~Economizer - Low Leak, Downflow & Horizontal~~

~~This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (3 cfm/ft<sup>2</sup>@1" wg exterior air, 4 cfm/ft<sup>2</sup>@1" wg return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief.~~

### ? High Static Drive Accessory

Available on many models, this high static drive accessory extends the capability of the standard motor. Avoid expensive motors and operating costs by installing this optimized sheave accessory.

### ~~Powered Exhaust~~

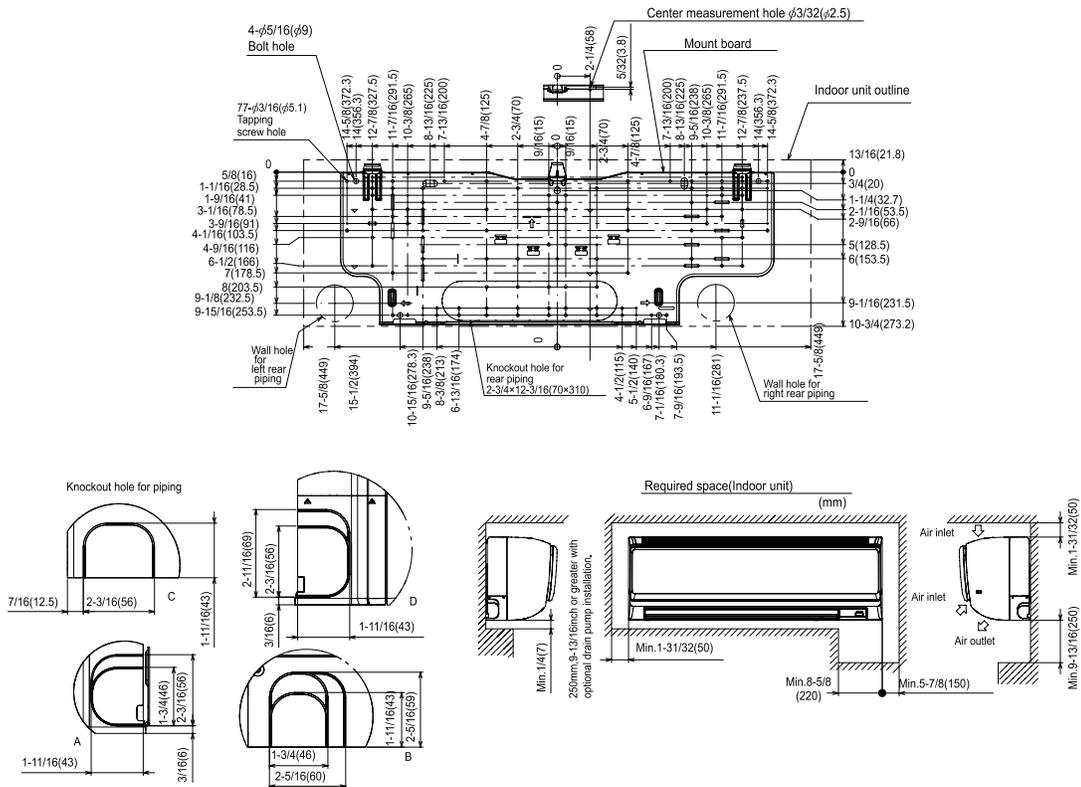
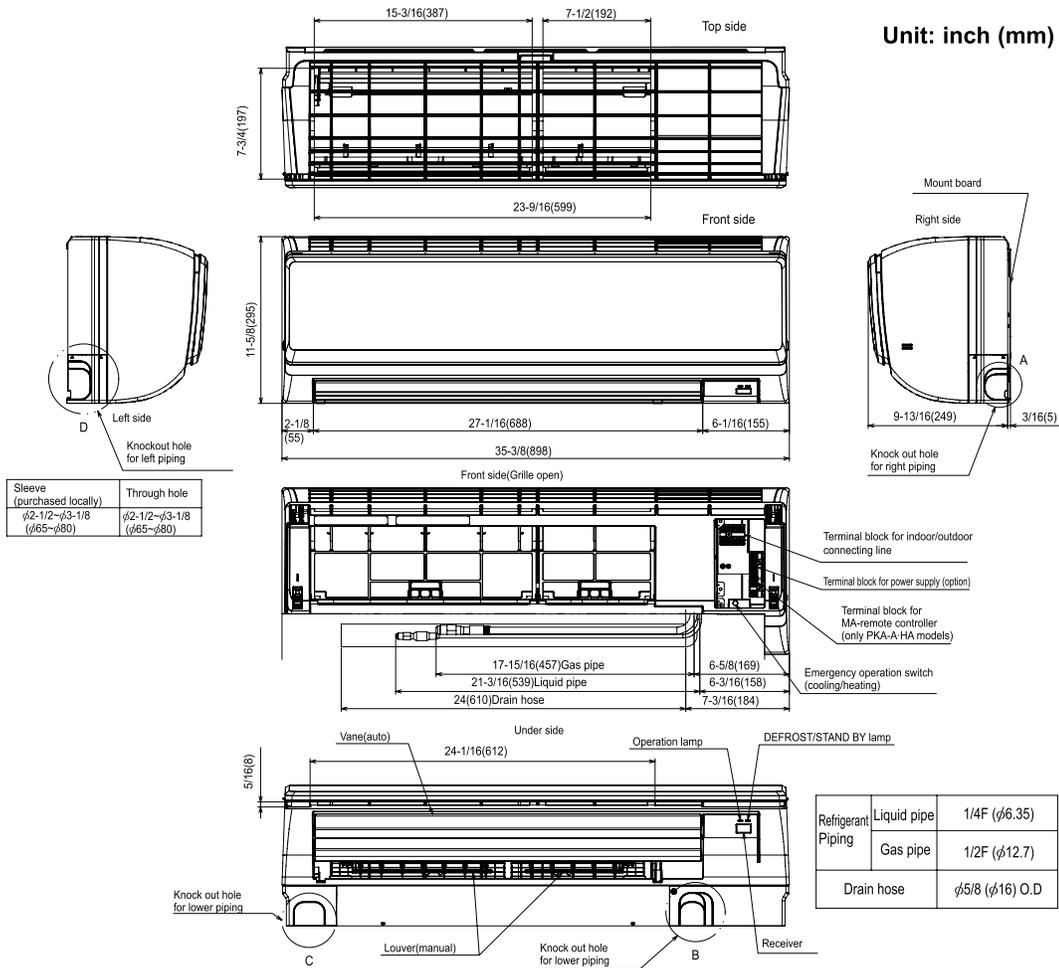
~~This option is available on downflow units and provides exhaust of the return air, when using a downflow economizer, to maintain proper building pressurization. Great for relieving most building overpressurization problems.~~





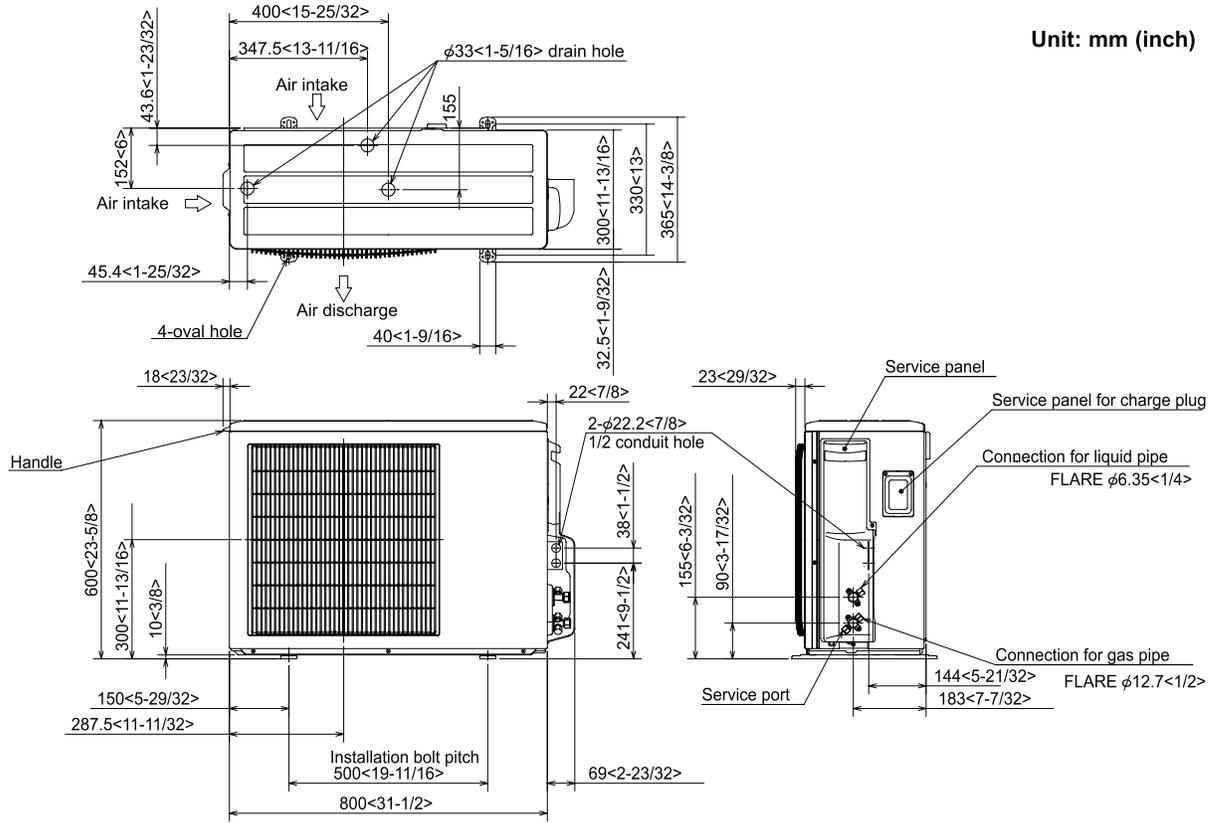
# DIMENSIONS: PKA-A18HA

Unit: inch (mm)

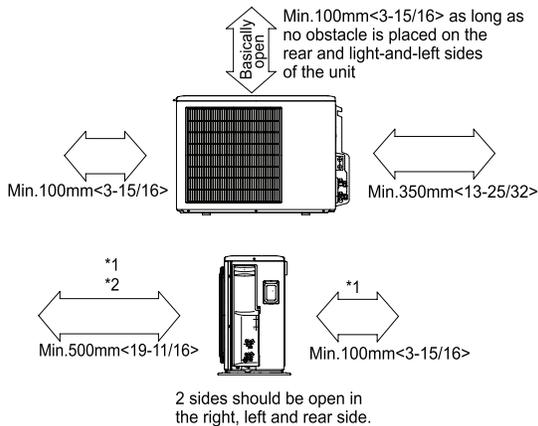


# DIMENSIONS: PUY-A18NHA3

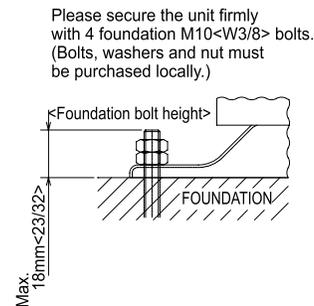
Unit: mm (inch)



### Clearance space around the outdoor unit



### FOUNDATION BOLTS



### PIPING-WIRING DIRECTION

Piping and wiring connection can be made from the rear direction only.

### Minimum installation space for outdoor unit

- \*1 In the place where short cycle tends to occur, cooling and heating capacity and power consumption might get lowered 10%. Air outlet guide (optional) will help them improve.
- \*2 If air discharges to the wall, the surface might get stained.



**HVAC Advanced Products Division**  
 3400 Lawrenceville Suwanee Rd  
 Suwanee, GA 30024  
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 www.mehvac.com  
**Specifications are subject to change without notice.**



# CU900 Cabinet Unit Heater



## 2 WEEK LEAD-TIME\*

- Built to your specifications in 2 weeks

## RUGGED, HEAVY DUTY

- Industrial Grade Unit Heater

## MULTIPLE AIR FLOW COMBINATIONS

- 16 Possible air inlet/outlet combinations - Field changeable

## 5 CABINET LENGTHS AVAILABLE

- 35", 45", 58", 68", 78"

## DUCT COLLARS - INLET AND DISCHARGE

- Provides easy connection to field supplied ductwork



## APPLICATIONS:

- |                  |                  |
|------------------|------------------|
| Schools          | Hospitals        |
| Hallways         | Vestibules       |
| Stairwells       | Entrance Lobbies |
| Mechanical Rooms | Offices          |
| Stadiums         | and much more    |

\* Factory approval required to check on part availability based on large order size



Complies with ANSI/UL 1995  
and CSA C22.2 No. 236-11

# SELECTION CHART

SERIES	HEATING CAPACITY		FINAL AIR TEMP (Deg. F)*	CFM	TOTAL LINE AMPERAGE (INCLUDING MOTOR AMPS)										Approx. Ship. Weight (lbs.)
	KW	BTU/Hr			208 1 PH 60 HZ	208 3 PH 60 HZ	240 1 PH 60 HZ	240 3 PH 60 HZ	277 1 PH 60 HZ	347 1 PH 60 HZ	380 3 PH 60 HZ	480 3 PH 60 HZ	600 3 PH 60 HZ		
CU935 Cabinet Length 35"	2	6826	85		10	6	9	6	8	7	4	3	3	120	
	3	10239	98	High	15	9	13	8	12	9	5	4	4		
	4	13652	111	250	20	12	17	10	15	12	7	6	5		
	5	17065	123		25	15	22	13	19	15	8	7	6		
	6	20478	136	Low	30	17	26	15	22	18	10	8	7		
	7	23891	148	200	34	20	30	18	26	21	11	9	7		
	8	27304	161		39	23	34	20	30	24	13	10	8		
	4	13652	85		20	12	18	11	16	13	7	6	5		
CU945 Cabinet Length 45"	6	20478	98	High	30	18	26	16	23	18	10	8	7	160	
	8	27304	111	500	40	23	34	20	30	24	13	11	9		
	10	34130	123		48	29	43	25	37	30	16	13	11		
	12	40956	136	Low	59	34	51	30	44	36	19	16	13		
	14	47782	148	400	68	40	59	35	52	41	22	18	15		
	16	54608	161		78	46	68	40	59	47	25	20	17		
	6	20478	85	High	30	18	26	16	23	18	10	8	7		200
	8	27304	96	750	40	23	34	20	30	24	13	11	9		
10	34130	103		48	29	43	25	37	30	16	13	11			
12	40956	111	Low	59	34	51	30	44	36	19	16	13			
14	47782	118	600	68	40	59	35	52	41	22	18	15			
16	54608	128		78	46	68	40	59	47	25	20	17			
6	20478	85		31	19	27	16	24	19	11	9	8	260		
9	30717	98	High	45	27	39	24	34	28	16	13	11			
12	40956	111	750	60	35	52	31	45	36	20	16	13			
15	51195	123		74	44	64	38	56	45	25	20	16			
18	61434	136	Low	88	52	77	45	67	N/A	29	24	19			
21	71673	148	600	N/A	60	89	52	78	N/A	34	27	22			
24	81912	161		N/A	69	N/A	60	N/A	N/A	38	31	25			
8	27304	85		41	24	36	21	31	25	14	12	10		300	
12	40956	98	High	60	36	52	31	46	37	20	17	14			
16	54608	111	1000	79	47	69	41	60	48	27	21	18			
20	68260	123		N/A	58	86	50	74	N/A	33	26	21			
24	81912	136	Low	N/A	69	N/A	60	N/A	N/A	39	34	25			
28	95564	148	800	N/A	80	N/A	70	N/A	N/A	45	36	29			
32	109216	161		N/A	91	N/A	79	N/A	N/A	N/A	41	33			

\* Based on 60° F inlet air temperature.

## OPTIONAL ACCESSORIES (Field Installed)

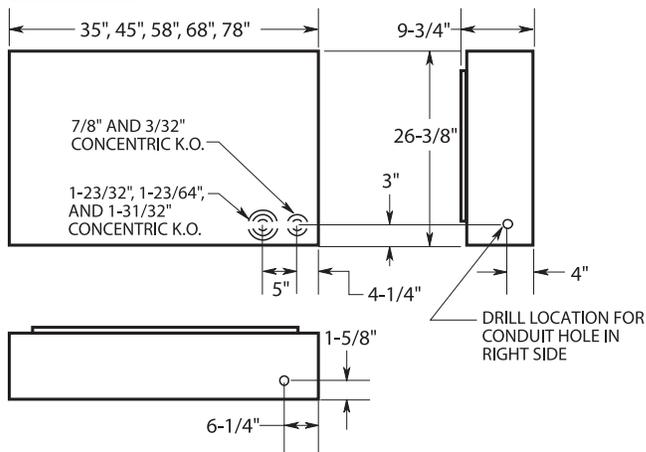
DESCRIPTION	FUNCTION
REMOTE MOUNTED SINGLE STAGE THERMOSTAT	Remote mounted single stage wall thermostat replaces standard built-in thermostat.
2 STAGE THERMOSTAT (Built-or Remote)	Built-in (or remote mounted) two stage thermostat that the elements for 2/3 heat for stage one and full heat for second stage. Fan cycles on high speed only.
120 VOLT CONTROL (Internally generated)	120 volt internally generated control voltage is available. Field supplied 120 volt control supply can be applied to heater. Requires removing only one jumper wire in the control panel.
MANUAL RESET	Manual Reset over temperature cutout wired into control circuit. Supplied in addition to auto-reset cutout.
DEAD FRONT DISCONNECT SWITCH	A three pole non-fused disconnect switch disconnects power to the heater. Design prevents entry into the control compartment until disconnect switch is turned to the OFF position.
DEAD FRONT FUSED DISCONNECT SWITCH	A three pole non-fused disconnect switch and circuit breaker(s) sized to the heater with load protection which disconnects power to the unit. Design prevents entry into the control compartment until disconnect switch is turned to the OFF position.
SUMMER FAN SWITCH	Built-in switch provides continuous fan operation with or without heat, or automatic fan cycling as the heat cycles on and off.
ON-OFF SWITCH	Built-in switch provides continuous fan operation with or without heat, or automatic fan cycling as the heat cycles on and off.
NIGHT SET-BACK RELAY	Provides ability to set-back heater from energy management system that supplies (Specify - 24 volts or 120 volts) to the relay holding coil for day operation.
MOTORIZED 100% OUTSIDE AIR DAMPER	24 volt electronically controlled damper with rear mounted duct collar permits infinite adjustment of outside air from 0% to 100%. Damper closes automatically in event of power failure or if the "OPEN - CLOSED" switch is in the closed position. Available only with heaters having 24 volt control supply. Can not be used with 120 volt control supply.
KEY LOCK for FRONT COVER	Two (2) toolhead key lock style spring latches prevent unauthorized adjustment of controls and provide additional safety from injury due to contact with internal components.
INLET or DISCHARGE DUCT COLLAR(S) (ea.)	Collars provide easy connection of field supplied duct work. We do not recommend exceeding 0.2" wg external static pressure. Heater with duct collars are with a single speed high static motor.

## OPTIONAL ACCESSORIES (Field Installed)

Recess Trim Kit	Provides a neat finish to semi-recessed or full recessed applications.
Base Kit	16 gauge, muted black base is recessed from the heater front and sides to provide an attractive and practical floor mounting application.
Aluminum Wall Louver	Used on exterior of masonry or panel walls of 2-3/4" or greater to provide a finished exterior. For heaters with 100% outside air.



## DIMENSIONS



## CLEARANCE

### Heater Wall Mounted

Front Discharge, No obstruction within 24" of discharge.  
Top Discharge, No obstruction within 24" of discharge.

Front Intake, Zero or greater to base of heater.  
Bottom Intake, No obstruction within 24" of discharge.

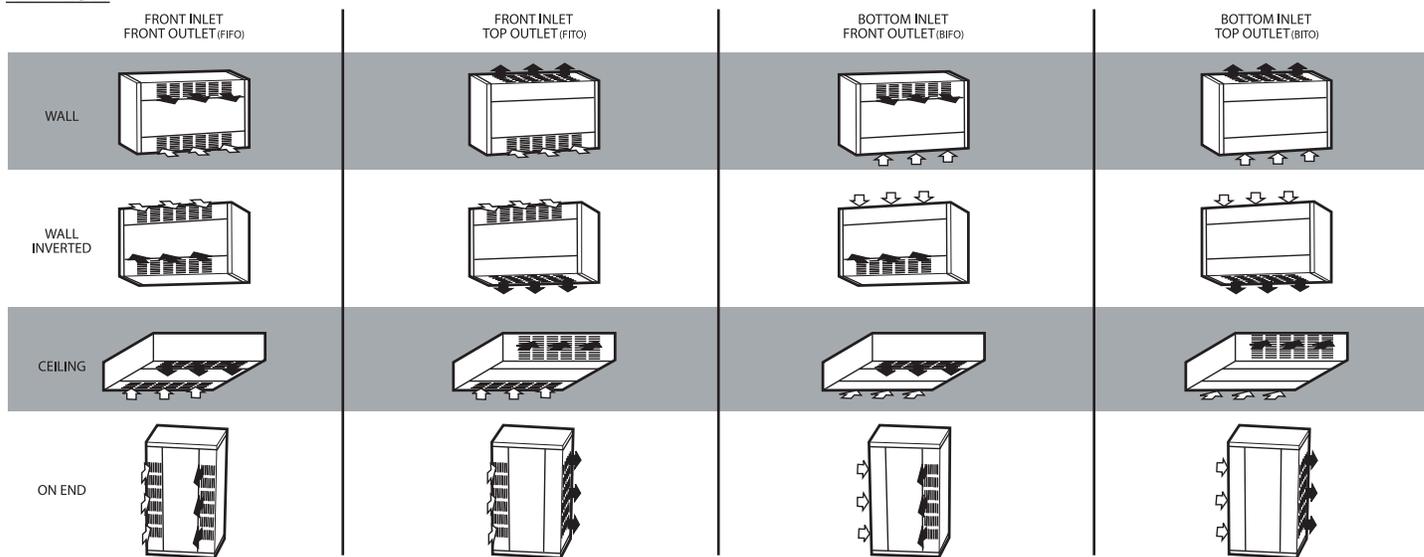
### Heater Ceiling Mounted

Front Discharge, No obstruction within 24" of discharge.  
Top Discharge, No obstruction within 24" of discharge.

Front Intake, Zero or greater to base of heater.  
Bottom Intake, No obstruction within 24" of discharge.

Minimum 2" to side wall.

## AIR FLOW



## ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The electric cabinet unit heaters shall be as manufactured by QMark®, a Marley Engineered Products Brand. Heaters shall be UL/cUL Listed, designed for mounting in any position, including on-end, fully recessed, semi-recessed or surface mounted. All capacities, voltages, physical sizes should be as specified in the heater schedule. All three phase heaters shall have a balanced heating load. Control voltage is to be internally generated by 24 VAC (Optional 120 VAC).

**CABINET** - The cabinet shall be of heavy duty cold-rolled steel. The heater front covers shall be securely attached to the cabinet with a maximum of two slotted head style spring latches (optional Toolhead Key Lock) and easily removable for access to elements, filters and control panel. Cabinet shall be finished in Neutral Gray (Optional - Color by Architect) polyester powder coated.

**HEATING ELEMENTS** - The heating elements shall be warranted for five years and shall be of non-glowing design consisting of 80/20 NiChi resistance wire enclosed in a steel sheath to which steel plate fins are brazed. The heating element shall be located directly in front of the blower discharge air for uniform heating.

**SAFETY THERMAL CUTOUTS** - Thermal safety cutouts shall be built into the system to automatically shut off heater in event of overheating due to any cause. The safety cutouts shall directly interrupt power to the elements and not depend on relays to interrupt the power. (Optional backup manual reset thermal safety cutout in the control circuit shall prevent heater reenergizing until cause of overheating has been cleared by a qualified service technician).

**MOTOR AND BLOWER ASSEMBLY** - The motor(s) and blower(s) shall be direct drive and resiliently mounted on a rigid heavy duty frame for quiet operation and long life. The motor(s) shall be two speed 1/8 H.P. with automatic reset

overload protection. The motor shall be vented and mounted in the air stream to provide maximum cooling of the motor. Motor fuse protection shall be provided to meet UL, cUL and NEC requirements. The blower(s) shall be forward curved, double inlet, centrifugal type with discharge directly on the full length of the elements to provide uniform discharge air temperatures.

**AIR FILTERS** - The filter shall be located ahead of the motor and blower assembly to ensure clean air circulation. The filter shall filter both the returning room or the outside air if the optional outside air damper assembly is provided. Filter shall be easily removed for changing or cleaning by removing the front panel and pulling on the filter. A disposable filter is standard and a permanent washable filter is optional.

**FRONT COVER INTERLOCK** - Heater shall be provided with an electrical interlock to shut down the heater when the front cover is opened to provide safety to the maintenance personnel during filter cleaning (replacement) or other maintenance.

**FAN DELAY CONTROL** - Fan control shall delay start up of the fan motor(s) until the heating elements have warmed up. It shall maintain motor operation after heating elements have been de-energized to dissipate residual heat.

**TEMPERATURE CONTROL** - Thermostat shall be built-in, snap-action single stage with remote bulb sensor located in the return air stream. (Optional - built-in two stage remote bulb snap action thermostat, remote mounted single stage wall thermostat, remote mounted two stage wall thermostat) Terminals shall be provided in the control panel for direct connection of the remote wall mounted thermostats. Silent time delay relays shall be provided, rather than contactors, to eliminate the noise of contactor opening and closing.

**TERMINALS FOR REMOTE INTERLOCK** - Terminals shall be provided in the control panel for connection to Building Automation or Energy Management Systems.

**HEAT SELECTION/FAN SPEED** - Two fan speeds and high-low heat ranges shall be selectable by means of a single rocker switch located behind the front cover.

**CIRCUIT BREAKERS** - Circuit breakers shall be provided for branch circuit protection where required by UL, cUL and NEC (Optional - Circuit breakers shall be supplied on all heaters).

**INTERCHANGEABLE INTAKE AND DISCHARGE LOUVERS** - Heater shall be provided with intake louver that can be changed from front to bottom by removing a maximum of two screws. Discharge louvers shall be able to be changed from front to top by removing a maximum of two screws.

*The Following Factory Installed/Prewired Optional Equipment Shall Be Supplied -*

- Manual Reset Thermal Cutout
- Circuit Breakers
- Fan Auto-On (Summer Fan) Switch
- 120 Volt Control Supply
- Dead Front Disconnect Switch
- Dead Front Fused (Non Fused Disconnect Switch & Circuit Breaker) Disconnect Switch
- On-Off Switch
- Night Set-Back Relay
- 100% Outside Air Damper
- Inlet/Discharge Duct Collars
- Permanent (Washable) Filter

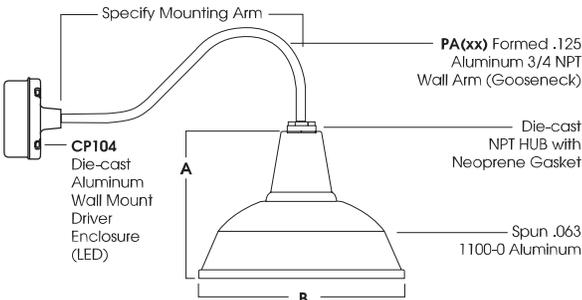
*The Following Field Installed Optional Equipment Shall Be Supplied:*

- Recess Trim Kit
- Base Kit
- Aluminum Wall Louver



# WAREHOUSE SHADE

## GV SERIES / 14 WATT MAX LED



MODEL#	A	B
WS1210	10,0	12,0
WS1410	10,0	14,0
WS1611	11,0	16,0
WS1812	12,0	18,0
WS2015	15,0	20,0

### WS\*LEDGV - INTERIOR/EXTERIOR WET LOCATION OPTION APPLICATION

The Warehouse Shade is one of our most popular RLM styles for general downlighting.

#### FEATURES

Spectrum Lighting's RLM Classics are reproductions of early American lighting fixtures reimagined with modern LED light sources and materials. The wide range of combinations for illumination, mounting, enclosures, guards and finishes allows for creative fixture specification and design. Frosted lamp enclosure (FJ1) is standard. A variety of colored lamp enclosures are available as well as guards and light shields. Fixtures may be wall or pendant mounted with standard or custom wall arm (goosenecks) and pendants. LED module and driver are serviceable for future replacement.

#### FINISH

Multi-stage polyester powder-coat process applied on our dedicated paint lines. A wide variety of standard and custom finishes are available. All exposed materials are chromate pretreated to resist corrosion.

#### ELECTRONICS

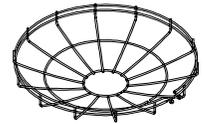
LED system features high brightness white LEDs. 3 step MacAdam Ellipses binning. Standard CRI: 85+, Higher CRI, R9 and custom LED configurations are available; consult factory. Variety of electronic 120v/277v and dimming drivers.

#### CONSTRUCTION

Fixture shades are spun in our factory from 0,063 high purity aluminum. Wall enclosures and fittings are die-cast aluminum with stainless steel hardware. Wall arms are formed 3/4 NPT aluminum pipe. Gaskets are machine cut neoprene.

#### CODE COMPLIANCE

ARRA Compliant, ETL/UL/CSA listed for damp locations, Optional Wet location. Manufactured and built to UL standards No. 1598/8750.



WG 12/14/16/18-Wire Guard

SERIES	WATTS	CCT	DRIVER	LED ENCLOSURE	MOUNTING	FINISH
WS1210LEDGV	14W	27K-2700° K	E1-Electronic, 120v	LAMP ENCLOSURE	WALL MOUNT	GW-Gloss White
WS1410LEDGV	1460 Lumens*	30K-3000° K	E2-Electronic, 277v	FJ1-Frosted Glass Enclosure 3" Standard	CP104-Wall Driver Housing	GB-Gloss Black
WS1611LEDGV		35K-3500° K		PJ3-Prismatic Lamp Enclosure 3"	CP6/RMD-Remote Mount Driver	BZ-Bronze
WS1812LEDGV		40K-4000° K	DS101-Spectrum 0-10v Dimming, 120v to 10%	AJ1-Amber Lamp Enclosure 3"	PA(xx)-See RLM Mounting Page for Available Arm Options	OB-Oil Rubbed Bronze
WS2015LEDGV		50K-5000° K	DS102-Spectrum 0-10v Dimming, 277v to 10%	RDJ1-Red Lamp Enclosure 3"	CEILING MOUNT	PT-Platinum
				GRJ1-Green Lamp Enclosure 3"	CP13-Driver Housing Required	SI-Silver
				BLJ1-Blue Lamp Enclosure 3"	CD*-Cord and Cable Mount (No WL)	GA-Galvanized
				WJ1-Wire Guard	CDC*-Coil Cord and Cable Mount (No WL)	CH-Charcoal
				CG1-Cast Wire Guard	CM*-Cord Mount	GH-Graphite
				SS1-Side Lamp Shield	HM*-Hang Straight Pendant	AM-Anodic Malachite
				BS1-Bottom Jar Cap	PM*-Pendant/Straight Mount	SN-Sun Gold
				WL-Wet Location		EG-Evergreen
				WIRE GUARD		VE-Verde Green
				WG12-12" Chrome Wire Guard		BL-Blue Streak
				WG14-14" Chrome Wire Guard		RD-Red Baron
				WG16-16" Chrome Wire Guard		OR-Orange
				WG18-18" Chrome Wire Guard		CO-Copper Metallic
					*Specify Length in Inches	CO-Copper Metallic

EXAMPLE: WS1210LEDGV14W30KE2/FJ1/CP104PA23/RD

Dimensions shown are nominal. Spectrum Lighting is continually improving products and reserves the right to make changes that will not alter performance or appearance with or without written notice.



PROJECT:	TYPE:
CAT. NO.:	





**DESCRIPTION**

Driven by performance and a clean aesthetic, the Straight and Narrow Series in LED represents the ultimate in simplicity; a narrow, uniform line of light. Constructed with premium materials with industry leading technology, the Straight and Narrow family is available in configurable runs and individual lengths of 2', 3', 4', 6' and 8'. Fully compatible with Cooper Controls FifthLight DALI and shipped standard with 0-10V dimming, the Straight and Narrow family integrates seamlessly with today's modern building management systems. With virtually unlimited applications, the Straight and Narrow family allows architects and designers the freedom to experiment with their designs without exceeding ever decreasing energy budgets.

<b>Catalog #</b>		<b>Type</b>
<b>Project</b>		
<b>Comments</b>		<b>Date</b>
<b>Prepared by</b>		

**SPECIFICATION FEATURES**

**Construction**

Housing extruded from premium 6063 aluminum. Nominal 2', 3', 4', 6' or 8' illuminated sections. Used in run configuration and/or individual fixtures. All components are RoHs compliant.

**Lens**

Available in snap-in or lay-in profiles, two diffusion options are available. Satin white provides the highest aesthetic uniformity while the high transmission lens provides the most superior efficacy.

**Finish**

Fixture housings are high reflectance white using electrostatically applied polyester powder coat paint.

**Electrical**

Long-life LED system coupled with electrical driver to deliver optimal performance. LED's are available in 3000K, 3500K or 4000K with a typical CRI ≤ 85. Projected life is 50,000 hours at 70% lumen output. Electronic drivers are available for 120-277V applications

**Controls**

Equipped standard with a 0-10V continuous dimming driver compatible with most standard dimming devices (refer to website for specific compatibility reference). Combine with FifthLight DALI and other energy saving products like sensors, daylighting controls and building management systems to maximize energy savings.

**Mounting**

Suspended.  
Pendant with adjustable single cable and circular canopy. Standard length of cable is 48".

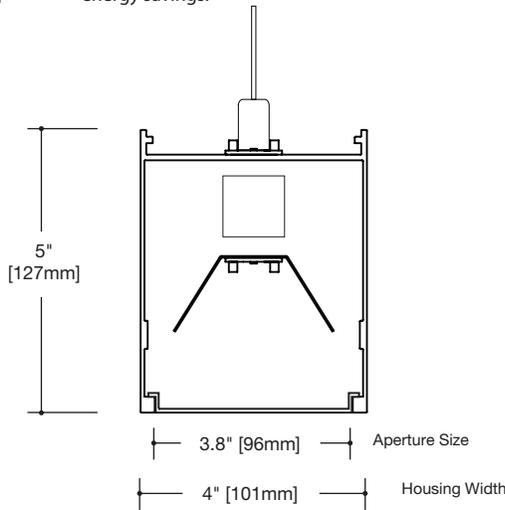
(SCST) = Single Cable - Structure  
(SCETG) = Single Cable - 15/16" T-grid  
(SCFTG) = Single Cable - 9/16" T-grid  
(SCSTG) = Single Cable - 9/16" Slot Grid  
(SCJB) = Single Cable - Junction Box (Sheet Rock)

**Warranty**

Five year warranty.



**23-DIP**  
**Straight & Narrow**  
LED  
Suspended  
Direct / InDirect



**ORDERING INFORMATION**

Sample Number: S23-DIP-2L35-ETG-4-U-DD-SI-S92-W

S23	DI	P										
<b>Series</b> S23 = Series 23	<b>Mounting</b> P = Pendant	<b>LED Color Temp</b> L30 = LED, 3000K L35 = LED, 3500K L40 = LED, 4000K	<b>Mounting Type</b> SCST = Structure SCETG = 15/16" T-grid SCFTG = 9/16" T-grid SCSTG = 9/16" Slot Grid SCJB = Junction Box (Sheet Rock)	<b>Length</b> 2 = 2 foot Individual 3 = 3 foot Individual 4 = 4 foot Individual 6 = 6 foot Individual 8 = 8 foot Individual xx = Configurable Run (Specify length in 1ft increments)	<b>Driver Options</b> DD = 0-10V Dimming 5LT = FifthLight DALI LUT = Lutron DALI	<b>Emergency Options</b> EM = Battery Pack <sup>2</sup> EC = Emergency Circuit	<b>Light Output</b> DI = Direct / InDirect	<b>Light Level</b> LED (3500K) per foot 1 = Light Level 1, UP: 515 Lumens, 7 Watts, 73 LPW DOWN: 515 Lumens, 7 Watts, 73 LPW 2 = Light Level 2, UP: 650 Lumens, 9.25 Watts, 70 LPW DOWN: 650 Lumens, 9.25 Watts, 70 LPW	<b>Circuiting Options</b> SI = Single Circuit DU = Dual Circuit	<b>Voltage</b> 1 = 120V 2 = 277V 3 = 347V(remote transformer) U = Universal Voltage	<b>Lens Options</b> S93 = Satin Lay-in Lens S93S = Satin Snap-in Lens <sup>3</sup> S93HT = High Transmission Lay-in Lens S93HTS = High Transmission Snap-in Lens <sup>3</sup>	<b>Color Options</b> W = Matte White S = Silver XX = Custom Color

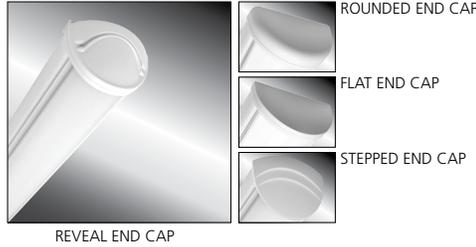
**NOTES:**  
Not all options available. Please consult your local Cooper Lighting Representative for availability. Specifications and dimensions subject to change without notice.  
1. Light Level measured at 3500K; add 10% lumen output for 4000K or subtract 10% lumen output for 3000K.  
2. Battery packs must be remote mounted  
3. For vertical and horizontal in-wall mounting use snap-in lens



**MILLENIUM STRETCH™**  
**MLHA5 SERIES – INDIVIDUAL**

**Product Features:**

- » Surface mount – ceiling, wall;  
5" x 24", 36", 48", 72" and 96"
- » Extruded aluminum housing with decorative end caps
- » Low-profile –ADA compliant
- » Peace of Mind Guarantee® against breakage



**PROJECT INFORMATION**

Job Name \_\_\_\_\_

Fixture Type \_\_\_\_\_

Catalog Number \_\_\_\_\_

Approved by \_\_\_\_\_

**SPECIFICATIONS:**

**HOUSING:** Marine grade aluminum. Extruded body with die-cast end caps. Housing, with end caps, post assembly TGIC polyester powder coat finished – 5-step pre-treatment. See Ordering Information for standard, optional and custom finishes.

**REFLECTOR:** Full reflector/wire cover – 92% reflectivity.

**LENS:** UV-stabilized, high impact extruded clear or pearlescent polycarbonate. Smooth exterior, linear prismatic interior. Nominal thickness .156". Lens securely positioned in body channels and caps. Lens locked in place with tamper-resistant stainless steel Torx® with center pin fasteners and sealed with closed cell gaskets.

**END CAPS:** Marine grade die-cast aluminum. Four styles available: Flat, Rounded, Reveal and Stepped. Conduit and "Wiremold™" ready" knockout visible only from interior of end cap (For Flat and Rounded styles only).

**SOCKETS:** Shock-resistant sockets with internal locking collar to ensure positive lamp retention.

**HARDWARE:** Stainless steel, tamper-resistant Torx® with center pin fasteners secure lens in housing body's lens channel (eight on 72" and 96" housings, four on 24", 36" and 48" housings).

**ELECTRICAL:** LED: Available 3500K, 4000K and 5000K color temperatures, 82 CRI. 120-277VAC, 50/60Hz electrical input with serviceable high power factor electronic, constant-current driver (<20% THD, >0.95 PF). Standard 0-10V dimming with 1-100% range, maximum driver source of 250 µA. LF: Class P ballasts. Fluorescent electronic 120/277/347 and dual voltage ballasts high power factor.

**INSTALLATION:** Standard two-point (24" housing), four-point (36" and 48" housing) and eight-point (72" and 96" housing) mounting required for Peace of Mind Guarantee®. LED product ambient temperature is -30°C to 25°C, unless otherwise noted.

**PHOTOMETRICS:** Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory. For additional photometric data, please go to [www.kenall.com](http://www.kenall.com).

**WARRANTY:** Limited ten (10) year warranty for LED Lamps.

**LISTINGS:** Luminaire is certified to UL Standards by Intertek Testing Laboratory for wet location – covered ceiling mount. Corner, horizontal wall, vertical wall and pendant mount installation – damp location only. ETL certified IP64 in compliance with IEC 60598 – ceiling mount. ADA compliant. Product listed on the Designlights Consortium® Qualified Products List. Check the latest version [here](#) for listed configuration details.



**ORDERING INFORMATION (Ex: MLHA5-48-F-MB-PP-45L40K-DCC-DV-FS)**

Model	Length	End Cap	Finish	Lens	Lamp Qty	Lamp Type	Ballast/Driver Type	Circuit Qty	Voltage	Options	Accessories
<b>MLHA5</b>											
<b>Length</b>					<b>Lamp Quantity (Cross Section)‡</b>		<b>Ballast/Driver Type</b>			<b>Options</b>	
24	2'				1 One		<b>DCC</b> Dimming Constant Current (LED Only)			<b>EL</b> ‡ 500 Minimum Lumen Battery Pack (4' only) (90 Minutes; 32°F Starting Temperature)	
36	3'				2‡ Two		<b>IS</b> Instant Start Electronic <10% THD (T8)			<b>PEL</b> ‡ 1100 Minimum Lumen Battery Pack (90 Minutes; 32°F Starting Temperature)	
48	4'						<b>RS</b> Rapid Start Electronic <10% THD (T8,T5,T5HO)			<b>LEL</b> LED Emergency Battery Backup (4' only; 32°F starting temp)	
72	Two 3' (factory connected)				<b>Lamp Type</b>		<b>SB</b> Specified Ballast			<b>CDF</b> Captive Diffuser Fasteners	
96	Two 4' (factory connected)				<b>2' Lengths</b>		<b>Circuit Quantity‡</b>			<b>CMB</b> Corner Mount Bracket (damp only)	
					<b>25L35K</b> 25 Watt 3500K LED		<b>1</b> One			<b>DL</b> Damp Location	
					<b>25L40K</b> 25 Watt 4000K LED		<b>2‡</b> Two			<b>FS</b> Single Fuse & Holder	
					<b>25L50K</b> 25 Watt 5000K LED		<b>Voltage</b>			<b>NAT</b> Natatorium Environment Option	
							<b>120</b> 120 Volts			<b>PH</b> Phillips Head Fasteners	
							<b>277</b> 277 Volts			<b>PM</b> Pendant Mount (stems by others; damp only)	
							<b>347</b> 347 Volts (Consult Factory)			<b>Accessories</b>	
							<b>DV</b> 120-277 Volts			<b>9500</b> Torx® Screwdriver	
										<b>D-0552</b> Torx® Driver Bit (Required for CMB Option)	
										† n/a on 2' fixtures with EL option.	
										▼ 347V n/a with EL or PEL options.	
										■ 2' Fixtures have minimum 350-450 lumen battery pack. n/a with (2) T5HO lamps.	
										● n/a on 2' fixtures, 3' fixtures with T5 or T8 lamping, or with (2) T5HO lamps.	
										‡ n/a with LED	



[www.kenall.com](http://www.kenall.com)

P: 800-4-Kenall

F: 262-891-9701

10200 55th Street Kenosha, Wisconsin 53144

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# MILLENNIUM STRETCH™

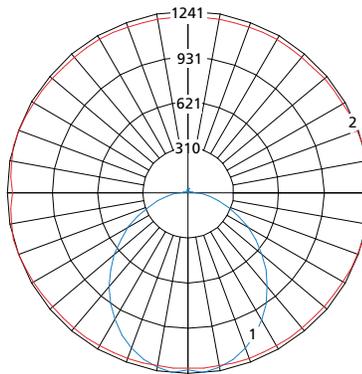
## MLHA5 SERIES – INDIVIDUAL

### PERFORMANCE

Length	Lamp Type	Initial Delivered Lumens		Input Power (W)	Drive Current (mA)	Estd. L70 LED Life (Hrs)
		@ 25°C	Efficacy (lm/W)			
2'	25L35K	2123	85	25	94	80,000
	25L40K	2263	91	25	94	80,000
	25L50K	2354	94	25	94	80,000
4'	45L35K	4246	85	50	94	80,000
	45L40K	4526	90	50	94	80,000
	45L50K	4707	94	50	94	80,000

Information above is valid for the recommended Type PP lens type and is subject to change without notice. Visit [www.kenall.com](http://www.kenall.com) for IES files and additional information.

Model: MLHA5-48-F-MW-PP-45L40K-DCC-DV

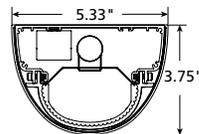


Maximum Candela = 1241 Located At Horizontal Angle = 15, Vertical Angle = 5

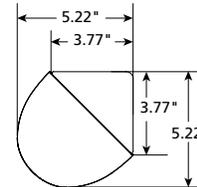
- 1 - Vertical Plane Through Horizontal Angles (15-195) (Through Max. Cd.)
- 2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)

### DIMENSIONAL DATA

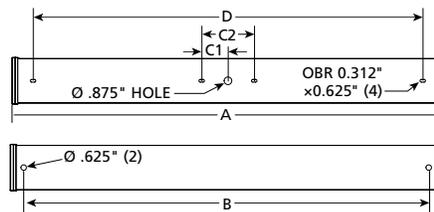
### CROSS SECTION/DETAILS



### CORNER MOUNT BRACKET



### MOUNTING HOLES



#### Nominal Two Foot Fixture Legend

LMP End Cap	A	B	C1	C2	D
T8/LED R	26.524	22.250	N/A	N/A	20.480
T8/LED F	25.308	22.250	N/A	N/A	20.480
T8/LED SP	28.131	22.250	N/A	N/A	20.480
T8/LED RV	27.674	22.250	N/A	N/A	20.480
T5 R	24.940	20.666	N/A	N/A	18.896
T5 F	23.724	20.666	N/A	N/A	18.896
T5 SP	26.547	20.666	N/A	N/A	18.896
T5 RV	26.090	20.666	N/A	N/A	18.896

#### Nominal Three Foot Fixture Legend

LMP End Cap	A	B	C1	C2	D
T8/LED R	38.524	34.250	3.000	6.000	32.480
T8/LED F	37.308	34.250	3.000	6.000	32.480
T8/LED SP	40.131	34.250	3.000	6.000	32.480
T8/LED RV	39.674	34.250	3.000	6.000	32.480
T5 R	36.751	32.478	2.953	5.906	30.708
T5 F	35.535	32.478	2.953	5.906	30.708
T5 SP	38.358	32.478	2.953	5.906	30.708
T5 RV	37.901	32.478	2.953	5.906	30.708

#### Nominal Four Foot Fixture Legend

LMP End Cap	A	B	C1	C2	D
T8/LED R	50.524	46.250	3.000	6.000	44.480
T8/LED F	49.308	46.250	3.000	6.000	44.480
T8/LED SP	52.131	46.250	3.000	6.000	44.480
T8/LED RV	51.674	46.250	3.000	6.000	44.480
T5 R	48.562	44.288	2.953	5.906	42.518
T5 F	47.346	44.288	2.953	5.906	42.518
T5 SP	50.169	44.288	2.953	5.906	42.518
T5 RV	49.712	44.288	2.953	5.906	42.518



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# MILLENIUM AURACYL™ SCONCE 265119 Interior LED Lighting MLAS826 SERIES

## PRODUCT FEATURES:

- » Surface wall mount – 8"Wx26"H
- » Marine grade aluminum housing with die-cast end caps
- » Peace of Mind Guarantee®
- » UL certified IP64 per IEC 60598



## PROJECT INFORMATION

Job Name \_\_\_\_\_

Fixture Type \_\_\_\_\_

Catalog Number \_\_\_\_\_

Approved by \_\_\_\_\_

## SPECIFICATIONS

**HOUSING:** Marine grade extruded aluminum. Marine grade die-cast aluminum end caps. TGIC polyester powder coat – 5-stage pre-treatment; Salt spray test: 1,000 hours.

**REFLECTOR:** Die-formed marine grade aluminum. Full reflector/wire cover – 92% reflectivity.

**OUTER LENS:** Thermoformed, UV-stabilized impact resistant polycarbonate, and frost or clear acrylic. See Ordering Information for options. Nominal thickness .125".

**INNER LENS:** UV-stabilized, high impact resistant, extruded 100% DR acrylic frost lens. Nominal thickness .100". Lens secured in place by lens frame.

**HARDWARE:** Four stainless steel Torx® with center pin fasteners. Internal brackets and fasteners are non-corrosive. Surface Conduit Adapter (SCA) accessory – aluminum trim frame assembly with integral J-box; finished to match lens frame. Water-tight conduit fittings supplied by others.

**ELECTRICAL:** **LED:** Available 3500K, 4000K and 5000K color temperatures, 82 CRI. 120-277VAC, 50/60Hz electrical input with serviceable high power factor electronic, constant-current driver (<20% THD, >0.95 PF). Standard 0-10V dimming with 1-100% range, maximum driver source of 200 µA. **LF:** 120-277V or 347V high power factor electronic fluorescent ballast (<10~25% THD).

**PHOTOMETRICS:** Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory. For photometric information, go to [www.kenall.com](http://www.kenall.com).

**WARRANTY:** Standard four-point mounting and polycarbonate lens required for Peace of Mind Guarantee®. Limited five (5) year warranty.

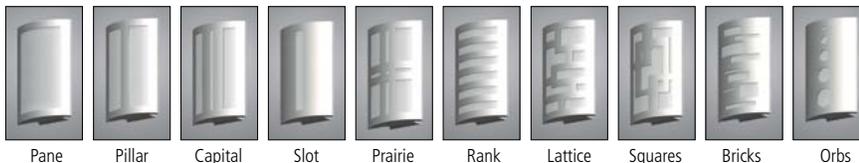
**LISTINGS:** UL and CUL listed for Wet Location – vertical wall mount only. UL certified IP64 per IEC 60598. ADA Compliant (SCA Option is non-ADA).



## ORDERING INFORMATION (Ex: MLAS826-PAN-PP-CS-1-17-DV-FS)

Model	Frame Type	Outer Lens	Finish	Lamp Qty	Lamp & Ballast/Driver	Options
<b>MLAS826</b>				<b>1</b>		
	<b>Frame Type</b> <b>PAN</b> Pane <b>PLR</b> Pillar <b>CPL</b> Capital <b>SLT</b> Slot <b>PRA</b> Prairie <b>RNK</b> Rank <b>LAT</b> Lattice <b>SQR</b> Squares <b>BRK</b> Bricks <b>ORB</b> Orbs	<b>Outer Lens</b> <b>AS</b> ▼ Frosted Acrylic <b>CAP</b> ▼ Clear Acrylic w/Inner Perforation painted to match housing <b>PP</b> Pearlescent Polycarbonate ▼n/a with Peace of Mind Guarantee®	<b>Finish</b> <b>MB</b> Matte Black <b>MW</b> Matte White <b>WS</b> Warm Satin Painted Anodized <b>CS</b> Cool Satin Painted Anodized <b>BR</b> Bronze <b>DB</b> Dark Bronze <b>LG</b> Light Gray <b>FG</b> Forest Green <b>CC</b> Custom Color (Consult factory)		<b>Lamp &amp; Ballast/Driver Type (Quantity, Ballast, Voltage, Starting Temperature)</b> <b>25L35K-DCC-DV</b> 25 Watt 3500K LED <b>25L40K-DCC-DV</b> 25 Watt 4000K LED <b>25L50K-DCC-DV</b> 25 Watt 5000K LED <b>14-120</b> F14T5 (1,PS,120V, 0°F) <b>14-277</b> F14T5 (1,PS,277V, 0°F) <b>17-DV</b> F17T8 (1,IS,120-277V, 0°F) <b>17-347</b> F17T8 (1,PRS,347V, 0°F) <b>24-DV</b> F24T5HO (1,PRS,120-277V, 0°F) <b>40B-DV</b> F40TT Biax (1,PRS,120-277V, 0°F) <b>55B-DV</b> F55TT Biax (1,PRS,120-277V, 0°F) <b>55B-347</b> F55TT Biax (1,PS,347V, -20°F)	<b>Options</b> <b>9500</b> Torx® Screwdriver <b>D-0552</b> Torx® Driver Bit Polycarbonate <b>FS</b> Single Fuse & Holder <b>SCA</b> Surface Conduit Adapter (non-ADA compliant)
		<b>Lamp Quantity</b> <b>1</b> One Lamp				

## FRAME TYPE



## OUTER LENS OPTIONS



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MLAS826-081015

# MILLENIUM AURACYL™ SCNCE

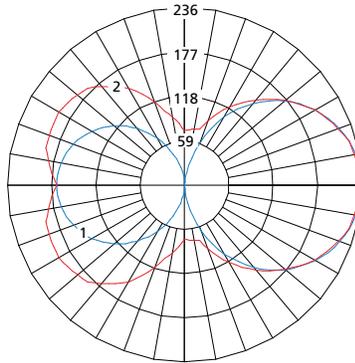
## MLAS826 SERIES – Technical Data

### PERFORMANCE

Lamp Type	Initial Delivered Lumens		Input Power (W)	Drive Current (mA)	Estd. L70 LED Life (Hrs)
	@ 25°C (lm)	Efficacy (lm/W)			
25L35K	1369	47	29	94	80,000
25L40K	1460	50	29	94	80,000
25L50K	1518	52	29	94	80,000

Displayed information above is for PP Lens type only. Info subject to change. Visit [www.kenall.com](http://www.kenall.com) for IES files and additional information.

Model: MLAS826-PAN-PP-MW-25L40K-DV

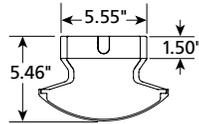
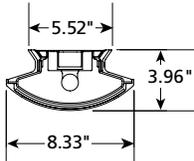


Maximum Candela = 236 Located At Horizontal Angle = 0, Vertical Angle = -90  
 1 - Vertical Plane Through Horizontal Angles (0-180) (Through Max. Cd.)  
 2 - Horizontal Cone Through Vertical Angle (90) (Through Max. Cd.)

### DIMENSIONAL DATA

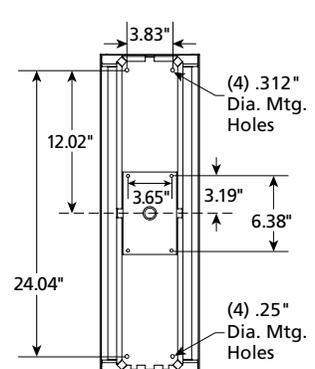
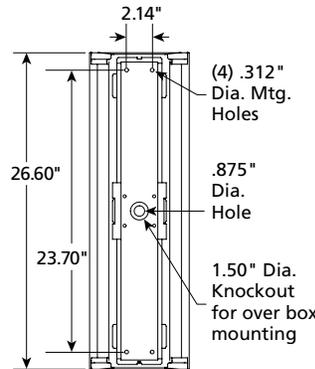
#### CROSS SECTION

#### SURFACE CONDUIT ADAPTER (SCA)



#### INSTALLATION DETAILS

#### (SCA)



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# SCONCE DECORATIVE FRAME STYLES

Pane



Pillar



Capital



Slot



Prairie



Rank



Lattice



Squares



Bricks



Orbs



## MILLENNIUM AURACYL SCONCE FINISH OPTIONS



MB Matte Black



MW Matte White



WS Warm Satin



CS Cool Satin



BR Bronze



DB Dark Bronze



LG Light Gray

Please consult Kenall for custom color availability



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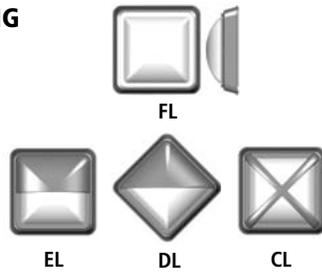


# MILLENNIUM™ SQUARE

## MS15 SERIES – LOW PROFILE HOUSING

### PRODUCT FEATURES:

- » Surface mount – ceiling (FL & CL only) or wall mount; 16"W×16"W×6"D (CL, EL, FL) 21"W×21"W×6"D (DL)
- » Peace of Mind Guarantee®
- » Dust and water protected to IP64 standards



### PROJECT INFORMATION

Job Name \_\_\_\_\_  
 Fixture Type \_\_\_\_\_  
 Catalog Number \_\_\_\_\_  
 Approved by \_\_\_\_\_

265119 Interior LED Lighting

### SPECIFICATIONS

**BASEPLATE:** Marine grade die-cast aluminum. Integral heat sinks. Baseplate flange interlocks and wraps around lens base producing maximum moisture deflection and resistance to prying. Baseplate provided with four-point mounting holes and one wireway hole. Standard black, bronze or white exterior TGIC polyester powder coat – 5-step pre-treatment. See Ordering Information for optional finishes.

**REFLECTOR:** CFL/LED: Full reflector/wire cover – 92% reflectivity. HID: High efficiency textured aluminum.

**LENS:** UV-stabilized, high impact resistant, virgin injection molded polycarbonate. High efficiency blonded fluted lens obscures lamp image and maximizes uniformity. Lens secured with four concealed captive Torx® with center pin fasteners. Exclusive water channeling lens design provides 360° ingress protection.

**LENS BASE/EYELID/GRILLE:** Lens base shields lamp from viewing angles. High impact resistant, injection molded opaque black, bronze or white polycarbonate. Optional Light Gray, Silver, Forest Green or Custom Color (see Ordering Information below) are chemically bonded, impact resistant finishes.

**GASKETING:** Die-cut, closed cell EPDM self adhesive gasket seals baseplate to mounting surface. Closed cell, silicone "O" ring gaskets positioned and friction secured in gasket channels of lens base, baseplate and optional surface adapter.

**HARDWARE:** Four stainless steel Torx® with center pin fasteners.

**ELECTRICAL:** Fluorescent electronic 120/277/347 and dual voltage ballasts high power factor (<10%THD). HID ballasts high power factor. Metal halide lamps utilize pulse start technology. See Lamp Type for electronic metal halide ballast option. LED: Replaceable high-brightness ANSI 3500K (80 CRI min.), 4000K (70 CRI min.), 5000K (70 CRI min.), or 5700K (70 CRI min.) white LED array. 120-277VAC high power factor electronic driver.

**WARRANTY:** Standard four-point mounting and polycarbonate lens required for Peace of Mind Guarantee®. One (1) year warranty against defects in materials and workmanship. Five (5) year warranty on LED lamps and driver for defects resulting in a fixture lumen depreciation of 30% or greater.

**LISTINGS:** Luminaire is certified to UL Standards by either Underwriters Laboratory or Intertek Testing Laboratory for wet location. (listing includes Emergency Battery Pack "EL" option). UL certified IP64 per IEC 60598. All Kenall SSL Luminaires are tested to the IESNA LM-79-08 standard requiring spectroradiometric measurements for CRI and CCT as well as goniophotometric measurements for lighting distributions and total luminous flux.



### ORDERING INFORMATION (Ex: MS15CL-PP-MB-40L40K-1-DCC-DV)

Model	Lens Type	Finish	Lamp Type	Lamp Qty	Driver Type	Voltage	Options	Accessories
<b>Model</b>			<b>Lamp Type (Qty/Ballast/Volt./Starting Temp)</b>			<b>Voltage (See Lamp Type)</b>		<b>Accessories</b>
<b>MS15CL</b>	Crossbar		<b>26L35K</b> 26 Watt 3500K LED (1/120-277V/-22°F) MS15DL/EL only			<b>120</b> 120 Volts		<b>SA</b> Die-Cast Surface Adapter
<b>MS15DL</b>	Diamond Eyelid		<b>26L40K</b> 26 Watt 4000K LED (1/120-277V/-22°F) MS15DL/EL only			<b>277</b> 277 Volts		<b>C-0796^</b> 75 Watt DC Bay Quartz Lamp
<b>MS15EL</b>	Eyelid		<b>26L50K</b> 26 Watt 5000K LED (1/120-277V/-22°F) MS15DL/EL only			<b>347^▲</b> 347 Volts		<b>9500</b> Torx® Screwdriver
<b>MS15FL</b>	Full Face		<b>26L57K</b> 26 Watt 5700K LED (1/120-277V/-22°F) MS15DL/EL only			<b>DV^</b> 120-277 Volts, electronic ballasts & LED driver only		* MS15EL 2-lamp only; 1 lamp available only on MS15DL
<b>Lens Type</b>			<b>40L35K</b> 40 Watt 3500K LED (1/120-277V/-40°F) MS15FL/CL only					** MS15EL 2-lamp only; n/a with MS15DL
<b>PP</b>	Pearlescent		<b>40L40K</b> 40 Watt 4000K LED (1/120-277V/-40°F) MS15FL/CL only			<b>Options</b>		‡ n/a with MS15DL, MS15EL
	Polycarbonate		<b>40L50K</b> 40 Watt 5000K LED (1/120-277V/-40°F) MS15FL/CL only			<b>CEL^</b> One-Lamp Cold Weather Emergency Pack (0°F) with Die-Cast Surface Adapter (SA) (n/a with 57P or 70P lamps; 120/277V only)		† UV shielding lamp supplied
<b>S^</b>	Clear Starburst		<b>40L57K</b> 40 Watt 5700K LED (1/120-277V/-40°F) MS15FL/CL only			<b>EL^</b> One-Lamp WL Emergency Pack (32°F) with Die-Cast Surface Adapter (SA) (n/a with 57P or 70P lamps; 120/277V only)		^ n/a with LED
	Polycarbonate		<b>18Q**</b> 18 Watt Quad (2,3/RS/120,277,347/0°F)			<b>LLE</b> LED Emergency Battery Backup with Die-cast Surface Adapter (SA)		▲ n/a with BPC
<b>Finish</b>			<b>26Q*</b> 26 Watt Quad (1,2,3/RS/120,277,347/0°F)			<b>2C^</b> Two Circuit Wiring (2 or 3 Lamp Qty only) (n/a with EL or CEL Option)		
<b>DB</b>	Dark Bronze		<b>32P</b> 32 Watt PLT (1,2/RS/120,277,347/0°F)			<b>BPC</b> Photo Control – Shielded Button Type with Die-Cast Surface Adapter (SA) (120 or 277V only)		
<b>FG</b>	Forest Green		<b>42P</b> 42 Watt PLT (1,2/RS/120,277,347/0°F)			<b>FS</b> Single Fuse & Holder		
<b>LG</b>	Light Gray		<b>57P‡</b> 57 Watt PLT (1/RS/120,277,347/0°F)			<b>NAT</b> Natatorium Environment Option		
<b>MB</b>	Matte Black		<b>50M†</b> 50 Watt MH (1/HPF/120,277/-20°F)			<b>QR</b> Quartz Restrike System for Maximum 75 Watt DC Bay Quartz Lamp (see C-0796) (HID only)		
<b>MW</b>	Matte White		<b>50S</b> 50 Watt HPS (1/HPF/120,277/-40°F)			<b>QRC</b> Hot/Cold Quartz Restrike System for Maximum 75 Watt DC Bay Quartz Lamp (see C-0796) (HID only)		
<b>SL</b>	Silver		<b>70M†</b> 70 Watt MH (1/HPF/120,277/-20°F)			<b>R80</b> Minimum 80 CRI (4000K LED Only)		
<b>CC</b>	Custom Color (Consult factory)		<b>70ME†</b> 70 Watt MH (1/EB/120,277/-20°F)			<b>WMR</b> Wiremold V500 Series™ Ready (See Tech Sheet) – UL Damp Location Rated Only		
			<b>70S</b> 70 Watt HPS (1/HPF/120,277/-40°F)					
			<b>70P‡</b> 70 Watt PLT (1/RS/120,277,347/0°F)					
			<b>Lamp Quantity (See Lamp Type)</b>					
			<b>1</b> One Lamp					
			<b>2</b> Two Lamps					
			<b>3</b> Three Lamps					
			<b>Driver Type (LED only)</b>					
			<b>DCC</b> Dimming Constant Current					
			<b>SCC</b> Standard Constant Current					



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MS15\_L-061114

# MILLENNIUM™ SQUARE

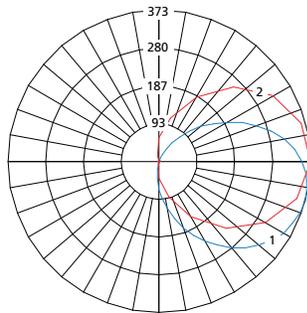
## MS15 SERIES – LOW PROFILE HOUSING

### PERFORMANCE

Model	Lamp Type	Initial Delivered Lumens		Input Power (W)	Drive Current (mA)	Estd. L70 LED Life (hrs)
		@ 25°C (lm)	Efficacy (lm/W)			
MS15EL	26L35K	1918	65	29	350	60,000
	26L40K	2187	74	29	350	60,000
	26L50K	2330	79	29	350	60,000
	26L57K	2491	85	29	350	60,000
MS15FL	40L35K	2716	62	44	700	50,000
	40L40K	3096	71	44	700	50,000
	40L50K	3299	75	44	700	50,000
	40L57K	3528	81	44	700	50,000

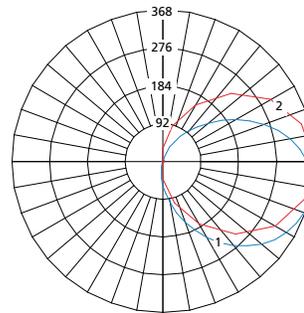
Displayed information above is for PP Lens type only. Info subject to change. Visit [www.kenall.com](http://www.kenall.com) for IES files and additional information.

Model: MS15EL-PP-MW-26L40K-1-DV



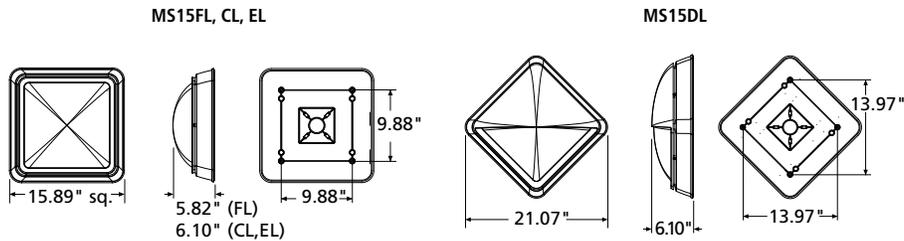
Max Candela = 703 Located At Horizontal Angle = 0, Vertical Angle = 75  
 1 - Vertical Plane Through Horizontal Angles (0-180) (Through Max. Cd.)  
 2 - Horizontal Cone Through Vertical Angle (75) (Through Max. Cd.)

Mode: MS15FL-PIA-MW-40L40K-1-DV



Max Candela = 910 Located At Horizontal Angle = 0, Vertical Angle = 0  
 1 - Vertical Plane Through Horizontal Angles (0-180) (Through Max. Cd.)  
 2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)

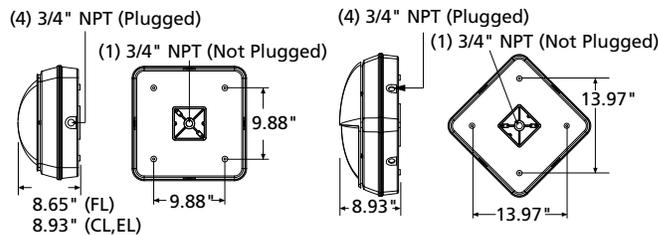
### DIMENSIONAL DATA



SURFACE ADAPTER SIDE & BACK VIEW

MS15FL, CL, EL

MS15DL



(4) 3/4" NPT (Plugged)

(1) 3/4" NPT (Not Plugged)

(4) 3/4" NPT (Plugged)

(1) 3/4" NPT (Not Plugged)



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# MILLENIUM FINITE™

## FN SERIES – LOW PROFILE

### PRODUCT FEATURES:

- » Surface wall mount; 9" & 15"
- » Full cutoff Type II, III, IV or IVN optic patterns
- » Dark-Sky friendly
- » Designlights Consortium listed (DLC)
- » Peace of Mind Guarantee®



FN9L

FN15L

### PROJECT INFORMATION

Job Name \_\_\_\_\_

Fixture Type \_\_\_\_\_

Catalog Number \_\_\_\_\_

Approved by \_\_\_\_\_

265619 Exterior LED Lighting

### SPECIFICATIONS

**HOUSING:** High-impact resistant, UV-stabilized injection molded polycarbonate. Marine-grade die-cast aluminum ballast/driver housing.

**DOOR:** High-impact resistant, UV-stabilized injection molded polycarbonate with detachable hinge. Secured to housing with four (4) captive, recessed Torx® (or optional Phillips head) stainless steel screws. Lens sealed with closed-cell silicone gasket and secured to door frame with heavy gauge stainless steel brackets.

**GASKETING:** Closed cell, silicone "O" ring gasket seals joint between polycarbonate housing and die-cast aluminum ballast housing and joint between polycarbonate housing and polycarbonate lens frame assembly. Thick gauge, die-cut, closed cell neoprene with self-adhesive gasket seals joint between housing and mounting surface or accessory surface conduit adapter.

**ELECTRICAL:** LED: Replaceable high-brightness ANSI 4000K (65 CRI min.), 5000K (65 CRI min.), and 5700K (70 CRI min.) white LED array. See Options for higher CRI lamp availability. 120-277VAC High Power Factor Electronic Dimming Constant Current driver. Fluorescent electronic 120/277/347 and dual voltage ballasts high power factor (<10% THD), HID ballasts high power factor. Metal halide lamps utilize pulse start technology. Shock absorbing, medium base lamp sockets provided for HID lamps. See Lamp Type for electronic halide ballast option.

**INSTALLATION:** Fixture is factory pre-wired and includes gasketed, 16-gauge stainless steel quick mounting plate. Once four-point mounted to wall (required for Peace of Mind Guarantee®) or accessory surface conduit adapter, allows quick mounting with hook-and-lock mechanism. Quick mounting plate bolts to wall (fasteners by other), fixture attaches to mounting plate with two (2) captive Torx® (or optional Phillips head) screws, which are concealed but accessible from bottom. Suitable for installation into -40°C to 40°C with 26L and 50L packages and -40°C to 25°C with 80L package.

**SURFACE CONDUIT ADAPTER (ACCESSORY):** Marine-grade die-cast aluminum construction includes die-cut gaskets and two 3/4" threaded connection ports. Once four-point mounted to wall (required for Peace of Mind Guarantee®) allows same quick mounting (hook-and-lock) capability as described in the Installation section above.

**PHOTOMETRICS:** Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO 17025 accredited laboratory. For additional photometric information, go to www.kenall.com.

**WARRANTY:** One (1) year warranty against defects in materials and workmanship. Five (5) year warranty on LED lamps and driver for defects resulting in a fixture lumen depreciation of 30% or greater.

**LISTINGS:** Luminaire is certified to UL Standards by either Underwriters Laboratory or Intertek Testing Laboratory for wet location. UL certified IP65 per IEC 60598 (LED only). IESNA-designated full cut-off. IDA-Approved™ Dark-Sky Friendly Fixture. Product listed on Designlights Consortium QPL.



### ORDERING INFORMATION (Ex: FN9L-4-7-MB-26L50K-DV-FS)

Model	Optic System	Lens Type	Finish	Lamp Type	Lamp Qty	Voltage	Options	Accessories
<b>Model</b>				<b>Lamp Type (Qty/Ballast/Volt/Starting Temp)</b>				<b>Lamp Quantity (See Lamp Type)</b>
<b>FN9L</b>	9" Full Cutoff Low Profile			<b>9"</b>				<b>1</b> One Lamp
<b>FN15L</b>	15" Full Cutoff Low Profile			<b>26L40K</b>	26 Watt 4000K LED			<b>2*</b> Two Lamps
				<b>26L50K</b>	26 Watt 5000K LED			
				<b>26L57K</b>	26 Watt 5700K LED			
<b>Optic System</b>				<b>18Q</b>	18 Watt Quad (2/RS/120/277,347/0°F)			<b>Voltage</b>
<b>2</b>	Type II			<b>26P</b>	26 Watt PLT (1,2/RS/120/277,347/0°F)			<b>120</b> 120 Volts
<b>3</b>	Type III (LED only)			<b>32P</b>	32 Watt PLT (1/RS/120/277,347/0°F)			<b>277</b> 277 Volts
<b>4</b>	Type IV (LED only on 9" Model; LED, HID, 1-lamp CFL only on the 15")							<b>347*</b> 347 Volts
<b>4N</b>	Type IV Narrow (LED only)			<b>15"</b>				<b>DV</b> 120-277 Volts (fluorescent or LED only)
<b>Lens Type</b>				<b>26L40K</b>	26 Watt 4000K LED			<b>Options</b>
<b>7</b>	.187" Clear Polycarbonate (n/a with two lamps or HID)			<b>26L50K</b>	26 Watt 5000K LED			<b>LEL</b> Integral Emergency Battery Backup (Available with FN15L, 26 Watt LED only)
<b>A</b>	.250" Clear Tempered Glass (STD w/HID)			<b>26L57K</b>	26 Watt 5700K LED			<b>2C*</b> Two Circuit Wiring (2 Lamp Quantity only)
<b>Finish</b>				<b>50L40K</b>	50 Watt 4000K LED			<b>FS</b> Single Fuse & Holder
<b>DB</b>	Dark Bronze			<b>50L50K</b>	50 Watt 5000K LED			<b>PH</b> Phillips Head Fasteners
<b>MB</b>	Matte Black			<b>50L57K</b>	50 Watt 5700K LED			<b>QRC</b> Hot/Cold Quartz Restrike (15" HID only)
<b>MW</b>	Matte White			<b>80L40K</b>	80 Watt 4000K LED			<b>QS2</b> Two Quartz sockets (max. 50W ea.) (15" HID only)
<b>CC</b>	Custom Color (Consult factory)			<b>80L50K</b>	80 Watt 5000K LED			<b>Accessories</b>
				<b>80L57K</b>	80 Watt 5700K LED			<b>50QL</b> 50 Watt DC Bayonet Base Quartz Lamp (15" only)
				<b>26Q</b>	26 Watt Quad (1,2/RS/120,277,347/0°F)			<b>9500</b> Torx® Screwdriver
				<b>32P</b>	32 Watt PLT (1,2/RS/120,277,347/0°F)			<b>SA</b> Die-Cast Surface Adapter
				<b>42P</b>	42 Watt PLT (1,2/RS/120,277,347/0°F)			* n/a with LED Option
				<b>50M</b>	50 Watt MH (1/HPF/120,277,347/-20°F)			
				<b>50S</b>	50 Watt HPS (1/HPF/120,277,347/-40°F)			
				<b>70M</b>	70 Watt MH (1/HPF/120,277,347/-20°F)			
				<b>70ME</b>	70 Watt MH (1/EB/120,277/-20°F)			
				<b>70S</b>	70 Watt HPS (1/HPF/120,277,347/-40°F)			



www.kenall.com

P: 800-4-Kenall

F: 262-891-9701

10200 55th Street Kenosha, Wisconsin 53144

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# MILLENNIUM FINITE™

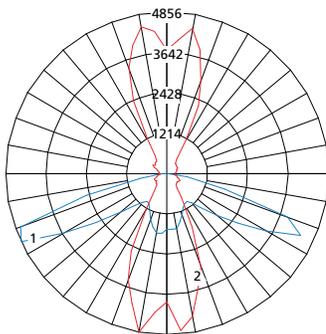
## FN SERIES – Technical Data

### PERFORMANCE

Model	Lamp Type	Initial Delivered Lumens (lm)				Efficacy (lm/W)	Input Power (W)	Drive Current (mA)	Estd. L70 LED Life (hrs)
		Type 2	Type 3	Type 4	Type 4N				
FN9L	26L40K	1699	1741	1695	1783	58-61	29	350	60,000
	26L50K	1811	1855	1806	1900	62-66	29	350	60,000
	26L57K	1936	1983	1931	2031	67-70	29	350	60,000
FN15L	26L40K	1769	1907	1842	1788	61-66	29	350	60,000
	26L50K	1884	2032	1963	1905	65-70	29	350	60,000
	26L57K	2015	2172	2098	2037	69-75	29	350	60,000
	50L40K	3685	3618	3705	3556	65-67	55	350	60,000
	50L50K	3927	3856	3948	3789	69-72	55	350	60,000
	50L57K	4199	4122	4221	4057	74-77	55	350	60,000
	80L40K	4653	4569	4679	4490	58-61	77	525	50,000
	80L50K	4958	4868	4985	4784	62-65	77	525	50,000
80L57K	5301	5205	5330	5115	66-69	77	525	50,000	

Information above was tested with the Clear Polycarbonate lens. Subject to change without notice. Visit [www.kenall.com](http://www.kenall.com) for IES files and additional information.

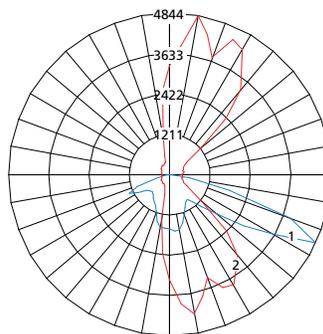
Model: FN15L-2-7-xx-80L50K-DV



Maximum Candela = 4856 Located At Horizontal Angle = 260, Vertical Angle = 65

- 1 - Vertical Plane Through Horizontal Angles (260-80) (Through Max. Cd.)
- 2 - Horizontal Cone Through Vertical Angle (65) (Through Max. Cd.)

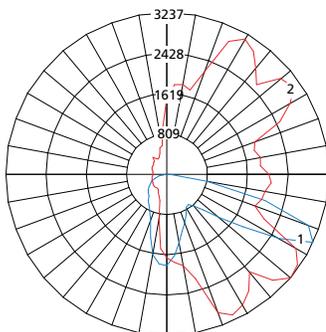
Model: FN15L-3-7-xx-80L50K-DV



Maximum Candela = 4844 Located At Horizontal Angle = 80, Vertical Angle = 65

- 1 - Vertical Plane Through Horizontal Angles (80-260) (Through Max. Cd.)
- 2 - Horizontal Cone Through Vertical Angle (65) (Through Max. Cd.)

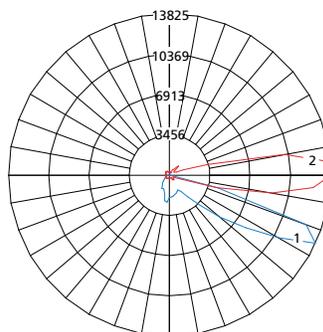
Model: FN15L-4-7-xx-80L50K-DV



Maximum Candela = 3237 Located At Horizontal Angle = 320, Vertical Angle = 65

- 1 - Vertical Plane Through Horizontal Angles (320-140) (Through Max. Cd.)
- 2 - Horizontal Cone Through Vertical Angle (65) (Through Max. Cd.)

Model: FN15L-4N-7-xx-80L50K-DV



Maximum Candela = 13825 Located At Horizontal Angle = 0, Vertical Angle = 65

- 1 - Vertical Plane Through Horizontal Angles (0-180) (Through Max. Cd.)
- 2 - Horizontal Cone Through Vertical Angle (65) (Through Max. Cd.)



[www.kenall.com](http://www.kenall.com)

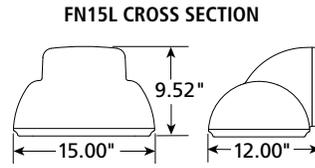
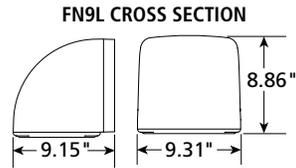
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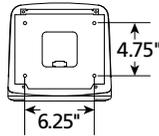
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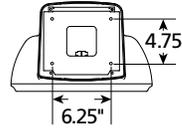
**MILLENNIUM FINITE™**  
**FN SERIES – Technical Data**  
 DIMENSIONAL DATA



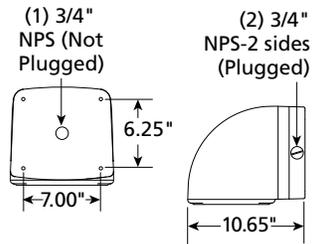
**MOUNTING HOLES**



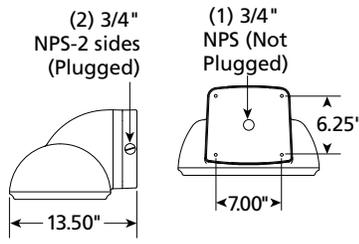
**MOUNTING HOLES**



**SURFACE ADAPTER**



**SURFACE ADAPTER**





Date: \_\_\_\_\_ Customer: \_\_\_\_\_

Project: \_\_\_\_\_

Type: \_\_\_\_\_ Qty: \_\_\_\_\_



265619 Exterior LED Lighting

## Saturn 2 Cutoff LED



Order Code: SAC2L - - - - -

Pole Order Code: \_\_\_\_\_

	Series	Height	Finish	Options			
<u>SAC2L</u>	Series <b>SAC2L</b> Saturn 2 Cutoff LED						
	Optics	<b>R1</b> Type I Distribution	<b>R2</b> Type II Distribution	<b>R3</b> Type III Distribution	<b>R5</b> Type V Distribution		
	Mounting	<b>1</b> Single	<b>1A</b> Single Arm Mount	<b>2</b> Double	<b>W</b> Wall Mount		
	Light Engine	<b>LG3500</b> 500 mA/51W	<b>LG3700</b> 700 mA/65W	<b>LG3105</b> 1050 mA/101W			
	CCT	<b>30</b> 3000K	<b>35</b> 3500K	<b>40</b> 4000K	<b>50</b> 5000K	for other CCT please consult factory	
	Power Cord Length	<b>8<sup>1,2</sup></b> 8'	<b>10<sup>1,2</sup></b> 10'	<b>12<sup>1,2</sup></b> 12'	<b>14<sup>1,2</sup></b> 14'	<b>16<sup>1,2</sup></b> 16'	
	Finish	<b>WH</b> White	<b>BK</b> Black	<b>BZ</b> Bronze	<b>SV</b> Silver	<b>SP</b> Specify Premium Color	
	Voltage	<b>120</b>	<b>208</b>	<b>240</b>	<b>277</b>	<b>347*</b> *Equipped with step-down transformer	
	Options	<b>DS</b> No Uplight Finish	<b>HS</b> House Side Shield (180°)	<b>FS<sup>3</sup></b> Single Fusing	<b>PCT</b> Photocell Tenon See p. 7 for details	<b>DM</b> Dimming (0-10V)	<b>DMY<sup>4</sup></b> Dimming (Dynadim)
				<sup>3</sup> Not available with 347 or 480		<sup>4</sup> LG3500 LG3700 only	
						<sup>5</sup> 120, 240, 277 only	
						<b>HLxx<sup>4,5</sup></b> Hi-Lo Switching	

### Product Modifications

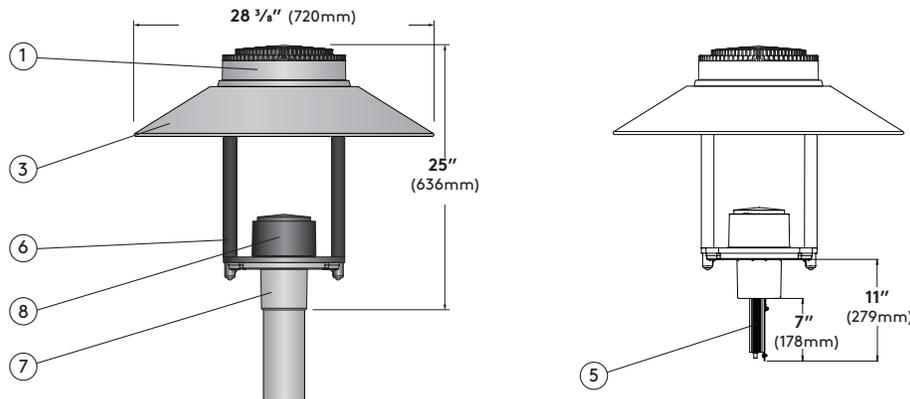
Please list modification requirements for review by factory:

### Approvals



Date: \_\_\_\_\_

## SAC2L-1-XX-DS



For further details, please see installation instructions.

### Specifications

**1. Luminaire Cover** - Die cast aluminum cover made from low copper alloy, designed to ensure optimal thermal management for extra long life time of LED light engine.

**2. Gasketing** - (not shown) Continuous gasket provides weatherproofing, dust and insect control at all fixture connections.

**3. Luminaire Hood** - Aluminum shade with white painted interior.

**4. LED Array** - (not shown) High flux LEDs mounted to PC boards and attached to aluminum heat sink for maximum LED performance and life. CCT tolerance 1/4 step binning for 3000K, 3500K and 4000K and ANSI standard for 5000K. CRI minimum 80 for 3000K, 3500K and 4000K and typical 80 for 5000K. Complete light engine can be removed easily for future upgrade. LED light engine provides a reported lumen maintenance of 94% at 60,000 hours. L70 calculated greater than 100,000 hours.

**5. LED Driver** - LEDs are driven by RoHS compliant high-efficiency driver. Excellent for cold temperature starting and instant on. Standard driver for DMY option is Philips Xitanium Driver.

**6. Hood Supports** - Two aluminum arms support shade and optic assembly and attach to the die cast aluminum pole fitter (shown painted matte black for DS option).

**7. Pole Fitter** - Self-leveling, die-cast low-copper aluminum alloy, fitter base secured to pole with three, stainless steel, Allen head set screws. Fitter for 3 1/2" (90mm) O.D. poles.

**8. Driver cover** - Die cast aluminum cover made from low copper alloy, removes for tool-less access to driver. Driver secured to removable tray for ease of maintenance (shown painted matte black for DS option).

**9. Surge Protector** - (not shown) Designed to protect luminaire from electrical surge (10kA).

**10. Hi-Lo Switching Option** - (not shown) Please see p. 5 for details.

**11. Power Cord** - (not shown) Pre-installed at factory. Please specify power cord length in accordance to height of the pole. Add 2 feet to power cord length if double mounting (2) is specified.

**Exterior Luminaire Finish** - Selux utilizes a high quality Polyester Powder Coating. All Selux luminaires and poles are finished in our Tiger Drylac certified facility and undergo a five stage intensive pretreatment process where product is thoroughly cleaned, phosphated and sealed. Selux powder coated products provide excellent salt and humidity resistance as well as ultraviolet resistance for color retention. All products are tested in accordance with test specifications for coatings from ASTM and PCI.

Standard exterior colors are White (WH), Black (BK), Bronze (BZ), and Silver (SV). Selux premium colors (SP) are available, please specify from your Selux color selection guide.

**5 Year Limited LED Luminaire Warranty** - Selux offers a 5 Year Limited Warranty to the original purchaser that the Saturn Cutoff LED luminaire shall be free from defects in material and workmanship for up to five (5) years from date of shipment. This limited warranty covers the LED driver and LED array when installed and operated according to Selux instructions. For details, see "Selux Terms and Condition of Sale."

**Listings and Ratings:** Luminaire and LED tested to IP65 and IESNA LM-79-08 standards. LED tested to LM-80 standards. Luminaire and LED tested at 25°C ambient temperature.

**For LG3500 and LG3700, luminaire suitable for ambient temperatures of 55°C (130°F). For LG3105, luminaire suitable for ambient temperature of 45°C (113°F). Minimum operating temperature of luminaire at -35°C (-31°F).**

**NRTL Listed (i.e. UL, CSA)**

**Visit [selux.us](http://selux.us) for our LED End of Life recycling policy.**

**Mounting**

**Single (1)**

Die-cast aluminum fitter base secured to pole with three stainless steel, Allen head set screws.

EPA = 1.7ft<sup>2</sup> (0.16m<sup>2</sup>)  
Weight = 39lbs. (17.7kg)

**Single Arm Mount (1A)**

Die-cast aluminum single luminaire mounting arm secured to pole with four stainless steel, Allen head set screws. Outer slip fitter for 3 1/2" O.D. tenon.

EPA = 2.7ft<sup>2</sup> (0.25m<sup>2</sup>)  
Weight = 53lbs. (24.0kg)

**Double (2)**

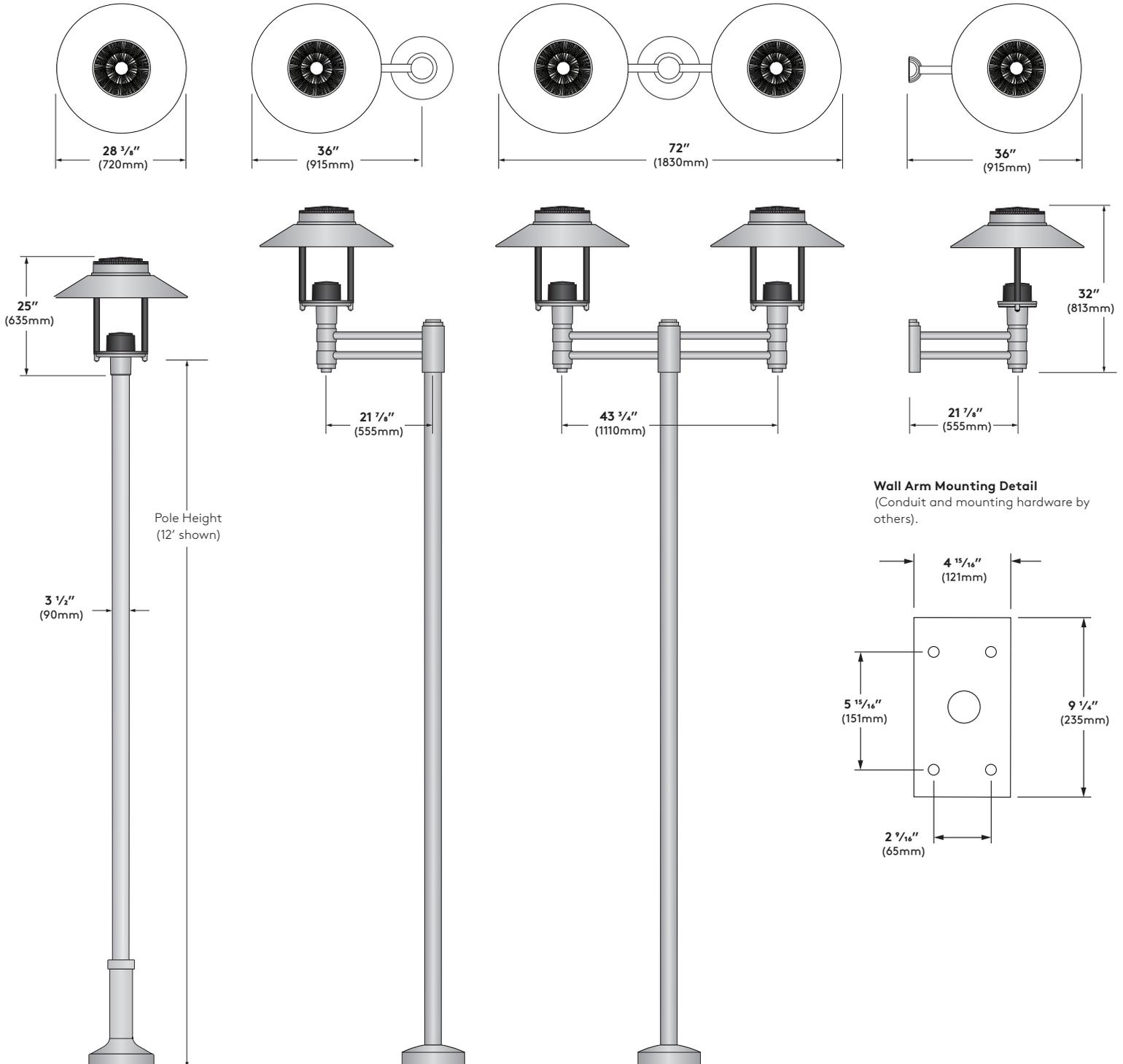
Die-cast aluminum double luminaire mounting arm secured to pole with four stainless steel, Allen head set screws. Outer slip fitter for 3 1/2" O.D. tenon.

EPA = 5ft<sup>2</sup> (0.46m<sup>2</sup>)  
Weight = 176lbs. (79.8kg)

**Wall (W)**

Die-cast aluminum double round wall mount arm. Secured to wall with 1/4" diameter threaded fasteners (by others).

EPA = 2.5ft<sup>2</sup> (0.23m<sup>2</sup>)  
Weight = 50lbs. (22.7kg)



**Pole Information**

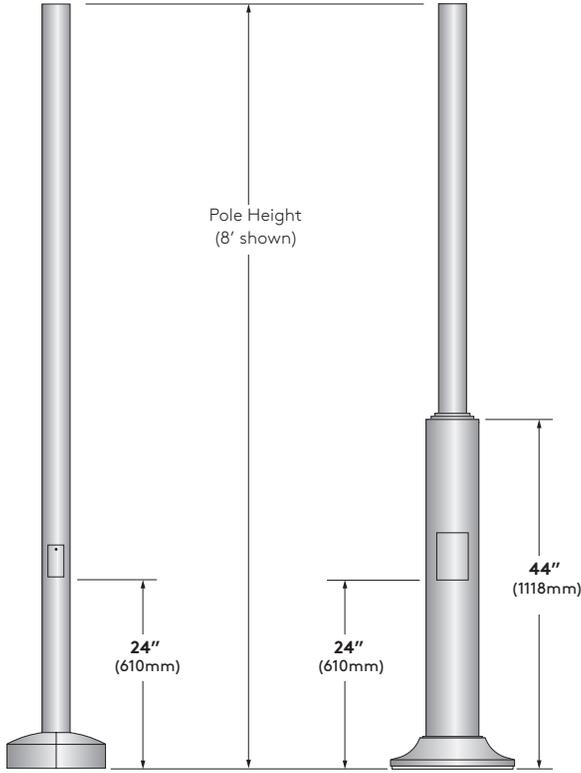
Refer to pole specification sheets for construction details, anchorage information and additional options.

**Base Cover Information**

Refer to pole specification sheets for construction details, anchorage information and additional options.

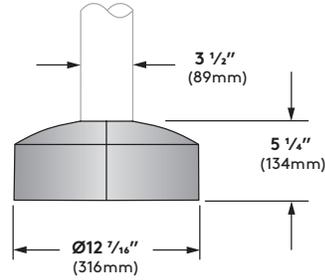
**A35 & S35  
Round Straight Aluminum  
& Round Straight Steel**

**S635  
Round Stepped Steel Poles**

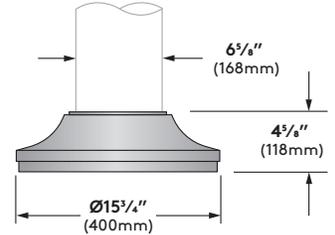


Shown with standard base covers.

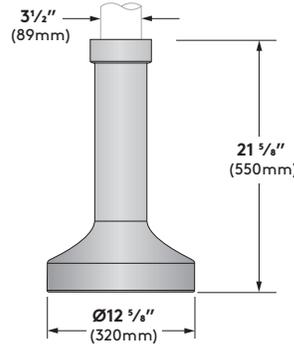
**Standard Base Cover (BC5)  
Supplied with A35 and S35**  
Two-piece cast aluminum



**Standard Base Cover (BC6)  
Supplied with A35 and S35**  
One-piece cast aluminum



**Optional Base Cover (BC1)  
For A35 and S35 only**  
One-piece cast aluminum

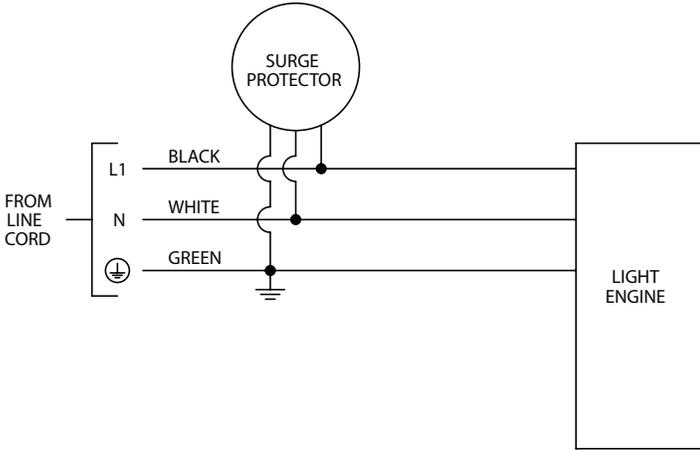


**Pole Data Chart**

Pole Series	Bolt Circle	EPA Information					Height	Finish	Options
		70mph	80mph	90mph	100mph	110mph			
<b>S635</b> 3 1/2" Diameter Stepped Steel Pole	Ø9"	57.6	44.3	34.6	27.5	22.8	8 ft.	<b>WH</b> White <b>BK</b> Black <b>BZ</b> Bronze <b>SV</b> Silver <b>SP</b> Specify Premium Color	<b>BC1</b> Decorative Cast Aluminum Base Cover (for A35 & S35 poles only)  <b>REC</b> GFCI Receptacle with weatherproof cover <sup>1</sup> (120V only)
<b>A35</b> 3 1/2" Diameter Straight Aluminum Pole	Ø7 3/4"	16.1	12.2	9.4	7.3	5.9			
<b>S35</b> 3 1/2" Diameter Straight Steel Pole	Ø7 3/4"	14.8	11.3	8.6	6.7	5.4			
<b>S635</b> 3 1/2" Diameter Stepped Steel Pole	Ø9"	45.6	35.0	27.3	21.6	17.8	10 ft.	<b>WH</b> White <b>BK</b> Black <b>BZ</b> Bronze <b>SV</b> Silver <b>SP</b> Specify Premium Color	<b>BC1</b> Decorative Cast Aluminum Base Cover (for A35 & S35 poles only)  <b>REC</b> GFCI Receptacle with weatherproof cover <sup>1</sup> (120V only)
<b>A35</b> 3 1/2" Diameter Straight Aluminum Pole	Ø7 3/4"	12.4	9.3	7.1	5.4	4.3			
<b>S35</b> 3 1/2" Diameter Straight Steel Pole	Ø7 3/4"	11.4	8.6	6.5	4.9	3.9			
<b>S635</b> 3 1/2" Diameter Stepped Steel Pole	Ø9"	37.6	28.7	22.3	17.5	14.4	12 ft.	<b>WH</b> White <b>BK</b> Black <b>BZ</b> Bronze <b>SV</b> Silver <b>SP</b> Specify Premium Color	<b>BC1</b> Decorative Cast Aluminum Base Cover (for A35 & S35 poles only)  <b>REC</b> GFCI Receptacle with weatherproof cover <sup>1</sup> (120V only)
<b>A35</b> 3 1/2" Diameter Straight Aluminum Pole	Ø7 3/4"	9.9	7.3	5.4	4.0	3.1			
<b>S35</b> 3 1/2" Diameter Straight Steel Pole	Ø7 3/4"	9.1	6.7	4.9	3.6	2.8			
<b>S635</b> 3 1/2" Diameter Stepped Steel Pole	Ø9"	31.7	24.2	18.6	14.6	11.9	14 ft.	<b>WH</b> White <b>BK</b> Black <b>BZ</b> Bronze <b>SV</b> Silver <b>SP</b> Specify Premium Color	<b>BC1</b> Decorative Cast Aluminum Base Cover (for A35 & S35 poles only)  <b>REC</b> GFCI Receptacle with weatherproof cover <sup>1</sup> (120V only)
<b>A35</b> 3 1/2" Diameter Straight Aluminum Pole	Ø7 3/4"	8.0	5.8	4.2	3.0	2.2			
<b>S35</b> 3 1/2" Diameter Straight Steel Pole	Ø7 3/4"	7.3	5.3	3.8	2.7	1.9			
<b>S635</b> 3 1/2" Diameter Stepped Steel Pole	Ø9"	21.7	15.8	12.3	9.6	7.6	16 ft.	<b>WH</b> White <b>BK</b> Black <b>BZ</b> Bronze <b>SV</b> Silver <b>SP</b> Specify Premium Color	<b>BC1</b> Decorative Cast Aluminum Base Cover (for A35 & S35 poles only)  <b>REC</b> GFCI Receptacle with weatherproof cover <sup>1</sup> (120V only)
<b>A35</b> 3 1/2" Diameter Straight Aluminum Pole	Ø7 3/4"	4.9	3.2	2.2	1.4	N/A			
<b>S35</b> 3 1/2" Diameter Straight Steel Pole	Ø7 3/4"	4.4	2.8	1.9	N/A	N/A			

**Wiring**

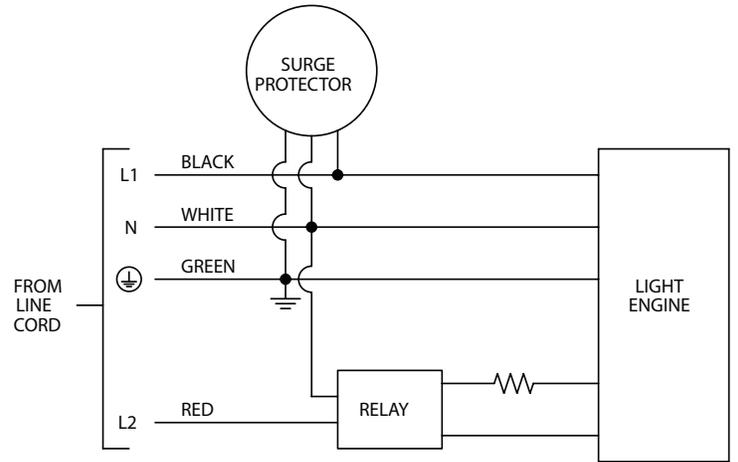
**Standard Single Wiring & Dynadim (DMY)**



**Hi-Lo Switching Option (HL) Wiring**

LG3700 and LG3105, 120V, 240V, 277V. When red is energized, light output will be at "Lo" level. Specify low level by using one of the 3 levels listed below (i.e. HL70, HL50 and HL33). For other combinations, consult factory.

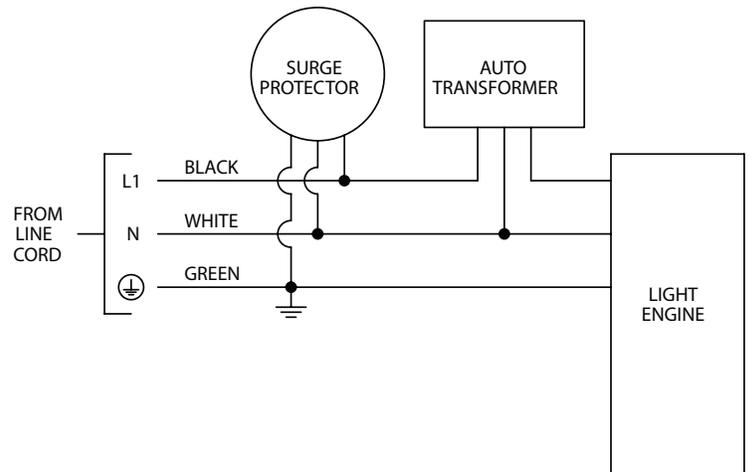
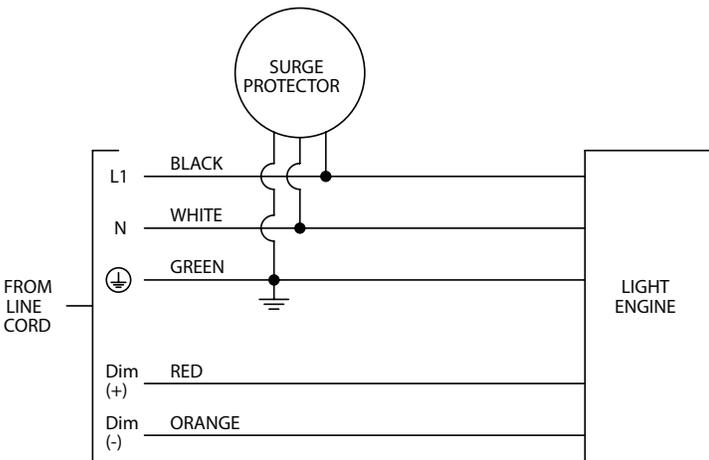
	Standard HL levels	LG3105	LG3700
HL70 = low output	70%	X	X
HL50 = low output	50%	X	X
HL33 = low output	33%	X	X



**0-10V Dimming Option (DM) Wiring**

LG3700 and LG3105, 120-277V. (347V and 480V available with step-down transformer.)

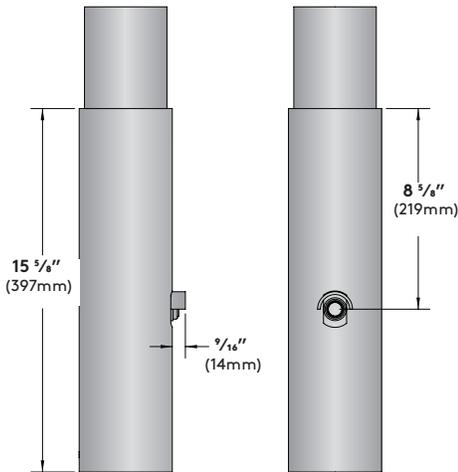
347/480 V



**Optional Accessories**

**Dynadim (DMY)** - Please refer to the Dynadim Option Form (includes a link to the Philips® Design-In Guide) on the Selux [Saturn 2 Cutoff LED webpage](#) under Additional Downloads.

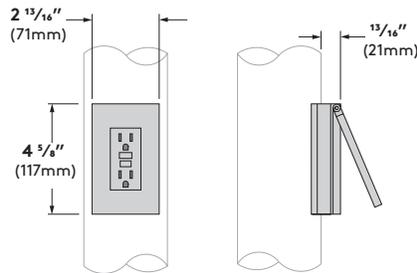
**Photo Cell Tenon (PCT)** - Button type photocell mounted in cast aluminum pole top tenon. Tenon has integral cast visor to prevent false start/stop cycle and can be oriented for optimum performance. Refer to luminaire spec sheet to determine if this option is applicable.



**Single Fusing (FS)** - Single inline fuse holder, shipped separately for infold installation behind hand hole (by others). Available up to 277V.

**No Uplight Finish (DS)** - In order to achieve BUG U0 rating, the hood support and the driver cover are painted matte black to avoid uplight.

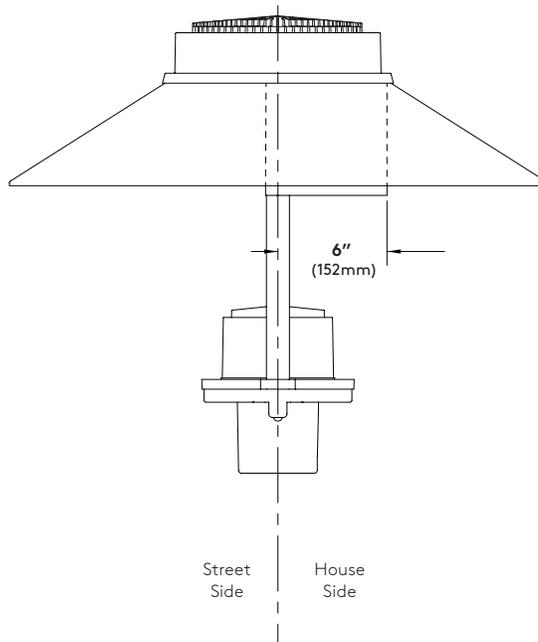
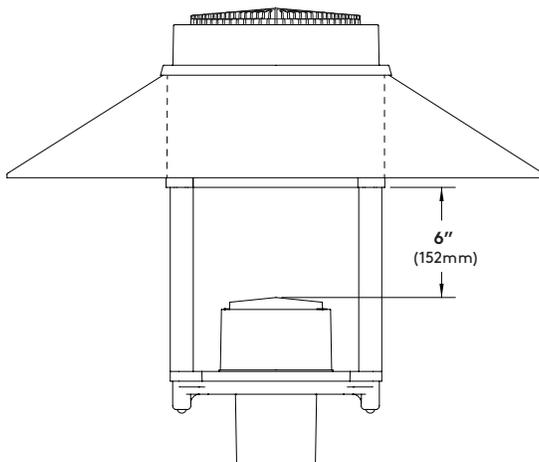
**GFCI Receptacle (REC)** - GFCI duplex receptacle with cast base bolted to pole and gasketed, provided with weather-proof, self-closing cover; located 36" (915mm) from base of pole, inline with handhole. Receptacle is intended only for portable tools or other portable equipment to be connected to outlet only when attended by operating personnel (120V only).



**House Side Shield**

Front View

Side View



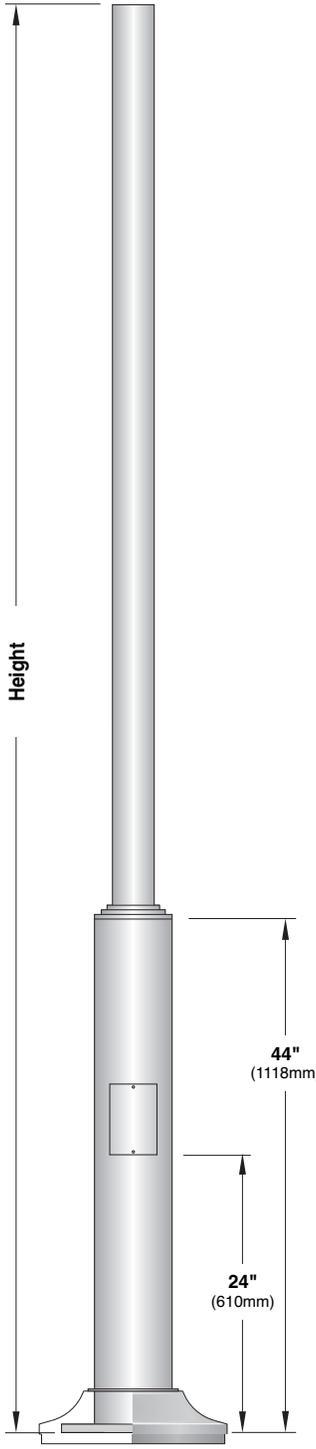
# S635 6" to 3 1/2" Round Straight Stepped Steel Pole



**Project:** \_\_\_\_\_

**Type:** \_\_\_\_\_ **Qty:** \_\_\_\_\_

**Ordering Format:** S635 - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_  
Series Height Finish Option Option



Height	Wall Thickness	EPA Information (ft <sup>2</sup> )					Finish	Options
		70 mph	80 mph	90 mph	100 mph	110 mph		
8 8 ft.	0.125	57.6	44.3	34.6	27.5	22.8	WH White	<b>REC</b> GFCI Receptacle  For PCT refer to fixture spec sheets (where applicable). For other options please consult factory.
10 10 ft.	0.125	45.6	35.0	27.3	21.6	17.8	BK Black	
12 12 ft.	0.125	37.6	28.7	22.3	17.5	14.4	BZ Bronze	
14 14 ft.	0.125	31.7	24.2	18.6	14.6	11.9	SV Silver	
16 16 ft.	0.125	21.7	15.8	12.3	9.6	7.6	SP Specify Premium Color	
18 18 ft.	0.125	18.8	13.6	10.4	8.1	6.3		
Other heights available, consult factory.		EPA Calculations allow for 1.3 Gust Factor						

## Standard Specifications

**Pole Shaft** - Pole shaft is constructed of ASTM A554 steel tubing.

**Anchor Base** - Anchor base is manufactured of 3/4" thick ASTM A36 steel. The anchor base and shaft are joined by a continuous circumferential weld at the outside top and inside bottom of the anchor base.

**Access Hole** - The opening measures 3" x 5" (76 x 127mm). Flush access cover is supplied with tamper resistant fasteners. 5/16-18 ground lug is located inside pole, opposite the hand hole.

**Anchor Bolts** - Pole is supplied with four 3/4 x 17" steel hot dip galvanized anchor bolts each with two nuts, two flat washers and one lock washer.

**Base Cover** - Standard one-piece base cover is made from cast 319 alloy aluminum which is heat treated to produce a T6 temper, measuring 4 1/8" (105mm) high by 15 3/4" (400mm) diameter.

**Exterior Luminaire Finish** - Selux utilizes a high quality Polyester Powder Coating. All Selux luminaires and poles are finished in our Tiger Drylac certified facility and undergo a five stage intensive pretreatment process where product is thoroughly cleaned, phosphated and sealed. Selux powder coated products provide excellent salt and humidity resistance as well as ultra violet resistance for color retention. All products are tested in accordance with test specifications for coatings from ASTM and PCI.

Standard exterior colors are White (WH), Black (BK), Bronze (BZ), and Silver (SV). Selux premium colors (SP) are available, please specify from your Selux color selection guide. Hot Dip Galvanized finish (GV) on all steel parts also available.

**All Poles** are constructed per AASHTO standards for structural supports for highway signs, luminaires and traffic signals as published in 1975, amended and adopted in 1985 and 1994.

A consideration of field conditions such as (but not limited to) wind zone, height, vibration must be given by the designer/specifier for the appropriate application.

Performance of poles is dependent upon proper support/attachment of pole to adequate foundation design. Selux does not design or offer recommendations for foundations. EPA values assume that the bottom of the pole is at grade level.

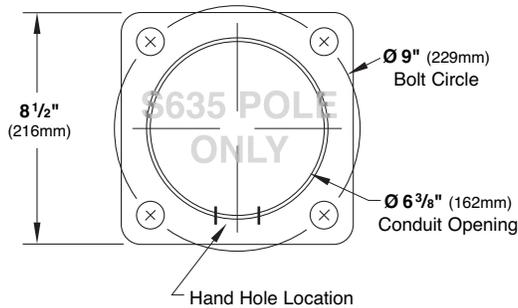
Call Selux (1-800-SELUXCS) if there are any questions, or for any assistance in determining suitability with appropriate fixtures.

# S635 6" to 3 1/2" Round Straight Stepped Steel Pole



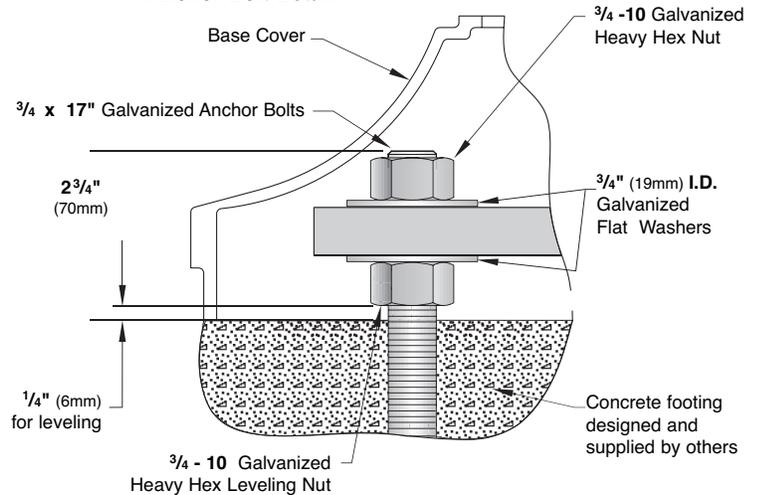
## Bolt Circle

Use caution when setting anchor bolts. Bolts must be vertically straight and centered on dimensions shown.



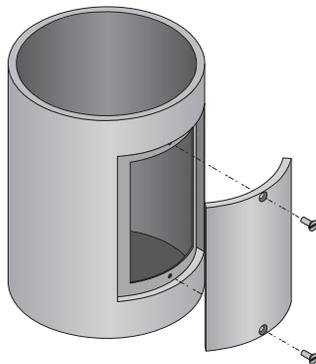
**Note:** Adequate drainage must be provided in concrete foundation.

## Anchor Bolt Detail



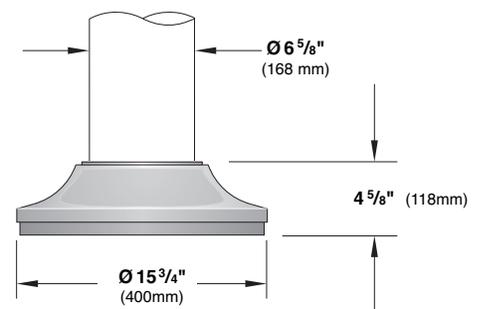
## Hand Hole

3" x 5" (76 x 127mm) with a 5/16 - 16 ground lug inside pole opposite hand hole.



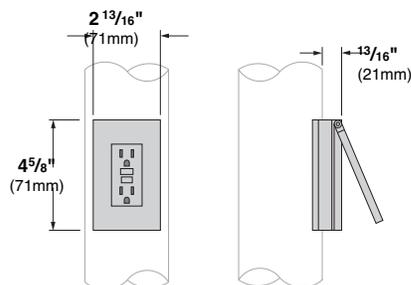
## Standard Base Cover (BC6)

One-piece cast aluminum.

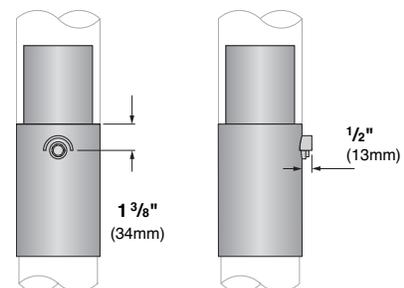


## Optional Accessories

**GFCI Receptacle (REC)** - GFCI duplex receptacle with cast base bolted to pole and gasketed, provided with weather-proof, self-closing cover; located 36" (915mm) from base of pole, inline with handhole. Receptacle is intended only for portable tools or other portable equipment to be connected to outlet only when attended by operating personnel.



**Photo Cell Tenon (PCT)** - Button type photocell mounted in cast aluminum pole top tenon. Tenon has integral cast visor to prevent false start/stop cycle and can be oriented for optimum performance. Refer to fixture spec sheet to determine if this option is applicable.





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# Digital Watchdog VMAX IP 2.1MP Bullet Camera with 3.6mm Fixed Focal Lens

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The **VMAX IP 2.1MP Bullet Camera** from **Digital Watchdog** utilizes a 1/2.8" Sony Exmor CMOS sensor and a 3.6mm fixed focal lens to capture images at a resolution up to 1952 x 1116 at 30 fps. With a built-in IR-cut filter and integrated IR LEDs, this camera can capture clear images in complete darkness. The IR LEDs provide illumination up to 50'. The camera supports H.264 and MJPEG compression formats with dual streaming capabilities. With the IP66-rated weather-resistant housing, this camera is suitable for outdoor applications.

### 1/2.8" Sony Exmor CMOS Sensor

The camera delivers real-time HD video streams of 1080p resolution at 30 frames per second for live and monitoring.

### Recommended Accessories

#### Traditional Power Supply / POE Power

[See More >](#)

**Required item:** A power supply is not included, and required to power and control this camera.

### Triple Codecs (H.264, MJPEG, MPEG4) with Simultaneous Dual-Stream

The camera allows you to optimize your bandwidth usage, by offering simultaneous streaming. This allows you to stream high-resolution for live monitoring and motion events, and setup a lower-resolution streaming profile for when no activity is detected. This allows the camera to seamlessly transition between low and high resolution streams to maximize bandwidth usage, reduce network traffic and improve your overall system's performance and power.

### 3D Digital Noise Reduction (DNR)

3D Digital Noise Reduction increases the camera's clarity in very low light environments by using a unique algorithm to clean electronic noise signals that can reduce the camera's visibility and trigger false motion-detection events. DNR technology allows the camera to produce clearer images in both color and B/W in low light without creating lagging or ghosting effects in the image.

### Wide Dynamic Range (WDR)

Wide Dynamic Range technology enables the camera to capture an entire scene in a single frame, even when there are very bright and dark areas in the camera's Field of View or images are distorted by a strong backlight. The camera adjusts the exposure to the dark area and the bright area at the same time, capturing both areas with no detail loss.

### Smart IR

Smart IR adjusts the image for IR cameras to eliminate LED light reflection and white spots in the image. By breaking down the camera's Field of View into five zones, Smart IR allows for even distribution of the IR light. This prevents excessive illumination on images that are in the front of the scene and offers a clear image in B/W with no detail loss.

### TDN (True Day/Night) with IR Cut Filter

During daylight, the IR cut filter allows visible light to pass through, reflecting the unwanted infrared light. In low-light environments, where artificial or external light is not available, the cut filter is removed from in front of the lens allowing the camera to capture the infrared light that is given out from the infrared LEDs, to capture as much light as possible to produce brighter images.

### Complete Camera Control and Configuration via VMAX IP NVR

The camera is engineered to work with the NVR by enabling complete camera control from the NVR's VMAX GUI. This includes auto network and image settings, all managed from the NVR's local GUI, with no need for additional software.

### Other Features

- 3.6mm fixed focal lens
- IP66-rated weather resistant housing
- Can be powered via Power over Ethernet (PoE) & 12 VDC supply

[Overview](#)   [Specifications](#)   [In the Box](#)   [Accessories](#)   [Q&A](#)



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Connect your cameras to a network and sort them efficiently with high-grade cable.



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Snagless Patch Cable  
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DIGITAL WATCHDOG DWCMF21M4TIR 2.1 MP VANDAL DOME 4.0MM FIXED



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Description

**2.1 MP VANDAL DOME 4.0MM FIXED DOME CAMERA**

The MF21M4TIR MEGAPIX camera is a triple codec Weather Resistant Flat Vandal dome network camera that provides 1080P megapixel resolution at 30 frames per second. The camera's advanced technologies such as True Day and Night, 3D-DNR, WDR, and Smart IR will deliver the best images in any type of environment. And Power over Ethernet will simplify installation by connecting both power and network through a single cable.

[PRODUCT BROCHURE HERE](#)

**Features**

- **3D DNR (Digital Noise Reduction)**
- **BLC - Backlight Compensation**
- **D/N - Day/ Night:** True
- **IR Distance:** 30ft IR with Intelligent Camera Sync
- **Image Sensor:** 1/2.8" CMOS Sensor
- **Lens:** 4.0mm Fixed Lens
- **NEMA RATING:** IP66 Certified [Weatherproof]
- **OnVIF Conformant**
- **PoE (Power over Ethernet):** Class 2 PoE Switch
- **Programmable Privacy Zones:** 16 Programmable Zones
- **SD Card Backup**
- **WDR- Wide Dynamic Range**
- **Web Server Built-in**
- **Zoom:** 12x Digital Zoom

Image

Effective Pixels (H X V)	1920 (H) x 1080 (V)
Image Sensor	1/2.8" Sony CMOS Sensor
Minimum Illumination	F2.5 (30IRE): 0.5 Lux [Color] F2.5 (30IRE): 0.00 Lux [B&W]
Resolution	2.1 Megapixels (1080P, 30fps)
Lens	
Focal Length	4.0mm Fixed Lens, F1.8
IR Distance	30ft Range IR
Lens Type	Fixed Lens
Zoom	12x Digital Zoom

<b>Mechanical</b>		
Dimensions	ø 125 x 74.3mm (ø 4.9 x 2.9")	
Housing Material	Aluminum Die-Casting	
Housing Type	Vandal Dome	
Weight	1 lbs	
<b>Network</b>		
Frame Rate	Up to 30 frames per second at 2.1MP	
LAN	802.3 Compliance 10/100 LAN	
Maximum Simultaneous User Access	5 Simultaneous Users	
OnVIF Conformant		
Protocols	TCP/IP, HTTP, DHCP, PPPoE, ICMP, ARP, RARP, RTSP, NTP, UDP, Multicast	
SD Card Backup	Up to 24 Hours to Micro SD Card (4~32GB) Card not included.	
Streaming Capability	Simultaneous Dual-Stream	
Video Compression Type	H.264, MPEG4, MJPEG	
Video Management Software	DW Spectrum	
Web Viewer	OS: Windows XP / Vista / 7, MAC OS Browser: Internet Explorer, Chrome, Firefox, Safari	
<b>Operational</b>		
3D DNR	3D Digital Noise Reduction Off/ Low/ Middle/ High	
AGC	Auto Gain Control	Max 41dB
Alarm Notifications	Notifications Via E-mail	
BLC	Backlight Compensation	OFF / ON
D/N	Day/ Night	Auto, Day (Color), Night (B/W)
DSS- Digital Slow Shutter	Off, up to 8x	
Programmable Privacy Zones	OFF / ON (16 Programmable Zones)	
Recording Schedule	Continuous, Motion, Pre- & Post-Alarm	
Sharpness	0~10	
WDR	Wide Dynamic Range	Off, Low, Medium, High
<b>Environmental</b>		
NEMA RATING	IP66 (Protects against dust and high pressure water)	
Operating Humidity	Less than 90% (Non-Condensing)	
Operating Temperature	-10°C ~ 50°C (14°F ~ 122°F)	
Power Consumption	LED OFF: 3.6W, 300mA LED ON: 4.3W, 360mA	
Voltage	DC 12V, PoE (IEEE802.3af Class 2)	

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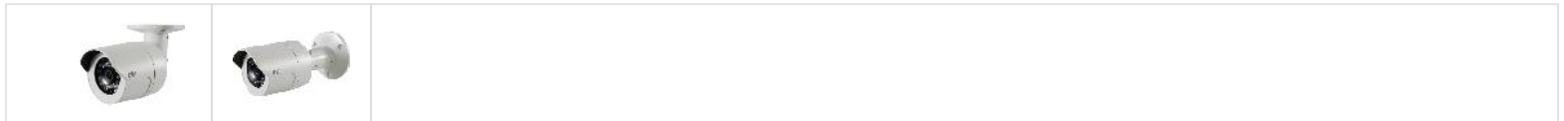
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## VMAX IP 2.1MP Bullet Cameras

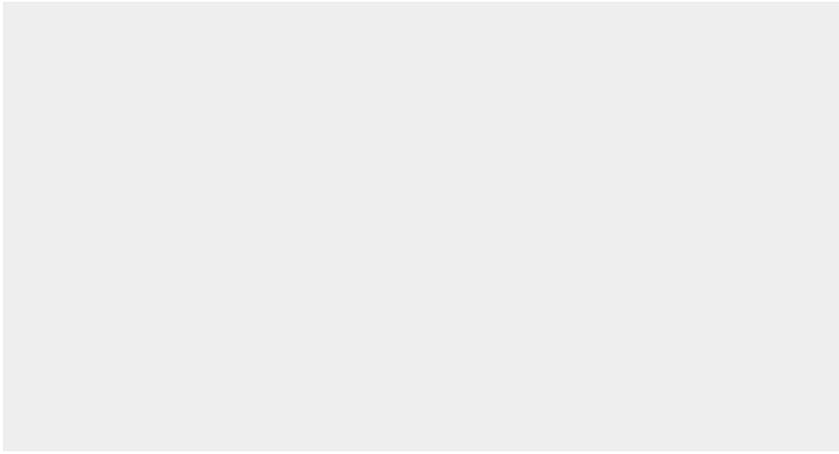
Model: DWC-BV12IR

The DWC-BV12IR is a 2.1-megapixel network camera with simple installation and configuration via the VMAX IP NVR on screen display (OSD). The camera is sold as a complete solution with the VMAX IP network video recorder (NVR), offering 3.6mm Fixed Lens, IP66 environmental-rated enclosure, IR LEDs for low light environments and image enhancement features such as WDR and Auto Digital Noise Reduction. Powered and configured completely via the VMAX IP NVR, the VMAX IP bundle is a complete solution that is simple to install and set up, perfect for single-site small scale applications.



### 1/2.8" Sony Exmor™ CMOS Sensor

Using the state of art video compression engine, the camera delivers real time HD video streams of 1080p resolution at 30 framer per second for live and monitoring.



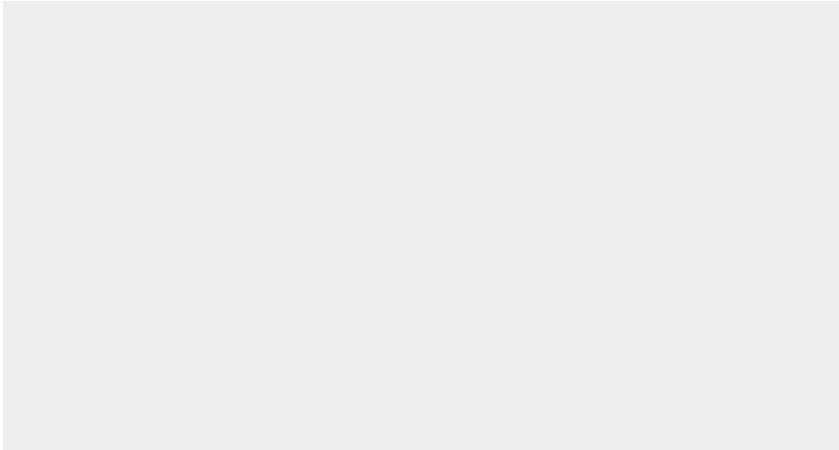
## Smart DNR™ 3D Digital Noise Reduction

Smart DNR™ 3D Digital Noise Reduction increases the camera's clarity in very low light environments by using a unique algorithm to clean electronic noise signals that can reduce the camera's visibility and trigger false motion detection events. Digital Watchdog's special noise reduction technology allows the camera to produce clearer images in both color and B/W in low light without creating lag or ghost effects in the image.



## Complete Camera Control and Configuration via VMAX IP NVR

The cameras are uniquely engineered to work with the NVR by enabling complete camera control from the NVR's familiar VMAX GUI. This includes auto network and image settings, all managed from the NVR's local GUI, with no need for additional software.

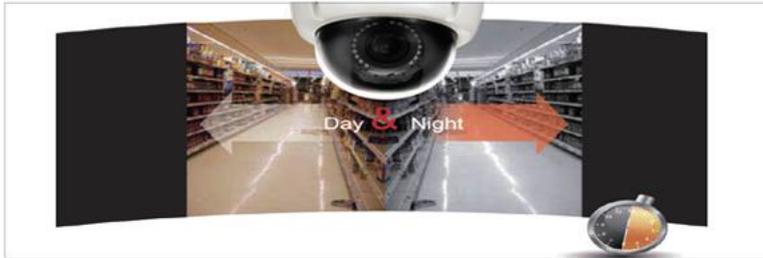


## Smart IR™

Smart IR™ adjusts the image for IR cameras to eliminate LED light reflection and white spots in the image. By breaking down the camera's field of view into five zones, Smart IR allows for even distribution of the IR light. This prevents excessive illumination on images that are in the front of the scene and offers a clear image in B/W without any loss of detail.

## TDN [True Day/Night] with IR Cut Filter

During daylight, the IR cut filter allows visible light to pass through, reflecting the unwanted infrared light. In low light environments, where artificial or external light is not available, the cut filter is removed from in front of the lens, allowing the camera to capture the infrared light that given out from the infrared LEDs, to capture as much light as possible to produce brighter images.



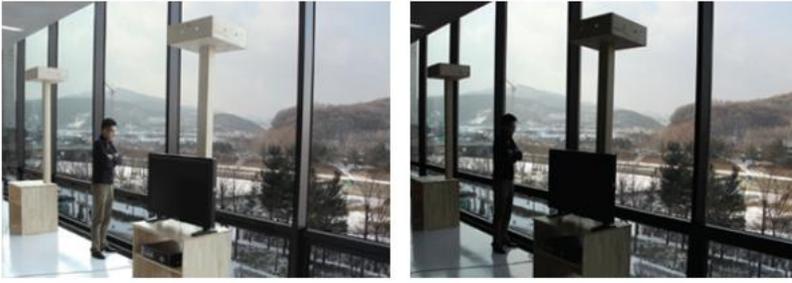
## Triple Codecs (H.264, MJPEG, MPEG4) with Simultaneous Dual-Stream

The cameras allow you to optimize your bandwidth usage, by offering simultaneous streaming. This allows you to stream high resolution for live monitoring and motion events, and setup a lower resolution streaming profile for when no activity is detected. This allows the camera to seamlessly transition between low and high resolution streams to maximize bandwidth usage, reduce network traffic and improve your overall system's performance and power.



## Wide Dynamic Range (WDR)

Wide Dynamic Range technology mechanically allows to capture an entire scene in challenging lighting conditions. One shutter is set to a short exposure, capturing the bright areas in the FoV, while the other is set for a long exposure, capturing the dark areas in the FoV. The camera then interlaces the images and combines them, capturing both areas with no loss of detail. This allows for an image capture even when there are very bright and dark areas in the camera's field of view or images are distorted by a strong backlight.

[Features](#)[Specifications](#)[Related Products](#)[Documents](#)[Software](#)

## Environmental\*

Power Requirements

DC 12V, PoE (IEEE802.3af Class 2)

## Image

Image Sensor

1/2.8" Sony® Exmor™ CMOS

Minimum Illumination

F2.5 (30IRE): 0.15 Lux [Color] F2.5 (30IRE): 0.0 Lux [B&W]

S/N Ratio- Signal to Noise Ratio

42dB (AGC Off)

Total Pixels (H X V)

1952 (H) x 1116 (V) = 2.18MP

## Network\*

IP Protocols

IPv4, TCP/IP, UDP, IPv4, RTSP, DHCP

## Lens

Focal Length

3.6mm

IR Distance

50ft Range IR

Lens Type

Fixed Lens

## Mechanical

Dimensions

1.1 lbs (0.5 kg)

Housing Material

Aluminum Die-casting

Housing Type

Bullet

Dimensions

75 x 70 x 135 mm (2.95 x 2.75 x 5.31")

## Network

Frame Rate	Up to 30fps at All Resolutions
LAN	802.3af Compliance 10/100 LAN
Streaming Capability	Dual-Stream at Different Rates and Resolutions
Streaming Resolution	1080P, 720P, 640 x 360
Video Compression Type	H.264, MJPEG
Video Management Software	VMAXIP NVR GUI
Web Viewer	Camera Configuration and Access via VMAXIP NVR Only

## Operational

AWB	Auto White Balance	Auto
D/N	Day/ Night	Auto
DNR	Digital Noise Reduction	Auto (2D / 3D Dual Streaming)
Exposure Mode		Auto (Shutter, Gain Control)
WDR	Wide Dynamic Range	Off, On

## Environmental

NEMA RATING	IP66 (Protects against dust and high pressure water)
Operating Humidity	Less than 96% (Non-Condensing)
Operating Temperature	-10°C ~ 50°C (14°F ~ 122°F)
Other Certifications	CE, FCC, RoHS
Power Consumption	Max 6W, 500mA (LED ON)

[Back to top](#)

## About Our Company

Digital Watchdog is a leading manufacturer of security and surveillance solutions, offering stunning image quality, advanced hardware capabilities, reliable customer support and lowest total cost of deployment to the analog & IP megapixel surveillance markets. Located in Tampa, FL with manufacturing facilities in Seoul, Korea, Digital Watchdog is committed to delivering powerful security solutions to its customers worldwide.



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# Digital Watchdog DW-VAONE164T VMAX A1 960H, AHD, and TVI Digital Video Recorder (4TB)

B&H # DIDWVAONE164 • MFR # DW-VAONE164T



### SPECIAL ORDER

Ship Time: 3-7 business days ⓘ

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### Recommended Accessories

**Monitors** [See More >](#)

Verify the video feed or check recorded video on a monitor.



**ASUS - VS228H-P 21.5" LED-Backlit Widescreen Computer Display**

You Pay: **\$139.99**

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### Cables & Cable Management

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Connect your cameras to a DVR and sort them efficiently with high-grade cable.



**Pearstone - 25' SDI Video Cable - BNC to BNC**

You Pay: **\$19.95**

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### Media Cards & USB Storage

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**Lexar - 64GB JumpDrive S75 USB 3.0 Flash Drive (Green)**

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### Power

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Protect delicate circuitry from surges and keep the current flowing.



**APC - Power-Saving Back-UPS Pro 700 (120V)**

Reg. Price: \$

Instant Savings: **-\$90.00**

Offer ends Dec 30 '15 at 11:59 PM

You Pay: **\$102.95**

Limited supply at this price

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**Hikvision - DS-9000HQHI-SH Series**

**32-Channel Digital**

B&H# HI9016HQHSH4  
MFR# DS-9016HQHI-SH-4TB

You Pay: **\$2,109.00**

**Digital Watchdog - DW-VAC164T VMAX**

**AHD CORE 16-Channel**

B&H# DIDWVAC164T  
MFR# DW-VAC164T

You Pay: **\$845.99**

**Digital Watchdog - DW-VAONE1612T**

**VMAX A1 960H, AHD,**

B&H# DIDWVANE1612  
MFR# DW-VAONE1612T

You Pay: **\$1,696.79**

**Digital Watchdog - DW-VAONE163T VMAX**

**A1 960H, AHD, and TVI**

B&H# DIDWVAONE163  
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You Pay: **\$669.95**

**Digital Watchdog - DW-VAONE166T VI**

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# Bosch DIVAR AN 3000 Series 16-Channel DVR with 2TB HDD

B&H # BODVR316A201 • MFR # DVR-3000-16A201

## BOSCH



### SPECIAL ORDER

Ship Time: 3-7 business days ⓘ

### Free Standard Shipping

Not eligible for free Expedited Shipping

### PRODUCT HIGHLIGHTS

- 960H/RT Technology
- Free Viewing Apps
- H.264 Compression
- Web-Based Interface

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Channels: 16

4  8  16

Included HDD: 2TB

None  1TB  2TB

Options: Built-in DVD Burner

Built-in DVD Burner  DVR Only

You Pay: **\$869.00**

QTY

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Electrical

### Recommended Accessories

**Monitors** [See More >](#)

Verify the video feed or check recorded video on a monitor.

## Voltage

<b>External Power Adapter</b>	AC Input: 100 to 240 VAC, 50 to 60 Hz, 1.7 A
<b>Power Adapter</b>	DC: 12 VDC, 5 A
<b>DVR Power Input</b>	12 VDC, 35 W, 119 BTU/h
<b>RTC</b>	Battery On Main PCB: Lithium CR2032, 3 VDC

## Video

<b>Video Standard</b>	PAL or NTSC (select via general setup menu, or auto detect on channel 1) 960H resolution support
<b>Playback</b>	960H: 960 x 576 (PAL), 960 x 480 (NTSC) 4CIF: 704 x 576 (PAL), 704 x 480 (NTSC) 2CIF: 704 x 288 (PAL), 704 x 240 (NTSC) CIF: 352 x 288 (PAL), 352 x 240 (NTSC) QCIF: 176 x 144 (PAL), 176 x 120 (NTSC)
<b>Compression</b>	H.264
<b>Input</b>	16 Composite video 1 Vpp, 75 Ω, CVBS (BNC)
<b>Output</b>	1 Channel Monitor A: CVBS (BNC) 1 Channel Monitor A: HDMI 1 Channel Monitor A: VGA 1 Channel Monitor B: CVBS (BNC) Support for simultaneous CVBS/VGA/HDMI output to Monitor A

## Monitor

<b>Monitor A</b>	Live, playback, menus VGA: Analog RGB maximum 1920 x 1080, 60 Hz HDMI: Digital RGB maximum 1920 x 1080, 165 MHz CVBS: 1 Vpp, 75 Ω, BNC (NTSC/PAL)
<b>Resolution</b>	MON.A: CVBS (PAL): 704 x 576 CVBS (NTSC): 704 x 480 VGA: 1920 x 1080, 1280 x 1024, 1280 x 720, 1024 x 768 HDMI: 1920 x 1080, 1280 x 1024, 1280 x 720, 1024 x 768 960H Camera: 960 x 576 (PAL), 960 x 480 (NTSC) 720H Camera: 704 x 576 (PAL), 704 x 480 (NTSC)
<b>Monitor B</b>	Live
<b>Resolution</b>	MON.B: CVBS (PAL): 704 x 576 CVBS (NTSC): 704 x 480

## Audio

<b>Input</b>	4-Channel RCA (for 16-channel units), 200 to 3000 mV, 10 kΩ (RCA)
<b>Output</b>	Mono RCA, 200 to 3000 mV, 5 kΩ (RCA)



**EverFocus - 19" LED-Backlit CCTV Monitor**

You Pay: **\$198.00**

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## Cables & Cable Management

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Connect your cameras to a DVR and sort them efficiently with high-grade cable.



**Pearstone - 25' SDI Video Cable - BNC to BNC**

You Pay: **\$19.95**

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## Media Cards & USB Storage

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**Lexar - 64GB JumpDrive S75 USB 3.0 Flash Drive (Green)**

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## Power

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Protect delicate circuitry from surges and keep the current flowing.



**Belkin - 7-Outlet Commercial Surge Protector (7' (2.1 m))**

You Pay: **\$14.49**

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## Network Devices

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Connect your cameras to a network.



**D-Link - DGS-1008P 8-Port Gigabit Ethernet PoE Switch**

You Pay: **\$98.93**

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<b>Mic Input</b>	Mono talk input RCA, 200 to 3000 mV, 10 k $\Omega$ (RCA)
<b>Compression</b>	G.711A
<b>Sample Rate</b>	8 kHz per channel
<b>Bitrate</b>	8-bit

## Controls

<b>RS485</b>	PTZ control port Output signals according to RS485, maximum signal voltage -5 to +5 V
<b>RS232</b>	PTZ control port interface Output signals according to EIA/TIA-232-F, maximum input voltage $\pm 10$ V
<b>Supported Protocols</b>	Pelco P and D (over RS-485) Bosch OSD (over RS-485 or RS-232)

## Alarm

<b>Input</b>	16 inputs configurable NO/NC, maximum input voltage 5 VDC
<b>Output</b>	3 relay outputs, configurable NO/NC
<b>Relay Contacts</b>	Maximum rated, 30 VDC, 2 A continuous or 125 VAC, 1 A (activated)

## Connectors

<b>Video Input</b>	4 BNC
<b>Monitor Outputs</b>	1 VGA D-SUB 1 HDMI 2-channel BNC (CVBS)
<b>Alarm</b>	Inputs: 16 screw terminal inputs; Cable diameter AWG26-16 (0.13 to 1.5 mm) Outputs: 3 screw terminal outputs; Cable diameter AWG26-16 (0.13 to 1.5 mm)
<b>Audio</b>	Input: 4 RCA Output: 1 RCA
<b>Bi-Directional I/O</b>	Audio (MIC): 1 RCA for talk input or output
<b>Ethernet</b>	RJ45, 10/100/1000Base-T according to IEEE802.3
<b>RS485</b>	Screw terminal output
<b>External Power Input</b>	DB9 male, 9-pin D-type
<b>USB 2.0</b>	1 x front and 1 x rear USB connector for mouse or USB memory device
<b>Power</b>	+12 VDC

## Video Recording

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### Recording

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<b>Speed</b>	Maximum 30 IPS per channel (NTSC), configurable Maximum 25 IPS per channel (PAL), configurable
<b>Mode</b>	Manual, motion detection, scheduled, alarm

---

### Network

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<b>View</b>	Alarm: External, motion detection, system alarms, and video loss
<b>Audio</b>	Bi-directional (audio input and output connected via device)
<b>Software</b>	PC: Bosch Video Client or Web Client

---

### Playback

---

<b>Multi-Channel Input</b>	Simultaneous 16 channels
<b>Mode</b>	Frame-by-frame, slow play, fast play, reverse
<b>Search</b>	Time, channel, type, smart

---

### Alarm Handling

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<b>Motion Detection</b>	Detection Zones: 396 (PAL) / 330 (NTSC)
<b>Video Loss Detection</b>	External alarm and screen prompt

---

### Storage

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<b>Internal</b>	2 TB HDD + 1 DVD (R/RW) Maximum capacity per HDD: 3 TB Maximum supported speed per HDD: 6 Gb/s
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### Export Format

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<b>DVD</b>	Built-in DVD+R/RW writer
<b>USB</b>	Flash memory or external HDD (FAT32)

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### Environmental

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<b>Temperature</b>	Operating: 32 to 104°F (0 to 40°C) Storage: -40 to +158°F (-40 to 70°C)
<b>Humidity</b>	Operating: <93% non-condensing Storage: <95% non-condensing

---

## PC Requirements

<b>Operating System</b>	For Web Support: Windows XP, Windows Vista or Windows 7
<b>Web Browser</b>	Safari, Chrome, Firefox (QuickTime required; no playback supported) Internet Explorer 9 (playback supported)
<b>Processor</b>	Intel Core Duo 2.0 GHz or comparable
<b>RAM</b>	Memory: 2048 MB
<b>Free Disk Space</b>	10 MB
<b>Graphics Card</b>	NVIDIA GeForce 8600 or better
<b>Video Memory</b>	256 MB
<b>Network Interface</b>	10/100/1000-BaseT

## Certifications and Approvals

<b>Standard</b>	<p>EMC Directive: 2004/108/EC          EMC Immunity: EN 50130-4:2011          EMC Emission:          EN 55022:2010, +AC:2011 Class B conducted + radiated emission          EN 61000-3-2:2006, +A1: 2009, +A2:2009, mains harmonics          EN 61000-3-3:2008, voltage fluctuations          Environment: EN 50130-5 Class 1          Low Voltage Directive: 2006/95/EC          Safety: EN 60950-1:2006, +A11:2009, +A1:2010, +A12:2011, +AC:2011,          USA: UL 60950-1: 2nd edition 2011-12-19 CAN/CSA C22.2 No.60950-1-07, 2nd edition 2011-12          FCC: CFR Title 47 Part 15:2009 class B          EMC Australia: C-Tick ⓘ</p>
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## Mechanical

<b>Dimensions (W x D x H)</b>	14.8 x 11.4 x 2.0" (375.0 x 290.0 x 50.0 mm), excluding cabling and feet 0.1" (5.0 mm)
<b>Weight</b>	Approximately 5.51 lb (2.50 kg), excluding HDD and DVD writer

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B&H# BODVR316A200  
MFR# DVR-3000-16A200

You Pay: **\$643.00**

**Bosch - DIVAR-5000 960H/RT 16-Channel 1080p DVR with 2TB**

B&H# BODVR516A201  
MFR# F.01U.288.838

You Pay: **\$1,192.95**

**Bosch - DIVAR-5000 16-Channel 960H Digital Video Recorder (DVD,**

B&H# BODVR500016A  
MFR# F.01U.300.017

You Pay: **\$1,283.95**

**Bosch - DIVAR AN 3000 Series 16-Channel DVR with 1TB HDD**

(1 reviews)

B&H# BODVR316A100  
MFR# DVR-3000-16A100

You Pay: **\$571.00**

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VMAXA1, 16CH, 960H, AHD, TVI, 4T

Digital Watchdog

Model #: DW-VAONE164T

ADI #: 6K-VAONE164T



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Specifications

General Information

ADI Part Number	6K-VAONE164T
Brand Name	Digital Watchdog
Manufacturer	Digital Watchdog
Manufacturer Part Number	DW-VAONE164T
Product Line	VMAX
Product Model	DW-VAONE 16
Product Type	Video Surveillance Station
UPC	813379016196
Weight	11.3 lbs

Physical Characteristics

Weight (Approximate)	9.83 lb
----------------------	---------

Storage

Hard Drive	4 TB
------------	------

Video

Video Formats	H.264
---------------	-------

Warranty

Standard Warranty	5 Year
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# MS-25(E) Rev 2

## Addressable FACP With Built-in Communicator



### Addressable Fire Alarm Control Panels

#### General

The Fire•Lite MS-25(E) is a 25 point addressable Fire Alarm Control Panel (FACP) with built-in Digital Alarm Communicator Transmitter (DACT). This control panel supports up to 25 addressable devices in any combination of detectors and modules. With simple programming, operation on standard wire, and features such as drift compensation and maintenance alert, the MS-25(E) is a preferred alternative to conventional control panels in both new and retrofit applications.

The JumpStart® (or auto-learn) feature and easy-to-set code-wheel addressing of Honeywell Fire Systems (HFS) or equivalent Fire•Lite detectors and modules enable the system to be configured for fire protection without a programming utility. The default programming can be modified using the panels embedded web server.

The integral DACT transmits system status (alarms, troubles, supervisories, etc.) to a remote monitoring location via the public switched telephone network. Reporting formats are contact ID, SIA 8 or SIA 20.

*NOTE: Unless otherwise specified, the term MS-25 is used in this data sheet to refer to the MS-25 and the MS-25E. For details on the Canadian version, see DF-60704.*

#### Features

- SBUS supports two ANN-80 Remote Annunciators
- JumpStart® auto-learn feature reduces installation time and makes programming easy.
- Built-in digital communicator.
- IP communicator compatible
- Two programmable Style Y (Class B) notification appliance circuits (NACs).
- Selectable strobe synchronization for System Sensor®, Gentex®, Wheelock® or AMSECO devices.
- Two programmable Form-C relays and one Form-C trouble relay.
- Automatic detector sensitivity testing (NFPA 72 compliant).
- Point status eliminates calibrated smoke test requirements for NFPA 72.
- Drift compensation.
- Alarm verification per zone of detectors.
- Walk-test.
- Detectors and modules are code-wheel addressed for faster installation time.
- Maintenance alert region.
- Uses standard wire (unshielded or twisted pair).
- Central Station reporting up to five zones.
- Custom programming performed through the control panel's built-in browser; no programming software is required.



ms25\_sm.jpg

#### SLC Communication

- Single addressable SLC loop which meets NFPA Style 4 (Class B) requirements.
- 25 addressable device capacity (any combination of addressable detectors and modules).
- Compatible with Honeywell Fire Systems (HFS) or equivalent Fire•Lite detectors and modules.

#### Notification Appliance Circuits (NACS)

- Two independently programmable output circuits. Circuits can be configured for the following outputs:
  - Style Y (Class B).
  - Door Holder Service (cannot be used for notification appliances).
  - Aux Power Source (cannot be used for notification appliances).
- Silence Inhibit and Auto-silence timer options.
- Continuous or Temporal code.
- Selectable strobe synchronization per NAC.
- Up to 2.0 A total output power, 1.0 A for auxiliary power and door holder. Each circuit can source up to the total system current 2.0 A.

## Programming and Software

- Auto-learn JumpStart® feature for easy programming reduces installation time.
- Two programmable Form-C relay outputs.
- 5 programming zones.
- Custom programming can be performed through control panel's built-in browser.

## User Interface

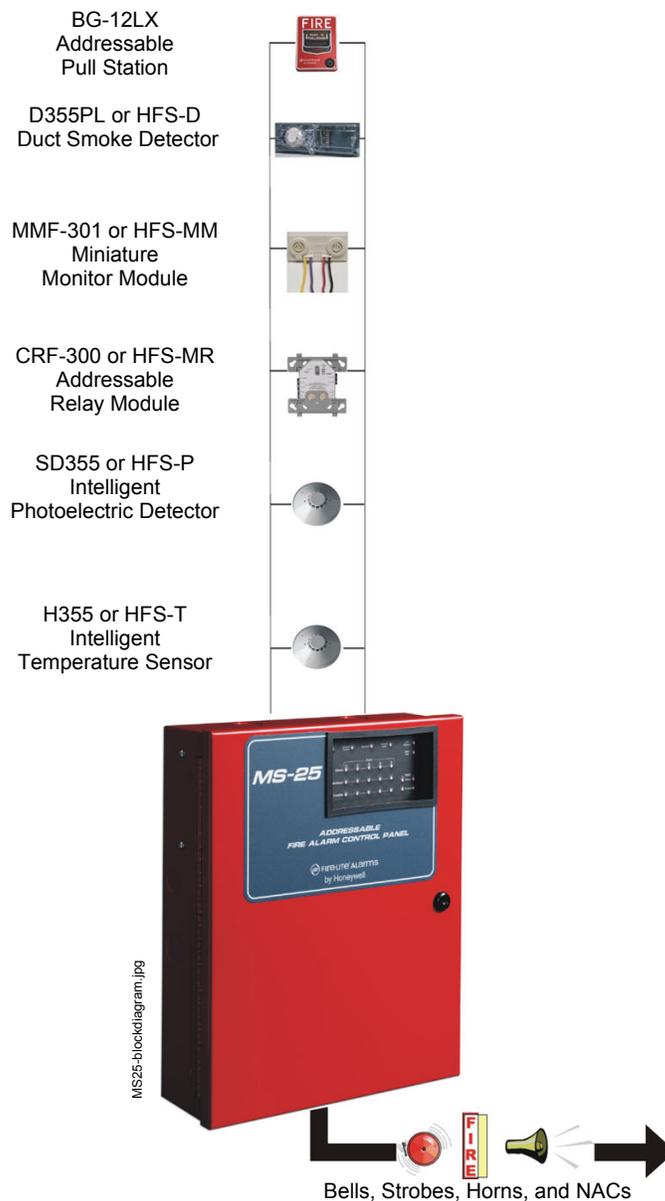
### LED INDICATORS

- AC Power (green)
- Fire Alarm (red)
- Supervisory (yellow)
- Alarm Silenced (yellow)
- System Trouble (yellow)
- Disabled (yellow)

- Low Battery Fault (yellow)
- Ground Fault (yellow)
- Walk Test (yellow)

### KEYPAD CONTROLS

- Acknowledge
- Silence
- Drill
- System Reset (lamp test)
- 10-key numeric keypad
- 5 Zones Disable keypad
- 2 NACs Disable keypad



## Product Line Information

**MS-25:** Combination DACT/Fire Alarm Control Panel with one SLC loop. Includes main circuit board with display, transformer, backbox with door, manual, and required screws, cables, key, etc. Red, 120 VAC.

**MS-25E:** Same as **MS-25**, but operates from 220/240 VAC.

**MS-25C:** Same as **MS-25**, but listed for Canadian applications. For details on the Canadian version, see DF-60704.

### HONEYWELL FIRE SYSTEMS DEVICES

**HFS-P:** Honeywell Fire Systems addressable photoelectric smoke detector. Includes base.

**HFS-PT:** Honeywell Fire Systems addressable photoelectric smoke detector with thermal sensor. Includes base.

**HFS-T:** Honeywell Fire Systems addressable fixed temperature heat detector. Includes base.

**HFS-MM:** Honeywell Fire Systems addressable Mini-Monitor module for normally-open contact devices.

**HFS-MR:** Honeywell Fire Systems addressable relay module.

**HFS-D:** Honeywell Fire Systems addressable photoelectric duct smoke detector. Includes detector.

### FIRE-LITE EQUIVALENT DEVICES

**BG-12LX:** Addressable dual-action manual pull station.

**SD355:** Addressable low-profile photoelectric smoke detector.

**SD355T:** Addressable low-profile photoelectric smoke detector with thermal sensor.

**H355:** Fast-response, low-profile heat detector.

**D355PL:** InnovairFlex low-flow non-relay duct-detector housing; includes SD355R.

**MMF-301:** Miniature version of MMF-300. Excludes LED and Style D option. Connects with wire pigtails. May mount in device backbox.

**CRF-300:** Addressable relay module containing two isolated sets of Form-C contacts, which operate as a DPDT switch.

**I300:** This module isolates the SLC loop from short circuit conditions

### COMPATIBLE ANNUNCIATORS

**ANN-80(-W):** Remote LCD annunciator mimics the information displayed on the FACP LCD display. Recommended wire type is un-shielded. (Basic model is red; order -W version for white; see DF-52417.)

**ANN-SB80KIT-R:** Red surface mount backbox with angled wedge.

**ANN-SB80KIT-W:** White surface mount backbox with angled wedge.

### MISCELLANEOUS

**SB-IO:** Surface-mount backbox for the BG-12LX, plastic.

**BG12TR:** Optional trim ring for semi-flush mounting the pull-station.

**BB-26:** Battery backbox, holds up to two 25 AH batteries and CHG-75.

**BB-55F:** Battery box, houses two 55 AH batteries.

**CHG-75:** Battery charger for lead-acid batteries with a rating of 25 to 75 AH.

**CHG-120F:** Remote battery charging system for lead-acid batteries with a rating of 55 to 120 AH. Requires additional BB-55F for mounting.

**BAT Series:** Batteries. See DF-52397.

**005220:** City Box Transmitter Module.

**007860:** DACT Phone Cord (2 required).

**IPDACT-2/2UD, IPDACT Internet Monitoring Module:** Connects to primary and secondary DACT telephone output ports for internet communications over customer provided ethernet internet connection. Requires compatible Teldat VisorALARM Central Station Receiver. Can use DHCP or static IP. (See DF-60407 or DF-52424 for more information.)

**IPSPLT:** Y-adaptor option allows connection of both panel dialer outputs to one IPDACT-2/2UD cable input.

**IPENC:** External mounting enclosure consisting of mounting bracket IPBRKT, and screws. When using the supplied phone cables, enclosure must be mounted within 6" (15.24 cm) of the FACP. Red.

## Wiring Requirements

While shielded wire is not required, it is recommended that all SLC wiring be twisted-pair to minimize the effects of electrical interference. Refer to the panel manual for wiring details.

# SYSTEM SPECIFICATIONS

## System Capacity

- Intelligent Signalling Line Circuits..... 1
- Addressable device capacity ..... 25
- Programmable software zones ..... 5
- Annunciators ..... 2

## Electrical Specifications

- **AC Power:** MS-25: 120 VAC, 60 Hz, 1.5 A. MS-25E: 230 VAC, 50/60 Hz, 0.75 A. AC wire size is minimum 14 AWG (2.00 mm<sup>2</sup>) with 600 V insulation. Nonpower-limited, supervised.
- **Battery:** Charging capacity 7-33 AH (18 AH for ULC applications). MS-25 cabinet holds maximum of two 7 AH batteries. Larger batteries require a separate battery cabinet, such as the **BB-26** or **BB-55F**.
- **Communication Loop:** Supervised and power-limited.
- **Notification Appliance Circuits:**
  - Terminal Strip provides connections for two NACs, Style Y (Class B).
  - Maximum signaling current: 2.0 A.
  - End-of-Line Resistor: 4.7 kOhm, ½ watt (P/N 71252 UL listed) for Style Y (Class B) NAC. Refer to the MS-25 manual for listed compatible devices.
- **Standby Current:** 135 mA
- **Alarm Current:** 220 mA
- **Aux Power Circuits:** 1.0A @ 24 VDC per circuit, power-limited
- **Two Programmable Relays and One Fixed Trouble Relay:**
  - Contact rating: 2.5 A @ 24 VDC (resistive).
  - Form-C relays, nonpower-limited, nonsupervised.

## Physical Specifications

- **Dimensions:** 15.2" H (38.42 cm) x 12.75" W (32.39 cm) x 3.4" D (8.57 cm)
- **Weight:** 11.5 lbs. (5.2 kg)
- **Color:** Red

## Temperature and Humidity Ranges

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

## Agency Listings and Approvals

The listings and approvals below apply to the basic MS-25(E) control panel. In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL Listed:** S624
- **CSFM:** 7165-0075:0217

For the ULC-listed version, see DN-60641.

## NFPA Standards

The MS-25(E) complies with the following NFPA 72 Fire Alarm Systems requirements:

- **LOCAL** (Automatic, Manual, Waterflow and Sprinkler Supervisory).
- **AUXILIARY** (Automatic, Manual and Waterflow) (requires 5220 module).
- **REMOTE STATION** (Automatic, Manual, Waterflow and Sprinkler Supervisory) (Where a DACT is not accepted, the alarm, trouble and supervisory relays may be connected to UL 864 listed transmitters).
- **PROPRIETARY** (Automatic, Manual and Waterflow).
- **CENTRAL STATION** (Automatic, Manual and Waterflow, and Sprinkler Supervised).

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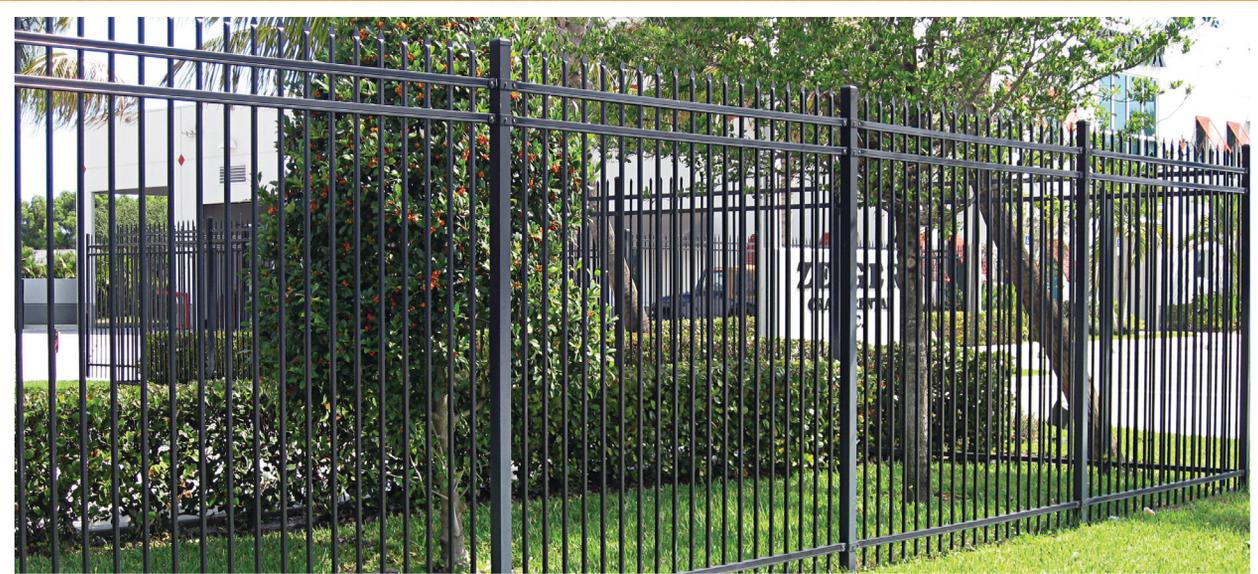
This document is not intended to be used for installation purposes.  
We try to keep our product information up-to-date and accurate.  
We cannot cover all specific applications or anticipate all requirements.  
All specifications are subject to change without notice.



Made in the U.S. A.

For more information, contact Fire•Lite Alarms. Phone: (800) 627-3473, FAX: (877) 699-4105.  
[www.firelite.com](http://www.firelite.com)

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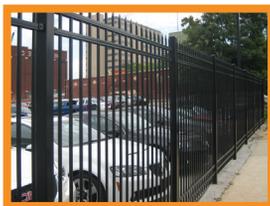


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Montage Commercial steel fences have *redefined the commercial fence industry* with strength that matches the *level of security demanded*. In the past commercial fencing was defined as a chain link fence with three strands of barbwire, today Montage Commercial ornamental fences are the *standard for security fencing*.

### PRIMARY APPLICATIONS

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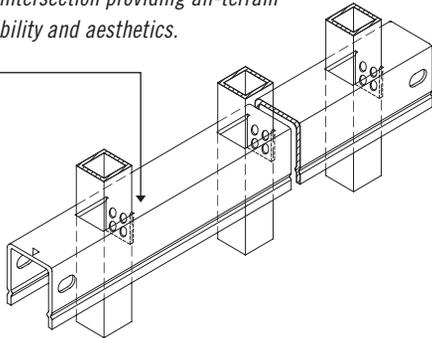
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## COMMERCIAL ORNAMENTAL STEEL FENCE

.75"sq x 14ga PICKETS | 1.4375" x 1.5" x 14ga RAILS | 2.5"sq x 14ga POSTS

Each picket is precisely welded at each rail intersection providing all-terrain flexibility and aesthetics.



### STYLE OPTIONS



Also available in Pool, Pet & Play (3" air spacing) – styles vary

### PROFUSION WELDED STEEL



All Montage fence panels are fabricated using Ameristar's ProFusion welding process. This technique combines laser and fusion technology to create a virtually invisible structural connection at every picket to rail intersection. Unlike typical aluminum fence systems that are held together with unsightly screws, the ProFusion weld used with Montage promotes a "good neighbor" profile with sleek lines and no exposed picket to rail fasteners. When compared to aluminum fencing, Montage's welded steel construction is unmatched in strength and durability.



### E-COAT<sup>™</sup> PROTECTIVE FINISH

Montage galvanized steel framework is subjected to a multi-stage pre-treatment/wash (with zinc phosphate), followed by a duplex cathodic electrocoat system consisting of an epoxy primer, which significantly increases corrosion protection, and an acrylic topcoat, which provides the protection necessary to withstand adverse weathering effects. This process results in years of maintenance-free ownership.



### 20 YEAR LIMITED WARRANTY

The Montage families of fencing products are manufactured from superior quality materials by skilled craftsmen with the highest standards of workmanship in the industry. Ameristar is confident in offering Montage with a 20 year limited warranty.



### DOMESTIC MANUFACTURING

Ameristar is committed to providing products that are manufactured in the USA. We have made significant investments in technology, process improvement, and employee training in an effort to secure American jobs and combat inferior import products.

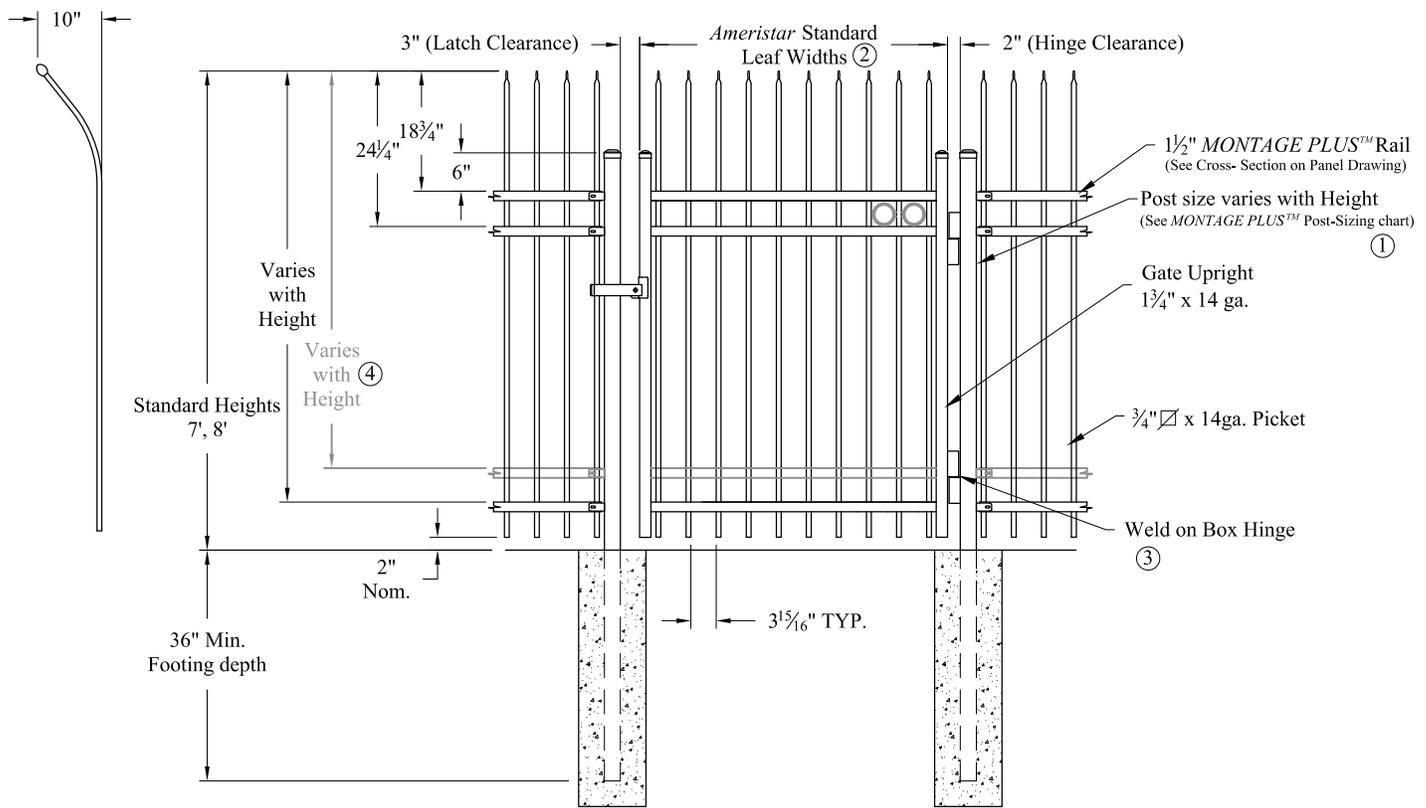
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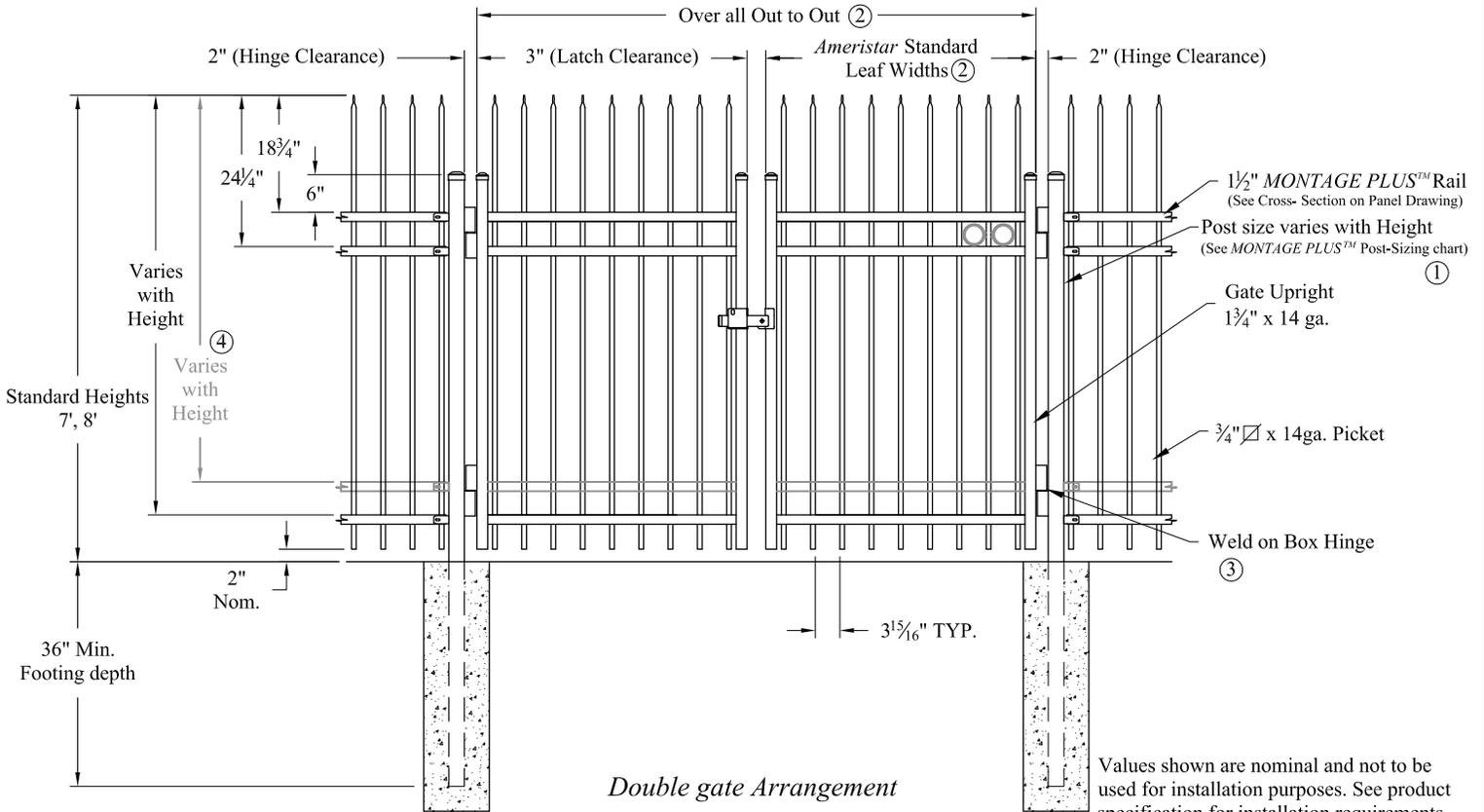
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**NOTES:** *Single gate Arrangement*

- 1.) Post size depends on fence height, weight and wind loads. See MONTAGE PLUS™ specifications for post sizing chart.
- 2.) See Ameristar gate table for standard out to outs. Custom gate openings available for special out to out/leaf widths.
- 3.) Additional styles of gate hardware are available on request. This could change the Latch & Hinge Clearance.
- 4.) Forth rail optional.



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