

WEBER STATE UNIVERSITY

Social Science Building Remodel

GSBS Project No. 2016.036.00

DFCM Project No. 16050810



SCHEMATIC DESIGN PROJECT MANUAL

July 8, 2016



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Basis of Design
Construction Documents Schematic Design Submittal
Social Science Building Renovation
Weber State University
Ogden, Utah

July 08, 2016

The existing building is approximately 119,000 square feet on four levels.

PROJECT TEAM

Owner	DFCM	Tim Parkinson	801.538.3431
User	Weber State University	Chad Downs	801.626.6642
Architect	GSBS Architects	Garth Shaw	801.575.8600
Mechanical Engineer	Colvin Engineering	Bret Christiansen	801.505.5411
Electrical Engineer	ECE Engineering	Akbar Matinkhah	801.521.8007
Structural Engineer	ARW Engineering	Jeremy Achter	801.782.6008
Fire Protection Engineer	Spectrum Engineering	Jeff Dubois	801.328.5151
Civil Engineer	NV5	Ryan Cathey	801.743.1308

APPLICABLE CODES AND STANDARDS)

The project is located in Ogden, Utah. The project will be designed in accordance with:

2015 IBC
2015 IMC
2015 IPC
2015 IFC
2015 IECC
ANSI/ASHRAE Standard 90.1 2013
ANSI/ASHRAE Standard 55-2010
ANSI/ASHRAE Standard 62.2-2010
ANSI/ASHRAE Standard 52.2-1999
ANSI/AIHA Z9.5-2009- Laboratory Ventilation
DFCM Design Standards, current as of completion of Design Development
Weber State University Design and Construction Standards, April 20, 2016 with section updates as available up to Design Development
LEED and DFCM State High Performance Building Standard are included.

AVAILABLE UTILITIES

CULINARY WATER

Existing culinary water and PRV to be replaced.
Water pressure is assumed to be adequate.
No future capacity included in design.

SANITARY SEWER

Existing cast iron sanitary sewer piping will be replaced.
New 6" in two locations.
No future capacity included in design.

STORM SEWER

Existing storm water piping will be replaced.
New 6" in four locations.
No future capacity included in design.

NATURAL GAS

No natural gas is available if required.

STEAM

Existing steam will be removed and capped in tunnel at Student Services.

CHILLED WATER – FUTURE CONDENSER WATER

Existing chilled water supply and return piping will be replaced and rerouted to new mechanical room with isolation valves at new connection to existing.
New 6" supply and return.

MEDIUM VOLTAGE POWER DISTRIBUTION

Existing medium voltage switch will be relocated where existing medium transformers are located to maintain power distribution loop in the campus.
Existing single bucket transformers will be replaced with a new pad mounted medium voltage transformers.

GENERATOR

Existing generator to be replaced with re-sized unit.
Ventilation systems upgrades to meet new generator requirements.

COMMUNICATION

All existing communication conduit and conductors will be removed.
New four (4) 4" conduit will be installed between the utility tunnel in south east corner of the building and new MDF room. New conduit will be utilized for fiber and copper cables.

GENERAL MECHANICAL REQUIREMENTS

SITE ELEVATION

4,650' ASL

TEMPERATURE

Outdoor design temperatures: winter12.0 °F
 (ASHRAE 99%, Ogden Airport) summer95.1_{DB}/61.0_{WB} °F
 VRF low ambient controls winter-13 °F

Indoor design conditions:

	Temperature				Noise
	Summer		Winter		RC Mark II RC(N)
	Occupied*	Unocc	Occupied*	Unocc	
Open Public Areas	75/75	85	72/69	65	35 – 40
Computer Laboratories	72/75	85	72/69	65	35 – 40
Private Offices	75/78	85	72/69	65	30 – 35
Open Offices/Shared Space	75/78	85	72/69	65	35 – 40
Conference Rooms	75/78	85	72/69	65	25 – 30
Classrooms	75/78	85	72/69	65	25 - 30
Laboratories	72/75	85	72/69	65	35-40
Restrooms	75/75	85	72/69	65	n/a
Storage	80/NA	85	60/NA	55	n/a
Copy Rooms	75/78	85	72/69	65	n/a
Mechanical Rooms	80/NA	80	55/NA	55	n/a
Elevator Rooms	80/NA	85	60/NA	55	n/a

* setup/setback temperature when space is temporarily unoccupied during occupied period, as determined by space occupancy sensor

HOURS OF OPERATION:

Day of Week	Occupied
M-F	0700 – 2200
Sat	0800 - 1600
Sun/Holiday	N/A

LOAD CALCULATIONS

Envelope

Existing loads will be based on architectural skin upgrades if necessary.

Internal Loads

The following internal loads form the basis for load calculations:

Room Type	ASHRAE 62.1 – 2010 Classification	People (Pers/ft ²)	OSA Rate (cfm/ft ²)	OH Lights (W/ft ²)	Equip (W/ft ²)
Open Public Areas	General: Corridors, library	0.000	0.060	0.5	0.00
Private Offices	Office Building: Office Space	0.008	0.100	1.1	0.85
Open Offices	Office Building: Office Space	0.005	0.085	1.1	0.75
Conference Rooms	General: Conference/meeting	0.050	0.310	1.3	0.25
Classroom	Education: Classroom (age 9 plus)	0.035	0.470	1.4	0.25
Public Restroom	Table 6-4: Toilets-public	0.000	N/A	0.9	0.00
Private Restroom	Table 6-4: Toilets-private	0.000	N/A	0.9	0.00
Storage	Office Bldg. Storage	0.002	0.070	0.8	0.10
Computer labs	Computer labs	0.028	0.060	0.5	0.95
Mechanical Rooms	Misc: Electrical equipment rooms	0.000	N/A	1.5	tbd
Elevator Rooms	Misc: Elevator Machine Rooms	0.000	N/A	1.5	tbd

Notes: Lighting Power Density per ASHRAE 90.1-2010
 Equipment Density per standard design practice

People: 250 Btuh, sensible
 200 Btuh, latent

Equipment: 1 laptop PC @ 50 W each per person in classrooms
 1 desktop PC @ 125 W per seat in offices, computer labs
 1 copier @ 300 W per 10 people in office group

Laboratory Sensible gain (cooling load) from people, lights and equipment

Ventilation air to the laboratory also cools the laboratory. The volume of air required is function of the heat gain to the space, and is driven by these factors:

Parameter	Discussion	BOD
Envelope	Conduction through opaque walls, conduction and radiation through fenestration	From load calculations
People	The amount of heat generated by a person. ASHRAE publishes generally accepted data.	Laboratory80 W/person
Lights	Overhead lights, with a maximum defined by the energy code.	Teaching Lab1.28 W/sf Research Lab.....1.81 W/sf
Equipment	All equipment plugged into the wall, including task lights, ovens, freezers, and bench top equipment. This number is commonly over-estimated by users, which leads to oversized mechanical equipment and poor operation at part-load.	General Laboratories: 2 W/sf.

Room pressurization requirements

All laboratories are maintained at negative pressure relative to adjoining corridors by offsetting the supply air volume by approximately 100 cfm per door to corridor.

VARIABLE AIR VOLUME EXHAUST

In laboratories where fume hood exhaust rate drives ventilation rates, variable volume control of hood exhaust rates have been implemented.

Since variable volume hoods only save energy when sashes are not fully open, strategies must be implemented to ensure proper sash management. They include:

- Set sash stops so that maximum sash opening is fixed
- Promote active sash management by users, so that sashes are lowered whenever possible

BUILDING PERFORMANCE

Energy cost required to be 20% less than code minimum ASHRAE 90.1 – 2013, in accordance with DFCM HPBS.

Annual energy cost will define building performance.

SUSTAINABILITY/ENERGY EFFICIENCY

Energy efficient measures to be investigated:

Improved EER/COP for VRF units.

Supply air fan baseline = 1.05 w/cfm, proposed = 0.75 w/cfm.

Hydronic pump baseline = 19w/gpm, proposed = 10.9 w/gpm.

Transport energy consumption: Full load = 0.75 bhp/1,000 cfm, 50% load = 0.30 bhp/1,000 cfm.

Reduced air volume in laboratories below standard, and variable volume exhaust when operating.

Heat pump water heater with heat source from electrical or mechanical room.

Oversized duct for pressure drop.

Evaporative cooling on exhaust/relief air to provide indirect cooling of outside air.

LEED

WE P1	Water use reduction 20%
WE C3	Water use reduction 35%
EA P3	Fundamental refrigerant management
IEQ P1	Minimum indoor air quality performance
IEQ C1	Outdoor air delivery monitoring
IEQ C6.2	Controllability of systems – Thermal comfort
IEQ C7.1	Thermal comfort - Design
IEQ C7.2	Thermal comfort - Verification

HUMIDITY

There is no active control of humidity.

HVAC

HEATING AND COOLING

The central heating and cooling source will be high-efficiency Variable Refrigerant Flow (VRF) heat pumps by Mitsubishi. The system is capable of simultaneous heating and cooling. The heat pumps will distribute R-410a refrigerant throughout the building with Type-L copper to fan coils per zoning plan. Refrigerant piping to be rigidly mounted to unistrut and supported without sags. Refrigerant zone level piping will be distributed through the Mitsubishi BC controller distribution header. Zoning will be to maximize load sharing.

VRF performance requirements:

Cooling: ECWT = 77 deg. F at 12.0 EER per AHRI 1230.

Heating: ECWT = 50 deg. F at 3.6 COP per AHRI 1230.

Water-cooled heat pumps will be located in the lower mechanical room. Campus chilled water will be utilized by the heat pumps for heat rejection into the existing chilled water

system that will be converted to a condenser water system per the master plan. Circulate VRF condenser water in building with variable speed secondary pumps. Provide a pressure-independent control valve at each heat pump unit to ensure constant flow when heat pump unit is activated. Air separation, expansion compensation and makeup are not required.

Data rooms will be served by the VRF system as primary cooling with backup transfer air ventilation fan on emergency power. Data room to alarm to the BMS on room temperature. Data room design temperature – 72 degrees F. with maximum of 85-90 degrees. F.

Elevator equipment rooms to be cooled by a ductless split DX cooling unit and an outdoor condensing unit.

MDF room to be cooled by a ductless split DX cooling unit and an outdoor condensing unit.

VENTILATION AND AIR DISTRIBUTION

Ventilation of all spaces will comply with the minimum requirements of ASHRAE Standard 62.1-2010, Ventilation for Acceptable Indoor Air Quality.

The ventilation system is designed for an air change effectiveness of 0.8, as determined by ASHRAE Standard 62.1-2010.

Reset outdoor air intake flow and/or space or zone airflow as operating conditions change, in accordance with Section 6.2.7 of the Standard, for zones that require Demand Controlled Ventilation (DCV).

Implement a Construction IAQ construction Management Plan that includes the use of high efficiency filters (Minimum Efficiency Reprint Value (MERV) 8 filters as determined by ASHRAE 52.2-1999 designed as part of the return air grille of the VRF fan coil system. DOAS/ERV unit will be provided with 2” MERV 13 filters.

Space	Exhaust Rate Criteria
Toilet Rooms	10 cfm/fixture public, 75 cfm/fixture private
Janitor Closets	0.5 cfm/ft ² or larger as required to maintain at negative pressure of 0.02” w.c. relative to adjoin spaces
Laboratories	6 ACH, occupied 3 ACH, unoccupied 0 ACH, de-commissioned

All supply and transfer air ductwork will be constructed with galvanized sheet metal. All low pressure ductwork will be constructed to SMACNA 2” pressure class. Ductwork will be sealed to SMACNA seal class “A” and require pressure testing in accordance with 2015 IMC.

Heating and cooling air will be generated by a dedicated fan coil for each temperature control zone. Each fan coil will operate based on a call for heating or cooling from a space mounted thermostat. Refrigerant will be delivered to the fan coil based on the call from the thermostat (heating or cooling). Each fan coil will be located above the ceiling and either be a cassette type serving single offices or small meeting rooms or ducted unit serving open areas and classrooms and ducted to the supply diffusers and return grilles. Supply air diffusers will be of the radial blade design, similar to the Air Diffusion Products DNR series, or linear slot diffusers, depending on ceiling heights and types. In heating mode, the terminal fan coil unit discharge air will be limited to the space set point plus 15° F, per ASHRAE 55-2004.

Ventilation air will be supplied to the building through a Dedicated Outdoor Air System (DOAS)/Energy Recovery Ventilator (ERV). DOAS/ERV unit will be located outdoors in the North loading dock area and ducted underground to the existing fresh air tunnel. The DOAS unit will deliver tempered, 100% outside air to the return duct of each fan coil unit through a VAV box to ensure ventilation rate is delivered. The DOAS/ERV system will be designed to deliver ventilation air at a rate that is code required minimum. The supply fans will include a VRF to modulate the fan speed to maintain duct static pressure. The outdoor air will be ducted from the roof of the building down the shaft to a booster fan and then underground ducted to the DOAS/ERV unit.

Exhaust for restrooms and building relief air will be ducted to the DOAS/ERV system. Exhaust rates will comply with the 2015 IMC and ASHRAE 62.1-2010. Exhaust and relief rates may be increased above code requirements if it is determined that additional exhaust is required to meet desirable building pressure relationships. The exhaust fan will include a VRF to modulate the fan speed to maintain building pressure.

Laboratory exhaust will be ducted to roof and include (2) 100% variable volume redundant fans with 10'-0" high stacks. Duct from hood to main vertical riser will be stainless steel, vertical riser will be galvanized. Quick response air valves will serve the supply and exhaust air in the labs. Provide a close of damper in exhaust duct at each hood to allow de-commissioning and shutdown. Automatic sash closers will be used.

Duct will be constructed of galvanized sheet metal.

All duct will be constructed and leak tested to achieve a leak rate less 10 cfm/100 ft², based on $C_L = 6$ and $P = 2''$

Duct pressure drop will a max of 0.08" WC per 100 feet of duct.

No sound attenuators are planned.

Each space is provided with individual room temperature control. A zoning plan will be developed that indicates proposed zoning plan for review and approval by Campus Planning staff.

Duct standards and classifications for duct construction per SMACNA standard.

Motorized damper will be used on exhaust fans

COMMISSIONING

Commissioning will be provided by WSU personnel. Coordinate with the commissioning plan. Develop a specification for test and balance that is specific to the project, and is coordinated with the Owner's commission plan.

CONTROLS

There will be a written sequence of operation provided on drawings and BAS graphics for all systems controlled by the DDC system.

The VRF system will control individual zone control and operation of the water-cooled heat pumps.

Label the areas served by VRF and other fan systems on the BAS graphics.

All controls should be able to monitor, control, and adjust all set points and control points. Provide onsite NAE connection to the BAS system.

All DDC controls and PLCs should interface with the current Johnson Automation system and integrate with the Notifier and LENEL systems.

The campus data network system is used to communicate with the supervisory controllers. The supervisory controllers communicate with the individual DDC and PLC.

Critical PLC's should be stand alone operational if they are disconnected from the Head-end.

Individual room temperature sensor to include push button temporary override to occupied mode for a set period time.

DDC and PLC should be Native Bacnet.

Integrate the electrical systems including the VFDs, air handler, electrical distribution, lighting, emergency generators, UPS system and building power.

Provide additional monitoring points for future engineering department use.

Johnson Controls Systems (as required by WSU) for compatibility with VRF system is required. VRF controls to include local control panel for onsite use. Remote monitoring of status of alarms, and adjustment of zone setpoint and schedule.

Meter Main building domestic water, campus chilled water and main power. Integrate all meters with BMS system and campus Lucid system. All meters to have local and remote readouts using BACnet protocol. Magnetic insertion flow meter similar to Onicon F-3500, with Onicon system 10 Btu meter providing fluid flow rate, supply and return temperature, instantaneous energy flow rate, totalized energy flow rate.

Existing exhaust control will be modified to be through building occupancy schedule.

PLUMBING

DOMESTIC WATER SUPPLY

The building will change the existing water main service into building from the East tunnel, new water meter, PRV and backflow preventer.

Domestic water distribution (galvanized pipe) will be replaced with copper.

Backflow preventers will be installed at point of use equipment as required.

Provide isolation valves to Laboratories, No industrial water required.
No soft water required.
No hose Bibbs required.
No industrial water required.

DOMESTIC HOT WATER

Hot water is currently generated with electric water heaters and will be replaced with heat pump type water heaters.
Recirculate hot water to within 3 feet of fixtures.
Provide isolation valves to Laboratories, No industrial water required.
No solar hot water generation will be provided.

SANITARY SEWER/WASTE/ROOF DRAINS

All new waste and vent piping will be cast-iron pipe and no-hub fittings above grade and PVC below grade, minimum drain size 3" above grade and 4" below grade.
No special plumbing traps required.
Laboratory waste includes acid resistant (schedule 40 flame retardant polypropylene, CPVC, or tempered and annealed borosilicate glass) tailpiece and piping at all horizontal piping from lab sinks.

PLUMBING FIXTURES

All existing plumbing fixtures will be replaced.
Wall-hung water closets, urinals and lavatories. Manual flush valves on water closets, urinals and lavatories.
Water closet = 1.28 gpf, urinals = 0.125 gpf
Lavatory = automatic battery sensor faucet 0.5 gpm and ASEE 1070 mixing valve.
Deep seal traps, not trap primers will be specified.
Water filler stations will be provided in place of traditional water cooler units.
Combination emergency shower/eyewash station and floor drain in Criminal Justice Laboratory.
Sediment trap at sinks in Archeology laboratory.

VACUUM

Laboratory requires 18" Hg vacuum using a single stage, oil free positive displacement, non-pulsating liquid ring vacuum pump.
Type L hard drawn copper with wrought copper solder fittings and lead free solder.

COMPRESSED AIR

Laboratory requires 100 psig compressed air using a single stage, oil free positive displacement, non-pulsating liquid ring compressor.

ASME certified storage tank will provide volume and include electronic drains piped to floor drain.

Type L hard drawn copper with wrought copper solder fittings and lead free solder.

Each laboratory to include filter/drier.

INDOOR LIGHTING SYSTEM

The section is completed by Akbar Matinkhah, Project Engineer

Electrical Consulting Engineers (ECE), LLC

939 South West Temple

Salt Lake City, Utah 84101

801.521.8007 / telephone

801.521.8057 / facsimile

akbar@eceonline.com

LIGHTING

All the existing light fixtures in the entire building will be removed. New ceiling will be installed throughout the building.

New energy efficient LED light fixtures will be installed in the entire building.

2'x4' dimmable lay-in LED light fixtures (campus standard) will be used in 2'x4' lay-in ceiling grid as possible (approximately one every 80 square feet).

Emergency lights will be provided in path of egress to meet code and will be tied to emergency panel through automatic transfer switches in each emergency light fixture.

Light fixtures in critical spaces such as IT rooms, mechanical rooms, electrical rooms, etc. will be tied to emergency panel.

LED strip light fixture will be used in all electrical rooms, tunnels, mechanical rooms, etc.

Wall mounted LED light fixtures will be used in the stairs as possible to allow ease of maintenance.

Pendant mounted linear UP/DOWN LED light fixtures will be used in open ceiling areas.

Edge Lite exit signs with NiCad battery back-up will be used.

Color of Cat. Cable for lighting will be green.

Fixtures – Refer to the Project Manual Specification Section 265100 for standard fixtures.

CONTROL TYPE

Motion sensors will be installed in the entire building for automatic control and to maximize on energy saving.

Dimmer switches with motion sensors will be provided in all private offices to allow occupants to set the light level at desire level.

Dimmer switches with motion sensors will be provided in classrooms by the entrance doors and A/V cabinets. Lights by the projector screen will be on separate zone than the rest of the lights in the room.

Motion sensors will be installed in all public spaces such as hallways, restrooms, janitor room, etc. to maximize on energy savings.

Lighting Design Illumination

AREA TYPE	AVERAGE ILLUMINATION LIGHT LEVEL
Small Office Spaces and Open Offices	30 FC
Labs	50 FC
Corridors	15 FC
Storage Spaces	15 FC
Classrooms	30 FC
Electrical, MDF, IDF Room	30 FC
Toilet Rooms	15 FC

EMERGENCY POWER DISTRIBUTION SYSTEM

Existing 80 KW diesel engine generator will be replaced with a new diesel engine generator. New diesel engine generator will have 125 gallon skid mounted fuel tank. New engine generator will be installed where the existing engine generator is located.

Emergency power will be provided to all new life safety emergency lights, light fixtures in IT room, electrical rooms, mechanical rooms or any other critical spaces.

Security and IT equipment will be backed-up with emergency power.

Diesel engine generator will be sized to handle the new elevator load.

FUTURE SOLAR SYSTEM

All the conduit rough-in will be provided to allow the installation of photo voltaic panels on the entire roof.

All necessary roof penetration for solar system will be provided for all future cabling.

Space will be provided in the electrical room for solar equipment.

Design of future solar system will be coordinated closely with WSU.

FIRE ALARM SYSTEM

Entire fire alarm system will be replaced with a new voice fire alarm system.
New fire alarm control panel will be provided and installed in main electrical room.
New fire alarm control panel will be tied to campus with a single mod fiber cable.
Fire alarm devices will be installed throughout the building to meet DFCM, WSU and National Fire Code.
Voice/strobe devices will be installed throughout the building.
Smoke detectors will be installed in corridors, MDF room, IDF rooms, mechanical room, electrical rooms, etc.
Color of Cat. Cable for fire alarm will be red.
Emergency communication signal strength test will be performed to meet NFPA 72.

SECURITY SYSTEM

Card access will be provided for all building entrances, IDF rooms, MDF rooms and classrooms.
New cameras will be installed by the entrances and other areas as directed by WSU.
Conduit will be provided from camera locations to nearest cable tray on the same floor.
Cable trays will be utilized for security cables as possible.

VOICE / DATA SYSTEM

Campus communication system has adequate capacity to support the communication needs in this new renovated building.
New MDF room will be constructed as close as possible to existing utility tunnel to house IT racks, equipment, TTB, etc.
Security equipment panels will be installed in MDF room.
IDF rooms will be constructed in center of the building on every floor. IDF rooms will be stacked above each other.
Cable tray or conduit will be installed between the MDF and nearest IDF room.
Four (4) 4" conduit sleeves will be provided between the IDF rooms. Locations to be coordinated with WSU IT Group.
Cable trays will be installed above the ceilings on all the floors for voice/data cabling.
Conduit and boxes will be provided in all the walls for voice/data outlets. Conduit will run to nearest cable tray on the same floor. Conduit will be sized for Cat. 60 cables.
An isolated ground bus bar will be installed in the MDF and IDF rooms. The ground bus bars will be tied to main ground bus bar in 277/480 Volt Main Distribution Switchboard.
208 volt and 120 volt power will be provided for all IT equipment. Rack mounted UPS will be provided by IT group.
Voice/Data cabling and its installation will not be a part of the electrical contractor's responsibility.
Color of Cat. Cable for voice/data will be blue.

ENVELOPE DESIGN

WINDOW-TO-WALL RATIO

Orientation	Ratio of glass/opaque	Sun Control	Notes
North Façade	37.7%	No	
South Façade	45.6%	Yes	Projection Factor=2/9=.222
East Façade	46.5%	No	
West Façade	34.6%	No	
Overall Building	40.8%		

OPAQUE ASSEMBLIES

Brick Fields: R-13 cavity with R-12 continuous insulation. U=0.050

Roof: R-30 continuous entirely above deck. U=0.032 (IECC Tab C402.1.4)

WINDOW PERFORMANCE

Curtain Wall:

Spec: Thermally broken frame with double-pane argon filled insulated glazing unit. Glass is PPG Atlantica with Solarban 70XL (2) + Clear. Fiberglass pressure plates.

Basis of Design: Kawneer 1600UT

U-Value: 0.34

SHGC: .23

VLT: 51% (Glass)

Spandrel Glass: Curtainwall assembly performance + semi-rigid mineral wool backing providing U=0.310 and SHGC=0.25

SUSTAINABLE DESIGN

The project will follow the State of Utah's High Performance Building Standard. The project will also pursue a LEED-NC v3 Silver level certification. The following LEED score sheet reflects the project rating strategy as coordinated with WSU, the architect and consultants.

LEED 2009 for New Construction and Major Renovations		Project Checklist		WSU Social Science Renovation		07/08/2016	
18 5 3 Sustainable Sites		Possible Points: 26		Materials and Resources, Continued		Possible Points: 15	
Y ? N	Prereq 1	Construction Activity Pollution Prevention		Y ? N	Credit 4	Recycled Content	1 to 2
1	Credit 1	Site Selection	1	1	Credit 5	Regional Materials	1 to 2
5	Credit 2	Development Density and Community Connectivity	5	1	Credit 6	Rapidly Renewable Materials	1
1	Credit 3	Brownfield Redevelopment	1	1	Credit 7	Certified Wood	1
6	Credit 4.1	Alternative Transportation—Public Transportation Access	6	12	3	Indoor Environmental Quality	Possible Points: 15
1	Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1	Y	Prereq 1	Minimum Indoor Air Quality Performance	
3	Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3	Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control	
2	Credit 4.4	Alternative Transportation—Parking Capacity	2	1	Credit 1	Outdoor Air Delivery Monitoring	1
1	Credit 5.1	Site Development—Protect or Restore Habitat	1	1	Credit 2	Increased Ventilation	1
1	Credit 5.2	Site Development—Maximize Open Space	1	1	Credit 3.1	Construction IAQ Management Plan—During Construction	1
1	Credit 6.1	Stormwater Design—Quantity Control	1	1	Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1	Credit 6.2	Stormwater Design—Quality Control	1	1	Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1	Credit 7.1	Heat Island Effect—Non-roof	1	1	Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1	Credit 7.2	Heat Island Effect—Roof	1	1	Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1	Credit 8	Light Pollution Reduction	1	1	Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
4	2	Water Efficiency	Possible Points: 10	1	Credit 5	Indoor Chemical and Pollutant Source Control	1
Y	Prereq 1	Water Use Reduction—20% Reduction		1	Credit 6.1	Controllability of Systems—Lighting	1
2	Credit 1	Water Efficient Landscaping	2 to 4	1	Credit 6.2	Controllability of Systems—Thermal Comfort	1
2	Credit 2	Innovative Wastewater Technologies	2	1	Credit 7.1	Thermal Comfort—Design	1
2	Credit 3	Water Use Reduction	2 to 4	1	Credit 7.2	Thermal Comfort—Verification	1
12	13	Energy and Atmosphere	Possible Points: 35	1	Credit 8.1	Daylight and Views—Daylight	1
Y	Prereq 1	Fundamental Commissioning of Building Energy Systems		1	Credit 8.2	Daylight and Views—Views	1
Y	Prereq 2	Minimum Energy Performance		3	3	Innovation and Design Process	Possible Points: 6
Y	Prereq 3	Fundamental Refrigerant Management		1	Credit 1.1	Innovation in Design: Low Mercury Lighting	1
10	4	5	1 to 19	1	Credit 1.2	Innovation in Design: Building Envelope Commissioning	1
7	Credit 1	Optimize Energy Performance	1 to 7	1	Credit 1.3	Innovation in Design: Specific Title	1
2	Credit 2	On-Site Renewable Energy	2	1	Credit 1.4	Innovation in Design: Specific Title	1
2	Credit 3	Enhanced Commissioning	2	1	Credit 1.5	Innovation in Design: Specific Title	1
3	Credit 4	Enhanced Refrigerant Management	3	1	Credit 2	LEED Accredited Professional	1
2	Credit 5	Measurement and Verification	2	2	2	Regional Priority Credits	Possible Points: 4
2	Credit 6	Green Power	2	1	Credit 1.1	Regional Priority: Development Density	1
7	1	Materials and Resources	Possible Points: 14	1	Credit 1.2	Regional Priority: Alternate Transportation	1
Y	Prereq 1	Storage and Collection of Recyclables		1	Credit 1.3	Regional Priority: Specific Credit	1
1	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3	1	Credit 1.4	Regional Priority: Specific Credit	1
1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1	58	26	Total	Possible Points: 110
2	Credit 2	Construction Waste Management	1 to 2	25	25		
1	Credit 3	Materials Reuse	1 to 2				

Certified: 40 to 49 points Silver: 50 to 59 points Gold: 60 to 79 points Platinum: 80 to 110

REVIT LEVEL OF DESIGN

The design team intends to follow WSU's BIM Standard dated April 20th, 2016. The design team has coordinated with WSU and understands that certain aspects of the standard may not be achievable. These items include, but are not limited to:

Elements not modeled:

- Penetrations through gypsum board and metal framing.
- Gypsum board will run the full height of walls, regardless of actual wall type.
- Insulation
- Spray applied fireproofing.
- BRB gusset plates.
- Site amenities
- Pipes and conduit under 2" that are not under the control of designers.

Items that may not be addressed through BIM:

- Square foot cost analysis
- Quantity estimates
- Load calculations
- Daylighting analysis
- Acoustical analysis
- Detailed narrative of each BIM clash (gyp. board conflicts for example)



INTERSTATE® BRICK

Nothing Else Stacks Up!



Architectural Series

Interstate Brick: Beautiful, Durable, Sustainable!

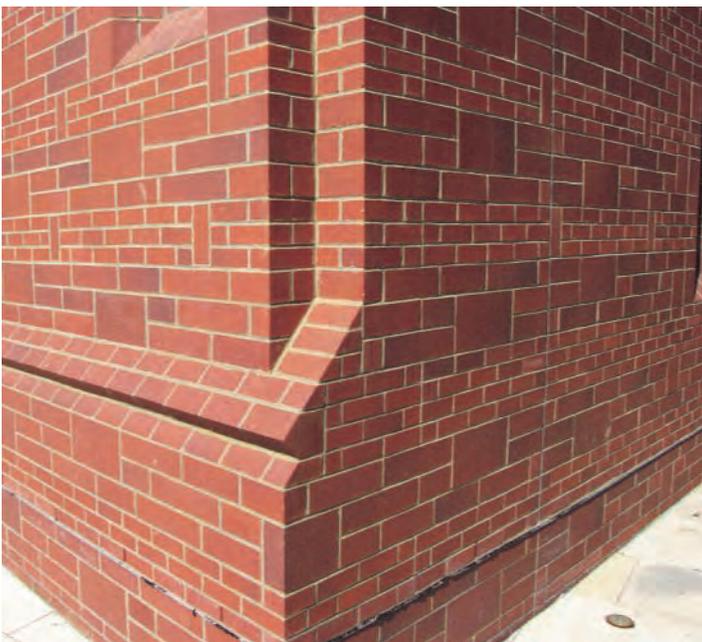
When Interstate Brick Company was formed in 1891, the founders established one simple goal: To be the best brick manufacturer in America.

More than a century later, that goal has been transformed into thousands of notable projects from coast to coast.

Like most other brick manufacturers, Interstate produces paving brick, thin brick and a wide range of small residential and commercial veneer 8 inches to 12 inches in length.

What sets Interstate apart from our competition is our 16 inch Emperor™ face brick, our Atlas™ 16" structural brick and our technical leadership. Our focus is on systems analysis and design...not just color and size.

Interstate is the industry benchmark!



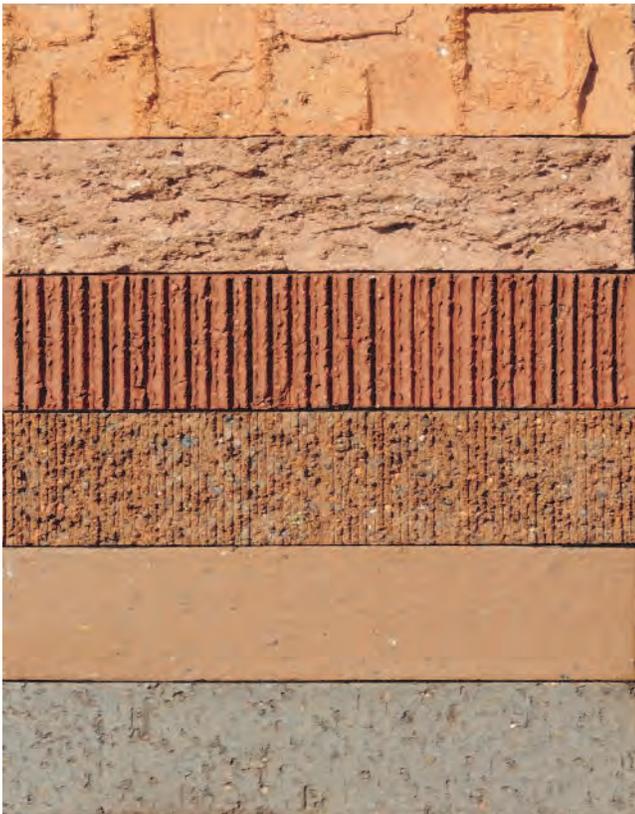
Responsible owners and designers select brick because they know that brick have low embodied energy, one of the lowest life cycle costs, and the durability of stone. Adding to these qualities, Interstate brick are made from blends of natural clays, post industrial and post consumer recycled brick. Interstate bricks have contributed to many LEED certified projects across the country.

Our production process has set the industry EPA MACT standard for clean air and our waste water is reclaimed to tertiary standards.

Interstate Brick is your sustainable solution!

Interstate Brick: Imagine the Options!

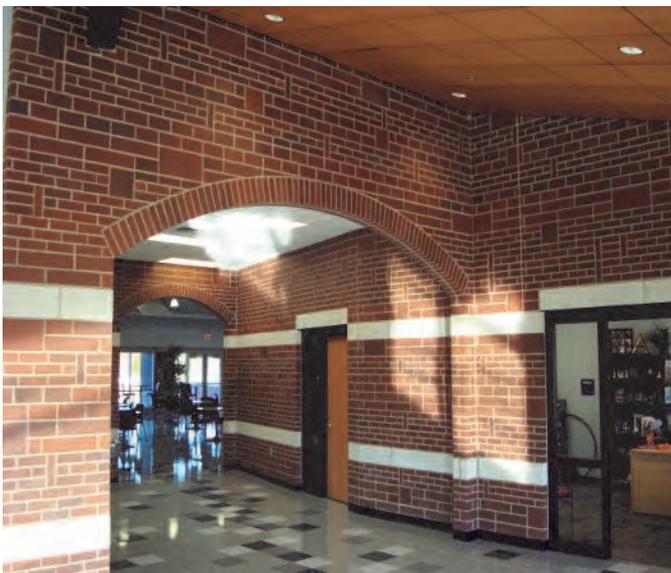
Small Veneer - Interstate offers a wide array of colors and textures in Modular, King and Utility sized brick.



Interstate Brick: Bigger, Cheaper, Better!



Large Veneer - Finally, a veneer brick that makes large projects as economical as they are beautiful. The 16" Emperors and Super Emperors cut labor costs by eliminating repetitive motions. Slots are often incorporated to reduce the scale while eliminating units, mortar joints and labor. Most Emperor brick are made with two good faces.



Interstate Brick: Supporting Your Ideas!

Atlas™ Structural Brick - Interstate Brick is the industry leader in structural brick. Atlas™ brick combines the beauty and strength of face brick with the economy of larger through-the-wall, hollow structural two faced units which makes Atlas™ brick ideally suited for use in load-bearing walls, columns, beams, prefabricated panels, and structural brick veneer. Stronger than standard CMU, Atlas™ systems are often thinner and smaller and occupy less building space. Compared to traditional brick systems, Atlas walls are usually less complicated, more efficient and cost less.



Interstate Brick: Your Lightweight Option!

Thin Brick - is the industry solution for a light weight building facing material. Interstate Thin brick are available in almost every size offered in a face brick from Modular brick faces to Super Emperor faces. Furthermore, since Interstate makes most face brick with two good faces, Interstate Thin brick cost less. Thin brick install quickly over a variety of substrates.



Interstate Brick: Paving the Future!

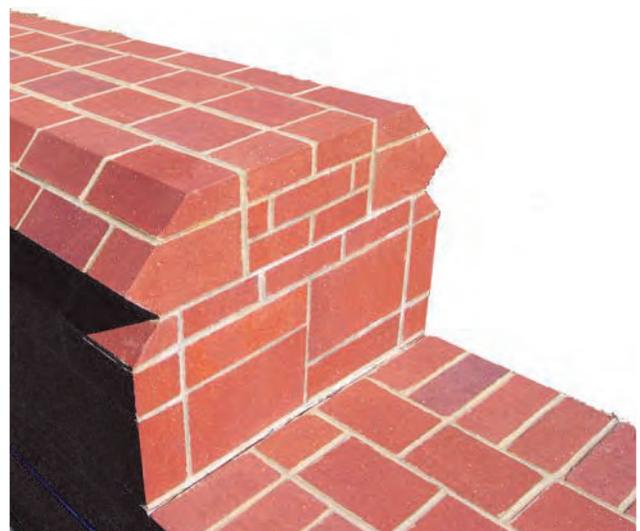
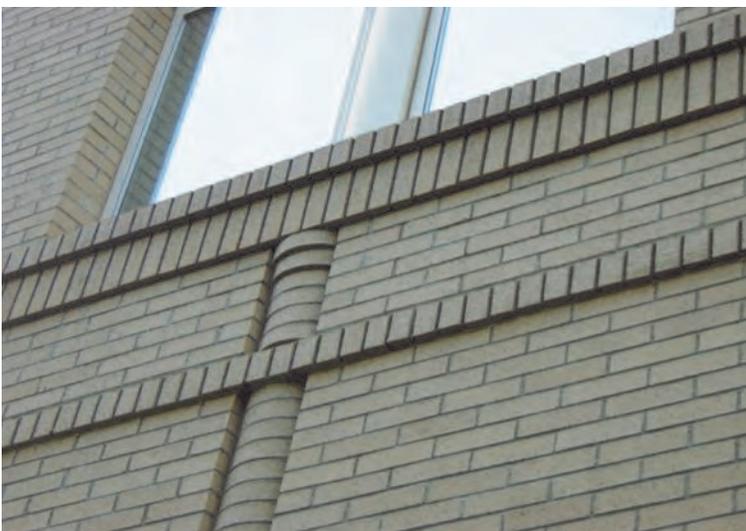
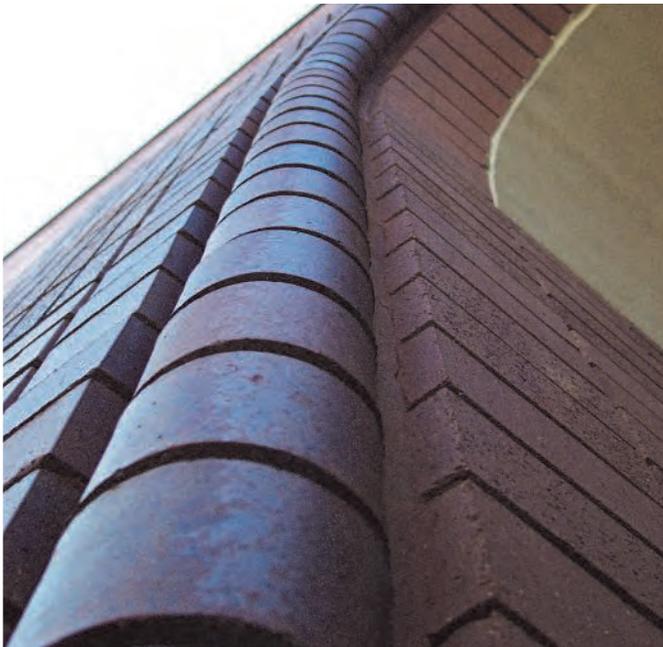


Paving Brick - For the distinguished look in landscaping, nothing compares with brick paving. Outstanding physical properties make brick pavers an excellent choice for driveways, plazas and patios. Paving brick come in a variety of sizes and colors and can be laid in a wide range of patterns. Bullnosed Pavers are also available to finish the edges of pools, stair treads and courtyard walls.



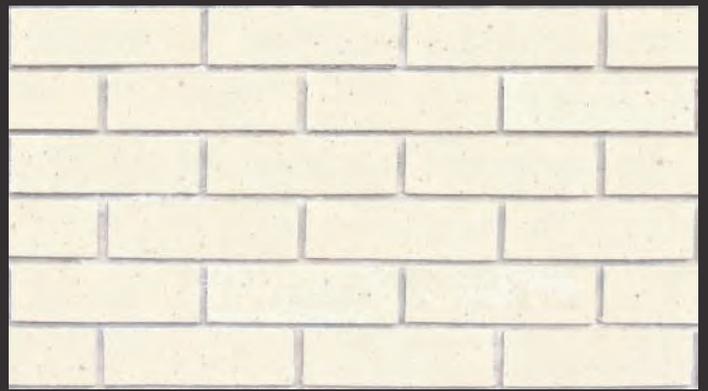
Interstate Brick: Shaping the World!

Special Shapes - One of the most significant features of brick is in the ability to make special shapes and Interstate makes thousands of different shapes each year. When it comes to shapes, we pride ourselves on our standard and custom work. To maximize your design potential, ask your Interstate representative for assistance. Interstate Brick ...Nothing Else Stacks Up.





Arctic White



Almond



Ash



Pewter



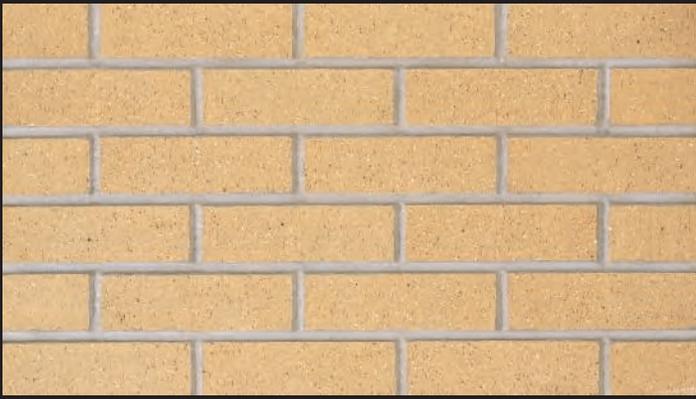
Platinum



Midnight Black

The printed colors shown in this brochure may vary from actual brick samples. We recommend color selection be made from actual brick samples.





Desert Sand



Tumbleweed



Cedar



Mocha



Smokey Mountain



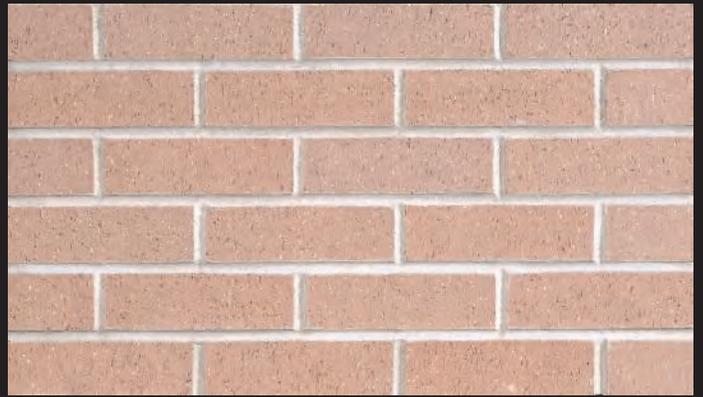
Ochre Buff

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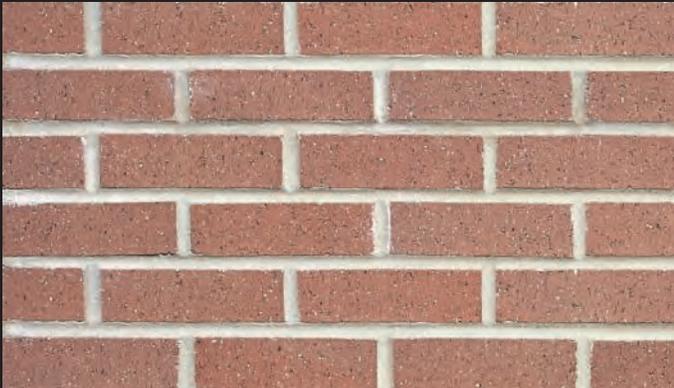




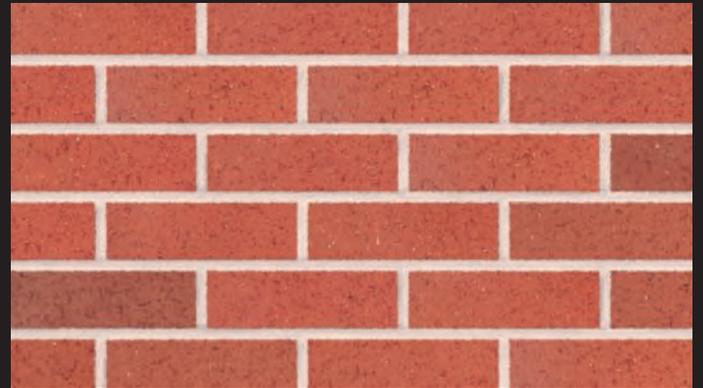
Golden Buff



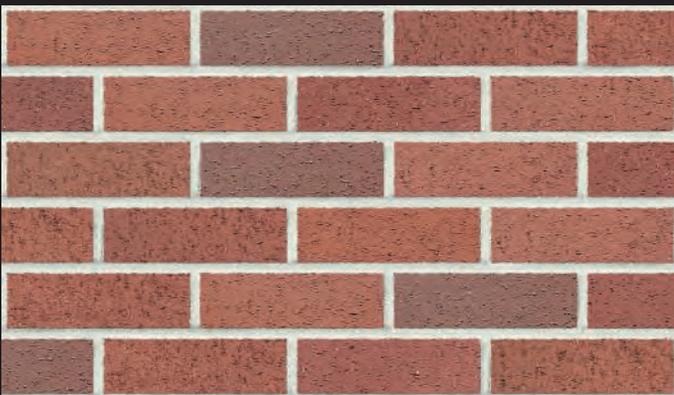
Canyon Rose



Park Rose



Terra Cotta

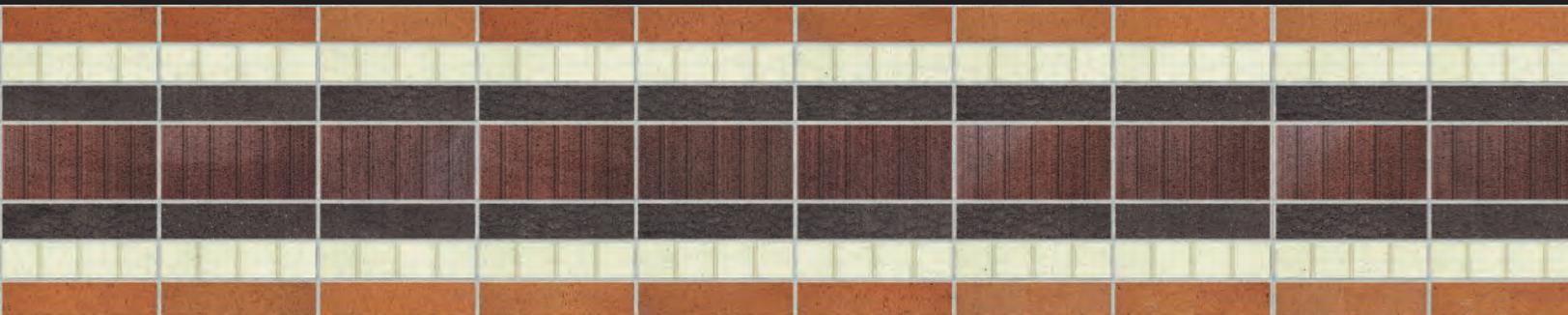


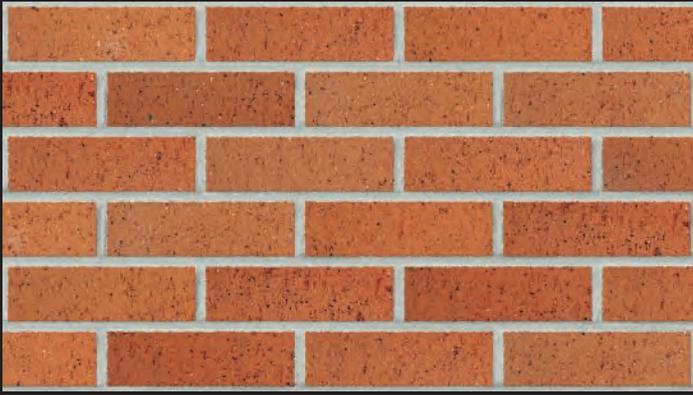
Monterey



Mountain Red

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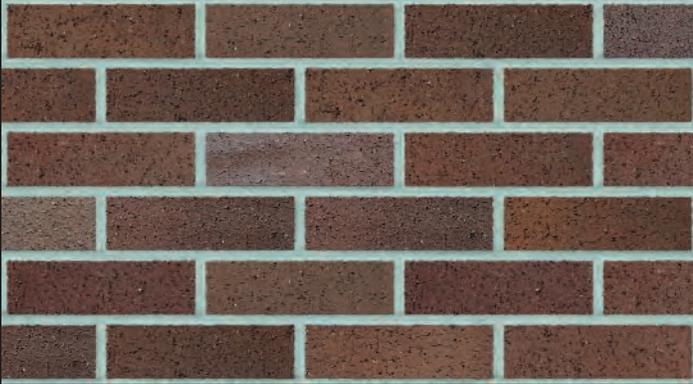




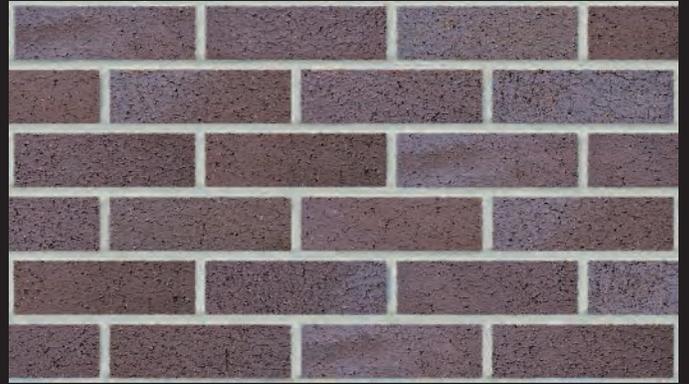
Copperstone



Bronzestone



Walnut



Ironstone



Obsidian



Onyx

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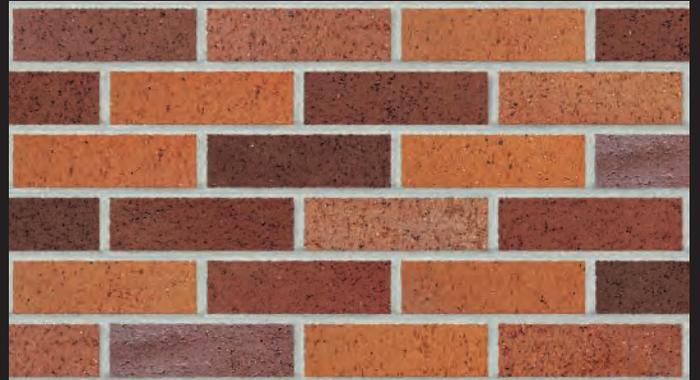
Desert Sand, Tumbleweed, Golden Buff



Platinum, Smokey Mtn, Tumbleweed



Arctic White, Ash, Pewter



Copperstone, Ironstone, Bronzestone

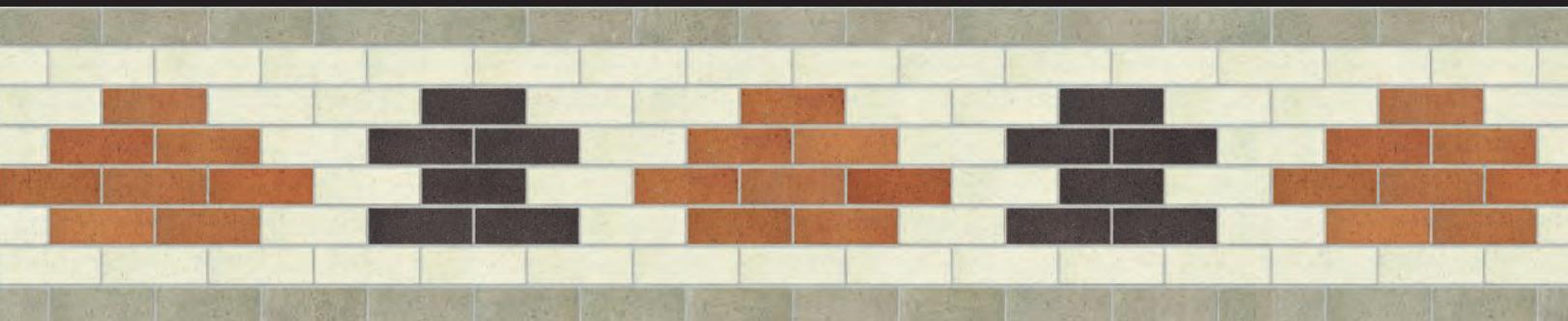


Mtn Red, Monterey, Terracotta



Mountain Red, Midnight black

The blends shown are a representation of the many possible color options there are with Interstate Brick. Actual patterns are subject to actual runs, percentages of each color and installation procedures. We recommend color selection be made from actual brick samples in a mock-up panel installed prior to construction.



LINE 4 - COMMERCIAL SERIES

Color	2-1/4 Modular	2-1/2 Modular	2-3/4 Modular	3-9/16 Modular	7-9/16 Modular	2-1/4 Norman	2-1/2 Norman	2-3/4 Norman	3-9/16 Norman	2-1/4 Emperor	2-1/2 Emperor	2-3/4 Emperor	3-9/16 Emperor	7-9/16 Emperor	6x4x12 Atlas	8x4x12 Atlas	4x4x16 Atlas	6x4x16 Atlas	6x8x16 Atlas	8x4x16 Atlas	8x8x16 Atlas	10x4x16 Atlas
Almond	S								S				S						NA	S	NA	
Arctic White	S								S				S						NA	S	NA	
Ash	S								S				S						NA	S	NA	
Bronzestone	S								S				S								S	
Canyon Rose	S								S				S								S	
Cedar	S								S				S						NA	S	NA	
Copperstone	S								S				S								S	
Desert Sand	S								S				S						NA	S	NA	
Golden Buff	S								S				S						NA	S	NA	
Ironstone	S								S				S						NA	S	NA	
Midnight Black	S								S				S								S	
Mocha	S								S				S								S	
Monterey	S								S				S								S	
Mountain Red	S								S				S								S	
Obsidian	S								S				S								S	
Ochre Buff	S								S				S						NA	S	NA	
Onyx	S								S				S								S	
Park Rose	S								S				S								S	
Pewter	S								S				S						NA	S	NA	
Platinum	S								S				S						NA	S	NA	
Smokey Mountain	S								S				S						NA	S	NA	
Terra Cotta	S								S				S								S	
Tumbleweed	S								S				S						NA	S	NA	
Walnut	S								S				S								S	

Notes

All Brick are available in **Matte, Smooth, Antique, Ruff and Scratch** textures unless noted.

Colors and Sizes highlighted in **Yellow** are **not available** in **Smooth** texture.

NA - indicates colors are not available in Super Atlas.

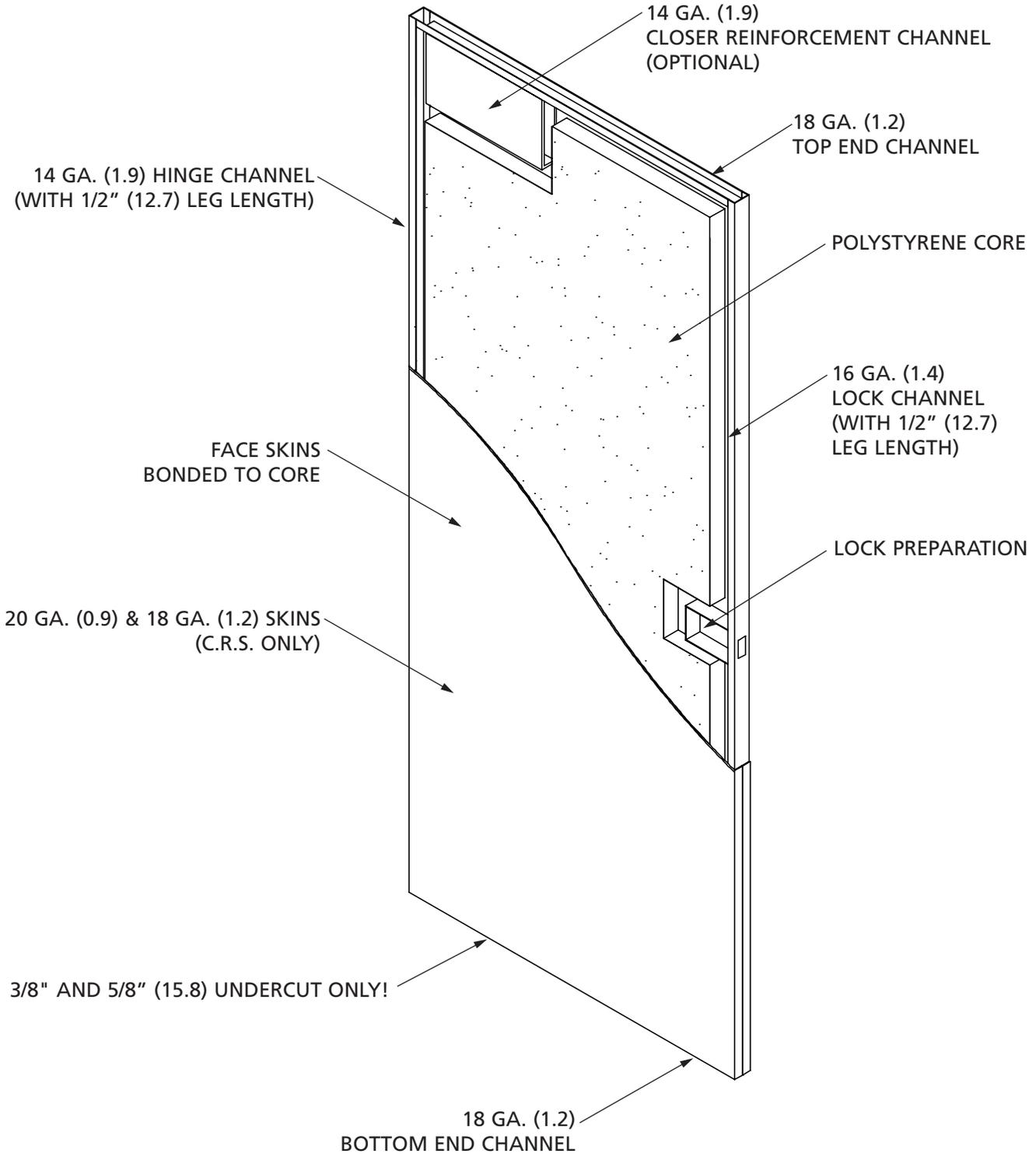
S - indicates brick are **available** in **Matte** texture in limited stocking quantities.

Contact Manufacturer for other colors not listed in Matrix above.

The printed colors shown in this brochure may vary from actual brick samples. We recommend color selection be made from actual brick samples.



Interstate Brick
9780 South 5200 West
West Jordan, Utah 84081-5625
(801) 280-5200





KD Drywall Frames

SLEEK...
VERSATILE...
ECONOMICAL...
AND DURABLE

Greater Flexibility Than Ever Before...

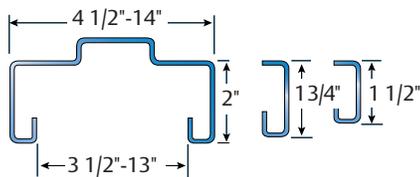
CURRIES KD Drywall Frames

- **Sleek** - choice of narrower 1 1/2", 1 3/4" & 2" face dimensions.
- **Versatile** - 18, 16, and 14 gauge
- **Economical** - Only 3 frame pieces for faster, easier installation.
- **Durable** - Tested to 1 million cycles.

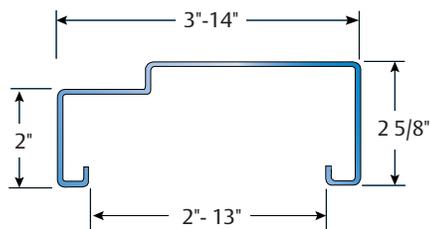
Versatility to Handle Nearly Any Drywall Installation

For any combination of wood stud, wire truss or steel stud construction. CURRIES can wrap your wall condition with double rabbet frames, in 1/8" increments, 18, 16 or 14-ga. steel for 1 3/8" or 1 3/4" doors with frame jamb depths ranging from 4 1/2" through 14" (i.e. frame depth 1" larger than wall thickness).

To satisfy any design requirement, CURRIES KD Drywall Frames are available with face dimensions of 1 1/2", 1 3/4" & 2".

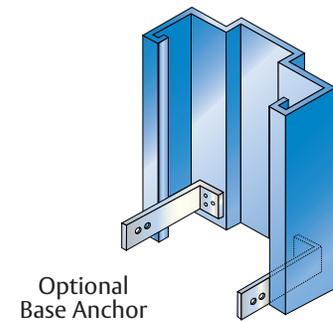
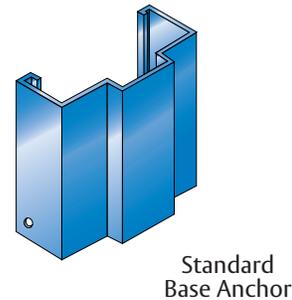
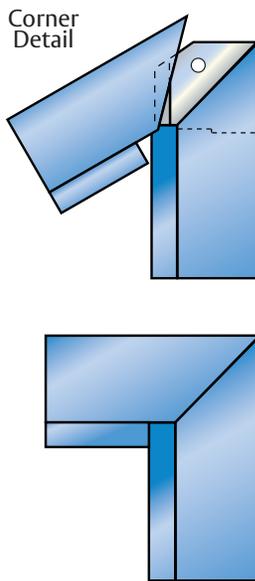


Also available in a full range of single rabbet KD frames, in 1/8" increments, in 18 or 16-ga. steel for 1 3/8" and 1 3/4" doors with frame jamb depths ranging from 3" through 14" (i.e. frame depth 1" larger than wall thickness).



3-Piece, Simplified Design Frame with Features that Save Time and Money

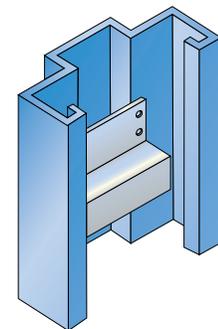
Solid interlocking corners with 16-ga. corner clip reinforcing. Hairline seam at corner face is aesthetically pleasing to the eye.



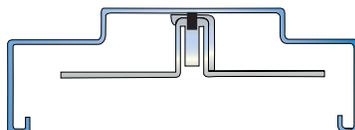
Easily, quickly installed, dependable compression bar anchor system at top of each jamb, secures frame in opening.

Bottom base anchor options provide a simple, yet solid, bottom anchor.

Note: Optional base anchor (shown) required on 1 1/2" and 1 3/4" face frames. Optional jamb security anchor provides extra security from pry bar thieves attempting forcible entry.



Security Anchor Option



Fast and Easy to Install

The End Result: A First Class Frame

1.

Construct wall with rough opening height equal to finished opening height plus $\frac{3}{4}$ " to 1" max. Rough opening width is as follows:

- a) For 2" face frames—opening width plus $2\frac{1}{8}$ " to $2\frac{3}{8}$ "
- b) For $1\frac{3}{4}$ " and $1\frac{1}{2}$ " face frames—opening width plus 2"

2.

Bottom of frame must set on a solid surface.

3.

If optional base anchor is used, notch drywall in that area.



4.

Retract compression bars in the jambs by turning screws counter clockwise and install one jamb in position on wall.



5.

Insert frame head under the corner clips of the jamb and raise the head into position.

6.

Insert the corner clips of the remaining jamb into the opposite end of the head and position jamb on wall.

7.

Locate a removable frame bar at sill of the frame to maintain proper opening width during installation.

8.

Level, square, and plumb frame and install base anchor screws through countersunk holes in frame face and into floor plate.

9.

Square top of frame and tighten compression bars by turning screws clockwise. (Do not overtighten).

10.

Install (4) No. 8 x $\frac{1}{2}$ sheet metal screws at the corners of the head to attach head to jambs. (Mandatory for fire rated frames)



Pertinent Data

CURRIES KD Drywall Frames

Applications

CURRIES KD Drywall Frames can be provided to wrap any drywall condition. Because of CURRIES capability to provide jamb depths in 1/8" increments, it permits any combination of wood stud, wire truss, or steel stud wall and combination of drywall thickness to be used in single or double layer conditions.

Fire Ratings

Maximum 1-1/2 hour fire protection can be achieved with CURRIES KD Drywall Frames, including 1-1/2" x 1-3/4" narrow face style, with a maximum single frame size of 4'0" x 9'0" and maximum pair size of 8'0" x 7'2" or 7'0" x 9'0".

Capabilities

CURRIES KD Drywall Frames are available for any standard door size opening—and CURRIES offers manufactured door opening sizes to any width and height desired—at **no extra cost**.

Combining the above with CURRIES capability to furnish narrow face frame dimensions, means that even "hard to fit" doorways can be filled with ease if CURRIES is specified.

Paint Finishes

A variety of standard and custom colors are available to coordinate color schemes in a prefinish frame condition. Contact your local CURRIES Distributor for prefinish color charts.

Check the Yellow Pages under "Doors" or "Doors-Metal."

Specifications

Dry-Wall frames shall be as manufactured by CURRIES Company, Mason City, Iowa. Frames shall be manufactured from cold rolled steel 14, 16 or 18 gauge steel. Frames shall be knock-down, double return back bend (to prevent cutting into wall), flush hairline miter at corner of head and jamb, corner reinforced with concealed clip. Each jamb to have one compression anchor to securely hold frame between studs and maintain proper alignment. Frames shall be bonderized and receive one coat of factory baked-on prime coat. Minimum requirements for hardware reinforcements are to be as follows:

Hinge Reinforcing - 7 ga.
Lock/Strike Reinforcing - 14 ga. x Template Requirements



CURRIES • 1502 12th Street NW • Mason City • IA 50401
Phone: 641-423-1334 • Fax: 641-424-8305
Website: www.curries.com

ASSA ABLOY, the global leader
in door opening solutions

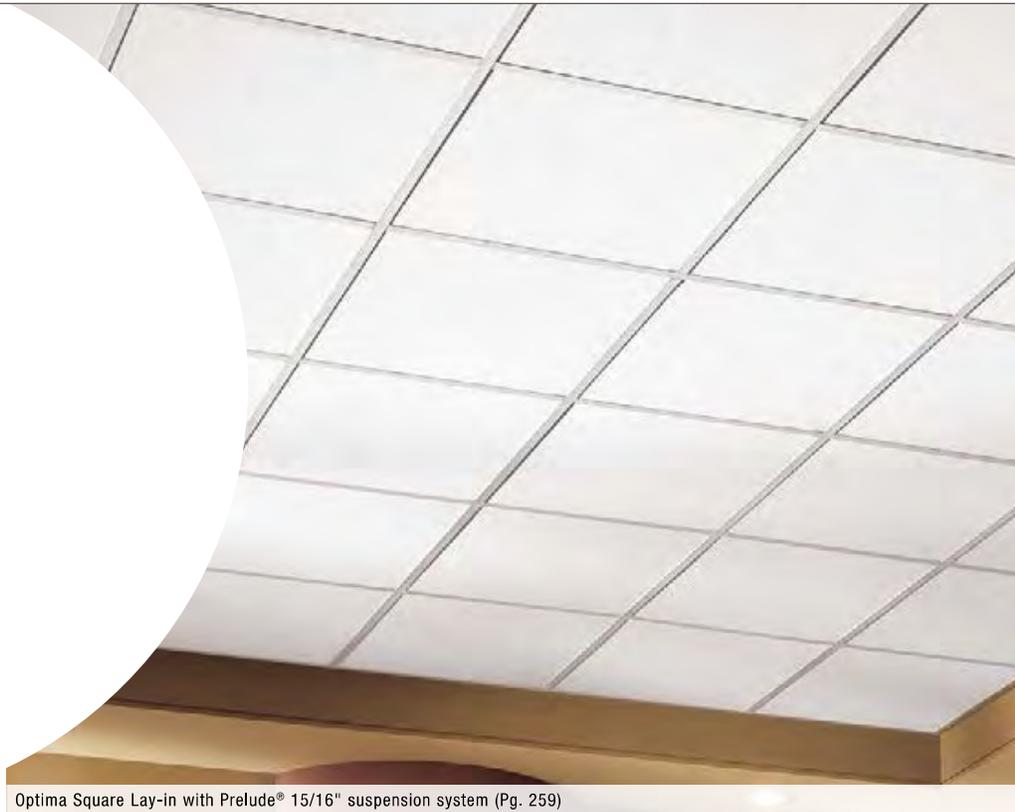


OPTIMA®
Square Lay-in
 fine texture

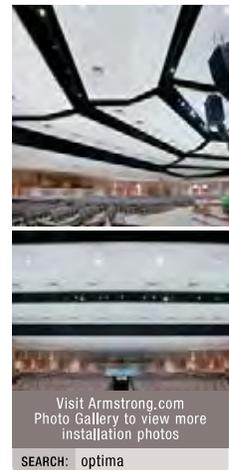
Items with Breakthrough Plant-based Binder have a PB Suffix



Items 3152 & 3153



Optima Square Lay-in with Prelude® 15/16" suspension system (Pg. 259)



Visit Armstrong.com Photo Gallery to view more installation photos

SEARCH: optima

KEY SELECTION ATTRIBUTES

- Outstanding acoustical performance for open plan areas, both Articulation Class (180-200) and NRC (0.90-1.00)
- Smooth, clean, durable finish – Washable, Impact-resistant, Scratch-resistant, Soil-resistant
- Energy-saving high light-reflective finish
- Non-directional visual reduces installation time and scrap
- Items with PB suffix are manufactured with a plant-based binder
- Sag-resistant large size panels
- Compatible with TechZone™ Ceiling Systems (Pgs. 235-241)
- Item 3352 available with Create!™ colors and images, see pages 165-167
- 30-Year Limited System Warranty against visible sag, mold/mildew, and bacterial growth

TYPICAL APPLICATIONS

- Open plan offices
- Computer rooms
- Corridors (walls-to-deck)
- Auditoriums
- Waiting rooms/nurses' stations – assists in addressing HIPAA and FGI acoustical requirements
- Areas with indirect lighting systems

DETAIL (Other Suspension Systems compatible. Refer to listing on page 196.)



1. Optima Square Lay-in
2. Optima Square Lay-in with Prelude 15/16" suspension system

COLOR



White

Create! colors available on item 3352. See pages 165-167.

FIBERGLASS

OPTIMA® Square Lay-in fine texture



UP TO **71%** RECYCLED CONTENT

LEED®

- energy management
- construction waste mgmt
- regional materials*
- design for flexibility
- EPD
- recyclable/extended producer resp.
- biobased materials
- recycled content
- sourcing of raw materials
- material ingredient reporting
- low emitting materials
- lighting quality
- acoustics



Calculate LEED contribution at armstrong.com/greengenie

*LOCATION DEPENDENT

VISUAL SELECTION

PERFORMANCE

Dots represent high level of performance.

Edge Profile	Susp. Dwg. Pgs. 273-277 armstrong.com/catdwgs	Item No.	Dimensions (Inches)	Acoustics		Fire Rating	Light Reflect	Anti-Mold & Mildew	Sag Resist	Certified Low VOC Emissions	Durability					Primary (Embodied) Energy	Recycled Content*	Recycle Program	Warranty*			
				NRC	CAC						AC	Water Repel	Wash	Scrub	Impact					Scratch	Soil	
OPTIMA Square Lay-in																						
9/16" Square Lay-in	23	1401	6 x 48 x 1"	UL Classified	N/A	N/A	N/A	Class A	0.90	•	•	-	•	•	•	•	•	•	•	High	•	30
9/16" Square Lay-in	23	1405	6 x 60 x 1"	UL Classified	N/A	N/A	N/A	Class A	0.90	•	•	-	•	•	•	•	•	•	•	High	•	30
OPTIMA Health Zone™ Square Lay-in																						
15/16" Square Lay-in	1, 6, 7	3114	24 x 24 x 1"	UL Classified	0.95	N/A	190	Class A	0.86	•	•	-	•	•	•	•	•	•	•	High	•	30
15/16" Square Lay-in	1, 6, 7	3314	24 x 24 x 1-1/2"	UL Classified	0.95	29**	190	Class A	0.86	•	•	-	•	•	•	•	•	•	•	High	-	30
15/16" Square Lay-in	1, 6, 7	3115	24 x 48 x 1"	UL Classified	0.95	N/A	190	Class A	0.86	•	•	-	•	•	•	•	•	•	•	High	•	30
15/16" Square Lay-in	1, 6, 7	3315	24 x 48 x 1-1/2"	UL Classified	0.95	29**	190	Class A	0.86	•	•	-	•	•	•	•	•	•	•	High	-	30
15/16" Square Lay-in	1, 6, 7	Other Sizes	W: 4" – 48" / L: 12" – 48" 1" Thick	UL Classified	0.95	N/A	190	Class A	0.86	•	•	-	•	•	•	•	•	•	•	High	•	30

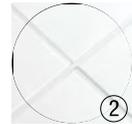
** CAC 29 achieved with Clean Room™ suspension system, not UL classified for acoustics.

SUSPENSION SYSTEMS



Blizzard White – Suspension System Finish

A color and texture coordinated suspension system to complement Optima ceiling panels for a monolithic look and feel. Available for:
1. Prelude® XL® and XL HRC
2. Suprafine® ML, XL, and XL HRC



PHYSICAL DATA

Material

Fiberglass with DuraBrite® acoustically transparent membrane; 3314, 3315, 3352, 3353, 3356 – Fiberglass with DuraBrite acoustically transparent membrane; CAC backing

Surface Finish

DuraBrite with factory-applied latex paint

Fire Performance

ASTM E84 and CAN/ULC S102 surface burning characteristics. Flame Spread Index 25 or less. Smoke Developed Index 50 or less. (UL labeled)

ASTM E1264 Classification

Type XII, Form 2, Pattern E
Fire Class A

Sag Resistance

HumiGuard® Plus – superior resistance to sagging in high humidity conditions up to, but not including, standing water and outdoor applications.

Anti Mold/Mildew & Bacteria

Fiberglass substrate is inherently resistant to the growth of mold, mildew, and bacteria.

VOC Emissions

(PB suffix items only)

Third party certified compliant with California Department of Public Health CDPH/EHLB/Standard Method Version 1.1, 2010. This standard is the guideline for low emissions in LEED, CalGreen Title 24, ANSI/ASHRAE/USGBC/IES Standard 189, ANSI/GBI Green Building Assessment Protocol.

Primary (Embodied) Energy

See all LCA information on our EPD's.

High Recycled Content*

Contains greater than 50% total recycled content. Total recycled content based on product composition of post-consumer and pre-consumer (post-industrial) recycled content per FTC guidelines.

Acoustical Details

Some items have CAC backing. CAC backing may be available as a special order. A CAC value of 37 can be achieved by backloading fiberglass products with item 769 or 770.

Insulation Value

1400, 1401, 1404, 1405, 1462, 1463, 3114, 3115, 3152, 3153, 3154, 3156, 3157, 3158, 3160, 3352, 3353 –
R Factor – 4.0 (BTU units)
R Factor – 0.70 (Watts units)
3150, 3151, 3161, 3162, 3164 –
R Factor – 3.0 (BTU units)
R Factor – 0.53 (Watts units)
3155, 3159, 3314, 3315, 3356 –
R Factor – 6.0 (BTU units)
R Factor – 1.05 (Watts units)

Application Consideration

Do not mix Optima and Optima Health Zone in the same room.

30-Year Performance Guarantee & Warranty!

When installed with Armstrong Suspension System. Details at armstrong.com/warranty

Weight; Square Feet/Carton

1400, 1401 – 0.13 lbs/SF; 24 SF/ctn
1404, 1405 – 0.16 lbs/SF; 30 SF/ctn
1462 – 0.44 lbs/SF; 16 SF/ctn
1463 – 0.44 lbs/SF; 20 SF/ctn
3150, 3151 – 0.44 lbs/SF; 128 SF/ctn
3114, 3115, 3152, 3153 – 0.45 lbs/SF; 96 SF/ctn
3155, 3159, 3356 – 0.61 lbs/SF; 64 SF/ctn
3156 – 0.47 lbs/SF; 100 SF/ctn
3158 – 0.47 lbs/SF; 75 SF/ctn
3154 – 0.45 lbs/SF; 128 SF/ctn
3160, 3314, 3315 – 0.45 lbs/SF; 96 SF/ctn
3160PB – 0.45 lbs/SF; 96 SF/ctn
3157 – 0.56 lbs/SF; 100 SF/ctn
3161 – 0.43 lbs/SF; 96 SF/ctn
3164 – 0.43 lbs/SF; 100 SF/ctn
3162 – 0.42 lbs/SF; 128 SF/ctn
3352, 3353 – 0.46 lbs/SF; 96 SF/ctn

Minimum Order Quantity

1 carton

Metric Items Available

3150M, 3151M, 3152M, 3153M, 3154M, 3155M, 3156M, 3158M, 3159M, 3160M, 3353M, 3356M – Metric items are subject to extended lead times and minimum quantities. Contact your representative for more details.



700 Series Wall Base

MADE IN THE USA

PRODUCT QUICK SPEC



ROPPE.

Proven. Flooring. Experiences.

1. MANUFACTURER

Roppe Corporation

1602 N. Union Street

P.O. Box 1158

Fostoria, Ohio USA 44830-1158

t: (419) 435.8546 | tf: (800) 537.9527

f: (419) 435.1056

E-mail: sales@roppe.com | Internet: www.roppe.com

2. PRODUCT DESCRIPTION

Roppe 700 Series Wall Base is designed for use in both commercial and residential wall base applications. Easier to work with and providing more flexibility than vinyl base products, Roppe's unique blend of thermoplastic rubber and vinyl makes the 700 Series an attractive and economical choice for a variety of applications.

Available Styles (All Dimensions Nominal)



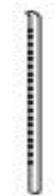
Profile: Standard Cove

Gauge: 1/8" (3.2 mm)

Heights: 2 1/2" (63.5 mm), 4" (101.6 mm) or 6" (152.4 mm)

Lengths: 48" (1.22 m) Pieces & 120' (36.58 m) Coils

Factory Corners: Inside & Outside Corners in 2 1/2" (63.5 mm), 4" (101.6 mm), 6" (152.4 mm) heights with 3" (76.2 mm) returns



Profile: Standard No Toe

Gauge: 1/8" (3.2 mm)

Heights: 2 1/2" (63.5 mm), 4" (101.6 mm) or 6" (152.4 mm)

Lengths: 48" (1.22 m) Pieces & 120' (36.58 m) Coils

Factory Corners: Outside Corners in 2 1/2" (63.5 mm) or 4" (101.6 mm) heights with 3" (76.2 mm) returns

3. TECHNICAL DATA

ASTM F 1861 - Type TP, Group 2, Styles A & B

ASTM E 648, Critical Radiant Flux - Class 1 >.45 W/cm²

ASTM E 662, Smoke Density - Passes <450

ASTM E 84, Surface Burning - Class B

According to the BOCA (Building Officials & Code Administrators International Inc.) codes and the NFPA (National Fire Protection Agency), Accessories are considered incidental trim. According to these sections, any incidental trim not in excess of 10% of the aggregate wall and ceiling area of any room or space may be Class C material in occupancies where interior finish of Class A or Class B is required.

4. LIMITATIONS

Roppe 700 Series Wall Base is for indoor use only. Do not install on any surface exposed to moisture or extreme temperature changes. Do not install in areas subject to vegetable or petroleum based oils & greases. Fading can

occur from extensive exposure to heavy direct or glass-filtered sunlight, or unfiltered ultra-violet rays.

5. INSTALLATION

General Preparation and Conditioning

Allow all trades to complete work prior to installation of 700 Series Wall Base. Deliver all materials to the installation location in its original packaging with labels intact. Maintain the installation area, material, and adhesive between 65° F (18° C) and 85° F (30° C) for at least 48 hours before installation, during installation, and after the installation.

Wall Surface Inspection

Use only on structurally sound interior wall surfaces such as dry plaster, cured drywall, exterior grade plywood (Group 1, CC type), concrete and masonry that is clean, smooth, dry and structurally sound. All surfaces must be free from moisture, alkali, old adhesive, dust dirt, wax, oil, grease, loose paint or plaster, nonporous wall coverings or paints and other extraneous coatings or materials that could prevent a successful bond. Any rough or uneven surfaces may telegraph through the wall base. Follow the manufacturer's recommendations for any patching materials.

Adhesive for Porous Substrates

1100 Wall Base Adhesive is a premium solvent free Acrylic adhesive with aggressive wet suction grip for all Roppe Wall Base products. Coverages are described on the 1100 Wall Base Adhesive quick spec.

Adhesive for Non-Porous Substrates

Use a premium contact adhesive for installation over all non-porous substrates such as metal, FRP panels, etc.

6. MAINTENANCE

Do not clean, rub or apply lateral or vertical pressure to the 700 Series Wall Base for at least 72 hours after the installation is complete to allow the adhesive to properly cure. 700 Series Wall Base can be routinely cleaned by wiping with a soft cloth slightly dampened with warm water or by using a properly diluted neutral pH cleaner. Some disinfectants, cleaning agents, floor maintenance products and pesticides may stain or damage the surface of the 700 Series Wall Base. If applying finish to flooring, take necessary precautions to keep finish from the 700 Series Wall Base. If applying finish to the 700 Series Wall Base, test inconspicuous area first for compatibility.

7. AVAILABILITY AND COST

Products are available through Roppe distributors. Contact Roppe Customer Service (800) 537-9527 or visit www.roppe.com.

8. TECHNICAL ASSISTANCE

Technical service information and assistance may be obtained by calling Roppe Customer Service at 1-800-537-9527, or by visiting www.roppe.com.

Acrovyn® Corner Guards *selection guide*

Style	SM Series	SSM Series	SM-20MN	VA Series	LG Series	CO Series	SMWS-10
Leg Size	3" 76MM	2" 51MM	3" 76MM	3/4" - 2 1/2" 19 - 64MM	3/4" - 3" 19 - 76MM	3 1/2" 89MM	2 3/4" 70MM
Mounting Style	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Guard Radius	Bullnose SM-10N 1" (25MM) Square nose SM-20N 1/4" (6MM)	Bullnose SSM-10N 1-1/4" (32MM) Square nose SSM-20N & SSM-25N 1/4" (6MM)	1/4" (6MM)	3/16" (5MM)	1/8" (3MM)	3/16" (5MM)	3/4" (21MM)
Attachment	SM-10N Aluminum SM-20N Regrind (Aluminum Optional)	SSM-10N Aluminum SSM-20N & SSM-25N Regrind (Aluminum Optional)	2-Piece Aluminum Retainer (2-Piece cover over 10')	Self-Adhesive Tape	Chrome-Plated Screws	Screws or Construction Adhesive	1" Stainless Steel Clips
Max. Heights	20' (6.1M)	20' (6.1M)	20' (6.1M)	10' (3.0M) VA-034N = 8'	10' (3.0M)	12' (3.7M)	10' (3.0M)
Odd Angle	SM-10N No SM-20N Yes	No	Yes	Yes (VA-034N No)	Yes (LG-034 No)	CO-8 Yes SCO-8 No	No
Cost Index*	100	80	140	35	50	120	335
Page	14	14	15	15	15	15	14

*By assigning our most popular profile a designation of 100, you can estimate how much more or less an alternate profile will cost.

For comprehensive information on these products, visit www.c-sgroup.com/cornerguards



SM-20MN

Product features

3" corner guard for 135° corner conditions, other angles available
Includes 2-piece aluminum retainer
Top and bottom end caps included



45° - 160° range

Available in:

64 Acrovyn Colors | 16 Faux Woods | 2 Faux Metals

For selection charts see pgs. 74-76



VA Series

Product features

Lower cost Acrovyn corner guards
Installs with self adhesive tape only
Three models: VA-034N (3/4"), VA-200N (1-1/2") and VA-250N (2-1/2")

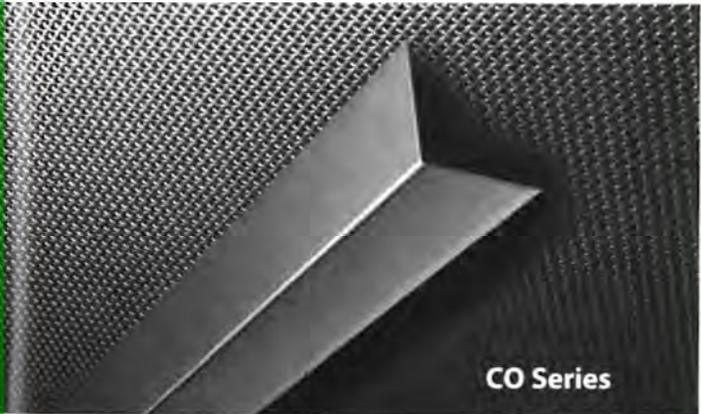


Varies

Available in:

64 Acrovyn Colors | 16 Faux Woods | 2 Faux Metals

*VA-200N & VA-250N only. For selection charts see pgs. 74-76



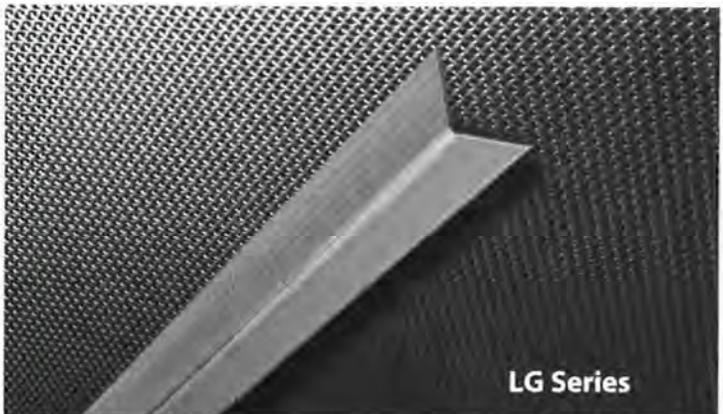
CO Series

Product features

CO-8 features 3-1/2" legs, mounts with screws (min 2" legs) or adhesive (min 1" legs)
304 stainless alloy 16 GA features a #4 satin finish
Stainless steel can be powder coated, optional
SCO-8 supplied to specified dimension for end wall conditions



(Other sizes available)



LG Series

Product features

Clear, scratch resistant corner guards
Six models LG-034 (3/4"), LG-118 (1-1/8"), LG-150 (1-1/2"), LG-200 (2"), LG-250 (2-1/2") and LG-300 (3")
Chrome plated sheet metal screws



Varies

Advantage Manual with CSR

Designed to eliminate the extra step of finishing the screen with trim, the Advantage line of projection screens is designed with ceiling trim already in place. Once the screen is installed, the screen's trim conceals the rough opening eliminating the need to complete additional trim work.

Sliding installation brackets make it easy to attach the screen housing to the structure above the drop ceiling.

The Advantage® Manual screen features simple in ceiling installation that can be done in two stages. The screen case can be installed during the rough-in construction stage and the fabric assembly can be completed during the finishing stage. Screens with CSR ensure a quiet and controlled return to the case, and must be fully extended during use.

Features

- UL Plenum rated case
- Quiet, controlled screen return to case
- Includes pull cord
- Standard black backing retains projected brightness
- White powder-coated case for a clean aesthetic

Optional Accessories:

- Green Laser Pointers
- Pull Rod
- Red Laser Pointers
- RF PowerPoint Remote with Green Laser Pointer
- Tilt Lock



16:9 HDTV Format

Viewing Area (H x W)		Nominal Diagonal		Overall Case Length	
in.	cm	in.	cm	in.	cm
45" x 80"	114 x 203	92"	234	89½"	227
52" x 92"	132 x 234	106"	269	101½"	258
54" x 96"	137 x 244	110"	279	105½"	268
58" x 104"	147 x 264	119"	302	113½"	288
65" x 116"	165 x 295	133"	338	125½"	319
78" x 139"	198 x 353	159"	404	149½"	380
90" x 160"	229 x 406	184"	467	184¼"	405

16:10 Wide Format

Viewing Area (H x W)		Nominal Diagonal		Overall Case Length	
in.	cm	in.	cm	in.	cm
50" x 80"	127 x 203	94"	239	89½"	227
57½" x 92"	146 x 234	109"	277	101½"	258
60" x 96"	152 x 244	113"	287	105½"	268
65" x 104"	165 x 264	123"	312	113½"	288
69" x 110"	175 x 279	130"	330	119½"	304
72½" x 116"	184 x 295	137"	348	125½"	319
87" x 139"	221 x 353	164"	417	149½"	380
100" x 160"	254 x 406	189"	480	185¼"	471

4:3 Video Format

Viewing Area (H x W)		Nominal Diagonal		Overall Case Length	
in.	cm	in.	cm	in.	cm
43" x 57"	109 x 145	72"	183	65½"	166
50" x 67"	127 x 170	84"	213	75½"	192
57" x 77"	145 x 196	96"	244	89½"	227
60" x 80"	152 x 203	100"	254	89½"	227
69" x 92"	175 x 234	120"	305	101½"	258
87" x 116"	221 x 295	150"	381	125½"	319
105" x 140"	267 x 356	180"	457	149½"	380
120" x 160"	305 x 406	200"	508	169½"	430

Available with the Following Screen Surfaces



Matte White

Half Angle: 60° Gain: 1.0



High Contrast Matte White

Half Angle: 50° Gain: 1.1



Video Spectra 1.5

Half Angle: 35° Gain: 1.5

Product images



Case



A Milestone AV Technologies Brand

3100 North Detroit Street
Warsaw, Indiana 46582
P: 574.267.8101 or 800.622.3737
F: 574.267.7804 or 877.325.4832
E: info@da-lite.com
www.da-lite.com

DL-0499 08.14

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Manual Shades

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Motorized shades

MagnaShade®

UrbanShade®

WhisperShade® IQ2®

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Warranty

The MechoShade System

Mecho®/5 & SlimLine™

Other Products

DoubleShades®

Bottom Up Shades

DualShades®

Sloped Shades

Fixed Shades

Features

Multi-Band Shades

Offset Chain

SnapLoc® Spline

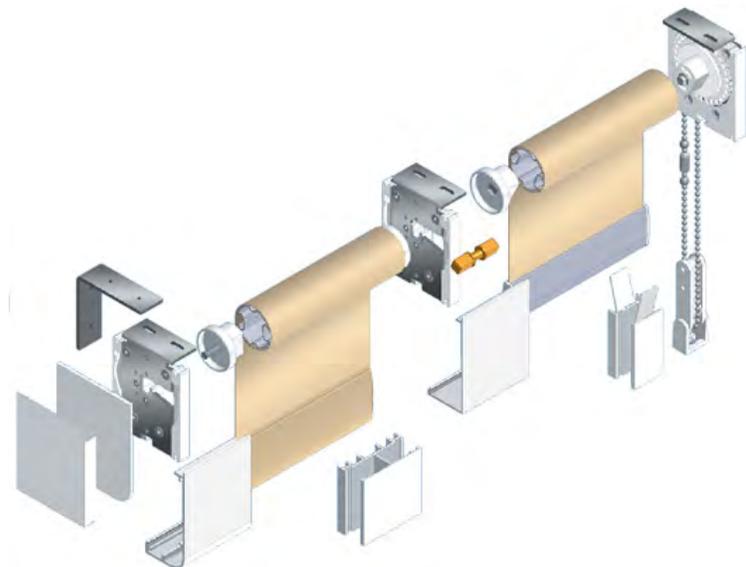
Accessories / Components

Pockets

Blackout Channel

Lift-Assist Mechanism

Manually Operated Window Covering



Classic Mecho®/5 roller-shade system

The fifth generation of MechoSystems' popular manual shade system features:

- Easy installation.
- Smooth operation, thanks to its patented clutch design.
- A clean design aesthetic with fascia, pockets, and closure accessories.
- Optimized light control through optional room-darkening channels—mounted inside the jamb, outside, or overhead.
- Little upkeep due to its heavy-duty hardware.
- 25-year lifetime limited warranty with 100% replacement and no depreciation over the life of the warranty.
- Design flexibility with its Standard, SlimLine, Extended, and DoubleShade® brackets.
- Easy removal and maintenance of shadecloth bands with the SnapLoc® spline and optional SnapLoc fascia.

Awards include:

- Cradle to Cradle Certified™ silver with EcoVeil® shadecloth.
- Interior Design magazine's 2006 Best of Year Merit/ROSCOE award.

The manual system can also be motor driven through the simple addition of a quiet tubular motor.



Shadecloth

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Manual shades
 Motorized shades
 MagnaShade®
 UrbanShade®
 WhisperShade® IQ2®
 Control systems
 Room Darkening
 Speciality Shades
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 SunDialer®
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About

Introduction - The Research Behind Our Fabrics
 Light vs. Dark Colors
 Polyester vs. Fiberglass
 Why shades?

Collections

Designer
 Blackout
 ThermoVeil Basket Weaves
 EcoVeil
 EuroVeil, EuroTwill
 ThermoVeil Vertical, Satin/Diamond
 Bogota
 Acoustiveil

Selection

Shadecloth Specifications
 Test Reports
 Shadecloth Selection Guide

ThermoVeil® Basket Weave Shadecloth Collection

[ThermoVeil 1300 Series](#) | [ThermoVeil 1500 Series](#) | [ThermoVeil 2100 Series](#)

ThermoVeil® Dense Basket Weave

1300 Series (5% open)

This series is composed of a technically advanced material woven in a 2 x 2 basket-weave pattern. Its weave provides a uniform scrim effect at the window wall with an appropriate density for sun control. The 1300 Series' colors match those of the 1500 Series (3% open) and 2100 Series (10% open).

Content: 75% PVC (coating), 25% polyester (yarn)

Openness factor: approx. 5%

Stocked: 63 in. (160cm), 96 in. (244cm), and 126 in. (320cm) wide

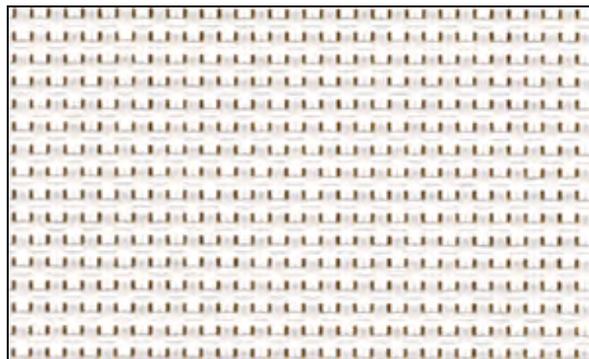
NFPA 701-2004: pass

[Solar optical properties](#)

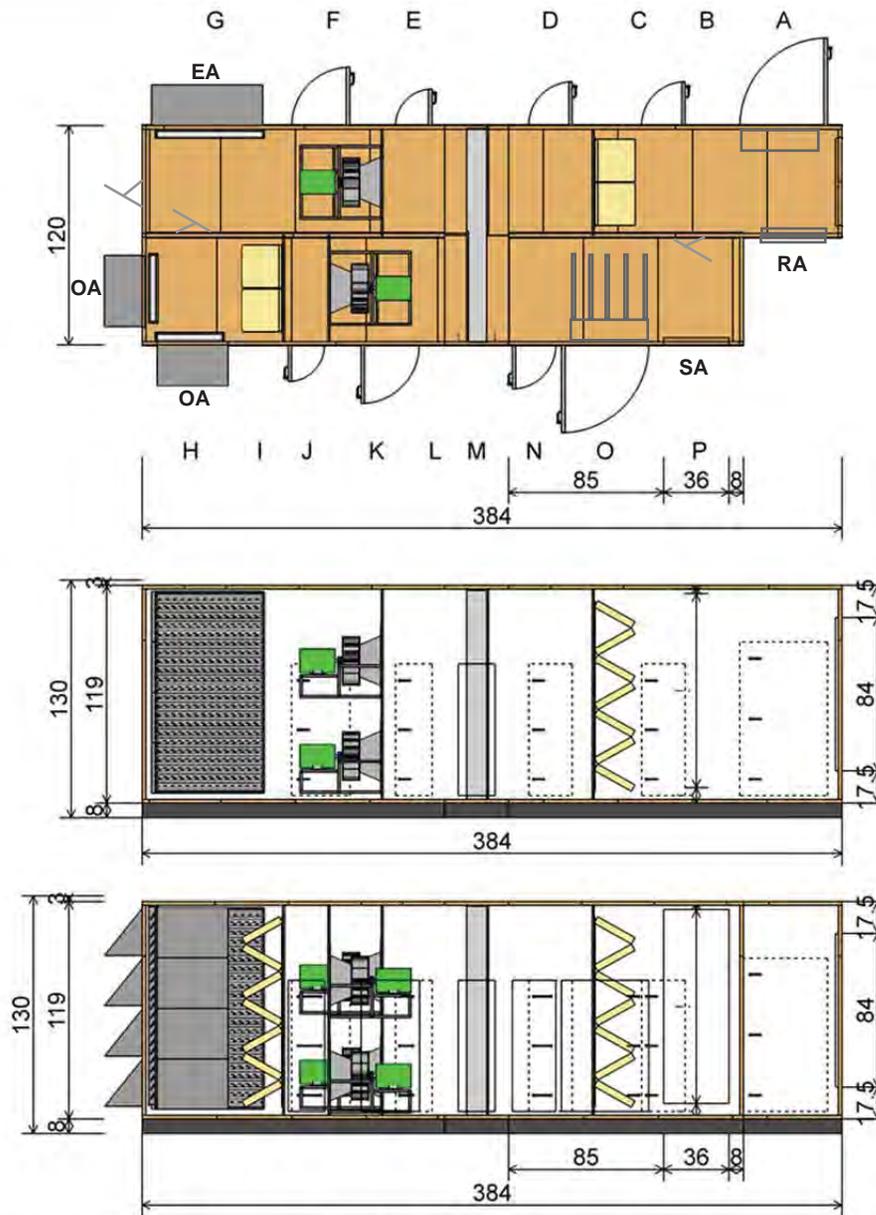


To request a sample, send an e-mail to samples@mechosystems.com

- quarter-memo samples, 4 1/4 x 5 1/2 in. (11 x 14cm)
- memo samples, 8 1/2 x 11 in. (22 x 28cm)
- large samples, 24 x 24 in. (61 x 61cm)



White 1301



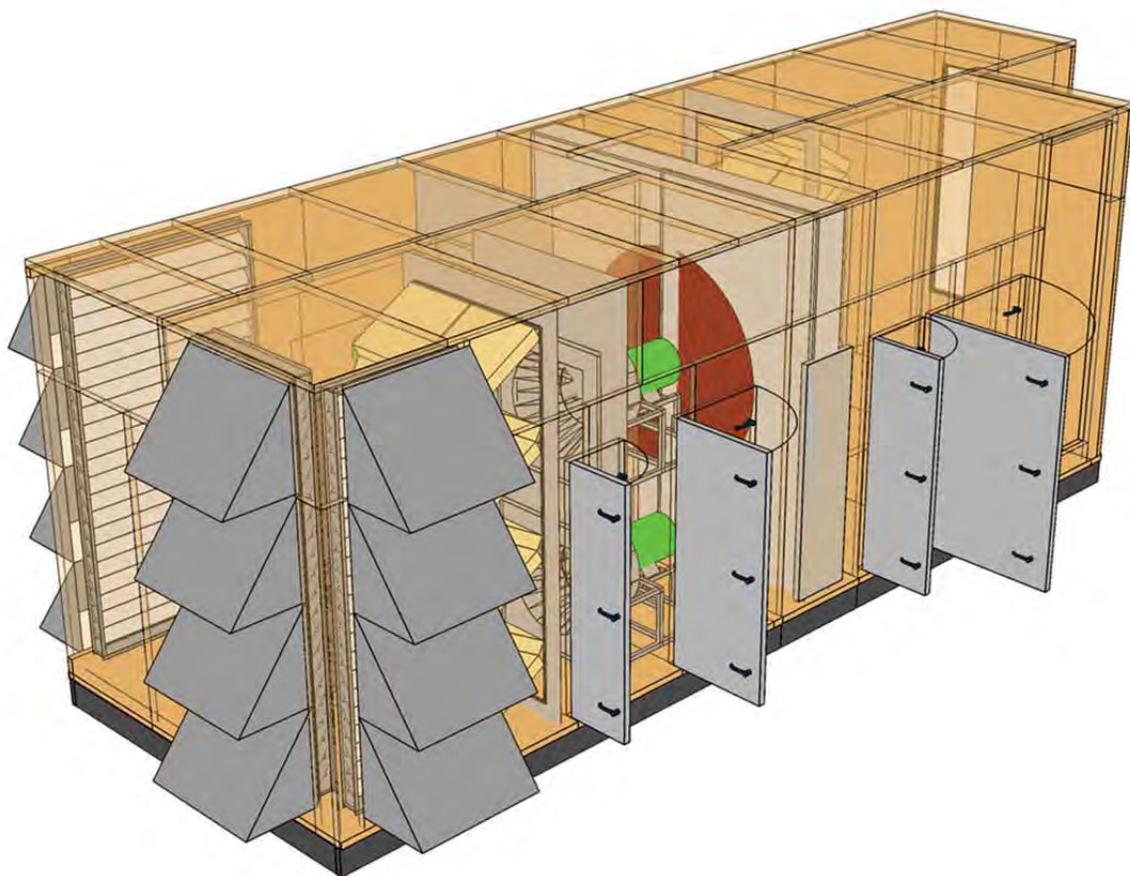
- E ACCESS / PLENUM
- F FAN
- G OUTLET
- H SINGLE MIXING
- I SINGLE FILTER
- J ACCESS / PLENUM
- K FAN
- L ACCESS / PLENUM
- M HEAT WHEEL
- A INLET
- B ACCESS / PLENUM
- C SINGLE FILTER
- D ACCESS / PLENUM
- N ACCESS / PLENUM
- O TUBE HEATER SECTION
- P OUTLET

SHIPPING WEIGHT: 22,181 LBS
 OPERATING WEIGHT: 22,181 LBS
 DATE DRAWN: 6/16/2016



JOB NAME	WSU SS BUILDING
TAG #	ERV-1
MODEL #	CAH-OBM-56
JOB #	061516AMSAMS0145

DUE TO INDIVIDUAL COMPONENT TOLERANCES, ALL PLUMBING AND ELECTRICAL LOCATIONS ARE WITHIN 6.0" OF DRAWING LOCATION. DRAWING TO BE READ IN CONJUNCTION WITH UNIT DATA SHEET. ALL DIMENSIONS ARE IN INCHES.



- E ACCESS / PLENUM
- F FAN
- G OUTLET
- H SINGLE MIXING
- I SINGLE FILTER
- J ACCESS / PLENUM
- K FAN
- L ACCESS / PLENUM
- M HEAT WHEEL
- A INLET
- B ACCESS / PLENUM
- C SINGLE FILTER
- D ACCESS / PLENUM
- N ACCESS / PLENUM
- O TUBE HEATER SECTION
- P OUTLET

SHIPPING WEIGHT: 22,181 LBS
 OPERATING WEIGHT: 22,181 LBS
 DATE DRAWN: 6/16/2016



JOB NAME	WSU SS BUILDING
TAG #	ERV-1
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DUE TO INDIVIDUAL COMPONENT
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 WITH UNIT DATA SHEET.
 ALL DIMENSIONS ARE IN INCHES.



COOK



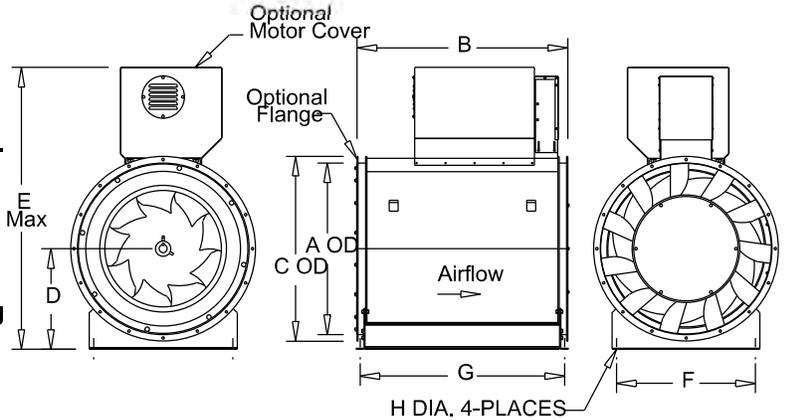
MARK: OPTION 1
PROJECT: WSU SOCIAL SCIENCE
DATE: 6/21/2016

QMX

**Mixed Flow Inline
Horizontal Mount
Belt Drive
Arrangement 9**

STANDARD CONSTRUCTION FEATURES:

High efficiency mixed flow wheel - Continuously welded steel housing with Lorenized powder coating - Welded aerodynamic straightening vanes - Integral inlet and outlet collars for slip fit duct connections - Adjustable motor plate utilizing threaded studs for positive belt tensioning - Heavy duty ball or roller bearings with extended lube lines - Belt guard - Lifting lugs - Adjustable mounting feet.



Performance (*Bhp includes 4% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	490QMX	40000	2.00	624	18.4	80

Altitude (ft): 4300 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Position	Mounted
25	1725	460/3/60	ODP -PE	34	E	Yes

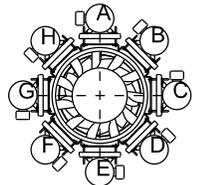
NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2014) Table 430.250

Fan Information

OVel(fpm)	Fan Mount	Access
1535	Horz. Ceiling	G

Dimensions (inches)

A	69-3/8
B	80-1/2
C	72-3/8
D	39-7/16
E	103-3/8
F	52-3/4
G	79-7/8
H	13/16
Shaft Diam.	3-7/16



View facing Outlet
Mounting positions are field adjustable

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	3521	Unit	3282
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***Includes fan, motor & accessories.

Sound Data Sound Power by Octave Band

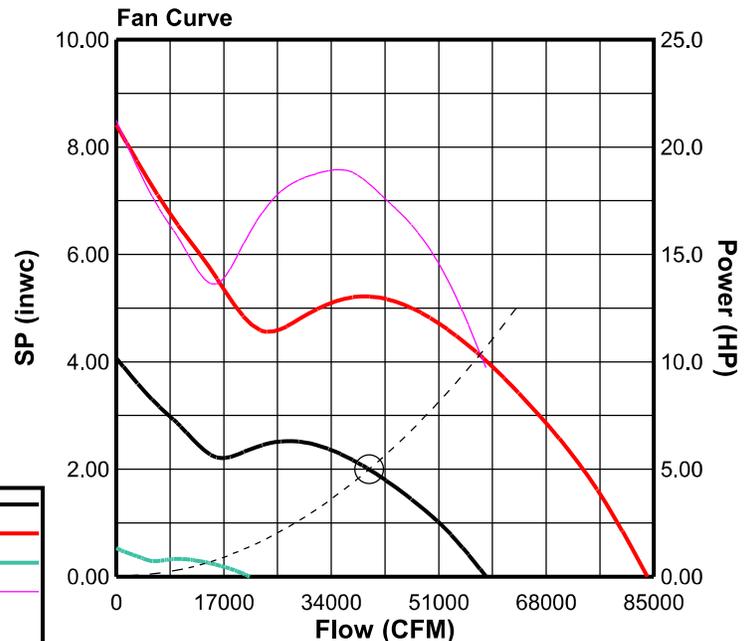
	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	88	86	84	82	79	75	70	65	84	73
Outlet	90	92	90	87	82	78	76	74	89	77

Accessories:

- Premium Efficiency Motor (Min. 93.6%)
- DRIVES (1.5 SF) @ 624 RPM
- LORENIZED-SPEC.COLOR-(SAFETY YELLOW)
- ACCESS DOOR-HINGED@G
- DRAIN
- BELT TUNNEL
- ALUMINUM WHEEL
- L10 200K CONCLOCKBRG
- SC2-1025 SET(4) - ISOLATORS

Fan Curve Legend

CFM vs SP (624)	—
MaxRPM(897)	—
MinRPM(225)	—
CFM vs HP	—
Point of Operation	○
System Curve	---





COOK



MARK: LEF-1
PROJECT: WSU SOCIAL SCIENCE
DATE: 6/20/2016

CPSLE

Lab Exhaust Flat Blade Centrifugal Blower Inlet Box & Curb Cap

STANDARD CONSTRUCTION FEATURES:

High velocity adjustable discharge nozzle - Continuously welded heavy duty flat blade wheel - Heavy gauge spun aluminum inlet cone - Continuously welded housing - Phenolic Epoxy Powder with UV (Light Gray) - L50/200k Ball or roller bearings - Weather Cover - Lifting lugs - Stainless Steel hardware - Stainless Steel shaft - Drain - Integral curb cap - Integral adjustable motor mounting plate - Dynamically balanced wheels - Adjustable pitch drives through 5 Hp - All fans factory adjusted to specified fan RPM.



System Design Conditions

SP (inwc)	Lab System Exhaust (CFM)	Bypass Airflow (CFM)	Total Inlet Airflow (CFM)	Fans/ System (Operating)	Fan Inlet Airflow (CFM)
2.50	800	+ 0	= 800	÷ 1	= 800

System Information (*Includes fan, motor & accessories.)

System Qty	Fans/ System	Fans on Standby	System Weight*	
			Shipping (lbs)	Unit (lbs)
1	1	0	446	261

Individual Fan Performance (*Bhp includes 9% drive loss)

Catalog Number	Fan Inlet Airflow (CFM)	Outlet Airflow (CFM)	Dilution Ratio	Fan RPM	Power* (HP)	FEG	Outlet Velocity (fpm)
100 CPSLE-4A	800	800	100%	3540	1.05	80	5446

Altitude (ft): 4226 Temperature (F): 70

Plume Information

Windspeed (MPH)	Plume Information (ft)		
	Plume Rise	Unit Height	Effective Plume Ht
9.0	9.3	+ 4.3	= 13.6

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	Mounted
1-1/2	3450	115/1/60	TEFC -SE	Yes

Fan Information

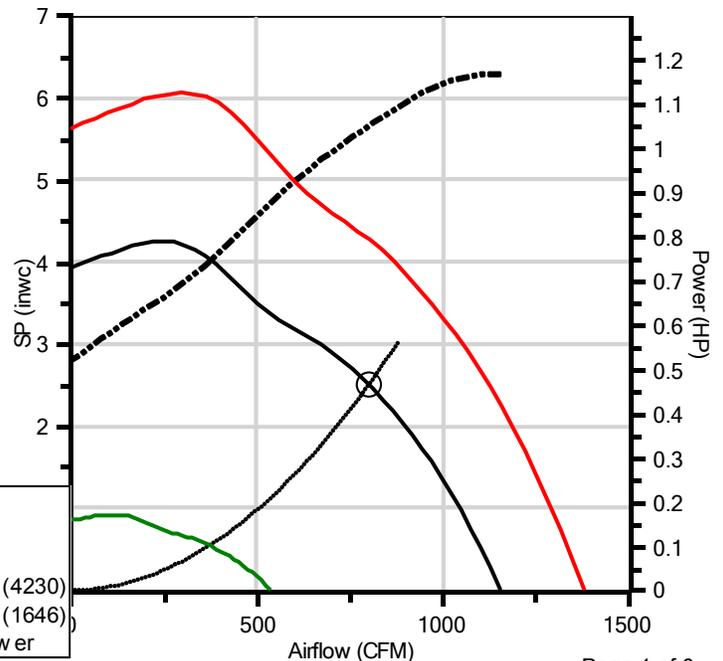
Class	OVel(fpm)	Rotation	Discharge
I	5446	CCW	Upblast

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA
84	93	96	89	87	84	77	74	93	81

Accessories:

- DRIVES (1.5 SF) @ 3540 RPM
- PHENOLIC EPOXY W/UV -(LIGHT GRAY)
- CONCENTRIC LOCK BRGS
- STACK EXTENSION
- BELT TENSIONR-ROTARY
- SPARE BELT SET
- ST STL LUBE LINES





Plume Information

Fan Only

CPSLE

System Design Conditions

SP (inwc)	Lab System Exhaust (CFM)		Bypass Airflow (CFM)		Total Inlet Airflow (CFM)		Fans/ System (Operating)		Fan Inlet Airflow (CFM)
2.50	800	+	0	=	800	÷	1	=	800

Individual Fan Performance

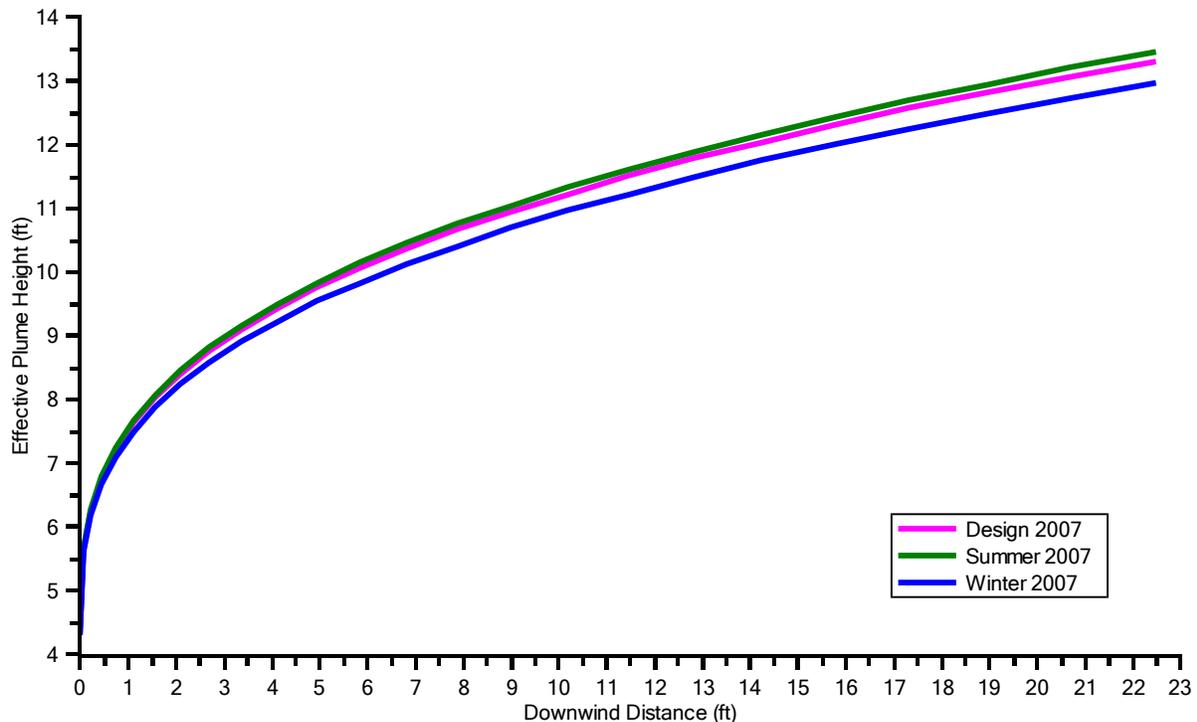
Catalog Number	Fan Inlet Airflow (CFM)	Outlet Airflow (CFM)	Dilution Ratio	Fan RPM	Power* (HP)	FEG	Motor (HP)	Outlet Velocity (fpm)	Tip Speed (fpm)	TEMP (°F)	ALT (ft)	*Medium Drive Loss Included
100 CPSLE-4A	800	800	100%	3540	1.05	80	1.5	5446	9267	70	4226	9%

Plume Information

Windspeed (MPH)	Building Height (Ft)	Terrain Category
9.0	30	Flat, Water, Desert

Calculation Method		Temperature (°F)		Plume Information (ft)					
		Lab Exhaust	Bypass	Plume Rise	Unit Height	Effective Plume Ht	Plume Type		
ASHRAE 2007	Design	70	70	9.3	+	4.3	=	13.6	Momentum
ASHRAE 2007	Summer	70	94	9.3	+	4.3	=	13.6	Momentum
ASHRAE 2007	Winter	70	11	8.9	+	4.3	=	13.2	Momentum

Effective Plume Height vs. Distance





CPSLE

Flow Diagram

Fan Only

System Design Conditions

SP (inwc)	Lab System Exhaust (CFM)		Bypass Airflow (CFM)		Total Inlet Airflow (CFM)		Fans/ System (Operating)		Fan Inlet Airflow (CFM)
2.50	800	+	0	=	800	÷	1	=	800

Individual Fan Performance

Catalog Number	Fan Inlet Airflow (CFM)	Outlet Airflow (CFM)	Dilution Ratio	Fan RPM	Power* (HP)	FEG	Motor (HP)	Outlet Velocity (fpm)	Tip Speed (fpm)	TEMP (°F)	ALT (ft)	*Medium Drive Loss Included
100 CPSLE-4A	800	800	100%	3540	1.05	80	1.5	5446	9267	70	4226	9%

A: Total Lab Airflow

800 CFM

B: Total Outlet Airflow

800 CFM



(Flow diagrams are for illustration only. Bottom intake shown, your configuration may vary.)



COOK

MARK: LEF-1

PROJECT: WSU SOCIAL SCIENCE

DATE: 6/20/2016

Dimensions

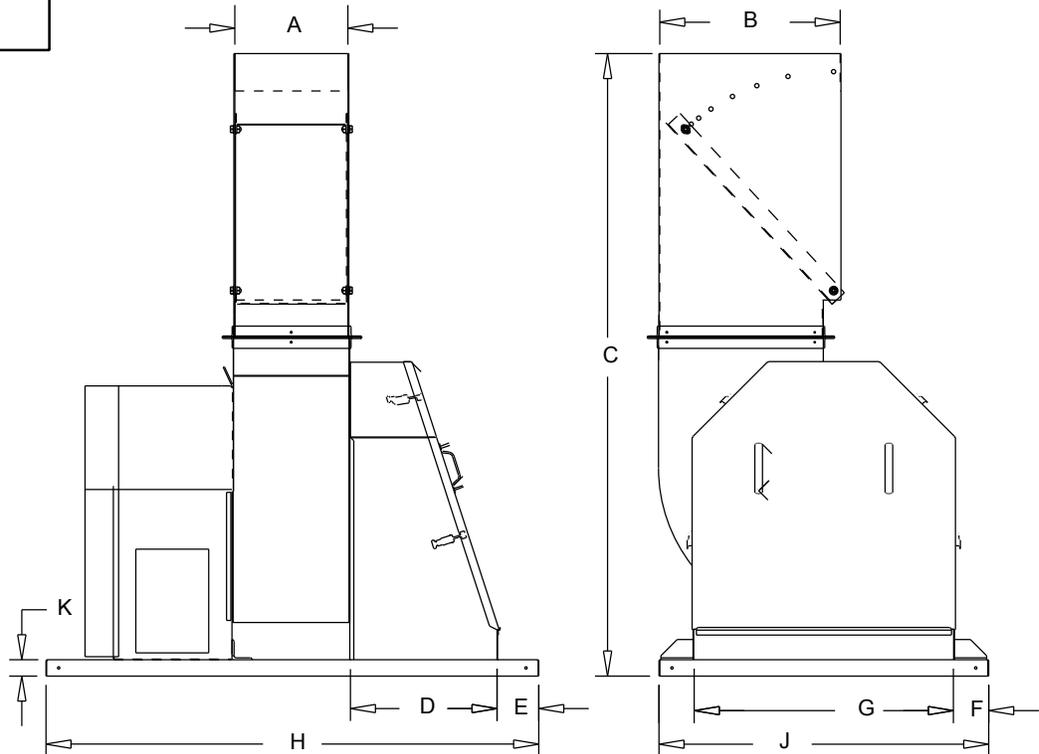
CPSLE

Lab Exhaust Flat Blade Centrifugal Blower Inlet Box & Curb Cap

Dimensions (inches)

Model	100 CPSLE-4A
A	7-9/16
B	12-3/16
C	51-3/4
D	12-9/16
E	4-11/16
F	4-7/16
G	22-7/16
H	47-1/2
J	31-1/2
K	2
*System Weight	261 (lbs)

*Estimated Weight - includes fan motor and accessories





COOK

MARK: LEF-1

PROJECT: WSU SOCIAL SCIENCE

DATE: 6/20/2016

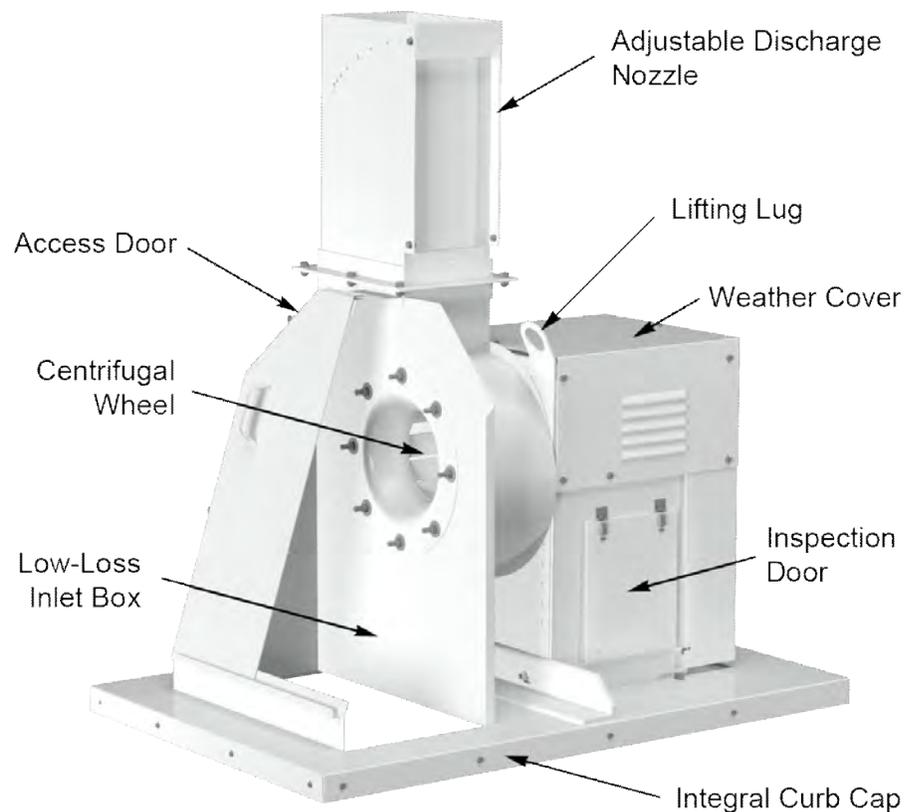
Features

Standard Construction

- High velocity adjustable discharge nozzle
- Continuously welded heavy duty flat blade wheel
- Heavy gauge spun aluminum inlet cone
- Continuously welded housing
- Phenolic Epoxy Powder with UV (Light Gray)
- L50/200k Ball or roller bearings
- Weather Cover
- Lifting lugs
- Stainless Steel hardware
- Stainless Steel shaft
- Drain
- Integral curb cap
- Integral adjustable motor mounting plate
- Dynamically balanced wheels
- Adjustable pitch drives through 5 Hp
- All fans factory adjusted to specified fan RPM.

CPSLE

Lab Exhaust
Flat Blade Centrifugal Blower
Inlet Box & Curb Cap

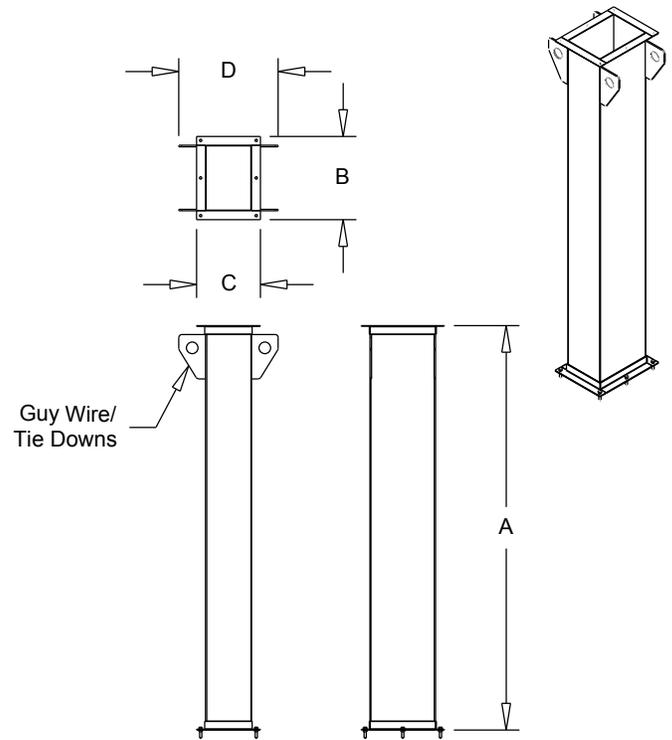


(Standard Construction Features are for illustration only, your configuration may vary.)



Stack Extension

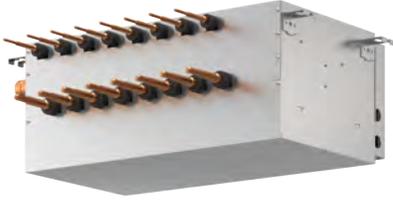
NOTE:
 Stack must be supported by guy wires.
 Do not over tighten wires.



Dimensions (inches)

Mark	Qty	Description	A	B	C	D	Dischg Ht.
LEF-1	1	STACK EXTENSION	68-1/4	14-1/16	10-3/4	16-3/4	120

Job Name:	
System Reference:	Date:



SAMPLE IMAGE FOR REFERENCE

ACCESSORIES:

- Joint Kit.....CMY-R160-J1
- Branch Joint (T-Branch).....CMY-Y102SS-G2
- Condensate Pump (BlueDiamond).....X87-721
- Condensate Pump (Sauer mann).....SI3100-230
- Ball Valve (3/8" SAE Brazed).....BV38BBS
- Ball Valve (5/8" SAE Brazed).....BV58BBS

SPECIFICATIONS:

Indoor Unit Capacity Connectable To 1 Branch	Btu/h	54,000
Number Of Branches	8	
Electrical Requirements		
Electrical Power Requirements	208 / 230V, 1 phase, 60Hz	
Minimum Circuit Ampacity (MCA)	A	0.64/0.58
Power Input (208 / 230V)		
Cooling	kW	0.106
Heating		0.053
Current Input (208 / 230V)		
Cooling	A	0.51 / 0.46
Heating		0.25 / 0.23
External Dimensions	In.(mm)	11-3/16 x 25-17/32 x 17-1/32 (284 x 648 x 432)
Net Weight	Lbs.(kg)	82 (37)
External Finish	Galvanized steel plate	

Refrigerant Piping Diameter to Indoor Unit (Brazed)			
		Liquid	Gas
less than 18,000 Btu/h	In.(mm)	1/4 (6.35)	1/2 (12.7)
18,000 to 54,000 Btu/h	In.(mm)	3/8 (9.52)	5/8 (15.88)
54,000 to 72,000 Btu/h	In.(mm)	3/8 (9.52)	3/4 (19.05)
greater than 72,000 Btu/h	In.(mm)	3/8 (9.52)	7/8 (22.2)

Refrigerant Piping Diameter to Sub BC Controller (Brazed)				
		Liquid	High Pressure	Low Pressure
to 72,000 Btu/h	In.(mm)	3/8 (9.52)	5/8 (15.88)	3/4 (19.05)
73,000 to 108,000 Btu/h	In.(mm)	3/8 (9.52)	3/4 (19.05)	7/8 (22.2)
109,000 to 126,000 Btu/h	In.(mm)	1/2 (12.7)	3/4 (19.05)	1-1/8 (28.58)

Field Drain Pipe Size	In.(mm)	1-1/4 (32)
------------------------------	---------	------------

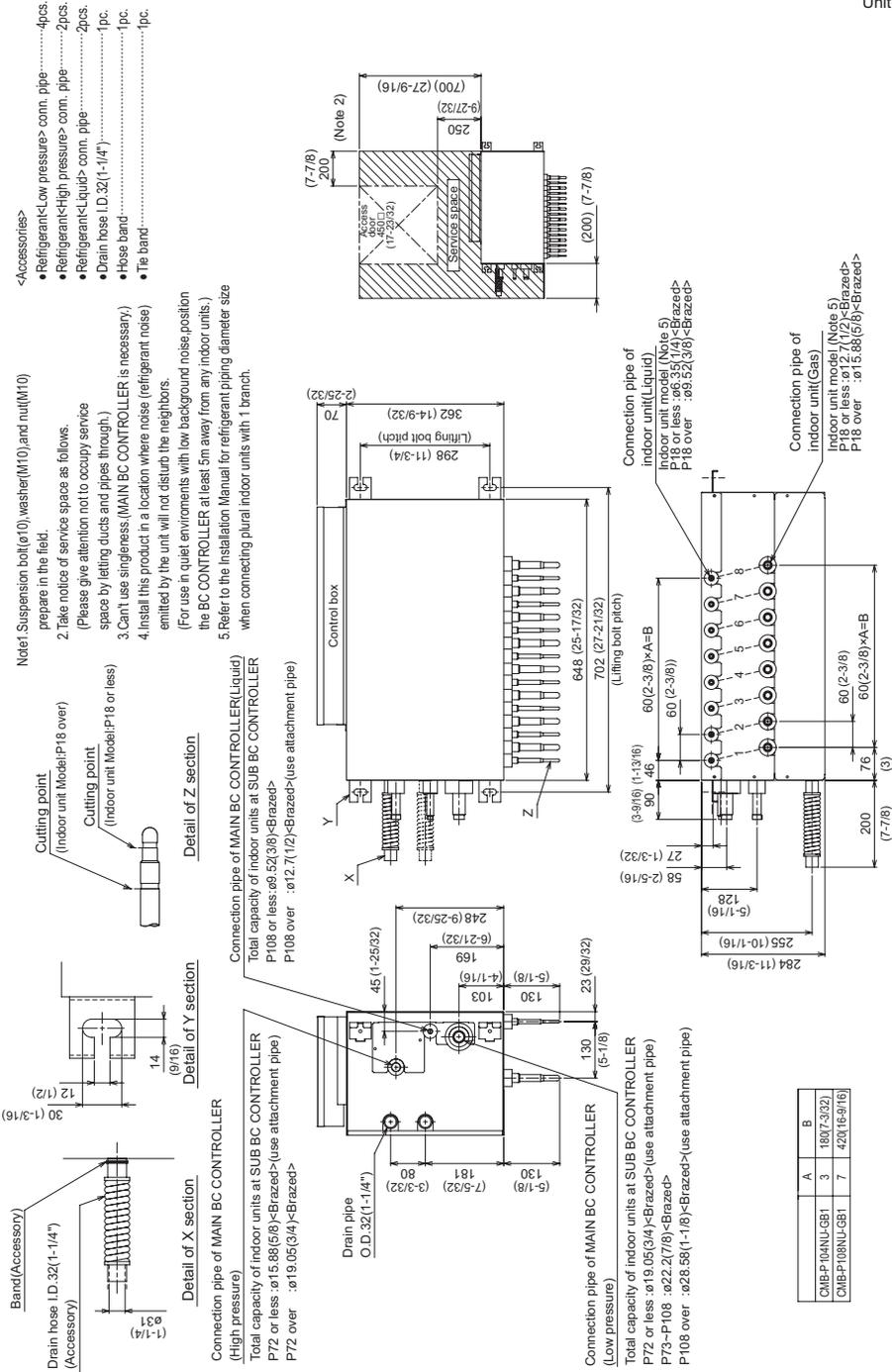
Refrigerant	R410A
--------------------	-------

NOTES:

1. Use the Reducer (standard accessory) when the indoor unit capacity is 18,000 Btu/h or less.
2. Use Ball Valves to isolate individual branches (recommended).
3. Use Joint Pipe to combine branches when connected indoor unit capacity on a single branch exceeds 54,000 Btu/h.

Model: CMB-P108NU-GB1 - DIMENSIONS

Unit: mm (in.)



COOLING & HEATING

1340 Satellite Boulevard, Suwanee, GA 30024
 Toll Free: 800-433-4822 www.mehvac.com



Job Name:	Date:
System Reference:	



GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8" (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16" (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

OPTIONS

- External Heater Adapter.....CN24RELAY-KIT-CM3
- Filter Box (Includes 2" MERV 13 filter).....FBM2-2

SPECIFICATIONS

Capacity*

Cooling.....18,000 Btu/h
 Heating.....20,000 Btu/h

Power

Power Source.....208 / 230V, 1-phase, 60Hz

Power Consumption

Cooling.....0.11 kW
 Heating.....0.09 kW

Current

Cooling.....0.77 / 0.73 A
 Heating.....0.66 / 0.62 A
 Minimum Circuit Ampacity (MCA).....1.56 A
 Maximum Overcurrent Protection (MOCP) Fuse.....15 A

External Finish.....Galvanized-steel Sheet

External Dimensions

Inches.....9-7/8 H x 35-7/16 W x 28-7/8 D
 mm.....250 H x 900 W x 732 D

Net Weight.....58 lbs. / 26 kg

Coil Type.....Cross Fin
 (Aluminum Plate Fin and Copper Tube)

Fan

Type x Quantity.....Sirocco Fan x 1
 Airflow Rate (Low-Mid-High)..... 424 - 512 - 600 CFM
 External Static Pressure.....0.14 - 0.20 - 0.28 - 0.40 - 0.60"WG
 (External static pressure is factory set to 0.20"WG)
 Motor Type.....DC Motor

Air Filter.....Polypropylene Honeycomb

Refrigerant Piping Dimensions

Liquid (High Pressure).....1/4" / 6.35 mm (Brazed)
 Gas (Low Pressure).....1/2" / 12.7 mm (Brazed)

Drainpipe Dimension.....O.D. 1-1/4" / 32 mm

Sound Pressure Levels

Low-Mid-High.....28 - 32 - 35 dB(A)

* Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
 Cooling | Indoor: 80° F (27° C) DB / 67° F (19° C) WB,
 Cooling | Indoor: Outdoor 95° F (35° C) DB
 Heating | Indoor: 70° F (21° C) DB,
 Heating | Outdoor 47° F (8° C) DB / 43° F (6° C) WB

Job Name:

Schedule Reference:

Date:



GENERAL FEATURES

- Dual set point functionality
- Lightweight, low-profile compact design
- 2' x 2' size matches size of many ceiling tiles
- Three-speed fan settings
- Auto fan
- Corner-pocket design for simplified installation
- Built-in condensate lift mechanism; lifts to 19-11/16 in.
- Ventilation air intake supported

OPTIONS

- External Heater Adapter.....CN24RELAY-KIT-CM3

** PLFY-P-NCMU-ER4 should be used with the SLP-15AAUW.

Service Access Note: If the PLFY-NCMU-ER4 indoor unit is to be installed in a non-accessible location, such as a gypsum ceiling, an access panel meeting the minimum size requirements shown on the dimension page shall be required for service and maintenance.

SPECIFICATIONS

Capacity*

Cooling.....8,000 Btu/h
 Heating.....9,000 Btu/h

Power

Power Source.....208/230V, 1-phase, 60Hz

Power Consumption

Cooling.....0.05 kW
 Heating.....0.05 kW

Current

Cooling.....0.23 A
 Heating.....0.23 A

Minimum Circuit Ampacity (MCA).....0.29 A

Maximum Overcurrent Protection (MOCP) Fuse.....15 A

External Finish...Grille (White; Munsell No. 6.4Y 8.9 / 0.4)

External Dimensions

Inches.....8-3/16 H x 22-7/16 W x 22-7/16 D
 mm.....208 H x 570 W x 570 D

Grille

Inches.....25/32 H x 25-19/32 W x 25-19/32 D
 mm.....20 H x 650 W x 650 D

Net Weight

Unit.....34 lbs. / 15.5 kg
 Grille.....7 lbs. / 3 kg

Coil Type.....Cross Fin
 (Aluminum Plate Fin and Copper Tube)

Fan

Type x Quantity.....Turbo Fan x 1
 Airflow Rate (Low - Med - High).....280 - 320 - 350 cfm
 Motor Type.....Single-phase Induction

Air Filter.....Polypropylene Honeycomb

Refrigerant Piping Dimensions

Liquid (High Pressure).....1/4" / 6.35 mm Flare
 Gas (Low Pressure).....1/2" / 12.7 mm Flare

Drainpipe Dimension.....O.D. 1-1/4" / 32 mm

Sound Pressure Level

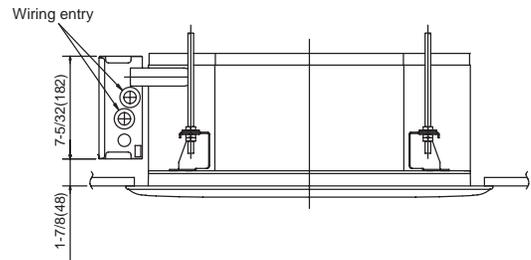
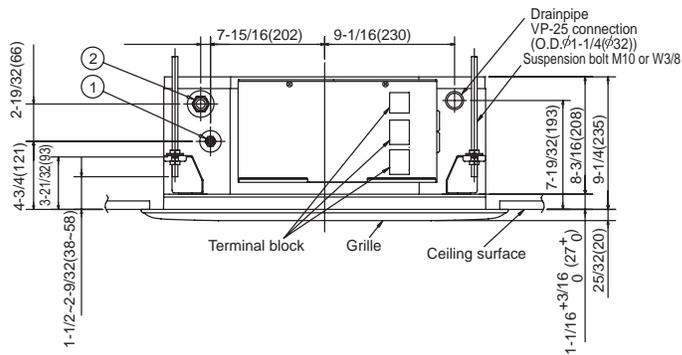
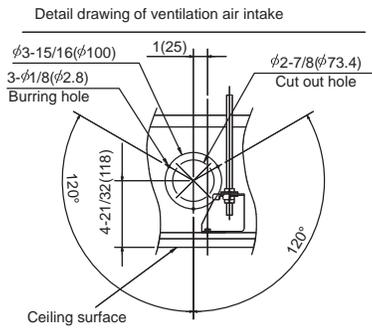
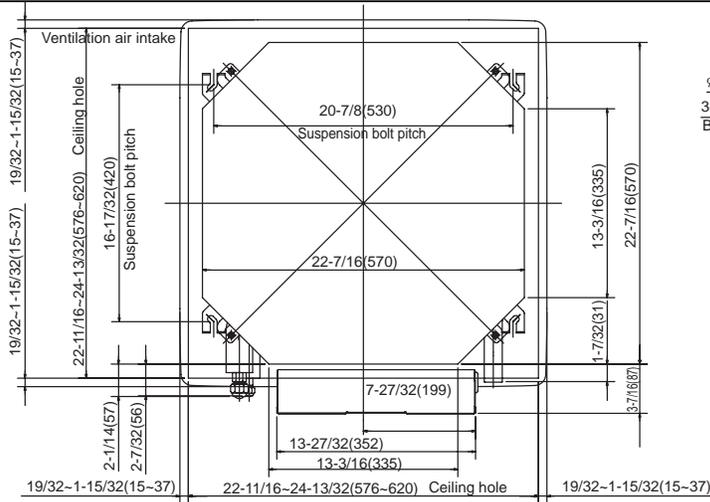
(Low - Med - High).....29 - 32 - 38 dB(A)

* Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
 Cooling | Indoor: 80° F (27° C) DB / 67° F (19° C) WB, Outdoor 95° F (35° C) DB
 Heating | Indoor: 70° F (21° C) DB, Outdoor 47° F (8° C) DB / 43° F (6° C) WB

Notes:

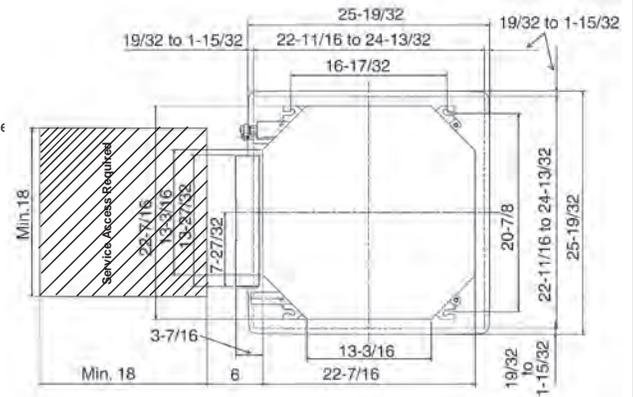
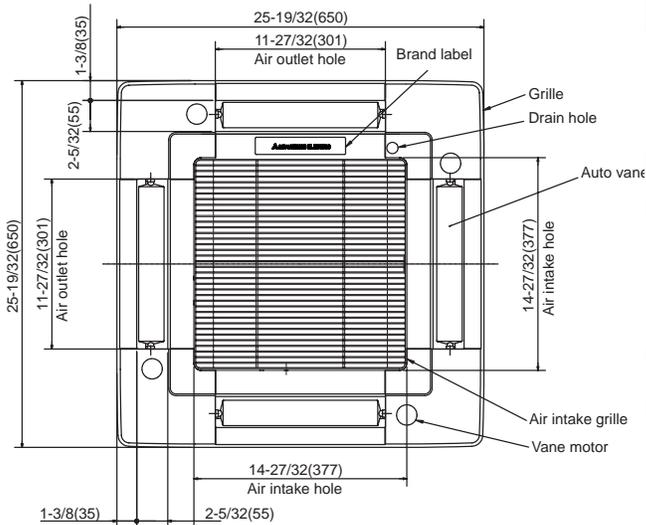


Model: PLFY-P08NCMU-ER4 – DIMENSIONS



Unit : in.(mm)

Models	①	②
PLFY-P08NCMU-ER4	Refrigerant pipe (1/4 (6.35) dia.) flared connection 1/4F	Refrigerant pipe (1/2 (12.7) dia.) flared connection 1/2F
PLFY-P12NCMU-ER4		
PLFY-P15NCMU-ER4		



Intertek

FORM# PLFY-P08NCMU-ER4 - 201207

Specifications are subject to change without notice.
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www.mitsubishipro.com
Specifications are subject to change without notice.

Job Name: _____
 System Reference: _____ Date: _____



**MODULAR WATER-SOURCE
VRF HEAT PUMP SYSTEM**

ACCESSORIES:

Twinning Kit (required) CMY-Q100CBK2
 Joint Kit For details see Piping Accessories Submittal
 BC Controller For details see BC Controller Submittal

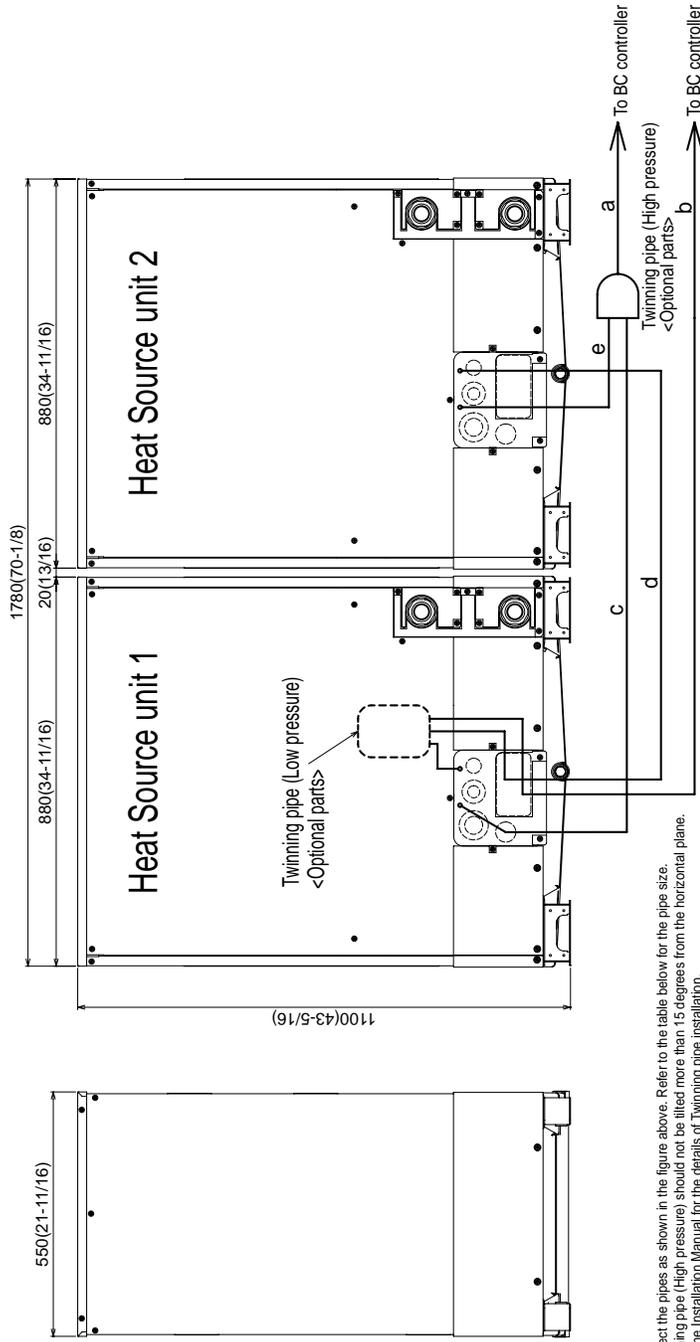
Specifications		System	Module 1	Module 2
Unit Type		PQRY-P240YSLMU-A(-BS)	PQRY-P120YLMU-A(-BS)	PQRY-P120YLMU-A(-BS)
Nominal Cooling Capacity (460V)	Btu/h	240,000	120,000	120,000
Nominal Heating Capacity (460V)	Btu/h	270,000	135,000	135,000
Operating Temperature Range	Cooling (Indoor)	Refer to Module Data	59~75° F (15~24° C) WB	
	Heating (Indoor)		59~81° F (15~27° C) DB	
Operating Water Temperature Range	Cooling*		50~113° F (10~45° C)	
	Heating*		50~113° F (10~45° C)	
External Dimensions (H x W x D)	In. (mm)	Refer to Module Data	43-5/16 x 34-11/16 x 21-11/16 (1100 x 880 x 550)	43-5/16 x 34-11/16 x 21-11/16 (1100 x 880 x 550)
Net Weight	Lbs. (kg)	808 (366)	404 (183)	404 (183)
External Finish		Refer to Module Data	Galvanized steel sheet	
Electrical Power Requirements	Voltage, Phase, Hertz	Refer to Module Data**	460V, 3-phase, 60Hz	
Minimum Circuit Ampacity (MCA)**	A	Refer to Module Data**	13	13
Maximum Overcurrent Protection (MOP)**	A	Refer to Module Data**	20	20
<i>Circulating Water (quality must meet regulations)</i>				
Flow Rate	GPM / L/s	Refer to Module Data	25.4 / 1.6	25.4 / 1.6
Pressure Drop	FT / psi		8.0 / 3.48	8.0 / 3.48
Operation Volume Range	GPM / L/m		13.2 - 31.7 / 50 - 120	13.2 - 31.7 / 50 - 120
Maximum Water Pressure	MPa / psi		2 / 290	2 / 290
Water-source Connection for Inlet and Outlet	In.		1-1/2 NPT	1-1/2 NPT
<i>Piping Diameter (Brazed)</i>				
From Twinning Kit to First Joint or Header (In. / mm)	Liquid (High Pressure)	7/8 / 22.20	Refer to System Data	Refer to System Data
	Gas (Low Pressure)	1-3/8 / 34.9	Refer to System Data	Refer to System Data
From Modules to Twinning Kit (In. / mm)	Liquid (High Pressure)	Refer to Module Data	3/4 / 19.05	3/4 / 19.05
	Gas (Low Pressure)	Refer to Module Data	7/8 / 22.2	7/8 / 22.2
Max. Total Refrigerant Line Length	Ft.	2,460	Refer to System Data	Refer to System Data
Max. Refrigerant Line Length (Bet.ODU & IDU)	Ft.	541		
Max. Control Wiring Length	Ft.	1,640		
Indoor Unit	Total Capacity	50~150	Refer to System Data	Refer to System Data
	Model / Quantity	P6~P96 / 2~50	Refer to System Data	Refer to System Data
Sound Pressure Level	dB(A)	57	54	54
Compressor Operating Range		7% - 100%	Refer to System Data	Refer to System Data
Compressor Type x Quantity		Refer to Module Data**	Inverter scroll hermetic compressor x 1	Inverter scroll hermetic compressor x 1
Refrigerant		Refer to Module Data	R410A x 11 lbs. + 1 oz. (5.0 kg)	R410A x 11 lbs. + 1 oz. (5.0 kg)
Protection Devices	High Pressure	Refer to Module Data	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter Circuit		Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor		Over-heat protection	Over-heat protection
AHRI Ratings (Ducted/Non-Ducted)	EER	12.5 / 13.8	Refer to System Data	
	IEER	22.4 / 25.7	Refer to System Data	
	COP	5.46 / 5.32	Refer to System Data	
	SCHE	19.3 / 20	Refer to System Data	

NOTES:

*If using circulating water temperatures between 23° and 50° F, Dip switch 3-9 must be turned on and glycol must be added to the water loop to prevent freezing down to 5° F.
 ** Each individual module requires a separate electrical connection. Reference electrical data for each individual module.

Model: PQR-Y-P240YSLMU-A- DIMENSIONS

Unit : mm(in)



- Note 1. Connect the pipes as shown in the figure above. Refer to the table below for the pipe size.
 2. Twinning pipe (High pressure) should not be tilted more than 1.5 degrees from the horizontal plane.
 3. See the Installation Manual for the details of Twinning pipe installation.
 4. Only use the Twinning pipe by Mitsubishi (optional parts).

Twinning pipe connection size

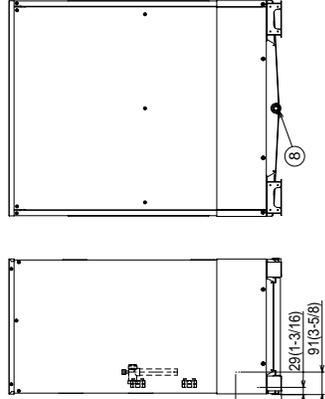
Package unit name	PQR-Y-P144YSLMU-A PQR-Y-P168YSLMU-A PQR-Y-P192YSLMU-A PQR-Y-P216YSLMU-A PQR-Y-P240YSLMU-A
Component unit name	Heat Source unit 1 PQR-Y-P72YLMU-A PQR-Y-P96YLMU-A PQR-Y-P120YLMU-A PQR-Y-P144YLMU-A PQR-Y-P168YLMU-A PQR-Y-P192YLMU-A PQR-Y-P216YLMU-A PQR-Y-P240YLMU-A
Twinning pipe Kit(optional parts)	PQR-Y-P72YLMU-A PQR-Y-P96YLMU-A PQR-Y-P120YLMU-A PQR-Y-P144YLMU-A PQR-Y-P168YLMU-A PQR-Y-P192YLMU-A PQR-Y-P216YLMU-A PQR-Y-P240YLMU-A
BC controller-Twinning pipe	High pressure a $\phi 22.2(7/8)$ $\phi 28.58(1-1/8)$ $\phi 34.93(1-3/8)$
	Low pressure b $\phi 22.2(7/8)$ $\phi 28.58(1-1/8)$ $\phi 34.93(1-3/8)$

Unit model	High pressure core	Low pressure d
P72	$\phi 15.88(5/8)$ *2	$\phi 19.05(3/4)$ *2
P96	$\phi 19.05(3/4)$	$\phi 22.2(7/8)$
P120		

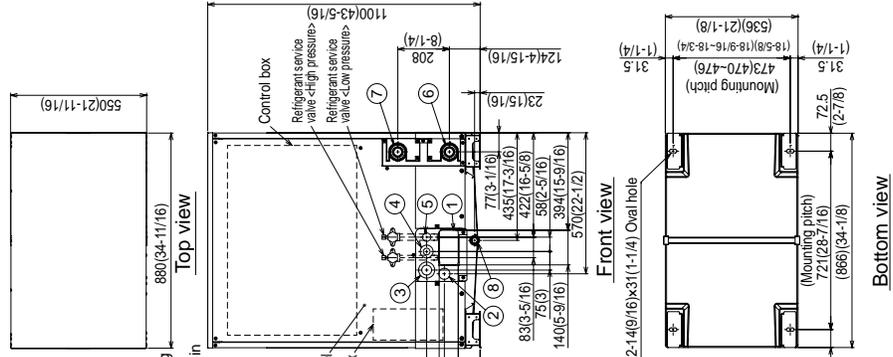
- *1. When the piping length is 65 m or longer, use the $\phi 28.58(1-1/8)$ pipe for the part that exceeds 65 m.
 2. When the package unit name PQR-Y-P168YSLMU-A, use the $\phi 19.05(3/4)$ pipe for high pressure and the $\phi 22.2(7/8)$ pipe for low pressure.

- <Accessories>
- Refrigerant (high pressure) conn. pipe.....1pc. (P72/P66/P120 ; Packaged in the accessory kit)
 - Refrigerant (low pressure) conn. elbow.....1pc. (P72/P66/P120 ; Packaged in the accessory kit)
 - Water stopper.....1pc. (P72/P66/P120 ; Packaged in the accessory kit)
 - Spring material (water stopper.....1pc. (P72/P66/P120 ; Packaged in the accessory kit)
 - Spring material (field piping (high pressure, low pressure).....1pc. each (P72/P66/P120 ; Packaged in the accessory kit)
 - Spring material (drain socket.....1pc. (P72/P66/P120 ; Packaged in the accessory kit)
 - Pipe for low pressure.....1pc. (P72/P66/P120 ; Packaged in the accessory kit)

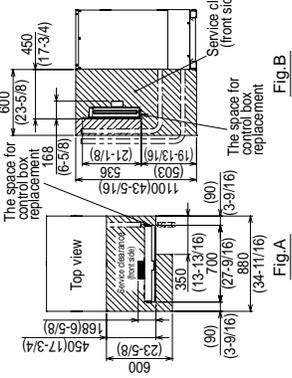
Top of unit casing not suitable for supporting system modules stacked above - field framing required for stacking modules of additional systems



NO.	Usage	Specifications
①	Front through hole	140 x 77 Knockout hole (5-9/16) (3-1/16)
②	For pipes	Front through hole (for pipe kit (optical parts) is mounted) ø45 Knockout hole (1-13/16)
③	For wires	Front through hole ø62.7 or ø34.5 Knockout hole (2-1/2) (1-3/8)
④	For transmission cables	Front through hole ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑤	For transmission cables	Front through hole ø34 Knockout hole (1-3/8)
⑥	Water pipe inlet	NPT1-1/2 Screw
⑦	Water pipe outlet	NPT1-1/2 Screw
⑧	Drain pipe	Rc3/4 Screw



- Note1. Seal around the water piping, the refrigerant piping, the power supply, and the control wiring and plug unused knockout holes with putty, etc., to prevent moisture or dirt from entering cabinet.
- Note2. At the time of product shipment, the front side piping serves as the local drainage connection. When connecting on the rear side, please remove the rear side plug sealing corks, and attach on the front side. Ensure there is no leak in piping system once connected.
- Note3. See Fig. A and Fig. B for service clearances.
- Note4. If piping is installed in front of the unit, provide clearances as shown in Fig. A and Fig. B.
- Note5. Environmental condition for installation: -20~40°C(DB) (-4~104°F) for indoor installation.
- Note6. In case the temperature around the heat source unit has possibility to drop under 0°C(32°F), be careful for the following point to prevent the pipe burst by the water pipe freeze-up.
- Circulate the water all the time even if heat source unit is not in operation and provide glycol for freeze protection.
 - Operate the heat source unit in the mode when the heat source unit will operate for a long term.
- Note7. Ensure that the drain piping is downward with a pitch of more than 1/100.
- Note8. At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).



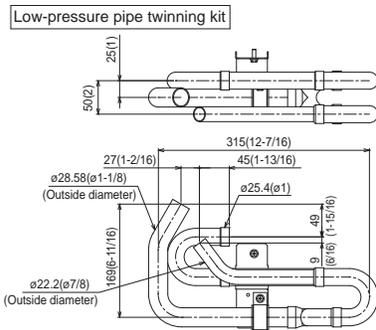
Connecting pipe specifications

Model	Refrigerant pipe		Diameter		Service valve	
	High pressure	Low pressure	High pressure	Low pressure	High pressure	Low pressure
PQRV-P72YLMU-A	ø15.88 Braze	ø19.05 Braze	ø19.05 (3/4) * 1/2	ø25.4 (1)	ø19.05 (3/4)	ø25.4 (1)
PQRV-P66YLMU-A	ø15.88 Braze	ø19.05 Braze	ø19.05 (3/4) * 1/2	ø25.4 (1)	ø19.05 (3/4)	ø25.4 (1)
PQRV-P120YLMU-A	ø15.88 Braze	ø19.05 Braze	ø19.05 (3/4) * 1/2	ø25.4 (1)	ø19.05 (3/4)	ø25.4 (1)

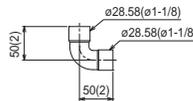
*1. Connect by using the connecting pipes and elbow that are supplied.
 *2. Use the pipe joint(field supply) and connect to the refrigerant service valve piping.

Twining Kit: CMY-Q100CBK2- DIMENSIONS

Unit : mm(in)



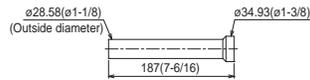
<Elbow pipe(Accessory)>



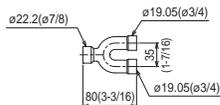
<Accessory>

- Fixing screw 1
- Insulation cover 1
- Pipe cover (150mm(5-15/16) Length) 2
- Pipe cover (60mm(2-3/8) Length) 1
- Pipe cover (80mm(3-3/16) Length) 2
- Cable tie 2
- Water stopper 1
- Sealing material (Small) 1
- Sealing material (Large) 1

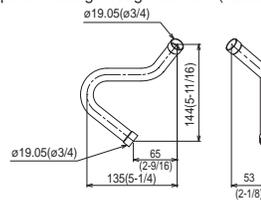
<Pipe for routing through the front (Accessory)>



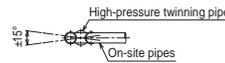
High-pressure twining pipe



<Pipe for routing through the front (Accessory)>



Note 1. Refer to the figure below for the installation position of the high-pressure twining pipe.



Inclination tolerance of the high-pressure twining pipe is $\pm 15^\circ$ relative to the ground.

2. Pipe diameter is indicated by inside diameter.



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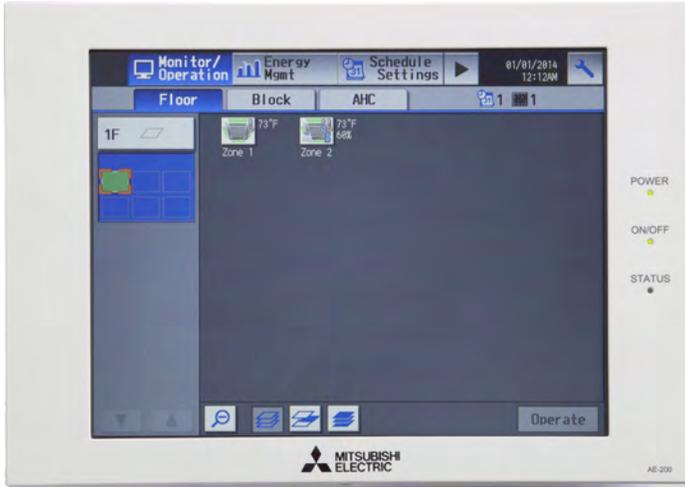


FORM# PQRV-P240YSLMU-A-20160224

Job Name:

System Reference:

Date:



AE-200A

- AE-200A is the Master Controller
- Master Controller can operate and monitor up to 50 indoor units.
- Expansion Controllers can expand an AE-200A to operate and monitor up to 50 additional indoor units through the touch screen or web browser. Network up to three AE-50A or EW-50A to one AE-200A to allow the AE-200A to manage up to 200 indoor units.

OPTIONAL LICENSES

- SW-BACnet Master: BACnet Function
 - Connected air conditioning units can be monitored and operated not only from the existing web browser or the AE-200/AE-50's LCD, but also from the building management system using the BACnet® communication protocol. See SW-BACnet Data Sheet for more information.
- SW-Charge Master: Energy Allocation
 - The apportioned electricity billing function is an electric energy apportionment system that apportions electric energy using input from electricity meters with a pulse generator function. The respective mounts of electric energy can be apportioned based on the operating status and capacity of each tenant. See SW-Charge Data Sheet for more information.
- SW-PWeb Master: Online Personal Browser
 - Allows tenant managers and general users to control their respective zone conditions via a networked PC, tablet, or mobile phone with or without local remote controllers installed in the space. See SW-PWeb Data Sheet for more information.

SPECIFICATIONS

- Supports dual set point functionality (connected equipment dependent)
- Displays:
 - CITY MULTI® compressor speed and hi/low pressure
 - Advanced HVAC Controller (DC-A2IO) input/output status
 - Indoor unit free contact input/output status
 - Space Temperature and Humidity (from Smart ME or AI controller)
 - Error code
 - Unoccupied setback up temperature range
- Functions
 - Hold function (temporarily disables schedules indoor unit model dependent)
 - Initial setting
 - Operation data back-up

- Permits or prohibits remote controller functions:
 - On/Off
 - Change Operation Mode
 - Change Set point Temperature
 - Filter Status
 - Change Fan Speed
 - Change Air Direction
- External input/output signals can be used for batch operations such as Start/Stop and Emergency Stop (Requires PAC-YG10HA)
- Pulse signal input can obtain watt-hour meter, billing data and energy management data based on the cumulative number of pulse signal pulse signals directly input from a metering device.
- Temperature set point range limits can be set for local remote controllers
- User defined indoor unit functions:
 - On/Off
 - Monitoring and Operation
 - Operation mode:
 - Auto* (Dual or Single set point)
 - Heat
 - Fan
 - Drying
 - Setback*
 - Note: *R2 Series only (connected equipment dependent)
 - Temperature Setting
 - Fan Speed
 - Airflow Direction
- Monitoring and Control:
 - CITY MULTI® indoor units
 - M & P Series units (Requires M-Net adapter)
 - Lossnay units
 - PWFY hydronic heat pump units
 - DIDO controllers
 - CITY MULTI® DOAS
 - Interlock setting enables integration of general equipment inputs/outputs and indoor units
- Scheduling
 - Daily
 - Annually
 - Five pattern weekly seasonal schedule
- Twenty four scheduled events per day, indoor unit model dependent:
 - ON/OFF
 - Mode
 - Temperature Setting
 - Vane Direction
 - Fan
 - Speed
 - Operation Prohibits
- Trend data:
 - Fan operation time
 - Thermo-on time
 - Set temperature
 - Room temperature
 - AI Controller temperature and humidity (Requires PAC-YG63 MCA, 2 inputs total for each controller)
- Memory back up via USB (universal serial bus)
- Memory back up via LAN (Local Area Network) port

Model: AE-200A - Specifications, cont.

AE-200A Expansion Controller

Item	Specifications	
Power Supply	Rated input	100–240 VAC ± 10%; 0.3–0.2 A 50/60 Hz Single-phase
	Fuse	250 VAC 6.3 A Time-Lag type (IEC 60127-2S.S.5)
M-NET power feeding capability	No specifications**Only an MN converter can be connected.	
Ambient conditions	Temperature	Operating Range
		Non-operating Range
	Humidity	30-90% RH (No condensation)
Weight	2.3 kg (5-5/64 lbs)	
Dimensions (W x H x D)	11-5/32 x 7-55/64 x 2-17/32 in. (284 x 200 x 65 mm)	
Installation conditions	Indoor only **To be used in a business office or similar environment	

Web Browser Requirements

Item	Requirements
CPU	1 GHz or faster
Memory	512 MB or more
Screen Resolution	1024 x 768 or higher recommended
Compatible Browser	Microsoft® Internet Explorer 8.0 Microsoft® Internet Explorer 9.0 Microsoft® Internet Explorer 10.0 Microsoft® Internet Explorer 11.0 **Java execution environment is required. (Oracle® Java Plug-in Ver. 1.8.0_60) **Install Oracle® Java Plug-in that is appropriate for your operating system. When using a 64-bit Internet Explorer, install a 64-bit Java Plug-in. **The version of the Oracle® Java Plug-in can be verified by clicking [Java] in the Control Panel.
Onboard LAN Port or LAN Card	100 BASE-TX
100 BASE-TX	e.g., mouse

Notes:

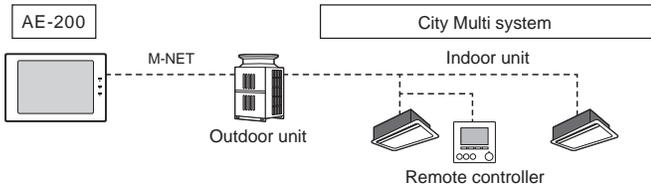
Models: AE-200A - System Configuration

*AE-200A is indicated as AE-200

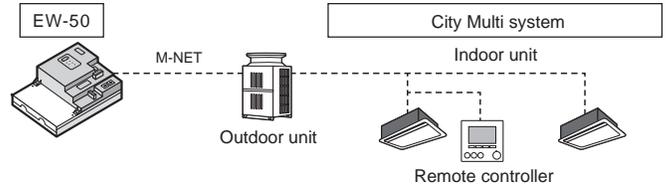
*AE-50A is indicated as AE-50

Controlling 50 or fewer units of equipment

1. AE-200



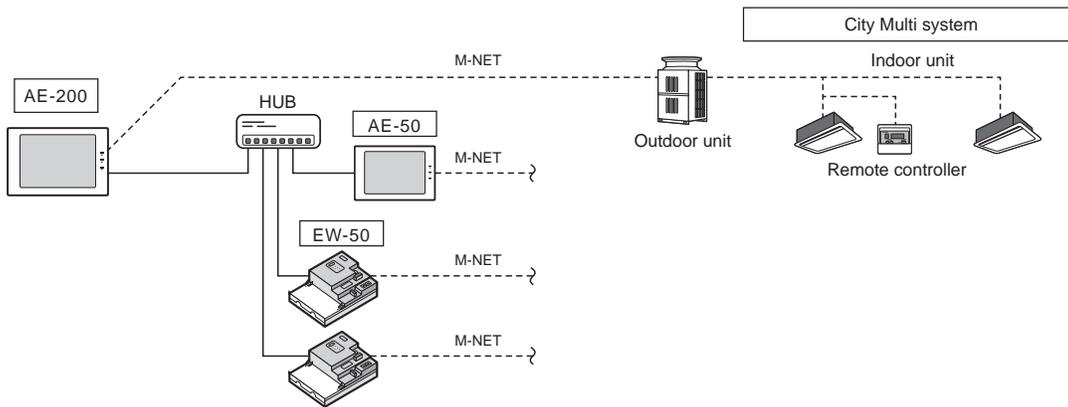
2. EW-50



Controlling more than 50 units of equipment (with connection to an AE-200 controller)

Note

AE-200 is required when using AE-50.

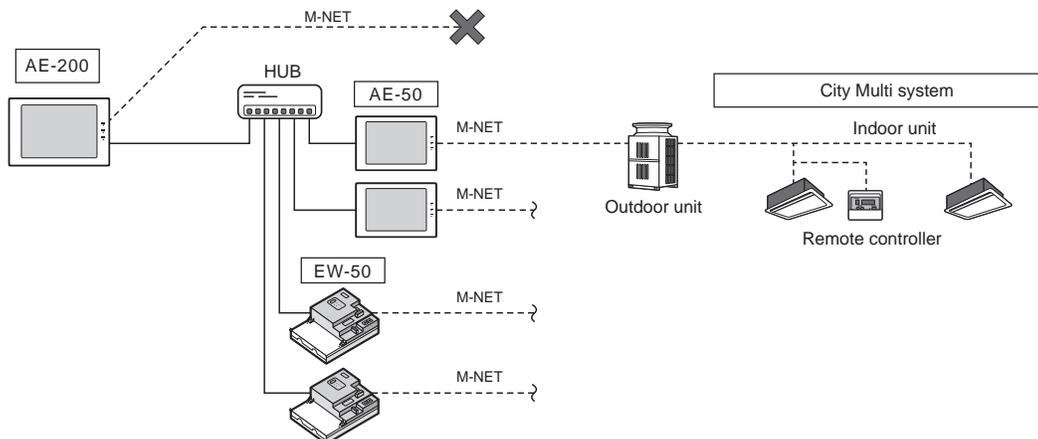


When using an apportioned electricity billing function

Note: AE-200 is required to use a billing function.

Note: AE-200 M-NET cannot be used when a billing function is used.

Note: "Charge" license is required to use a billing function.

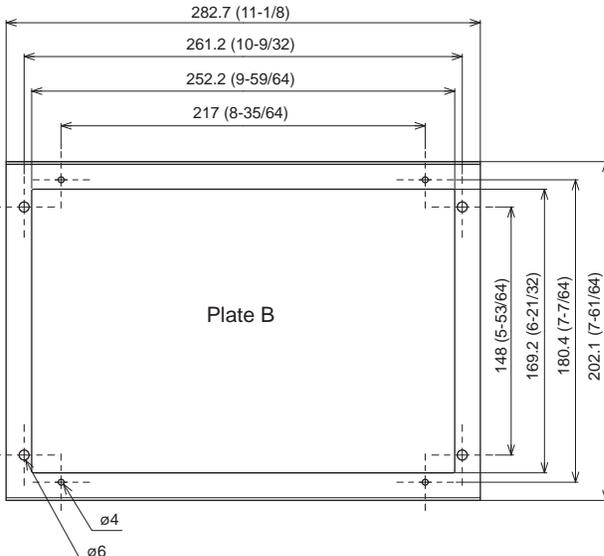
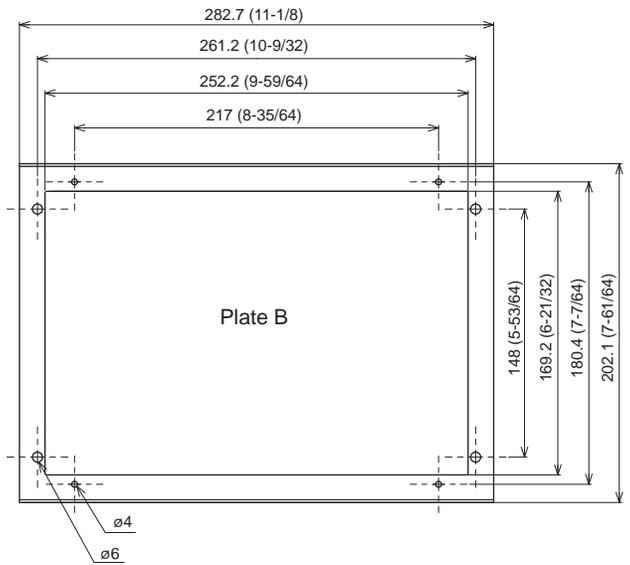
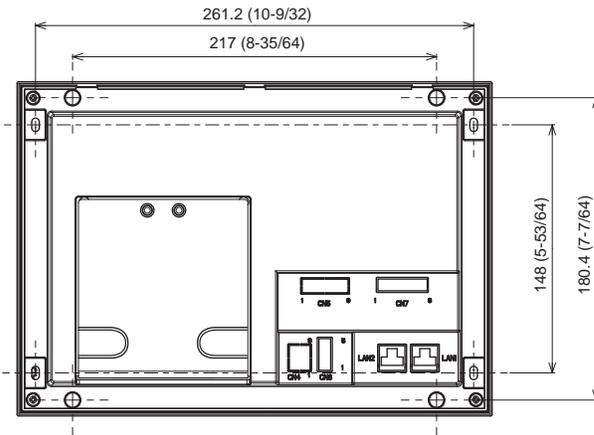
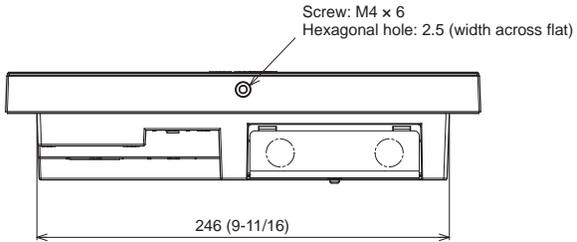
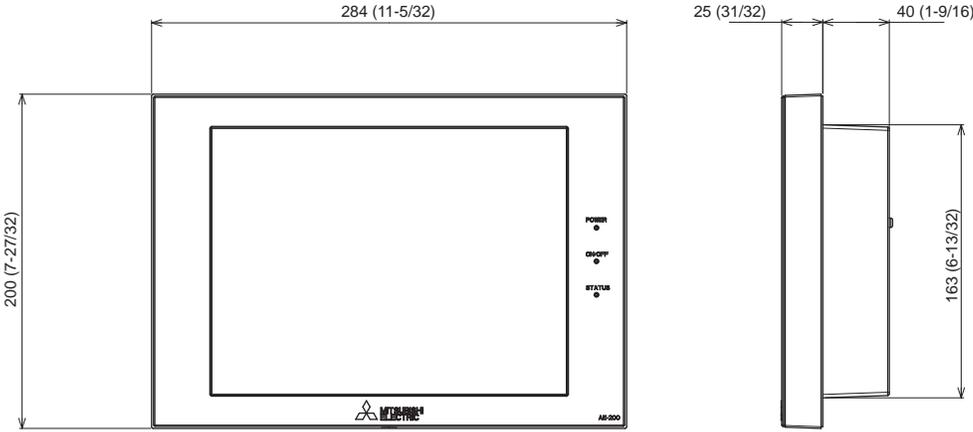


Model: AE-200A - Dimensions

Unit: mm (inch)

*AE-200A is indicated as AE-200

*AE-50A is indicated as AE-50



PERFORMANCE PLATINUM™



The new degree of comfort.™

PERFORMANCE PLATINUM™ Hybrid Heat Pump is our most advanced, energy-efficient water heater – with over \$4,000 in lifetime savings with less than 2 years payback*

Efficiency

- High 2.45 EF reduces operating cost \$340 annually compared to a standard 50-gallon electric model
- ENERGY STAR® rated

Performance

- Delivers hot water faster than most standard electric water heaters – 73 gallons first-hour delivery for 50-gallon model and 86 gallons FHD for 80-gallon model
- 8700 Btu/h compressor – the most powerful in its class for quick recovery of hot water
- Ambient operating range: 37-120° F is widest in class, offering more days of HP operation annually; designed to meet Northern Climate Spec (Tier 1)

Easy Installation

- Easy access side connections
- Quick access to electrical junction box
- Designed to be installed as easily as a standard electric water heater

Integration

- LCD Screen with built-in water sensor alert with audible alarm and service notifications



- EcoNet™ enabled WiFi-connected† technology gives users control over water systems, allowing for customizable temperature, energy savings and system monitoring at home or away. Visit Rheem.com/EcoNetConnect



Operation Modes

- Energy Saver
- Heat Pump Only
- High Demand
- Electric Heat Only
- Vacation: 2-28 days (or placed on hold indefinitely)

Plus...

- Premium grade anode rod with resistor extends the life of the tank
- 3/4" NPT water inlet and outlet; 3/8" condensate drain connections
- Incoloy stainless steel resistor elements
- Dry-fire protection
- Easy access, top mounted washable air filter
- 2-1/2" Non-CFC foam insulation
- Enhanced flow brass drain valve
- Temperature and pressure relief valve included
- Low lead compliant

Warranty

- 12-Year limited warranty for tank and parts, 1-year full in-home labor warranty
- See Residential Warranty Certificate for complete information

Units meet or exceed ANSI requirements and have been tested according to D.O.E. procedures. Units meet or exceed the energy efficiency requirements of NAECA, ASHRAE standard 90, ICC Code and all state energy efficiency performance criteria.

*Compared to a 50-gallon standard electric water heater with a .95 EF.

† WiFi broadband internet connection required, EcoNet WiFi Kit sold separately



PERFORMANCE PLATINUM Hybrid

50 and 80-Gallon Capacities
208-240 Volt / 1 PH / 24 Amps



LEED Points = 3

See specifications chart on back.

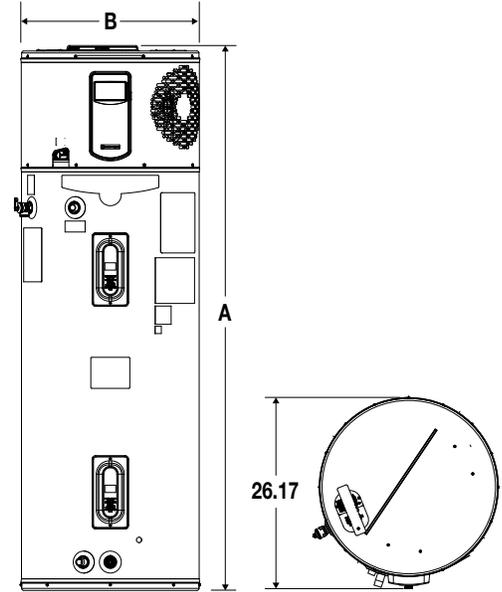


The new degree of comfort.™

PERFORMANCE PLATINUM™ Hybrid Specifications

Fuel Type	Description	Gallon Capacity	Model Number	Recovery in G.P.H. 90° Rise	First Hour Rating G.P.H.	Tank Height A	Diameter B	Unit Weight (LBS)	Ship Weight (LBS)	Energy Saver
Electric	Tall	50	XE50T12EH45U0	26	73	61	22-1/4	185	204	2.45 EF
Electric	Tall	80	XE80T12EH45U0	26	86	74-1/2	24-1/4	230	245	2.45 EF

Energy Factor based on D.O.E. (Department of Energy) test procedures.



In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice.

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Montgomery, Alabama 36117-4305 • www.rheem.com



SIZING INSTRUCTIONS THERM-X-TROL® POTABLE WATER EXPANSION TANK

1400 Division Road, West Warwick, RI 02893 ▲ T: 401.884.6300 ▲ F: 401.885.2567 ▲ www.amtrol.com

Sizing the Therm-X-Trol® Potable Water Expansion Tank

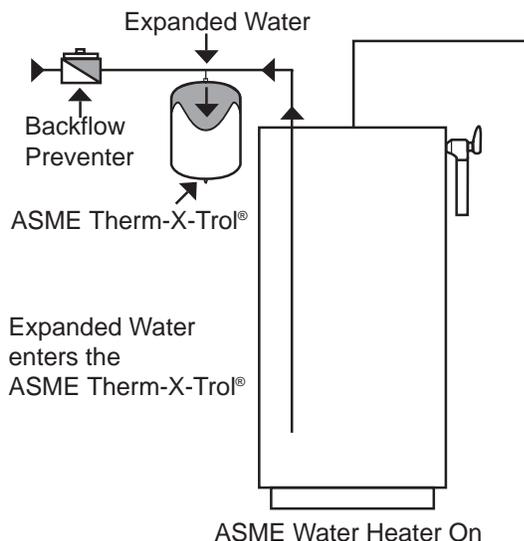
As water is heated, thermal expansion takes place. This small volume of water can cause rapid increases in system pressure if a backflow preventer or other one-way device is installed without the proper thermal expansion tank. Examples of one-way devices include:

- Backflow Preventers (BFP's)
- Check Valves
- Pressure Reducing Valves (PRV's)

ASME Therm-X-Trol® expansion tanks incorporate a polypropylene liner and non-ferrous materials suitable for use with domestic potable water systems. In the following pages, you'll find helpful information to assist you in the sizing and general installation requirements of Therm-X-Trol® tanks.

Here's how the ASME Therm-X-Trol® works:

As can be seen, the ASME Therm-X-Trol® tank assumes an important role in reducing water heater damage. Next, we'll begin the process of sizing a thermal expansion tank.



ASME Code

The ASME boiler pressure vessel code is quite explicit on exemptions from ASME requirements. ASME Section VIII, Division 1 (U-1)(c)(2) states: "Based on the committee's consideration, the following classes of vessels are included in the scope of this Division: a vessel for containing water under pressure, including those containing air the compression of which serves only as a cushion, when one of the following limitations are exceeded:

- a) a design pressure of 300 psi (2070 kPa)
- b) a design temperature of 210°F (99°C)

AMTROL Therm-X-Trol® models ST-5 through ST-210V have a maximum working pressure of 150 psi, and a maximum design temperature of 200°F. These models are, therefore, exempt. Local code authorities having jurisdiction may follow this criteria, utilize guidelines with additional volumetric constraints, or develop requirements independent of these ASME suggested criteria. It is the responsibility of the designer to meet the requirements of the authority having jurisdiction. For interpretation of local code guidelines, contact the AMTROL technical representative in your area.

Typical Engineering Specification

Furnish and install as shown on plans a _____ gallon, _____" diameter x _____" (high) pre-charged hydropneumatic steel expansion tank. The tank construction shall be in accordance with Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code, with all welds conforming to ASME Section IX. The tank must be stamped with a maximum working pressure of _____psi and a maximum working temperature of _____° F. All internal wetted parts must comply with FDA regulations and approvals. An internal butyl/EPDM diaphragm or butyl bladder will be used to isolate air charge from water.

Each tank shall be AMTROL Therm-X-Trol® Model No. ST-_____-C.

Table 1. Expansion Factor

Operating (Design) Temperature of Water Heater (Tank)	Expansion Factor* (Percentage of Water Volume Increase)	
100° F	.0062	0.6%
120° F	.0100	1.0%
130° F	.0124	1.2%
140° F	.0150	1.5%
150° F	.0179	1.8%
160° F	.0209	2.0%
170° F	.0242	2.4%
180° F	.0276	2.8%

*Based on initial temperature of 40° F.

Table 2. Design Pressure Factor: DPF

Maximum Allowable Pressure	Line Pressure psi	Design Pressure Factor (DPF)
100	40	1.9
	50	2.3
	60	2.9
	70	3.8
	80	5.7
125	40	1.6
	50	1.9
	60	2.1
	70	2.5
	80	3.1
150	40	1.5
	50	1.6
	60	1.8
	70	2.1
	80	2.4

For conditions not shown in table, use equation:

$$DPF = \frac{\text{Max. Allow. Pressure} + 14.7}{\text{Max. Allow. Pressure} - \text{Line Pressure}}$$

The procedure for sizing the Therm-X-Trol for any application depends on four(4) vital pieces of information:

1. ASME or non-ASME requirement.
2. Calculated thermally expanded water volume.
3. Minimum water pressure experienced at the tank location.
4. Maximum water pressure allowable at the tank location.

The tank required for any application can be sized with the following equation:

$T_v = \text{Design Pressure Factor} \times \text{expanded water}$
Where: T_v is the total Therm-X-Trol volume required in gallons.

Critical Sizing AMTROL Therm-X-Trol	
1. Total Water Heater Volume (Gallons)	1.
2. Water Expansion Factor (Table 1)	2.
3. Calculate Expanded Water (Gallons) (Line 1 x Line 2)	3.
4. Design Pressure Factor (Table 2)	4.
5. Therm-X-Trol Volume Required (Gallons) (Line 3 x Line 4)	5.
6. Select Therm-X-Trol Model	6.

Example: A 240 gallon water heater with a 150°F aquastat setting is installed with a 125 psi maximum pressure requirement. For static supply line pressure of 60 psi, what Therm-X-Trol model is required for critical protection?

Critical Sizing AMTROL Therm-X-Trol: Example	
1. Total Water Heater Volume (Gallons)	240
2. Water Expansion Factor (Table 1)	0.0179
3. Calculate Expanded Water (Gallons) (Line 1 x Line 2) = (240 x .0179)	4.3
4. Design Pressure Factor (Table 2)	2.1
5. Therm-X-Trol Volume Required (Gallons) (Line 3 x Line 4) = (4.3 x 2.1)	9.0
6. Select Therm-X-Trol Model	ST-25V or ST30V-C

Notes:

The THERM-X-TROL® air pressure should be equal to static line pressure. When sizing a THERM-X-TROL®, the unit must meet the calculated expanded water (step 3 in example) and total tank volume (step 5 in example).

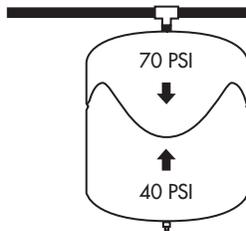
Basic Tank Installation Considerations

Now that the proper expansion tank has been selected, it is time to install the unit.

Tank Precharge

The pre-charge equalization of the tank and incoming supply pressure is a critical step and if done improperly can contribute to premature tank failure. As Boyle’s law showed us, air pressure determines the ability to cushion expanded water. As such, it is important to properly charge the Therm-X-Trol before installation. Standard Therm-X-Trol tanks are shipped at 40 psi. How does the air charge affect the tank’s operation? Let’s take a look at our 70 psi incoming pressure if the tank is left at 40 psi:

Note how the 70 psi incoming pressure pushes against the diaphragm and takes up valuable space before the water

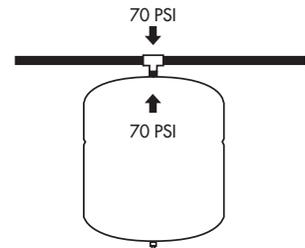


has even begun to heat and expand. Because of this, it is necessary to match the precharge to the incoming supply pressure before installation. See below: **Tank Location**

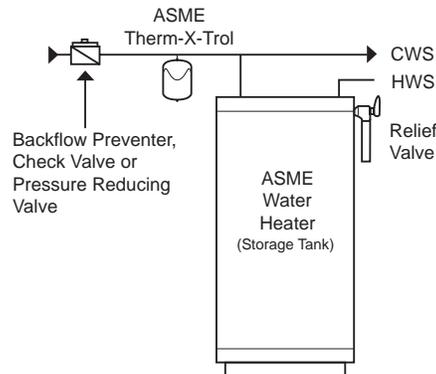
Placement of an expansion tank is important for two reasons.

1. Location affects the tank’s ability to absorb water
2. Improper placement can temporarily affect water delivery temperature

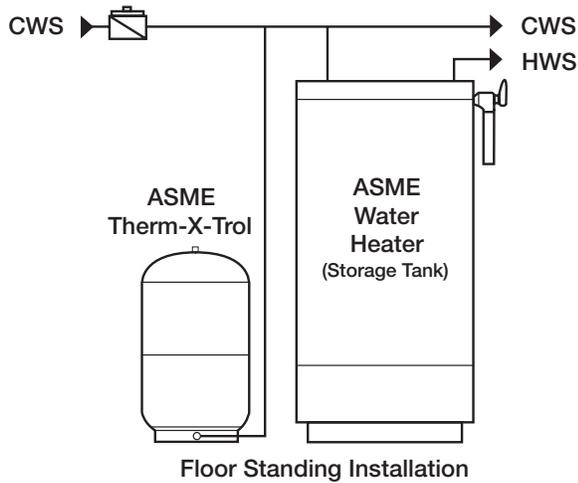
Let’s look at a typical hot water system:



Note the backflow preventer separating the cold water supply



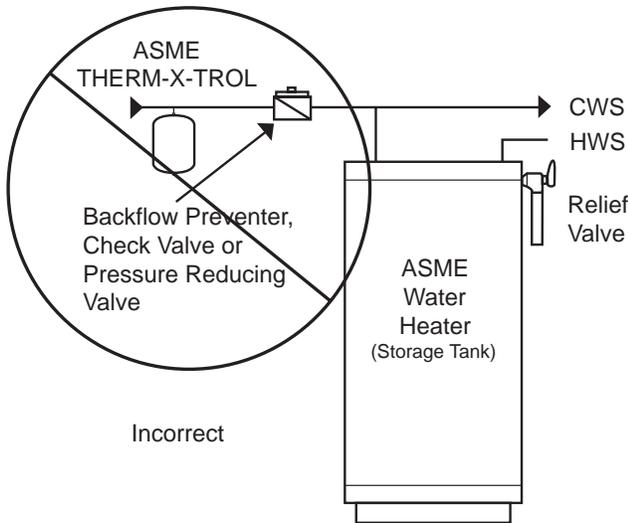
In-Line Installation



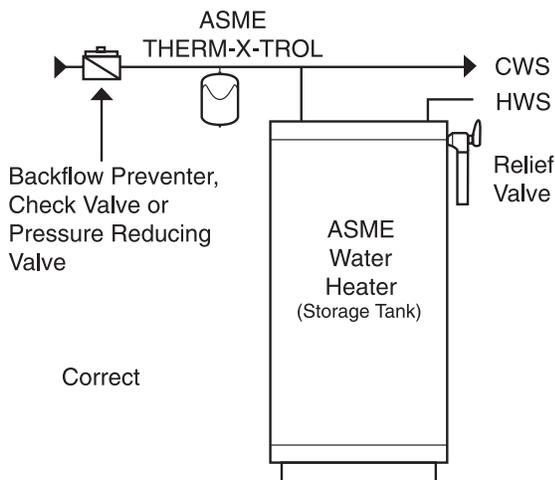
Floor Standing Installation

and water heater. The backflow preventer will not allow water to flow back to the supply. It is therefore necessary to install the Therm-X-Trol® on the cold water supply after the backflow preventer.

Now that we have established the proper side of the system for installation of the Therm-X-Trol®, let's look at the Therm-X-Trol's relation to the position of the water heater.



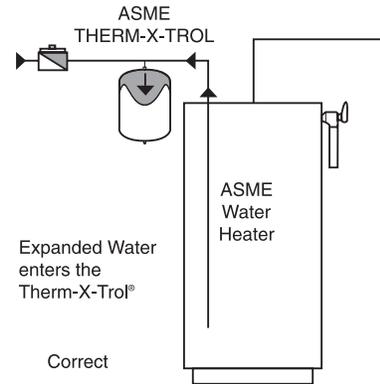
Incorrect



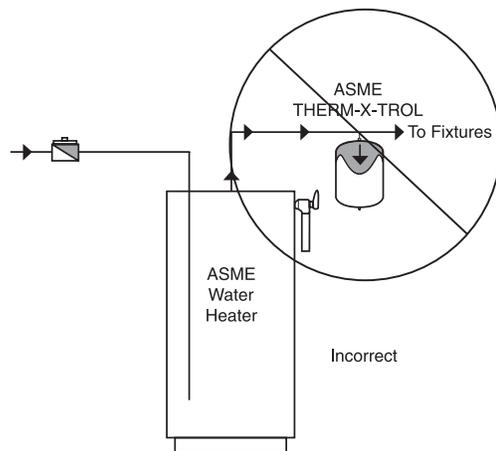
Correct

In the diagram below, the Therm-X-Trol® has been properly placed on the cold supply entering the water heater. As thermal expansion takes place, a small volume of water from the heater flows into the tank. Upon water use, the tank will release this absorbed water allowing it to flow into the heater.

Let's explore the effect of placing the Therm-X-Trol® on the hot



water outlet. As thermal expansion takes place, heated water flows from the water heater outlet into the expansion tank. As water sits in the tank, it begins to cool. As previously explained, water is expelled from the tank during a demand. Since this water has cooled, hot water will not be immediately available at the fixtures.



Incorrect

Mounting Position

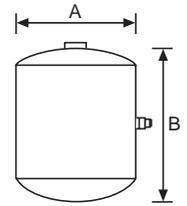
One benefit inherent in the Therm-X-Trol® is the ability to mount the tank in any position. Due to the use of a heavy butyl/EPDM diaphragm or butyl bladder, the Therm-X-Trol® can be mounted in an arrangement that best suits the installation space.

This Technical Bulletin is intended to provide general information for use in assessing the propriety of the Therm-X-Trol® for your residential hot water application. It is not an installation and/or operation manual. The detailed steps for proper installation and operation of the Therm-X-Trol® are published in the AMTROL Product Installation Manual for this product. Proper installation and operation of the Therm-X-Trol® requires, among other things, consideration of local building ordinances and plumbing codes, appropriate situation and configuration of the unit, and compliance with all pre-installation requirements and post-installation operation and maintenance procedures.

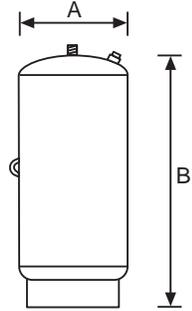
THERM-X-TROL® ASME Specifications



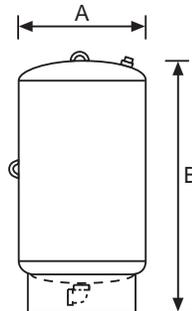
Model No.	Max. Working Pressure (PSIG)	Total Volume (Gals.)	Maximum Acceptance (Gals.)	Diameter (A)	Height (B)	System Connection	Ship Weight (lbs)
ST-5-C	150	2.1	.9	10"	10 3/8"	3/4" NPT	21
ST-12-C	150	6.4	3.2	12"	15 5/8"	3/4" NPT	26
ST-20V-C	150	8.0	3.2	12"	19 1/2"	3/4" NPT	41
ST-30V-C	150	14.0	10.5	16 1/4"	19 1/8"	3/4" NPT	84
ST-42V-C	150	17.5	11.3	16 1/4"	24 1/4"	3/4" NPT	90
ST-60V-C	150	25.0	11.3	16 1/4"	34"	3/4" NPT	96
ST-70V-C	150	34.0	11.3	16 1/4"	45 3/4"	3/4" NPT	123
ST-80V-C	150	53.0	34	24"	40 1/2"	1 1/4" NPT	229
ST-120V-C	150	66.0	34	24"	47 3/4"	1 1/4" NPT	258
ST-180V-C	150	77.0	34	24"	52 5/8"	1 1/4" NPT	288
ST-210V-C	150	90.0	34	24"	60"	1 1/4" NPT	318



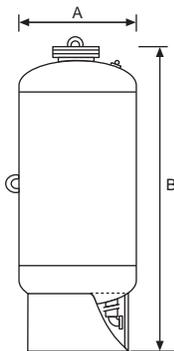
ST-5-C, ST-12-C



ST-20V-C to ST-70V-C



ST-80V-C to ST-210V-C



ST-447-C to ST-457-C

THERM-X-TROL® Replaceable Bladder Design ASME Tanks

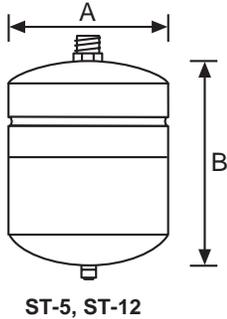
Model No.	Max. Working Pressure (PSIG)	Total Volume (Gals.)	Recommended Acceptance Volume	Diameter (A)	Height (B)	System Connection	Ship Weight (lbs)
ST-447-C	125/150	53.0	34.45	24"	45 1/4"	2" NPT	263
ST-448-C	125/150	80.0	52.00	24"	59 1/8"	2" NPT	308
ST-449-C	125/150	106.0	68.90	24"	73 1/8"	2" NPT	353
ST-450-C	125/150	132.0	85.80	24"	86 5/8"	2" NPT	391
ST-451-C	125/150	158.0	102.70	30"	73 1/4"	2" NPT	508
ST-452-C	125/150	211.0	137.15	30"	91"	2" NPT	760
ST-453-C	125/150	264.0	171.60	36"	85 5/8"	3" NPT	810
ST-454-C	125/150	317.0	206.05	36"	98"	3" NPT	914
ST-455-C	125/150	370.0	240.50	36"	110 3/8"	3" NPT	1,018
ST-456-C	125/150	422.0	274.30	48"	81 7/8"	3" NPT	1,655
ST-457-C	125/150	528.0	343.20	48"	97 1/4"	3" NPT	1,925

Maximum Allowable Working Temperature: ST-5-C through ST-210V-C: 200°F; ST-447-C through ST-457-C: 240°F
 Standard Factory Precharge: 55 PSIG. All Models listed by NSF 61 (excluding ST-447-C through ST-457-C).
 ST-447-C through ST-457-C are replaceable bladder design.

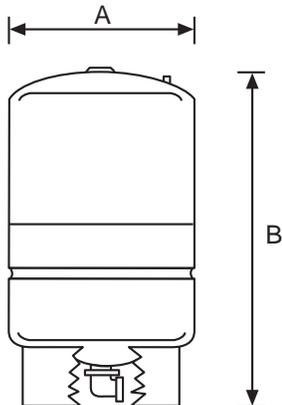
THERM-X-TROL® Non-ASME Specifications



Model No.	Total Volume (Gals.)	Maximum Acceptance (Gals.)	Diameter (A)	Height (B)	System Connection	Ship Weight (lbs)
ST-5	2.0	.9	8"	12 5/8"	3/4" NPT	5
ST-12	4.4	3.2	11"	15"	3/4" NPT	9
ST-25V	10.3	10.3	15 3/8"	19 1/4"	1" NPT	23
ST-30V	14.0	11.3	15 3/8"	23 7/8"	1" NPT	25
ST-42V	20.0	11.3	15 3/8"	31 5/8"	1" NPT	33
ST-60V	34.0	34	22"	29 5/8"	1 1/4" NPT	61
ST-80V	44.0	34	22"	36"	1 1/4" NPT	69
ST-180V	62.0	34	22"	46 3/4"	1 1/4" NPT	92
ST-210V	86.0	46	26"	47 1/4"	1 1/4" NPT	123



ST-5, ST-12



ST-25V through ST-210V

THERM-X-TROL® Replaceable Bladder Design

Model No.	Total Volume (Gals.)	Diameter (A)	Height (B)	System Connection	Ship Weight (lbs)
ST-451	158.0	73 1/4"	30"	2" NPT	508
ST-452	211.0	91"	30"	2" NPT	760
ST-453	264.0	85 5/8"	36"	3" NPT	810
ST-454	317.0	98"	36"	3" NPT	914
ST-455	370.0	110 3/8"	36"	3" NPT	1,018
ST-456	422.0	81 7/8"	48"	3" NPT	1,655
ST-457	528.0	97 1/4"	48"	3" NPT	1,925

Maximum Working Pressure: 150 PSI. All Models listed by NSF 61 (excluding ST-451 – ST-457);
 Maximum Allowable Working Temperature: ST-5 through ST-210V: 200°F; ST-451 through ST-457: 240°F;
 Standard Factory Precharge: 40 PSIG (ST-5 – ST-210V); 55 PSIG (ST-451 – ST-457)



1400 Division Road, West Warwick, RI 02893 ▲ T: 401.884.6300 ▲ F: 401.885.2567 ▲ www.amtrol.com

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Submittal Data Information

101-032

Model 009 Cartridge Circulator

Effective: February 10, 2009

Supersedes: September 1, 2003

Job: _____ Engineer: _____ Contractor: _____ Rep: _____

ITEM NO.	MODEL NO.	IMP. DIA.	G.P.M.	HEAD/FT.	H.P.	ELEC. CHAR.

Features

- Standard high capacity output-compact design
- Quiet, efficient operation
- Direct drive - Low power consumption
- Unique replaceable cartridge design - Field serviceable
- Self lubricating
- No mechanical seal
- Unmatched reliability - Maintenance free
- Universal flange to flange dimensions
- Cast Iron or Stainless Steel construction

Materials of Construction

Casing (Volute):	Cast Iron or Stainless Steel
Stator Housing:	Aluminum
Cartridge:	Stainless Steel
Impeller:	Non-Metallic
Shaft:	Ceramic
Bearings:	Carbon
O-Ring & Gaskets:	EPDM

Model Nomenclature

F – Cast Iron, Flanged
 SF – Stainless Steel, Flanged

Variations:

Z – Zoning Circulator
 J – Bronze cartridge with Cast Iron casing

Performance Data

Flow Range: 0 – 10 GPM
 Head Range: 0 – 35 Feet
 Minimum Fluid Temperature: 40°F (4°C)
 Maximum Fluid Temperature: 230°F (110°C)
 Maximum Working Pressure: 125 psi
 Connection Sizes: 3/4", 1", 1-1/4", 1-1/2" Flanged



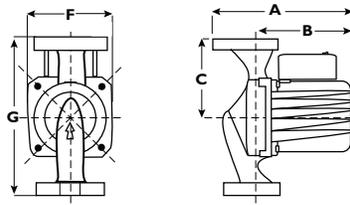
FOR INDOOR USE ONLY

Application

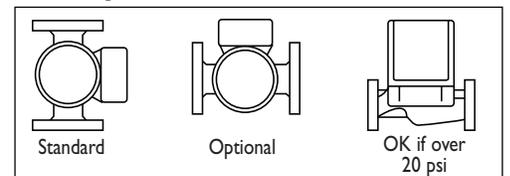
The Taco 009 is designed for a wide range of residential and light commercial higher-head/lower-flow water circulating applications. Typical uses include hydronic heating, radiant in-floor/panel heating and closed-loop solar heating systems. The Stainless Steel 009 can be used in higher-head/lower-flow heat recovery, open-loop solar heating and light commercial domestic water recirculation systems. The unique replaceable cartridge contains all of the moving parts and allows for easy service, instead of replacing the entire circulator. Compact, direct-drive, low power consumption design is ideal for high-efficiency jobs.

Pump Dimensions & Weights

Model	Casing	A		B		C		D		F		G		Ship Wt.	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
009-F5	Cast Iron	7	178	5-11/16	144	3-3/16	81	3-5/16	84	4-1/8	105	6-3/8	162	9.5	4.3
009-SF5	St. Steel	7	178	5-11/16	144	3-3/16	81	3-5/16	84	4-1/8	105	6-3/8	162	9.5	4.3



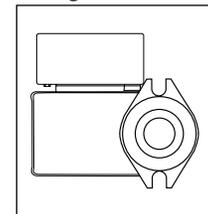
Mounting Positions



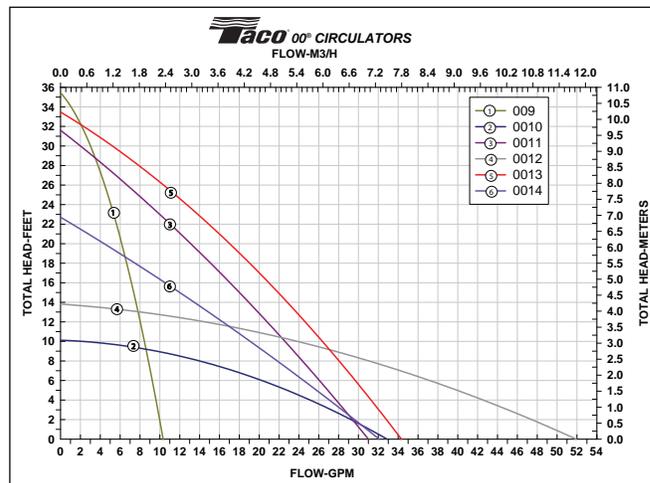
Electrical Data

Model	Volts	Hz	Ph	Amps	RPM	HP
009-F5	115	60	1	1.40	3250	1/8
009-SF5	115	60	1	1.40	3250	1/8
Motor Type	Permanent Split Capacitor Impedance Protected					
Motor Options	220/50/1, 220/60/1, 230/60/1, 100/110/50/60/1					

Flange Orientation



Performance Field - 60Hz



Do it Once. Do it Right.®

TACO INC., 1160 Cranston Street, Cranston, RI 02920 Telephone: (401) 942-8000 Fax: 942-2360
 TACO (Canada), Ltd., 6180 Ordan Drive, Mississauga, Ontario L5T 2B3 Telephone: (905) 564-9422 Fax: (905) 564-9436
 Visit our website at: www.taco-hvac.com

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ELKAY

SPECIFICATIONS

EZH2O[®] Bottle Filling Station

Versatile Bi-Level Filtered LZ Cooler

Models LZSTL8WS & LZSTLDDWS

PRODUCT SPECIFICATION

Unit shall include electric water cooler with bottle filling station. Model LZSTL8WS shall deliver 8 GPH of 50°F drinking water at 90°F ambient and 80°F inlet water. LZSTLDDWS shall deliver non-chilled drinking water. Cooler units shall have pushbar activation. Bottle filling unit shall include an electronic sensor for touchless activation with auto 20-second shut-off timer. Shall include Green Ticker™ displaying count of plastic bottles saved from waste. Bottle filler shall provide 1.1-1.5 gpm flow rate with laminar flow to minimize splashing. Shall include the WaterSentry® Plus 3000-gallon capacity filter, certified to NSF/ANSI 42 and 53, with visual monitor to indicate when replacement is necessary. Shall include integrated silver ion anti-microbial protection in key areas. Unit shall meet ADA guidelines. Unit shall be lead-free design which is certified to NSF/ANSI 61 & 372 and meets Federal and State low-lead requirements. Unit shall be certified to UL399 and CAN/CSA 22.2 No. 120.

STANDARD FEATURES

- Sanitary, touchless activation with auto 20-second shut-off (Bottle Filler)
- Easy-Touch front and side pushbar controls (Cooler)
- WaterSentry® Plus 3000-gallon capacity Filtration System, certified to NSF/ANSI 42 & 53 (Lead, Class 1 Particulate, Chlorine, Taste & Odor)
- Integrated Silver Ion Anti-microbial Protection in key areas
- Quick Fill Rate: 1.1 gpm (LZSTL8WS); 1.5 gpm (LZSTLDDWS)
- Laminar Flow provides minimal splash
- Real Drain System eliminates standing water
- Visual User Interface display includes:
 - Innovative Green Ticker™ counts bottles saved from waste
 - LED Visual Filter Monitor shows when replacement is necessary
- Available with Flexi-Guard® bubbler or optional Vandal-resistant[†] bubbler (*includes "VR" code in model no. see chart below)
- *Versatile cooler design allows units to be installed either left-hand high and right-hand low or left-low and right high
- Cooler panel finishes: Light Gray Granite Vinyl Clad Steel or Stainless Steel

COOLING SYSTEM (Models LZSTL8WS & LZSTL8WSVR only)

- Compressor: Hermetically-sealed, reciprocating type, single phase. Sealed-in lifetime lubrication.
- Condenser: Fan cooled, copper tube with aluminum fins. Fan motor is permanently lubricated.
- Cooling Unit: Combination tube-tank type. Self-cleansing. Continuous copper tubing with stainless steel tank. Fully insulated with EPS foam which meets UL requirements for self-extinguishing material.
- Refrigerant Control: Refrigerant R134a is controlled by accurately calibrated capillary tube.
- Temperature Control: Easily accessible enclosed adjustable thermostat is factory preset. Requires no adjustment other than for altitude requirements.

RATED FOR INDOOR USE ONLY



*Versatile cooler configuration as shipped

*Versatile cooler configuration alternate installation

CONSTRUCTION

- Stainless Steel basin with integral drain
- Galvanized structural steel cooler chassis provides structural integrity
- Stainless steel bottle filler wrapper with ABS plastic alcove
- Cooler cabinet available as Light Gray Granite Vinyl Clad Steel or Stainless Steel (additional cost) construction
- Flexi-Guard® Safety bubbler (option) utilizes an infused anti-microbial pliable polyester elastomer to prevent accidental mouth injuries. Flexes on impact.
- Vandal-resistant[†] bubbler (option) is one-piece heavy-duty

Replacement Filters: Available as Singles and Multi-packs.

Order part numbers:

- 51300C (single)
- 51300C_3PK (three)
- 51300C_12PK (twelve)
- 51300C_24PK (twenty-four)
- 51300C_48PK (forty-eight)

Warranty: 5 year limited warranty on the unit's refrigeration system. Electrical components and water system are warranted for 12 months from date of installation or 18 months from factory shipment, whichever date falls first.

CAPACITIES CHART						ETL CLASSIFIED  Intertek		 C USA	 www.GreenSpec.com	
Model	Voltage / Hertz	Chilling** Capacity	F.L. Amps	Rated Watts	Approx. Ship Wt.	UL399 and CAN/CSA 22.2 No. 120 Certified	ADA COMPLIANT	ANSI/NSF 61 and 372 Certified	ANSI/NSF 42 and 53 Certified (Filter only)	GreenSpec® Listed
LZSTL8WS(VR)*K	115V / 60Hz	8.0 GPH	5.0	370	92 lbs	•	•	•	•	•
LZSTL8WS(VR)*2K	220V / 50Hz	6.7 GPH	2.5	370	92 lbs	++	•	•	•	•
LZSTL8WS(VR)*3K	220V / 60Hz	8.0 GPH	2.5	370	92 lbs	++	•	•	•	•
LZSTLDDWS(VR)*K	115V/60 Hz	—	1.0	15	66 lbs	•	•	•	•	•
LZSTLDDWS(VR)*2K	220V/50Hz	—	0.5	15	66 lbs	++	•	•	•	•
LZSTLDDWS(VR)*3K	220V/60Hz	—	0.5	15	66 lbs	++	•	•	•	•

*Color code of (L) Light Gray Granite or (S) Stainless Steel cooler wrapper
 **Based on 80°F inlet water & 90°F ambient air temp for 50°F chilled drinking water.
 ++Complies; not third party certified

This specification describes an Elkay product with design, quality and functional benefits to the user. When making a comparison of other producer's offerings, be certain these features are not overlooked.

EZH2O® Bottle Filling Station
Versatile Bi-Level Filtered LZ Cooler
Models LZSTL8WS & LZSTLDDWS

ELKAY®
ROUGH-IN DIMENSIONS

RATED FOR INDOOR USE ONLY

IMPORTANT! INSTALLER PLEASE NOTE:

These units are designed and built to provide water to the user which has not been altered by materials in the cooler waterway. The grounding of electrical equipment such as telephone, computers, etc. to water lines is a common procedure. This grounding may be in the building but may also occur away from the building. This grounding can cause electrical feedback into a water cooler creating an electrolysis which results in a metallic taste or an increase in the metal content of the water. This condition is avoidable by installing the cooler using the proper materials as shown.

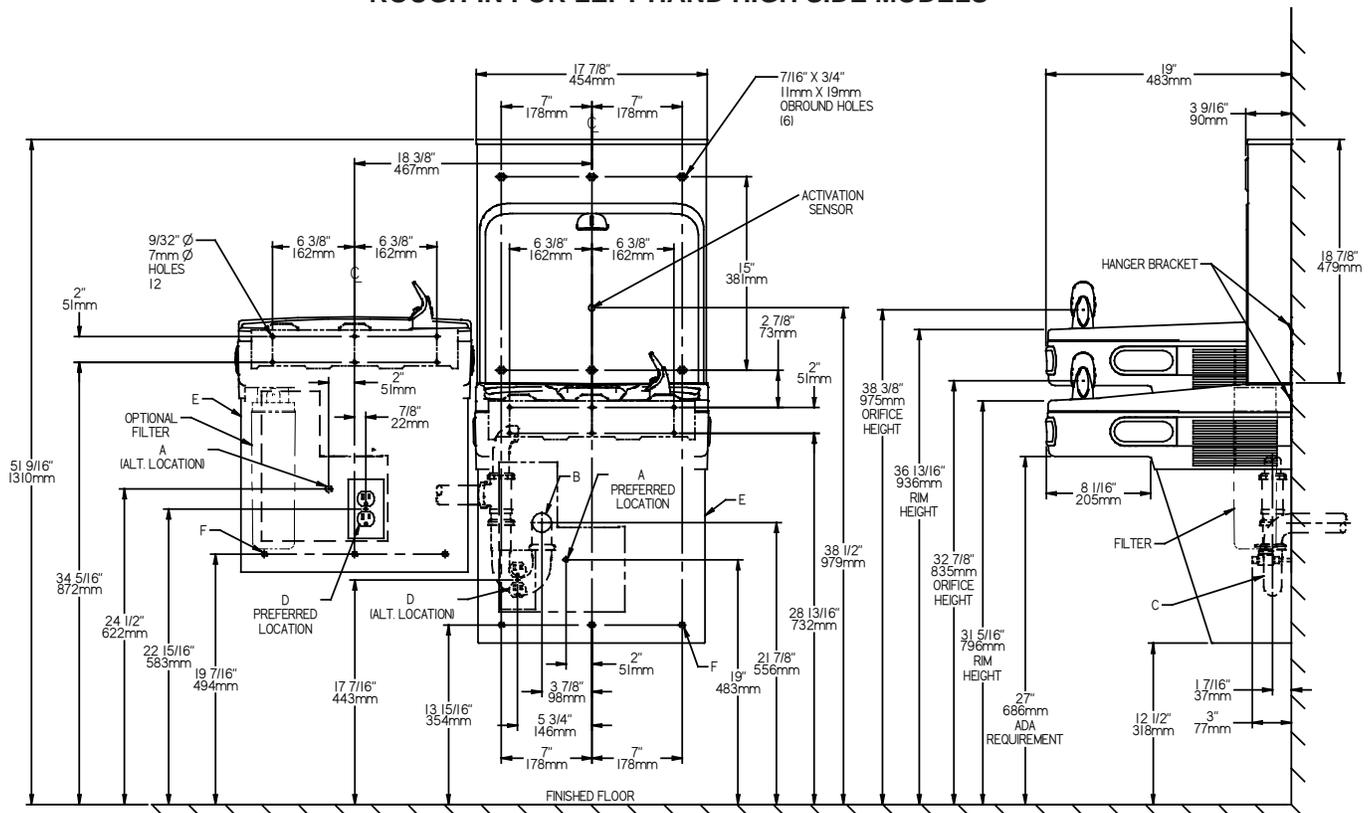
NOTICE

This water cooler must be connected to the water supply using a dielectric coupling. The cooler is furnished with a non-metallic strainer which meets this requirement. The drain trap which is provided by the installer should also be plastic to completely isolate the cooler from the building plumbing system.

Model shown with Flexi-Guard® bubbler.

Bottle Filler unit will mount on bracket attached to wall by 6 holes (as shown). Water and electrical will connect through pre-punched hole in basin.

ROUGH-IN FOR LEFT-HAND HIGH SIDE MODELS



REDUCE HEIGHT BY 3 INCHES FOR INSTALLATION OF CHILDRENS ADA COOLER

LEGEND:

- A = Recommended Water Supply location. Shut-off Valve (not furnished) to accept 3/8" O.D. unplated copper tube. Up to 3" (76mm) maximum out from wall.
- B = Recommended Waste Outlet location. To accommodate 1-1/2" nominal drain. Drain stub 2" (51mm) out from wall.
- C = 1-1/2" Trap (not furnished).
- D = Electrical Supply (3) Wire Recessed Box Duplex Outlet.
- E = Insure proper ventilation by maintaining 6" (152mm) minimum clearance from cabinet louvers to wall.
- F = 7/16" (11mm) Bolt Holes for fastening to wall.

NOTE: New Installations Must Use Ground Fault Circuit Interrupter (GFCI).

Job Name: _____	
Model: _____	Qty. _____
Contact: _____	
Approval Signature: _____	
Notes: _____	

EZH20® Bottle Filling Station
Versatile Bi-Level Filtered LZ Cooler
Models LZSTL8WS & LZSTLDDWS

ELKAY®
ROUGH-IN DIMENSIONS

RATED FOR INDOOR USE ONLY

IMPORTANT! INSTALLER PLEASE NOTE:

These units are designed and built to provide water to the user which has not been altered by materials in the cooler waterway. The grounding of electrical equipment such as telephone, computers, etc. to water lines is a common procedure. This grounding may be in the building but may also occur away from the building. This grounding can cause electrical feedback into a water cooler creating an electrolysis which results in a metallic taste or an increase in the metal content of the water. This condition is avoidable by installing the cooler using the proper materials as shown.

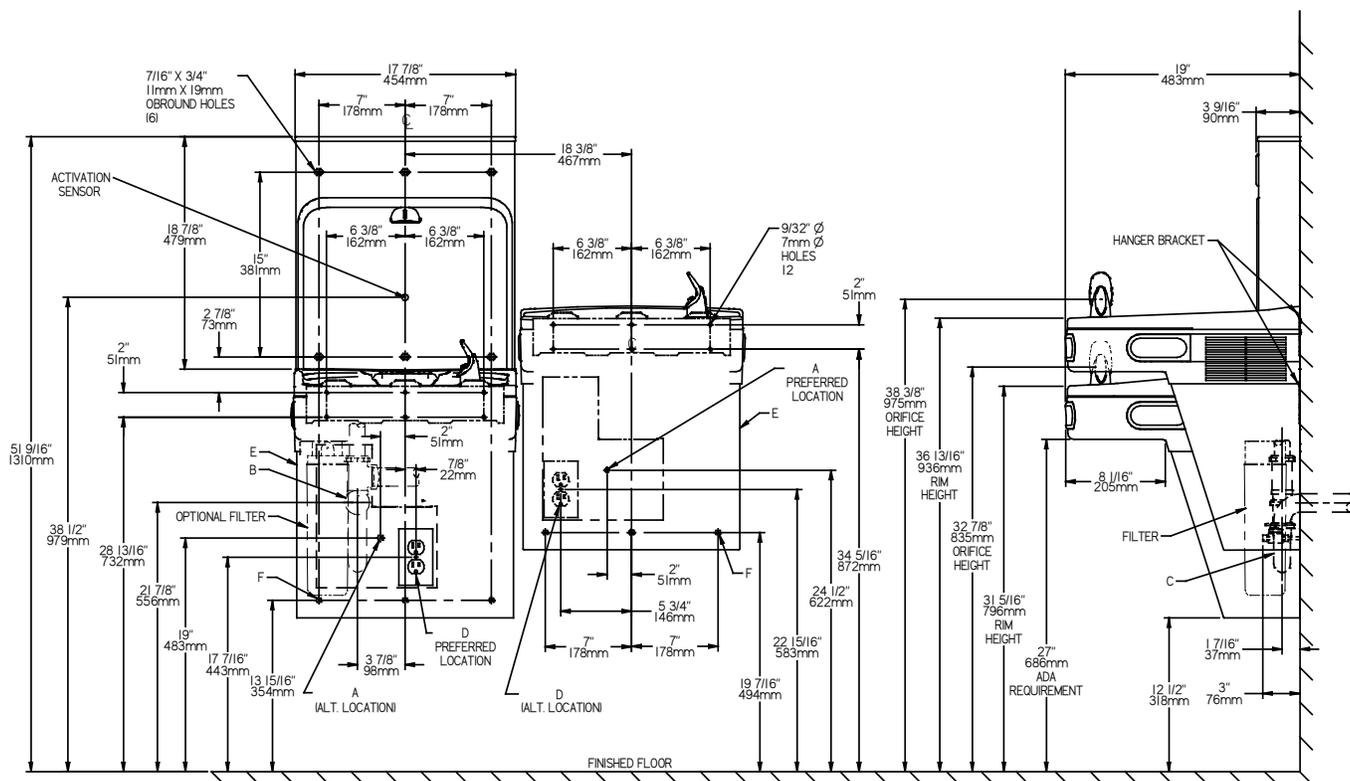
NOTICE

This water cooler must be connected to the water supply using a dielectric coupling. The cooler is furnished with a non-metallic strainer which meets this requirement. The drain trap which is provided by the installer should also be plastic to completely isolate the cooler from the building plumbing system.

Model shown with Flexi-Guard® bubbler.

Bottle Filler unit will mount on bracket attached to wall by 6 holes (as shown). Water and electrical will connect through pre-punched hole in basin.

ROUGH-IN FOR RIGHT-HAND HIGH SIDE MODELS



REDUCE HEIGHT BY 3 INCHES FOR INSTALLATION OF CHILDRENS ADA COOLER

LEGEND:

- A = Recommended Water Supply location. Shut-off Valve (not furnished) to accept 3/8" O.D. unplated copper tube. Up to 3" (76mm) maximum out from wall.
 - B = Recommended Waste Outlet location. To accommodate 1-1/2" nominal drain. Drain stub 2" (51mm) out from wall.
 - C = 1-1/2" Trap (not furnished).
 - D = Electrical Supply (3) Wire Recessed Box Duplex Outlet.
 - E = Insure proper ventilation by maintaining 6" (152mm) minimum clearance from cabinet louvers to wall.
 - F = 7/16" (11mm) Bolt Holes for fastening to wall.
- NOTE: New Installations Must Use Ground Fault Circuit Interrupter (GFCI).

Job Name: _____	
Model: _____	Qty. _____
Contact: _____	
Approval Signature: _____	
Notes: _____	

ELKAY® SPECIFICATIONS

EZH2O® Bottle Filling Station With Single Filtered Mechanically-Activated Water Cooler Models LMABF8WS and LMABFDWS

PRODUCT SPECIFICATION

RATED FOR INDOOR USE ONLY

Self-contained, wall hung refrigerated water cooler with bottle filling station. LMABF8WS shall deliver 8 GPH of 50°F drinking water at 90°F ambient and 80°F inlet water. LMABFDWS shall deliver non-chilled drinking water. Unit shall have mechanically-activated pushbar operation. Bottle filling unit shall include an electronic sensor for touchless activation with auto 20-second shut-off timer. Shall include Green Ticker™ displaying count of plastic bottles saved from waste. Bottle filler shall provide 1.1-1.5 gpm flow rate with laminar flow to minimize splashing. Shall include the WaterSentry® Plus 3000-gallon capacity filter, certified to NSF/ANSI 42 and 53, with visual monitor to indicate when replacement is necessary. Shall include integrated silver ion anti-microbial protection in key areas. Unit shall meet ADA guidelines. Unit shall be lead-free design which is certified to NSF/ANSI 61 and 372 and meets Federal and State low-lead requirements. Unit shall be certified to UL399 and CAN/CSA 22.2 No. 120.

STANDARD FEATURES

- Sanitary, touchless activation with auto 20-second shut-off (Bottle Filler)
- Self-closing, mechanically-activated front and side pushbar controls (Cooler)
- Designed for installations where activation of cooler is needed even during power disruptions
- WaterSentry® Plus 3000-gallon capacity Filtration System, certified to NSF/ANSI 42 & 53 (Lead, Class 1 Particulate, Chlorine, Taste & Odor)
- Integrated Silver Ion Anti-microbial Protection in key areas
- Quick Fill Rate: 1.1 gpm (LMABF8WS); 1.5 gpm (LMABFDWS)
- Laminar Flow provides minimal splash
- Real Drain System eliminates standing water
- Visual User Interface display includes:
 - Innovative Green Ticker™ counts bottles saved from waste
 - LED Visual Filter Monitor shows when replacement is necessary
- Available with Flexi-Guard® Safety Bubbler
- Cooler panel finishes: Light Gray Granite Vinyl Clad Steel or Stainless Steel

COOLING SYSTEM (Model LMABF8WS only)

- Compressor: hermetically-sealed, reciprocating type, single phase. Sealed-in lifetime lubrication.
- Condenser: Fan cooled, copper tube with aluminum fins. Fan motor is permanently lubricated.
- Cooling Unit: Combination tube-tank type. Self-cleansing. Continuous copper tubing with stainless steel tank. Fully insulated with EPS foam which meets UL requirements for self-extinguishing material.
- Refrigerant Control: Refrigerant R134a is controlled by accurately calibrated capillary tube.
- Temperature Control: Easily accessible enclosed adjustable thermostat is factory preset. Requires no adjustment other than for altitude requirements.

CAPACITIES CHART

Model	Voltage / Hertz	Chilling** Capacity	F.L. Amps	Rated Watts	Approx. Ship Weight.
LMABF8WS*	115V / 60Hz	8 GPH	4.0	370	75
LMABFDWS*	-	-	1.0	15	40

*Color code of (L) Light Gray Granite or (S) Stainless Steel cooler panels

**Based on 80°F inlet water & 90°F ambient air temp for 50°F chilled drinking water.

Warranty: 5 year limited warranty on the unit's refrigeration system. Electrical components and water system are warranted for 12 months from date of installation or 18 months from factory shipment, whichever date falls first.

In keeping with our policy of continuing product improvement, Elkay reserves the right to change specification without notice. Please visit elkaypro.com for the most current version.

2222 Camden Court
OakBrook, IL 60523
630-572-3192
elkay.com

Model LMABF8WSLK or LMABFDWSLKWSLK



CONSTRUCTION

- Stainless Steel basin with integral drain and embossed bubbler pad
- Galvanized structural steel cooler chassis provides structural integrity
- Cooler cabinet available as Light Gray Granite Vinyl Clad Steel or Stainless Steel (additional cost) construction
- Flexi-Guard® Safety Bubbler utilizes an infused anti-microbial pliable polyester elastomer to prevent accidental mouth injuries. Flexes on impact.

Replacement Filters: Available as Singles and Multi-packs. Order part numbers:

- 51300C (single)
- 51300C_3PK (three)
- 51300C_12PK (twelve)
- 51300C_24PK (twenty-four)
- 51300C_48PK (forty-eight)

CERTIFICATIONS / STANDARDS

- ADA Compliant
- UL399 and CAN/CSA 22.2 No. 120 Certified
- ANSI/NSF 61 and 372 Certified
- ANSI/NSF 42 and 53 Certified (Filter only)
- GreenSpec® Listed



This specification describes an Elkay product with design, quality and functional benefits to the user. When making a comparison of other producer's offerings, be certain these features are not overlooked.

EZH2O® Bottle Filling Station

With Single Filtered Mechanically-Activated Water Cooler

Models LMABF8WS and LMABFDWS

ELKAY®

ROUGH-IN DIMENSIONS

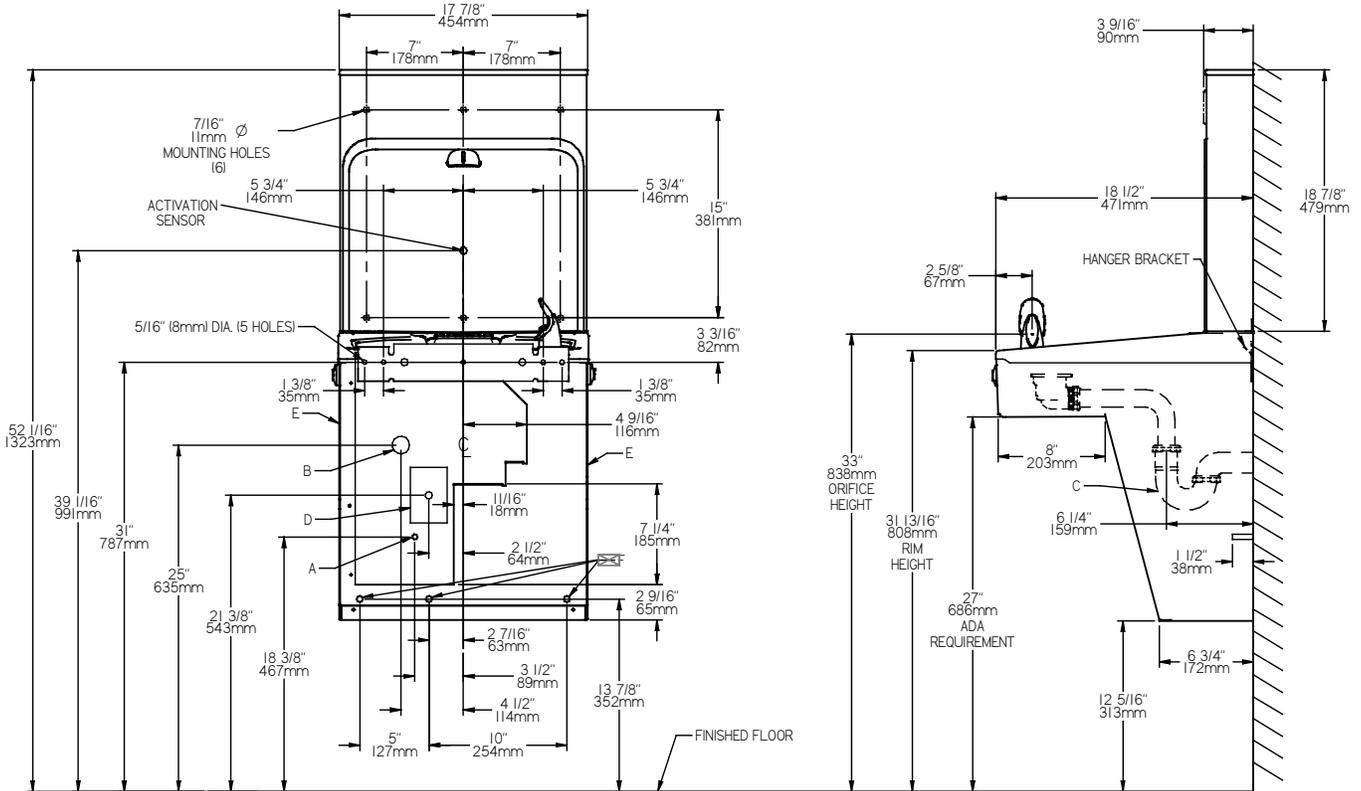
IMPORTANT! INSTALLER PLEASE NOTE

This water cooler has been designed and built to provide water to the user which has not been altered by materials in the cooler waterways. The grounding of electrical equipment such as telephone, computers, etc., to water lines is a common procedure. This grounding may be in the building but may also occur away from the building. This grounding can cause electrical feedback into a water cooler creating an electrolysis which creates a metallic taste or causes an increase in the metal content of the water. This condition is avoidable by installing the cooler using the proper materials as shown below.

NOTICE

This water cooler must be connected to the water supply using a dielectric coupling. The cooler is furnished with a non-metallic strainer which meets this requirement. The drain trap which is provided by the installer should also be plastic to completely isolate the cooler from the building plumbing system.

Bottle Filler unit will mount on bracket attached to wall by 6 holes (as shown). Water and electrical will connect through pre-punched hole in basin.



REDUCE HEIGHT BY 3 INCHES FOR INSTALLATION OF CHILDRENS ADA COOLER

LEGEND:

- A = Recommended Water Supply location. Shut-off Valve (not furnished) to accept 3/8" O.D. unplated copper tube. Up to 3" (76mm) maximum out from wall.
- B = Recommended Waste Outlet location. To accommodate 1-1/4" nominal drain. Drain stub 2" (51mm) out from wall.
- C = 1-1/4" Trap (not furnished).
- D = Electrical Supply (3) Wire Recessed Box Duplex Outlet.
- E = Insure proper ventilation by maintaining 6" (152mm) minimum clearance from cabinet louvers to wall.
- F = 7/16" (11mm) Bolt Holes for fastening to wall.

**New Installations Must Use Ground Fault Circuit Interrupter (GFCI).

Job Name: _____
Model: _____ Qty. _____
Contact: _____
Approval Signature: _____
Notes: _____

RONDALYN™ COUNTERTOP SINK

- Made from vitreous china
- Self-rimming with cutout template supplied
- Front overflow
- Faucet ledge
Shown with 4801.862 Amarilis/Heritage faucet with Triune cross handles (not included)

- 0490.011** Faucet holes on 8" (203mm) centers (illustrated)
- 0491.019** Faucet holes on 4" (102mm) centers
- 0491.027** Faucet holes on 4" (102mm) centers
 - Extra right-hand hole
- 0491.035** Faucet holes on 4" (102mm) centers
 - Extra left-hand hole
- 0490.156** Center hole only

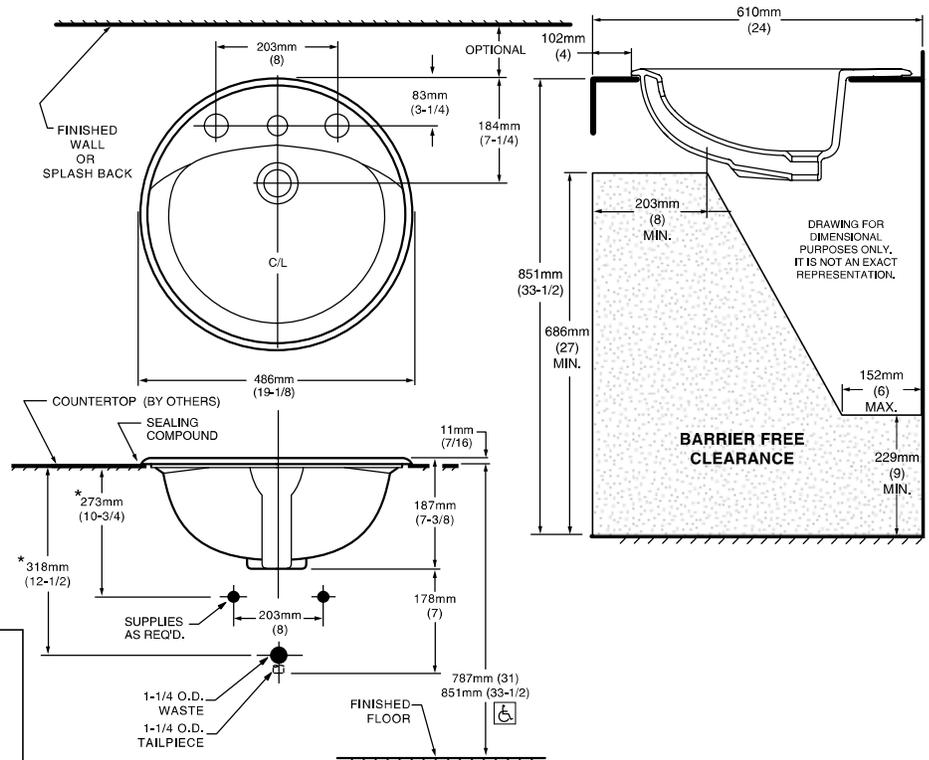


Nominal Dimensions:
486mm (19-1/8") Round

Bowl sizes:
381mm (15") wide
308mm (12-1/8") front to back
146mm (5-3/4") deep

Compliance Certifications - Meets or Exceeds the Following Specifications:

- ASME A112.19.2M for Vitreous China Fixtures



To Be Specified:

- Color: White Bone Linen Silver Fawn Beige Black
- Faucet*:
- Faucet Finish:
- Supplies:
- 1-1/4" Trap:

* See faucet section for additional models available

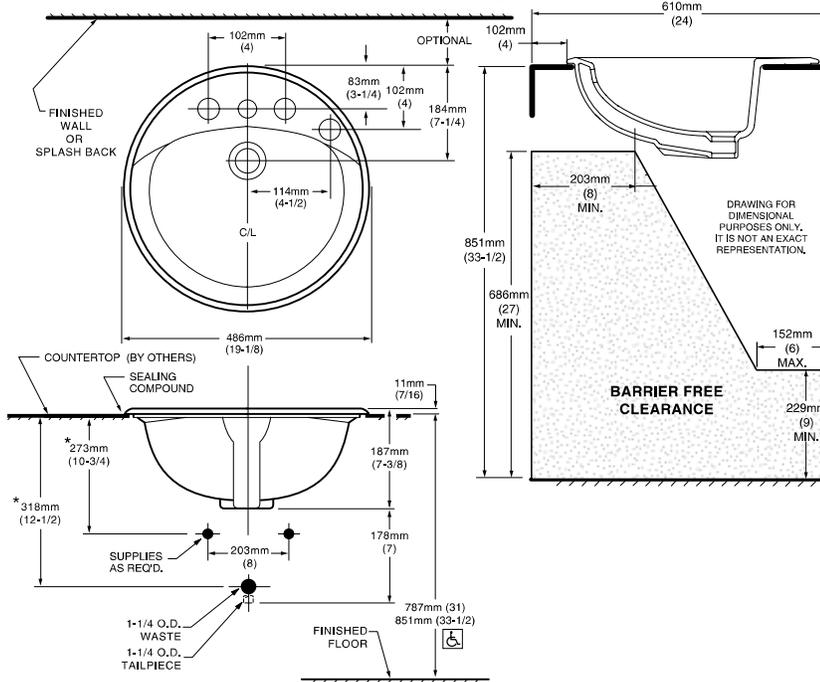
MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.
Install lavatory 864mm (34") from finished floor.
Lavatory installed 51mm (2") minimum from front edge of countertop provides 686mm (27") knee clearance area.

SEE REVERSE FOR ADDITIONAL ROUGHING-IN DIMENSIONS

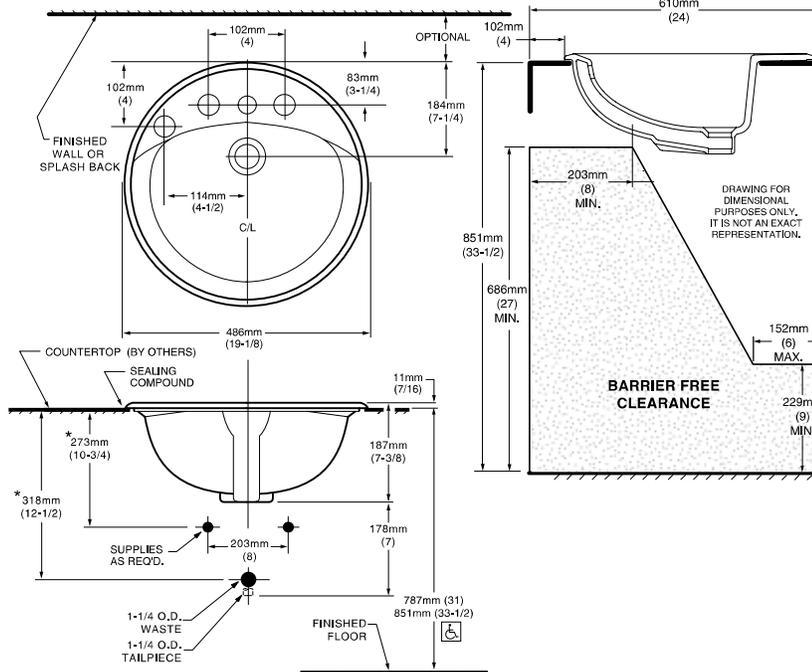
NOTES:
* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
FOR COUNTERTOP CUTOUT AND INSTALLATION INSTRUCTIONS USE TEMPLATE SUPPLIED WITH SINK.
FITTINGS NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.
SEALING COMPOUND SUPPLIED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

0491.027 4" Ctrs Extra Right Hand Hole



0491.035 4" Ctrs Extra Left Hand Hole



NOTES:
* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
FOR COUNTERTOP CUTOUT AND INSTALLATION INSTRUCTIONS USE TEMPLATE SUPPLIED WITH SINK.
FITTINGS NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.
SEALING COMPOUND SUPPLIED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.

Install lavatory 864mm (34") from finished floor.
Lavatory installed 51mm (2") minimum from front edge of countertop provides 686mm (27") knee clearance area.

FAUCET DESCRIPTION

- Brass construction with chrome plated finish
- 4" centerset
- 1/2" IPS connections
- Vandal resistant torx head screws
- Vandal resistant aerator
- 8216 includes metal pop up drain

OPERATION

- Lever style handles with hot and cold color indicators

FLOW

- Aerator is limited to 2.2 gpm max. (8.3 L/min)
- Aerator is limited to 0.5 gpm max. (1.9 L/min) for model # 8211

CARTRIDGE

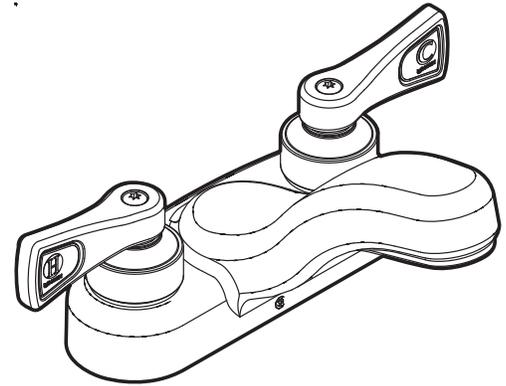
- Brass shell, ceramic disc cartridge
- 1/4 turn operation

STANDARDS

- Third party certified to meet ASME A112.18.1/CSA B-125.1 and all applicable specifications referenced therein
- Certified to NSF 61/9
- Complies with California Proposition 65 and with the Federal Safe Drinking Water Act
- **ADA**  for lever handles

WARRANTY

- Warranted for five years against material or manufacturing defects



Two-Handle Lavatory Faucet

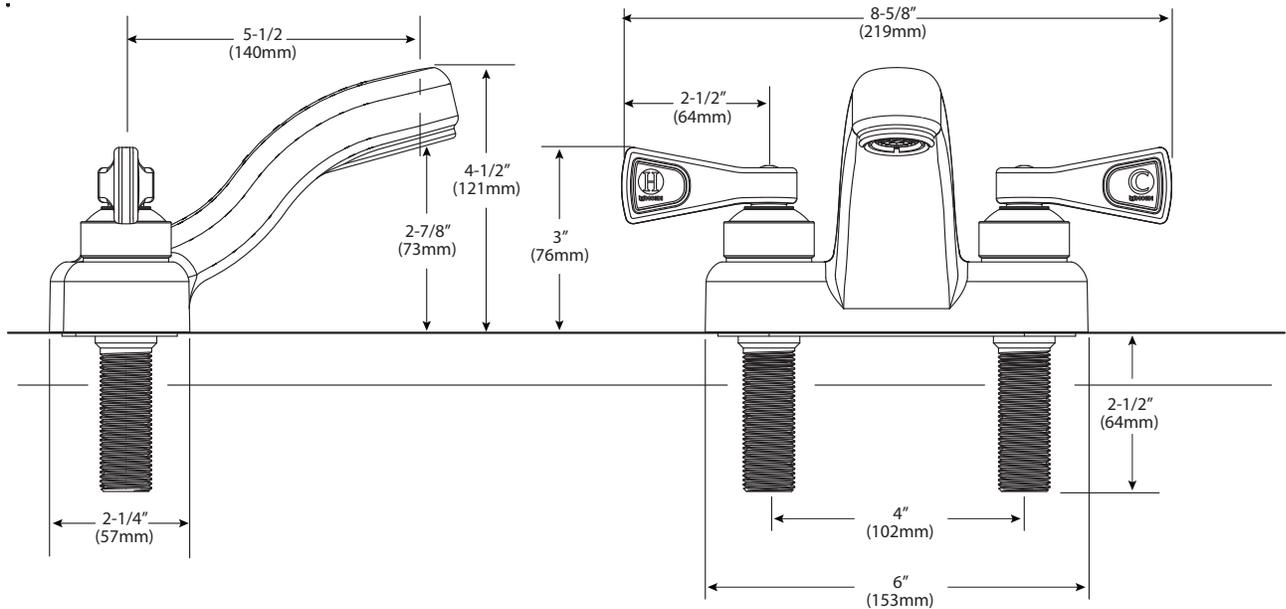
Models: 8210, 8211, 8216[†], 8218*

[†] 8216 includes metal pop up drain

* 8218 uses 14750 grid strainer



NOTE: Designed to be installed through 2 holes - 1" (25mm) min. dia.



CRITICAL DIMENSIONS

(DO NOT SCALE)

LUCERNE™ WALL-HUNG LAVATORY

- Wall-hung sink
- Vitreous china
- Front overflow
- D-shaped bowl
- Self-draining deck area with contoured back and side splash shields
- Faucet ledge
- Compliant with Texas accessibility standard (TAS) for children age group 13 and up

Faucet holes on 203mm (8") centers (Illus.):

- 0356.028** For exposed bracket support
Shown with 4801.862 Amarilis Heritage faucet with Triune Cross handles (not included)
- 0356.015** For wall hanger (included) or concealed arms support
- 0356.915** For wall hanger (included) or concealed arms support
 - Less overflow

Faucet holes on 102mm (4") centers:

- 0355.027** For exposed bracket support
- 0355.012** For wall hanger (included) or concealed arms support
- 0355.912** For wall hanger (included) or concealed arms support
 - Less overflow

Single center faucet hole (Illus.):

- 0356.041** For exposed bracket support
Shown with 1340.000 metering faucet (not included)
- 0356.421** For wall hanger (included) or concealed arms support
- 0356.921** For wall hanger (included) or concealed arms support
 - Less overflow
- 0356.439** For wall hanger (included) or concealed arms support
 - Single faucet hole on right
- 0356.066** For exposed bracket support
 - Single faucet hole on right

Nominal Dimensions:

521 x 464mm
(20-1/2" x 18-1/4")

Bowl sizes:

381mm (15") wide
254mm (10") front to back
165mm (6-1/2") deep

Compliance Certifications -

Meets or Exceeds the Following Specifications:

- ASME A112.19.2 / CSA B45.1 for Vitreous China Fixtures



0356.028



0356.041

SEE FOLLOWING PAGES FOR ROUGHING-IN DIMENSIONS

To Be Specified:

- Color: White
- Faucet*:
- Faucet Finish:
- Supplies:
- 1-1/4" Trap:
- Nipple:
- Bracket Support (by others):
- Concealed Arms Support (by others):

* See faucet section for additional models available



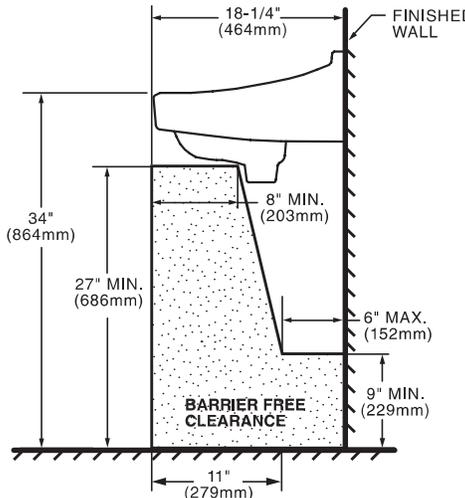
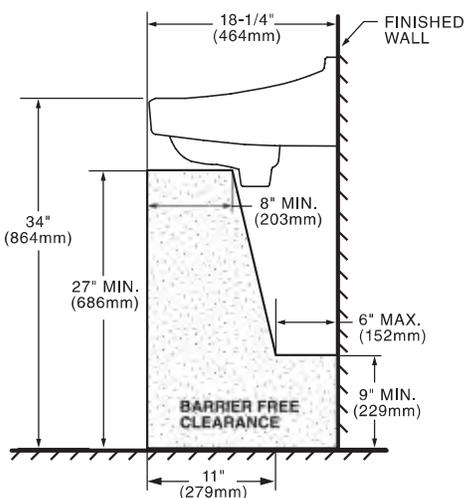
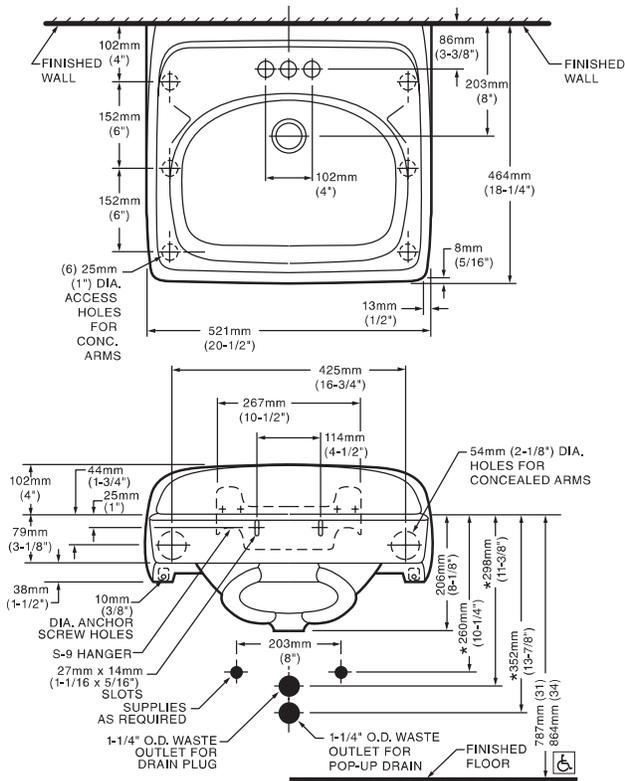
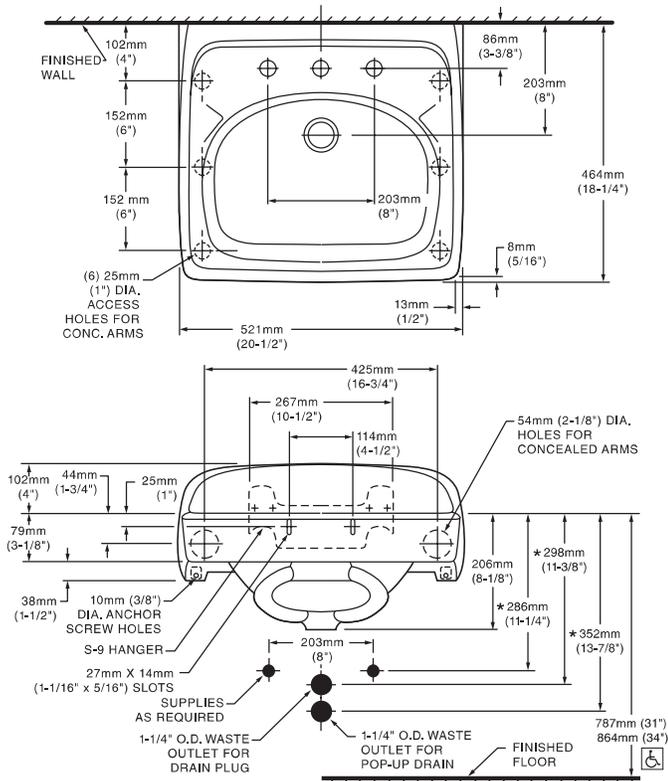
MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.

Top of front rim mounted 864mm (34") from finished floor.

BARRIER FREE

- 0356.028** 8" CTRS FOR EXPOSED BRACKET SUPPORT
- 0356.015** 8" CTRS FOR WALL HANGER OR CONCEALED ARMS
- 0356.915** LESS OVERFLOW

- 0355.021** 4" CTRS FOR EXPOSED BRACKET SUPPORT
- 0355.012** 4" CTRS FOR WALL HANGER OR CONCEALED ARMS
- 0355.912** LESS OVERFLOW



NOTES:
* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS.
FITTINGS NOT INCLUDED AND MUST BE ORDERED SEPARATELY.
CONCEALED ARM SUPPORT AS REQUIRED TO BE FURNISHED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

LAVATORY DESIGNED TO MEET ADA HANDICAPPED GUIDELINES WITH MOUNTING HEIGHT SET AT 864MM (34") ABOVE FINISHED FLOOR.

BARRIER FREE

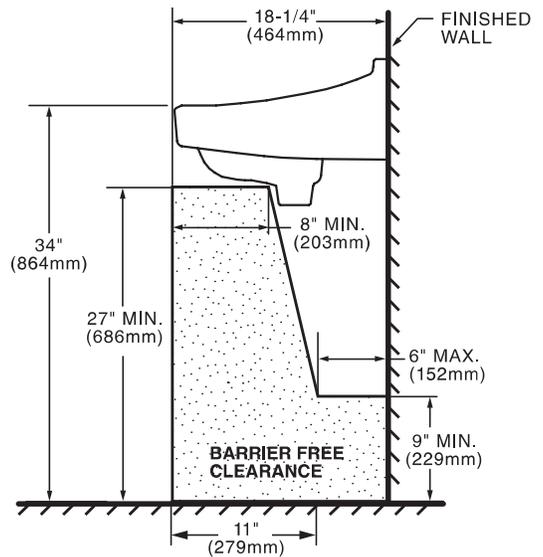
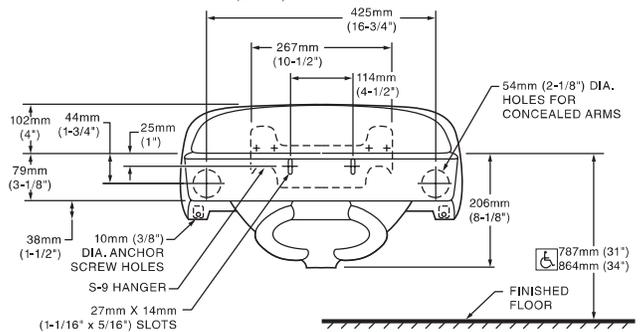
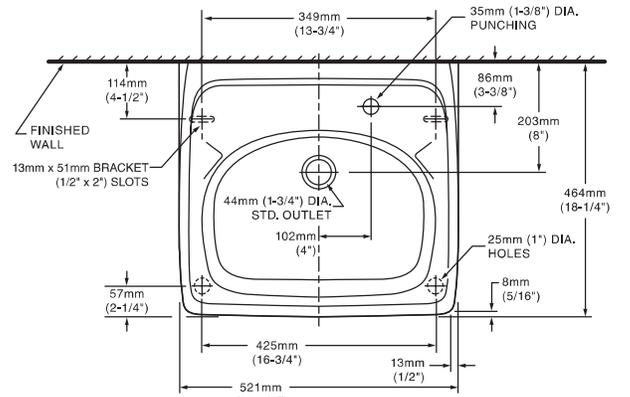
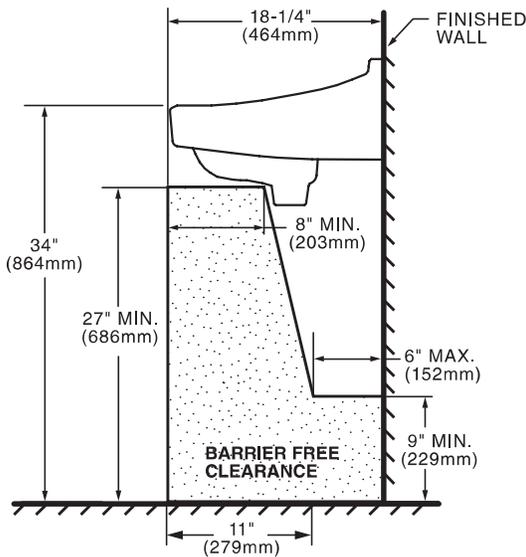
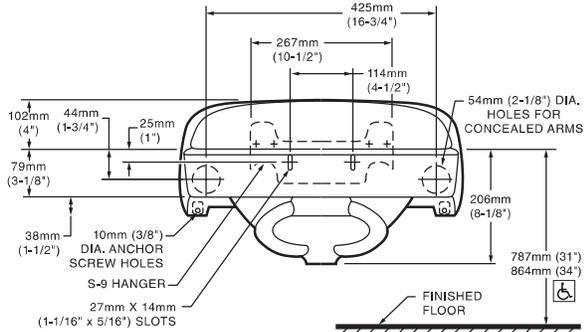
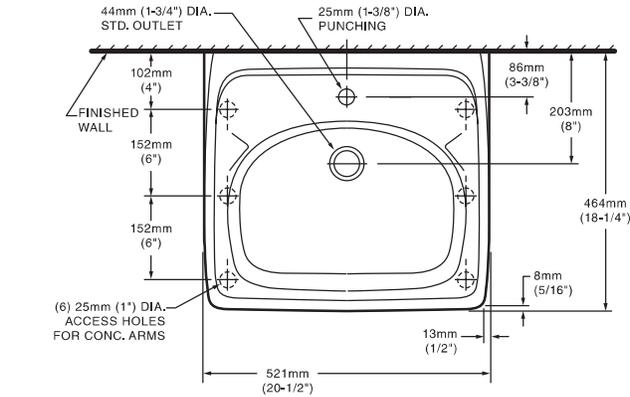
0356.041 SINGLE CENTER HOLE FOR EXPOSED BRACKET SUPPORT

0356.421 SINGLE CENTER HOLE FOR WALL HANGER OR CONCEALED ARMS

0356.921 LESS OVERFLOW

0356.439 SINGLE CENTER HOLE ON RIGHT FOR WALL HANGER OR CONCEALED ARMS

0356.066 SINGLE CENTER HOLE ON RIGHT FOR EXPOSED BRACKET SUPPORT



NOTES:
* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS.
FITTINGS NOT INCLUDED AND MUST BE ORDERED SEPARATELY.
CONCEALED ARM SUPPORT AS REQUIRED TO BE FURNISHED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

LAVATORY DESIGNED TO MEET ADA HANDICAPPED GUIDELINES WITH MOUNTING HEIGHT SET AT 864MM (34") ABOVE FINISHED FLOOR.

FAUCET DESCRIPTION

- Brass construction with chrome plated finish
- 4" centerset
- 1/2" IPS connections
- Vandal resistant torx head screws
- Vandal resistant aerator
- 8216 includes metal pop up drain

OPERATION

- Lever style handles with hot and cold color indicators

FLOW

- Aerator is limited to 2.2 gpm max. (8.3 L/min)
- Aerator is limited to 0.5 gpm max. (1.9 L/min) for model # 8211

CARTRIDGE

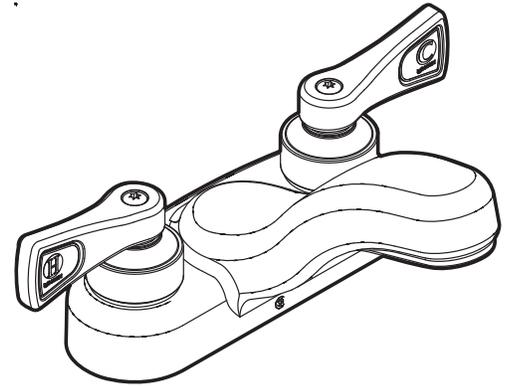
- Brass shell, ceramic disc cartridge
- 1/4 turn operation

STANDARDS

- Third party certified to meet ASME A112.18.1/CSA B-125.1 and all applicable specifications referenced therein
- Certified to NSF 61/9
- Complies with California Proposition 65 and with the Federal Safe Drinking Water Act
- **ADA**  for lever handles

WARRANTY

- Warranted for five years against material or manufacturing defects



Two-Handle Lavatory Faucet

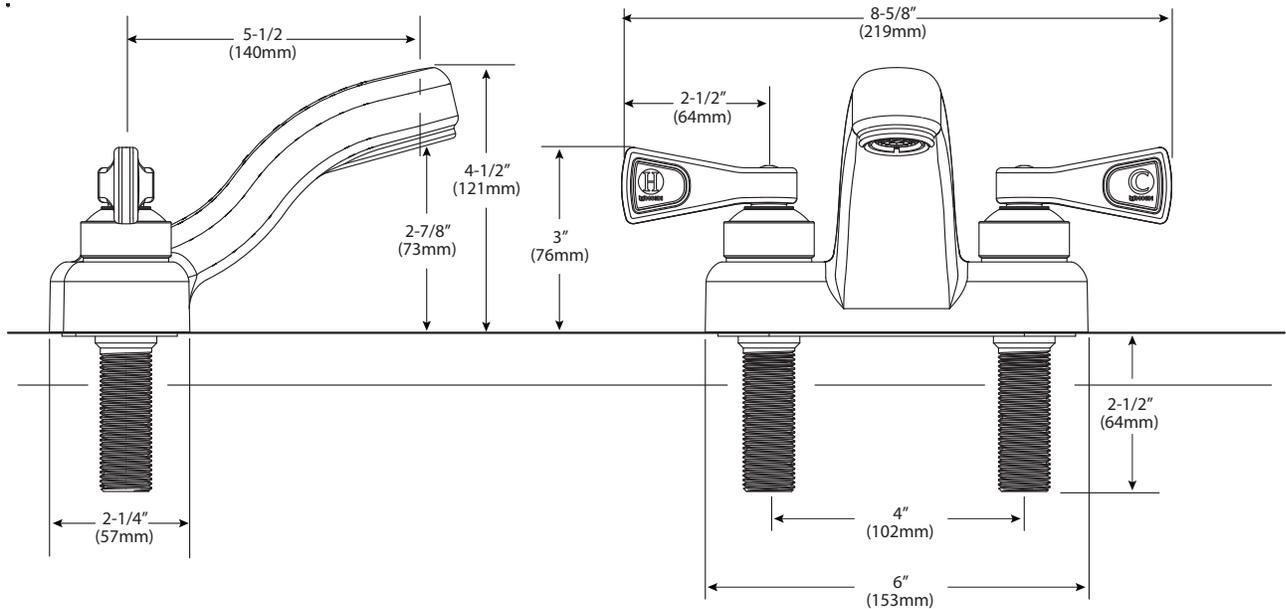
Models: 8210, 8211, 8216[†], 8218*

[†] 8216 includes metal pop up drain

* 8218 uses 14750 grid strainer



NOTE: Designed to be installed through 2 holes - 1" (25mm) min. dia.



CRITICAL DIMENSIONS

(DO NOT SCALE)

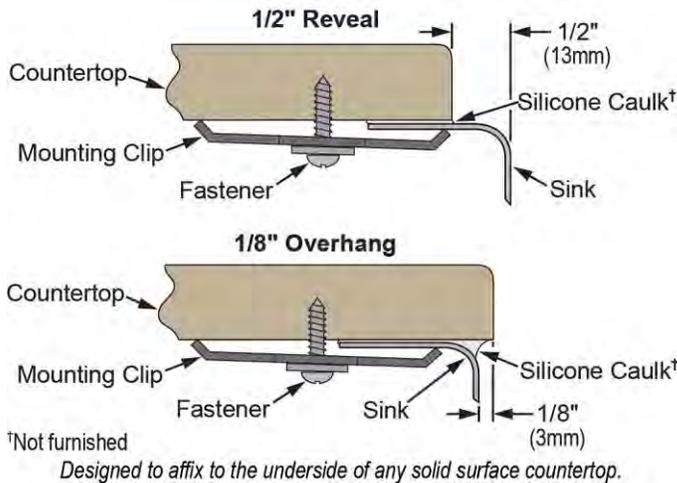
PRODUCT SPECIFICATIONS

Gourmet Stainless Steel Single Bowl Undermount Sink. Overall dimensions are 30-1/2" x 18-1/4" x 8". Sink is manufactured from 18 gauge 304 Stainless Steel with a Soft Highlighted Satin finish, Rear Right drain placement and SoundGuard®.

Installation Type:	Undermount
Material:	304 Stainless Steel
Finish:	Soft Highlighted Satin
Gauge:	18
Sound Deadening:	SoundGuard®
Number of Bowls:	1
Sink Dimensions:	30-1/2" x 18-1/4" x 8"
Bowl 1 Dimensions:	28" x 15-3/4" x 8"
Drain Size:	3-1/2" (89mm)
Drain Location:	Rear Right
Minimum Cabinet Size:	36"
Mounting Hardware:	Part # 54300308 included
Template Included:	Yes
Cutout Template #:	1000001382

Template is available for download at [elkay.com](#)

Installation Profile:



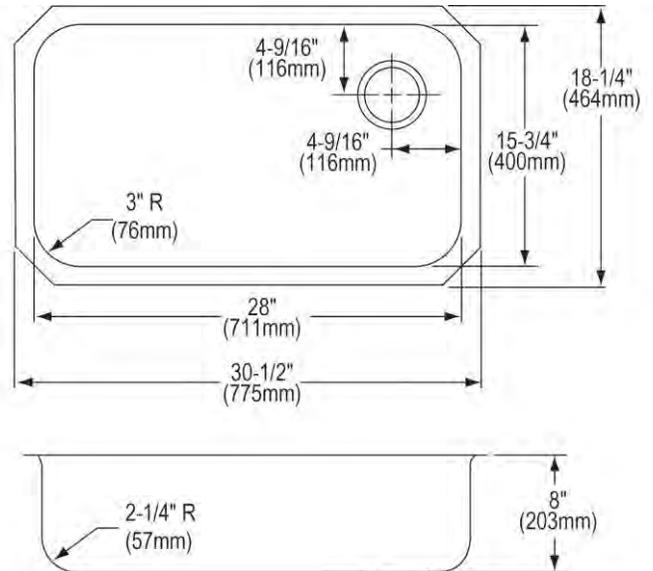
AMERICAN PRIDE. A LIFETIME TRADITION.
Like your family, the Elkay family has values and traditions that endure. For almost a century, Elkay has been a family-owned and operated company, providing thousands of jobs that support our families and communities.



Sinks are listed by IAPMO® as meeting the applicable requirements of the Uniform Plumbing Code®, International Plumbing Code®, and National Plumbing Code of Canada.

Product Compliance: ASME A112.19.3/CSA B45.4
[Clean and Care Manual \(PDF\)](#)
[Installation Instructions \(PDF\)](#)
[Limited Lifetime Warranty \(PDF\)](#)

Similar models are available with: extra deep bowls, included accessories (kit)



PART: _____ QTY: _____
 PROJECT: _____
 CONTACT: _____
 DATE: _____
 NOTES: _____
 APPROVAL: _____

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit [elkay.com](#) for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

OPTIONAL ACCESSORIES

Bottom Grid:	LKWOBG2815RSS
Cutting Board:	CB1516
Drain:	LK99
Faucet:	LKGT1041, LKGT2041
Rinsing Basket:	LKWERBSS
Sinkmate:	LKSM17, LKSMHOOK, LKSMSPONGE, LKSMHSL
Soap Dispenser:	LKGT1054

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.



Buy it for looks. Buy it for life.®

Specifications

FAUCET DESCRIPTION

- Metal construction with various finishes identified by suffix
- High arc spout provides the height and reach to fill or clean large pots
- Single hole mounting
- Flexible supply lines with 3/8" compression fittings
- 360° rotating spout

OPERATION

- Single handle lever
- Temperature controlled by 100° arc of handle travel

FLOW

- Spout flow is limited to 1.5 gpm max (5.7L/min) at 60 psi

CARTRIDGE

- 1255™ Duralast™ cartridge for Single-Handle Faucets

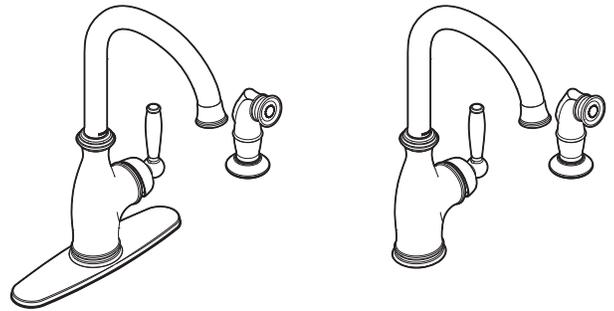
STANDARDS

- Third party certified to IAPMO Green, ASME A112.18.1/CSA B125.1 and all applicable requirements referenced therein including NSF 61/9
- Meets Calgreen and Georgia SB370 requirements
- Contains no more than 0.25% weighted average lead content
- Complies with California Proposition 65 and with the Federal Safe Drinking Water Act

- **ADA**  for lever handle

WARRANTY

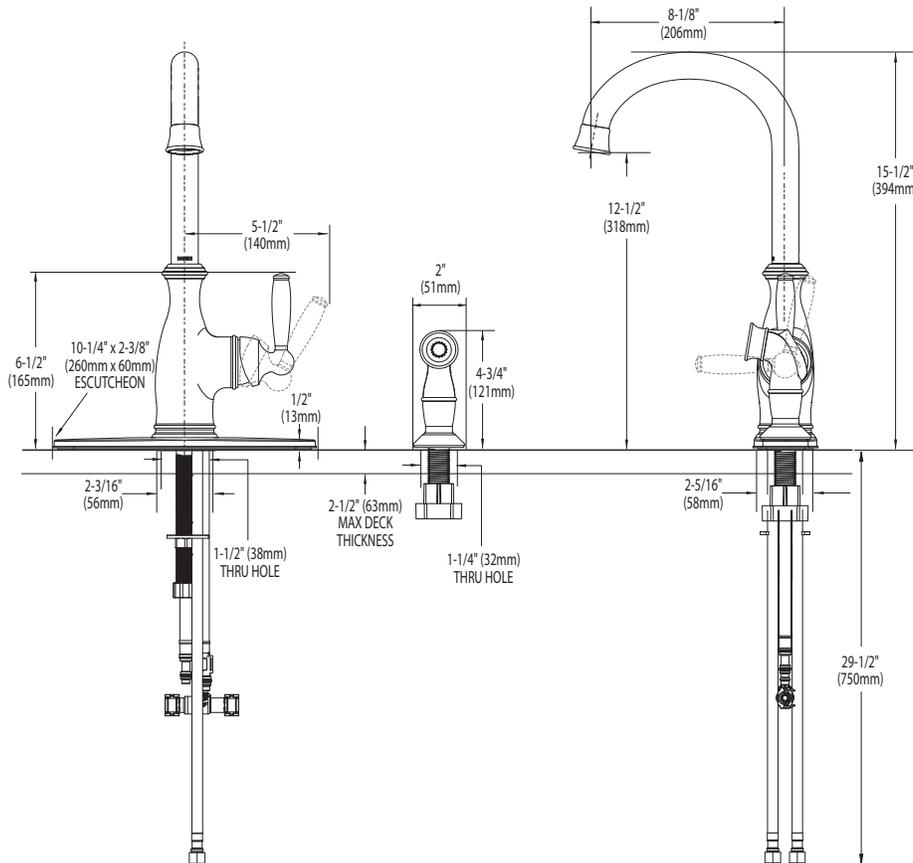
- Lifetime limited warranty against leaks, drips and finish defects to the original consumer purchaser
- 5 year warranty if used in commercial installations



BRANTFORD™ Single Handle Single Hole Mount High Arc Kitchen Faucet

Models: 7735 series with spray

NOTE: THIS FAUCET IS DESIGNED TO BE INSTALLED THRU 2 HOLES: A 1-1/2" (38MM) MIN. DIA. HOLE FOR VALVE AND A 1-1/4" (32MM) MIN. DIA. HOLE FOR SIDE SPRAY. HOLES ON 4" OR 8" CENTERS.



CRITICAL DIMENSIONS

(DO NOT SCALE)

Features

- KOHLER® cast iron.
- Floor-mount.
- Corner basin.
- Acid-resistant enamel finish.
- Without overflow.
- No faucet holes; requires wall-mount faucet.
- 28" (711 mm) x 28" (711 mm)

Optional Accessories

K- 8940 Sink Rim Guard



Codes/Standards

ASME A112.19.1/CSA B45.2

KOHLER® Lifetime Limited Warranty for Cast Iron Components

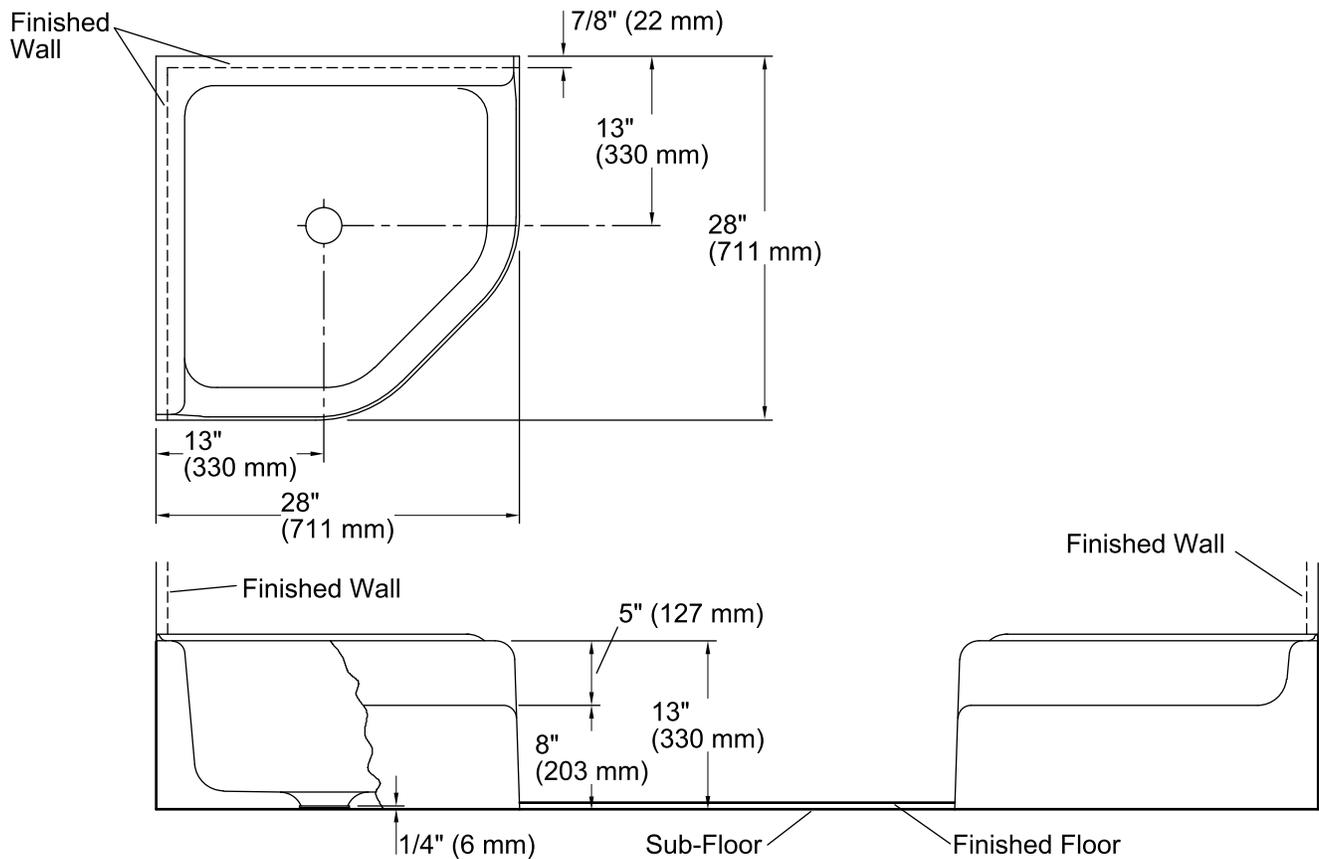
See website for detailed warranty information.

Available Color/Finishes

Color tiles intended for reference only.

Color	Code	Description
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	0	White
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Technical Information

All product dimensions are nominal.

Bowl configuration: Single

Bowl area (Only) Length: 23" (584 mm)

Width: 23" (584 mm)

Water depth: 6-3/4" (171 mm)

Drain hole: 2-7/8" (73 mm)

Notes

Install this product according to the installation guide.



Bardon™ 1/8th GPF High Efficiency Urinal (HEU) K-4904-ET

Features

- Vitreous china.
- Washout flushing action.
- 3/4" top spud.
- 14-1/8" (359 mm) extended rim.
- 0.125 gpf (0.47 lpf) to 1.0 gpf (3.8 lpf).
- WaterSense® compliant when used with WaterSense flushometer.
- Will replace K-4960-ET urinal.
- 26-7/8" (683 mm) x 18" (457 mm) x 14-1/8" (359 mm)

Recommended Accessories

- K- 10668 WAVE DC 1/8 GPF Urinal Flushometer
- K- 10949 Tripoint™ DC 1/8 GPF Urinal Flushometer
- K- 13520 Manual 1/8 GPF Urinal Flushometer
- K- 10675 WAVE DC 0.5 GPF Urinal Flushometer
- K- 10958 Tripoint™ DC 0.5 GPF Urinal Flushometer
- K- 13519 Manual 0.5 GPF Urinal Flushometer
- K- 10676 WAVE DC 1.0 GPF Wshdwn Flushometer
- K- 10960 Tripoint™ DC 1.0 GPF Wshdwn Flushometer
- K- 13518 Manual 1.0 GPF Wshdwn Flushometer

Components

Additional included component/s: 3/4" inlet spud, 2" outlet spud, Strainer, and Hangers (2).



ADA

Codes/Standards

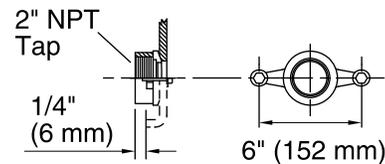
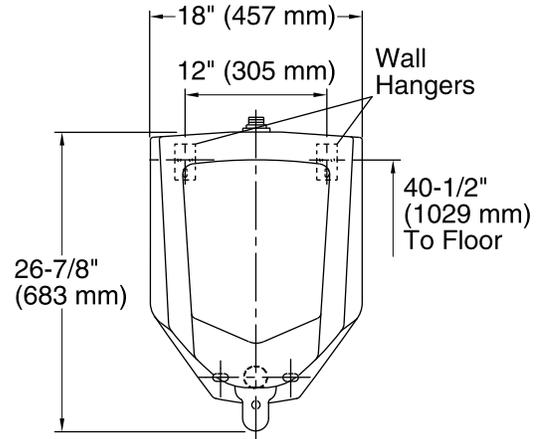
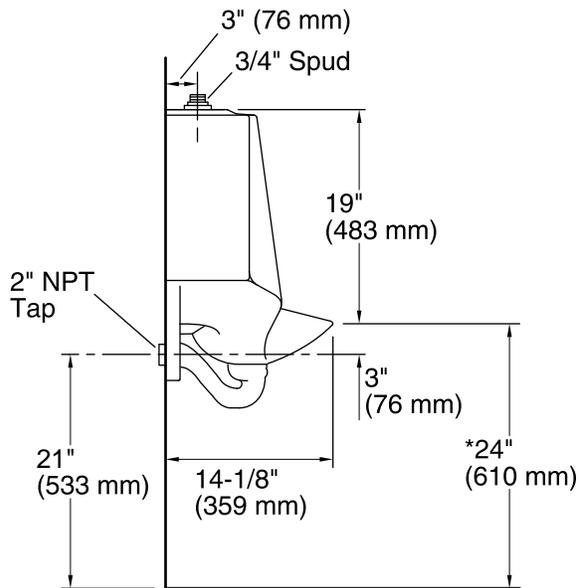
ASME A112.19.2/CSA B45.1
EPA WaterSense®
ADA
ICC/ANSI A117.1

KOHLER® One-Year Limited Warranty

See website for detailed warranty information.

*Urinal complies with ADA requirements when rim is mounted no higher than 17" (432 mm) from finished floor.

*Urinal complies with CSA B651 when rim is mounted no higher than 16-7/8" (430 mm) from finished floor.



Spud Detail

Technical Information

All product dimensions are nominal.

Spud size: 3/4"

Notes

Install this product according to the installation guide.

ADA compliant when installed to the specific requirements of these regulations.

Features

- Vitreous china.
- Elongated bowl.
- Siphon jet.
- Wall-mount.
- 1-1/2" top spud.
- 1.28 gpf (4.8 lpf) or 1.6 gpf (6 lpf) depending on flushometer specified.
- 10-1/2" (267 mm) x 9" (229 mm) water area.
- 26-1/2" (673 mm) x 16-1/2" (419 mm) x 13-1/4" (337 mm).
- Will replace K-4330 and K-4330-L bowls.

Recommended Accessories

- K- 4731-C Commercial Heavy-duty Toilet Seat
- K- 4731-SC Commercial Heavy-duty Toilet Seat
- K- 4731-GC Commercial Heavy-duty Toilet Seat
- K- 10673 WAVE DC 0.5 GPF Urinal Flushometer
- K- 10956 Tripoint™ DC 1.28 GPF WC Flushometer
- K- 13517 Manual 1.28 GPF WC Flushometer
- K- 10674 Wave DC 1.6 GPF WC Flushometer
- K- 10957 Tripoint™ DC 1.6 GPF WC Flushometer
- K- 13516 Manual 1.6 GPF WC Flushometer

Components

Additional included component/s: Spud.



ADA CSA B651

Codes/Standards

ASME A112.19.2/CSA B45.1
DOE - Energy Policy Act 1992
ADA
ICC/ANSI A117.1
CSA B651

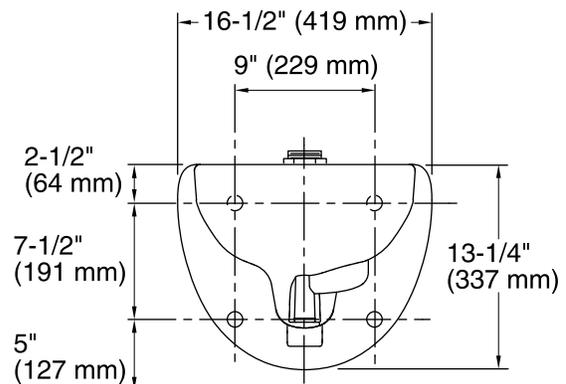
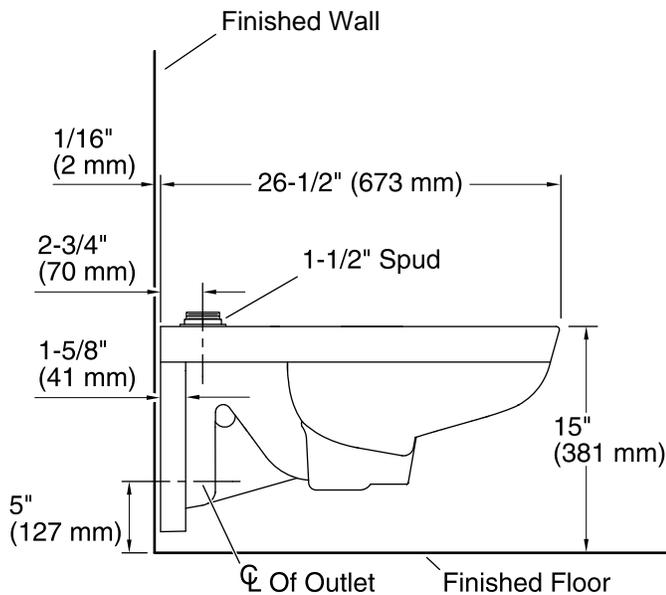
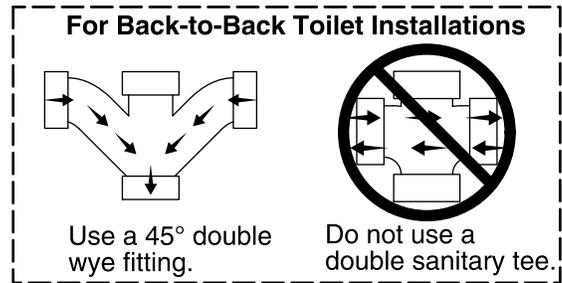
KOHLER® One-Year Limited Warranty

See website for detailed warranty information.

Available Color/Finishes

Color tiles intended for reference only.

Color	Code	Description
	0	White
	96	Biscuit
	47	Almond
	7	Black Black™



Technical Information

All product dimensions are nominal.

Bowl shape:	Elongated front
Spud size:	1-1/2", Inlet, Top
Trap passageway:	2-1/8" (54 mm)
Water surface size:	10-1/2" x 9" (267 mm x 229 mm)
Rim to water surface:	5-1/4" (133 mm)
Seat-mounting holes:	5-1/2" (140 mm)

Fixture Supply Requirements

Min static pressure:	35 psi (241.3 kPa)
Max static pressure:	80 psi (551.6 kPa)
Min flow rate:	25 gpm (94.6 lpm)

Notes

Install this product according to the installation guide.

Refer to manufacturer's instructions and local codes for flushometer requirements.

For back-to-back toilet installations: Use only a 45° double wye fitting.

ADA, CSA B651 compliant when installed to the specific requirements of these regulations.

The Model Plumbing Codes require the installation of elongated open-front toilet seats on public bathrooms.

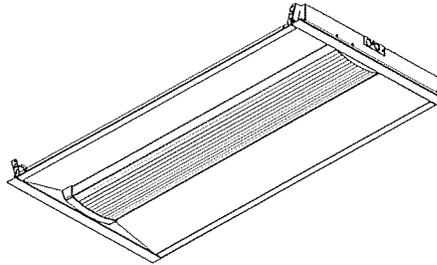


PHILIPS
Day-Brite
CFI

Recessed

**EvoGrid
LED 2x4**

3800, 4300, 4800,
5400, or 7400 lumens



Project _____
Location _____
Cat No. _____
Type _____
Lamps _____ Qty _____
Notes _____

The Philips Day-Brite / Philips CFI EvoGrid recessed LED utilizes highly reliable and efficient Philips LED platform boards and dimmable driver enabling market leading performance in its category. Its soft opal diffuser with large luminous area minimizes apparent brightness compared to other basket luminaires and provides general lighting perfect for a wide variety of applications.

Ordering guide

Example: 2EVG38L840-4-D-UNV-DIM

Width	Family	Ceiling Type	Air Function	Lumens	Color	Length	Center Diffuser	Voltage	Driver	Options
2	EV	G		38L	850 -	4	D	UNV -	DIM -	
2, 2'	EV EvoGrid	G Grid	blank Static	Standard efficacy 38L 3800 nominal delivered lumens 43L 4300 nominal delivered lumens 48L 4800 nominal delivered lumens 54L 5400 nominal delivered lumens 74L 7400 nominal delivered lumens High efficacy 38LH 3800 nominal delivered lumens 43LH 4300 nominal delivered lumens 48LH 4800 nominal delivered lumens 54LH 5400 nominal delivered lumens 74LH 7400 nominal delivered lumens	835 80 CRI, 3500K 840 80 CRI, 4000K 850 80 CRI, 5000K	4, 4'	D Diffuse (opal)	UNV Universal Voltage, 120-277 volt 120 120V 277 277V 347 347V	DIM 0-10V dimming SOIM Step dimming to 40% input power XDIM MarkX phase dimming LJD Lutron Hi-lume A 1% dimming LDE Lutron EcoSystem 5% dimming DALI DALI	F1 3/8" flex, 3 wire 18 gauge 6' F2 3/8" flex, 4 wire 18 gauge 6' F1/D 3/8" twin flex, 3 wire 18 gauge 6' for dimmable luminaires. F2/SW 3/8" single flex, 5 wire 18 gauge 6' for dimmable luminaires. GLR Fusing, fast blow EMLED Integral emergency battery pack OCC Integral sensor, occupancy DAY Integral sensor, daylighting DAYOCC Integral sensor, daylighting and occupancy SWZG2 ^{1,2} SpaceWise automated wireless technology for integrated occupancy and daylight harvesting CHIC Chicago Plenum rated CRM Continuous row mount

Footnotes

- SWZG2 option not available until Q4 2015
- Consult factory for SOIM on 74L and 74LH packages.
- XDIM requires 120V or 277V specification.
- Specify with 38L or 43L lumen packages only. Consult factory for higher lumen packages.
- OCC option allows individual auto shutoff per luminaire and is not recommended for applications with multiple luminaires.
- DAY option requires manual light level calibration.
- SWZG2 option provides occupancy sensing suitable for rooms with multiple luminaires, along with daylight harvesting with auto-calibration. See page 2 for more information.
- Must order SWZ-REMOTE SpaceWise handheld remote with each system order.

Energy data

Luminaire	Catalog Number	Input Power	Efficacy
2x4	2EVG38L840	36.5	109.96
	2EVG43L840	40.6	107.81
	2EVG48L840	47.7	105.15
	2EVG54L840	54.8	102.05
	2EVG74L840	82.6	92.80
2x4 High Efficacy	2EVG38LH840	31.0	121.62
	2EVG43LH840	34.4	124.63
	2EVG48LH840	38.5	123.85
	2EVG54LH840	45.3	123.48
	2EVG74LH840	62.7	120.52

Accessories (order separately)

- FMA24 – 2'x4' "F" mounting frame for NEMA "F" mounting
- EVD4L – EvoGrid 4' replacement lens
- LRM1743 – External sensor to increase occupancy coverage area of SpaceWise luminaire groups
- SWZ-REMOTE – SpaceWise handheld remote for grouping and configuration (at least one remote required for any SpaceWise installation)
- UID8451/10 – Wireless Dimmer Switch Selector
- UID8461/10 – Wireless Scene Selector



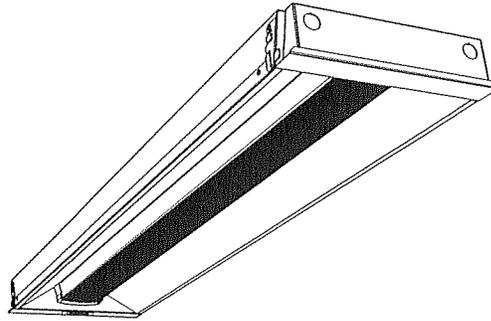


PHILIPS
Day-Brite
CFI

Recessed

EvoGrid
LED 1 X 4

3000, 3800, or 4500 lumens



Project	
Location	
Cat No	
Type	
Lamps	Qty
Notes	

The Philips Day-Brite / CFI EvoGrid LED recessed utilizes highly reliable and efficient Philips LED platform boards and dimmable driver enabling market leading performance in its category. Its soft opal diffuser with large luminous area minimizes apparent brightness compared to other basket luminaires and provides general lighting perfect for a wide variety of applications.

Ordering guide

Example: 1EVG30L840-4-D-UNV-DIM

Width	Family	Ceiling Type	Lumens	Color	Length	Center Diffuser	Voltage	Driver	Options
1	EV	G	38L	850	4	D	UNV	DIM	
1' 1'	EV EvoGrid	G Grid	30L 3000 nominal delivered lumens 38L 3800 nominal delivered lumens 45L 4500 nominal delivered lumens	830 80 CRI, 3000K 835 80 CRI, 3500K 840 80 CRI, 4000K 850 80 CRI, 5000K	4' 4"	D Diffuse (opal)	UNV Universal Voltage, 120-277 volt 120 120V 277 277V 347 347V	DIM 0-10V dimming Step dimming to 40% input power SDIM MarkX phase dimming XDIM ² Lutron Hi-lume A 1% dimming LDE Lutron EcoSystem Series 5, 5% dimming DALI DALI	F1 3/8" flex, 3 wire 18 gauge 6' F2 3/8" flex, 4 wire 18 gauge 6' F1/D 3/8" twin flex, 3 wire 18 gauge 6' for dimmable luminaires. F2/5W 3/8" single flex, 5 wire 18 gauge 6' for dimmable luminaires. GLR Fusing, fast blow EMLED ¹ Integral emergency battery pack OCC ⁴ Integral sensor, occupancy DAY ⁵ Integral sensor, daylighting DAYOCC Integral sensor, daylighting CRM Continuous row mount

Footnotes

- EMLED option overall luminaire height is 4-1/8".
- XDIM requires 120V or 277V specification.
- Not available with 45L lumen package.
- OCC option allows individual auto shutoff per luminaire and is not recommended for applications with multiple luminaires.
- DAY option requires manual light level calibration.

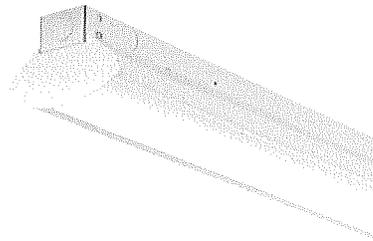
Energy data

Luminaire	Catalog Number	Input Power	Efficacy
1x4	1EVG30L840	25.6	118
	1EVG38L840	32.1	117
	1EVG45L840	39.7	114

Accessories (order separately)

- FMA14 – 1'x4' "F" mounting frame for NEMA "F" mounting
- EVD14L – EvoGrid 4' replacement lens





Project _____
 Location _____
 Cat No _____
 Type _____
 Lamps _____ Qty _____
 Notes _____

Philips Day-Brite / CFI FluxStream LED strip with reflector is a high performing LED linear luminaire delivering smooth diffuse light ideal for light industrial, commercial and residential applications with the unparalleled energy efficiency of Philips LED lighting.

Ordering guide

Example: LFR4FLSLD3740UDZT

Series	Length (nominal)	Lens	Reflector	Lumens' (nominal)	Color	Voltage	Driver	Options
LFR	4	FL	SLD	37	50	U	DZT -	
LFR FluxStream Reflector	4 4' length	FL Frosted Linear Lens	SLD Solid SLT Slotted PER Perforated	37 3700 lumens 40 4000K lumens 55 5500 lumens	50 5000K 40 4000K 35 3500K 30 3000K	U Universal 120/277V 1 120V ² 2 277V ² 3 347V ¹	DZT 0-10v dimming SZT Step dimming (100-40) XDIM ² MarkX Phase Dimming DALI DALI	EMLED Factory wired Philips Bodine BSL310LP integral emergency pack. Nominal 1100 lm FH360 120-347V motion sensor, factory installed on end cap (120-347V) PAF Paint after fabrication (white)

1. Nominal delivered lumens at 25°C ambient.
 2. XDIM option must be specified with 120V or 277V options only
 3. 347V not available with 5500 lumens

Accessories (order separately)

- SV5CPL Continuous Row Joiner: Required for row mounting. Number of joiners required per row is equal to one less than the number of luminaires per row.
- FH360-UNV 120-347V motion sensor, field installed via 7/8" KO on end cap

Accessories (order separately)

Stem and Canopy Sets: Suspend the luminaire 12", 18", 24", 36", or 48" from surface. Two per luminaire recommended.
 SV5F12 - 12" SV5F24 - 24" SV5F48 - 48"
 SV5F18 - 18" SV5F36 - 36"

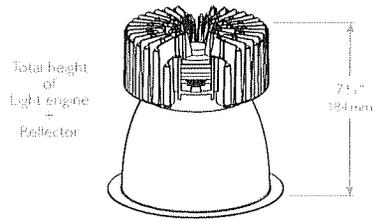
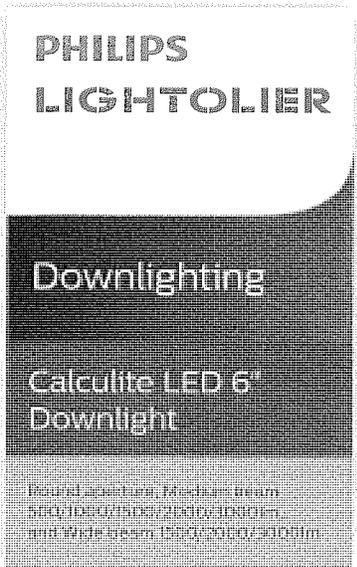
Chain Hanging Kit: Includes two 5' heavy duty link chains with sturdy "V" hook for luminaire suspension.
 FKR-126 - Two 5' chains and "V" hooks

Aircraft Cable Kit:
 Power feed cable/canopy kit (adjustable 6" to 60")
 SVCC60-UNV - 120/277V SVCC60-347 - 347V
 Cable and canopy kit (adjustable 6" to 60")
 SVC60

General Notes

Many luminaire components, such as reflectors, refractors, lenses, sockets, lampholders, and LEDs are made from various types of plastics which can be adversely affected by airborne contaminants. If sulfur based chemicals, petroleum based products, cleaning solutions, or other contaminants are expected in the intended area of use, consult factory for compatibility.





Calculite LED 6" features an LED array of high brightness white light LEDs. The new LED boards in Calculite LED ensure a less than 2-step SDCM color variation between luminaires.

Complete product = Frame-in kit + Trim kit
Lumen package for the frame-in kit must match the trim kit.

Project	
Location	
Cat No	
Type	
Lamps	Qty
Notes	

Frame-in kit

example: C6L10NUVBZ10V

Series	Lumens	Installation	Input voltage	Version	Dimming	Options ⁵
C6L	10	N	U	VB	Z10V	
C6L Calculite 6" LED round aperture	05 500lm 10 1000lm	N New construction	U Universal (120/277V)	VB Version B	Z10V 0-10V dimming LD Lutron driver	LC Chicago Plenum
	15 1500lm	N New construction R Remodeler	U Universal (120/277V)	VB Version B	Z10V 0-10V dimming LD Lutron driver	EM Emergency ¹ LC Chicago Plenum ³
	20 2000lm 30 3000lm	N New construction R Remodeler ⁸	1 120V 2 277V	VB Version B	Z10V 0-10V dimming LD Lutron driver ¹	EM Emergency ¹ LC Chicago Plenum ³
C6L Calculite 6" LED round aperture (347v configurations)	15 1500lm 20 2000lm	N New construction R Remodeler	1 120V	VB Version B	Z10V 0-10V dimming	-347 347V (for Canada) ²
	30 3000lm	N New construction R Remodeler	2 277V	VB Version B	Z10V 0-10V dimming	-347 347V (for Canada) ²
	CUL Calculite LED Universal aperture	15 1500lm 20 2000lm	J J-box mount retrofit	U Universal (120/277V)	VB Version B	Z10V 0-10V dimming Existing wiring will determine if dimming is an option.
15 1500lm 20 2000lm		J J-box mount retrofit	1 120V 2 277V	VB Version B	Z10V 0-10V dimming Existing wiring will determine if dimming is an option.	
15 1500lm 20 2000lm		S Screw-in base retrofit	1 120V	VB Version B	Existing wiring will determine if dimming is an option.	

Trim kit

example: C6L1520DL35KWCCDPVB

Series	Lumens	Style	CCT	Beam	Reflector	Flange	Version ¹	Options ⁹
C6L	1520	DL	50K	W	WH	FT	VB	
C6L Calculite 6" LED round aperture	05 500lm ⁷ 10 1000lm ⁷	DL Downlight	27K 2700K 30K 3000K	M Medium, 0.8 s.c. ⁵	CL Clear CCL Comfort clear	W White (painted) P Polished (matches aperture) FT Flangeless (flush-mount) ^{4,5}	VB Version B	blank None EM Emergency
	1520 1500/2000/3000lm		35K 3500K 40K 4000K	W Wide, 1.1 s.c. ⁶	CCD Comfort clear diffuse CCZ Champagne bronze WH White (painted)			

1. Consult LED-EM spec sheet for Emergency (EM) option details and restrictions.
Not available with Lutron driver (LD) dimming.
2. Consult factory for availability of other 347V (-347) option configurations.
3. Consult factory for availability for other Chicago Plenum (LC) option configurations.
4. Accessory **CA6FMR** required for gypsum applications and flangeless (FT) trims (minimal 1/8" reflector flange).
5. Available for new construction (N) installation frame-in kits only.
6. Available for 1500/2000/3000 (1520) lumen trim kits only.
7. Available for medium (M) beam only.
8. Remodeler only available with 0-10V dimming (Z10V) not available with Emergency (EM) or Chicago Plenum (LC)
9. Specified only when reflector mounted EM test switch is required. For ceiling mounted switch leave blank.
Note: See page 3 for Energy Star compatibility.
CalculiteLED-6in-Downlight-C6LDLVB 10/15 page 1 of 6



CA6FMR
Flangeless trim with plaster ring accessory.
(Required for gypsum installations)



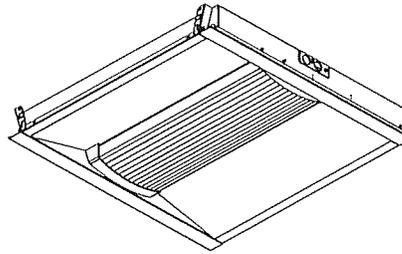


PHILIPS
Day-Brite
CFI

Recessed

EvoGrid
LED 2x2

3000, 3800, or 4500 lumens



Project _____

Location _____

Call No _____

Type _____

Lamps _____ Qty _____

Notes _____

The Philips Day-Brite / Philips CFI EvoGrid recessed LED utilizes highly reliable and efficient Philips LED platform boards and dimmable driver enabling market leading performance in its category. Its soft opal diffuser with large luminous area minimizes apparent brightness compared to other basket luminaires and provides general lighting perfect for a wide variety of applications.

Ordering guide

Example: 2EVG30L840-2-D-UNV-DIM

Width	Family	Ceiling Type	Air Function	Lumens	Color	Length	Center Diffuser	Voltage	Driver	Options
2	EV	G		20L		2	D	UNV	DIM	
2' 2'	EV EvoGrid	G Grid	blank Static	30L 3000 nominal delivered lumens 38L 3800 nominal delivered lumens 45L 4500 nominal delivered lumens	835 80 CRI, 3500K 84D 80 CRI, 4000K 850 80 CRI, 5000K	2' 2'	D Diffuse (opal)	UNV Universal Voltage, 120-277 volt 120 120V 277 277V 347 347V	DIM 0-10V dimming Step dimming to 40% input power SDIM MarkX phase dimming L3D ¹ Lutron Hi-lume A 1% dimming LDE Lutron EcoSystem 5% dimming DALI DALI	F1 3/8" flex, 3 wire 18 gauge 6' F2 3/8" flex, 4 wire 18 gauge 6' F1/D 3/8" twin flex, 3 wire 18 gauge 6' for dimmable luminaires. F2/SW 3/8" single flex, 5 wire 18 gauge 6' for dimmable luminaires. GLR Fusing, fast blow EMLED Integral emergency battery pack OCC ⁴ Integral sensor, occupancy DAY ⁵ Integral sensor, daylighting DAYOCC Integral sensor, daylighting and occupancy SWZG2 ^{1,5,7} SpaceWise automated wireless technology for integrated occupancy and daylight harvesting CHIC Chicago Plenum rated CRM Continuous row mount

Footnotes

- 1 SWZG2 option not available until Q4 2015
- 2 XDIM requires 120V or 277V specification.
- 3 Not available with 45L lumen package.
- 4 OCC option allows individual auto shutoff per luminaire and is not recommended for applications with multiple luminaires.
- 5 DAY option requires manual light level calibration.
- 6 SWZG2 option provides occupancy sensing suitable for rooms with multiple luminaires, along with daylight harvesting with auto-calibration. See page 2 for more information.
- 7 Must order SWZ-REMOTE SpaceWise handheld remote with each system order.

Energy data

Luminaire	Catalog Number	Input Power	Efficacy
2x2	2EVG30L840	30.2	102.19
	2EVG38L840	40.1	98.44
	2EVG45L840	47.1	97.32

Accessories (order separately)

- FMA22 – 2'x2' "F" mounting frame for NEMA "F" mounting
- EVD2L – EvoGrid 2' replacement lens
- LRM1743 – External sensor to increase occupancy coverage area of SpaceWise luminaire groups
- SWZ-REMOTE – SpaceWise handheld remote for grouping and configuration (at least one remote required for any SpaceWise installation)
- UID8451/10 – Wireless Dimmer Switch Selector
- UID8461/10 – Wireless Scene Selector



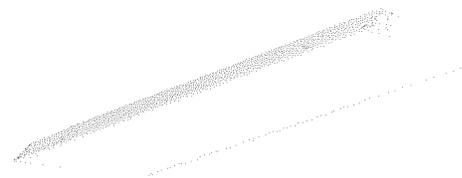


PHILIPS
Day-Brite
CFI

Recessed

T-Grid LED Troffer 2x4

3200, 3800, 4300, 4800, 5400, or 7400 lumens



Project _____
Location _____
Cat No _____
Type _____
Lamps _____ Qty _____
Notes _____

The Philips Day-Brite / Philips CFI T-Grid LED Troffer is an energy efficient low profile luminaire offering excellent performance for general lighting applications such as offices, schools, healthcare, or retail. Featuring a frosted prismatic lens to enhance visual comfort, the T-Grid LED Troffer utilizes highly reliable and efficient Philips LED platform boards and dimmable driver, enabling market leading efficiency in its category.

Ordering guide

Example: 2TG32L840-4-FS-02F-UNV-DIM

Width	Family	Ceiling Type	Lumen Package	Color	Length	Door Frame	Lens	Voltage	Driver	Options
2	T	G	32L	850 -	4 -	FS -	02F -	UNV -	DIM -	
2' 2'	T, T-Grid LED Troffer	G, Grid	32L 3200 nominal delivered lumens 38L 3800 nominal delivered lumens 43L 4300 nominal delivered lumens 48L 4800 nominal delivered lumens 54L 5400 nominal delivered lumens 74L 7400 nominal delivered lumens	830 80 CRI, 3000K 835 80 CRI, 3500K 840 80 CRI, 4000K 850 80 CRI, 5000K	4' 4'	FS Flat Steel FA Flat Aluminum RA Regressed Aluminum	02F Pattern 12, .100" nominal diffuse 50%	UNV Universal Voltage 120-277V 347 347V	DIM 0-10V dimming (control leads factory installed and extended to access plate) SDIM Step dimming to 40% input power	F1 3/8" flex, 3 wire, 18 gauge F2 3/8" flex, 4 wire, 18 gauge FID Two 3/8" flex, 3 Wire, 18 gauge, for separated 0-10V dimming control leads F2/SW 3/8" flex, 5 wire, 18 gauge, for integrated 0-10V dimming control leads EMLED ^{1,3} Integral emergency battery pack 1W 1-way gasket between lens & door frame 2W 1-way & gasket between door frame & housing 3W 2-way & gasket between housing & ceiling (field installed)

Footnotes

- 1 SDIM not available with 74L lumen option
- 2 Not available for 74L-347V
- 3 1100 nominal lumens delivered in DC mode

Accessories (order separately)

- FMA24 - 2'x4' "F" mounting frame for NEMA "F" mounting



Description : **DL-AC-FLEX-50 (4' RUN)**

TYPE:

Project Name:

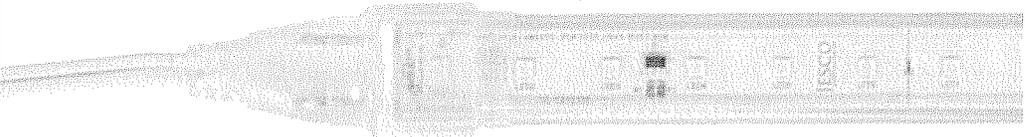
Notes:



DL-AC-FLEX

LED FLEXIBLE LINEAR
 DL-FLEX STATIC SERIES

Type	
Project	
Catalog No.	



DESCRIPTION

INFINA™ is the next generation of high lumen output, specification grade, flexible lighting system that incorporates JESCO's exclusive, patent pending, constant current, *Driverless AC LED* technology** which operates directly off of line voltage - no additional power source required and no drivers to hide. With a run length of 150', the product can be dimmed with an ELV dimmer***. The product is mounted either in a channel or with snap-in mounting clips. INFINA™ is designed for dry, damp and wet locations. The LEDs are imbedded within a patent pending, flexible, optically clear thermoplastic jacket. For easy installation, JESCO offers a full complement of connectors.

FEATURES

- Provides up to 555 lm from 4.95W with an efficacy of 112 lm/W
- Patent pending constant current IC's provide uniform intensity over the entire run
- 3 Step Mac Adam LEDs
- JESCO's exclusive *Driverless AC LED*** technology incorporated within our patent pending, flexible, optically clear thermoplastic jacket provides for true 50,000 hours of operation with 70% lumen maintenance
- Line voltage – No power supplies to hide
- Run length of 150 feet (4' increments)
- Rated for Indoor and Outdoor* applications
- High CRI of 80+
- Available in 2700K, 3000K, 4000K.*
- Mounts easily with snap-in clear plastic channel or mounting clips.
- Hardwire mounting and terminating options, see page 2
- Plug and Play mounting and terminating options, see page 3

SPECIFICATIONS

Input Voltage	120V AC		
Wattage	4.95 W per ft.		
CCT	2700K	3000K	4000K
Lumens* Efficacy	480 lm	500 lm	555 lm
Efficacy	97 lm/W	101 lm/W	112 lm/W
Power Factor	0.95		
Max run / Min run	150' / 4"		
Beam Angle	160°		
Fixture Life	50,000 hours		
Dimming	ELV ***		
Dimensions*	7/8" W x 1/4" H		
Environment	Indoor/Outdoor* - dry, damp and wet		
Operating Temp.	-22°F to 122°F		
Certifications - Indoor	UL for Hard Wire applications		
Certifications - Indoor/ Outdoor	c-ETL-us for Plug and Play applications		
Warranty	5 Years. See published warranty terms for detailed information.		

SERIES - **COLOR** **5000K** **4' RUN**
DL-AC-FLEX - + Input and Output Termination Options (See Below)
 27 – 2700K
 30 – 3000K
 40 – 4000K
 3 Hard wire and 2 Plug & Play input options available.

Example: DL-AC-FLEX-30

* Contact factory for custom colors
 ** Powered by Mag-LED
 *** Never exceed dimmer max wattage
 † Plug & Play version only. ETL certified. Not submersible. Not intended for applications where water can puddle or product can be covered by snow.
 ‡ Nominal



DL-AC-FLEX (INFINA) Order Calculations Sheet