

**ADDENDUM NUMBER 4**

**November 11, 2022**

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**PROJECT:                   A NEW ADDITION TO DEKALB COUNTY JAIL  
FOR THE DEKALB COUNTY COMMISSION  
FORT PAYNE, ALABAMA  
GMC PROJECT NO. ABHM190069  
Local Funds**

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**AD4-1 GENERAL:**

- A. The following revisions and/or additions to the Drawings and Project Manual are hereby made a part of same, and shall be incorporated in the Work of the Contract the same as if originally included in the Bid and Construction Documents.
- B. Bidders shall acknowledge receipt of this Addendum in writing, as provided on the Proposal Form.
- C. When a revision and/or addition is called for to the Drawings or Project Manual, they shall be fully coordinated with and carried through all applicable Drawings and portions of the Project Manual, including in part, all related Civil, Landscaping, Architectural, Structural, Plumbing, Mechanical, Electrical, and other Documents.

**AD4-2 PROJECT MANUAL AND SPECIFICATIONS:**

- A. Refer to Section 01351 - 3.8-A and add approved DEC-  
"9. US Security Systems, Inc, Opelika, AL Phone 334-424-1823"
- B. Refer to Section 17000 - 1.01- F and add approved ESC  
"8. DPS Group LLC, Montgomery, AL (344) 262-06098"
- C. Refer to Section 17400 - 2.1- A-2 and add approved VMS  
"...Hanwha Wisenet wave..."
- D. Refer to Section 09760 - Resinous flooring - 2.2.B - Add "TENEMEC" - Deco Tread Series 222.
- E. See Section 11194- Manufactured Steel Detention Cells, and replace in its entirety with attached Section 11194.
- E. Refer to SECTION 15010 - GENERAL PROVISIONS - MECHANICAL
  - 1.     1.4     APPLICABLE CODES AND STANDARDS:  
  
          Change 4. to read as follows:           ASHRAE 90.1 - 2013 Energy Compliance  
          Change 13. to read as follows:       2015 International Building Code

Change 14. to read as follows: 2015 International Plumbing Code  
Change 15. to read as follows: 2015 International Mechanical Code  
Delete 16. in its entirety.

F. Refer to SECTION 15970 – HVAC TESTING AND BALANCING

1. 1.2 SCOPE

Add Paragraph C to read as follows:

C. In addition, the smoke purge systems shall be tested as required to comply with 2015 IBC 909.3 Special Inspection and Test Requirements and in accordance with the Local Authority having Jurisdiction.

G. See attached Lighting substitutions from SESCO – Add to approved manufacturers list.

**AD4-3 DRAWINGS:**

A. Refer to attached sheet M0.01:

1. Added equipment efficiency ratings to Outdoor Heat Pump Schedule.
2. Deleted EF-8 on Fans Schedule.
3. Added ERV-2 to Energy Recovery Ventilator Schedule.

B. Refer to attached Sheet M0.04:

1. Added ERV-2 to Control Sequence.

C. Refer to attached Sheet M1.0:

1. Deleted EF-8. Added ERV-2 and associated ductwork.

**AD4-4 MISCELLANEOUS:**

A. Refer to Advertisement for Bids and note that the Mandatory Pre-Bid Conference was held as scheduled and the minutes of that meeting, along with the sign in sheet, are attached to this Addendum No. 4.

B. Questions from Contractors:

1. The specs reference Section 02820 – High Security Chain Link Fences and Gates, but I don't see that spec section anywhere in the documents.

**GMC RESPONSE: Delete reference to Section 02820**

2. The specs reference Section 07921 – Security Joint Sealants, but I don't see that spec section anywhere in the documents.

**GMC RESPONSE: Delete reference to Section 07921**

3. Page A6.01 – Door and Frame Schedule references glazing types SG1B, SG2, and SG2B, but those types are not listed in spec section 11193 – Security Glazing.

**GMC RESPONSE: See response below:**

a. Type SG1B – Interior Fire Rated glass

1. 2-1/8” UL fire rated for 45 minutes, equal to McGrory Glass FireDefend AD60-F60I or approved equal. ASTM F1915-19 Grade 1- 60-minute containment rated. Glazing shall be installed per UL Classified. Glazing shall be installed with UL classified Kerafix or Closed Cell PVC foam tape. Construction is proprietary. No intumescent gel, no exceptions.

b. SG2 – GCP

1. 13/16” clear glass clad polycarbonate laminate, equal to McGrory Glass AttackDefend 40 or approved equal. ASTM F1915-19 Grade 2 – 40-minute containment of the following construction:
  - 1) 1/8” Clear heat strengthened glass
  - 2) .050” Urethane
  - 3) 1/4” Polycarbonate
  - 4) .050” Urethane
  - 5) 1/4” Polycarbonate
  - 6) .050” Urethane
  - 7) 1/8” Clear heat strengthened glass

c. SG2B –Fire Rated 20 – 60 minutes

1. 1-15/16” UL fire rated for 60 minutes, equal to McGrory Glass FireDefend AD40-F60I or approved equal. ASTM F1915-19 Grade 2 - 40-minute containment rated. Glazing shall be installed with UL classified Kerafix or Closed Cell PVC foam tape. Glass construction is proprietary. No intumescent gel, no exceptions.

4. Page A6.01 – Window Types references glazing type SG2 and SG2(F), but those types are not listed in spec section 11193 – Security Glazing.

**GMC RESPONSE: For SG2, see question 4 above. For SG2(F) see SG2A-OBS1 in 11193.**

5. Page A6.01 – Door and Frame Schedule references hardware set SH2A, but that set is not listed in spec section 11191 – Detention Door Hardware.

**GMC RESPONSE: Same as SH2 but without weather strip.**

6. The detention hardware set Sh2A is listed for 2 doors, but I do not see a hardware set for this.

**GMC RESPONSE: Same as SH2 but without weather strip.**

7. Is the UPS backup supposed to be 15 minutes or 1 hr? I see both in the specs.

**GMC RESPONSE: 15 Minutes**

8. The video specifications call for an Aruba core switch for the video with something like 125 ports. Are we still supposed to provide this on the base bid since there are only 14 cameras in the base? That would likely cost more than the cameras and storage combined.

**GMC RESPONSE: 125 is for the video replacement alternate.**

9. In the CATV specifications we do not see a fiber transmitter spelled out. Is the owner providing or should the bidder include although not specified?

**GMC RESPONSE: Bidder shall include in the bid.**

10. In the CATV specifications the fiber receiver is single mode. The plans call for a 12 multimode pairs of FO. Please clarify is this is correct.

**GMC RESPONSE: Single mode is required for CATV.**

11. The video specifications state that the exacqvision camera cabling can be reused. Exacqvision cameras are not identified on the plans. Please advise how many of these cameras are located in the existing building.

**GMC RESPONSE: Approximately 5.**

12. The video specifications specify an Arxys video server. Can video servers from the Bosch be used as well since their VMS software is approved?

**GMC RESPONSE: Yes.**

13. The detention hardware set Sh2A is listed for 2 doors, but I do not see a hardware set for this.

**GMC RESPONSE: Same as SH2 but without weather strip.**

14. None of the Security Glass types shown on the architectural drawings are listed in specification section 11193.

**GMC RESPONSE: See response to items 3 and 4 above.**

15. In the Security Glazing section 11193 1.03, B. states "Provide 2 (two) spare pieces of security glazing for each size and glass type ordered." This seems to be excessive for such a small project. Please advise.

**GMC RESPONSE: Provide as specified.**

16. Refer: Section 11194 - 2.5A, Electrical - calls for ***"The DCM shall provide the light fixture, intercom station and video camera in the pre-finished modular steel cell."***

We (STEEL CELL MANUFACTUER) only provide back boxes and pull strings for intercom and cameras. We do provide the specified light fixture. The DEC's and security electronics subs will have to include the cameras and intercoms in their scope and coordinate with us the location and requirements for back boxes.

**GMC RESPONSE: The DEC's and security electronics subs SHALL include the cameras and intercoms in their scope and coordinate with the steel cell manufacturer the location and requirements for back boxes.**

**END OF ADDENDUM NUMBER 4**

Attachments: Pre-Bid Conference Minutes – 4 pages (8.5 x 11)  
Pre-Bid Conference Sign- In Sheet – 3 pages (8.5 x 11)  
Wisenet Wave Brochure – 12 pages (8.5 x 11)  
Section 11194- Manufactured Steel Detention Cells - 12 pages (8.5 x 11)  
Section 15010 – General Provisions-Mechanical – 18 pages (8.5 x 11)  
Section 15970 – HVAC Testing & Balancing – 7 pages (8.5 x 11)  
Sesco Lighting Substitutions- 56 pages (8.5 x 11)  
Sheet M0.01 – 1 page (30 x 42)  
Sheet M0.04 – 1 page (30 x 42)  
Sheet M1.0 – 1 page (30 x 42)

**PREPARED BY**

**GMC**

**2660 EastChase Lane, Suite 200 | Montgomery, Alabama 36117**

**Tel 334.271.3200 | GMCNETWORK.COM**

**Goodwyn, Mills Cawood, LLC**



**PRE-BID CONFERENCE MINUTES**

**A NEW ADDITION TO DEKALB COUNTY JAIL  
FORT PAYNE, ALABAMA**

Dekalb County Commission  
111 Grand Avenue SW  
Fort Payne, Alabama  
10:00 AM, Tuesday, November 8, 2022

**Note: These minutes are complimentary, for the purpose of review during this meeting only; they do not attempt to nor do they represent a total recapitulation of Project requirements, and do not change or alter same in any respect; Changes, if any, will only be made by written Addendum.**

1	Welcoming remarks. Reminder to sign-in on sheet at front of room or being circulated.
2	Introductions and names and relationship to job of personnel.
3	Client representatives involved.
4	Project Directory: Names of Architects and Engineers personnel involved.
5	Bid Documents available for review at Architect's office and state-wide plan rooms.
6	Every General Contractor <u>and every Subcontractor</u> should read and be familiar with all of the front-end documents and all of Division 1 of the Project Manual, in addition to the work they are bidding and other work they have to coordinate with.
7	Bidding: 2:00 PM, Tuesday, November 15, 2022 at the DeKalb County Commission; 111 Grand Avenue SW; Fort Payne, Alabama 35967
8	Note that Advertisement and Instructions to Bidders should be read by each bidder.  Note that Bids are to be held open for at least 60 days.
9	Proposal Form included in Project Manual, and copies furnished to each bidder with Bid Documents.
10	Two (2) Addenda have been issued to date.
11	Insurance requirements should be read by each bidder, and should be provided to each General Contractor's and Subcontractor's insurance carrier for review.  Insurance requirements are indicated in General and Supplementary Conditions; AND  Additional requirements are indicated in Section 01015 - Special Conditions and should also be carefully reviewed and also sent to insurance carriers for review.
12	Section 01015 -Special Conditions - General Review:

a.	<b>Construction schedule requirements: A. Verify existing conditions at the site. B. Completion dates as per Proposal Form.</b>
b.	<b>Liquidated damages amount - as indicated in Paragraph 1.1A.</b>
c.	<b>Site restrictions - as indicated in Sections 01010 and 01015, and other locations on the Drawings and in the Project Manual.</b>
d.	<b>Pre-Construction Conferences - required for entire project and prior to beginning each major portion of the Work.</b>
e.	<b>Contractor's schedule must coordinate the overall construction schedule of the project.</b>
f.	<b>Contractor's job meetings - coordination of the Work with all subcontractors and suppliers is required.</b>
g.	<b>Requirements for stored materials - as indicated.</b>
h.	<b>Safety and Protection – Contractor's responsibility.</b>
i.	<b>Work limits protection - the public, Owner's staff, workers, etc.</b>
j.	<b>Testing: Paid by the Owner for Divisions 2-16 (except utility testing). Other provisions and requirements as indicated in the Specifications.</b>
k.	<b>Project Sign: Contractor to provide one sign as per Special Conditions 1.12 and details in Project Manual. No Subcontractor signs. Note other requirements in this paragraph.</b>
l.	<b>Superintendents and construction personnel experience requirements - as indicated.</b>
m.	<b>Submittal requirements indicated. Contractor is required to check, mark, stamp, and approve and/or reject submittals, prior to submittal to Architect. Refer to General Conditions for additional information and related requirements.</b>
n.	<b>Substitutions - Ten-day minimum cut-off prior to original bid date for requests for substitutions, additional manufacturers, and where listed in individual spec sections - for pre-approved subcontractors and suppliers. Longer for some products - as indicated.  Substitutions and additional manufacturers, suppliers, etc., will not be allowed after that date except in extraordinary circumstances.</b>
o.	<b>Site maintenance requirements indicated. Daily attention required.</b>
p.	<b>Insurance and special provisions - in addition to other insurance requirements.</b>
q.	<b>Accessibility requirements - as indicated, and as otherwise required.</b>

	r.	<b>Contractor Programs and Conduct of Personnel.</b>
	s.	<b>Work by Others - as indicated.</b>
13		<b>Section 01030 - Alternates - as indicated on the Drawings, Proposal Form, and Section 01030 - Alternates. Specific materials and other requirements occur throughout the Project Manual, as applicable to the work involved in Base Bid Work and the work of each Alternate.</b>
14		<b>Section 01045 Cutting and Patching as indicated in this section.</b>
15		<b>Section 01500 - Temporary Facilities should be reviewed by each bidder.</b>  <b>Owner will allow Contractor to connect to existing power and water, for reasonable use, to the extent it is available on site. Refer to this Section 01500 for additional information, restrictions, and requirements.</b>
16		<b>Section 01700 - Project Close-Out and Section 01720 Project Record Documents should be reviewed by each bidder.</b>  <b>Final payment will not be made until the requirements of these sections and General Conditions are completed.</b>  <b>Project Record Documents have to be kept up-to-date on the project and will be checked periodically during the Work of the project.</b>
17		<b>Requirements for quality control, testing, and inspections are located throughout the project manual, and should be reviewed so that they are understood prior to bidding the project and prior to the low bidder entering into a contract for the project.</b>
18		<b>Section 01732 - Selective Demolition: Note requirements for scheduling and coordination with other Work of the project, as well as schedule for completing the Work of the Project, which are generally indicated in this Section 02070 and in detail on the Drawings and other parts of the Project Manual.</b>
19		<b>Questions?</b>
20		<b>Site tour - availability - contact persons - etc.</b>
21		<b>Closing remarks.</b>
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23		
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28		



**END OF PRE-BID CONFERENCE AGENDA**

<b>NOTES:</b>

PRE-BID CONFERENCE ATTENDEES

A NEW ADDITION TO DEKALB COUNTY JAIL  
FORT PAYNE, ALABAMA

10:00 AM, November 8, 2022

#	NAME:	COMPANY:	PHONE NUMBER:	FAX NUMBER:	EMAIL:
1	Chuck Jones	Goodwyn Mills & Cawood	334-271-3200	334-272-1566	Chuck.jones@gmcnetwork.com
2	KELLY HOWARD	MARTIN & COBEY CONST.	256-614-3517	256-232-5454	khoward@martinandcobey.com
3	ERIC SANTZ	Maximum Security	256-623-2338	-	dave@mss1.us
4	KERRICK WHISENANT	LIMESTONE BUILDING GROUP	256-214-1571	-	kwhisenant@limestonebuildinggroup.com
5	Wilbur Dunlap	DCSO	256-717-4677		wdunlap@dekalbcountysheriff.org
6	Seth Cagle	DCSO	256-717-9894		Scagle@dekalbcountysheriff.org
7	Tracie Hamilton	DCSO	256-706-5259	-	thamilton@dekalbcountysheriff.org
8	Kenneth Poole	DCSO	256-418-2103	-	KPoole@dekalbcountysheriff.org
9					

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WISENET



# WISENET WAVE

# Video Management System

## Intuitive and Easy to Use

- An intuitive 'drag & drop' tool makes it extremely easy for operators to set up a display of live and recorded images on a single screen or video wall, with customizable layouts and sizes.
- Zoom windows which, with just simple clicks of a mouse, enables operators to zoom in to see close up detail of any suspicious activity.
- Motion detection and video analytics support can be configured to generate alerts when user defined incidents occur.
- A wide range of smart, keyword, calendar and preview search options facilitate rapid retrieval of recorded video.

Wisenet WAVE targets the needs of projects in the mid-market with an emphasis on simplified user experience.

## SUNAPI 2.0 INTEGRATION

Wisenet WAVE is integrated with the latest SUNAPI 2.0 for seamless interaction with Wisenet cameras and recorders.

Full SUNAPI 2.0 driver has been rigorously tested with Wisenet P, X, and Q series and supports:

- Video/audio streaming
- PTZ
- Event - advanced analytics, MD, alarm
- Device configurations

### Hanwha Techwin specific features

#### Deep camera integrations and NVR monitoring, search & playback:

- H.265
- WiseStream
- All triggering events including sound classification and loitering
- Simple Focus / Initialize Focus / Lens Control settings
- Multi-directional camera support
- Hallway view
- Camera profile/image configuration
- PTZ preset Sync



## Simple. Reliable. Customizable.

Wisenet WAVE VMS features a very unique adaptive scaling technology which dynamically switches between the high resolution and low resolution images depending on the CPU usage of the client PC. It is an endlessly customizable IP Video Management platform that gives users the ability to create tailored networked video solutions for any type of project, for use by anyone, on any device.



## An Operating System to Suit Your Needs

Wisenet WAVE has applications for all major operating systems so our users are not limited by what device or operating system they choose to use on their desktops, mobile devices, rack mount servers, or even low-powered embedded devices. (For embedded devices, please contact Hanwha Techwin Support)



WAVE Sync

A cloud-based service that enables simple, centralized remote access and insight into any Wisenet WAVE system.



Desktop

A rich media player designed to view and manage a single Wisenet WAVE system from a desktop or laptop PC.



Mobile

A mobile app designed for viewing Wisenet WAVE system video and archives while on-the-go.



Server

A media server responsible for discovering, connecting to, and managing system devices and data.

Supported Browsers	Desktop OS Support	Mobile OS Support	Server OS Support
Google Chrome	Microsoft Windows	Google Android	Microsoft Windows
Mozilla Firefox	Ubuntu Linux	Apple iOS	Ubuntu Linux
Opera / Opera Neon	Apple macOS		
Microsoft Edge			
Apple Safari			

# Cloud

## Wisenet WAVE Sync Simplifies Everything

A cloud-based service which can be remotely accessed by an unlimited number of authorized users from anywhere in the world.

### Setup in Seconds



- Step 1: Create Wisenet WAVE Sync Account
- Step 2: Link your System to Wisenet WAVE Sync
- Step 3: Connect, View and Manage from anywhere

### Connect. View. Manage. Scale.

Wisenet WAVE Sync is a public cloud application hosted on Amazon AWS that enables simple remote connectivity, streaming and management of one or an unlimited number of Wisenet WAVE Systems.

Supported Operating Systems:



Google Chrome



Mozilla Firefox



Opera/Opera Neon



Microsoft Edge



Apple Safari

View	Manage	Scalability / Integration
Live Video (adaptive)	System Settings	Unlimited # of Systems
Recorded Video (adaptive)	User Permissions	Unlimited # of Users
Camera Details	Cloud Connections	Unlimited # of Devices
Keyword Search	Email Notifications	Cloud API
Calendar Search	Cloud System Merge	
Flex Timeline		



## Wisenet WAVE Sync Browser & Devices Interface



### Cloud Systems

**Cloud Connect** Connect any Wisenet WAVE System for simple remote connectivity from anywhere using NAT Traversal and Cloud Data Proxy technology.

**User Management** Add an unlimited number of users to a single Wisenet WAVE Sync System.

Share access to your Wisenet WAVE system in seconds using only email addresses.

Create Custom Roles to quickly assign access to multiple Wisenet WAVE Sync connected systems.

**How it works** Wisenet WAVE applications (Server, Desktop, Mobile) connect via an active internet connection to the Wisenet WAVE Sync (Cloud) and are automatically connected together using a combination of NAT Traversal (direct connection) and data proxy technologies (connected via Wisenet WAVE Sync).

Wisenet WAVE Sync Features	
Connectivity	Nat Traversal: Connect directly to proxied Wisenet WAVE servers Cloud Data Proxy: Connect via AWS cloud proxy service
Interface Tabs	Systems: View connected system tiles Settings: View users / rename system / merge system / disconnect system View: Use Wisenet WAVE sync client to view live or recorded video
Security	
Secure Password Recovery:	Via email
HTTPS:	Open SSL encrypted server/client/cloud connections
Email:	TLS (Transport Layer Security)
Passwords:	Complex multi-level hash
Developer Tools	
Cloud API	Available upon request
Scalability	
# of Connected Systems	Unlimited
# of Users	Unlimited

# Desktop

## The Ultimate Flexibility

Wisenet WAVE offers a wide range of options to allow users to choose how and where to manage their video surveillance systems with minimal hardware requirements.

Wisenet WAVE is offered as software which can be installed onto a user's desktop running Windows, Linux or Apple devices.



## One App, Many Features

Wisenet WAVE Desktop combines performance, ease-of-use, and a robust reliability into a single cross-platform lightweight app capable of running on everything from Atom based tablets to Xeon based servers.

Supported Operating Systems:



Microsoft Windows



Ubuntu Linux



Apple MacOS

Usability	Media	Configuration	Search
Drag & Drop Everything	IP Cameras / Encoders / DVRs	Events & Rules Engine	Smart Motion Search
Consolidated Notifications	RTSP/HTTP Streams	User Management	Keyword Search
Flex Timeline	I/O Devices	IP Cameras / Encoders	Calendar Search
Customizable Layouts	Web Pages	Server Management	Time-Slice Search
Digital Maps	Videos	I/O Device Management	Bookmarks
Adaptive Scaling	Images	Storage Management	Audit Trail

# Desktop Application



## Supported Operating Systems



Windows 8  
 Windows 8.1  
 Windows 10  
 Windows Server 2012  
 Windows Server 2012 R2  
 Windows Server 2016 (Long-term Service Channel) 1607  
 Windows Server 2019



Ubuntu Linux 16.04 LTS  
 Ubuntu Linux 18.04 LTS  
 Ubuntu Linux 20.04 LTS



macOS Mojave 10.14  
 macOS Catalina 10.15  
 macOS Big Sur 11

Supported Media Playback On Grid	
Live Streams	Codecs: H.265 H.264 MJPEG
Offline Media	Videos: AVI MKV MP4 MOV TS M2TS MPEG MPG FLV WMV 3GP Images: JPG PNG GIF BMP TIFF
Connected Devices	I/O Devices: Status and Triggers Servers: Server Health Monitoring
Browser	Web Pages: Responsive Websites / Progressive Web Apps
Viewing Modes	
Media Player	View, edit, and export offline videos and images
Connected	View, configure, and manage any Wisenet WAVE system
Videowall	Put Desktop into VideoWall mode to control remotely
Showreel	Fully customizable timed viewing tour of any GRID media
Maximum # Of Grid Items	
64 Bit OS	64 Items (e.g. 64 live streams)
Hardware Requirements	
Minimum Supported Specs	Hard Drive: HDD/SSD/mSATA RAM: 2GB CPU: Quad Core Intel Celeron CPU or higher Graphics: Intel HD Graphics 3000 w/ OpenGL2.1 support Networking: 1GB NIC
Performance Specs	Hard Drive: Performance SSD RAM: 16 GB RAM CPU: Intel Core i5 Graphics: NVIDIA GeForce GTX 1050 (OpenGL2.1 support is required) Networking: 10 GB NIC

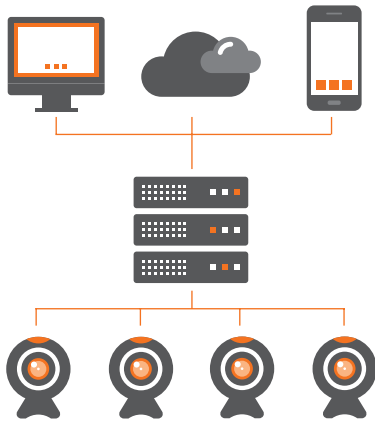
# Server

## Lightweight. Powerful. Server Hive.

The Wisenet WAVE server application is the foundation of the entire platform - with the ability to operate alone or as one part of a hive.

Wisenet WAVE is available as a downloadable software application from the Hanwha Techwin website which enables the installers to easily and effortlessly install and configure.

The supporting web-based application enables each Wisenet WAVE platform to be managed as a stand alone system or as part of a larger, scalable video management solution. The application also provides an audit trail, real-time health monitoring and camera failover support, as well as reports on server health and storage status.



## Server Hive

Connect to any Server w/ any Client

- Instant synchronization
- No single point of failure
- Automatic failover
- One-click upgrades

## Discover. Manage. View. Integrate.

The Wisenet WAVE server application is a lightweight, powerful media server responsible for discovering, connecting to and managing Wisenet WAVE system devices and data.

Supported Operating Systems:



Microsoft Windows



Ubuntu Linux

Discover	Manage	View	Integrate
IP Cameras (ONVIF, Custom)	IP Cameras / NVRs / DVRs	Live Video (adaptive)	HTTP Generic Events
RTSP/HTTP Streams	Advanced Routing	Recorded Video (adaptive)	HTTP Request-as-an-Action
I/O Devices	Storage (HDD/NAS/DAS)	Server Health	Server API
Servers / Systems	Events & Rules Engine	Log Files	Storage SDK
SAMBA NAS	Failover	Audit Trail	Video Source SDK
	Transcoding	Storage Status	Any Device or System
	HTTPS & Encrypted video traffic		Metadata SDK & Plugins

# Server Application



## Supported Operating Systems



Windows 8  
 Windows 8.1  
 Windows 10  
 Windows Server 2012  
 Windows Server 2012 R2  
 Windows Server 2016 (Long-term Service Channel) 1607  
 Windows Server 2019



Ubuntu Linux 16.04 LTS  
 Ubuntu Linux 18.04 LTS  
 Ubuntu Linux 20.04 LTS

Supported Media Streaming																					
Live Streams	Video: H.265 H.264 MJPEG Audio: AAC PCM (Mu-Law, A-law) g726 MP3																				
Live Streams (Available to pull from Server to 3rd Party)	Video: H.265 H.264 MJPEG WebM Audio: AAC PCM (Mu-Law, A-law) g726 MP3 Protocols: RTSP MJPEG WebM HLS																				
Other																					
Automatic Camera Failover	~1 Min. Configurable.																				
Transcoding	Supported (For Web Client, Mobile, Api)																				
Database	SQLITE + Proprietary Archive Index																				
Single Sign On	LDAP / Active Directory																				
Security	Open SSL Salted MD5 Hash TLS/SSL HTTPS																				
Dev tools	Server API (HTTP) / Video source SDK / Storage SDK / Metadata SDK																				
NAS	SAMBA (Authenticated, Unauthenticated)																				
Scalability																					
# Of Resources Per System:	10,000																				
# Of Clients Per System:	Unlimited																				
# Of Streams Per Server:	128																				
# Of Servers In a Server Hive	100 (100 is a recommended maximum. Contact technical support for more info).																				
# Of Users In a System	1,000																				
Hardware Recommendations																					
Recommended based on # of streams	<table border="1"> <thead> <tr> <th>Streams</th> <th>RAM</th> <th>NIC</th> <th>CPU*</th> </tr> </thead> <tbody> <tr> <td>Up to 16</td> <td>2 GB</td> <td>1 GB</td> <td>Dual Core Atom</td> </tr> <tr> <td>Up to 32</td> <td>4 GB</td> <td>1 GB</td> <td>Dual Core Atom</td> </tr> <tr> <td>Up to 64</td> <td>8 GB</td> <td>1 GB</td> <td>Core i3</td> </tr> <tr> <td>Up to 128</td> <td>16 GB</td> <td>1 GB</td> <td>Core i3</td> </tr> </tbody> </table>	Streams	RAM	NIC	CPU*	Up to 16	2 GB	1 GB	Dual Core Atom	Up to 32	4 GB	1 GB	Dual Core Atom	Up to 64	8 GB	1 GB	Core i3	Up to 128	16 GB	1 GB	Core i3
	Streams	RAM	NIC	CPU*																	
	Up to 16	2 GB	1 GB	Dual Core Atom																	
	Up to 32	4 GB	1 GB	Dual Core Atom																	
	Up to 64	8 GB	1 GB	Core i3																	
Up to 128	16 GB	1 GB	Core i3																		
*CPUs data correct at time of print.																					

## Mobile

### Smart Phone. Smart Video.

A mobile app provides the opportunity to remotely access the key functions of Wisenet WAVE from a smart device to enable 'on-the-road' users to view and respond to any incidents captured by Wisenet cameras.



### Connect. View. Search. Control.

Wisenet WAVE Mobile, with a custom developed media player, is a low-latency, user-friendly mobile application for iOS and Android devices that allows users to connect to, view, search and control IP cameras over Wi-Fi or data networks.

Supported Operating Systems:



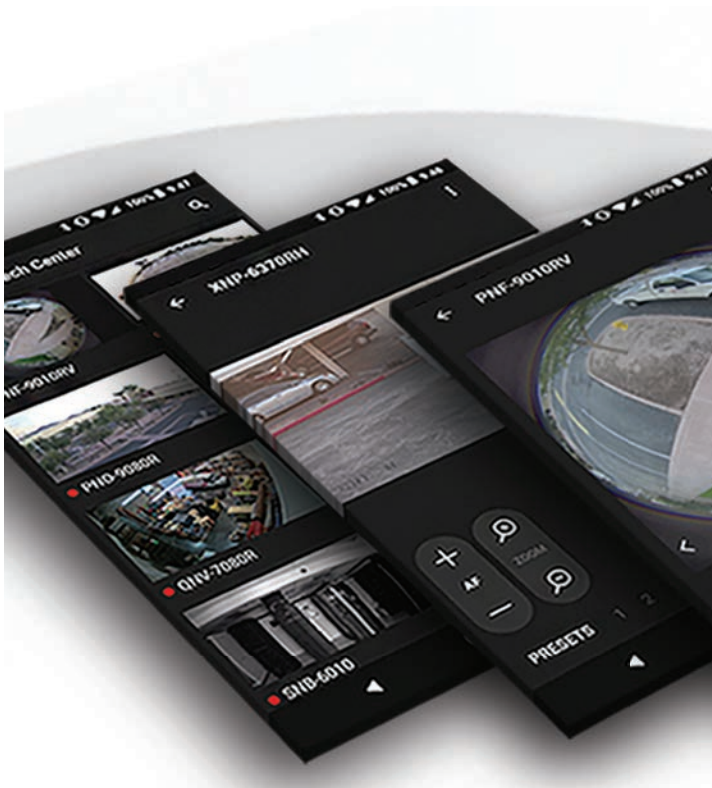
Google Android



Apple iOS

Connect	View	Search	Control
Wifi	Live Video (adaptive)	Keyword	Advanced PTZ / Standard PTZ
Data 4G/LTE	Recorded Video (adaptive)	Calendar	Fisheye Dewarping
	Layouts	Flex Timeline	2 Way Audio
	Available Systems	Smart Motion Search	

# Mobile



## Supported Operating Systems



Oreo	8.0 - 8.1
Pie	9.0
Android 10	10.0
Android 11	11.0



iOS 11	11.0
iOS 12	12.0
iOS 13	13.0
iOS 14	14.0



Supported Media Playback	
Streams	Codecs: H.265 H.264 HLS
Features	
Remote Connect	Login using local or Wisenet WAVE Sync credentials
Live Thumbnails	Thumbnails refresh in real time
Keyword Search	Search for cameras or layouts by name
Calendar Search	Search by date and time
Smart Motion Search	Search motion events within the entire video or specific region
Advanced PTZ	Point pan, zoom, tilt controls, PTZ presets
Fisheye Dewarping	Dewarp fisheye images
Adaptive Scaling	Hi / low resolution switching transcoding
Layouts	View thumbnails of System Layouts
Quick System Switch	Quickly switch between multiple Wisenet WAVE systems

# WISENET

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**REVISED 11-2021**



## **DIVISION 11**

### **SECTION 11194 - MANUFACTURED STEEL DETENTION CELLS**

#### **PART 1 - GENERAL**

##### **1.1 SCOPE**

This specification covers the requirements, including labor, materials, services and equipment for the manufacturing, delivering and installing of pre-engineered, prefabricated Steel Detention Cells.

##### **1.2 RELATED DOCUMENTS**

Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 specification sections, apply to the work of this section.

##### **1.3 REFERENCES**

The publications listed in this section form a part of this specification to the extent referenced. The publications are referenced herein by basis designation only.

ASTM A366/A366M - Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality

ASTM A569/A569M - Specification for Steel, Carbon (0.15 Maximum), Hot-Rolled Sheet and Strip Commercial Quality

ASTM A666 - Specification for Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar

ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Testing Apparatus

ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation

ASTM D3359 - Test Methods for Measuring Adhesion by Tape Test

ASTM D2240 - Test Method for Film Hardness by Shor D

ASTM F1450 - Test Methods for Hollow Metal Swinging Door Assemblies for Detention Facilities

ANSI/AWS D1.1 - Structural Welding Code-Steel

ANSI/AWS D1.3 - Structural Welding Code - Sheet Steel

AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings

AISC Load and Resistance Factor Design Specification for Structural Steel Buildings

AISI ASD/LRFD Design Specification for Cold-Formed Steel Structural Members

SSPC-SP1 - Solvent Cleaning

SSPC-SP6 - Commercial Blast Cleaning

SSPC-SP7 - Brush-off Blast Cleaning

**SUMMARY****1.4 The Steel Detention Cell Manufacturer (DCM) shall provide the following and as indicated in PART 5 - DIVISION OF RESPONSIBILITY. (per design requirements)**

1. *Security Doors and Frames*
2. *Chase Doors and Frames*
3. *Light fixtures*
4. *Conduit, back boxes and pull strings as required*
5. *Insulation*
4. *Plumbing Fixtures as specified*
5. *Integrated HVAC Grilles*
6. *Furnishing and accessories as specified*

**1.5 APPROVED MANUFACTURERS**

Basis of Design: Maximum Security Systems - Fyffe, Alabama  
 Dave Tierney  
 dave@mssi.us

- A. Or approved equal.  
 Firms wishing to be pre-qualified must submit in writing, no later than twenty (20) business days before the bid, the pre-qualification package must include the following:
- a. A notarized statement from the Owner or the company's President, listing those products that will be used. No exceptions to this bill of materials shall be accepted after the awarding of the contract. Multiple selections are not acceptable. State in writing, your intent to "comply fully with the requirements of this specification and to hold harmless the Architect, Engineer, and the Owner from omissions of a casual nature that would be considered to be an implied requirement for a fully operational modular cell system." Provide a list of compliance to and non-compliance for each section of this specification. Compliance/Non-compliance must be a formal listing of each section and subsection of this specification and an explanation of compliance/non-compliance for each section and subsection.
  - b. A list of all outstanding or past judgements or lawsuits against the company Owners, under their current name, or any previous name or business entity.
  - c. Design Engineering Capability:
    1. The modular steel cell producer must have current design engineering capability to provide the final engineered structural design for modular steel cells and associated items and their integration into the building construction.
    2. Submit a list of the engineering design staff, listing the name, title, discipline, degree, registration, licenses, and years of experience designing detention structures.
    3. Submit a list of technical support personnel collaborating with the design engineers.
    4. Submit samples of design engineering systems (or samples of previous projects) in either AutoCAD or DXF format.
  - d. In-House production engineering capability:
    1. The modular steel cell producer must have current, in-house production management, with at least three (10) years of cell experience, capable of understanding design engineering documentation and managing the fabrication and erection process to produce the modular steel cells as engineered.
    2. Submit a list of key in-house production management staff giving name, credentials, number of years experience, years with company, and title.

- e. Production Capacity:
  1. The modular steel cell manufacturer must have the production capacity required to produce a minimum of three (3) cells per day or fifteen (15) cells per work week with sufficient manpower and financial resources to produce the required number of cells within the time period specified in the contract construction schedule.
  2. Submit name, location and historic production rate and annual production capacity of the plant, crew and equipment proposed.
  3. Submit the estimated quantity of work under contract and either scheduled or anticipated for the production facilities proposed for the time period of this project. List the projects and estimated production dates.
- f. Upon receipt of the pre-qualification package, the Architect/Engineer will review the package for compliance/non-compliance with the specified requirements. Compliance with all of the pre-qualification requirements will be strictly enforced. Approval of all pre-approved alternates will be issued in an addendum prior to the bid date. The determination of acceptance and non-acceptance is the sole discretion of the Architect/Engineer. All decisions are final.

## 1.6 SUBMITTALS

1. General:  
Submit the following according to conditions of Contract and Division 1 Specifications Sections.
2. Product data and instructions for manufactured materials and products. Include manufacturer's certifications and laboratory test reports as required.
3. Shop drawings prepared by or under supervision of a qualified licensed professional, showing complete information for fabrication and installation of Steel Detention Cell units. Indicate member dimensions and cross-section; location, size and type of reinforcement, including special reinforcement; and lifting devices necessary for handling and erection. Coordinate shop drawings with other trades to ensure compatibility of required service connections.
4. Provide catalog data with full performance criteria and dimension for components purchased from outside sources.
5. Submit color samples for review and selection by the Owner. Submit samples of the cell finish, color, and texture.
6. Submit drawings of recommended bearing pads and/or special anchoring devices.
7. Provide shipping, lifting and handling diagrams indicating point loads and net and gross loads.

## PART 2 - PRODUCTS

### 2.1 ENGINEERING AND DESIGN

The DCM shall provide Professional certification for the design of the manufactured Steel Detention Cells to support superimposed dead loads and live loads as indicated on the contract documents. The DCM shall certify the design for compliance with applicable governing code requirements.

The design shall include integration of Steel Detention Cells into the physical floor plan, sections, elevations, and structural design of the facility and shall assure that all systems specified in the contract documents are interfaced completely with Steel Detention Cells for a fully installed, fully working facility.

## 2.2 WORKMANSHIP

1. All units shall be tightly fitted and securely fastened with no through seams or cracks. Minimum of 3/16" thick (A-36) American Made Carbon Steel Plate with continuous welded seams.
2. All panels and assemblies shall be inspected for correct dimensions, joint configuration, straightness, fairness and squareness.
3. All exposed edges shall be chamfered or bent for finger contact.
4. Out-to-out length, width and height dimensions of individual cell units shall be a tolerance of +/-1/4 in. (6.4mm). The cumulative tolerance in any direction shall not exceed the available horizontal or vertical dimension for the entire assembly of cell units.
5. All ceiling joints and cell corner joints shall be continuous welded.
6. Joints to be welded shall be cleaned and prepared as necessary to assure quality welds.
7. Welding shall be controlled and sequenced to reduce warpage and distortion.
8. All welds shall be free of deleterious porosity, pinholes, and cracks.
9. Finished welds shall be smooth, and weld spatter and flux shall be removed.
10. All Bunks, Desk, Seats, horizontal to vertical walls and ceilings to be continually welded. Stitch welding will not be accepted.

## 2.3 STRUCTURAL COMPONENTS

1. Framing, floors, walls, and ceilings, as required, shall be constructed of steel shapes, tubing, stiffened plates, cold-formed sections, and/or sheets stiffened with formed sections from steels conforming to design requirements to provide adequate structural strength including the ability to support loading as specified.
2. Structural steel shall be designed to AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings or AISC - Load and Resistance Factor Design Specification for Structural Steel Buildings. Cold-formed steel shall be designed to AISI - Specification for the Design of Cold-Formed Steel Structural Members.
3. Welding shall be in conformance with ANSI/AWS D1.1, Structural Welding Code - Steel and/or ANSI/AWS D1.3, Structural Welding Code - Sheet Steel, as applicable.
4. Tamper resistant fasteners shall be used for all exposed fasteners where required for accessories.
5. Mounting and bearing pads, anchorages, spacers, and alignment devices, except those shown to be field installed, shall be furnished and attached.

## 2.4 DOORS, WINDOWS, AND FRAMES

1. All door, window, and frame construction shall be of an equivalent security level to the wall framing in which they are to be mounted.
2. Materials
  - a. Interior security and cell doors: Face sheets shall be as specified

conforming to ASTM [A366/A366M] [A569/A569M] steel.

*For interior are as subject to corrosive conditions, specify ASTM A653/A653W(A60, G60 / Z180, ZF180).*

- b. Exterior doors: Face sheets shall be 0.083 in. (2.3mm) minimum thickness conforming to ASTM A653/A653M (A60, G60 / Z180, ZF180) steel.
  - c. Door and window frames shall be as specified. Doors, Windows, and Frames shall be those equal in design and quality of those manufactured by approved door manufacturer.
3. Glass and Glazing
- a. DCM shall provide and install all door and cell window glass utilized in the modular steel cell windows shall be as scheduled in the door and window schedule.

## 2.5 ELECTRICAL

1. The DCM shall provide the light fixture, conduit, back boxes and pull stings.
2. Light Fixture:  
The light fixture shall be a recessed Kenall model RCCA, or equal, as specified. The housing shall be 14 gauge steel. The frame shall be 14 gauge with .250 polycarbonate and .125 prismatic acrylic overlay. Voltage is 120-277 volts. The finish shall be baked-on white enamel. With security Torx fasteners. The night light will be a LED w/light level control (100% to 20%). All fixtures will provide a minimum of 20-foot candles of light at the desk and the mirror per ACA standards.
3. Intercommunication and Video Surveillance device prep with back boxes and conduit specified in the Detention Electronic Systems specification section. Devices will be by others.
4. Termination of lighting, communications and controls permanent connections in the cell's service chase shall be performed by others.

## 2.6 PLUMBING

1. The DCM shall provide and install the plumbing fixtures for the pre-finished modular steel cells. The DCM shall supply the specified flush valve and accessories for the combination toilets separate and uninstalled. The flush valves shall be installed by others.
2. Plumbing Fixtures:  
Lavatory/Toilet Combination Unit: Unit shall be by Acorn Engineering, or approved equal, as specified.  
  
Handicap Lavatory/Toilet Combination Unit: Unit shall be by Acorn Engineering or approved equal, as specified.
3. Final adjustment and connections of all plumbing fixtures shall be by others.

## 2.7 HVAC

1. Each Steel Detention Cell shall be designed, manufactured and equipped to receive the required HVAC fixtures specified in other divisions of this specification.
2. The DCM shall provide integral HVAC grilles. The grilles shall be pre-punched perforated panel in compliance with the specified CFM requirement. A flange suitable for the attachment of the HVAC duct shall also be provided.

## 2.8 THERMAL AND ACOUSTICAL INSULATION

1. Insulation Material: Materials shall be approved by the applicable codes of NFPA and governing authorities to provide a fire resistance classification as required.
2. Thermal Insulation: Walls, floors, and ceilings shall be insulated to R-values as indicated on the contract drawings.
3. Acoustical Insulation: The walls between cells and adjacent rooms shall have a Sound Transmission Classification of not less than 60 (ASTC – 60)
4. As manufactured by Roxul, 551 Harrop Drive, Ontario L9T 3H3 800-265-6878, or approved equal.

## 2.9 FURNISHINGS, AND ACCESSORIES

1. Steel Cell Furniture: Where shown on the contract drawings as cell furniture to be so provided, the DCM shall provide and install wall mounted bunks, tables, shelves and stools. Bunks, shelves and tables shall be fabricated out of American Made 3/16" thick (A36) Carbon Steel Plate minimum thickness and of the sizes shown. All installed furnishings shall be continuously welded, stitch welding is not acceptable. DCM shall include drawings which detail materials, construction, and attachment. These drawings shall be a part of the submittals as outlined in Section 1.5 herein. Fabrication of these items shall not begin prior to the Architect's approval.
2. Stool Top: DCM shall furnish and install 12" stool top, similar to a Northwest 610 bolt on or approved equal.
3. Grab Bars: DCM shall furnish and install stainless steel grab bars as specified, similar to Norix IGS-336-3 or approved equal.
4. Clothes Hook: DCM shall furnish and install stainless steel clothes hooks as specified, similar to Northwest 608-53.
5. Detention Mirrors: DCM shall furnish and install detention mirrors as specified, similar to Northwest 605-1 or approved equal.
6. Handicap Toilet Paper Holder: DCM shall furnish and install a wall mounted and recessed Toilet Paper holder at each handicap combination fixture as specified, similar to Northwest 621 or approved equal.
7. Fixtures, Furnishings and Accessories Load Test: Reinforce walls, stiffen furnishings, and provide connections as required to support dead loads plus single point (concentrated) static live loads as indicated, at maximum distance on each from wall and from supports for each of the following:
  - a. Wall mounted desk and seats - 600 lbf
  - b. Wall mounted locker - 600 lbf
  - c. Grab bars - 600 lbf
  - d. Wall mounted lavatory - 1000 lbf
8. All furnishings and accessories shall be caulked with 2 part pick resistant caulk to close gaps at wall surfaces. Where required all accessories shall be mounted using stainless steel Torx head detention grade security fasteners.

**2.10 AUTOMATIC FIRE PROTECTION SYSTEMS (as applicable)**

1. The DCM shall provide a prepared location for the installation of the sprinkler head by the fire protection contractor.
2. The DCM and fire protection contractor shall coordinate to confirm the type and location of the sprinkler head to ensure the proper interface of work.

**2.11 FINISH**

1. All exposed surfaces shall be cleaned and finished in accordance with SSPC-SP1, SSPC- SP6 or SSPC-SP7 as specified by the paint manufacturer.
2. Painting: All finished steel wall and ceiling assemblies shall be electrostatic powder coated with a Zinc rich primer rust inhibitor prior to being top-coated with a finish powder coat on all exposed surfaces. The finish coatings shall meet this criterion as a minimum:

**Zinc Primer Cured Film Properties**

All Tests were performed at a film thickness of: 1.0to 2.5mils

Test	Method	Range
Gloss @ 60 Degrees	D5 23	60% +/- 7%
Direct Impact (Inch LBS)	D2794	120-in. lbs
Indirect Impact (Inch LBS)	D2794	120+ in. lbs
Pencil Hardness:	D3363	2H+
Cross Hatch Adhesion	D33598B	4H+
Flexibility (Conical Mandrell)	D1737/D522	90%

Application: this product was designed to be applied by electrostatic spray on steel or galvanized steel.

**Finish Coat**

- a. Corrosion Resistance: Meets ASTM B117, for 1000 hours.
  - b. Impact Resistance: Meets ASTM D2794, impact force of 140 in-lb.
  - c. Abrasion Resistance: Meets ASTM D4060, for 75 mg loss.
  - d. Adhesion Resistance: Meets ASTM D4541, for 2000psi.
  - e. Hardness: Meets ASTM: Meets ASTM D2240, for 6H.
3. Cells shall be of a color as selected by the Owner from samples submitted by the manufacturer. As an additive option, doors furnished with cells may be a second color as selected by the Owner. Upper tier cell floors may be finished a floor gray as an additive option. Available colors shall be included with cell product data submittals. *(additive option shall be noted on the contract drawings)*
  4. The exterior of the cell fronts and cell door along with the cover plates shall be finished using the same powder coat procedures as the finish applied to the cell interiors.

**2.12 MEZZANINES, RAILINGS, AND STAIRS**

1. DCM shall fabricate and provide Cell mezzanine walkway as specified and outlined in the construction documents and the Division of Responsibility.
2. DCM shall coordinate locations and device types for under mezzanine lighting and fire protection. DCM shall provide sleeves, conduit and back boxes for installation of devices by others.
3. Mezzanine walk surface shall be finished by DCM to match upper cell floors, color selected by owner.
4. Railings and stairs by others, DCM and Fabricator shall coordinate in order to ensure proper interface of work.

## **PART 3 - DELIVERY AND INSTALLATION**

### **3.1 DELIVERY SEQUENCING AND SCHEDULING**

1. DCM shall coordinate the scheduling of delivery to the project site. A mutually approved schedule shall be determined by the project scheduler and DCM at the pre- construction meeting. The sequencing of the cell units shall conform to this schedule to properly interface the delivery and installation of cells at the proper time during the construction period.
2. DCM shall deliver cell units, to a designated project site, properly protected from shipping damage. The General Contractor shall provide suitable protective coverings, devices or such methods and procedures to protect the cells from damage from the weather or vandalism. Protective measures shall remain throughout the construction period. Unloading and handling of the cell units shall be the responsibility of the installer.

### **3.2 SITE INSPECTION**

The installer of the structural steel cell units shall examine areas and conditions under which the structural steel cells are to be installed. The installer is to notify the contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

### **3.3 INSTALLATION**

1. The General Contractor, or DEC under a separate contract shall install or provide a qualified installer to install the steel cells. The DCM shall provide a qualified on-site representative for initial cell installation to verify proper cell offloading and installation procedures.
2. The General Contractor shall provide adequate access for the DCM's tractor-trailer transport trucks. This access shall be suitable enough so that the trucks will have the needed room to maneuver under their own power.
3. Steel cell units shall be set in place by the installer and shall be checked for correct alignment and level. Shims shall be installed as necessary and securely fastened to the foundation. Complete all connections, trim and touch up, meeting the acceptable industry standards and manufacturer's recommendations.
4. The General Contractor shall provide for the protection of the cells from the weather and vandalism once the cells are delivered and installed.
5. Filling voids between the bottom of the cells walls and the floor with security caulk shall be provided by the General Contractor



## **PART 4 - WARRANTIES**

Provide special project warranty signed by the DCM, Installer, and Contractor agreeing to repair defective materials and workmanship of the steel cell, installation, and related work. The cell warranty shall be conditional upon normal use of the cells. Abuse and misuse or damage during a riot is not considered normal use. The Warranty shall be for a period of one (1) year from the date of acceptance by the Architect and/or Owner's representative.

## **PART 5 - DIVISION OF RESPONSIBILITY**

### **1. INSTALLATION ITEMS EXCLUDED BY DCM**

1. Cell to floor Security Caulking
2. On-Site Mechanical, Plumbing, and Electrical Connections to the Cell.
3. Interim Job-site Weather Protection.
4. Installation of Door hardware, locks and Security Electronics (Optional Installation by MFG).

### **2. INSTALLATION ITEMS FURNISHED BY DCM**

1. Shim Packs for Leveling Cells to Foundations or Floor Slabs, excluding mechanical fasteners.
2. Lifting Eyes on Cells.

### **3. FURNISHINGS PROVIDED BY DCM**

1. Cell Door Glazing
2. Cell Electrical Back Boxes and Conduit
3. Cell Light fixtures
4. Cell Intercom Station, excluding devices
5. Cell Video Surveillance back boxes and conduit
6. Cell Plumbing fixture
7. Cell Bunks, ladder, Tables, Stools and shelves
8. Cell Weld-In Accessories
9. Other cell accessories as specified.

*Final coordination of responsibility should be made by GC, DEC, and DCM prior to bidding to ensure no exceptions or qualifications exist in proposal relationship.*

<b>Division of Responsibility</b>
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			DCM		OTHERS	
			Materials	Labor	Materials	Labor
1.0		Manufacture of <u>16</u> Steel Detention Cells,				
<b>2.0</b>		<b>Cell Security Doors</b>				
	2.1	Door Frames	X	X		
	2.2	Doors	X	X		
	2.3	Hinges	X	X		
	2.4	Locks			X	X
	2.5	Door Position Switch			X	X
	2.6	Door Closure			X	X
	2.7	Pulls			X	X
	2.8	Door Window Frame	X	X		
	2.9	Door Window Glazing	X	X		
	2.10	Food Pass	X	X		
	2.11	Food Pass Lock			X	X
	2.12	Food Pass Hinge	X	X		
	2.13	Security Calk Around Frames	X	X		
<b>3.0</b>		<b>Cell Chase Doors</b>				
	3.1	Doors and Frames	X	X		
	3.2	Hinges				
	3.3	Smoke Seal on Chase			X	X
	3.4	Locks			X	X
<b>4.0</b>		<b>Cell Windows</b>				
	4.1	Window Frames	X	X		
	4.2	Window Glazing	X	X		
	4.3	Security Caulk Around Frames	X	X		
<b>5.0</b>		<b>Cell Insulation</b>	X	X		
<b>6.0</b>		<b>Cell Interior Finish Coatings</b>	X	X		

			DCM		OTHERS	
			Materials	Labor	Materials	Labor
<b>7.0</b>		<b>Cell Furnishings</b>				
	7.1	Bunks	X	X		
	7.2	Desks and Seats	X	X		
	7.3	Mirrors	X	X		
	7.4	Clothes Hooks	X	X		
	7.5	DE - Intercom Station & Wiring			X	X
	7.6	Surveillance Camera and Wiring			X	X
	7.7	Intercom Station Glazing			X	X
	7.8	Surveillance Cameras Glazing			X	X
	7.9	Cell Padding			X	X
	7.10	Exterior 3/16" Plate Steel in Exposed Area	X	X		
	7.11	Security Caulk Around Furnishings	X	X		
<b>8.0</b>		<b>Plumbing Equipment and Fixtures</b>				
	8.1	Combination Toilet/Lavatory Units	X	X		
	8.2	Handicap Toilets and Lavatories	X	X		
	8.3	Drain			X	X
	8.4	Pressure Piping			X	X
	8.5	Flush Valves	X			X
	8.6	Metering Valves	X			X
	8.7	Cell Shower Heads and Valves, Receptor Pans	X			X
	8.8	Shower Pans			X	X
	8.9	Sprinkler System Heads			X	X
	8.10	Sprinkler System Piping			X	X
	8.11	Security Caulk Around Fixtures			X	X
<b>9.0</b>		<b>Electrical and Lighting</b>				
	9.1	Recessed Mounted Light Fixtures	X	X		
	9.2	Install Light Fixtures		X		
	9.3	Electrical Conduit Terminated in Junction Boxes in Access Chase	X	X		

			DCM		OTHERS	
			Materials	Labor	Materials	Labor
	9.4	Electrical Whip from Light Fixture to Junction Box	X	X		
	9.5	Communication System Intercommunication Station and Video Surveillance Junction and Back Boxes	X	X		
	9.6	Security Caulk Around Lights	N/A	N/A		
<b>10.0</b>		<b>HVAC</b>				
	10.1	Supply and Return Security Grilles	X	X		
	10.2	Sleeve at Cell Grilles for Duct Connection	X	X		
	10.3	Sleeve at Cell Roof for Duct Connection	N/A	N/A		
	10.4	HVAC Duct			X	X
<b>11.0</b>		<b>Cell Installation</b>				
	11.1	Foundation Bearing Pad Installation	X			X
	11.2	Shim Packs for Cell Setting/Leveling	X			X
	11.3	Weld Connect Cells to Foundation Bearing Pads			X	X
	11.4	Mezzanine Walkways, Hand-railings, and Stairs. Fabrication, Finish Painting, and Installation	N/A	N/A		
	11.5	Floor Sealer at Concrete Cell Floors	N/A	N/A		
	11.6	Security Sealant/Caulking Cell to Cell Joints			X	X
	11.7	Provision of Suitable Site Surface Preparation for Access of Cell Transportation Trucks & Cranes			X	X
	11.8	Delivery of Cells	X	X		
	11.9	Off-load Cells			X	X
	11.10	Crane to Off-Load Cells			X	X
	11.11	Rigging to Off-Load Cells			X	X
	11.12	Storage and Protection of Cells On Site			X	X
	11.13	Erect Cells			X	X
	11.14	Masonry Reinforcement Brackets			X	X
<b>12.0</b>		<b>Taxes and Bond</b>				
	12.1	Taxes	N/A	N/A		
	12.2	Bond	N/A	N/A		

**SECTION 15010**

**GENERAL PROVISIONS – MECHANICAL**

**PART 1 – GENERAL**

**1.1 SCOPE:**

- A. Provisions of this Section apply to all HVAC, Plumbing, Fire Protection, and Test and Balance work.
- B. Include the provisions of General Conditions as part of this Section.
- C. Provide all labor, materials, equipment, and services necessary for the completion of all Mechanical work shown or specified, complete and ready for operation, consisting in general of the following:
  - 1. A new HVAC System serving the new addition consisting of split-system heat pumps, general building and smoke exhaust fans and extension of the existing BAS System.
  - 2. A system of sanitary drain, waste, and vent piping.
  - 3. A system of domestic water piping.
  - 4. Provide wet automatic sprinkler system coverage for the new addition to the building.
- D. Give required notices, file drawings, obtain and pay for permits, deposits and fees necessary for the installation of the Mechanical work. Obtain and pay for inspections required by laws, ordinances, rules, regulations or public authority having jurisdiction. Obtain and pay for certificates of such inspections, and file such certificates with Owner.
- E. "Provide" means to furnish and install, complete and ready for operation.

**1.2 USE OF BUILDING SYSTEMS FOR TEMPORARY HEAT/AIR CONDITIONING DURING CONSTRUCTION:**

- A. Building HVAC systems shall not be used during construction unless the following conditions are met: (Existing systems may be used during construction and the following must be met:)
  - 1. Cleaning of water systems shall have been completed.
  - 2. All return air and outside air openings shall have temporary filter media installed over inlet side of openings and secured air tight there-to.
  - 3. Air filters of quality specified for ultimate use shall be installed in the air handling units.
  - 4. Motors shall have correct overload elements installed in the starters.

5. All safety controls shall be in operation.
- B. Contractor shall turn system over to Owner in condition equal to that which would have occurred if the systems had not been used during construction.

**1.3 DRAWINGS:**

- A. Mechanical Drawings are diagrammatic and subject to requirements of Architectural Drawings and conditions existing in the field. Mechanical Drawings indicate generally the location of components and are not intended to show all fittings or all details of the work.
- B. Follow the drawings closely, coordinate dimensions with Architectural Drawings and field conditions. DO NOT scale mechanical drawings for location of system components.
- C. Make no changes without Architect's written permission. In case of doubt, obtain Architect's decision before proceeding with work. Failure to follow this instruction shall make the Contractor liable for damage to other work and responsible for removing and repairing defective or mislocated work in proper manner.
- D. DO NOT scale drawings to locate ceiling diffusers or sprinkler heads. COORDINATE with lighting and ceiling grids. Contractor for Mechanical work is responsible for coordinating with all trades.
- E. Drawings and specifications are complementary. Work shown or specified in one is binding as if shown or specified in both. Any discrepancies between the drawings and specifications shall be brought to the attention of the Consultant for clarification during the bidding period. No allowance shall be subsequently made to the Contractor by reason of his failure to have brought said discrepancies to the attention of the Consultant during the bidding period or by reason of any error on the Contractor's part.
- F. No attempt has been made to establish the required sections or splits of equipment relative to the size of access into the space, building, etc. Contractor shall establish all said splits, sections, etc. necessary to install equipment complete without undue disassembly of equipment or demolition of building parts at site of work.

**1.4 APPLICABLE CODES AND STANDARDS:**

- A. Comply with the current editions of the following Codes and Standards:
  1. ANSI/B31.9 - Code for Building Services Piping
  2. ANSI/ASHRAE 15 - Safety Code for Mechanical Refrigeration
  3. ASHRAE 62.1 - Ventilation for Acceptable Indoor Air Quality
  4. ASHRAE 90.1 – 2013 Energy Compliance
  5. NFPA 13 - Installation of Sprinkler Systems
  6. NFPA 24 - Installation of Private Fire Service Mains and Their Appurtenances

7. NFPA 25 – Standard for Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.
8. NFPA 70 - National Electrical Code
9. NFPA 90A - Installation of Air Conditioning and Ventilating Systems
10. NFPA 91 - Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids
11. NFPA 101 - Safety to Life from Fire in Buildings and Structures
12. Other standards as referenced in other sections of Division 15
13. 2015 International Building Code
14. 2015 International Plumbing Code
15. 2015 International Mechanical Code

**1.5 QUALIFICATIONS OF SUBCONTRACTOR:**

- A. The Plumbing Subcontractor shall meet the following minimum qualifications:
1. He shall have been in business as a Plumbing Contractor for at least 3 years prior to the date of opening bids.
  2. He shall have a current Master Plumber's Certificate of competency issued by the State of **Alabama** and the City and County in which work occurs.
  3. He shall have a satisfactory experience record with Plumbing installation of character and scope comparable with this project and shall have completed three such installations in the past three years.
  4. If the sub-contractor, with the Engineer's approval, uses a sub-subcontractor to provide another discipline that the sub-contractor does not normally furnish, that sub-subcontractor shall meet the same qualifications as the sub-contractor.
- B. The Fire Protection sub-contractor shall meet the following minimum qualifications:
1. He shall have been in business as a Contractor for Fire Protection work continuously, for at least 3 years prior to the date of opening bids for this project.
  2. He shall have a satisfactory experience record with Fire Protection installations of character and scope comparable with this project and shall have completed three such installations in the past three years.

3. He shall be qualified, certified and licensed by the State of Alabama Fire Marshal. He shall meet all laws pertaining to fire protection in the Code of Alabama 1975 and any amendments of same.
- C. The Air Conditioning Subcontractor shall meet the following qualifications:
1. He shall have been in business as an air conditioning contractor for at least 3 years prior to the date of opening bids, and shall have held a license from the Alabama State Licensing Board for General Contractors for at least 3 years.
  2. He shall have a satisfactory experience record with air conditioning installations of character and scope comparable with this project, and for at least 3 years prior to the date of opening bids shall have had an established service department capable of providing service inspection or full maintenance contracts.
  3. If the air conditioning subcontractor, with the Engineer's approval, uses a sub-subcontractor to provide another discipline that the subcontractor does not normally furnish, that sub-subcontractor shall meet the same qualifications as the subcontractor.

**1.6 CONFLICTS AND INTERFERENCES:**

- A. If systems interfere or conflict, the Architect shall decide which equipment to relocate regardless of which was first installed.

**1.7 WORKMANSHIP:**

- A. Do all work in a neat and first-class manner. Remove and replace work not done in such manner as directed by the Architect.

**1.8 COOPERATION:**

- A. Cooperate with all other crafts. Perform work in a timely manner. Do not delay the execution of other work.

**1.9 VISITING SITE:**

- A. Visit site and become familiar with location and various conditions affecting work prior to bid. No additional allowance will be granted because of lack of knowledge of such conditions. No consideration shall be given to future claims due to existing conditions. Any discrepancies or interferences shall be reported immediately to the Architect/Consultant.

**1.10 MATERIALS:**

- A. Unless otherwise noted, provide new, standard, first-grade materials throughout. Unless otherwise noted, **all pipe, fittings and valves shall be manufactured in the U.S.A.**



- B. Where materials or products are specified by manufacturer's name, brand, trade name, or catalog reference, such named materials or products shall be the basis of the estimate, without substitution, and shall be furnished under the contract unless requests for equivalents are approved as noted below. Where two or more brands are named the choice of these shall be optional with the Contractor.
- C. Equivalents will be considered only if written request for approval has been received by the Architect (from a general contract bidder) 10 days prior to the date established for receipt of Proposals. Each request shall include the name of the material or equipment for which an equivalent is proposed and a complete description of the proposed equivalent including drawings, cuts, performance and test data, and deviation from the specification and any other information necessary for evaluation. A statement setting forth any changes in other materials, equipment or other Work that incorporation of the equivalent may require shall be included. The burden of proof of the merit of the proposed equivalent is upon the proposer. The Architect's decision of approval or disapproval of a proposed equivalent is final.
- D. If the Architect approves any proposed equivalent prior to receipt of Proposals, approval will be set forth in an Addendum. **DO NOT RELY UPON APPROVALS MADE IN ANY OTHER MANNER.**
- E. No proposed equivalent will be considered after the Contract has been executed, except as described in the General Conditions.
- F. Within 45 days of execution of contract and before ordering materials or equipment, submit to Architect and obtain his approval of a detailed list showing each item which is to be furnished by make, trade name, catalog number, or the like; together with manufacturer's specifications, certified prints, and other data sufficient for making comparisons with items specified. When approved, such schedule shall be of equal force with these specifications in that no variation there from shall be allowed except with Architect's written approval. Submit PDF format files for approval. Provide PDF files of approved data for project close-out.
- G. Similar items of equipment shall be the product of the same manufacturer.

**1.11 SHOP DRAWINGS:**

- A. Before starting work, submit and obtain approval of detailed drawings of the following, fully dimensioned (including elevations of ductwork and piping) and drawn to 1/4" to 1'-0" scale.
  - 1. Ductwork (do not scale for diffuser locations, but coordinate with ceiling grids and lighting layout). See Section "Air Distribution". Shop drawings shall include material type (stainless steel, galvanized), finish (paint grip, etc.), actual sizes increased to allow for internal insulation and gauges along with fabrication section notes for individual sections. In addition, include elevations of bottom of duct above finished floor level. Show building sections through congested areas for coordination with structure and other disciplines. Provide joint details, duct seal methods, insulation type, etc.
  - 2. Submit details of all apparatus casings and plenums.
  - 3. Apparatus casings.
  - 4. Complete mechanical equipment and fan room plans showing location of equipment, conduit stubs for motors, floor drains, and equipment pads and foundations.

5. Equipment piping.
  6. Plumbing piping.
- B. Submit complete control and power wiring diagrams for approval before installing controls. See Controls Section.
  - C. Thirty days before starting work, submit Fire Protection shop drawings bearing seals of approval of Owner's Underwriters and all Governmental Agencies having jurisdiction. Complete shop drawings are required to be submitted at one time. (See Section 15500.)
  - D. Engineers' CAD/electronic drawings files will be available upon request for the convenience of the contractor and for use in preparation of shop drawings. A service fee of \$100.00 per drawing sheet file shall be remitted to the Engineer prior to delivery of CAD/electronic drawing files along with a signed agreement between the Engineer and Contractor.

**1.12 RECORD DRAWINGS:**

- A. When work starts the Architect will furnish two complete sets of white prints of the Mechanical (Plumbing, Heating, Ventilating & Air Conditioning, Fire Protection) Drawings. All corrections, variations, and deviations, including those required by change orders, if any, must be recorded in colored ink or colored pencil at the end of each working day on these drawings. The marked prints shall be available at all times for the Architect's inspection.
- B. Prior to examining the request for final payment or making any response thereto, the Architect shall receive from the Contractor one complete set of the white prints, marked as stated above, indicating the actual completed installation of the work included under this contract.
  1. Accurately show location, size and elevation of new exterior utility work and its relationship to any existing utilities, obstructions, etc., contiguous to the area of work.
  2. Block out areas modified by change-order & identify them by change-order number.
  3. The Architect will forward the marked white prints to the Consulting Engineers for review. They will then be returned by the Architect to the Contractor for use in preparing record drawings.
- C. When work is completed, the Engineers' CAD/electronic drawing files will be made available upon request for the convenience to the contractor for a service fee of \$100.00 per CAD/electronic drawing sheet file and for use in preparing record drawings. Contractor shall transfer the information from the marked white prints to the CAD files, removing all superseded data in order to show the actual completed conditions.

**1.13 PROTECTION OF ROTATING PARTS:**

- A. For this paragraph only, "exposed" shall mean located in a casing or room or plenum with door large enough to admit a man.
- B. Equip exposed belt drives with belt guards with holes for measuring speeds of driven shafts.

- C. Provide exposed couplings with coupling guards.
- D. Equip propeller fan wheels with wheel guards.
- E. Equip inlets and outlets of exposed centrifugal fans with 1-1/2" #10 Diamond mesh galvanized steel screens.
- F. Equip all exposed plug fans with wheel screens.

**1.14 PROTECTION OF EQUIPMENT:**

- A. During construction, protect mechanical equipment from damage or deterioration.
- B. When installation is complete, clean equipment and make ready for painting.

**1.15 INSTALLATION OF EQUIPMENT:**

- A. Install equipment to provide normal service access to all components.
- B. Where drawings show sufficient space for removing components, install equipment to provide such clearance. *Provide space at all equipment power and control panels as required by local codes.*
- C. Install equipment in accordance with manufacturer's instructions. If manufacturer's instructions conflict with contract documents, obtain Architect's decision before proceeding.
- D. All equipment shall be firmly fastened in place:
  - 1. Pad mounted equipment shall be secured to pads using poured in place anchor bolts or cinch anchors.
  - 2. Vibration isolators shall be secured to floors or pads and equipment shall be bolted to the isolators.
  - 3. Air devices connected by flexible duct shall be secured independently of all other building systems to prevent falling if grid shifts.

**1.16 EQUIPMENT SUPPORTS:**

- A. Provide supports for ductwork, piping and equipment. Hot dip galvanize after fabrication all supports, etc., located outdoors. Where noted provide 304 stainless steel supports. At the Contractor's option, all supports, etc. located outdoors may be 304 stainless steel instead of hot dip galvanized.

**1.17 CUTTING AND PATCHING AND INCIDENTAL WORK:**

- A. Set sleeves and inserts and lay out and form openings in walls, beams, girders and structural floors in this Section.

- B. Cut, patch and repair as required to accomplish Mechanical Work and finish to match adjacent work. Architect's approval required before cutting any part where strength or appearance of finished work is involved.
- C. Provide all motors incidental to the Mechanical systems. Wiring of motors, switches and starters is included in "Electrical Sections".
- D. Do all control wiring required for Mechanical work and all power wiring required by Control Panels, Control System, and Control Devices.
- E. Furnish motor starters as specified below.
- F. Final water connections to services are included in this Section.
- G. Permanent drain connections from AC units, etc., and auto air vents to nearest floor drain are included in this Section.
- H. Door louvers are not included in this Section.

**1.18 FLASHING:**

- A. General: Furnish all fan curbs, pitch cups, metal base flashing and counter flashing required for Mechanical Work. Installation of above items is specified in Roofing Section.
- B. Fan curbs for power roof ventilators are specified with the fans.
- C. Pitch Cups: 20 gauge galvanized steel, at least 8" deep, bases mitered and soldered and extending at least 4" horizontally.
- D. Metal Base Flashing: Galvanized steel for ferrous items, and stainless steel for stainless steel items. Minimum thickness 22 gauge (0.034") galvanized steel, 20 gauge (0.038") stainless steel, 0.032" aluminum. Bases mitered and soldered extending out at least 4" horizontally and 8" vertically.
- E. Metal Counter Flashing: Of material and gauges specified for base flashing, lapping base flashing at least 3".
- F. Vent Pipe and Roof Drain Flashing: Specified in "Roofing Section".
- G. Shower pans specified in another section. Securely clamp drain to pan under this section.

**1.19 EXCAVATION & BACKFILLING:**

- A. Include all excavation and backfilling required to bring the work to line and grade shown, including excavation of rock and all other materials which may be encountered.

- B. Excavate trenches wide enough for proper installation of work. Grade trench bottoms evenly. Provide bell holes as necessary to insure uniform bearing for pipes. Excavate minimum 6" below pipe. Refill cuts below required pipe grade with sand or compacted gravel. Support pipe continuously along its entire length. (Do not use piers to support piping.)
- C. Backfill after inspection by Architect and authorities having jurisdiction. Backfill compacted areas (engineered fill) with sand or fine gravel (89/10) in accordance with requirements of "Sitework" no less than 95% compactancy. Backfill paved areas with sand or fine gravel (89/10) compacted to meet requirements of Paving Section. Backfill shall be free of rock, wood, steel, brick, etc. Do not disturb pipe. Restore or repair pavements and the like after backfilling, matching adjacent work.

**1.20 REMOVAL OF EXISTING WORK:**

- A. Dismantle the following items and remove them from the premises. Upon removal they shall become the Contractor's property:
  - 1. Equipment and piping noted "to be removed."
  - 2. Existing AC3.

**1.21 CONNECTIONS TO EXISTING SYSTEMS:**

- A. Make connections to existing systems only at time authorized, in writing, by Owner.
- B. Take existing systems and/or equipment out of service only at times authorized in writing by Owner.
- C. Drain existing systems and fill, vent, test, balance and put existing systems into operation after connections have been made.
- D. Repair existing insulation at points of connection to existing work.

**1.22 MOTORS, STARTERS & ELECTRICAL EQUIPMENT:**

- A. Provide electrical equipment compatible with the current shown on electrical drawings. Verify current characteristics before ordering equipment.
- B. Should the Contractor with the Architect's approval make changes in electrical equipment from that shown on the Electrical Drawings, the Contractor shall be responsible for the cost of required changes.
- C. Provide factory installed fuses in all equipment requiring fusing for branch circuit protection.
- D. Motors: 1750 RPM open drip-proof construction unless otherwise shown or specified. Integral horsepower motors shall meet NEMA premium efficiency levels as stated in the latest version of NEMA MG-1. Allis-Chalmers, General Electric, Goulds, Louis Allis, Westinghouse.

- E. Where motors are shown or scheduled to be connected to a variable frequency drive, this motor shall be an inverter duty rated by the motor manufacturer and shall comply with NEMA MG1, Article 31.
- F. Do not run motors until correct overload elements are installed in starters. Trading overload elements for elements of correct size for motors actually furnished shall be included in this Section.
- G. Furnishing all starters is included in this Section. Starter installation is specified under "Electrical Section". Starters shall be equipped with melting alloy thermal overload and phase loss protection, in all 3 phases.
- H. Unless otherwise shown or specified for single phase motors provide manual starters equal to Square D Class 2510. When installed in equipment rooms provide surface mounted enclosure, and when installed in finished walls outside equipment rooms provide flush mounted enclosure, key operated.
- I. Provide H-O-A switches, fused control circuit transformers, auxiliary contacts, etc., as shown on control diagrams or required by control sequences (and/or arrange for these items to be furnished with the starters specified in Division 16, Electrical Work.)
- J. All starters shall be the product of the same manufacturer.
- K. All control panels, electrical assemblies, etc. must bear a label from a recognized testing laboratory as an assembly, not as individual components.

**1.23 SLEEVES:**

- A. For pipe through floors inside fire rated chases or through non-fire-rated walls: 20 gauge galvanized steel, 1" larger than pipe or pipe covering.
- B. For pipe through concrete beams: schedule 40 black steel pipe, 1" larger than pipe or pipe covering.
- C. For pipe passing through floors outside fire rated chases and fire rated walls and partitions, provide 20 gauge steel sleeve leaving the annular space between pipe or pipe covering as required by UL systems. Where pipe is insulated, insulation shall be continuous thru sleeve. Refer to Section Through-Penetration Firestop Systems where included in the contract documents. Otherwise, seal between sleeve and pipe or pipe covering with 3M Brand Fire Barrier CP 25WB caulk, Flamestop V, Specified Technologies, Inc. "Spec Seal Sealant", Rectorseal Corp. Metacaulk 950 or Hilti FSONE bearing UL listing for actual conditions of installation, thickness and application in strict accord with UL reference for each type installation. *Any equivalents must meet the 10 day prior approval provision and must show UL approval for all conditions, bare pipe, insulated pipe, etc. For plastic piping material submittal must show UL approval for each application and if caulk comes in direct contact with pipe, it must be compatible and not injurious to the pipe.*
- D. Set sleeves before concrete is poured or masonry is erected. In existing construction, grout sleeves firmly in place.
- E. Sleeves for ducts: see fire dampers (Section: Air Distribution).
- F. Extend floor sleeves 1-1/2" above finish floor in areas where floor is subject to being wet during normal usage (mechanical rooms, toilets, etc.).

- G. Where exposed ducts pass through walls and partitions, provide 4" wide 20 gauge galvanized steel closure plates except at grilles and registers. Fit closure plates snugly to duct and secure to wall. Grout around ducts and sound absorbers at equipment room walls.
- H. Where exposed pipes pass through walls and partitions in finished spaces, provide chrome plated F & C plates or escutcheons.

**1.24 PAINTING:**

- A. Refinish equipment damaged during construction to new condition.
- B. Paint all non-potable water pipe and insulation yellow in accordance with Plumbing Code using paint of type specified in Painting Section.
- C. Paint un-insulated duct surfaces visible through grilles and registers flat black.
- D. Prime and paint all bare, exposed, exterior piping using type specified in Painting Section.
- E. Prime and paint all supports, etc. located indoors, except where noted to be galvanized.
- F. Other painting is specified in Painting Section, Finishes Division.

**1.25 PIPE IDENTIFICATION:**

- A. Identify all piping exposed to view or accessible through removable ceilings or access panels with plastic snap-on pipe line markers. Color code markers in accordance with ANSI A13.1. Show pipe contents and direction of flow. (Markers on lines 8" OD and smaller shall be taped in place; on lines over 8" OD secure with spring clips.) Markers shall be equal to Craftmark, Brady, Seton or Brimar.
- B. Protect all factory identification tags, nameplates, model and serial numbers, etc., during construction and replace if damaged.
- C. Label Spacing and Extent:
  - 1. On straight run of pipes: Above suspended ceilings space labels approximately 10 feet on center; elsewhere, 20 feet on center.
  - 2. Wherever a pipe enters or leaves a room or building.
  - 3. At change of direction.
  - 4. At main valves and control valves (not equipment valves).
  - 5. At manifolds.
  - 6. On risers, just above and below floors.

7. All natural gas piping in the 2 psig system: label at the beginning, at all gas cocks, at ends and at 6'-0" intervals with labels reading "2 psig".

**1.26 VALVE TAGS:**

- A. 2" X 3" laminated plastic with 1/2" numbers engraved at top, leaving space for further engraving by others. Secure tags with chains to valve yoke or stem, not handles.
- B. Valve tag colors:
  1. Plumbing: Black tags with white numbers.
  2. HVAC: White tags with black numbers.
  3. Fire Protection: White tags with red numbers.
- C. Valve tag locations: At all valves on mains, risers and branches (not equipment service valves).
- D. Valve tag numbers: Starting with Number 1, number tags in sequence from the lowest point to the highest point in the building. In existing buildings extend existing sequences.

**1.27 VALVE CHARTS:**

- A. In all mechanical and control rooms, provide charts showing number and locations of all labeled valves, type of service, etc. Laminate in heavy plastic and provide brass grommets for attaching to wall. Attach to wall with anchors and brass screws.
- B. In existing buildings include existing valves in the charts of new valves.

**1.28 EQUIPMENT IDENTIFICATION:**

- A. Provide 2" x 3" or larger laminated plastic nameplates with 1/2" numbers and letters in colors specified below. Screw tags to equipment in obvious locations. Engrave equipment designation and numbers as shown on plans and drawings on upper half of tag, leaving lower half of tag for future engraving by Owner.
- B. Provide similar nameplates for motor starters furnished under Division 15000.
- C. Secure nameplates with acorn head screws.
- D. Colors:
  1. Equipment connected to utility power only - black letters on white nameplates.
  2. Equipment connected to emergency power - red letters on white nameplates.



**1.29 EXHAUST FAN IDENTIFICATION:**

- A. 2" X 3" or larger laminated plastic nameplates with red letters and numbers on white background, identifying type of fan, number according to plans, and rooms served. Engrave on upper half of tag, leaving lower half for engraving by Owner. Fasten with acorn head screws.

**1.30 ACCESS DOORS:**

- A. Furnish and install access doors for valves, fire dampers, dampers, controls, air vents, trap cleanouts, sprinklers, and other items located above non-liftout ceilings or behind partitions or walls. Doors in non-fire rated walls and ceilings: 16-gauge steel with hinges and screwdriver latches. Doors in fire rated walls and ceilings: UL labeled with fire rating equal to fire rating of wall or ceiling. Provide door styles compatible with adjoining surfaces as selected by Architect. Size doors to permit removal of equipment and/or maintenance. Doors: Bar-Co, Nystrom, Williams Bros., or equal.
- B. Mark lay-in ceilings with colored vinyl self adhering disc stuck on grid adjacent to maintenance access points.

**1.31 TESTS, CLEANING & ADJUSTMENTS:**

- A. General:
  - 1. All tests shall be witnessed by the Architect in addition to the authorities having jurisdiction. A minimum of 72 hours notice is required prior to performance of tests.
  - 2. All air duct pressure tests are specified in Section Air Distribution.
  - 3. All HVAC air and water balance work and HVAC equipment tests (other than hydrostatic tests) are specified in section 15970, "HVAC Testing & Balancing". Notify the Testing and Balancing Agency when systems are ready for balancing - see Section 15970, "HVAC Testing & Balancing".
  - 4. Testing and Balancing other than that noted above is specified in Section "HVAC Testing & Balancing".
  - 5. All instruments used for testing and balancing work shall have been calibrated within 6 months and checked for accuracy prior to start of work.
  - 6. Cooperate in the execution of work specified in Section 15970 HVAC Testing and Balancing and provide assistance as noted in Section 15970.
  - 7. Perform all tests as required by local codes. Contractor shall furnish testing equipment.
  - 8. If local codes are more stringent than the following, local codes shall govern.

- B. Sanitary Systems:
1. Test piping by stopping lower outlets and filling with water to 10' hydrostatic head. Stop leaks and repeat test until watertight. All joints shall be exposed throughout test.
  2. Provide "Ball Test" on all piping 3" and larger with ball 1/2" smaller than pipe diameter.
- C. Domestic water piping: Test by applying pressure (by temporary pump or compressed air connection) to total hydrostatic pressure 1-1/2 times street pressure but not less than 150 psig for not less than 4 hours. Immediately and completely stop all leaks. On completion of roughing-in, cap all outlets, make connections with house supply line, and put under full water pressure. After testing, leave general pressure on until ready to install fixture (except when necessary to drain to avoid freezing during construction). After completion of all tests, repairs and installation of fixtures, flush all domestic hot and cold water piping with water to remove sediment and scale and then disinfect. Disinfect piping with hypochlorite solution of chlorine or compressed chlorine gas applied through an approved chlorinator. Operate valves and faucets several times to insure the chlorine reaches all parts of the system. Feed water and chlorination agent into the system at rates that will provide a residual chlorine content of not less than 50 ppm after a retention period of 6 hours. Upon completion of treatment, flush treated water from each system until the water supply is satisfactory to the public health authority having jurisdiction. Provide Architect a certificate of compliance from the local Health Department.
- D. Shower Floor:
1. Test shower floors for tightness after membrane is installed and clamped to shower drain with 3" of water for 4 hours with no loss of water.
- E. Air System:
1. Duct Cleaning:
    - a. Clean new duct system(s) before testing, adjusting, and balancing.
    - b. Use service openings for entry and inspection.
      - 1) Create new openings and install access panels appropriate for duct static-pressure class if required for cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation as recommended by insulation manufacturer. Comply with Section 15800 "Air Distribution" for access panels and doors.
      - 2) Disconnect and reconnect flexible ducts as needed for cleaning and inspection.
      - 3) Remove and reinstall ceiling to gain access during the cleaning process.
    - c. Particulate Collection and Odor Control:
      - 1) When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.

- 2) When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.
- d. Clean the following components by removing surface contaminants and deposits:
- 1) Air outlets and inlets (registers, grilles, and diffusers).
  - 2) Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
  - 3) Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.
  - 4) Coils and related components.
  - 5) Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
  - 6) Supply-air ducts, dampers, actuators, and turning vanes.
  - 7) Dedicated exhaust and ventilation components and makeup air systems.
- e. Mechanical Cleaning Methodology:
- 1) Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.
  - 2) Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.
  - 3) Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
  - 4) Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.
  - 5) Clean coils and coil drain pans according to NADCA 1992. Keep drain pan operational. Rinse coils with clean water to remove latent residues and cleaning materials; comb and straighten fins.
  - 6) Provide drainage and cleanup for wash-down procedures.

- 7) Antimicrobial Agents and Coatings: Apply EPA-registered antimicrobial agents if fungus is present. Apply antimicrobial agents according to manufacturer's written instructions after removal of surface deposits and debris.
2. When system has been completed, remove all trash and dirt, leave all balancing dampers open and install specified filters in all equipment. Check all fan motors for rotation. Provide all items as required for work specified in Section 15970 "HVAC Testing & Balancing".
  3. Make pitot tube openings in kitchen range hood exhaust ducts by welding 1/2" pipe nipples to duct and capping nipples with pipe caps.
- F. Start-Up and Service:
1. The Contractor and factory authorized service representative for the air compressors, vacuum pumps, water heaters, fire pump, domestic booster pump, boilers, deaerator feed pump set and variable frequency drives and chillers shall place each item of such equipment into satisfactory operation with all automatic and safety devices. Further, all adjustment service required shall be performed during the warranty period. Adjustment services do not include lubricating fans or motors and does not include changing filters or adjusting belts.
  2. In addition, submit equipment manufacturers' start-up reports for items listed above. See Paragraph "Project Close-Out", below.
  3. The Contractor shall balance all hot water pumps and circuit setters to flow shown on drawings. Balancing shall not be started until 1) Systems have been completed, including leak testing and cleaning and until systems have been refilled, pumps are rotating correctly, and strainers have been cleaned and baskets used for the ultimate installation have been installed, and 2) Expansion tanks have been installed and correct system pressure is being maintained, and system has been vented and is free from air.
    - a. Adjust circulating pumps to meet design GPM requirements. Measure and record GPM.
    - b. Adjust circuit setters to meet design GPM requirements. Measure and record GPM.
    - c. Produce a report documenting the measured flows and submit three (3) copies of the report to the Architect.

**1.32 WARRANTY & INSTRUCTIONS:**

- A. See General Conditions - One-Year Warranty.
- B. Contractor shall and hereby does warrant all materials, workmanship and equipment furnished and installed by him to be free from defects for a period of one year after date of substantial completion of the Contract. Should any defects in material, workmanship, or equipment be made known to Contractor within the one-year warranty period, Contractor shall replace such materials, workmanship, or equipment without charge.
- C. All reciprocating and scroll refrigeration compressors shall bear 5-year non-pro-rated parts warranty.

- D. All gas fired air furnaces shall bear 10 year prorated heat exchanger warranties.
- E. After completion of the work, Contractor shall operate the equipment which he installs for a period of (10) working days, as a test of satisfactory operating conditions. During this time, Contractor shall instruct the Owner's operating personnel in the correct operation of the equipment.
- F. Provide PDF of manufacturer's operating and maintenance manuals and parts lists for all equipment and materials furnished. Provide a maintenance schedule listing routine maintenance operations and suggested frequency thereof. Include all warranty dates on equipment and guarantees.
- G. Any work performed on new or existing air conditioning/refrigeration equipment, whether inside or out, that requires removing the refrigerant from the system will require the use of a recovery/recycling unit. Intentional release of the refrigerant, regardless of type, will not be allowed.
- H. Any refrigerant removed from a system that has been properly recycled and has not been exposed to "burn out" can and should be reused in the system. Refrigerant that has been contaminated and cannot be reused after being properly recycled shall be reclaimed by the contractor and returned to the proper company representative.
- I. During the period of tests, adjust all controls, regulators, etc., to comply with these Specifications.
- J. Supply initial charges of refrigerant, refrigeration lubricating oil and anti-freeze necessary for the correct operation of the equipment. Maintain these charges during the guarantee period, with no additional cost to the Owner, unless loss of charge is the fault of the Owner.
- K. Make available to the Owner, without additional cost, service and adjustment of the equipment for the guarantee period. Due to critical temperature guidelines Contractor shall respond to Owner's call for service within a 6 hour time period.

**1.33 PROJECT CLOSE-OUT:**

- A. Prior to the issuance of a certificate for final payment, submit to Architect and obtain his approval of the following:
  - 1. A letter signed by the subcontractors for mechanical, electrical, temperature control work stating that they have jointly checked each power circuit and control circuit and mutually agree that each item is properly wired and that controls and power circuits will function properly.
  - 2. Record drawings - sheet metal work: PDF files and CAD files.
  - 3. Record drawings - control systems: PDF files and CAD files.
  - 4. Record drawings – plumbing: PDF files and CAD files.
  - 5. Record drawings - Fire protection systems: PDF files and CAD files.
  - 6. Control manufacturer's letter of certification.

7. Air balance report PDF files. (See Section 15970 "HVAC Testing & Balancing").
8. Equipment Submittal Data PDF files.
9. Equipment operating and maintenance manuals with PDF files.
10. Maintenance schedule.
11. Equipment warranty dates and guarantees.
12. Certificate of disinfection of domestic water lines as required by local authority.
13. List of Owner's Personnel who have received maintenance instructions.
14. Test results of fire protection systems and names of those witnessing test. (See Section 15500 and NFPA 25 for testing requirements.)
15. Install valve charts in Mechanical Rooms.
16. Letter certifying that the cleaning program for the chilled water, hot water and condenser water systems has been completed in accordance to the specifications.
17. Letter certifying and signed by Owner or his representative that the Owner or his representative has received the spare filters and pump seals specified for each HVAC system.
18. Include with insulation material submittal letters from the insulation material manufacturer certifying that the insulation material does not contain asbestos in any shape, form or quantity.

**END OF GENERAL PROVISIONS - MECHANICAL**

**SECTION 15970**

**HVAC TESTING AND BALANCING**

**PART 1 - GENERAL**

- A. Provisions of Section 15010 - "General Provisions - Mechanical" shall apply to and become a part of this section.
- B. The HVAC testing and balancing work specified in this section shall be done by an Associated Air Balance Council (AABC) member or by a National Environmental Balancing Bureau (NEBB) member (and an AABC "National Project Performance Guarantee" shall be provided for the project). The Testing and Balancing Agency's (TABA) project manager shall be an AABC certified or NEBB certified testing and balancing engineer and be responsible for supervision of and certification of the work herein specified.
- C. The Testing and Balancing agency will be employed by the mechanical contractor.
- D. The balancing agency shall submit records of experience in the field of air and hydronic system balancing or any other data as requested by the Engineer. The supervisory personnel for the firm shall have at least five (5) years' experience, and all the employees used in this project shall be qualified technicians in this specific field.
- E. The balancing agency shall furnish all necessary calibrated instrumentation to adequately perform the specified services. An inventory of all instruments and devices in possession of the balancing agency may be required by the Engineer to determine the balancing agency's performance capability.

**1.2 SCOPE:**

- A. All air balance work shall be done in accordance with the AABC "National Standards for Testing and Balancing Heating & Air Conditioning Systems" (AABC National Standards), edition in force at time of bidding. If these specifications set forth more stringent requirements than the AABC National Standards, these specifications shall prevail.
- B. The systems to be balanced and/or tested shall include: All new split heat pump systems, smoke purge systems and building exhaust systems.
- C. In addition, the smoke purge systems shall be tested as required to comply with 2015 IBC 909.3 Special Inspection and Test Requirements and in accordance with the Local Authority having Jurisdiction.

**1.3 DOCUMENTS:**

- A. The architect will provide the balancing agency one copy of each of the following documents:
  - 1. Project drawings and specifications.

2. Approved construction revisions pertaining to the HVAC systems.
3. Approved submittal data on HVAC equipment and systems to be installed under Division 15.
4. Approved HVAC shop drawings.
5. Approved HVAC wiring diagrams, control diagrams and equipment brochures, as appropriate.

**1.4 COORDINATION:**

- A. The TABA shall perform its services in close coordination with the work specified in Division 15.
- B. The plans and specifications indicate meters, valves, dampers, etc. for the purpose of adjusting the HVAC systems to obtain optimum operating conditions. In the event that any of meters, valves, dampers, etc. have been installed in a manner which will not permit their being used for their intended purpose, TABA shall so notify the Mechanical Contractor so that the above items may be correctly installed as specified in the other sections of Division 15.
- C. Work included in this section shall not be started until the systems involved meet the following conditions:
  1. Air Distribution Systems
    - a. Systems have been completed (including sealing and/or leak testing where specified) with all components properly installed and ready for operation, fans are rotating correctly, motor starters have correct overload elements, variable speed drives have been put into operation and clean filters (of the type required for finished system) have been installed.
    - b. All dampers, including automatic dampers, are operating smoothly and without binding and that the automatic dampers close tightly and open wide without binding.
    - c. The spare sheaves as specified in Section 15010, General Provisions - Mechanical under Tests, Cleaning and Adjustments are on site.
  2. Automatic Control System:
    - a. Systems have been completed and are operating as designed.
      - 1) Installation is complete, all instruments (including room thermostats) have been field calibrated and operate correctly, and are set for design operating conditions.
      - 2) TABA personnel have been instructed in the proper use of and in changing set points of the various controllers including via computer or keypad if required.



**1.5 NOTIFICATION FOR TESTING & BALANCING WORK TO BEGIN:**

- A. When the above conditions have been met, the Mechanical Contractor shall notify the TABA in writing that the system(s) are ready for Testing and Balancing.
- B. When the TABA has been notified that the systems are ready for testing and balancing, the TABA shall inspect the various systems involved and notify Mechanical Contractor of any condition which may impede the TAB work (missing dampers, valves, incomplete control or electrical work, etc.).
- C. When the deficiencies noted above have been corrected, Mechanical Contractor shall again notify TABA that the system(s) are ready for testing and balancing.

**1.6 INSPECTIONS:**

- A. During construction the TABA shall inspect the installation of the piping systems, sheet metal work, control system and mechanical equipment.
- B. The inspections should be made when 60% of the ductwork has been installed and when 90% of the equipment has been installed.
- C. The TABA shall submit a brief written report of each inspection to the Engineer.

**1.7 TESTING AND BALANCING PROCEDURES:**

- A. All testing and balancing work shall be done in accordance with the AABC National Standards.
- B. Air Systems:
  - 1. Fan Speed: Test and adjust fan RPM to achieve design CFM requirements.
  - 2. Current and Voltage: Measure and record motor current and voltage of each fan.
  - 3. Pitot-tube Traverse: Perform a Pitot-tube traverse of main supply and return ducts to obtain total CFM. If a Pitot-tube traverse is not practical, the summation of the outlets or inlets may be used. An explanation why a traverse was not made must appear on the appropriate data sheet.
  - 4. Outside Air: Test and adjust system minimum outside air by Pitot-tube traverse. If a Pitot-tube traverse is not practical, the percentage of outside air may be determined by calculations from the return air, outside air, and discharge air temperatures with heating and cooling coil valves shut. Make allowances for heat of compression and motor heat where applicable.
  - 5. Static Pressure: Test and record system static pressures, including suction and discharge static pressure of each fan.

6. Air Temperature: Take wet-bulb and dry-bulb air temperatures on the entering and leaving side of each cooling coil. Dry-bulb temperature shall be taken on the entering and leaving side of each heating coil.
  7. Zone Ducts: Adjust zone ducts to within design CFM requirements. At least one zone balancing damper shall be completely open.
  8. Main Ducts: Adjust main ducts to within design CFM requirements and traverse for total CFM quantities.
  9. Branch Ducts: Adjust branch ducts to within design CFM requirements. Multi-diffuser branch ducts shall have at least one outlet or inlet volume damper completely open.
  10. Tolerances: Test and balance each diffuser, grille and register to within -5% and +10% of design requirements.
  11. Identification: Identify the location and area of each grille, diffuser, register, and terminal box. This information shall be recorded on air outlet data sheets.
  12. Description: Record the size, type and manufacturer of each diffuser, grille and register on air outlet data sheets.
  13. Terminal Boxes: Set volume regulators on all terminal boxes to meet design maximum and minimum CFM requirements. All associated temperature controls shall be checked for proper operation and calibration. If the terminal boxes have separate settings for heating and cooling CFM, the CFM quantities for each shall be recorded on air outlet data sheets. All diffusers connected to the terminal box shall be read in the heating and cooling modes and their readings recorded on air outlet data sheets.
  14. Minimizing Drafts: Set grille bars for throws, diffusers for patterns and adjust all diffusers, grilles, and registers to minimize drafts in all areas.
- C. Verification of Temperature Control:
1. Verify that all control components are installed in accordance with project requirements and are functional, including all electrical interlocks, damper sequences, air and water reset, and fire and freeze stats.
  2. Verify that all controlling instruments are calibrated and set for design operating conditions.
  3. Verify the accuracy of the final settings by taking temperature readings. The readings shall be in a typical conditioned space for each separately controlled zone.

**1.8 TEST AND BALANCE REPORT:**

- A. The test and balance report shall be complete with logs, data, and records as required herein. All logs, data, and records shall be typed on white bond paper and bound. The report shall be certified accurate and complete by the balancing agency's certified test and balance engineer. Any drawings submitted must be to a scale of 1/8" per foot or larger.
- B. Six (6) copies of the test and balance report are required and shall be submitted to the Architect.
- C. The report shall contain the following general data in a format selected by the balancing agency:
  - 1. Project Number
  - 2. Contract number
  - 3. Project title
  - 4. Project location
  - 5. Project architect
  - 6. Project mechanical engineer
  - 7. Test and balance agency
  - 8. Test and balance engineer
  - 9. General contractor
  - 10. Mechanical subcontractor
  - 11. Dates tests were performed
  - 12. Certification
- D. The test and balance report shall be recorded on report forms conforming to the recommended forms in the AABC *National Standards*. At a minimum, the report shall include:
  - 1. Preface: A general discussion of the system, any abnormalities and problems encountered.
  - 2. Instrumentation List: The list of instruments including type, model, manufacturer, serial number and calibration dates.
  - 3. System Identification: In each report, the VAV boxes, zones, supply, return, and exhaust openings, and traverse points shall be numbered and/or lettered to correspond to the numbers and letters used on the report data sheets.

4. Air handling equipment test report forms: Record the following on each air-handling equipment test form:
  - a. Manufacturer, model number and serial number
  - b. All design and manufacturer-rated data
  - c. Total actual CFM by traverse if practical. If not practical, the sum of the outlets may be used, or a combination of these procedures. For specific systems, such as ones with diversity, see the AABC *National Standards*.
  - d. Suction and discharge static pressure of each fan, as applicable.
  - e. Outside air, return air and total CFM.
  - f. Actual operating current, voltage and brake horsepower of each fan motor.
  - g. Final RPM of each fan.
  - h. Fan and motor sheave manufacturer, model, size, number of grooves and center distance.
  - i. Belt size and quantity.
  - j. Static pressure controls' final operating set points.
5. Heating and cooling-coil test forms: Record the following items on each test form:
  - a. Manufacturer.
  - b. All design and manufacturers' rated data.
  - c. Rated and actual water pressure drop through each coil and related GPM.
  - d. Rated and actual static pressure drop across each coil.
  - e. Entering and leaving water temperatures.
  - f. Wet-bulb and dry-bulb temperatures entering and leaving each cooling coil; dry-bulb temperatures entering and leaving each heating coil.
6. Electric Heating Coil/Duct Heater test forms: Test and record the following on each electric-heating-coil test form:
  - a. Manufacturer and model number.
  - b. All design and manufacturer rated data.

- c. Actual operating current and voltage.
  - d. Coil location and identification number.
7. Test and balance drawings: Include the following:
- a. Terminal Units: Indicate mark, design maximum airflow, actual maximum airflow, minimum design airflow and minimum actual airflow.
  - b. All air devices: Indicate terminal unit as air handler served from design airflow, actual airflow, neck size and air device type.
  - c. Air Handlers: Indicate mark, design supply airflow, actual supply airflow, design return airflow, actual return airflow, outside air design airflow and outside air actual airflow.
  - d. Fans: Indicate mark, design airflow and actual airflow.

**1.9 FINAL ACCEPTANCE:**

- A. Before Certificate of Final Payment is issued the TABA shall recheck, in the presence of the Engineer, specific and random selections of data recorded in the certified test and balance report.
- B. Points and areas for recheck shall be selected by the Engineer.
- C. Measurements and test procedures shall be the same as the original test and balance.
- D. Selections for recheck, specific plus random, shall not normally exceed 15 percent of the total number tabulated in the report, except where special air systems require a complete recheck for safety reasons.
- E. If random tests demonstrate a measured flow deviation of 10 percent or more from that recorded in the certified test and balance report, the report shall automatically be rejected. In the event the report is rejected, all systems shall be readjusted and tested, new data recorded, a new certified test and balance report submitted, and a new inspection test made, all at no additional cost to the Owner.

**1.10 OPPOSITE SEASON TEST:**

- A. The TABA shall perform an inspection of the HVAC system during the opposite season from that in which the initial adjustments were made. The balancing agency shall make any necessary modifications to the initial adjustments to produce optimum system operation.

**END OF HVAC TESTING AND BALANCING**

# DEKALB COUNTY JAIL ADDITION



**- Prepared By -**

WANDA LANGLEY - SESCO - Birmingham

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187 Cahaba Valley Parkway

Pelham, AL - Alabama 35124, USA



Type	Manufacturer	Model Number	Page
AE	DAY BRITE	2FGXG43L835-4-RS-UNV-DIM-BSL10LST	1
A2	DAY BRITE	2FGXG45L835-2-RS-UNV-DIM	8
A2E	DAY BRITE	2FGXG45L835-2-RS-UNV-DIM-BSL10LST	16
C	L C DOANE COMPA	ST4-2WSO-35/80-XCW-VARDM-53/32-TPKD-(7200)	24
CE	L C DOANE COMPA	ST4-2WSO-35/80-XCW-VARDM-53/32-TPKD-EM-(7200)	26
D	L C DOANE COMPA	ST4-1WSO-35/80-XCW-VARDM-53/32-TPKD-(4500)	28
DE	L C DOANE COMPA	ST4-1WSO-35/80-XCW-VARDM-53/32-TPKD-EM-(4500)	30
H	L C DOANE COMPA	ST4-1WSO-35/80-XCW-VARDM-53/32-TPKW-(4500)	32
T	DAY BRITE	FSW440L835-UNV-DIM	34
TE	DAY BRITE	FSW440L835-UNV-DIM-EMLED	41
W	ASL AMERICAN SC	WPR-W31-DVD-40K-L14.25-PC-FUS-XXX-MODIFIED WITH VANDAL SHIELD	48
WE	ASL AMERICAN SC	WPR-W31-DVD-40K-L14.25-PC-EMG-FUS-XXX-MODIFIED WITH VANDAL SHIELD	50
X1	L C DOANE COMPA	XTL-CWS-R32-TPD-EM-65	52
X3	CHLORIDE	ER55L3R	53



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG43L835-4-RS-UNV-DIM-BSL10LST

**TYPE:**  
**AE**

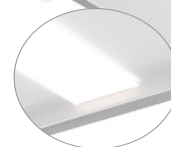
**Day-Brite**  
**CFI**  
 by **Signify**

**Recessed**

**FluxGrid gen 2 2x4**

**2FGX up to 9000 lumens**

RS diffuse round smooth



FS diffuse flat smooth



Project: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Cat.No: \_\_\_\_\_  
 Type: \_\_\_\_\_  
 Lamps: \_\_\_\_\_ Qty: \_\_\_\_\_  
 Notes: \_\_\_\_\_

Day-Brite / CFI FluxGrid gen 2 LED recessed offers architectural appeal with “must have” features. Two different lens styles, discrete air return, integral emergency, and access to the boards and driver from below make FluxGrid gen 2 an ideal solution for a wide range of applications.

**Ordering guide – standard & wireless controls**

Standard configurations available with all choices, unless otherwise noted. Base configurations selections indicated by blue.

example: 2FGXG42B840-4-RS-UNV-DIM

Width	Family	Ceiling Type	Air Function	Lumens (nominal delivered)	Color	Length	Center Diffuser	Voltage	Driver	Options
2	FGX	G				4				
2 2'	FGX FluxGrid	G Grid	Blank Static H Air return	Base Configurations 42B 4200 Standard Configurations 20L 2000 38L 3800 43L 4300 45L 4500 54L 5400 74L 7400 85L 8500 90L 9000	830 80 CRI, 3000K 835 80 CRI, 3500K 840 80 CRI, 4000K 850 80 CRI, 5000K 935 90 CRI, 3500K 940 90 CRI, 4000K 950 90 CRI, 5000K	4 4'	FS Diffuse flat smooth RS Diffuse round smooth F Diffuse flat ribbed R Diffuse round ribbed	UNV Universal voltage 120-277V 347-347V	DIM <sup>1</sup> Dimming XDIM <sup>9,10</sup> Step dimming to 40% input power LDEH <sup>5</sup> MarkX phase dimming 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 F2/6W 3/8" single flex, 6 wire 18 gauge 6' for dimmable and EMLED luminaires GLR Fusing, fast blow BSL10LST <sup>7</sup> Bodine 10W self-testing battery pack BSL0LST <sup>7</sup> Bodine 0W self-testing battery pack DSC Quick driver disconnect CHIC Chicago Plenum rated ER100 <sup>3,6,7</sup> UL924 listed sensor bypass relay, factory installed between driver & sensor GTD/E <sup>4,6</sup> UL924 listed Bodine GTD factory installed on driver input GTD/SNSR <sup>4,6,7</sup> UL924 listed Bodine GTD factory installed between driver and sensor SWZCS <sup>2,8</sup> Interact Pro scalable sensor with integral daylight & occupancy sensing, advanced grouping with dwell time SWZDT <sup>2</sup> SpaceWise only sensor, daylighting and occupancy, advanced grouping with dwell time RADIO <sup>2</sup> Interact Pro RF sensor, enables wireless connected lighting control IAOSB <sup>2,8</sup> Interact Pro wireless sensor with occupancy, daylight, and environmental sensing capabilities AG Antimicrobial finish BAC <sup>11</sup> Meets the requirements of the Buy American Act of 1933 (BAA)

- Integral controls options dimmable to 1% via wireless wall switch. Non-controls options are 0-10v dimmable to 1% for Standard configurations, and to 10% for Base configurations.
- Specify only with -DIM driver option.
- ER100 option not available with Bodine EM battery packs.
- Not available with 347V.
- Option is qualified as Engineered-to-Order (ETO) ready. Lead times and minimum order quantities may vary, please consult factory.
- Must be installed in conjunction with a UL1008 device.
- Must be ordered with an integral sensing option.
- Must order IRT9015 Interact commissioning remote with each system order.
- XDIM requires 120V
- Only available in lumen package range from 45L-60L
- Failure to properly select the "BAC" suffix could result in you receiving product that is not BAA compliant product with no recourse for an RMA or refund. This BAC designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies.
- Consult Signify to confirm whether specific accessories are BAA-compliant.

**Accessories<sup>12</sup> (order separately)**

- FSF24 – 2'x4' surface mount field installation kit (field assembled)
- FMA24 – 2'x4' "F" mounting frame for NEMA "F" ceiling
- FSK24 – 2'x4' surface mount field installation kit (factory welded seams)

**Replacement Lens (order separately)**

- FGXRS4L – FGX 4' round smooth replacement lens
- FGXR4L – FGX 4' round ribbed replacement lens
- FGXFS4L – FGX 4' flat smooth replacement lens
- FGXF4L – FGX 4' flat ribbed replacement lens
- FGXHFS4L – FGX 4' air return flat smooth replacement lens
- FGXHF4L – FGX 4' air return flat ribbed replacement lens
- FGXHRS4L – FGX 4' air return round smooth replacement lens
- FGXHR4L – FGX 4' air return round ribbed replacement lens
- FGXCFS4L – FGX 4' controls flat smooth replacement lens
- FGXCF4L – FGX 4' controls flat ribbed replacement lens
- FGXCFS4L – FGX 4' controls round smooth replacement lens
- FGXCR4L – FGX 4' controls round ribbed replacement lens

**SWZCS accessories (order separately)**

- IRT9015 – handheld remote for grouping and configuration (at least one remote required for any SWZCS installation).







**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG43L835-4-RS-UNV-DIM-BSL10LST

**TYPE:**  
**AE**

## 2FGX FluxGrid gen 2 recessed 2x4

up to 9000 lumens

### Application

- 3-1/8" deep low profile configuration provides minimal penetration into the plenum space.
- Acrylic diffusers available in round and flat smooth configurations which provides even illumination with comfortable appeal.
- Standard and base configurations available in multiple lumen packages to suit the needs of various applications.
- Lambertian distribution creates uniform horizontal and vertical illuminance on the work plane and reduces scalloping on the walls.
- CRI 80 minimum color rendering with balanced spectrum.
- LEDs coupled with standard dimming provide prolonged lumen maintenance. Optional integral sensors contribute further to LED lumen maintenance.
- Designed for use with standard Grid (NEMA "G") or Narrow Grid (NEMA "NFG") ceiling T-bars. Drywall or plaster requirements can be accommodated by using an FMA24 "F" mounting frame (sold separately).
- Continuous row mounting is possible with a 1" gap between fixtures accommodated by others.

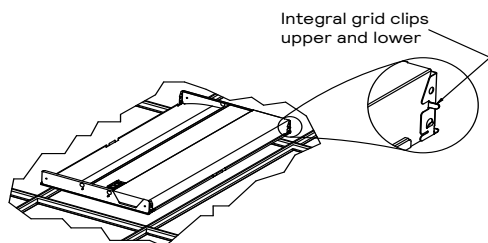
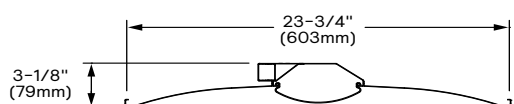
### Enclosure

- Opal acrylic diffuser provides visually comfortable luminance without compromise to luminaire efficacy.
- Diffuser requires no frames or fasteners and can be easily removed from below.

### Construction/Finish

- Uncomplicated design is 3-1/8" deep with minimal material overlap creating several benefits:
  - Less material required
  - Less packaging required
  - Reduced weight for ease of handling and transit
  - Less energy required for construction and assembly
  - More luminaires can be shipped per truck to reduce fuel consumption
- Metal side covers are die formed with a conical shape to enhance light distribution and visual aesthetic.

### Dimensions



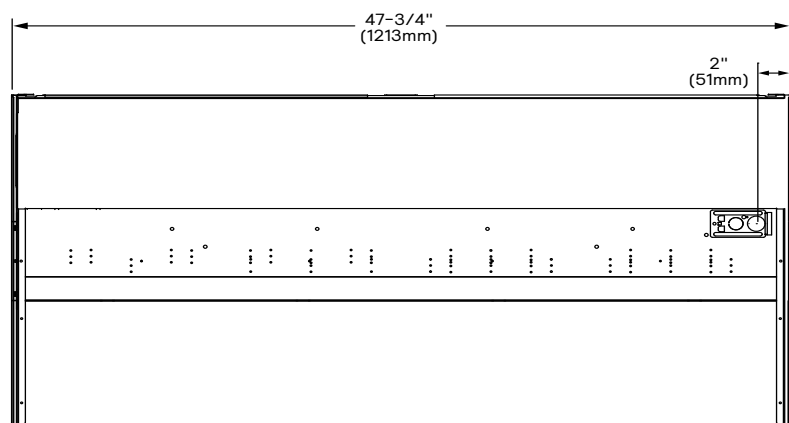
- Luminaire finish is matte white polyester powder coat for high quality, durable finish.
- T-bar grid clips are integral to the body.
- Air return option provides air flow through architectural forms located at each end of the lens. Air passes through these forms and through the end plates of the luminaire. A cover plate is provided to control air flow through the luminaire, or make it static as required.
- Integral controls options include sensor mounted architectural form at one end of the lens.
- Bodine BSL10LST and BSL6LST options require the emergency battery pack be installed with a top side cover. Access from above.
- To estimate lumen output in emergency mode, multiply emergency pack wattage by efficacy, then by 1.10.
- Other driver options including step dimming (SDIM, 100%/40%), DALI, phase dimming (XDIM), and Lutron are available.
- 5 year manufacturer's limited warranty. Visit [signify.com/warranties](http://signify.com/warranties) for complete warranty information.
- TM-21 predicted L70 lumen maintenance up >100,000 hours.
- cETLus listed to UL and CSA standards, suitable for damp locations.
- Base and Standard configurations are IC rated.

### General notes

- All options are factory installed.
- All accessories are field installed.
- 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.

### Electrical

- Integral sensor options for occupancy sensing and/or daylight harvesting are available for additional energy savings with no reduction of life or increase in installation labor.
- Standard configurations provide up to 146 lumens per watt and are available with multiple lumen packages and 3000, 3500, 4000, and 5000K color temperatures.
- Base configuration provides up to 141 lumens per watt and are available in 4200 lumen flux and 3500K and 4000K color temperatures.
- LED boards are accessible from below by removal of the lens.
- LED driver is accessible from below by removal of the lens and integral wireway cover.





**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG43L835-4-RS-UNV-DIM-BSL10LST

**TYPE:**  
**AE**

# 2FGX FluxGrid gen 2 recessed 2x4

up to 9000 lumens

## Wireless Controls Options

### SpaceWise DT (SWZDT)

- Standalone daylight and occupancy sensing with advanced grouping, wireless mesh networking and dwell time.
- Commissioning via compatible Android phone and Philips Field App
- Dimming via compatible Zigbee wireless wall switch only (see link below for details)
- Register for the commissioning app at <http://registration.componentcloud.philips.com/appregistration/>
- Integral sensing options may not be combined
- For more information including recommended switches, refer to the following: -

**SWZDT** - [www.usa.lighting.philips.com/systems/lighting-systems/spacewise](http://www.usa.lighting.philips.com/systems/lighting-systems/spacewise)

### Emergency Options (ER100)

- Power Sensing (Factory default) - Recommended UL924 option requires unswitched power sense line, absence of voltage on the normal circuit triggers luminaire to 100% output
- Power Interruption Detection (Field option) - Detects AC power interruption >30ms triggers 90 minute emergency mode with luminaire at 100% output

## FluxGrid shown with integral sensor



## Interact Pro scalable sensor for Foundation, Advanced & Enterprise tiers (SWZCS and an evolution of SpaceWise)

- SWZCS is a connected sensor with integral occupancy and daylight sensing and supports wireless mesh connectivity.
- The sensor works in the Foundation mode (similar to SpaceWise) when configured without a gateway or in an Interact Pro Advanced or Enterprise mode if a compatible gateway is used.
- Interact Pro includes an App, a portal and a broad portfolio of wireless luminaires, lamps and retrofit kits all working on the same system.
- Startup is implemented via Interact Pro App (Android or iPhone) & BlueTooth connectivity. The App provides flexibility to choose between a gateway or non gateway mode for setup.
- Setup with the gateway requires wired internet access to the gateway. It is possible to add a gateway at a later point.
- Prepare project configuration steps remotely and use IRT9015 remote onsite to identify and group devices together.
  - Compatible with:
    - SWS200 wireless scene switch
    - Battery powered IP42 presence sensor OCC sensor IA CM WH 10/1
    - Battery powered IP42 presence & daylight sensor OCC-DL sensor IA CM IP42 WH
    - LCN3110: Battery powered IP65 presence sensor, OCC sensor IA CM IP65WH
    - LCN3120: Battery powered IP65 presence & daylight sensor, OCC-DL sensor IA CM IP65 WH
- For more information on Interact Pro visit: [www.interact-lighting.com/interactproscalablesystem](http://www.interact-lighting.com/interactproscalablesystem)

## Radio only sensor (RADIO)

- Integral RADIO only sensor simply enables wireless mesh connectivity to the luminaire without any occupancy or daylight sensing.
- Ideal for applications where sensing functionality is managed by other Interact devices and the luminaire only needs to have wireless connectivity.

## Interact Pro scalable sensor bundles for Enterprise tier

- IAOSB option in addition to occupancy and daylight sensing supports advanced IoT capabilities such as people estimation analysis, desk level temperature & humidity sensing, noise classification, and BLE beacon.
- Compatible with SWS200 wireless scene switch and Interact Ready wireless battery powered sensors.
- Use Interact software and insights to increase building efficiency, achieve building wide integration and optimize space through occupancy analytics.
- Requires compatible Gateway and internet connectivity for commissioning.
- For more information, visit: [www.interact-lighting.com/office](http://www.interact-lighting.com/office) or [www.usa.lighting.philips.com/systems/system-areas/offices](http://www.usa.lighting.philips.com/systems/system-areas/offices)

Interact Pro scalable sensor option codes across Genlyte product lines

	Evokit	Day-Brite	Ledalite	Lightolier
ZigBee + Bluetooth + Sensing	SWZCS	SWZCS	CS	SBA accessory (external)
ZigBee + Bluetooth	RADIO	RADIO	RA	RA
ZigBee + Bluetooth + Sensing + Environmental data	IAOSB	IAOSB	SB	SB
ZigBee + Highbay + Sensing	-	SWZCSH	-	-



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG43L835-4-RS-UNV-DIM-BSL10LST

**TYPE:**  
**AE**

# 2FGX FluxGrid gen 2 recessed 2x4

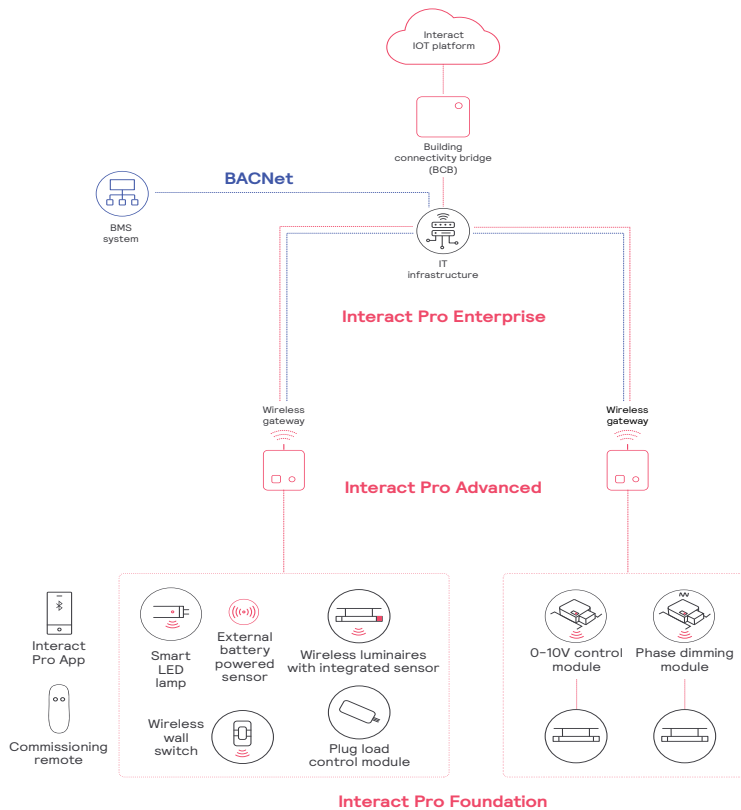
up to 9000 lumens

Interact Pro scalable system			
	Foundation	Advanced	Enterprise
Dimming, grouping, and zoning	✓	✓	✓
Bluetooth and ZigBee enabled	✓	✓	✓
Motion sensing and daylight harvesting	✓	✓	✓
Integration with 0-10V and phase dimming fixtures	✓	✓	✓
Code compliance	✓	✓	✓
Granular dimming and dwell time	✓	✓	✓
Energy reporting and monitoring		✓	✓
Scheduling		✓	✓
Demand response		✓	✓
BMS integration (BACnet)			✓
Floor plan visualization			✓
IoT sensors for wellness			✓
IoT Apps for productivity			✓

### Currently supported maximum system size

To be able to design the lighting system correctly for the customer, it is important to know the prime characteristics of the system, its possibilities and limitations.

System level	
Total number of gateways	Unlimited
Total number of devices	200 per network
• luminaires with integrated sensors	150
• smart TLEDs	150
Total number of ZGP devices (sensors and switches)	50
• sensors	30
• switches	50
• zones and groups	64
Group level	
Recommended number of lights	40 (recommended 25)
Number of ZGP devices	5
Number of scenes	16





**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG43L835-4-RS-UNV-DIM-BSL10LST

**TYPE:**  
**AE**

# 2FGX FluxGrid gen 2 recessed 2x4

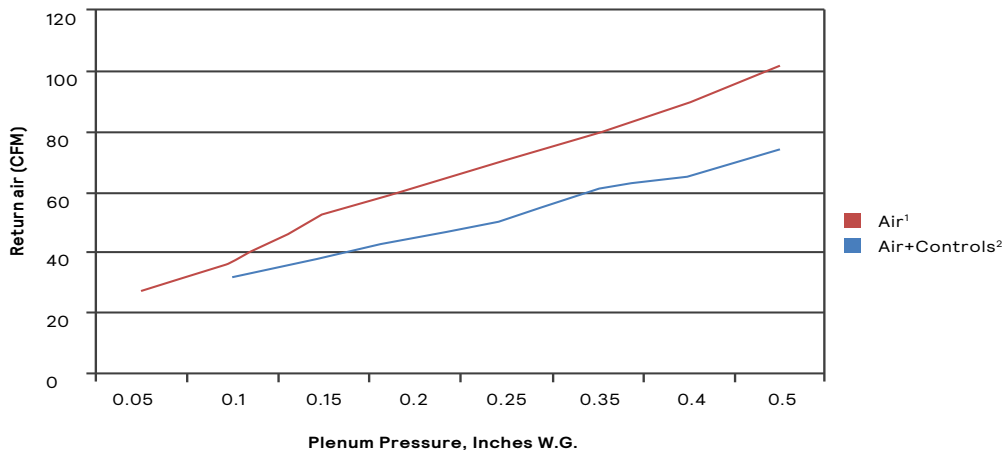
up to 9000 lumens

## Air return option



Allows air to flow through vents in the architectural forms located at both ends of the lens. Air blades are provided on each end of the luminaire to control air flow to the plenum.

**Return air data**  
 All luminaire sizes



**Return air - noise criteria**  
 All luminaire sizes

		CFM							
Mode		27	37	53	62	71	80	90	102
Air¹	NC (dB)	<15	24	25	29	33	35	38	40

		CFM							
Mode			31	38	45	51	61	65	74
Air+Controls²	NC (dB)		<15	19	21	25	28	30	34

1. Air-only option includes air return forms and pattern control blades on both ends of luminaire.  
 2. Air+Controls includes the air return form and pattern control blade on one end of the luminaire. Control form on the other with matching width.



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG43L835-4-RS-UNV-DIM-BSL10LST

**TYPE:**  
**AE**

# 2FGX FluxGrid gen 2 recessed 2x4

up to 9000 lumens

## Photometry

	Nominal CRI & CCT		CRI 80, 3000K			CRI 80, 3500K			CRI 80, 4000K			CRI 80, 5000K		
	Nominal Lumen Package (lm)	Watts	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR
2FGXG20LXXX-4-RS	2000	14.0	1,900	137.0	18.0	2,002	144.0	17.9	2,036	146.0	18.8	2,036	146.0	18.6
2FGXG38LXXX-4-RS	3800	27.0	3,564	132.0	20.0	3,756	139.0	20.1	3,820	141.0	21.0	3,820	141.0	20.8
2FGXG42BXXX-4-RS	4200	30.0	3,941	131.0	20.3	4,153	138.0	20.5	4,223	141.0	21.3	4,223	141.0	21.1
2FGXG43LXXX-4-RS	4300	31.0	4,051	129.0	20.4	4,269	136.0	20.5	4,341	139.0	21.4	4,341	139.0	21.2
2FGXG48LXXX-4-RS	4800	36.0	4,538	127.0	20.8	4,782	134.0	20.9	4,863	137.0	21.8	4,863	137.0	21.6
2FGXG54LXXX-4-RS	5400	41.0	5,086	125.0	21.2	5,359	132.0	21.3	5,450	134.0	22.2	5,450	134.0	22.0
2FGXG74LXXX-4-RS	7400	56.0	7,178	129.0	22.3	7,564	136.0	22.4	7,692	138.0	23.4	7,692	138.0	23.2
2FGXG85LXXX-4-RS	8500	63.0	8,000	127.0	22.7	8,437	134.0	22.9	8,580	136.0	23.8	8,580	136.0	23.6
2FGXG90LXXX-4-RS	9000	67.0	8,471	126.0	22.9	8,926	133.0	23.1	9,074	135.0	24.0	9,078	135.0	23.8

	Nominal CRI & CCT		CRI 90, 3500K			CRI 90, 4000K			CRI 90, 5000K		
	Nominal Lumen Package (lm)	Watts	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR
2FGXG20LXXX-4-RS	2000	14.0	1,868	134.0	17.9	1,937	139.0	18.4	1,922	138.0	18.4
2FGXG38LXXX-4-RS	3800	27.0	3,504	130.0	20.5	3,634	135.0	20.6	3,606	134.0	20.6
2FGXG42BXXX-4-RS	4200	30.0	3,875	129.0	20.8	4,018	134.0	20.9	3,987	133.0	20.9
2FGXG43LXXX-4-RS	4300	31.0	3,983	127.0	20.9	4,130	132.0	21.0	4,099	131.0	21.0
2FGXG48LXXX-4-RS	4800	36.0	4,462	125.0	21.3	4,627	130.0	21.4	4,591	129.0	21.4
2FGXG54LXXX-4-RS	5400	41.0	5,000	123.0	21.7	5,185	128.0	21.8	5,146	127.0	21.8
2FGXG74LXXX-4-RS	7400	56.0	7,057	126.0	22.9	7,319	131.0	23.0	7,263	130.0	23.0
2FGXG85LXXX-4-RS	8500	63.0	7,872	125.0	23.3	8,163	130.0	23.4	8,101	129.0	23.4
2FGXG90LXXX-4-RS	9000	67.0	8,328	124.0	23.5	8,637	129.0	23.6	8,571	128.0	23.6

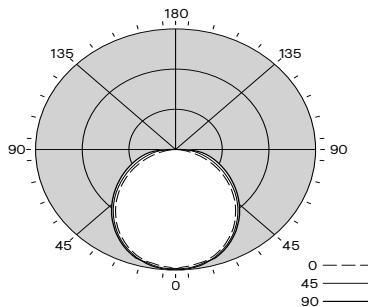
### 2FGXG42B840-4-RS-UNV

Luminaire Lumens 4223  
Luminaire Efficacy Rating (LER) 141  
Total Luminaire Watts 30.0  
Spacing Criterion (0-180) 1.24

	Candela Distribution					Flux	
	0	22.5	45	67.5	90	Lumens	
0	1487	1487	1487	1487	1487		
5	1461	1475	1482	1487	1492	141	
15	1406	1420	1428	1427	1428	401	
25	1280	1296	1307	1318	1323	601	
35	1105	1117	1135	1150	1156	709	
45	895	910	935	955	966	720	
55	670	686	720	753	763	643	
65	444	465	514	558	573	507	
75	225	260	330	385	404	342	
85	47	93	161	208	227	156	
90	3	8	34	53	60		

Zonal Lumen Summary			
Zone	Lumens	%Fixture	%Lamp
0-30	1143	27.1%	27.1%
0-40	1852	43.8%	43.8%
0-60	3215	76.1%	76.1%
0-90	4219	99.9%	99.9%
0-180	4223	100.0%	100.0%

Avg. Luminance (cd/m <sup>2</sup> )			
	0	90	180
0	2126	2126	2126
5	2096	2126	2142
15	2081	2114	2114
25	2020	2062	2086
35	1928	1982	2018
45	1810	1890	1952
55	1669	1796	1902
65	1501	1737	1938
75	1245	1821	2230
85	765	2645	3725



Coefficients of Utilization %												
Pc---	80				70				50			
	70	50	30	10	70	50	30	50	30	10	0	
Pw---												
RcR												
0	119	119	119	119	116	116	116	111	111	111	100	
1	108	103	98	94	105	100	96	96	93	89	82	
2	98	89	82	76	95	87	81	84	78	73	68	
3	89	78	70	63	87	77	69	74	67	61	57	
4	82	69	60	53	79	68	59	65	58	52	49	
5	75	62	53	46	73	61	52	59	51	45	42	
6	69	56	47	40	67	55	46	53	45	40	37	
7	64	51	42	35	63	50	41	48	41	35	32	
8	60	46	38	32	58	45	37	44	37	31	29	
9	56	42	34	29	55	42	34	41	33	28	26	
10	53	39	31	26	51	39	31	38	31	26	24	





**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM

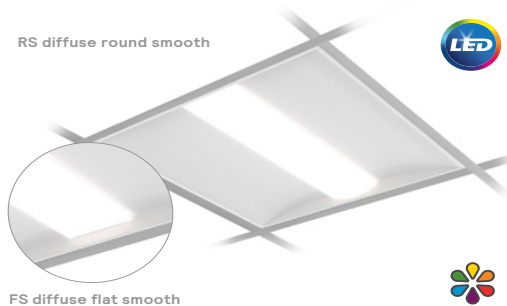
**TYPE:**  
**A2**

**Day-Brite**  
**CFI**  
by **Signify**

**Recessed**

**FluxGrid gen 2 2x2**

**2FGX up to 6000 lumens**



Project: \_\_\_\_\_  
Location: \_\_\_\_\_  
Cat.No: \_\_\_\_\_  
Type: \_\_\_\_\_  
Lamps: \_\_\_\_\_ Qty: \_\_\_\_\_  
Notes: \_\_\_\_\_

Day-Brite / CFI FluxGrid gen 2 LED recessed offers architectural appeal with “must have” features. Two different lens styles, discrete air return, integral emergency, and access to the boards and driver from below make FluxGrid gen 2 an ideal solution for a wide range of applications.

**Ordering guide – standard & wireless controls**

Standard configurations available with all choices, unless otherwise noted. Base configurations selections indicated by blue.

example: 2FGXG38B840-2-RS-UNV-DIM

Width	Family	Ceiling Type	Air Function	Lumens (nominal delivered)	Color	Length	Center Diffuser	Voltage	Driver	Options
2	FGX	G				2				
2 2'	FGX FluxGrid	G Grid	Blank Static H Air return	Base Configurations 38B 3800 Standard Configurations 15L 1500 20L 2000 30L 3000 38L 3800 45L 4500 54L 5400 60L 6000  Standard configuration lumen packages may be ordered in increments of 100lms from the lowest to highest lumen package	830 80 CRI, 3000K 835 80 CRI, 3500K 840 80 CRI, 4000K 850 80 CRI, 5000K 935 90 CRI, 3500K 940 90 CRI, 4000K 950 90 CRI, 5000K	2 2'	FS Diffuse flat smooth RS Diffuse round smooth F Diffuse flat ribbed R Diffuse round ribbed	UNV Universal voltage 120-277V 347-347V	DIM <sup>1</sup> Dimming XDIM <sup>9,10</sup> Step dimming to 40% input power LDEH <sup>5</sup> Lutron LDE1 1% dimming 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 F2/6W 3/8" single flex, 6 wire 18 gauge 6' for dimmable and EMLED luminaires GLR Fusing, fast blow BSL10LST <sup>4</sup> Bodine 10W self-testing battery pack BSL6LST <sup>4</sup> Bodine 6W self-testing battery pack DSC Quick driver disconnect CHIC Chicago Plenum rated ER100 <sup>3,6,7</sup> UL924 listed sensor bypass relay, factory installed between driver & sensor GTD/E <sup>4,6</sup> UL924 listed Bodine GTD factory installed on driver input GTD/SNSR <sup>4,6,7</sup> UL924 listed Bodine GTD factory installed between driver and sensor SWZCS <sup>2,8</sup> Interact Pro scalable sensor with integral daylight & occupancy sensing, advanced grouping with dwell time SWZDT <sup>2</sup> SpaceWise only sensor, daylighting and occupancy, advanced grouping with dwell time RADIO <sup>2</sup> Interact Pro RF sensor, enables wireless connected lighting control IAOSB <sup>2,8</sup> Interact Pro wireless sensor with occupancy, daylight, and environmental sensing capabilities AG Antimicrobial finish BAC <sup>11</sup> Meets the requirements of the Buy American Act of 1933 (BAA)

- Integral controls options dimmable to 1% via wireless wall switch. Non-controls options are 0-10v dimmable to 1% for Standard configurations, and to 10% for Base configurations.
- Specify only with -DIM driver option.
- ER100 option not available with Bodine EM battery packs.
- Not available with 347V.
- Option is qualified as Engineered-to-Order (ETO) ready. Lead times and minimum order quantities may vary, please consult factory.
- Must be installed in conjunction with a UL1008 device.
- Must be ordered with an integral sensing option.
- Must order IRT9015 Interact commissioning remote with each system order.
- XDIM requires 120V
- Only available in lumen package range from 45L-60L
- Failure to properly select the "BAC" suffix could result in you receiving product that is not BAA compliant product with no recourse for an RMA or refund. This BAC designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies.
- Consult Signify to confirm whether specific accessories are BAA-compliant.

**Accessories<sup>12</sup> (order separately)**

- FSF22 – 2'x2' surface mount field installation kit (field assembled)
- FMA22 – 2'x2' "F" mounting frame for NEMA "F" ceiling
- FSK22 – 2'x2' surface mount field installation kit (factory welded seams)

**Replacement Lens (order separately)**

- FGXRS2L – FGX 2' round smooth replacement lens
- FGXR2L – FGX 2' round ribbed replacement lens
- FGXFS2L – FGX 2' flat smooth replacement lens
- FGXF2L – FGX 2' flat ribbed replacement lens
- FGXHFS2L – FGX 2' air return flat smooth replacement lens
- FGXHF2L – FGX 2' air return flat ribbed replacement lens
- FGXHRS2L – FGX 2' air return round smooth replacement lens
- FGXHR2L – FGX 2' air return round ribbed replacement lens
- FGXCFS2L – FGX 2' controls flat smooth replacement lens
- FGXCF2L – FGX 2' controls flat ribbed replacement lens
- FGXCFS2L – FGX 2' controls round smooth replacement lens
- FGXCR2L – FGX 2' controls round ribbed replacement lens

**SWZCS accessories (order separately)**

- IRT9015 – handheld remote for grouping and configuration (at least one remote required for any SWZCS installation).



**interact ready.**



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM

**TYPE:**  
**A2**

## 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

### Application

- 3-1/8" deep low profile configuration provides minimal penetration into the plenum space.
- Acrylic diffusers available in round and flat smooth configurations which provides even illumination with comfortable appeal.
- Standard and base configurations available in multiple lumen packages to suit the needs of various applications.
- Lambertian distribution creates uniform horizontal and vertical illuminance on the work plane and reduces scalloping on the walls.
- CRI 80 minimum color rendering with balanced spectrum.
- LEDs coupled with standard dimming provide prolonged lumen maintenance. Optional integral sensors contribute further to LED lumen maintenance.
- Designed for use with standard Grid (NEMA "G") or Narrow Grid (NEMA "NFG") ceiling T-bars. Drywall or plaster requirements can be accommodated by using an FMA22 "F" mounting frame (sold separately).
- Continuous row mounting is possible with a 1" gap between fixtures accommodated by others.

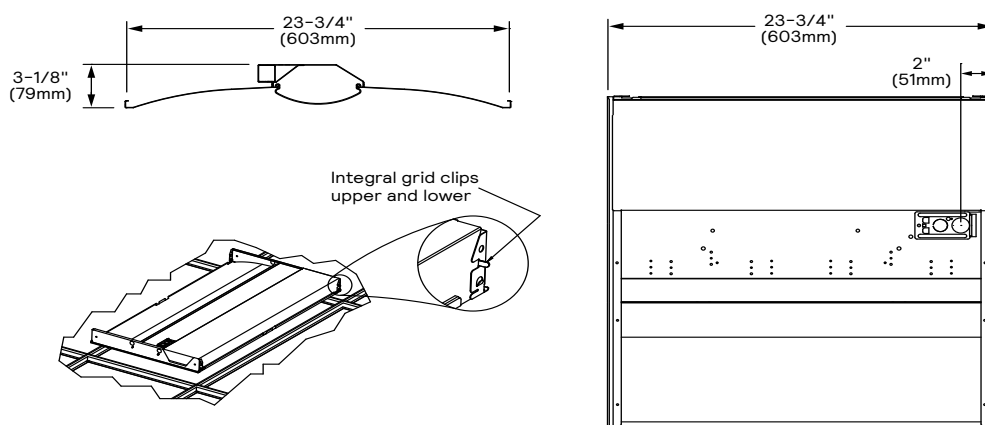
### Enclosure

- Opal acrylic diffuser provides visually comfortable luminance without compromise to luminaire efficacy.
- Diffuser requires no frames or fasteners and can be easily removed from below.

### Construction/Finish

- Uncomplicated design is 3-1/8" deep with minimal material overlap creating several benefits:
  - Less material required
  - Less packaging required
  - Reduced weight for ease of handling and transit
  - Less energy required for construction and assembly
  - More luminaires can be shipped per truck to reduce fuel consumption
- Metal side covers are die formed with a conical shape to enhance light distribution and visual aesthetic.

### Dimensions



- Luminaire finish is matte white polyester powder coat for high quality, durable finish.
- T-bar grid clips are integral to the body.
- Air return option provides air flow through architectural forms located at each end of the lens. Air passes through these forms and through the end plates of the luminaire. A cover plate is provided to control air flow through the luminaire, or make it static as required.
- Integral controls options include sensor mounted architectural form at one end of the lens.
- Bodine BSL10LST and BSL6LST options require the emergency battery pack be installed with a top side cover. Access from above.
- To estimate lumen output in emergency mode, multiply emergency pack wattage by efficacy, then by 1.10.
- Other driver options including step dimming (SDIM, 100%/40%), DALI, phase dimming (XDIM), and Lutron are available.
- 5 year manufacturer's limited warranty. Visit [signify.com/warranties](http://signify.com/warranties) for complete warranty information.
- TM-21 predicted L70 lumen maintenance up >100,000 hours.
- cETLus listed to UL and CSA standards, suitable for damp locations.
- Base and Standard configurations are IC rated.

### General notes

- All options are factory installed.
- All accessories are field installed.
- 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.

### Electrical

- Integral sensor options for occupancy sensing and/or daylight harvesting are available for additional energy savings with no reduction of life or increase in installation labor.
- Standard configurations provide up to 142 lumens per watt and are available with multiple lumen packages and 3000, 3500, 4000, and 5000K color temperatures.
- Base configuration provides up to 120 lumens per watt and are available in 3800 lumen flux and 3500K and 4000K color temperatures.
- LED boards are accessible from below by removal of the lens.
- LED driver is accessible from below by removal of the lens and integral wireway cover.





**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM

**TYPE:**  
**A2**

# 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

## Wireless Controls Options

### SpaceWise DT (SWZDT)

- Standalone daylight and occupancy sensing with advanced grouping, wireless mesh networking and dwell time.
- Commissioning via compatible Android phone and Philips Field App
- Dimming via compatible Zigbee wireless wall switch only (see link below for details)
- Register for the commissioning app at <http://registration.componentcloud.philips.com/appregistration/>
- Integral sensing options may not be combined
- For more information including recommended switches, refer to the following: -

**SWZDT** – [www.usa.lighting.philips.com/systems/lighting-systems/spacewise](http://www.usa.lighting.philips.com/systems/lighting-systems/spacewise)

### Emergency Options (ER100)

- Power Sensing (Factory default) – Recommended UL924 option requires unswitched power sense line, absence of voltage on the normal circuit triggers luminaire to 100% output
- Power Interruption Detection (Field option) – Detects AC power interruption >30ms triggers 90 minute emergency mode with luminaire at 100% output

## FluxGrid shown with integral sensor



### Interact Pro scalable sensor for Foundation, Advanced & Enterprise tiers (SWZCS and an evolution of SpaceWise)

- SWZCS is a connected sensor with integral occupancy and daylight sensing and supports wireless mesh connectivity.
- The sensor works in the Foundation mode (similar to SpaceWise) when configured without a gateway or in an Interact Pro Advanced or Enterprise mode if a compatible gateway is used.
- Interact Pro includes an App, a portal and a broad portfolio of wireless luminaires, lamps and retrofit kits all working on the same system.
- Startup is implemented via Interact Pro App (Android or iPhone) & BlueTooth connectivity. The App provides flexibility to choose between a gateway or non gateway mode for setup.
- Setup with the gateway requires wired internet access to the gateway. It is possible to add a gateway at a later point.
- Prepare project configuration steps remotely and use IRT9015 remote onsite to identify and group devices together.

- Compatible with:
  - SWS200 wireless scene switch
  - Battery powered IP42 presence sensor OCC sensor IA CM WH 10/1
  - Battery powered IP42 presence & daylight sensor OCC-DL sensor IA CM IP42 WH
  - LCN3110: Battery powered IP65 presence sensor, OCC sensor IA CM IP65WH
  - LCN3120: Battery powered IP65 presence & daylight sensor, OCC-DL sensor IA CM IP65 WH

• For more information on Interact Pro visit: [www.interact-lighting.com/interactproscalablesystem](http://www.interact-lighting.com/interactproscalablesystem)

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- IAOSB option in addition to occupancy and daylight sensing supports advanced IoT capabilities such as people estimation analysis, desk level temperature & humidity sensing, noise classification, and BLE beacon.
- Compatible, SWS200 wireless scene switch and Interact Ready wireless battery powered sensors.
- Use Interact software and insights to increase building efficiency, achieve building wide integration and optimize space through occupancy analytics.
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Interact Pro scalable sensor option codes across Genlyte product lines

	Evokit	Day-Brite	Ledalite	Lightolier
ZigBee + Bluetooth + Sensing	SWZCS	SWZCS	CS	SBA accessory (external)
ZigBee + Bluetooth	RADIO	RADIO	RA	RA
ZigBee + Bluetooth + Sensing + Environmental data	IAOSB	IAOSB	SB	SB
ZigBee + Highbay + Sensing	-	SWZCSH	-	-



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM

**TYPE:**  
**A2**

# 2FGX FluxGrid gen 2 recessed 2x2

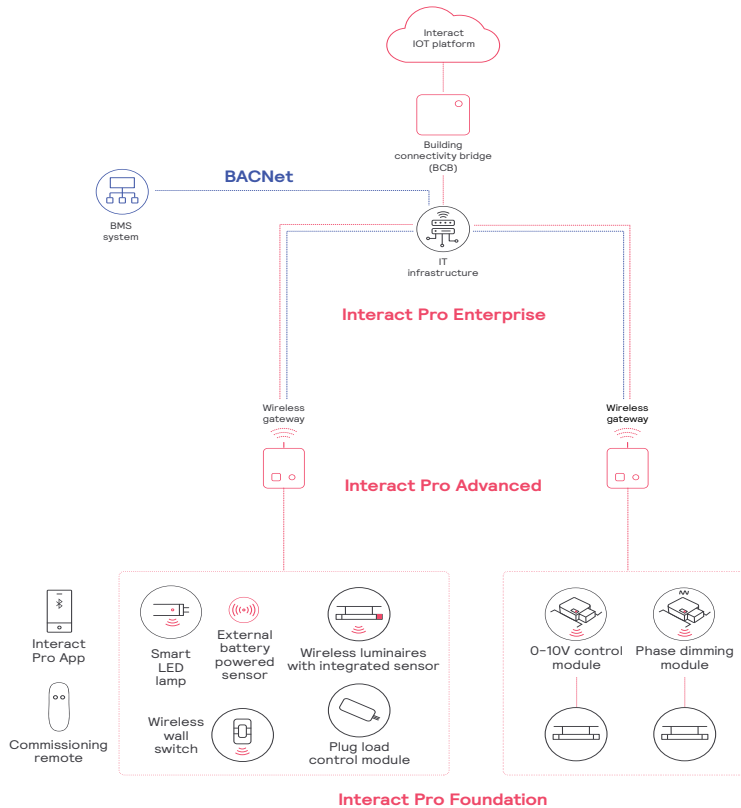
up to 6000 lumens

Interact Pro scalable system			
	Foundation	Advanced	Enterprise
Dimming, grouping, and zoning	✓	✓	✓
Bluetooth and ZigBee enabled	✓	✓	✓
Motion sensing and daylight harvesting	✓	✓	✓
Integration with 0-10V and phase dimming fixtures	✓	✓	✓
Code compliance	✓	✓	✓
Granular dimming and dwell time	✓	✓	✓
Energy reporting and monitoring		✓	✓
Scheduling		✓	✓
Demand response		✓	✓
BMS integration (BACnet)			✓
Floor plan visualization			✓
IoT sensors for wellness			✓
IoT Apps for productivity			✓

### Currently supported maximum system size

To be able to design the lighting system correctly for the customer, it is important to know the prime characteristics of the system, its possibilities and limitations.

System level	
Total number of gateways	Unlimited
Total number of devices	200 per network
• luminaires with integrated sensors	150
• smart TLEDs	150
Total number of ZGP devices (sensors and switches)	50
• sensors	30
• switches	50
• zones and groups	64
Group level	
Recommended number of lights	40 (recommended 25)
Number of ZGP devices	5
Number of scenes	16





**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM

**TYPE:**  
**A2**

# 2FGX FluxGrid gen 2 recessed 2x2

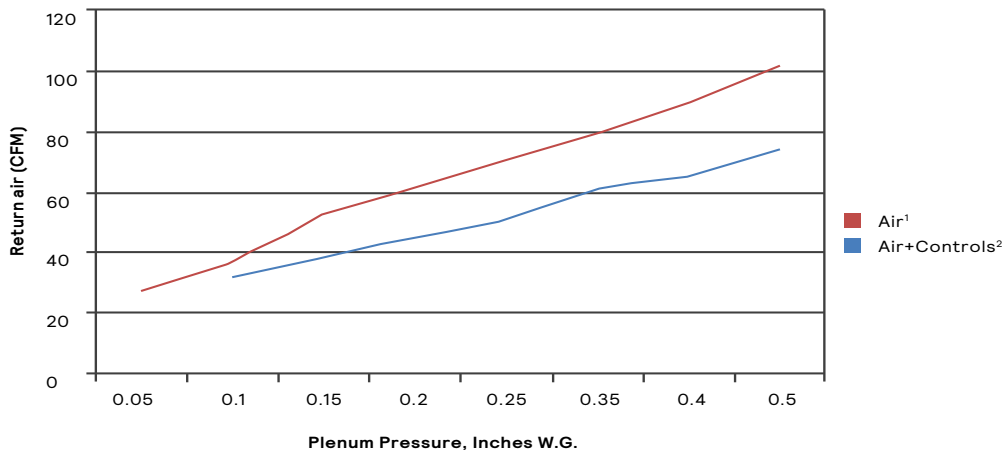
up to 6000 lumens

## Air return option



Allows air to flow through vents in the architectural forms located at both ends of the lens. Air blades are provided on each end of the luminaire to control air flow to the plenum.

**Return air data**  
 All luminaire sizes



**Return air - noise criteria**  
 All luminaire sizes

		CFM							
Mode		27	37	53	62	71	80	90	102
Air <sup>1</sup>	NC (dB)	<15	24	25	29	33	35	38	40

		CFM							
Mode			31	38	45	51	61	65	74
Air+Controls <sup>2</sup>	NC (dB)		<15	19	21	25	28	30	34

1. Air-only option includes air return forms and pattern control blades on both ends of luminaire.  
 2. Air+Controls includes the air return form and pattern control blade on one end of the luminaire. Control form on the other with matching width.



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM

**TYPE:**  
**A2**

# 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

## Photometry

	Nominal CRI & CCT		CRI 80, 3000K			CRI 80, 3500K			CRI 80, 4000K			CRI 80, 5000K		
	Nominal Lumen Package (lm)	Watts	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR
2FGXG15LXXX-2-RS	1500	10.6	1,395	132.0	19.4	1,470	139.0	19.5	1,495	141.0	19.9	1,495	141.0	19.6
2FGXG20LXXX-2-RS	2000	14.5	1,925	133.0	20.5	2,029	140.0	20.7	2,063	142.0	21.0	2,063	142.0	20.7
2FGXG30LXXX-2-RS	3000	21.9	2,836	130.0	21.8	2,989	137.0	22.0	3,040	139.0	22.4	3,040	139.0	21.7
2FGXG38BXXX-2-RS	3800	31.6	3,533	112.0	22.5	3,723	118.0	22.0	3,787	120.0	23.0	3,787	120.0	22.4
2FGXG38LXXX-2-RS	3800	28.2	3,583	127.0	22.6	3,775	134.0	22.8	3,839	136.0	23.2	3,839	136.0	22.7
2FGXG45LXXX-2-RS	4500	34.0	4,220	124.0	23.2	4,447	130.0	23.4	4,522	133.0	23.7	4,522	133.0	23.4
2FGXG54LXXX-2-RS	5400	43.2	5,164	119.0	23.8	5,441	126.0	24.0	5,534	128.0	24.3	5,534	128.0	24.0
2FGXG60LXXX-2-RS	6000	47.4	5,529	117.0	24.0	5,826	123.0	24.2	5,925	125.0	24.6	5,925	125.0	24.3

	Nominal CRI & CCT		CRI 90, 3500K			CRI 90, 4000K			CRI 90, 5000K		
	Nominal Lumen Package (lm)	Watts	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR
2FGXG15LXXX-2-RS	1500	10.6	1,372	129.0	19.3	1,423	134.0	19.4	1,412	133.0	19.4
2FGXG20LXXX-2-RS	2000	14.5	1,893	131.0	20.4	1,963	135.0	20.5	1,948	134.0	20.5
2FGXG30LXXX-2-RS	3000	21.7	2,789	128.0	21.8	2,892	133.0	21.9	2,870	132.0	21.9
2FGXG38BXXX-2-RS	3800	31.6	3,474	110.0	22.4	3,603	114.0	22.6	3,575	113.0	22.5
2FGXG38LXXX-2-RS	3800	28.1	3,522	125.0	22.6	3,653	130.0	22.7	3,625	129.0	22.7
2FGXG45LXXX-2-RS	4500	34.2	4,149	122.0	23.1	4,303	126.0	23.3	4,270	125.0	23.2
2FGXG54LXXX-2-RS	5400	43.2	5,077	117.0	23.7	5,265	122.0	23.9	5,225	121.0	23.8
2FGXG60LXXX-2-RS	6000	47.4	5,436	115.0	24.0	5,637	119.0	24.1	5,594	118.0	24.1

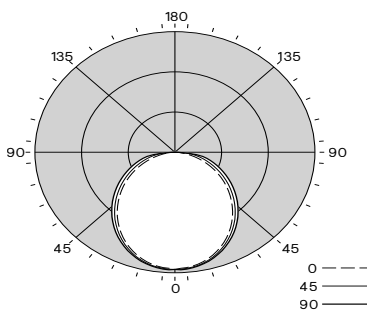
### 2FGXG38B840-2-RS-UNV

- Luminaire Lumens 3787
- Luminaire Efficacy Rating (LER) 120
- Total Luminaire Watts 31.5
- Spacing Criterion (0-180) 1.24

	Candela Distribution					Flux	
	0	22.5	45	67.5	90	Lumens	
0	1361	1361	1361	1361	1361		
5	1345	1346	1354	1361	1363	129	
15	1280	1285	1298	1306	1310	365	
25	1157	1164	1183	1200	1204	544	
35	991	1001	1027	1053	1062	642	
45	799	811	844	879	892	652	
55	599	613	653	694	710	585	
65	396	413	464	512	531	459	
75	203	228	291	343	366	304	
85	48	72	105	122	127	106	
90	2	3	3	3	2		

Zonal Lumen Summary			
Zone	Lumens	%Fixture	%Lamp
0-30	1038	27.4%	27.4%
0-40	1680	44.4%	44.4%
0-60	2917	77.0%	77.0%
0-90	3786	100.0%	100.0%
0-180	3787	100.0%	100.0%

Avg. Luminance (cd/m <sup>2</sup> )			
	0	90	180
0	3994	3994	3994
5	3961	3989	4014
15	3887	3943	3980
25	3746	3830	3899
35	3550	3677	3804
45	3315	3504	3700
55	3065	3343	3632
65	2748	3218	3684
75	2301	3299	4148
85	1611	3543	4257



Coefficients of Utilization %													
Pc---	80				70				50				0
Pw---	70	50	30	10	70	50	30	50	30	10	0	0	
RCR													
0	119	119	119	119	116	116	116	111	111	111	100		
1	108	103	99	95	105	101	97	97	93	90	83		
2	98	90	83	77	96	88	81	84	79	74	68		
3	89	79	70	64	87	77	69	74	67	62	58		
4	82	70	61	54	80	68	60	66	59	53	49		
5	75	62	53	46	73	61	53	59	51	46	42		
6	70	56	47	41	68	55	47	53	46	40	37		
7	65	51	42	36	63	50	42	49	41	35	33		
8	60	46	38	32	59	46	38	44	37	32	29		
9	56	43	34	29	55	42	34	41	34	29	26		
10	53	39	31	26	51	39	31	38	31	26	24		



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM

**TYPE:**  
**A2**

# 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

## Photometry

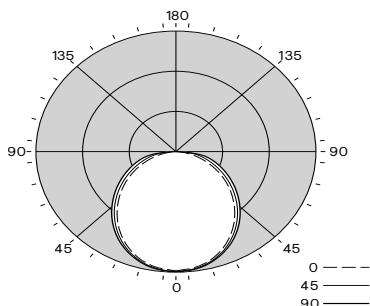
### 2FGXG30L840-2-RS-UNV

Luminaire Lumens 3040  
 Luminaire Efficacy Rating (LER) 139  
 Total Luminaire Watts 21.8  
 Spacing Criterion (0-180) 1.24

Candela Distribution					Flux	
	0	22.5	45	67.5	90	Lumens
0	1090	1090	1090	1090	1090	
5	1076	1079	1086	1091	1091	103
15	1028	1031	1041	1049	1050	293
25	930	935	950	963	966	437
35	795	803	825	845	851	515
45	640	651	678	703	711	522
55	479	491	522	554	565	467
65	316	332	371	409	424	367
75	163	184	234	277	295	244
85	38	60	88	104	110	89
90	2	3	5	7	8	

Zonal Lumen Summary			
Zone	Lumens	%Fixture	%Lamp
0-30	834	27.4%	27.4%
0-40	1349	44.4%	44.4%
0-60	2339	76.9%	76.9%
0-90	3039	100.0%	100.0%
0-180	3040	100.0%	100.0%

Avg. Luminance (cd/m²)			
	0	90	180
0	3199	3199	3199
5	3169	3199	3213
15	3123	3163	3188
25	3010	3076	3129
35	2848	2955	3047
45	2656	2813	2951
55	2451	2671	2891
65	2196	2572	2944
75	1851	2648	3343
85	1261	2960	3698



Coefficients of Utilization %												
Pc---	80				70			50		0		
Pw---	70	50	30	10	70	50	30	50	30	10	0	
RCR	0	119	119	119	119	116	116	116	111	111	111	100
1	108	103	99	95	105	101	97	97	93	90	83	
2	98	90	83	77	96	88	81	84	79	74	68	
3	89	79	70	64	87	77	69	74	67	62	57	
4	82	70	61	54	80	68	60	66	58	53	49	
5	75	62	53	46	73	61	53	59	51	46	42	
6	70	56	47	41	68	55	47	53	46	40	37	
7	65	51	42	36	63	50	42	49	41	35	33	
8	60	46	38	32	59	46	38	44	37	32	29	
9	56	43	34	29	55	42	34	41	34	29	26	
10	53	39	31	26	51	39	31	38	31	26	24	

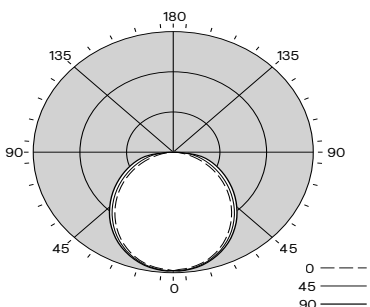
### 2FGXG38L840-2-RS-UNV

Luminaire Lumens 3839  
 Luminaire Efficacy Rating (LER) 136  
 Total Luminaire Watts 28.2  
 Spacing Criterion (0-180) 1.24

Candela Distribution					Flux	
	0	22.5	45	67.5	90	Lumens
0	1377	1377	1377	1377	1377	
5	1359	1362	1371	1378	1377	130
15	1299	1302	1314	1324	1325	370
25	1174	1180	1199	1216	1221	552
35	1003	1015	1042	1066	1074	651
45	809	823	856	887	898	660
55	605	621	659	699	714	590
65	400	419	468	517	536	464
75	204	233	295	350	372	309
85	47	76	111	131	138	113
90	3	5	8	12	13	

Zonal Lumen Summary			
Zone	Lumens	%Fixture	%Lamp
0-30	1052	27.4%	27.4%
0-40	1703	44.4%	44.4%
0-60	2953	76.9%	76.9%
0-90	3838	100.0%	100.0%
0-180	3839	100.0%	100.0%

Avg. Luminance (cd/m²)			
	0	90	180
0	4039	4039	4039
5	4002	4037	4056
15	3946	3992	4025
25	3801	3883	3951
35	3594	3731	3847
45	3357	3551	3727
55	3096	3370	3654
65	2777	3246	3721
75	2318	3347	4222
85	1596	3726	4628



Coefficients of Utilization %												
Pc---	80				70			50		0		
Pw---	70	50	30	10	70	50	30	50	30	10	0	
RCR	0	119	119	119	119	116	116	116	111	111	111	100
1	108	103	99	95	105	101	97	97	93	90	83	
2	98	90	83	77	95	88	81	84	79	74	68	
3	89	79	70	64	87	77	69	74	67	62	57	
4	82	70	61	54	80	68	60	66	58	53	49	
5	75	62	53	46	73	61	53	59	51	46	42	
6	70	56	47	41	68	55	47	53	46	40	37	
7	65	51	42	36	63	50	42	49	41	35	33	
8	60	46	38	32	59	46	38	44	37	32	29	
9	56	43	34	29	55	42	34	41	34	29	26	
10	53	39	31	26	51	39	31	38	31	26	24	



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM

**TYPE:**  
**A2**

# 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

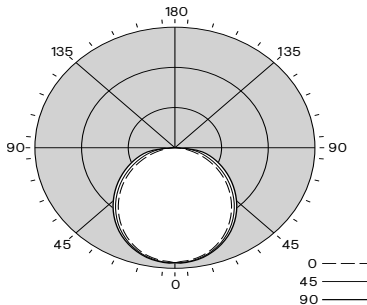
**2FGXG45L840-2-RS-UNV**

**Luminaire Lumens** 4522  
**Luminaire Efficacy Rating (LER)** 133  
**Total Luminaire Watts** 34.1  
**Spacing Criterion (0-180)** 1.24

Candela Distribution					Flux	
	0	22.5	45	67.5	90	Lumens
0	1622	1622	1622	1622	1622	
5	1600	1605	1616	1624	1623	153
15	1529	1534	1549	1560	1562	436
25	1383	1390	1414	1433	1438	650
35	1183	1194	1228	1257	1265	767
45	953	968	1009	1047	1058	777
55	713	731	777	824	841	696
65	471	494	552	609	631	547
75	241	274	348	414	439	364
85	56	89	132	156	160	132
90	2	3	4	6	6	

Zonal Lumen Summary			
Zone	Lumens	%Fixture	%Lamp
0-30	1240	27.4%	27.4%
0-40	2007	44.4%	44.4%
0-60	3479	76.9%	76.9%
0-90	4522	100.0%	100.0%
0-180	4522	100.0%	100.0%

Avg. Luminance (cd/m²)			
	0	90	180
0	4759	4759	4759
5	4713	4758	4781
15	4645	4705	4744
25	4478	4577	4654
35	4236	4398	4532
45	3954	4187	4390
55	3646	3976	4301
65	3273	3830	4379
75	2733	3949	4971
85	1885	4426	5392



Coefficients of Utilization %													
PC---	80				70				50				0
Pw---	70	50	30	10	70	50	30	50	30	10	0	0	
RCR													
0	119	119	119	119	116	116	116	111	111	111	100		
1	108	103	99	95	105	101	97	97	93	90	83		
2	98	90	83	77	96	88	81	84	79	74	68		
3	89	79	70	64	87	77	69	74	67	62	57		
4	82	70	61	54	80	68	60	66	58	53	49		
5	75	62	53	46	73	61	53	59	51	46	42		
6	70	56	47	41	68	55	47	53	46	40	37		
7	65	51	42	36	63	50	42	49	41	35	33		
8	60	46	38	32	59	46	38	44	37	32	29		
9	56	43	34	29	55	42	34	41	34	29	26		
10	53	39	31	26	51	39	31	38	31	26	24		



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**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM-BSL10LST

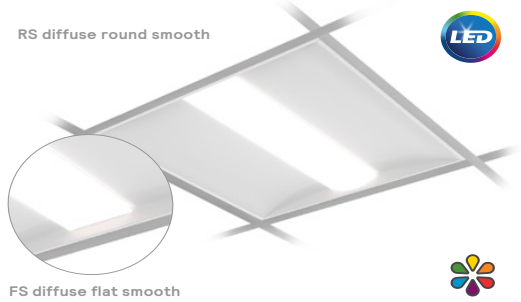
**TYPE:**  
**A2E**

**Day-Brite**  
**CFI**  
 by **Signify**

**Recessed**

**FluxGrid gen 2 2x2**

**2FGX up to 6000 lumens**



Project: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Cat.No: \_\_\_\_\_  
 Type: \_\_\_\_\_  
 Lamps: \_\_\_\_\_ Qty: \_\_\_\_\_  
 Notes: \_\_\_\_\_

Day-Brite / CFI FluxGrid gen 2 LED recessed offers architectural appeal with “must have” features. Two different lens styles, discrete air return, integral emergency, and access to the boards and driver from below make FluxGrid gen 2 an ideal solution for a wide range of applications.

**Ordering guide – standard & wireless controls**

Standard configurations available with all choices, unless otherwise noted. Base configurations selections indicated by blue.

example: 2FGXG38B840-2-RS-UNV-DIM

Width	Family	Ceiling Type	Air Function	Lumens (nominal delivered)	Color	Length	Center Diffuser	Voltage	Driver	Options
2	FGX	G				2				
2 2'	FGX FluxGrid	G Grid	Blank Static H Air return	Base Configurations 38B 3800  Standard Configurations 15L 1500 20L 2000 30L 3000 38L 3800 45L 4500 54L 5400 60L 6000  Standard configuration lumen packages may be ordered in increments of 100lms from the lowest to highest lumen package	830 80 CRI, 3000K 835 80 CRI, 3500K 840 80 CRI, 4000K 850 80 CRI, 5000K 935 90 CRI, 3500K 940 90 CRI, 4000K 950 90 CRI, 5000K	2 2'	FS Diffuse flat smooth RS Diffuse round smooth F Diffuse flat ribbed R Diffuse round ribbed	UNV Universal voltage 120-277V 347-347V	DIM <sup>1</sup> Dimming XDIM <sup>9,10</sup> Step dimming to 40% input power XDIM <sup>9,10</sup> MarkX phase dimming LDEH <sup>5</sup> Lutron LDE1 1% 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 F2/6W 3/8" single flex, 6 wire 18 gauge 6' for dimmable and EMLED luminaires GLR Fusing, fast blow BSL10LST <sup>7</sup> Bodine 10W self-testing battery pack BSL6LST <sup>7</sup> Bodine 6w self-testing battery pack DSC Quick driver disconnect CHIC Chicago Plenum rated ER100 <sup>3,6,7</sup> UL924 listed sensor bypass relay, factory installed between driver & sensor GTD/E <sup>4,6</sup> UL924 listed Bodine GTD factory installed on driver input GTD/SNSR <sup>4,6,7</sup> UL924 listed Bodine GTD factory installed between driver and sensor SWZCS <sup>2,8</sup> Interact Pro scalable sensor with integral daylight & occupancy sensing, advanced grouping with dwell time SWZDT <sup>2</sup> SpaceWise only sensor, daylighting and occupancy, advanced grouping with dwell time RADIO <sup>2</sup> Interact Pro RF sensor, enables wireless connected lighting control IAOSB <sup>2,8</sup> Interact Pro wireless sensor with occupancy, daylight, and environmental sensing capabilities AG Antimicrobial finish BAC <sup>11</sup> Meets the requirements of the Buy American Act of 1933 (BAA)

- Integral controls options dimmable to 1% via wireless wall switch. Non-controls options are 0-10v dimmable to 1% for Standard configurations, and to 10% for Base configurations.
- Specify only with -DIM driver option.
- ER100 option not available with Bodine EM battery packs.
- Not available with 347V.
- Option is qualified as Engineered-to-Order (ETO) ready. Lead times and minimum order quantities may vary, please consult factory.
- Must be installed in conjunction with a UL1008 device.
- Must be ordered with an integral sensing option.
- Must order IRT9015 Interact commissioning remote with each system order.
- XDIM requires 120V
- Only available in lumen package range from 45L-60L
- Failure to properly select the "BAC" suffix could result in you receiving product that is not BAA compliant product with no recourse for an RMA or refund. This BAC designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies.
- Consult Signify to confirm whether specific accessories are BAA-compliant.

**Accessories<sup>12</sup> (order separately)**

- FSF22 – 2'x2' surface mount field installation kit (field assembled)
- FMA22 – 2'x2' "F" mounting frame for NEMA "F" ceiling
- FSK22 – 2'x2' surface mount field installation kit (factory welded seams)

**Replacement Lens (order separately)**

- FGXRS2L – FGX 2' round smooth replacement lens
- FGXR2L – FGX 2' round ribbed replacement lens
- FGXFS2L – FGX 2' flat smooth replacement lens
- FGXF2L – FGX 2' flat ribbed replacement lens
- FGXHFS2L – FGX 2' air return flat smooth replacement lens
- FGXHF2L – FGX 2' air return flat ribbed replacement lens
- FGXHRS2L – FGX 2' air return round smooth replacement lens
- FGXHR2L – FGX 2' air return round ribbed replacement lens
- FGXCFS2L – FGX 2' controls flat smooth replacement lens
- FGXCF2L – FGX 2' controls flat ribbed replacement lens
- FGXCFS2L – FGX 2' controls round smooth replacement lens
- FGXCR2L – FGX 2' controls round ribbed replacement lens

**SWZCS accessories (order separately)**

- IRT9015 – handheld remote for grouping and configuration (at least one remote required for any SWZCS installation).





**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM-BSL10LST

**TYPE:**  
**A2E**

## 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

### Application

- 3-1/8" deep low profile configuration provides minimal penetration into the plenum space.
- Acrylic diffusers available in round and flat smooth configurations which provides even illumination with comfortable appeal.
- Standard and base configurations available in multiple lumen packages to suit the needs of various applications.
- Lambertian distribution creates uniform horizontal and vertical illuminance on the work plane and reduces scalloping on the walls.
- CRI 80 minimum color rendering with balanced spectrum.
- LEDs coupled with standard dimming provide prolonged lumen maintenance. Optional integral sensors contribute further to LED lumen maintenance.
- Designed for use with standard Grid (NEMA "G") or Narrow Grid (NEMA "NFG") ceiling T-bars. Drywall or plaster requirements can be accommodated by using an FMA22 "F" mounting frame (sold separately).
- Continuous row mounting is possible with a 1" gap between fixtures accommodated by others.

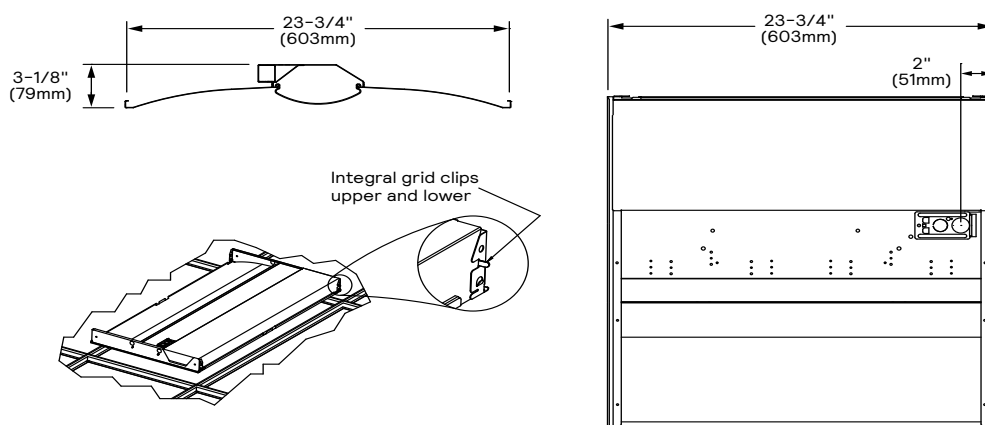
### Enclosure

- Opal acrylic diffuser provides visually comfortable luminance without compromise to luminaire efficacy.
- Diffuser requires no frames or fasteners and can be easily removed from below.

### Construction/Finish

- Uncomplicated design is 3-1/8" deep with minimal material overlap creating several benefits:
  - Less material required
  - Less packaging required
  - Reduced weight for ease of handling and transit
  - Less energy required for construction and assembly
  - More luminaires can be shipped per truck to reduce fuel consumption
- Metal side covers are die formed with a conical shape to enhance light distribution and visual aesthetic.

### Dimensions



- Luminaire finish is matte white polyester powder coat for high quality, durable finish.
- T-bar grid clips are integral to the body.
- Air return option provides air flow through architectural forms located at each end of the lens. Air passes through these forms and through the end plates of the luminaire. A cover plate is provided to control air flow through the luminaire, or make it static as required.
- Integral controls options include sensor mounted architectural form at one end of the lens.
- Bodine BSL10LST and BSL6LST options require the emergency battery pack be installed with a top side cover. Access from above.
- To estimate lumen output in emergency mode, multiply emergency pack wattage by efficacy, then by 1.10.
- Other driver options including step dimming (SDIM, 100%/40%), DALI, phase dimming (XDIM), and Lutron are available.
- 5 year manufacturer's limited warranty. Visit [signify.com/warranties](http://signify.com/warranties) for complete warranty information.
- TM-21 predicted L70 lumen maintenance up >100,000 hours.
- cETLus listed to UL and CSA standards, suitable for damp locations.
- Base and Standard configurations are IC rated.

### General notes

- All options are factory installed.
- All accessories are field installed.
- 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.

### Electrical

- Integral sensor options for occupancy sensing and/or daylight harvesting are available for additional energy savings with no reduction of life or increase in installation labor.
- Standard configurations provide up to 142 lumens per watt and are available with multiple lumen packages and 3000, 3500, 4000, and 5000K color temperatures.
- Base configuration provides up to 120 lumens per watt and are available in 3800 lumen flux and 3500K and 4000K color temperatures.
- LED boards are accessible from below by removal of the lens.
- LED driver is accessible from below by removal of the lens and integral wireway cover.





**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM-BSL10LST

**TYPE:**  
**A2E**

# 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

## Wireless Controls Options

### SpaceWise DT (SWZDT)

- Standalone daylight and occupancy sensing with advanced grouping, wireless mesh networking and dwell time.
- Commissioning via compatible Android phone and Philips Field App
- Dimming via compatible Zigbee wireless wall switch only (see link below for details)
- Register for the commissioning app at <http://registration.componentcloud.philips.com/appregistration/>
- Integral sensing options may not be combined
- For more information including recommended switches, refer to the following: -

**SWZDT** - [www.usa.lighting.philips.com/systems/lighting-systems/spacewise](http://www.usa.lighting.philips.com/systems/lighting-systems/spacewise)

### Emergency Options (ER100)

- Power Sensing (Factory default) - Recommended UL924 option requires unswitched power sense line, absence of voltage on the normal circuit triggers luminaire to 100% output
- Power Interruption Detection (Field option) - Detects AC power interruption >30ms triggers 90 minute emergency mode with luminaire at 100% output

## FluxGrid shown with integral sensor



## Interact Pro scalable sensor for Foundation, Advanced & Enterprise tiers (SWZCS and an evolution of SpaceWise)

- SWZCS is a connected sensor with integral occupancy and daylight sensing and supports wireless mesh connectivity.
- The sensor works in the Foundation mode (similar to SpaceWise) when configured without a gateway or in an Interact Pro Advanced or Enterprise mode if a compatible gateway is used.
- Interact Pro includes an App, a portal and a broad portfolio of wireless luminaires, lamps and retrofit kits all working on the same system.
- Startup is implemented via Interact Pro App (Android or iPhone) & BlueTooth connectivity. The App provides flexibility to choose between a gateway or non gateway mode for setup.
- Setup with the gateway requires wired internet access to the gateway. It is possible to add a gateway at a later point.
- Prepare project configuration steps remotely and use IRT9015 remote onsite to identify and group devices together.
- Compatible with:
  - SWS200 wireless scene switch
  - Battery powered IP42 presence sensor OCC sensor IA CM WH 10/1
  - Battery powered IP42 presence & daylight sensor OCC-DL sensor IA CM IP42 WH
  - LCN3110: Battery powered IP65 presence sensor, OCC sensor IA CM IP65WH
  - LCN3120: Battery powered IP65 presence & daylight sensor, OCC-DL sensor IA CM IP65 WH
- For more information on Interact Pro visit: [www.interact-lighting.com/interactproscalablesystem](http://www.interact-lighting.com/interactproscalablesystem)

## Radio only sensor (RADIO)

- Integral RADIO only sensor simply enables wireless mesh connectivity to the luminaire without any occupancy or daylight sensing.
- Ideal for applications where sensing functionality is managed by other Interact devices and the luminaire only needs to have wireless connectivity.

## Interact Pro scalable sensor bundles for Enterprise tier

- IAOSB option in addition to occupancy and daylight sensing supports advanced IoT capabilities such as people estimation analysis, desk level temperature & humidity sensing, noise classification, and BLE beacon.
- Compatible, SWS200 wireless scene switch and Interact Ready wireless battery powered sensors.
- Use Interact software and insights to increase building efficiency, achieve building wide integration and optimize space through occupancy analytics.
- Requires compatible Gateway and internet connectivity for commissioning.
- For more information, visit: [www.interact-lighting.com/office](http://www.interact-lighting.com/office) or [www.usa.lighting.philips.com/systems/system-areas/offices](http://www.usa.lighting.philips.com/systems/system-areas/offices)

Interact Pro scalable sensor option codes across Genlyte product lines

	Evokit	Day-Brite	Ledalite	Lightolier
ZigBee + Bluetooth + Sensing	SWZCS	SWZCS	CS	SBA accessory (external)
ZigBee + Bluetooth	RADIO	RADIO	RA	RA
ZigBee + Bluetooth + Sensing + Environmental data	IAOSB	IAOSB	SB	SB
ZigBee + Highbay + Sensing	-	SWZCSH	-	-



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM-BSL10LST

**TYPE:**  
**A2E**

# 2FGX FluxGrid gen 2 recessed 2x2

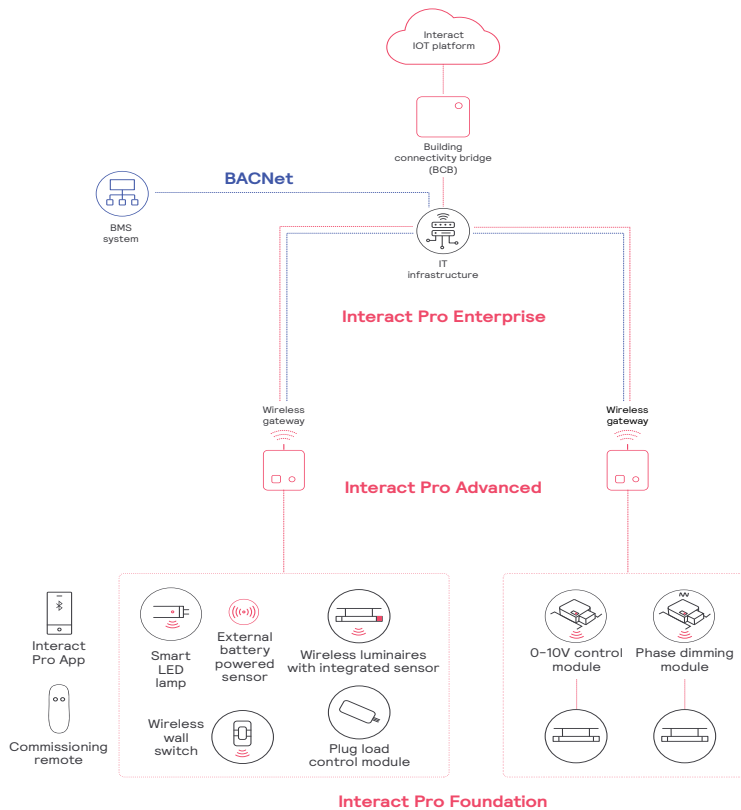
up to 6000 lumens

Interact Pro scalable system			
	Foundation	Advanced	Enterprise
Dimming, grouping, and zoning	✓	✓	✓
Bluetooth and ZigBee enabled	✓	✓	✓
Motion sensing and daylight harvesting	✓	✓	✓
Integration with 0-10V and phase dimming fixtures	✓	✓	✓
Code compliance	✓	✓	✓
Granular dimming and dwell time	✓	✓	✓
Energy reporting and monitoring		✓	✓
Scheduling		✓	✓
Demand response		✓	✓
BMS integration (BACnet)			✓
Floor plan visualization			✓
IoT sensors for wellness			✓
IoT Apps for productivity			✓

### Currently supported maximum system size

To be able to design the lighting system correctly for the customer, it is important to know the prime characteristics of the system, its possibilities and limitations.

System level	
Total number of gateways	Unlimited
Total number of devices	200 per network
• luminaires with integrated sensors	150
• smart TLEDs	150
Total number of ZGP devices (sensors and switches)	50
• sensors	30
• switches	50
• zones and groups	64
Group level	
Recommended number of lights	40 (recommended 25)
Number of ZGP devices	5
Number of scenes	16





**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM-BSL10LST

**TYPE:**  
**A2E**

# 2FGX FluxGrid gen 2 recessed 2x2

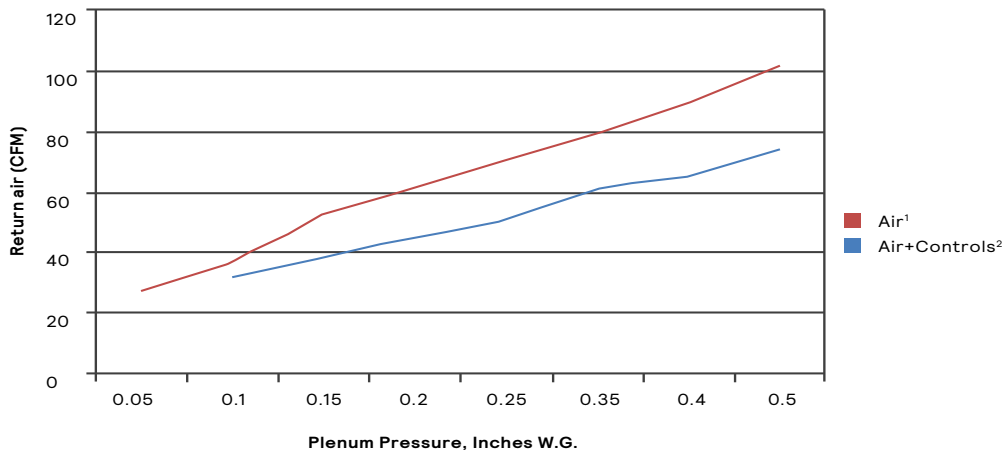
up to 6000 lumens

## Air return option



Allows air to flow through vents in the architectural forms located at both ends of the lens. Air blades are provided on each end of the luminaire to control air flow to the plenum.

**Return air data**  
 All luminaire sizes



**Return air - noise criteria**  
 All luminaire sizes

		CFM							
Mode		27	37	53	62	71	80	90	102
Air <sup>1</sup>	NC (dB)	<15	24	25	29	33	35	38	40

		CFM							
Mode		31	38	45	51	61	65	74	
Air+Controls <sup>2</sup>	NC (dB)	<15	19	21	25	28	30	34	

1. Air-only option includes air return forms and pattern control blades on both ends of luminaire.  
 2. Air+Controls includes the air return form and pattern control blade on one end of the luminaire. Control form on the other with matching width.



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM-BSL10LST

**TYPE:**  
**A2E**

# 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

### Photometry

Nominal CRI & CCT	CRI 80, 3000K			CRI 80, 3500K			CRI 80, 4000K			CRI 80, 5000K				
	Nominal Lumen Package (lm)	Watts	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR
2FGXG15LXXX-2-RS	1500	10.6	1,395	132.0	19.4	1,470	139.0	19.5	1,495	141.0	19.9	1,495	141.0	19.6
2FGXG20LXXX-2-RS	2000	14.5	1,925	133.0	20.5	2,029	140.0	20.7	2,063	142.0	21.0	2,063	142.0	20.7
2FGXG30LXXX-2-RS	3000	21.9	2,836	130.0	21.8	2,989	137.0	22.0	3,040	139.0	22.4	3,040	139.0	21.7
2FGXG38BXXX-2-RS	3800	31.6	3,533	112.0	22.5	3,723	118.0	22.0	3,787	120.0	23.0	3,787	120.0	22.4
2FGXG38LXXX-2-RS	3800	28.2	3,583	127.0	22.6	3,775	134.0	22.8	3,839	136.0	23.2	3,839	136.0	22.7
2FGXG45LXXX-2-RS	4500	34.0	4,220	124.0	23.2	4,447	130.0	23.4	4,522	133.0	23.7	4,522	133.0	23.4
2FGXG54LXXX-2-RS	5400	43.2	5,164	119.0	23.8	5,441	126.0	24.0	5,534	128.0	24.3	5,534	128.0	24.0
2FGXG60LXXX-2-RS	6000	47.4	5,529	117.0	24.0	5,826	123.0	24.2	5,925	125.0	24.6	5,925	125.0	24.3

Nominal CRI & CCT	CRI 90, 3500K			CRI 90, 4000K			CRI 90, 5000K				
	Nominal Lumen Package (lm)	Watts	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR	Flux (lm)	Efficacy (LPW)	UGR
2FGXG15LXXX-2-RS	1500	10.6	1,372	129.0	19.3	1,423	134.0	19.4	1,412	133.0	19.4
2FGXG20LXXX-2-RS	2000	14.5	1,893	131.0	20.4	1,963	135.0	20.5	1,948	134.0	20.5
2FGXG30LXXX-2-RS	3000	21.7	2,789	128.0	21.8	2,892	133.0	21.9	2,870	132.0	21.9
2FGXG38BXXX-2-RS	3800	31.6	3,474	110.0	22.4	3,603	114.0	22.6	3,575	113.0	22.5
2FGXG38LXXX-2-RS	3800	28.1	3,522	125.0	22.6	3,653	130.0	22.7	3,625	129.0	22.7
2FGXG45LXXX-2-RS	4500	34.2	4,149	122.0	23.1	4,303	126.0	23.3	4,270	125.0	23.2
2FGXG54LXXX-2-RS	5400	43.2	5,077	117.0	23.7	5,265	122.0	23.9	5,225	121.0	23.8
2FGXG60LXXX-2-RS	6000	47.4	5,436	115.0	24.0	5,637	119.0	24.1	5,594	118.0	24.1

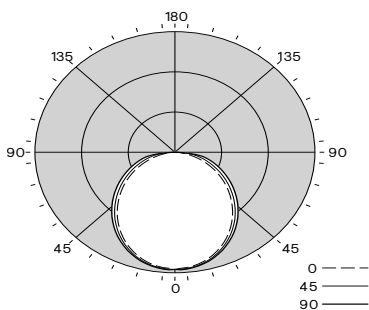
### 2FGX38B840-2-RS-UNV

Luminaire Lumens 3787  
 Luminaire Efficacy Rating (LER) 120  
 Total Luminaire Watts 31.5  
 Spacing Criterion (0-180) 1.24

	Candela Distribution					Flux	
	0	22.5	45	67.5	90	Lumens	
0	1361	1361	1361	1361	1361		
5	1345	1346	1354	1361	1363	129	
15	1280	1285	1298	1306	1310	365	
25	1157	1164	1183	1200	1204	544	
35	991	1001	1027	1053	1062	642	
45	799	811	844	879	892	652	
55	599	613	653	694	710	585	
65	396	413	464	512	531	459	
75	203	228	291	343	366	304	
85	48	72	105	122	127	106	
90	2	3	3	3	2		

Zonal Lumen Summary			
Zone	Lumens	%Fixture	%Lamp
0-30	1038	27.4%	27.4%
0-40	1680	44.4%	44.4%
0-60	2917	77.0%	77.0%
0-90	3786	100.0%	100.0%
0-180	3787	100.0%	100.0%

Avg. Luminance (cd/m²)			
	0	90	180
0	3994	3994	3994
5	3961	3989	4014
15	3887	3943	3980
25	3746	3830	3899
35	3550	3677	3804
45	3315	3504	3700
55	3065	3343	3632
65	2748	3218	3684
75	2301	3299	4148
85	1611	3543	4257



Coefficients of Utilization %												
C <sub>u</sub>	80				70				50			
	70	50	30	10	70	50	30	50	30	10	0	
0	119	119	119	119	116	116	116	111	111	111	100	
1	108	103	99	95	105	101	97	97	93	90	83	
2	98	90	83	77	96	88	81	84	79	74	68	
3	89	79	70	64	87	77	69	74	67	62	58	
4	82	70	61	54	80	68	60	66	59	53	49	
5	75	62	53	46	73	61	53	59	51	46	42	
6	70	56	47	41	68	55	47	53	46	40	37	
7	65	51	42	36	63	50	42	49	41	35	33	
8	60	46	38	32	59	46	38	44	37	32	29	
9	56	43	34	29	55	42	34	41	34	29	26	
10	53	39	31	26	51	39	31	38	31	26	24	



MANUFACTURER: DAY BRITE  
MODEL: 2FGXG45L835-2-RS-UNV-DIM-BSL10LST

TYPE:  
**A2E**

# 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

## Photometry

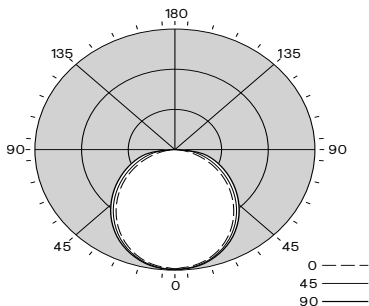
### 2FGXG30L840-2-RS-UNV

Luminaire Lumens	3040
Luminaire Efficacy Rating (LER)	139
Total Luminaire Watts	21.8
Spacing Criterion (0-180)	1.24

Candela Distribution						Flux
	0	22.5	45	67.5	90	Lumens
0	1090	1090	1090	1090	1090	
5	1076	1079	1086	1091	1091	103
15	1028	1031	1041	1049	1050	293
25	930	935	950	963	966	437
35	795	803	825	845	851	515
45	640	651	678	703	711	522
55	479	491	522	554	565	467
65	316	332	371	409	424	367
75	163	184	234	277	295	244
85	38	60	88	104	110	89
90	2	3	5	7	8	

Zonal Lumen Summary			
Zone	Lumens	%Fixture	%Lamp
0-30	834	27.4%	27.4%
0-40	1349	44.4%	44.4%
0-60	2339	76.9%	76.9%
0-90	3039	100.0%	100.0%
0-180	3040	100.0%	100.0%

Avg. Luminance (cd/m²)			
	0	90	180
0	3199	3199	3199
5	3169	3199	3213
15	3123	3163	3188
25	3010	3076	3129
35	2848	2955	3047
45	2656	2813	2951
55	2451	2671	2891
65	2196	2572	2944
75	1851	2648	3343
85	1261	2960	3698



Coefficients of Utilization %												
Pc---	80				70			50			0	
Pw---	70	50	30	10	70	50	30	50	30	10	0	
RCR	0	119	119	119	119	116	116	116	111	111	111	100
1	108	103	99	95	105	101	97	97	93	90	83	
2	98	90	83	77	96	88	81	84	79	74	68	
3	89	79	70	64	87	77	69	74	67	62	57	
4	82	70	61	54	80	68	60	66	58	53	49	
5	75	62	53	46	73	61	53	59	51	46	42	
6	70	56	47	41	68	55	47	53	46	40	37	
7	65	51	42	36	63	50	42	49	41	35	33	
8	60	46	38	32	59	46	38	44	37	32	29	
9	56	43	34	29	55	42	34	41	34	29	26	
10	53	39	31	26	51	39	31	38	31	26	24	

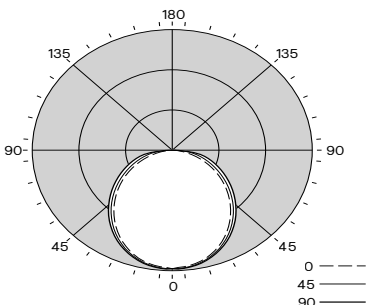
### 2FGXG38L840-2-RS-UNV

Luminaire Lumens	3839
Luminaire Efficacy Rating (LER)	136
Total Luminaire Watts	28.2
Spacing Criterion (0-180)	1.24

Candela Distribution						Flux
	0	22.5	45	67.5	90	Lumens
0	1377	1377	1377	1377	1377	
5	1359	1362	1371	1378	1377	130
15	1299	1302	1314	1324	1325	370
25	1174	1180	1199	1216	1221	552
35	1003	1015	1042	1066	1074	651
45	809	823	856	887	898	660
55	605	621	659	699	714	590
65	400	419	468	517	536	464
75	204	233	295	350	372	309
85	47	76	111	131	138	113
90	3	5	8	12	13	

Zonal Lumen Summary			
Zone	Lumens	%Fixture	%Lamp
0-30	1052	27.4%	27.4%
0-40	1703	44.4%	44.4%
0-60	2953	76.9%	76.9%
0-90	3838	100.0%	100.0%
0-180	3839	100.0%	100.0%

Avg. Luminance (cd/m²)			
	0	90	180
0	4039	4039	4039
5	4002	4037	4056
15	3946	3992	4025
25	3801	3883	3951
35	3594	3731	3847
45	3357	3551	3727
55	3096	3370	3654
65	2777	3246	3721
75	2318	3347	4222
85	1596	3726	4628



Coefficients of Utilization %												
Pc---	80				70			50			0	
Pw---	70	50	30	10	70	50	30	50	30	10	0	
RCR	0	119	119	119	119	116	116	116	111	111	111	100
1	108	103	99	95	105	101	97	97	93	90	83	
2	98	90	83	77	95	88	81	84	79	74	68	
3	89	79	70	64	87	77	69	74	67	62	57	
4	82	70	61	54	80	68	60	66	58	53	49	
5	75	62	53	46	73	61	53	59	51	46	42	
6	70	56	47	41	68	55	47	53	46	40	37	
7	65	51	42	36	63	50	42	49	41	35	33	
8	60	46	38	32	59	46	38	44	37	32	29	
9	56	43	34	29	55	42	34	41	34	29	26	
10	53	39	31	26	51	39	31	38	31	26	24	



**MANUFACTURER:** DAY BRITE  
**MODEL:** 2FGXG45L835-2-RS-UNV-DIM-BSL10LST

**TYPE:**  
**A2E**

# 2FGX FluxGrid gen 2 recessed 2x2

up to 6000 lumens

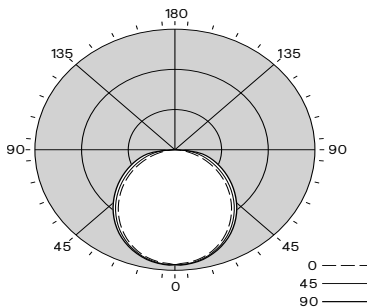
**2FGXG45L840-2-RS-UNV**

**Luminaire Lumens** 4522  
**Luminaire Efficacy Rating (LER)** 133  
**Total Luminaire Watts** 34.1  
**Spacing Criterion (0-180)** 1.24

Candela Distribution					Flux	
	0	22.5	45	67.5	90	Lumens
0	1622	1622	1622	1622	1622	
5	1600	1605	1616	1624	1623	153
15	1529	1534	1549	1560	1562	436
25	1383	1390	1414	1433	1438	650
35	1183	1194	1228	1257	1265	767
45	953	968	1009	1047	1058	777
55	713	731	777	824	841	696
65	471	494	552	609	631	547
75	241	274	348	414	439	364
85	56	89	132	156	160	132
90	2	3	4	6	6	

Zonal Lumen Summary			
Zone	Lumens	%Fixture	%Lamp
0-30	1240	27.4%	27.4%
0-40	2007	44.4%	44.4%
0-60	3479	76.9%	76.9%
0-90	4522	100.0%	100.0%
0-180	4522	100.0%	100.0%

Avg. Luminance (cd/m²)			
	0	90	180
0	4759	4759	4759
5	4713	4758	4781
15	4645	4705	4744
25	4478	4577	4654
35	4236	4398	4532
45	3954	4187	4390
55	3646	3976	4301
65	3273	3830	4379
75	2733	3949	4971
85	1885	4426	5392



Coefficients of Utilization %													
PC---	80				70				50				0
Pw---	70	50	30	10	70	50	30	50	30	10	0	0	
RCR													
0	119	119	119	119	116	116	116	111	111	111	100		
1	108	103	99	95	105	101	97	97	93	90	83		
2	98	90	83	77	96	88	81	84	79	74	68		
3	89	79	70	64	87	77	69	74	67	62	57		
4	82	70	61	54	80	68	60	66	58	53	49		
5	75	62	53	46	73	61	53	59	51	46	42		
6	70	56	47	41	68	55	47	53	46	40	37		
7	65	51	42	36	63	50	42	49	41	35	33		
8	60	46	38	32	59	46	38	44	37	32	29		
9	56	43	34	29	55	42	34	41	34	29	26		
10	53	39	31	26	51	39	31	38	31	26	24		



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**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** ST4-2WSO-35/80-XCW-VARDM-53/32-TPKD-(7200)

**TYPE:**  
**C**



# ST-LED

Correctional **LED** Surface Ceiling

## PRODUCT SPECIFICATION

The ST series is designed for use in all levels of correctional facilities and high abuse applications.

**Mounting**  
Surface-mounts to ceilings.

**Housing**  
Die-formed cold rolled steel with seams welded and ground smooth. Stainless steel available.

**Door**  
One piece, die-formed cold rolled steel door with 14 gauge lens retainers and a full length welded pin piano hinge. Stainless steel available.

**Internal Lens**  
Optic Plus lens (standard) completely hides diode image while providing greater than 90% light transmission.

**Finish**  
Polyester powder-coated after phosphate pretreatment for superior adhesion and corrosion resistance. 304 Brushed stainless steel available.

**Hardware**  
Recessed, stainless steel, tamper-proof fasteners.

**Driver**  
0-10Vdc 1% dimming, >0.9 PF, <20% THD  
Factory programmable, Operating temp -40°C Min. to 50°C Max

**Wiring**  
Driver provided with pre-wired 3-wire self-aligning input power quick disconnect and 2-wire quick disconnect to LED module.

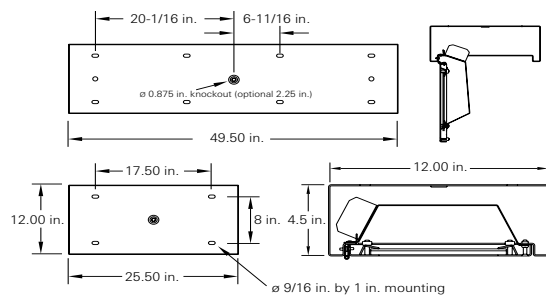
**Certifications**  
UL Listed damp or wet location. IP54 rated. Covered ceilings only.

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

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

Catalog No. \_\_\_\_\_

Approval \_\_\_\_\_ Date \_\_\_\_\_



**ST** [ ] - [ ] [ ] - [ ] [ ] - [ ] [ ] - [ ] [ ] - [ ] **DM** - [ ] / [ ] - [ ] [ ] - [ ] [ ] - [ ] [ ] - [ ] [ ] - [ ] [ ] - [ ] [ ]

one two three four five six seven eight nine ten eleven twelve thirteen fourteen fifteen

- |   |  |   |
|---|--|---|
| <p><b>one Luminaire Size</b><br/>2 2 ft fixture<br/>4 4 ft fixture</p> <p><b>two LED Source</b><br/>Refer to the LED Source Table on Page 2 for available options.<br/><b>2WSO</b></p> <p><b>three Color Temperature</b><br/>30 3000K<br/>35 3500K<br/>40 4000K<br/>50 5000K</p> <p><b>four CRI</b><br/>80 80 CRI<br/>90 90 CRI</p> <p><b>five Material Gauge</b><br/>N 18 gauge, minimum security<br/>D 16 gauge, medium security<br/>X 14 gauge, maximum security<br/>U 12 gauge, ultra maximum security</p> <p><b>six Material</b><br/>C Cold rolled steel<br/>S Stainless steel</p> | <p><b>seven Finish</b><br/>R 304 Brushed stainless steel<br/>W White</p> <p><b>eight Voltage</b><br/>VAR Variable, 120-277 V, 50/60Hz<br/>347 347VAC, 60Hz</p> <p><b>nine Driver</b><br/>DM 0-10Vdc Dimming, standard</p> <p><b>ten Internal Lens</b><br/>122 Optic Plus LED diffusing acrylic, standard<br/>130 .125 in. LED diffusing Lexan<br/>53 .125 in. K12 prismatic acrylic<br/>12 .125 in. K12 prismatic polycarbonate<br/>15 .156 in. K12 prismatic polycarbonate<br/>16 .187 in. K12 prismatic polycarbonate<br/>75 .156 in. C73 prismatic tempered glass</p> <p><b>eleven External Lens</b><br/>30 .187 in. clear polycarbonate<br/>32 .250 in. clear polycarbonate<br/>36 .375 in. clear polycarbonate<br/>38 .500 in. clear polycarbonate<br/>90 .187 in. clear tempered glass<br/>92 .250 in. clear tempered glass<br/>96 .375 in. clear tempered glass</p> | <p><b>twelve Door Fasteners</b><br/>AP Stainless steel allen head with pin<br/>TP Stainless steel torx head with pin<br/>PH Phillips head, non-security</p> <p><b>thirteen Electrical Access</b><br/>A 2.250 in. diameter access hole<br/>K 0.875 in. diameter knockout(s), standard</p> <p><b>fourteen UL Listing</b><br/>D Damp Location<br/>W Wet Location</p> <p><b>fifteen Options</b><br/>2C Two-circuit wired<br/>CU Canadian UL Listing<br/>EM Emergency battery backup<br/>FH Fuse and holder<br/>NL-LED Night light, LED* (Amber available)<br/>5-100% Adjustability<br/>IMS Integral Occ Sensor</p> <p>* Field adjustable LED Night light from approximately 250 - 500 Lumens.</p> |
|---|--|---|



**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** ST4-2WSO-35/80-XCW-VARDM-53/32-TPKD-(7200)

**TYPE:**  
**C**

**ST-LED**

PRODUCT SPECIFICATION

LED Source (Box 2)	3000K		3500K		4000K		5000K		Input Watts
	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	
<b>2' Fixture</b>									
1W21	2048	89	2079	90	2140	93	2200	96	23.0
2W39	3766	95	3822	97	3935	99	4045	102	39.6
2W52	5041	92	5116	93	5267	96	5414	99	54.8
<b>4' Fixture</b>									
1W22	2129	95	2161	97	2225	100	2287	103	22.3
1W39	3766	95	3822	97	3935	99	4045	102	39.6
1W52	5041	92	5116	93	5267	96	5414	99	54.8
2W67	6488	96	6585	97	6779	100	6969	103	67.6
2W92	8838	94	8971	96	9235	99	9494	101	93.7
2W105	10081	92	10233	93	10534	96	10829	99	109.6

Delivered lumen output calculated using 122 inner lens and 32 (.250" Clear Polycarbonate) outer lens (Highlighted below).

Lens Multiplier - Use the multipliers below to adjust the delivered lumens									
Internal Lens					External Lens				
53	.125 in. K12 prismatic acrylic			1.00	30	.187" Clear polycarbonate			1.02
12	.125 in K12 prismatic polycarbonate			.98	32	.250" Clear Polycarbonate			1.00
15	.156 in. K12 prismatic polycarbonate			.97	36	.375" Clear polycarbonate			.96
16	.187 in. K12 prismatic polycarbonate			.95	38	.500" Clear polycarbonate			.92
75	.156 in. C73 prismatic tempered glass			.97	90	.187" Clear tempered glass			1.04
122	Optic Plus diffusing acrylic			1.00	92	.250" Clear tempered glass			1.03
<b>90 CRI Multiplier</b>				<b>.86</b>	96	.375" Clear tempered glass			.99

**Specified Output Option**

L.C. Doane programmable drivers allows us to deliver a specific lumen output. If none of the options in the chart above fit your application, let us know the desired lumen output and we will do the rest. See the example how this will be specified.

**Example Model:**

ST-**XX**<sup>1</sup>SO-40/80-DCW-VARDM-122/32-TP-DAW-(**XX**<sup>2</sup>/LUMENS)

LUMENS = You provide the lumens.

**XX**<sup>1</sup> = We will determine the number of rows.

**XX**<sup>2</sup> = We will provide the wattage information.





**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** ST4-2WSO-35/80-XCW-VARDM-53/32-TPKD-EM-(7200)

**TYPE:**  
**CE**



# ST-LED

Correctional **LED** Surface Ceiling

## PRODUCT SPECIFICATION

The ST series is designed for use in all levels of correctional facilities and high abuse applications.

**Mounting**

Surface-mounts to ceilings.

**Housing**

Die-formed cold rolled steel with seams welded and ground smooth. Stainless steel available.

**Door**

One piece, die-formed cold rolled steel door with 14 gauge lens retainers and a full length welded pin piano hinge. Stainless steel available.

**Internal Lens**

Optic Plus lens (standard) completely hides diode image while providing greater than 90% light transmission.

**Finish**

Polyester powder-coated after phosphate pretreatment for superior adhesion and corrosion resistance. 304 Brushed stainless steel available.

**Hardware**

Recessed, stainless steel, tamper-proof fasteners.

**Driver**

0-10Vdc 1% dimming, >0.9 PF, <20% THD  
 Factory programmable, Operating temp -40°C Min. to 50°C Max

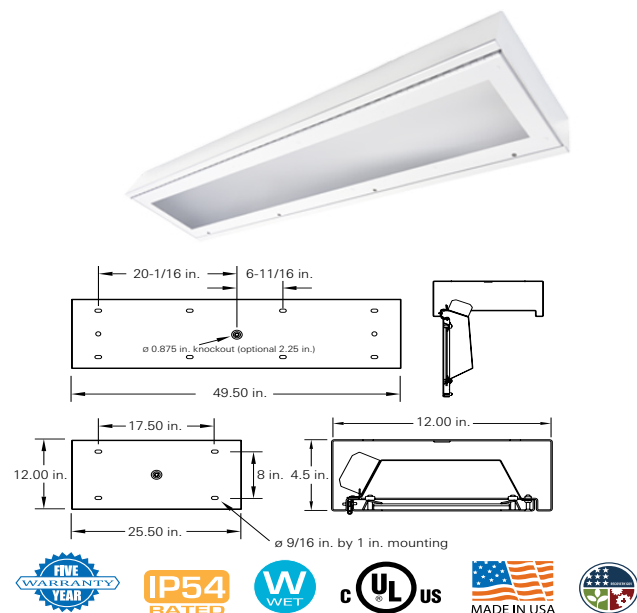
**Wiring**

Driver provided with pre-wired 3-wire self-aligning input power quick disconnect and 2-wire quick disconnect to LED module.

**Certifications**

UL Listed damp or wet location. IP54 rated.  
 Covered ceilings only.

Job Name \_\_\_\_\_  
 Fixture Type \_\_\_\_\_  
 Catalog No. \_\_\_\_\_  
 Approval \_\_\_\_\_ Date \_\_\_\_\_



ST
  -     /   -       -       -                   **DM** -   /   -                

- one Luminaire Size**
  - 2 2 ft fixture
  - 4 4 ft fixture
- two LED Source**
  - 2WSO Refer to the LED Source Table on Page 2 for available options.
- three Color Temperature**
  - 30 3000K
  - 35 3500K
  - 40 4000K
  - 50 5000K
  - 7200 = CUSTOM LUMENS
- four CRI**
  - 80 80 CRI
  - 90 90 CRI
- five Material Gauge**
  - N 18 gauge, minimum security
  - D 16 gauge, medium security
  - X 14 gauge, maximum security
  - U 12 gauge, ultra maximum security
- six Material**
  - C Cold rolled steel
  - S Stainless steel
- seven Finish**
  - R 304 Brushed stainless steel
  - W White
- eight Voltage**
  - VAR Variable, 120-277 V, 50/60Hz
  - 347 347VAC, 60Hz
- nine Driver**
  - DM 0-10Vdc Dimming, standard
- ten Internal Lens**
  - 122 Optic Plus LED diffusing acrylic, standard
  - 130 .125 in. LED diffusing Lexan
  - 53 .125 in. K12 prismatic acrylic
  - 12 .125 in. K12 prismatic polycarbonate
  - 15 .156 in. K12 prismatic polycarbonate
  - 16 .187 in. K12 prismatic polycarbonate
  - 75 .156 in. C73 prismatic tempered glass
- eleven External Lens**
  - 30 .187 in. clear polycarbonate
  - 32 .250 in. clear polycarbonate
  - 36 .375 in. clear polycarbonate
  - 38 .500 in. clear polycarbonate
  - 90 .187 in. clear tempered glass
  - 92 .250 in. clear tempered glass
  - 96 .375 in. clear tempered glass
- twelve Door Fasteners**
  - AP Stainless steel allen head with pin
  - TP Stainless steel torx head with pin
  - PH Phillips head, non-security
- thirteen Electrical Access**
  - A 2.250 in. diameter access hole
  - K 0.875 in. diameter knockout(s), standard
- fourteen UL Listing**
  - D Damp Location
  - W Wet Location
- fifteen Options**
  - 2C Two-circuit wired
  - CU Canadian UL Listing
  - EM Emergency battery backup
  - FH Fuse and holder
  - NL-LED Night light, LED\* (Amber available) *5-100% Adjustability*
  - IMS Integral Occ Sensor

\* Field adjustable LED Night light from approximately 250 - 500 Lumens.  
 Modifications are available to meet custom requirements. Specifications and dimensions are subject to change without notice.



**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** ST4-2WSO-35/80-XCW-VARDM-53/32-TPKD-EM-(7200)

**TYPE:**  
**CE**

**ST-LED**

PRODUCT SPECIFICATION

LED Source (Box 2)	3000K		3500K		4000K		5000K		Input Watts
	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	
<b>2' Fixture</b>									
1W21	2048	89	2079	90	2140	93	2200	96	23.0
2W39	3766	95	3822	97	3935	99	4045	102	39.6
2W52	5041	92	5116	93	5267	96	5414	99	54.8
<b>4' Fixture</b>									
1W22	2129	95	2161	97	2225	100	2287	103	22.3
1W39	3766	95	3822	97	3935	99	4045	102	39.6
1W52	5041	92	5116	93	5267	96	5414	99	54.8
2W67	6488	96	6585	97	6779	100	6969	103	67.6
2W92	8838	94	8971	96	9235	99	9494	101	93.7
2W105	10081	92	10233	93	10534	96	10829	99	109.6

Delivered lumen output calculated using 122 inner lens and 32 (.250" Clear Polycarbonate) outer lens (Highlighted below).

Lens Multiplier - Use the multipliers below to adjust the delivered lumens									
Internal Lens					External Lens				
53	.125 in. K12 prismatic acrylic			1.00	30	.187" Clear polycarbonate			1.02
12	.125 in K12 prismatic polycarbonate			.98	32	.250" Clear Polycarbonate			1.00
15	.156 in. K12 prismatic polycarbonate			.97	36	.375" Clear polycarbonate			.96
16	.187 in. K12 prismatic polycarbonate			.95	38	.500" Clear polycarbonate			.92
75	.156 in. C73 prismatic tempered glass			.97	90	.187" Clear tempered glass			1.04
122	Optic Plus diffusing acrylic			1.00	92	.250" Clear tempered glass			1.03
<b>90 CRI Multiplier</b>				<b>.86</b>	96	.375" Clear tempered glass			.99

**Specified Output Option**

L.C. Doane programmable drivers allows us to deliver a specific lumen output. If none of the options in the chart above fit your application, let us know the desired lumen output and we will do the rest. See the example how this will be specified.

**Example Model:**

ST-**XX**<sup>1</sup>SO-40/80-DCW-VARDM-122/32-TP-DAW-(**XX**<sup>2</sup>/LUMENS)

LUMENS = You provide the lumens.

XX<sup>1</sup> = We will determine the number of rows.

XX<sup>2</sup> = We will provide the wattage information.





**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** ST4-1WSO-35/80-XCW-VARDM-53/32-TPKD-(4500)

**TYPE:**  
**D**

**ST-LED**

PRODUCT SPECIFICATION

LED Source (Box 2)	3000K		3500K		4000K		5000K		Input Watts
	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	
<b>2' Fixture</b>									
1W21	2048	89	2079	90	2140	93	2200	96	23.0
2W39	3766	95	3822	97	3935	99	4045	102	39.6
2W52	5041	92	5116	93	5267	96	5414	99	54.8
<b>4' Fixture</b>									
1W22	2129	95	2161	97	2225	100	2287	103	22.3
1W39	3766	95	3822	97	3935	99	4045	102	39.6
1W52	5041	92	5116	93	5267	96	5414	99	54.8
2W67	6488	96	6585	97	6779	100	6969	103	67.6
2W92	8838	94	8971	96	9235	99	9494	101	93.7
2W105	10081	92	10233	93	10534	96	10829	99	109.6

Delivered lumen output calculated using 122 inner lens and 32 (.250" Clear Polycarbonate) outer lens (Highlighted below).

Lens Multiplier - Use the multipliers below to adjust the delivered lumens									
Internal Lens					External Lens				
53	.125 in. K12 prismatic acrylic			1.00	30	.187" Clear polycarbonate			1.02
12	.125 in K12 prismatic polycarbonate			.98	32	.250" Clear Polycarbonate			1.00
15	.156 in. K12 prismatic polycarbonate			.97	36	.375" Clear polycarbonate			.96
16	.187 in. K12 prismatic polycarbonate			.95	38	.500" Clear polycarbonate			.92
75	.156 in. C73 prismatic tempered glass			.97	90	.187" Clear tempered glass			1.04
122	Optic Plus diffusing acrylic			1.00	92	.250" Clear tempered glass			1.03
<b>90 CRI Multiplier</b>				<b>.86</b>	96	.375" Clear tempered glass			.99

**Specified Output Option**

L.C. Doane programmable drivers allows us to deliver a specific lumen output. If none of the options in the chart above fit your application, let us know the desired lumen output and we will do the rest. See the example how this will be specified.

**Example Model:**

ST-**XX**<sup>1</sup>SO-40/80-DCW-VARDM-122/32-TP-DAW-(**XX**<sup>2</sup>/LUMENS)

LUMENS = You provide the lumens.

**XX**<sup>1</sup> = We will determine the number of rows.

**XX**<sup>2</sup> = We will provide the wattage information.



**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** ST4-1WSO-35/80-XCW-VARDM-53/32-TPKD-EM-(4500)

**TYPE:**  
**DE**



# ST-LED

Correctional **LED** Surface Ceiling

PRODUCT SPECIFICATION

The ST series is designed for use in all levels of correctional facilities and high abuse applications.

**Mounting**

Surface-mounts to ceilings.

**Housing**

Die-formed cold rolled steel with seams welded and ground smooth. Stainless steel available.

**Door**

One piece, die-formed cold rolled steel door with 14 gauge lens retainers and a full length welded pin piano hinge. Stainless steel available.

**Internal Lens**

Optic Plus lens (standard) completely hides diode image while providing greater than 90% light transmission.

**Finish**

Polyester powder-coated after phosphate pretreatment for superior adhesion and corrosion resistance. 304 Brushed stainless steel available.

**Hardware**

Recessed, stainless steel, tamper-proof fasteners.

**Driver**

0-10Vdc 1% dimming, >0.9 PF, <20% THD  
 Factory programmable, Operating temp -40°C Min. to 50°C Max

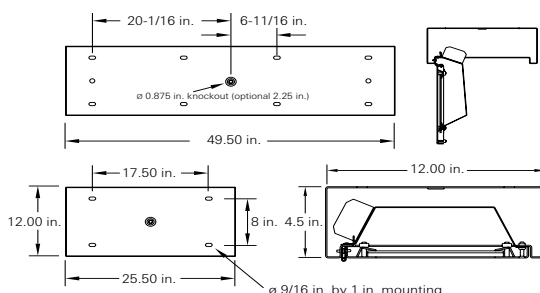
**Wiring**

Driver provided with pre-wired 3-wire self-aligning input power quick disconnect and 2-wire quick disconnect to LED module.

**Certifications**

UL Listed damp or wet location. IP54 rated. Covered ceilings only.

Job Name \_\_\_\_\_  
 Fixture Type \_\_\_\_\_  
 Catalog No. \_\_\_\_\_  
 Approval \_\_\_\_\_ Date \_\_\_\_\_



ST	one	two	three	four	five	six	seven	eight	nine	ten	eleven	twelve	thirteen	fourteen	fifteen	DM
----	-----	-----	-------	------	------	-----	-------	-------	------	-----	--------	--------	----------	----------	---------	----

**one Luminaire Size**

- 2 2 ft fixture
- 4 4 ft fixture

**two LED Source**

**1WSO** Refer to the LED Source Table on Page 2 for available options.

**three Color Temperature**

- 30 3000K
- 35 3500K
- 40 4000K
- 50 5000K

**4500= CUSTOM LUMENS**

**four CRI**

- 80 80 CRI
- 90 90 CRI

**five Material Gauge**

- N 18 gauge, minimum security
- D 16 gauge, medium security
- X 14 gauge, maximum security
- U 12 gauge, ultra maximum security

**six Material**

- C Cold rolled steel
- S Stainless steel

**seven Finish**

- R 304 Brushed stainless steel
- W White

**eight Voltage**

- VAR Variable, 120-277 V, 50/60Hz
- 347 347VAC, 60Hz

**nine Driver**

- DM 0-10Vdc Dimming, standard

**ten Internal Lens**

- 122 Optic Plus LED diffusing acrylic, standard
- 130 .125 in. LED diffusing Lexan
- 53 .125 in. K12 prismatic acrylic
- 12 .125 in. K12 prismatic polycarbonate
- 15 .156 in. K12 prismatic polycarbonate
- 16 .187 in. K12 prismatic polycarbonate
- 75 .156 in. C73 prismatic tempered glass

**eleven External Lens**

- 30 .187 in. clear polycarbonate
- 32 .250 in. clear polycarbonate
- 36 .375 in. clear polycarbonate
- 38 .500 in. clear polycarbonate
- 90 .187 in. clear tempered glass
- 92 .250 in. clear tempered glass
- 96 .375 in. clear tempered glass

**twelve Door Fasteners**

- AP Stainless steel allen head with pin
- TP Stainless steel torx head with pin
- PH Phillips head, non-security

**thirteen Electrical Access**

- A 2.250 in. diameter access hole
- K 0.875 in. diameter knockout(s), standard

**fourteen UL Listing**

- D Damp Location
- W Wet Location

**fifteen Options**

- 2C Two-circuit wired
- CU Canadian UL Listing
- EM Emergency battery backup
- FH Fuse and holder
- NL-LED Night light, LED\* (Amber available) 5-100% Adjustability
- IMS Integral Occ Sensor

\* Field adjustable LED Night Night from approximately 250 - 500 Lumens.

Modifications are available to meet custom requirements. Specifications and dimensions are subject to change without notice.



**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** ST4-1WSO-35/80-XCW-VARDM-53/32-TPKD-EM-(4500)

**TYPE:**  
**DE**

**ST-LED**

PRODUCT SPECIFICATION

LED Source (Box 2)	3000K		3500K		4000K		5000K		Input Watts
	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	
<b>2' Fixture</b>									
1W21	2048	89	2079	90	2140	93	2200	96	23.0
2W39	3766	95	3822	97	3935	99	4045	102	39.6
2W52	5041	92	5116	93	5267	96	5414	99	54.8
<b>4' Fixture</b>									
1W22	2129	95	2161	97	2225	100	2287	103	22.3
1W39	3766	95	3822	97	3935	99	4045	102	39.6
1W52	5041	92	5116	93	5267	96	5414	99	54.8
2W67	6488	96	6585	97	6779	100	6969	103	67.6
2W92	8838	94	8971	96	9235	99	9494	101	93.7
2W105	10081	92	10233	93	10534	96	10829	99	109.6

Delivered lumen output calculated using 122 inner lens and 32 (.250" Clear Polycarbonate) outer lens (Highlighted below).

Lens Multiplier - Use the multipliers below to adjust the delivered lumens									
Internal Lens					External Lens				
53	.125 in. K12 prismatic acrylic			1.00	30	.187" Clear polycarbonate			1.02
12	.125 in K12 prismatic polycarbonate			.98	32	.250" Clear Polycarbonate			1.00
15	.156 in. K12 prismatic polycarbonate			.97	36	.375" Clear polycarbonate			.96
16	.187 in. K12 prismatic polycarbonate			.95	38	.500" Clear polycarbonate			.92
75	.156 in. C73 prismatic tempered glass			.97	90	.187" Clear tempered glass			1.04
122	Optic Plus diffusing acrylic			1.00	92	.250" Clear tempered glass			1.03
<b>90 CRI Multiplier</b>				<b>.86</b>	96	.375" Clear tempered glass			.99

**Specified Output Option**

L.C. Doane programmable drivers allows us to deliver a specific lumen output. If none of the options in the chart above fit your application, let us know the desired lumen output and we will do the rest. See the example how this will be specified.

**Example Model:**

ST-**XX**<sup>1</sup>SO-40/80-DCW-VARDM-122/32-TP-DAW-(**XX**<sup>2</sup>/LUMENS)

LUMENS = You provide the lumens.

**XX**<sup>1</sup> = We will determine the number of rows.

**XX**<sup>2</sup> = We will provide the wattage information.



**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** ST4-1WSO-35/80-XCW-VARDM-53/32-TPKW-(4500)

**TYPE:**  
**H**



# ST-LED

Correctional **LED** Surface Ceiling

## PRODUCT SPECIFICATION

The ST series is designed for use in all levels of correctional facilities and high abuse applications.

**Mounting**  
 Surface-mounts to ceilings.

**Housing**  
 Die-formed cold rolled steel with seams welded and ground smooth. Stainless steel available.

**Door**  
 One piece, die-formed cold rolled steel door with 14 gauge lens retainers and a full length welded pin piano hinge. Stainless steel available.

**Internal Lens**  
 Optic Plus lens (standard) completely hides diode image while providing greater than 90% light transmission.

**Finish**  
 Polyester powder-coated after phosphate pretreatment for superior adhesion and corrosion resistance. 304 Brushed stainless steel available.

**Hardware**  
 Recessed, stainless steel, tamper-proof fasteners.

**Driver**  
 0-10Vdc 1% dimming, >0.9 PF, <20% THD  
 Factory programmable, Operating temp -40°C Min. to 50°C Max

**Wiring**  
 Driver provided with pre-wired 3-wire self-aligning input power quick disconnect and 2-wire quick disconnect to LED module.

**Certifications**  
 UL Listed damp or wet location. IP54 rated.  
 Covered ceilings only.

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

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

Catalog No. \_\_\_\_\_

Approval \_\_\_\_\_ Date \_\_\_\_\_



ST - [ ] - [ ] / [ ] - [ ] [ ] [ ] [ ] - [ ] DM - [ ] / [ ] - [ ] [ ] [ ] [ ] - [ ]

one two three four five six seven eight nine ten eleven twelve thirteen fourteen fifteen

**one Luminaire Size**

- 2 2 ft fixture
- 4 4 ft fixture

**two LED Source**

**1WSO** Refer to the LED Source Table on Page 2 for available options.

**three Color Temperature**

- 30 3000K
  - 35 3500K
  - 40 4000K
  - 50 5000K
- 4500= CUSTOM LUMENS**

**four CRI**

- 80 80 CRI
- 90 90 CRI

**five Material Gauge**

- N 18 gauge, minimum security
- D 16 gauge, medium security
- X 14 gauge, maximum security
- U 12 gauge, ultra maximum security

**six Material**

- C Cold rolled steel
- S Stainless steel

**seven Finish**

- R 304 Brushed stainless steel
- W White

**eight Voltage**

- VAR Variable, 120-277 V, 50/60Hz
- 347 347VAC, 60Hz

**nine Driver**

- DM 0-10Vdc Dimming, standard

**ten Internal Lens**

- 122 Optic Plus LED diffusing acrylic, standard
- 130 .125 in. LED diffusing Lexan
- 53 .125 in. K12 prismatic acrylic
- 12 .125 in. K12 prismatic polycarbonate
- 15 .156 in. K12 prismatic polycarbonate
- 16 .187 in. K12 prismatic polycarbonate
- 75 .156 in. C73 prismatic tempered glass

**eleven External Lens**

- 30 .187 in. clear polycarbonate
- 32 .250 in. clear polycarbonate
- 36 .375 in. clear polycarbonate
- 38 .500 in. clear polycarbonate
- 90 .187 in. clear tempered glass
- 92 .250 in. clear tempered glass
- 96 .375 in. clear tempered glass

**twelve Door Fasteners**

- AP Stainless steel allen head with pin
- TP Stainless steel torx head with pin
- PH Phillips head, non-security

**thirteen Electrical Access**

- A 2.250 in. diameter access hole
- K 0.875 in. diameter knockout(s), standard

**fourteen UL Listing**

- D Damp Location
- W Wet Location

**fifteen Options**

- 2C Two-circuit wired
- CU Canadian UL Listing
- EM Emergency battery backup
- FH Fuse and holder
- NL-LED Night light, LED\* (Amber available) 5-100% Adjustability
- IMS Integral Occ Sensor

\* Field adjustable LED Night Light from approximately 250 - 500 Lumens.

Modifications are available to meet custom requirements. Specifications and dimensions are subject to change without notice.



**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** ST4-1WSO-35/80-XCW-VARDM-53/32-TPKW-(4500)

**TYPE:**  
**H**

**ST-LED**

PRODUCT SPECIFICATION

LED Source (Box 2)	3000K		3500K		4000K		5000K		Input Watts
	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	Delivered Lumens	L/W	
<b>2' Fixture</b>									
1W21	2048	89	2079	90	2140	93	2200	96	23.0
2W39	3766	95	3822	97	3935	99	4045	102	39.6
2W52	5041	92	5116	93	5267	96	5414	99	54.8
<b>4' Fixture</b>									
1W22	2129	95	2161	97	2225	100	2287	103	22.3
1W39	3766	95	3822	97	3935	99	4045	102	39.6
1W52	5041	92	5116	93	5267	96	5414	99	54.8
2W67	6488	96	6585	97	6779	100	6969	103	67.6
2W92	8838	94	8971	96	9235	99	9494	101	93.7
2W105	10081	92	10233	93	10534	96	10829	99	109.6

Delivered lumen output calculated using 122 inner lens and 32 (.250" Clear Polycarbonate) outer lens (Highlighted below).

Lens Multiplier - Use the multipliers below to adjust the delivered lumens									
Internal Lens					External Lens				
53	.125 in. K12 prismatic acrylic			1.00	30	.187" Clear polycarbonate			1.02
12	.125 in K12 prismatic polycarbonate			.98	32	.250" Clear Polycarbonate			1.00
15	.156 in. K12 prismatic polycarbonate			.97	36	.375" Clear polycarbonate			.96
16	.187 in. K12 prismatic polycarbonate			.95	38	.500" Clear polycarbonate			.92
75	.156 in. C73 prismatic tempered glass			.97	90	.187" Clear tempered glass			1.04
122	Optic Plus diffusing acrylic			1.00	92	.250" Clear tempered glass			1.03
<b>90 CRI Multiplier</b>				<b>.86</b>	96	.375" Clear tempered glass			.99

**Specified Output Option**

L.C. Doane programmable drivers allows us to deliver a specific lumen output. If none of the options in the chart above fit your application, let us know the desired lumen output and we will do the rest. See the example how this will be specified.

**Example Model:**

ST-**XX**<sup>1</sup>SO-40/80-DCW-VARDM-122/32-TP-DAW-(**XX**<sup>2</sup>/LUMENS)

LUMENS = You provide the lumens.

**XX**<sup>1</sup> = We will determine the number of rows.

**XX**<sup>2</sup> = We will provide the wattage information.





**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM

**TYPE:**  
**T**

**Day-Brite**  
**CFI**  
by **Signify**

Linear

FluxStream wraparound

FSW 2', 4', & 8'



Day-Brite / CFI FluxStream LED wraparound is a high performing luminaire delivering smooth diffuse light ideal for light industrial, commercial and residential applications with unparalleled energy efficiency.

Project: \_\_\_\_\_  
Location: \_\_\_\_\_  
Cat.No: \_\_\_\_\_  
Type: \_\_\_\_\_  
Lumens: \_\_\_\_\_ Qty: \_\_\_\_\_  
Notes: \_\_\_\_\_

**Ordering guide**

**Example: FSW440L840-UNV-DIM**

Series	Length (nominal)	Lumens <sup>2</sup> (nominal)	Color temp. (K)	Voltage	Driver	Options	
<b>FSW</b>							
<b>FSW FluxStream Wraparound</b>	2' 2' length	20L 2000 lumens	830 80 CRI, 3000K	UNV Universal voltage 120-277V	DIM <sup>11</sup> Dimming	EMLED <sup>4,8,9</sup> Factory wired Bodine BSL310LP integral emergency pack. Nominal 1100lm ER100 <sup>5,12,13</sup> UL924 listed sensor bypass relay, factory installed between driver & sensor (PS/PI compatible) ER100/HVPS <sup>5,12,13</sup> UL924 listed sensor bypass relay, factory installed between driver & sensor for 347/480 Power Sense ER100/HVPI <sup>5,12,13</sup> UL924 listed sensor bypass relay, factory installed between driver & sensor 347/480 Power Interrupt GTD/E <sup>12</sup> UL924 listed Bodine GTD factory installed on driver input GTD/SNSR <sup>12,13</sup> UL924 listed Bodine GTD factory installed between driver & sensor SWZCS <sup>10,14</sup> Interact Pro scalable sensor with integral daylight & occupancy sensing, advanced grouping with dwell time SWZDT <sup>10</sup> SpaceWise only sensor, daylighting and occupancy, advanced grouping, with dwell time RADIO <sup>10</sup> Integral Interact Pro RF sensor, enables wireless connected lighting control IAOSB <sup>10,14</sup> Interact Pro wireless sensor with occupancy, daylight, and environmental sensing capabilities LSXR10 120-347V motion sensor, factory installed on end cap LSXR10ADC <sup>10</sup> 120-347V motion sensor with photocell and hi/lo trim dimming, factory installed on end cap PCSR Pull chain switch right, 120V only PCSL Pull chain switch left, 120V only PAF Paint after fabrication for extra corrosion resistance (white) BAC <sup>15</sup> Meets the requirements of the Buy American Act of 1933 (BAA)	
		30L 3000 lumens					
	4' 4' length	40L 4000 lumens	835 80 CRI, 3500K	120 <sup>3</sup> 120V	XDIM <sup>3,5,6</sup> MarkX phase dimming		
		55L 5500 lumens					
		70L 7000 lumens					
	8' 8' length	60L 6000 lumens	840 80 CRI, 4000K	277 <sup>3</sup> 277V	DALI <sup>7</sup> DALI		
		80L 8000 lumens					
		110L 11000 lumens					
		140L 14000 lumens					
				850 80 CRI, 5000K	347 <sup>4</sup> 347V		

- 8' is tandem (2) 4' lenses with single piece 8' body.
- Nominal delivered lumens at 25°C ambient.
- XDIM option must be specified with 120V or 277V options only.
- 347V with EMLED only available in 8' models.
- Not available in 2' models.
- Not available in 4' 70L or 8' 140L models.
- DALI available up to 80L options only, consult factory for other options.
- EMLED not available on 2' models.
- EMLED on 8' models illuminates 4' section in emergency mode.
- Available with DIM driver option only.
- Integral controls options dimmable to 5% via wireless wall switch (see p.2). Non-integral controls configurations are 0-10V dimmable to 1%.
- Must be installed in conjunction with a UL1008 device.
- Must be ordered with an integral sensing option.
- Must order IRT9015 Interact commissioning remote with each system order.
- Failure to properly select the "BAC" suffix could result in you receiving product that is not BAA compliant product with no recourse for an RMA or refund. This BAC designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies.
- Consult Signify to confirm whether specific accessories are BAA-compliant.

**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.

**Accessories<sup>16</sup> (order separately)**

- FSWD2L – FluxWrap Diffuse 2' replacement lens
  - FSWD4L – FluxWrap Diffuse 4' replacement lens (order two for 8' models)
  - LSXR10 – Low bay PIR occ sensor, 120-277V
  - LSXR10ADC – Low bay PIR occ with photocell sensor and hi/lo trim dimming, 120-277V
  - FSTH – Sliding hanger bracket (set of 2)
  - FSWJ – Continuous row joiner (one per joint)
- See last page for details and more options.

**SWZCS accessories<sup>16</sup> (order separately)**

- IRT9015 – handheld remote for grouping and configuration (at least one remote required for any SWZCS installation).



**Interact ready.**



**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM

**TYPE:**  
**T**

# FSW FluxStream LED wraparound

2', 4' and 8'

## Features

- Compact design for installation in tight spaces
- Frosted acrylic diffuser provides wide light distribution and superior glare control
- Injection molded lens retainers<sup>5</sup> provide positive diffuser retention, and easy tool-free access to LED boards and driver
- 2', 4' and 8' tandem lengths available to accommodate many field applications
- Up to 100,000 hour predicted L70 LED lumen maintenance provides long service life to reduce maintenance costs
- Can be surface mounted on ceilings or walls, or suspended via chain, pendants or cables
- Wall mountable – ADA compliant
- Ideal for cold applications (~20°C to 25°C)
- FSWJ accessory required for continuous row mounting, one FSWJ at each joint
- 7/8" knock out provided at each end and on base of luminaire. Note: Center knockout is covered and not useable in 4' version with EMLED option.

- Multiple driver options available with 0-10v as standard
- Enclosed lens minimizes penetration of dust, insects, and other debris into the lamp compartment
- 8' tandem unit is two 4' optical assemblies with an aesthetic center mullion on a single full length chassis
- Integral controls options include sensor mounted in one lens retainer.
- Fluxstream luminaires are Designlights Consortium<sup>®</sup> qualified. Please see the DLC QPL list for exact catalog numbers [www.designlights.org/QPL](http://www.designlights.org/QPL)
- 5 year manufacturer's limited warranty. Visit [signify.com/warranties](http://signify.com/warranties) for complete warranty information

## Finish

- Baked white acrylic matte high reflectance paint finish
- PAF option gives extra corrosion resistance for canopy or humid applications.

## Shielding

- Contoured frosted acrylic lens

## Electrical

- LED boards and drivers are RoHS (Restriction of Hazardous Substances) compliant. Total system life rated at 50,000 hours. Predicted L70 lifetime based on LED manufacturer's supplied LM-80 data and in-situ laboratory testing at 25°C ambient
- Integral emergency driver with EMLED option. To estimate lumen output in emergency, multiply emergency pack wattage by efficacy, then by 1.10

## Materials

- Heavy gauge cold rolled steel housing and LED pan. Polycarbonate injection molded end caps. Profile extruded acrylic diffuser

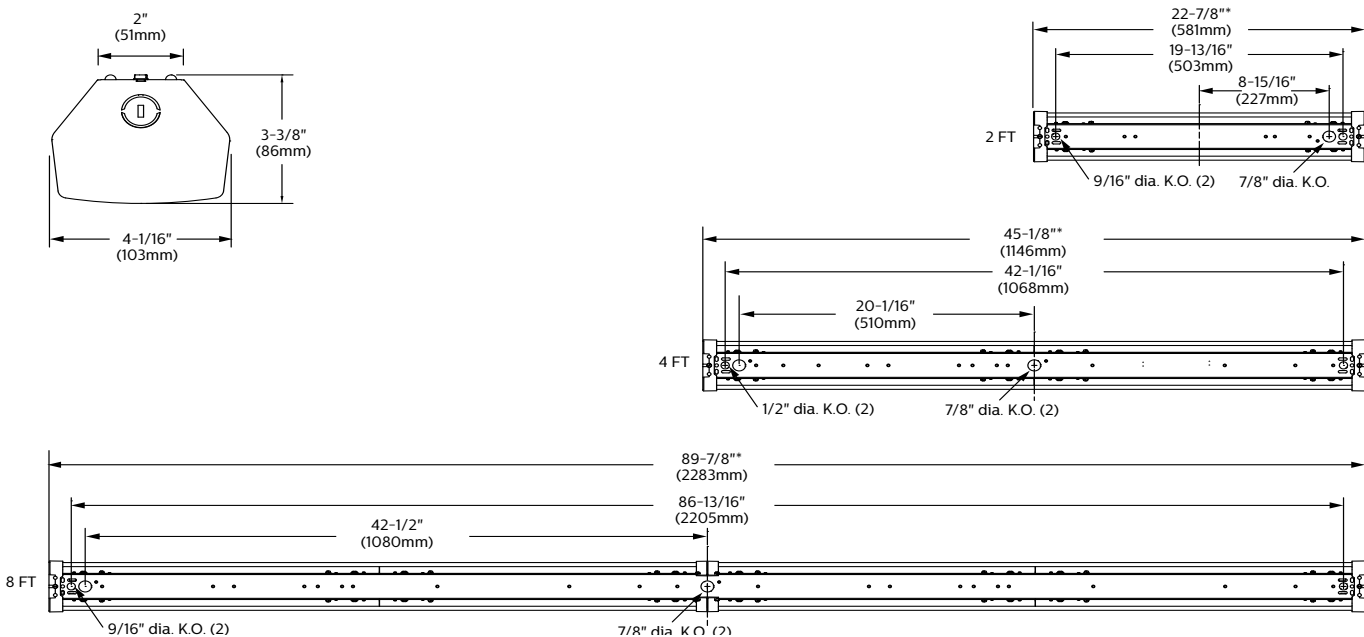
## Labels

- cETLus listed
- Suitable for damp locations

## Performance data

Fixture	Lumens	Wattage	Efficacy
FSW220L840	1904lm	16.6W	114lm/w
FSW230L840	3028lm	28.9W	104lm/w
FSW440L840	3856lm	31.4W	122lm/w
FSW455L840	5339lm	44.5W	119lm/w
FSW470L840	6712lm	58.0W	114lm/w

## Dimensions



\*For integral controls option, overall length is 1-3/8" (35mm) longer.



**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM

**TYPE:**  
**T**

# FSW FluxStream LED wraparound

2', 4' and 8'

## Wireless Controls Options

### SpaceWise DT (SWZDT)

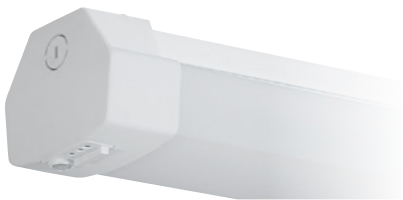
- Standalone daylight and occupancy sensing with advanced grouping, wireless mesh networking and dwell time.
- Commissioning via compatible Android phone and Philips Field App
- Dimming via compatible Zigbee wireless wall switch only (see link below for details)
- Register for the commissioning app at <http://registration.componentcloud.philips.com/appregistration/>
- Integral sensing options may not be combined
- For more information including recommended switches, refer to the following: -

**SWZDT** - [www.usa.lighting.philips.com/systems/lighting-systems/spacewise](http://www.usa.lighting.philips.com/systems/lighting-systems/spacewise)

### Emergency Options (ER100)

- Power Sensing (Factory default) - Recommended UL924 option requires unswitched power sense line, absence of voltage on the normal circuit triggers luminaire to 100% output
- Power Interruption Detection (Field option) - Detects AC power interruption >30ms triggers 90 minute emergency mode with luminaire at 100% output

### FluxStream wrap shown with integral sensor



### Interact Pro scalable sensor for Foundation, Advanced & Enterprise tiers (SWZCS and an evolution of SpaceWise)

- SWZCS is a connected sensor with integral occupancy and daylight sensing and supports wireless mesh connectivity.
- The sensor works in the Foundation mode (similar to SpaceWise) when configured without a gateway or in an Interact Pro Advanced or Enterprise mode if a compatible gateway is used.
- Interact Pro includes an App, a portal and a broad portfolio of wireless luminaires, lamps and retrofit kits all working on the same system.
- Startup is implemented via Interact Pro App (Android or iPhone) & Bluetooth connectivity. The App provides flexibility to choose between a gateway or non gateway mode for setup.
- Setup with the gateway requires wired internet access to the gateway. It is possible to add a gateway at a later point.
- Prepare project configuration steps remotely and use IRT9015 remote onsite to identify and group devices together.
- Compatible with:
  - SWS200 wireless scene switch
  - Battery powered IP42 presence sensor OCC sensor IA CM WH 10/1
  - Battery powered IP42 presence & daylight sensor OCC-DL sensor IA CM IP42 WH
  - LCN3110: Battery powered IP65 presence sensor, OCC sensor IA CM IP65WH
  - LCN3120: Battery powered IP65 presence & daylight sensor, OCC-DL sensor IA CM IP65 WH
- For more information on Interact Pro visit: [www.interact-lighting.com/interactproscalablesystem](http://www.interact-lighting.com/interactproscalablesystem)

### Radio only sensor (RADIO)

- Integral RADIO only sensor simply enables wireless mesh connectivity to the luminaire without any occupancy or daylight sensing.
- Ideal for applications where sensing functionality is managed by other Interact devices and the luminaire only needs to have wireless connectivity.

### Interact Pro scalable sensor bundles for Enterprise tier

- IAOSB option in addition to occupancy and daylight sensing supports advanced IoT capabilities such as people estimation analysis, desk level temperature & humidity sensing, noise classification, and BLE beacon.
- Compatible with SWS200 wireless scene switch, wireless Occ sensor (OCC SENSOR IA CM IP42 WH 10/1) and wireless Day/Occ sensor (OCC MULTI SENSOR IA CM WH 10/1) and wireless Occupancy or Daylight & Occupancy sensors available.
- Use Interact software and insights to increase building efficiency, achieve building wide integration and optimize space through occupancy analytics.
- Requires compatible Gateway and internet connectivity for commissioning.
- For more information, visit: [www.interact-lighting.com/office](http://www.interact-lighting.com/office) or [www.usa.lighting.philips.com/systems/system-areas/offices](http://www.usa.lighting.philips.com/systems/system-areas/offices)



**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM

**TYPE:**  
**T**

# FSW FluxStream LED wraparound

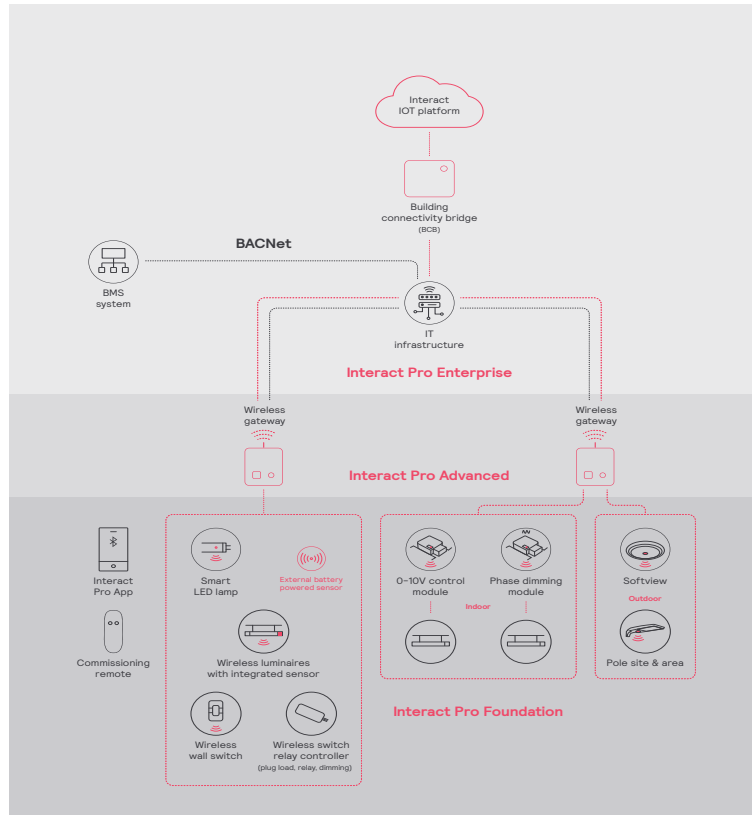
2', 4' and 8'

Interact Pro scalable system			
	Foundation	Advanced	Enterprise
Dimming, grouping, and zoning	✓	✓	✓
Bluetooth and ZigBee enabled	✓	✓	✓
Motion sensing and daylight harvesting	✓	✓	✓
Integration with 0-10V and phase dimming fixtures	✓	✓	✓
Code compliance	✓	✓	✓
Granular dimming and dwell time	✓	✓	✓
Energy reporting and monitoring		✓	✓
Scheduling		✓	✓
Demand response		✓	✓
BMS integration (BACnet)			✓
Floor plan visualization			✓
IoT sensors for wellness			✓
IoT Apps for productivity			✓

### Currently supported maximum system size

To be able to design the lighting system correctly for the customer, it is important to know the prime characteristics of the system, its possibilities and limitations.

System level	
Total number of gateways	Unlimited
Total number of devices	200 per network
• luminaires with integrated sensors	150
• smart TLEDS	150
Total number of ZGP devices (sensors and switches)	50
• sensors	30
• switches	50
• zones and groups	64
Group level	
Recommended number of lights	40 (recommended 25)
Number of ZGP devices	5
Number of scenes	16





**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM

**TYPE:**  
**T**

# FSW FluxStream LED wraparound

2', 4' and 8'

## Photometry

### 2' FluxStream LED wraparound, 2000 nominal delivered lumens

LER - 114

<p><b>Catalog No.</b> FSW220L840-UNV-DIM  <b>Test No.</b> 37658  <b>S/MH</b> 1.3  <b>Lamp Type</b> LED  <b>Lumens</b> 1904  <b>Input Watts</b> 17</p> <p>Comparative yearly lighting energy cost per 1000 lumens – <b>\$2.09</b> based on 3000 hrs. and \$.08 pwr KWH.</p> <p>The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.</p> <p>Photometric values based on test performed in compliance with LM-79.</p>	<p style="text-align: center;"><b>Candlepower</b></p> <table border="1"> <thead> <tr> <th>Angle</th> <th>End</th> <th>45</th> <th>Cross</th> <th>Back-45</th> </tr> </thead> <tbody> <tr><td>0</td><td>559</td><td>559</td><td>559</td><td>559</td></tr> <tr><td>5</td><td>551</td><td>558</td><td>560</td><td>558</td></tr> <tr><td>15</td><td>531</td><td>541</td><td>545</td><td>541</td></tr> <tr><td>25</td><td>490</td><td>504</td><td>512</td><td>504</td></tr> <tr><td>35</td><td>432</td><td>452</td><td>463</td><td>452</td></tr> <tr><td>45</td><td>359</td><td>386</td><td>401</td><td>386</td></tr> <tr><td>55</td><td>278</td><td>312</td><td>330</td><td>312</td></tr> <tr><td>65</td><td>190</td><td>233</td><td>254</td><td>233</td></tr> <tr><td>75</td><td>100</td><td>153</td><td>176</td><td>153</td></tr> <tr><td>85</td><td>23</td><td>77</td><td>103</td><td>77</td></tr> </tbody> </table>	Angle	End	45	Cross	Back-45	0	559	559	559	559	5	551	558	560	558	15	531	541	545	541	25	490	504	512	504	35	432	452	463	452	45	359	386	401	386	55	278	312	330	312	65	190	233	254	233	75	100	153	176	153	85	23	77	103	77	<p><b>Light Distribution</b></p> <table border="1"> <thead> <tr> <th>Degrees</th> <th>Lumens</th> <th>% Luminaire</th> </tr> </thead> <tbody> <tr><td>0-30</td><td>437</td><td>22.9</td></tr> <tr><td>0-40</td><td>718</td><td>37.7</td></tr> <tr><td>0-60</td><td>1291</td><td>67.7</td></tr> <tr><td>0-90</td><td>1754</td><td>92</td></tr> <tr><td>90-180</td><td>153</td><td>8.0</td></tr> <tr><td>0-180</td><td>1906</td><td>100</td></tr> </tbody> </table>	Degrees	Lumens	% Luminaire	0-30	437	22.9	0-40	718	37.7	0-60	1291	67.7	0-90	1754	92	90-180	153	8.0	0-180	1906	100	<p><b>Average Luminance</b></p> <table border="1"> <thead> <tr> <th>Zone</th> <th>End</th> <th>45'</th> <th>Cross</th> </tr> </thead> <tbody> <tr><td>45</td><td>8732</td><td>7352</td><td>7212</td></tr> <tr><td>55</td><td>8094</td><td>6557</td><td>6466</td></tr> <tr><td>65</td><td>7141</td><td>5657</td><td>5641</td></tr> <tr><td>75</td><td>5584</td><td>4560</td><td>4685</td></tr> <tr><td>85</td><td>2667</td><td>3099</td><td>3553</td></tr> </tbody> </table>	Zone	End	45'	Cross	45	8732	7352	7212	55	8094	6557	6466	65	7141	5657	5641	75	5584	4560	4685	85	2667	3099	3553																																		
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### 2' FluxStream LED wraparound, 3000 nominal delivered lumens

LER - 104

<p><b>Catalog No.</b> FSW230L840-UNV-DIM  <b>Test No.</b> 37662  <b>S/MH</b> 1.3  <b>Lamp Type</b> LED  <b>Lumens</b> 3028  <b>Input Watts</b> 29</p> <p>Comparative yearly lighting energy cost per 1000 lumens – <b>\$2.29</b> based on 3000 hrs. and \$.08 pwr KWH.</p> <p>The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.</p> <p>Photometric values based on test performed in compliance with LM-79.</p>	<p style="text-align: center;"><b>Candlepower</b></p> <table border="1"> <thead> <tr> <th>Angle</th> <th>End</th> <th>45</th> <th>Cross</th> <th>Back-45</th> </tr> </thead> <tbody> <tr><td>0</td><td>912</td><td>912</td><td>912</td><td>912</td></tr> <tr><td>5</td><td>899</td><td>910</td><td>914</td><td>910</td></tr> <tr><td>15</td><td>866</td><td>882</td><td>890</td><td>882</td></tr> <tr><td>25</td><td>800</td><td>824</td><td>836</td><td>824</td></tr> <tr><td>35</td><td>706</td><td>740</td><td>756</td><td>740</td></tr> <tr><td>45</td><td>587</td><td>633</td><td>656</td><td>633</td></tr> <tr><td>55</td><td>425</td><td>478</td><td>523</td><td>478</td></tr> <tr><td>65</td><td>290</td><td>358</td><td>388</td><td>358</td></tr> <tr><td>75</td><td>153</td><td>235</td><td>270</td><td>235</td></tr> <tr><td>85</td><td>36</td><td>119</td><td>158</td><td>119</td></tr> </tbody> </table>	Angle	End	45	Cross	Back-45	0	912	912	912	912	5	899	910	914	910	15	866	882	890	882	25	800	824	836	824	35	706	740	756	740	45	587	633	656	633	55	425	478	523	478	65	290	358	388	358	75	153	235	270	235	85	36	119	158	119	<p><b>Light Distribution</b></p> <table border="1"> <thead> <tr> <th>Degrees</th> <th>Lumens</th> <th>% Luminaire</th> </tr> </thead> <tbody> <tr><td>0-30</td><td>713</td><td>23.5</td></tr> <tr><td>0-40</td><td>1174</td><td>38.7</td></tr> <tr><td>0-60</td><td>2085</td><td>68.8</td></tr> <tr><td>0-90</td><td>2794</td><td>92.2</td></tr> <tr><td>90-180</td><td>238</td><td>7.8</td></tr> <tr><td>0-180</td><td>3032</td><td>100</td></tr> </tbody> </table>	Degrees	Lumens	% Luminaire	0-30	713	23.5	0-40	1174	38.7	0-60	2085	68.8	0-90	2794	92.2	90-180	238	7.8	0-180	3032	100	<p><b>Average Luminance</b></p> <table border="1"> <thead> <tr> <th>Zone</th> <th>End</th> <th>45'</th> <th>Cross</th> </tr> </thead> <tbody> <tr><td>45</td><td>14277</td><td>12051</td><td>11797</td></tr> <tr><td>55</td><td>12361</td><td>10058</td><td>10244</td></tr> <tr><td>65</td><td>10928</td><td>8693</td><td>8623</td></tr> <tr><td>75</td><td>8566</td><td>7007</td><td>7172</td></tr> <tr><td>85</td><td>4110</td><td>4810</td><td>5437</td></tr> </tbody> </table>	Zone	End	45'	Cross	45	14277	12051	11797	55	12361	10058	10244	65	10928	8693	8623	75	8566	7007	7172	85	4110	4810	5437																																		
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**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM

**TYPE:**  
**T**

# FSW FluxStream LED wraparound

2', 4' and 8'

## Photometry

### 4' FluxStream LED wraparound, 4000 nominal delivered lumens

LER - 122

**Catalog No.** FSW440L840-UNV-DIM  
**Test No.** 37656  
**S/MH** 1.3  
**Lamp Type** LED  
**Lumens** 3856  
**Input Watts** 31

Comparative yearly lighting energy cost per 1000 lumens - \$1.95 based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Candlepower

Angle	End	45	Cross	Back-45
0	1123	1123	1123	1123
5	1107	1117	1124	1117
15	1067	1085	1096	1085
25	987	1014	1033	1014
35	871	913	934	913
45	728	790	813	790
55	557	642	674	642
65	360	451	505	451
75	190	297	341	297
85	43	155	206	155

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	880	22.8
0-40	1449	37.5
0-60	2612	67.6
0-90	3514	91
0-180	348	9.0
0-180	3862	100

#### Average Luminance

Zone	End	45°	Cross
45	9388	7848	7492
55	8718	7090	6755
65	7439	5791	5742
75	6070	4741	4639
85	3243	3385	3631

#### Coefficients of Utilization

EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)												
pfc =	20			80			70			50		
Cell												
Wall	70	50	30	70	50	30	70	50	30	70	50	30
RCR												
0	116	116	116	112	112	112	106	106	106	106	106	106
1	105	100	94	102	96	93	91	88	88	88	88	88
2	94	86	79	92	83	77	79	72	72	72	72	72
3	86	76	67	82	72	66	68	63	63	63	63	63
4	79	67	57	76	65	56	60	54	54	54	54	54
5	72	59	50	69	57	48	55	46	46	46	46	46
6	67	53	44	65	52	44	48	41	41	41	41	41
7	61	47	40	59	46	39	45	36	36	36	36	36
8	57	44	34	56	42	34	40	34	34	34	34	34
9	54	40	32	52	39	32	38	30	30	30	30	30
10	50	36	28	48	35	28	34	28	28	28	28	28

### 4' FluxStream LED wraparound, 5500 nominal delivered lumens

LER - 119

**Catalog No.** FSW455L840-UNV-DIM  
**Test No.** 376555  
**S/MH** 1.3  
**Lamp Type** LED  
**Lumens** 5339  
**Input Watts** 45

Comparative yearly lighting energy cost per 1000 lumens - \$2.00 based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Candlepower

Angle	End	45	Cross	Back-45
0	1546	1546	1546	1546
5	1523	1538	1549	1538
15	1468	1493	1511	1493
25	1357	1396	1423	1396
35	1199	1256	1286	1256
45	1002	1086	1119	1086
55	776	883	927	883
65	495	663	716	663
75	261	408	468	408
85	60	211	279	211

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	1211	22.7
0-40	1995	37.3
0-60	3602	67.4
0-90	4871	91.1
0-180	477	8.9
0-180	3862	100

#### Average Luminance

Zone	End	45°	Cross
45	12919	10790	10317
55	12142	9742	9297
65	10244	8513	8138
75	8365	6504	6366
85	4505	4608	4912

#### Coefficients of Utilization

EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)												
pfc =	20			80			70			50		
Cell												
Wall	70	50	30	70	50	30	70	50	30	70	50	30
RCR												
0	116	116	116	112	112	112	106	106	106	106	106	106
1	105	100	95	102	96	93	91	88	88	88	88	88
2	94	86	79	92	83	77	79	72	72	72	72	72
3	86	76	67	82	72	66	68	61	61	61	61	61
4	79	67	57	76	65	56	60	54	54	54	54	54
5	72	58	50	69	57	48	55	46	46	46	46	46
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9	54	40	32	52	39	30	36	29	29	29	29	29
10	50	36	28	48	35	28	34	28	28	28	28	28



**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM

**TYPE:**  
**T**

# FSW FluxStream LED wraparound

2', 4' and 8'

4' FluxStream LED wraparound, 7000 nominal delivered lumens

LER - 114

**Catalog No.** FSW470L840-UNV-DIM  
**Test No.** 37654  
**S/MH** 1.3  
**Lamp Type** LED  
**Lumens** 6712  
**Input Watts** 58

Comparative yearly lighting energy cost per 1000 lumens - \$2.07 based on 3000 hrs. and S.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

**Candlepower**

Angle	End	45	Cross	Back-45
0	1941	1941	1941	1941
5	1914	1930	1941	1930
15	1845	1875	1893	1875
25	1706	1753	1784	1753
35	1506	1576	1611	1576
45	1259	1362	1402	1362
55	975	1106	1161	1106
65	665	830	895	830
75	327	531	608	531
85	75	264	350	264

**Light Distribution**

Degrees	Lumens	% Luminaire
0-30	1520	22.6
0-40	2503	37.2
0-60	4518	67.2
0-90	6130	91.2
90-180	593	8.8
0-180	6723	100

**Average Luminance**

Zone	End	45°	Cross
45	16224	13532	12918
55	15244	12210	11640
65	13762	10665	10181
75	10461	8469	8275
85	5654	5775	6164

**Coefficients of Utilization**

**EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)**

pfc =	20			80			70			50		
Ceil	70	50	30	70	50	30	70	50	30	70	50	30
0	116	116	116	112	112	112	106	106	106	106	106	106
1	105	100	94	102	96	93	91	88	88	88	88	88
2	94	86	79	92	83	77	79	72	72	72	72	72
3	86	76	67	82	72	65	68	61	61	61	61	61
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5	72	58	50	69	57	48	55	46	46	46	46	46
6	67	53	44	64	52	42	48	41	41	41	41	41
7	61	47	39	59	46	39	45	36	36	36	36	36
8	57	44	34	56	42	34	40	33	33	33	33	33
9	54	40	32	52	39	30	36	29	29	29	29	29
10	50	36	28	48	35	28	34	28	28	28	28	28

**Accessories<sup>16</sup>**



Accessory Catalog Code	Description
FSTH	Sliding hanger bracket (pair)
SV5F12	12" Stem and canopy kit
SV5F18	18" Stem and canopy kit
SV5F24	24" Stem and canopy kit
SV5F36	36" Stem and canopy kit
SV5F48	48" Stem and canopy kit
FKR-126	Chain hanger set (pair)
DACHxx	Adjustable cable hanger kit (single)
DACHxx-1-SC	Adjustable cable hanger kit with white straight 18/3 cord (single)
DACHxx-1-CC	Adjustable cable hanger kit with white coiled 18/3 cord (single)
DACHxx-2-SC	Adjustable cable hanger kit with white straight 18/4 cord (single)
DACHxx-2-CC	Adjustable cable hanger kit with white coiled 18/4 cord (single)
DACHxx-1D-SC	Adjustable cable hanger kit with white straight 18/5 cord with dimming leads (single)
FSWJ	External continuous row joiner (one per joint).
LSXR10	Low bay pir motion sensor (120-277v)
LSXR10ADC	Low bay pir motion sensor with photocell and hi/lo trim dimming (120-277v)
FSWD2L	2' Diffuse replacement lens
FSWD4L	4' Diffuse replacement lens (order two for 8' models)

White stem and canopy kit, 1/4" trade size (1/2" O.D.) locknuts included. Works with 9/16" k.O. on base of housing.

Includes two 5' heavy duty link chains with "V" hooks. Attaches to base of housing.

Works with 1/4" hole on base of housing or FSTH hanger bracket.

xx=cable length in inches, enter 48" to 180" lengths in 12" increments

FSJW accessory required for continuous row mounting

<sup>16</sup> Consult Signify to confirm whether specific accessories are BAA-compliant.



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**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM-EMLED

**TYPE:**  
**TE**

**Day-Brite**  
**CFI**  
 by **Signify**

Linear

FluxStream wraparound

FSW 2', 4', & 8'



Day-Brite / CFI FluxStream LED wraparound is a high performing luminaire delivering smooth diffuse light ideal for light industrial, commercial and residential applications with unparalleled energy efficiency.

Project: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Cat.No: \_\_\_\_\_  
 Type: \_\_\_\_\_  
 Lumens: \_\_\_\_\_ Qty: \_\_\_\_\_  
 Notes: \_\_\_\_\_

**Ordering guide**

Example: FSW440L840-UNV-DIM

Series	Length (nominal)	Lumens <sup>2</sup> (nominal)	Color temp. (K)	Voltage	Driver	Options
<b>FSW</b>						
FSW FluxStream Wraparound	2' 2' length	20L 2000 lumens 30L 3000 lumens	830 80 CRI, 3000K 835 80 CRI, 3500K	UNV Universal voltage 120-277V	DIM <sup>11</sup> Dimming SDIM <sup>12,13</sup> Step dimming to 40% input power XDIM <sup>3,5,6</sup> MarkX phase dimming DALI <sup>7</sup> DALI	EMLED <sup>4,8,9</sup> Factory wired Bodine BSL310LP integral emergency pack. Nominal 1100lm ER100 <sup>10,12,13</sup> UL924 listed sensor bypass relay, factory installed between driver & sensor (PS/PI compatible) ER100/HVPS <sup>5,12,13</sup> UL924 listed sensor bypass relay, factory installed between driver & sensor for 347/480 Power Sense ER100/HVPI <sup>5,12,13</sup> UL924 listed sensor bypass relay, factory installed between driver & sensor 347/480 Power Interrupt GTD/E <sup>12</sup> UL924 listed Bodine GTD factory installed on driver input GTD/SNSR <sup>12,13</sup> UL924 listed Bodine GTD factory installed between driver & sensor SWZCS <sup>10,14</sup> Interact Pro scalable sensor with integral daylight & occupancy sensing, advanced grouping with dwell time SWZDT <sup>10</sup> SpaceWise only sensor, daylighting and occupancy, advanced grouping, with dwell time RADIO <sup>10</sup> Integral Interact Pro RF sensor, enables wireless connected lighting control IAOSB <sup>10,14</sup> Interact Pro wireless sensor with occupancy, daylight, and environmental sensing capabilities LSXR10 LSXR10ADC <sup>10</sup> 120-347V motion sensor, factory installed on end cap 120-347V motion sensor with photocell and hi/lo trim dimming, factory installed on end cap PCSR Pull chain switch right, 120V only PCSL Pull chain switch left, 120V only PAF Paint after fabrication for extra corrosion resistance (white) BAC <sup>15</sup> Meets the requirements of the Buy American Act of 1933 (BAA)
	4' 4' length	30L 3000 lumens 40L 4000 lumens 55L 5500 lumens 70L 7000 lumens	840 80 CRI, 4000K 850 80 CRI, 5000K	120 <sup>3</sup> 120V 277 <sup>3</sup> 277V 347 <sup>4</sup> 347V		
	8' 8' length	60L 6000 lumens 80L 8000 lumens 110L 11000 lumens 140L 14000 lumens				

- 8' is tandem (2) 4' lenses with single piece 8' body.
- Nominal delivered lumens at 25°C ambient.
- XDIM option must be specified with 120V or 277V options only.
- 347V with EMLED only available in 8' models.
- Not available in 2' models.
- Not available in 4' 70L or 8' 140L models.
- DALI available up to 80L options only, consult factory for other options.
- EMLED not available on 2' models.
- EMLED on 8' models illuminates 4' section in emergency mode.
- Available with DIM driver option only.
- Integral controls options dimmable to 5% via wireless wall switch (see p.2). Non-integral controls configurations are 0-10V dimmable to 1%.
- Must be installed in conjunction with a UL1008 device.
- Must be ordered with an integral sensing option.
- Must order IRT9015 Interact commissioning remote with each system order.
- Failure to properly select the "BAC" suffix could result in you receiving product that is not BAA compliant product with no recourse for an RMA or refund. This BAC designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies.
- Consult Signify to confirm whether specific accessories are BAA-compliant.

**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.

**Accessories<sup>16</sup> (order separately)**

- FSWD2L – FluxWrap Diffuse 2' replacement lens
  - FSWD4L – FluxWrap Diffuse 4' replacement lens (order two for 8' models)
  - LSXR10 – Low bay PIR occ sensor, 120-277V
  - LSXR10ADC – Low bay PIR occ with photocell sensor and hi/lo trim dimming, 120-277V
  - FSTH – Sliding hanger bracket (set of 2)
  - FSWJ – Continuous row joiner (one per joint)
- See last page for details and more options.

**SWZCS accessories<sup>16</sup> (order separately)**

- IRT9015 – handheld remote for grouping and configuration (at least one remote required for any SWZCS installation).



**Interact ready.**





**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM-EMLED

**TYPE:**  
**TE**

# FSW FluxStream LED wraparound

2', 4' and 8'

## Features

- Compact design for installation in tight spaces
- Frosted acrylic diffuser provides wide light distribution and superior glare control
- Injection molded lens retainers<sup>5</sup> provide positive diffuser retention, and easy tool-free access to LED boards and driver
- 2', 4' and 8' tandem lengths available to accommodate many field applications
- Up to 100,000 hour predicted L70 LED lumen maintenance provides long service life to reduce maintenance costs
- Can be surface mounted on ceilings or walls, or suspended via chain, pendants or cables
- Wall mountable – ADA compliant
- Ideal for cold applications (~20°C to 25°C)
- FSWJ accessory required for continuous row mounting, one FSWJ at each joint
- 7/8" knock out provided at each end and on base of luminaire. Note: Center knockout is covered and not useable in 4' version with EMLED option.

- Multiple driver options available with 0-10v as standard
- Enclosed lens minimizes penetration of dust, insects, and other debris into the lamp compartment
- 8' tandem unit is two 4' optical assemblies with an aesthetic center mullion on a single full length chassis
- Integral controls options include sensor mounted in one lens retainer.
- Fluxstream luminaires are Designlights Consortium<sup>®</sup> qualified. Please see the DLC QPL list for exact catalog numbers [www.designlights.org/QPL](http://www.designlights.org/QPL)
- 5 year manufacturer's limited warranty. Visit [signify.com/warranties](http://signify.com/warranties) for complete warranty information

## Finish

- Baked white acrylic matte high reflectance paint finish
- PAF option gives extra corrosion resistance for canopy or humid applications.

## Shielding

- Contoured frosted acrylic lens

## Electrical

- LED boards and drivers are RoHS (Restriction of Hazardous Substances) compliant. Total system life rated at 50,000 hours. Predicted L70 lifetime based on LED manufacturer's supplied LM-80 data and in-situ laboratory testing at 25°C ambient
- Integral emergency driver with EMLED option. To estimate lumen output in emergency, multiply emergency pack wattage by efficacy, then by 1.10

## Materials

- Heavy gauge cold rolled steel housing and LED pan. Polycarbonate injection molded end caps. Profile extruded acrylic diffuser

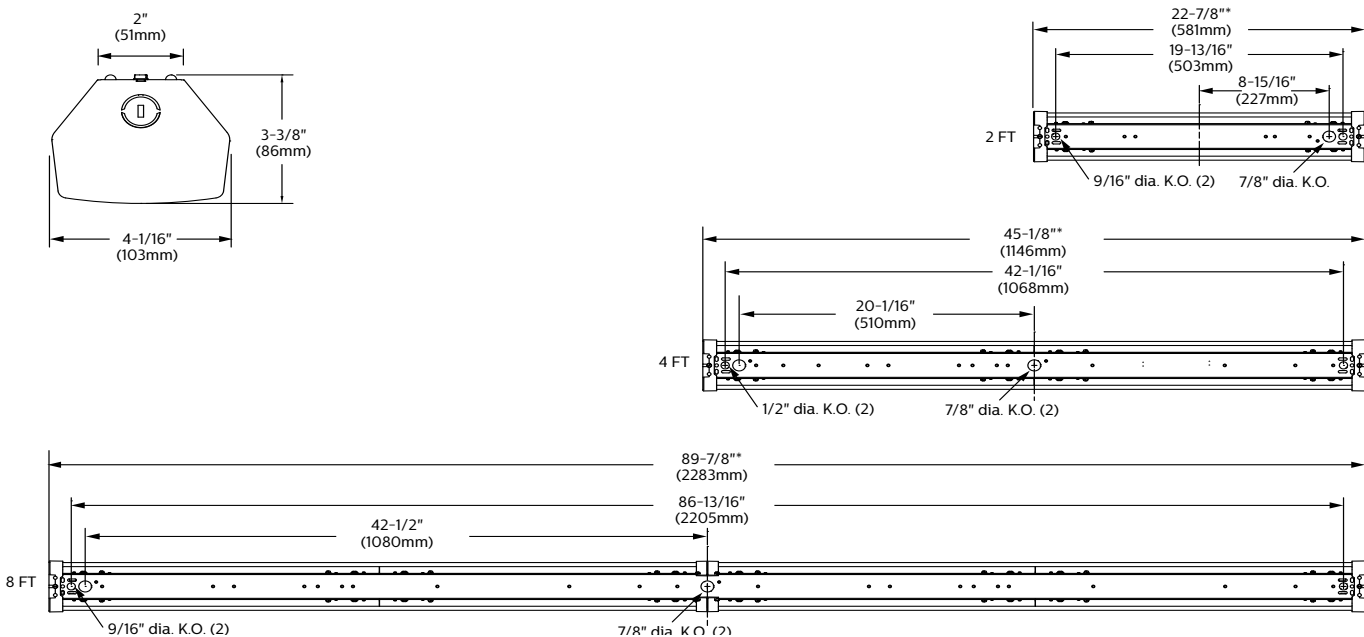
## Labels

- cETLus listed
- Suitable for damp locations

## Performance data

Fixture	Lumens	Wattage	Efficacy
FSW220L840	1904lm	16.6W	114lm/w
FSW230L840	3028lm	28.9W	104lm/w
FSW440L840	3856lm	31.4W	122lm/w
FSW455L840	5339lm	44.5W	119lm/w
FSW470L840	6712lm	58.0W	114lm/w

## Dimensions



\*For integral controls option, overall length is 1-3/8" (35mm) longer.



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# FSW FluxStream LED wraparound

2', 4' and 8'

## Wireless Controls Options

### SpaceWise DT (SWZDT)

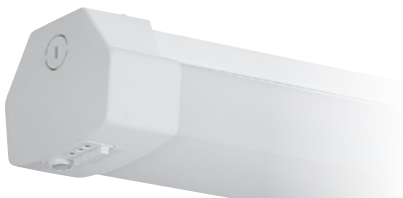
- Standalone daylight and occupancy sensing with advanced grouping, wireless mesh networking and dwell time.
- Commissioning via compatible Android phone and Philips Field App
- Dimming via compatible Zigbee wireless wall switch only (see link below for details)
- Register for the commissioning app at <http://registration.componentcloud.philips.com/appregistration/>
- Integral sensing options may not be combined
- For more information including recommended switches, refer to the following: -

**SWZDT** - [www.usa.lighting.philips.com/systems/lighting-systems/spacewise](http://www.usa.lighting.philips.com/systems/lighting-systems/spacewise)

### Emergency Options (ER100)

- Power Sensing (Factory default) - Recommended UL924 option requires unswitched power sense line, absence of voltage on the normal circuit triggers luminaire to 100% output
- Power Interruption Detection (Field option) - Detects AC power interruption >30ms triggers 90 minute emergency mode with luminaire at 100% output

### FluxStream wrap shown with integral sensor



### Interact Pro scalable sensor for Foundation, Advanced & Enterprise tiers (SWZCS and an evolution of SpaceWise)

- SWZCS is a connected sensor with integral occupancy and daylight sensing and supports wireless mesh connectivity.
- The sensor works in the Foundation mode (similar to SpaceWise) when configured without a gateway or in an Interact Pro Advanced or Enterprise mode if a compatible gateway is used.
- Interact Pro includes an App, a portal and a broad portfolio of wireless luminaires, lamps and retrofit kits all working on the same system.
- Startup is implemented via Interact Pro App (Android or iPhone) & Bluetooth connectivity. The App provides flexibility to choose between a gateway or non gateway mode for setup.
- Setup with the gateway requires wired internet access to the gateway. It is possible to add a gateway at a later point.
- Prepare project configuration steps remotely and use IRT9015 remote onsite to identify and group devices together.
  - Compatible with:
    - SWS200 wireless scene switch
    - Battery powered IP42 presence sensor OCC sensor IA CM WH 10/1
    - Battery powered IP42 presence & daylight sensor OCC-DL sensor IA CM IP42 WH
    - LCN3110: Battery powered IP65 presence sensor, OCC sensor IA CM IP65WH
    - LCN3120: Battery powered IP65 presence & daylight sensor, OCC-DL sensor IA CM IP65 WH
- For more information on Interact Pro visit: [www.interact-lighting.com/interactproscalablesystem](http://www.interact-lighting.com/interactproscalablesystem)

### Radio only sensor (RADIO)

- Integral RADIO only sensor simply enables wireless mesh connectivity to the luminaire without any occupancy or daylight sensing.
- Ideal for applications where sensing functionality is managed by other Interact devices and the luminaire only needs to have wireless connectivity.

### Interact Pro scalable sensor bundles for Enterprise tier

- IAOSB option in addition to occupancy and daylight sensing supports advanced IoT capabilities such as people estimation analysis, desk level temperature & humidity sensing, noise classification, and BLE beacon.
- Compatible with SWS200 wireless scene switch, wireless Occ sensor (OCC SENSOR IA CM IP42 WH 10/1) and wireless Day/Occ sensor (OCC MULTI SENSOR IA CM WH 10/1) and wireless Occupancy or Daylight & Occupancy sensors available.
- Use Interact software and insights to increase building efficiency, achieve building wide integration and optimize space through occupancy analytics.
- Requires compatible Gateway and internet connectivity for commissioning.
- For more information, visit: [www.interact-lighting.com/office](http://www.interact-lighting.com/office) or [www.usa.lighting.philips.com/systems/system-areas/offices](http://www.usa.lighting.philips.com/systems/system-areas/offices)



**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM-EMLED

**TYPE:**  
**TE**

# FSW FluxStream LED wraparound

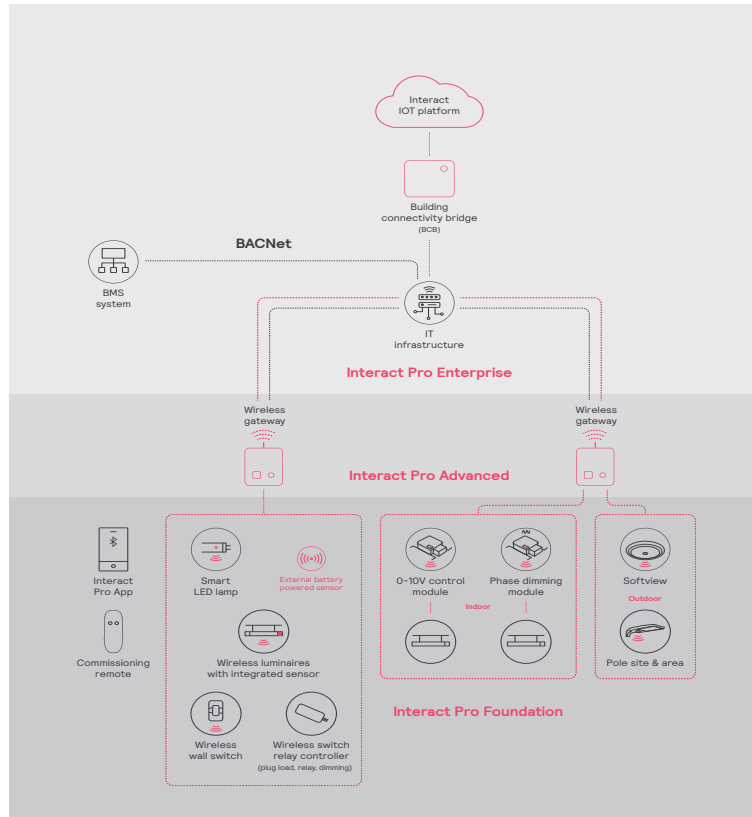
2', 4' and 8'

Interact Pro scalable system			
	Foundation	Advanced	Enterprise
Dimming, grouping, and zoning	✓	✓	✓
Bluetooth and ZigBee enabled	✓	✓	✓
Motion sensing and daylight harvesting	✓	✓	✓
Integration with 0-10V and phase dimming fixtures	✓	✓	✓
Code compliance	✓	✓	✓
Granular dimming and dwell time	✓	✓	✓
Energy reporting and monitoring		✓	✓
Scheduling		✓	✓
Demand response		✓	✓
BMS integration (BACnet)			✓
Floor plan visualization			✓
IoT sensors for wellness			✓
IoT Apps for productivity			✓

**Currently supported maximum system size**

To be able to design the lighting system correctly for the customer, it is important to know the prime characteristics of the system, its possibilities and limitations.

System level	
Total number of gateways	Unlimited
Total number of devices	200 per network
• luminaires with integrated sensors	150
• smart TLEDS	150
Total number of ZGP devices (sensors and switches)	50
• sensors	30
• switches	50
• zones and groups	64
Group level	
Recommended number of lights	40 (recommended 25)
Number of ZGP devices	5
Number of scenes	16





**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM-EMLED

**TYPE:**  
**TE**

# FSW FluxStream LED wraparound

2', 4' and 8'

## Photometry

### 2' FluxStream LED wraparound, 2000 nominal delivered lumens

LER - 114

<p><b>Catalog No.</b> FSW220L840-UNV-DIM  <b>Test No.</b> 37658  <b>S/MH</b> 1.3  <b>Lamp Type</b> LED  <b>Lumens</b> 1904  <b>Input Watts</b> 17</p> <p>Comparative yearly lighting energy cost per 1000 lumens – <b>\$2.09</b> based on 3000 hrs. and \$.08 pwr KWH.</p> <p>The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.</p> <p>Photometric values based on test performed in compliance with LM-79.</p>	<p><b>Candlepower</b></p> <table border="1"> <thead> <tr> <th>Angle</th> <th>End</th> <th>45</th> <th>Cross</th> <th>Back-45</th> </tr> </thead> <tbody> <tr><td>0</td><td>559</td><td>559</td><td>559</td><td>559</td></tr> <tr><td>5</td><td>551</td><td>558</td><td>560</td><td>558</td></tr> <tr><td>15</td><td>531</td><td>541</td><td>545</td><td>541</td></tr> <tr><td>25</td><td>490</td><td>504</td><td>512</td><td>504</td></tr> <tr><td>35</td><td>432</td><td>452</td><td>463</td><td>452</td></tr> <tr><td>45</td><td>359</td><td>386</td><td>401</td><td>386</td></tr> <tr><td>55</td><td>278</td><td>312</td><td>330</td><td>312</td></tr> <tr><td>65</td><td>190</td><td>233</td><td>254</td><td>233</td></tr> <tr><td>75</td><td>100</td><td>153</td><td>176</td><td>153</td></tr> <tr><td>85</td><td>23</td><td>77</td><td>103</td><td>77</td></tr> </tbody> </table>	Angle	End	45	Cross	Back-45	0	559	559	559	559	5	551	558	560	558	15	531	541	545	541	25	490	504	512	504	35	432	452	463	452	45	359	386	401	386	55	278	312	330	312	65	190	233	254	233	75	100	153	176	153	85	23	77	103	77	<p><b>Light Distribution</b></p> <table border="1"> <thead> <tr> <th>Degrees</th> <th>Lumens</th> <th>% Luminaire</th> </tr> </thead> <tbody> <tr><td>0-30</td><td>437</td><td>22.9</td></tr> <tr><td>0-40</td><td>718</td><td>37.7</td></tr> <tr><td>0-60</td><td>1291</td><td>67.7</td></tr> <tr><td>0-90</td><td>1754</td><td>92</td></tr> <tr><td>90-180</td><td>153</td><td>8.0</td></tr> <tr><td>0-180</td><td>1906</td><td>100</td></tr> </tbody> </table>	Degrees	Lumens	% Luminaire	0-30	437	22.9	0-40	718	37.7	0-60	1291	67.7	0-90	1754	92	90-180	153	8.0	0-180	1906	100	<p><b>Average Luminance</b></p> <table border="1"> <thead> <tr> <th>Zone</th> <th>End</th> <th>45'</th> <th>Cross</th> </tr> </thead> <tbody> <tr><td>45</td><td>8732</td><td>7352</td><td>7212</td></tr> <tr><td>55</td><td>8094</td><td>6557</td><td>6466</td></tr> <tr><td>65</td><td>7141</td><td>5657</td><td>5641</td></tr> <tr><td>75</td><td>5584</td><td>4560</td><td>4685</td></tr> <tr><td>85</td><td>2667</td><td>3099</td><td>3553</td></tr> </tbody> </table>	Zone	End	45'	Cross	45	8732	7352	7212	55	8094	6557	6466	65	7141	5657	5641	75	5584	4560	4685	85	2667	3099	3553																									
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10	50	36	28	48	35	28	34	28																																																																																																																								

### 2' FluxStream LED wraparound, 3000 nominal delivered lumens

LER - 104

<p><b>Catalog No.</b> FSW230L840-UNV-DIM  <b>Test No.</b> 37662  <b>S/MH</b> 1.3  <b>Lamp Type</b> LED  <b>Lumens</b> 3028  <b>Input Watts</b> 29</p> <p>Comparative yearly lighting energy cost per 1000 lumens – <b>\$2.29</b> based on 3000 hrs. and \$.08 pwr KWH.</p> <p>The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.</p> <p>Photometric values based on test performed in compliance with LM-79.</p>	<p><b>Candlepower</b></p> <table border="1"> <thead> <tr> <th>Angle</th> <th>End</th> <th>45</th> <th>Cross</th> <th>Back-45</th> </tr> </thead> <tbody> <tr><td>0</td><td>912</td><td>912</td><td>912</td><td>912</td></tr> <tr><td>5</td><td>899</td><td>910</td><td>914</td><td>910</td></tr> <tr><td>15</td><td>866</td><td>882</td><td>890</td><td>882</td></tr> <tr><td>25</td><td>800</td><td>824</td><td>836</td><td>824</td></tr> <tr><td>35</td><td>706</td><td>740</td><td>756</td><td>740</td></tr> <tr><td>45</td><td>587</td><td>633</td><td>656</td><td>633</td></tr> <tr><td>55</td><td>425</td><td>478</td><td>523</td><td>478</td></tr> <tr><td>65</td><td>290</td><td>358</td><td>388</td><td>358</td></tr> <tr><td>75</td><td>153</td><td>235</td><td>270</td><td>235</td></tr> <tr><td>85</td><td>36</td><td>119</td><td>158</td><td>119</td></tr> </tbody> </table>	Angle	End	45	Cross	Back-45	0	912	912	912	912	5	899	910	914	910	15	866	882	890	882	25	800	824	836	824	35	706	740	756	740	45	587	633	656	633	55	425	478	523	478	65	290	358	388	358	75	153	235	270	235	85	36	119	158	119	<p><b>Light Distribution</b></p> <table border="1"> <thead> <tr> <th>Degrees</th> <th>Lumens</th> <th>% Luminaire</th> </tr> </thead> <tbody> <tr><td>0-30</td><td>713</td><td>23.5</td></tr> <tr><td>0-40</td><td>1174</td><td>38.7</td></tr> <tr><td>0-60</td><td>2085</td><td>68.8</td></tr> <tr><td>0-90</td><td>2794</td><td>92.2</td></tr> <tr><td>90-180</td><td>238</td><td>7.8</td></tr> <tr><td>0-180</td><td>3032</td><td>100</td></tr> </tbody> </table>	Degrees	Lumens	% Luminaire	0-30	713	23.5	0-40	1174	38.7	0-60	2085	68.8	0-90	2794	92.2	90-180	238	7.8	0-180	3032	100	<p><b>Average Luminance</b></p> <table border="1"> <thead> <tr> <th>Zone</th> <th>End</th> <th>45'</th> <th>Cross</th> </tr> </thead> <tbody> <tr><td>45</td><td>14277</td><td>12051</td><td>11797</td></tr> <tr><td>55</td><td>12361</td><td>10058</td><td>10244</td></tr> <tr><td>65</td><td>10928</td><td>8693</td><td>8623</td></tr> <tr><td>75</td><td>8566</td><td>7007</td><td>7172</td></tr> <tr><td>85</td><td>4110</td><td>4810</td><td>5437</td></tr> </tbody> </table>	Zone	End	45'	Cross	45	14277	12051	11797	55	12361	10058	10244	65	10928	8693	8623	75	8566	7007	7172	85	4110	4810	5437																									
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**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM-EMLED

**TYPE:**  
**TE**

# FSW FluxStream LED wraparound

2', 4' and 8'

## Photometry

### 4' FluxStream LED wraparound, 4000 nominal delivered lumens

LER - 122

<b>Catalog No.</b>	FSW440L840-UNV-DIM
<b>Test No.</b>	37656
<b>S/MH</b>	1.3
<b>Lamp Type</b>	LED
<b>Lumens</b>	3856
<b>Input Watts</b>	31

Comparative yearly lighting energy cost per 1000 lumens - \$1.95 based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Candlepower

Angle	End	45	Cross	Back-45
0	1123	1123	1123	1123
5	1107	1117	1124	1117
15	1067	1085	1096	1085
25	987	1014	1033	1014
35	871	913	934	913
45	728	790	813	790
55	557	642	674	642
65	360	451	505	451
75	190	297	341	297
85	43	155	206	155

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	880	22.8
0-40	1449	37.5
0-60	2612	67.6
0-90	3514	91
90-180	348	9.0
0-180	3862	100

#### Average Luminance

Zone	End	45°	Cross
45	9388	7848	7492
55	8718	7090	6755
65	7439	5791	5742
75	6070	4741	4639
85	3243	3385	3631

#### Coefficients of Utilization

EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)												
pfc =	20			80			70			50		
Cell	70	50	30	70	50	30	50	30	70	50	30	
Wall												
RCR												
0	116	116	116	112	112	112	106	106	106	106	106	
1	105	100	94	102	96	93	91	88	88	88	88	
2	94	86	79	92	83	77	79	72	72	72	72	
3	86	76	67	82	72	66	68	63	63	63	63	
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8	57	44	34	56	42	34	40	34	34	34	34	
9	54	40	32	52	39	32	38	30	30	30	30	
10	50	36	28	48	35	28	34	28	28	28	28	

### 4' FluxStream LED wraparound, 5500 nominal delivered lumens

LER - 119

<b>Catalog No.</b>	FSW455L840-UNV-DIM
<b>Test No.</b>	376555
<b>S/MH</b>	1.3
<b>Lamp Type</b>	LED
<b>Lumens</b>	5339
<b>Input Watts</b>	45

Comparative yearly lighting energy cost per 1000 lumens - \$2.00 based on 3000 hrs. and \$.08 pwr KWH.

The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.

Photometric values based on test performed in compliance with LM-79.

#### Candlepower

Angle	End	45	Cross	Back-45
0	1546	1546	1546	1546
5	1523	1538	1549	1538
15	1468	1493	1511	1493
25	1357	1396	1423	1396
35	1199	1256	1286	1256
45	1002	1086	1119	1086
55	776	883	927	883
65	495	663	716	663
75	261	408	468	408
85	60	211	279	211

#### Light Distribution

Degrees	Lumens	% Luminaire
0-30	1211	22.7
0-40	1995	37.3
0-60	3602	67.4
0-90	4871	91
90-180	477	9.9
0-180	3862	100

#### Average Luminance

Zone	End	45°	Cross
45	12919	10790	10317
55	12142	9742	9297
65	10244	8513	8138
75	8365	6504	6366
85	4505	4608	4912

#### Coefficients of Utilization

EFFECTIVE FLOOR CAVITY REFLECTANCE 20 PER (pfc=0.20)												
pfc =	20			80			70			50		
Cell	70	50	30	70	50	30	50	30	70	50	30	
Wall												
RCR												
0	116	116	116	112	112	112	106	106	106	106	106	
1	105	100	95	102	96	93	91	88	88	88	88	
2	94	86	79	92	83	77	79	72	72	72	72	
3	86	76	67	82	72	66	68	61	61	61	61	
4	79	67	57	76	65	56	60	54	54	54	54	
5	72	58	50	69	57	48	55	46	46	46	46	
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10	50	36	28	48	35	28	34	28	28	28	28	



**MANUFACTURER:** DAY BRITE  
**MODEL:** FSW440L835-UNV-DIM-EMLED

**TYPE:**  
**TE**

# FSW FluxStream LED wraparound

2', 4' and 8'

4' FluxStream LED wraparound, 7000 nominal delivered lumens

LER - 114

<p><b>Catalog No.</b> FSW470L840-UNV-DIM <b>Test No.</b> 37654 <b>S/MH</b> 1.3 <b>Lamp Type</b> LED <b>Lumens</b> 6712 <b>Input Watts</b> 58</p> <p>Comparative yearly lighting energy cost per 1000 lumens - \$2.07 based on 3000 hrs. and S.08 pwr KWH.</p> <p>The photometric results were obtained in the Day-Brite laboratory which is NVLAP accredited by the National Institute of Standards and Technology.</p> <p>Photometric values based on test performed in compliance with LM-79.</p>	<p><b>Candlepower</b></p> <table border="1"> <thead> <tr> <th>Angle</th> <th>End</th> <th>45</th> <th>Cross</th> <th>Back-45</th> </tr> </thead> <tbody> <tr><td>0</td><td>1941</td><td>1941</td><td>1941</td><td>1941</td></tr> <tr><td>5</td><td>1914</td><td>1930</td><td>1941</td><td>1930</td></tr> <tr><td>15</td><td>1845</td><td>1875</td><td>1893</td><td>1875</td></tr> <tr><td>25</td><td>1706</td><td>1753</td><td>1784</td><td>1753</td></tr> <tr><td>35</td><td>1506</td><td>1576</td><td>1611</td><td>1576</td></tr> <tr><td>45</td><td>1259</td><td>1362</td><td>1402</td><td>1362</td></tr> <tr><td>55</td><td>975</td><td>1106</td><td>1161</td><td>1106</td></tr> <tr><td>65</td><td>665</td><td>830</td><td>895</td><td>830</td></tr> <tr><td>75</td><td>327</td><td>531</td><td>608</td><td>531</td></tr> <tr><td>85</td><td>75</td><td>264</td><td>350</td><td>264</td></tr> </tbody> </table>	Angle	End	45	Cross	Back-45	0	1941	1941	1941	1941	5	1914	1930	1941	1930	15	1845	1875	1893	1875	25	1706	1753	1784	1753	35	1506	1576	1611	1576	45	1259	1362	1402	1362	55	975	1106	1161	1106	65	665	830	895	830	75	327	531	608	531	85	75	264	350	264	<p><b>Light Distribution</b></p> <table border="1"> <thead> <tr> <th>Degrees</th> <th>Lumens</th> <th>% Luminaire</th> </tr> </thead> <tbody> <tr><td>0-30</td><td>1520</td><td>22.6</td></tr> <tr><td>0-40</td><td>2503</td><td>37.2</td></tr> <tr><td>0-60</td><td>4518</td><td>67.2</td></tr> <tr><td>0-90</td><td>6130</td><td>91.2</td></tr> <tr><td>90-180</td><td>593</td><td>8.8</td></tr> <tr><td>0-180</td><td>6723</td><td>100</td></tr> </tbody> </table>	Degrees	Lumens	% Luminaire	0-30	1520	22.6	0-40	2503	37.2	0-60	4518	67.2	0-90	6130	91.2	90-180	593	8.8	0-180	6723	100	<p><b>Average Luminance</b></p> <table border="1"> <thead> <tr> <th>Zone</th> <th>End</th> <th>45°</th> <th>Cross</th> </tr> </thead> <tbody> <tr><td>45</td><td>16224</td><td>13532</td><td>12918</td></tr> <tr><td>55</td><td>15244</td><td>12210</td><td>11640</td></tr> <tr><td>65</td><td>13762</td><td>10665</td><td>10181</td></tr> <tr><td>75</td><td>10461</td><td>8469</td><td>8275</td></tr> <tr><td>85</td><td>5654</td><td>5775</td><td>6164</td></tr> </tbody> </table>	Zone	End	45°	Cross	45	16224	13532	12918	55	15244	12210	11640	65	13762	10665	10181	75	10461	8469	8275	85	5654	5775	6164																
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Accessories<sup>16</sup>



Accessory Catalog Code	Description
FSTH	Sliding hanger bracket (pair)
SV5F12	12" Stem and canopy kit
SV5F18	18" Stem and canopy kit
SV5F24	24" Stem and canopy kit
SV5F36	36" Stem and canopy kit
SV5F48	48" Stem and canopy kit
FKR-126	Chain hanger set (pair)
DACHxx	Adjustable cable hanger kit (single)
DACHxx-1-SC	Adjustable cable hanger kit with white straight 18/3 cord (single)
DACHxx-1-CC	Adjustable cable hanger kit with white coiled 18/3 cord (single)
DACHxx-2-SC	Adjustable cable hanger kit with white straight 18/4 cord (single)
DACHxx-2-CC	Adjustable cable hanger kit with white coiled 18/4 cord (single)
DACHxx-1D-SC	Adjustable cable hanger kit with white straight 18/5 cord with dimming leads (single)
FSWJ	External continuous row joiner (one per joint).
LSXR10	Low bay pir motion sensor (120-277v)
LSXR10ADC	Low bay pir motion sensor with photocell and hi/lo trim dimming (120-277v)
FSWD2L	2' Diffuse replacement lens
FSWD4L	4' Diffuse replacement lens (order two for 8' models)

White stem and canopy kit, 1/4" trade size (1/2" O.D.) locknuts included. Works with 9/16" k.O. on base of housing.

Includes two 5' heavy duty link chains with "V" hooks. Attaches to base of housing.

Works with 1/4" hole on base of housing or FSTH hanger bracket.

xx=cable length in inches, enter 48" to 180" lengths in 12" increments

FSJW accessory required for continuous row mounting

<sup>16</sup> Consult Signify to confirm whether specific accessories are BAA-compliant.



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**MANUFACTURER:** ASL AMERICAN SC  
**MODEL:** WPR-W31-DVD-40K-L14.25-PC-FUS-XXX-MODIFIED WITH VANDAL SHIELD  
**NOTES:** VERIFY FINISH

**TYPE:**  
**W**

MODEL #  
**WPR**  
 TECHNICAL SPECIFICATION



MODEL #:	WATTAGE:	VOLTAGE:	KELVIN:	SIZE:
WPR				
TECHNOLOGY:			ACCESSORIES:	
PROJECT:			NOTES:	
TYPE:			AREA:	

**FEATURES**

**PRODUCT IMAGE**

- APPLICATION**  
Outdoor security
- LOCATION**  
Wet



**LIGHT PROPERTIES**

**Available Kelvin Options:**

<b>2700K</b> WARM WHITE	<b>3000K</b> SOFT WHITE	<b>3500K</b> NEUTRAL	<b>4000K</b> COOL WHITE	<b>5000K</b> DAYLIGHT
----------------------------	----------------------------	-------------------------	----------------------------	--------------------------

**LED CHIPS USED** LG/NICHIA/SAMSUNG  
**TESTED** LM80 AND LM82  
**CRI** 80+  
**LIFE HOURS** 50,000

WATTAGE	SOURCE LUMENS @40K	DELIVERED LUMENS
9	1259	1007
12	1520	1216
15	1750	1400
20	2494	1995
24	2793	2234
31	4000	3200

VOLTAGE
<b>Standard:</b> ND - 120V NON DIMMABLE
DV - 120V/277V NON DIMMABLE
TD - 120V TRIAC/ELV DIMMABLE
DVD - 120/277V 0-10V DIMMABLE



**ASL LIGHTING**

725 East state St. Trenton, NJ 08609 | info@aslightng.com | www.aslighting.com

**TOLL FREE: 800-1101-1101 | LOCAL: 718-369-1100 | Shipping & Receiving:** 322 Monmouth Street, Trenton, NJ, 08609

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**MANUFACTURER:** ASL AMERICAN SC  
**MODEL:** WPR-W31-DVD-40K-L14.25-PC-FUS-XXX-MODIFIED WITH VANDAL SHIELD  
**NOTES:** VERIFY FINISH

**TYPE:**  
**W**

FIXTURE PROPERTIES

## STANDARD OPTIONS

**STANDARD BASE CONSTRUCTION**  
 Die Cast Aluminum

**STANDARD LENS**  
 Borosilicate Glass

**STANDARD FINISH**  
 Bronzestone

MODEL # **WPR** ORDER FORM

WATTAGE	VOLTAGE	KELVIN	SIZE
W9 - 9	Standard Voltage: ND - 120V NON DIMMABLE	27K	<b>L14.25 - L14.25 X H9 X D7.5</b>
W12 - 12		30K	
W15 - 15		35K	
W20 - 20		<b>40K</b>	
W24 - 24		50K	
<b>W31 - 31</b>		DV - 120V/277V NON DIMMABLE TD - 120V TRIAC/ELV DIMMABLE <b>DVD - 120/277V 0-10V DIMMABLE</b>	

## SPECIAL OPTIONS AVAILABLE (ONLY WHEN REQUIRED)

TECHNOLOGY	ACCESSORIES
EMG - Emergency EMGR - Emergency Remote OS - Occupancy Sensor OSCD - Occupancy Sensor Step Dimming <b>PC - Photo Control</b>	<b>FUS - Fused</b> PS - Pin Switch

**CUSTOM FINISH OPTIONS**

**VERIFY FINISH**

AFBA Brushed Aluminum	AFGBZ Gloss Bronze	AFPC Polished Chrome	AFSB Satin Brass	FBZ Bronzestone
FMB Matte Black	FW White			

Not seeing what you're looking for? Contact us to discuss more options.

**MODIFIED WITH VANDAL SHIELD**



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**MODEL:** WPR-W31-DVD-40K-L14.25-PC-EMG-FUS-XXX-MODIFIED WITH VANDAL SHIELD  
**NOTES:** VERIFY FINISH

**TYPE:**  
**WE**

MODEL #  
**WPR**  
 TECHNICAL SPECIFICATION



MODEL #:	WATTAGE:	VOLTAGE:	KELVIN:	SIZE:
WPR				
TECHNOLOGY:			ACCESSORIES:	
PROJECT:			NOTES:	
TYPE:			AREA:	

**FEATURES**

**PRODUCT IMAGE**

- APPLICATION**  
Outdoor security
- LOCATION**  
Wet



**LIGHT PROPERTIES**

Available Kelvin Options:

2700K WARM WHITE	3000K SOFT WHITE	3500K NEUTRAL	4000K COOL WHITE	5000K DAYLIGHT
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**LED CHIPS USED** LG/NICHIA/SAMSUNG  
**TESTED** LM80 AND LM82  
**CRI** 80+  
**LIFE HOURS** 50,000

WATTAGE	SOURCE LUMENS @40K	DELIVERED LUMENS
9	1259	1007
12	1520	1216
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<b>Standard:</b> ND - 120V NON DIMMABLE
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**MODEL:** WPR-W31-DVD-40K-L14.25-PC-EMG-FUS-XXX-MODIFIED WITH VANDAL SHIELD  
**NOTES:** VERIFY FINISH

**TYPE:**  
**WE**

FIXTURE PROPERTIES

## STANDARD OPTIONS

**STANDARD BASE CONSTRUCTION**  
 Die Cast Aluminum

**STANDARD LENS**  
 Borosilicate Glass

**STANDARD FINISH**  
 Bronzestone

MODEL # **WPR** ORDER FORM

WATTAGE	VOLTAGE	KELVIN	SIZE
W9 - 9	Standard Voltage: ND - 120V NON DIMMABLE  DV - 120V/277V NON DIMMABLE  TD - 120V TRIAC/ELV DIMMABLE  <b>DVD - 120/277V 0-10V DIMMABLE</b>	27K	<b>L14.25 - L14.25 X H9 X D7.5</b>
W12 - 12		30K	
W15 - 15		35K	
W20 - 20		<b>40K</b>	
W24 - 24		50K	
<b>W31 - 31</b>			

## SPECIAL OPTIONS AVAILABLE (ONLY WHEN REQUIRED)

TECHNOLOGY	ACCESSORIES
<b>EMG - Emergency</b> EMGR - Emergency Remote OS - Occupancy Sensor OSCD - Occupancy Sensor Step Dimming <b>PC - Photo Control</b>	<b>FUS - Fused</b> PS - Pin Switch

**CUSTOM FINISH OPTIONS**

**VERIFY FINISH**

AFBA Brushed Aluminum	AFGBZ Gloss Bronze	AFPC Polished Chrome	AFSB Satin Brass	FBZ Bronzestone
FMB Matte Black	FW White			

Not seeing what you're looking for? Contact us to discuss more options.

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**MANUFACTURER:** L C DOANE COMPA  
**MODEL:** XTL-CWS-R32-TPD-EM-65

**TYPE:**  
**X1**



# XTL-IP65

Cleanroom Exit **LED** Surface Mount Ceiling or Wall

PRODUCT SPECIFICATION

## Surface Lighting XTL Series

The XT-IP65 series is designed for use in cleanroom facilities and high abuse applications.

**Mounting**

Surface wall mount or mounting canopy for ceiling and end mount.

**Light Source**

Parallel wired high output LED panel.

**Lens**

.250 in clear polycarbonate or clear tempered glass. Drop in exit stencil includes pop-out arrows.

**Housing**

14 gauge die-formed cold rolled steel with seams welded and ground smooth. Aluminum and 304 Stainless steel available.

**Finish**

Polyester powder-coated after phosphate pretreatment for superior adhesion and corrosion resistance. Anti-microbial white and brushed stainless steel available.

**Hardware**

Gasketed stainless steel fasteners. FDA-compliant washers and gasket safe for direct contact with food.

**Emergency Power**

Emergency units include a nickel-cadmium battery, and 120/277 dual voltage solid state charger with power indicator lights and test switch.

**Certifications**

ETL Listed 924 wet location. IP65 Rated, liquid tight conduit connector required. Meets or exceeds NEC article 700 requirements.

**Applications**

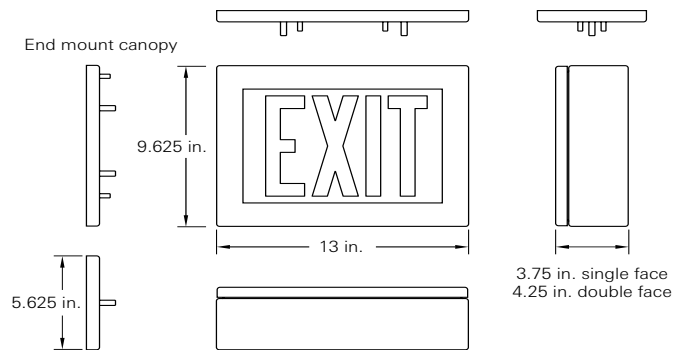
- Exit illumination

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

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

Catalog No. \_\_\_\_\_

Approval \_\_\_\_\_ Date \_\_\_\_\_



XTL -  one  two  three  four  five  six  seven  eight  65

**one Material**

- A Aluminum
- C Cold rolled steel
- S Stainless steel

**two Finish**

- R Brushed stainless steel
- W White, standard

**three Face Quantity**

- S Single face
- D Double face

**four Letter Color**

- R Red
- G Green

**five Lens**

- 32 .250 in clear polycarbonate
- 92 .250 in clear tempered glass

**six Fasteners**

- AP Stainless steel allen head with pin
- PH Phillips head, non-security, standard
- TP Stainless steel torx head with pin

**seven Mounting**

- C Ceiling
- E End
- W Wall and Surface

**eight Options**

- 24F 24 V flashing fire alarm
- AM Anti-microbial coating (exposed areas)
- CU Canadian UL Listing
- EM Emergency battery power
- 65 IP65 (Liquid tight conduit connector required)

Modifications are available to meet custom requirements. Specifications and dimensions are subject to change without notice.



**MANUFACTURER:** CHLORIDE  
**MODEL:** ER55L3R

**TYPE:**  
**X3**



**CHLORIDE**  
by **Signify**

**Exit/Emergency**

55 Series

Die cast aluminum exit sign



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

Location: \_\_\_\_\_

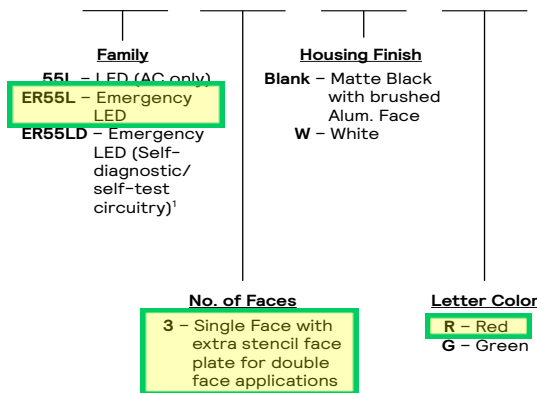
Cat.No: \_\_\_\_\_

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

Lamps: \_\_\_\_\_ Qty: \_\_\_\_\_

Notes: \_\_\_\_\_

**Example: ER55L3R**



**Accessories**

- PVS2 - Polycarbonate Vandal Shield
- WG4 - Wire Guard

**Footnotes**

<sup>1</sup> Not available in white housing with green letters.

**codes and standards**

- UL listed to Standard 924
- NFPA 101 (Life Safety Code)
- NFPA 70 (National Electric Code) and OSHA Standards California Energy Commission
- UL listed for damp location

**construction and finish**

- Available in matte black housing with brushed aluminum face or white with a powder coat paint finish.
- All signs provided with shallow canopy for ceiling or end installations.
- Extra stencil faceplate is provided for converting single face signs to double face signs in the field with ease. All units have concealed directional chevron indicators (knockouts).

**installation**

- Universal mounting (wall, side, or ceiling).
- Canopy and mounting hardware provided.
- Universal knockouts on backplate allow for wall mounting directly to J-Box.

**electronics**

- AC Only :
  - Red = 2 . 48 Watts , Green = 2 . 22 Watts
- Emergency :
  - Red = 3 . 08 Watts , Green = 3 . 08 Watts
- Surge protection is standard on all models .
- Charging System is complete with low voltage disconnect , AC lockout , and brownout protection .
- 120/277 VAC Selectable Input .

**battery**

- Maintenance free sealed nickel cadmium has estimated service life of 8 to 10 years .
- Operating temperature range of 10°C to 40°C (50°F to 104°F) .
- Provides 90 minutes of emergency illumination .

**warranty**

- Five full years on electronics and unit .



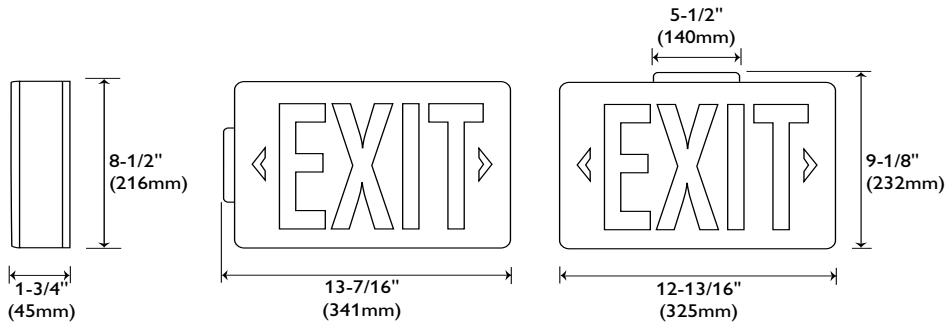


**MANUFACTURER:** CHLORIDE  
**MODEL:** ER55L3R

**TYPE:**  
**X3**

## 55 Die cast aluminum LED exit sign

### dimensions



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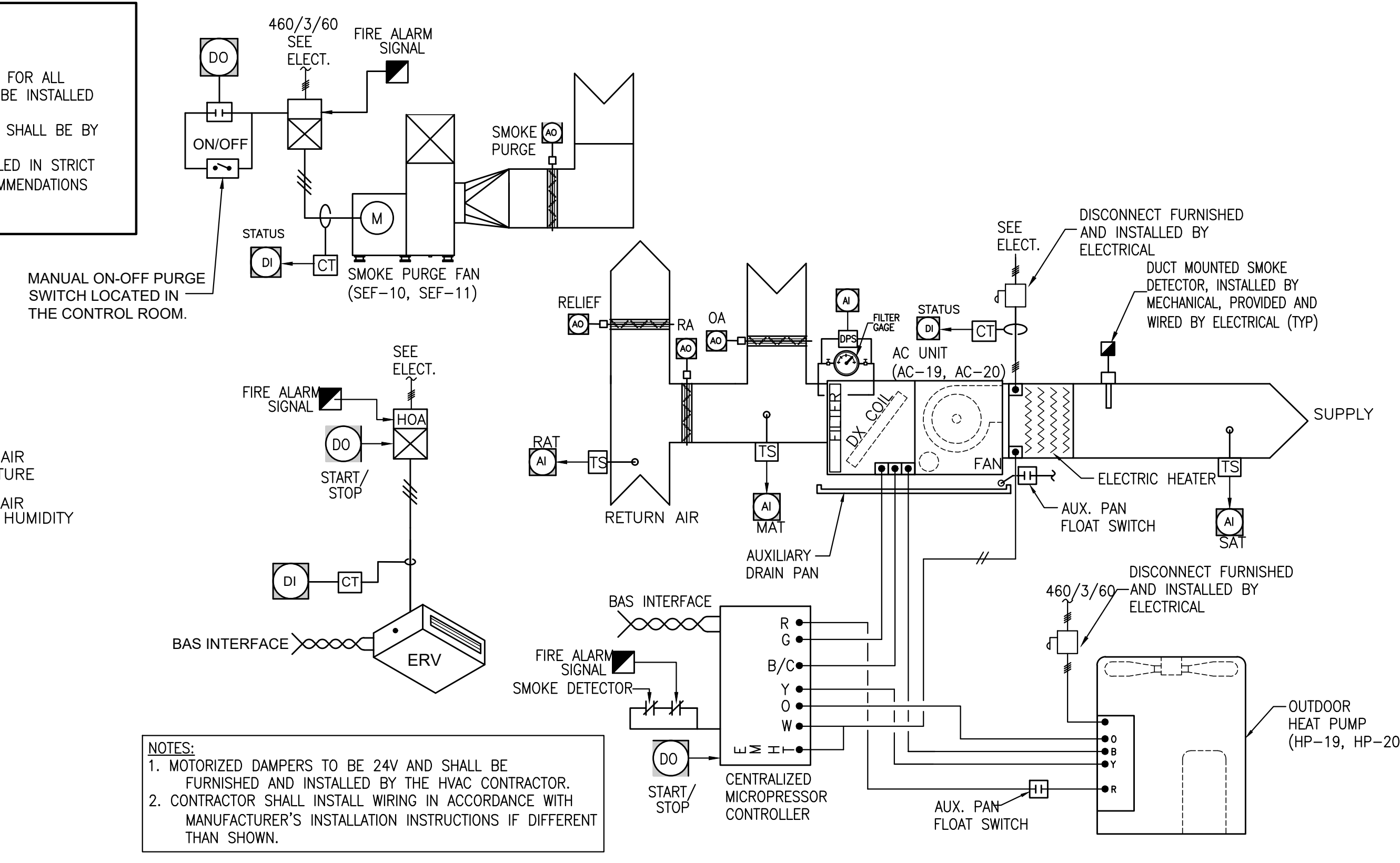
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CE-11300 www.chloride-lighting.com 11/18 page 2 of 2



**GENERAL NOTES:**

1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE DISCONNECT SWITCHES FOR ALL INDOOR UNITS AND OUTDOOR UNITS. DISCONNECT SWITCHES SHALL BE INSTALLED AND WIRED BY ELECTRICAL.
2. ALL CONTROLS WIRING BETWEEN INDOOR UNITS AND OUTDOOR UNITS SHALL BE BY THE MECHANICAL CONTRACTOR.
3. ALL POWER AND CONTROLS WIRING SHALL BE PROVIDED AND INSTALLED IN STRICT COMPLIANCE WITH THE SYSTEM MANUFACTURER'S INSTALLATION RECOMMENDATIONS AND REQUIREMENTS WHETHER SHOWN ON THE DRAWINGS OR NOT.



**AC 19 & AC 20 SPLIT SYSTEM HEAT PUMP CONTROLS DIAGRAM**  
 NOT TO SCALE

**GENERAL CONTROLS NOTES:**

THE CONTRACTOR SHALL PROVIDE ALL CONTROLS AS REQUIRED TO INCLUDE ALL CONTROL PANELS, WIRING, CONDUIT, CONTROL SEQUENCES, POWER WIRING, AND COMPONENTS NECESSARY TO PROVIDE A COMPLETE SYSTEM. ALL CONTROL WIRING SHALL BE INSTALLED IN CONDUIT IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND SPECIFICATIONS.

UNITS ARE TO BE CONTROLLED BY THE FACTORY MOUNTED CONTROLLER AND WILL INTERFACE WITH THE EXISTING BUILDING AUTOMATION SYSTEM (BAS) VIA BACNET IP OR AS DETERMINED BY THE CONTROLS CONTRACTOR. THE BAS WILL SEND THE CONTROLLER OCCUPIED, UNOCCUPIED, OPTIMAL START/STOP, NIGHT HEAT/COOL AND TIMED OVERRIDE COMMANDS. THE BAS WILL ALSO SEND A ZONE TEMPERATURE SETPOINT.

**CONTROL SEQUENCES:**

**AC-19, AC-20 AND ASSOCIATED ERV-1 AND ERV-2**

UNITS SHALL BE STARTED VIA THE BAS SUBJECT TO BUILDING ALARMS AND SAFETIES. PROVIDE A REMOTE TEMPERATURE SENSOR IN THE ASSOCIATED RETURN AIR DUCT FROM THE CELL AND DORM AC UNITS. PROVIDE COOLING/HEATING/EMERGENCY HEATING STEPS AND CONTROL FUNCTIONS TO MATCH EQUIPMENT REQUIREMENTS. IN THE OCCUPIED MODE AC UNIT FANS TO RUN CONTINUOUSLY. PROVIDE AUTOMATIC DAMPERS IN THE OUTSIDE AIR DUCT (NORMALLY CLOSED). RETURN DUCT (NORMALLY OPEN) AND RELIEF AIR DUCT (NORMALLY CLOSED). UNITS TO BE EQUIPPED TO PROVIDE COOLING BELOW 55°F OUTDOOR AIR TEMPERATURE VIA 100% OUTDOOR AIR ECONOMIZER. ON A CALL FOR COOLING WITH THE OUTSIDE AIR TEMPERATURE BELOW 55°F, THE COMPRESSORS SHALL BE DISABLED AND THE UNIT SHALL BE OPERATED IN THE ECONOMIZER MODE WITH THE OUTSIDE AIR, RETURN AIR AND RELIEF DAMPERS MODULATING TO PROVIDE COOLING TO THE SPACE AS REQUIRED (SUBJECT TO A MIXED AIR LOW LIMIT TEMPERATURE OF 52°F). THE SMOKE PURGE DAMPER SHALL BE CLOSED. IN THE MECHANICAL COOLING AND HEATING MODES THE OUTSIDE AIR AND RELIEF DAMPERS SHALL OPEN TO PROVIDE MINIMUM OUTSIDE AIR AS SCHEDULED. ERV-1 AND ERV-2 SHALL START AND OPERATE ON FACTORY MOUNTED CONTROLS WHEN THE ASSOCIATED HEAT PUMPS START. PROVIDE PAN OVERFLOW SWITCH TO STOP UNIT IF AUXILIARY DRAIN PAN OVERFLOWS. WHEN AN ASSOCIATED PURGE FAN IS STARTED THE SMOKE PURGE AND OUTSIDE AIR DAMPERS SHALL OPEN AND THE RETURN AND RELIEF DAMPERS SHALL CLOSE (SEE BELOW).

**SEF-10 AND SEF-11**

THE START SEQUENCE FOR EACH PURGE FAN SHALL BE INITIATED BY THE H-O-A SWITCH ON THE STARTER. WHEN THE H-O-A SWITCH IS IN THE AUTO POSITION THE FAN SHALL BE STARTED BY THE BUILDING FIRE ALARM PANEL OR BY A MANUAL CELL/DORM PURGE SWITCH LOCATED IN THE CONTROL ROOM. WHEN THE FAN IS STARTED, THE SMOKE PURGE DAMPER SHALL OPEN, THE ASSOCIATED AC UNIT SUPPLY FAN SHALL START, THE RETURN DAMPER SHALL CLOSE, THE RELIEF DAMPER SHALL CLOSE AND THE OUTSIDE AIR DAMPER SHALL OPEN TO MAXIMUM POSITION. WHEN THE FAN IS STOPPED, THE HEAT PUMP AND ALL ASSOCIATED DAMPERS WILL RETURN TO THEIR NORMAL POSITIONS. PROVIDE LABELS FOR THE SWITCHES MOUNTED IN THE CONTROL ROOM.

**AC-21**

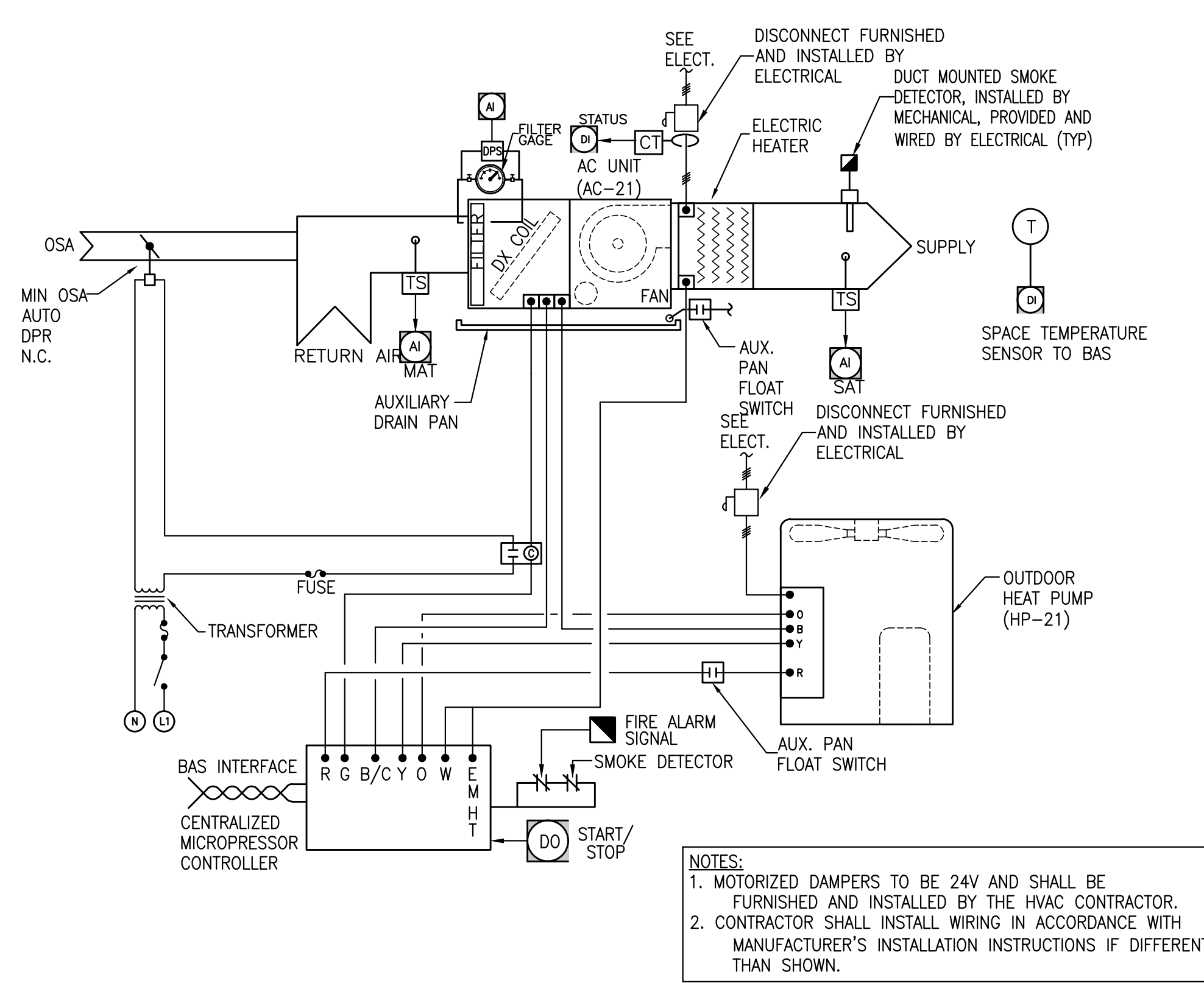
UNITS SHALL BE STARTED VIA THE BAS SYSTEM SUBJECT TO BUILDING ALARMS AND SAFETIES. PROVIDE A TEMPERATURE SENSOR CONNECTED TO THE BAS AND LOCATED IN THE SPACE AS SHOWN. THE UNITS SHALL BE CYCLED AS REQUIRED TO PROVIDE COOLING/HEATING/EMERGENCY HEATING STEPS AND CONTROL FUNCTIONS TO MATCH EQUIPMENT REQUIREMENTS. WHEN THE UNIT FAN IS STARTED, THE AUTOMATIC MINIMUM OUTSIDE AIR DAMPER SHALL OPEN. PROVIDE WATER LEVEL SENSOR IN AUXILIARY DRAIN PAN TO SHUT DOWN UNIT IF UNIT CONDENSATE PAN OVERFLOWS.

**GUH**

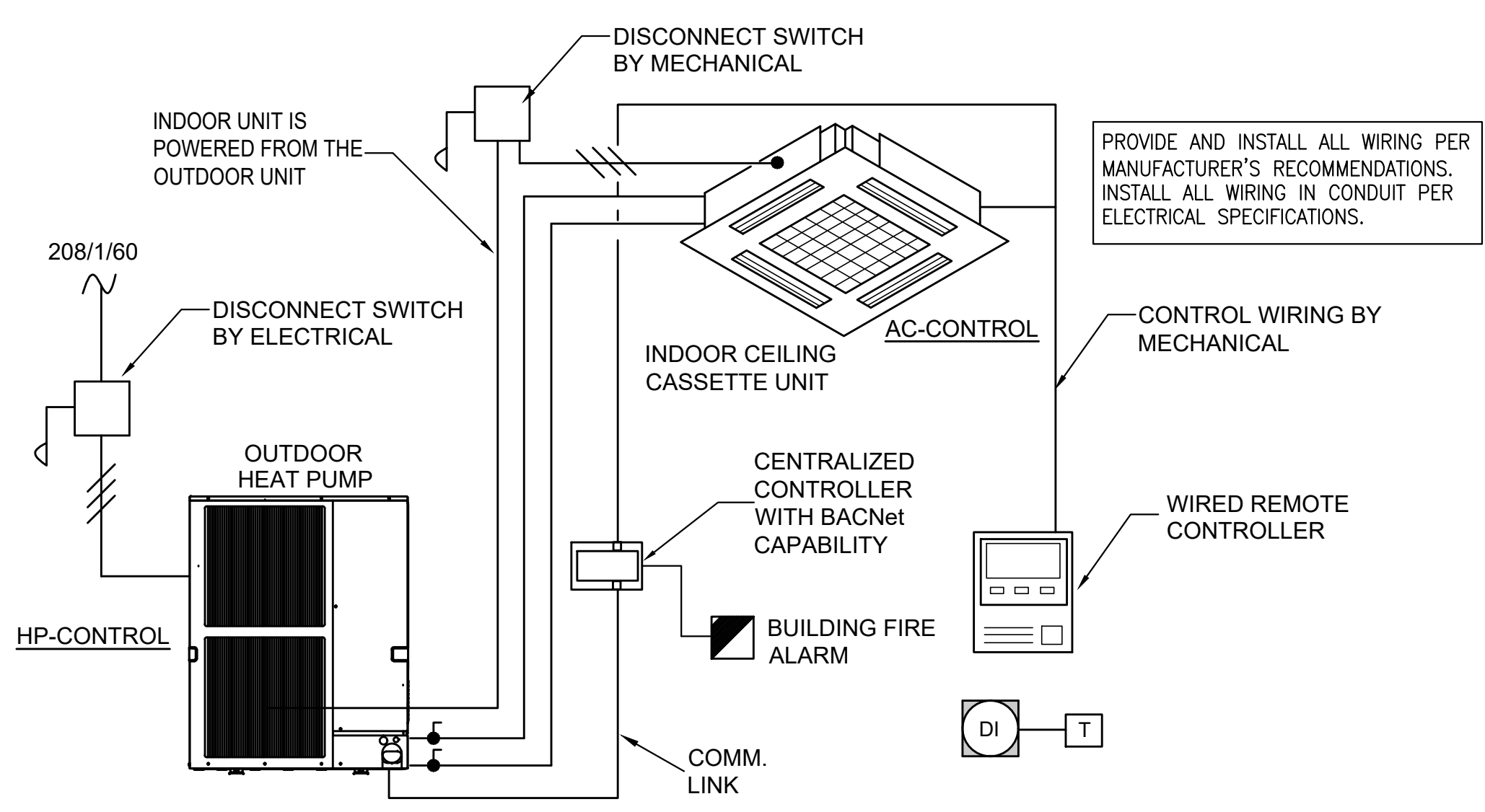
GAS UNIT HEATER SHALL BE OPERATED BY UNIT MOUNTED THERMOSTAT.

**EWH-1**

ELECTRIC WALL HEATER SHALL BE OPERATED BY UNIT MOUNTED THERMOSTAT.



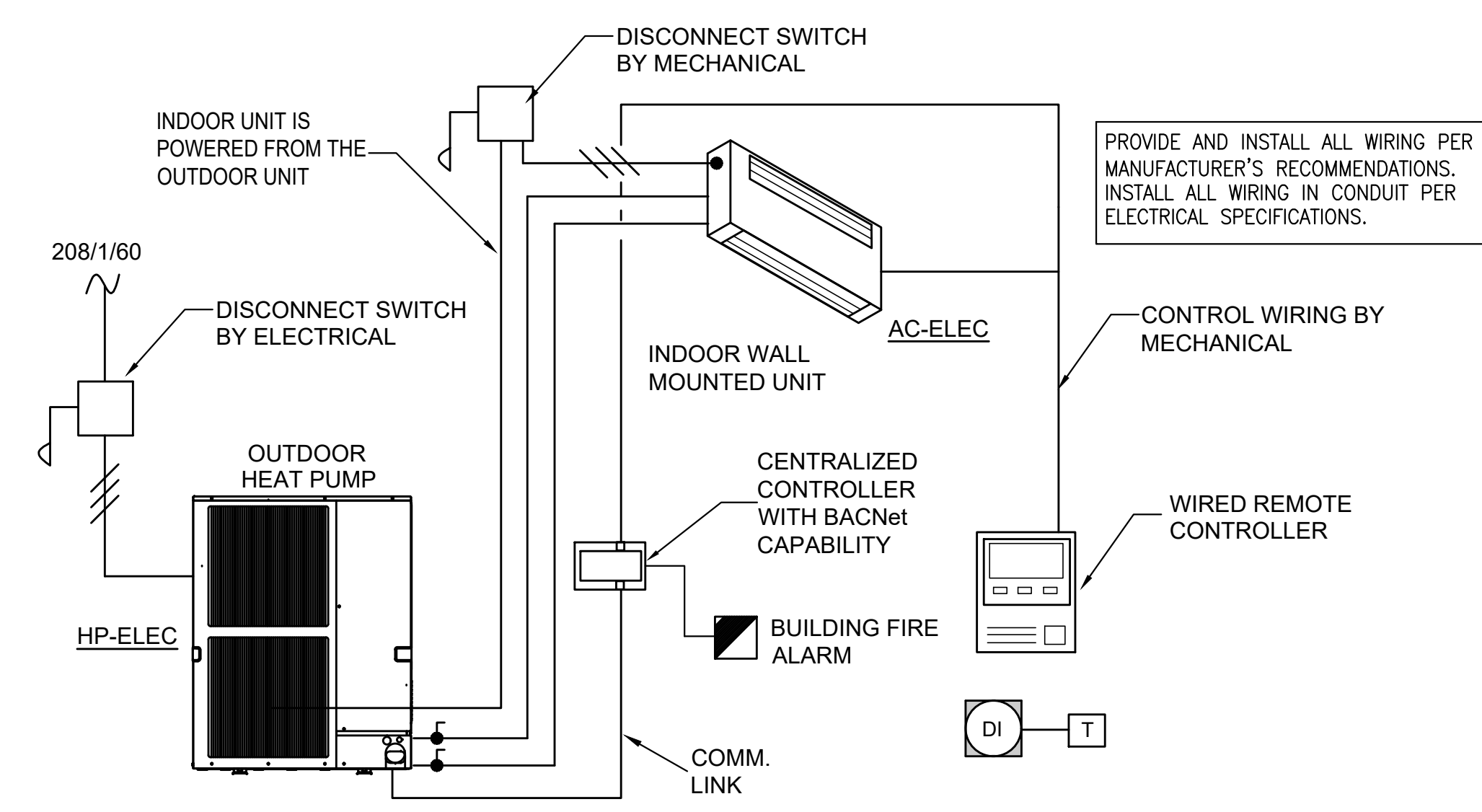
**AC 21 SPLIT SYSTEM HEAT PUMP CONTROLS DIAGRAM**  
 NOT TO SCALE



**SEQUENCE OF CONTROL-DUCTLESS SPLIT SYSTEM:**

The wired remote controller shall enable the unit and the unit shall operate on factory furnished controls. The unit controls shall cycle the compressor in cooling and heating mode to maintain space temperature. The controls contractor shall coordinate with the unit manufacturer and provide all control wiring required for the operation of the manufacturer provided controls and the sequence of control.

In the event of a fire alarm in the building, the indoor and outdoor units will be commanded off. Normal operation of the units will resume once the building fire alarm system returns to normal.



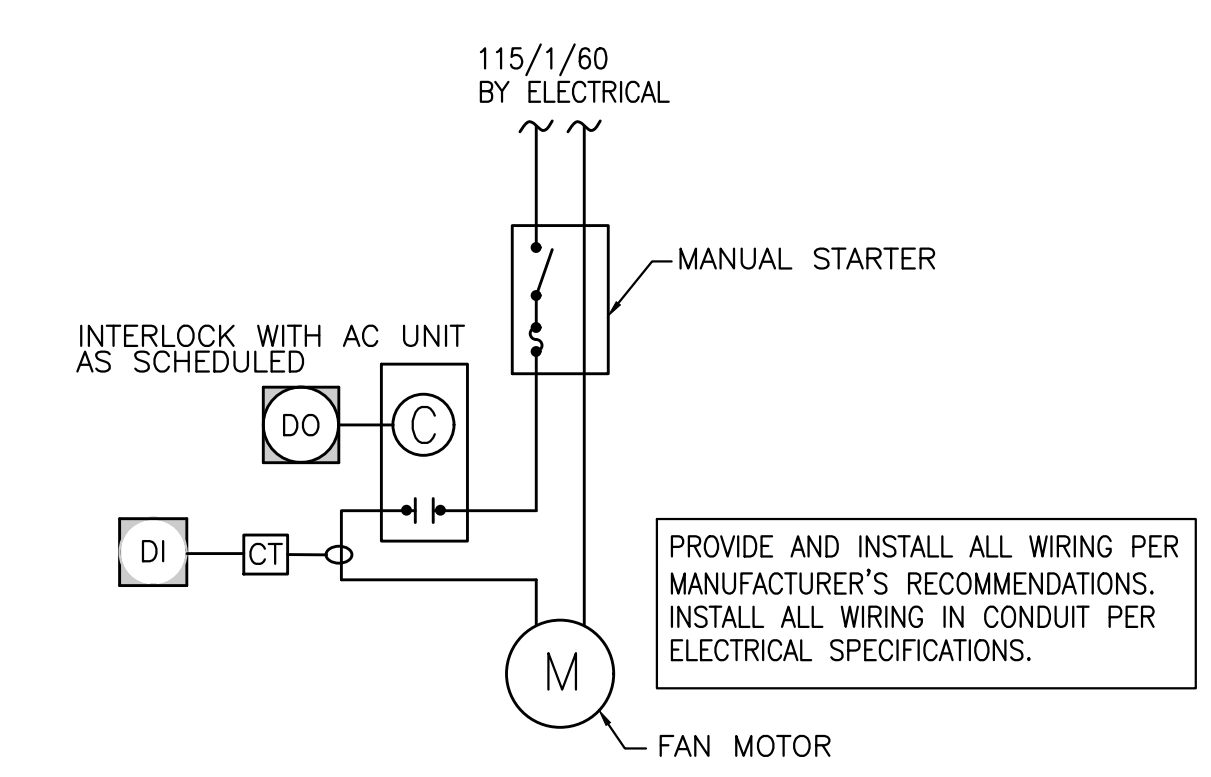
**SEQUENCE OF CONTROL-DUCTLESS SPLIT SYSTEM:**

The wired remote controller shall enable the unit and the unit shall operate on factory furnished controls. The unit controls shall cycle the compressor in cooling and heating mode to maintain space temperature. The controls contractor shall coordinate with the unit manufacturer and provide all control wiring required for the operation of the manufacturer provided controls and the sequence of control.

In the event of a fire alarm in the building, the indoor and outdoor units will be commanded off. Normal operation of the units will resume once the building fire alarm system returns to normal.

**AC-CONTROL SPLIT SYSTEM CONTROLS**  
 NO SCALE

**AC-ELEC SPLIT SYSTEM CONTROLS**  
 NO SCALE



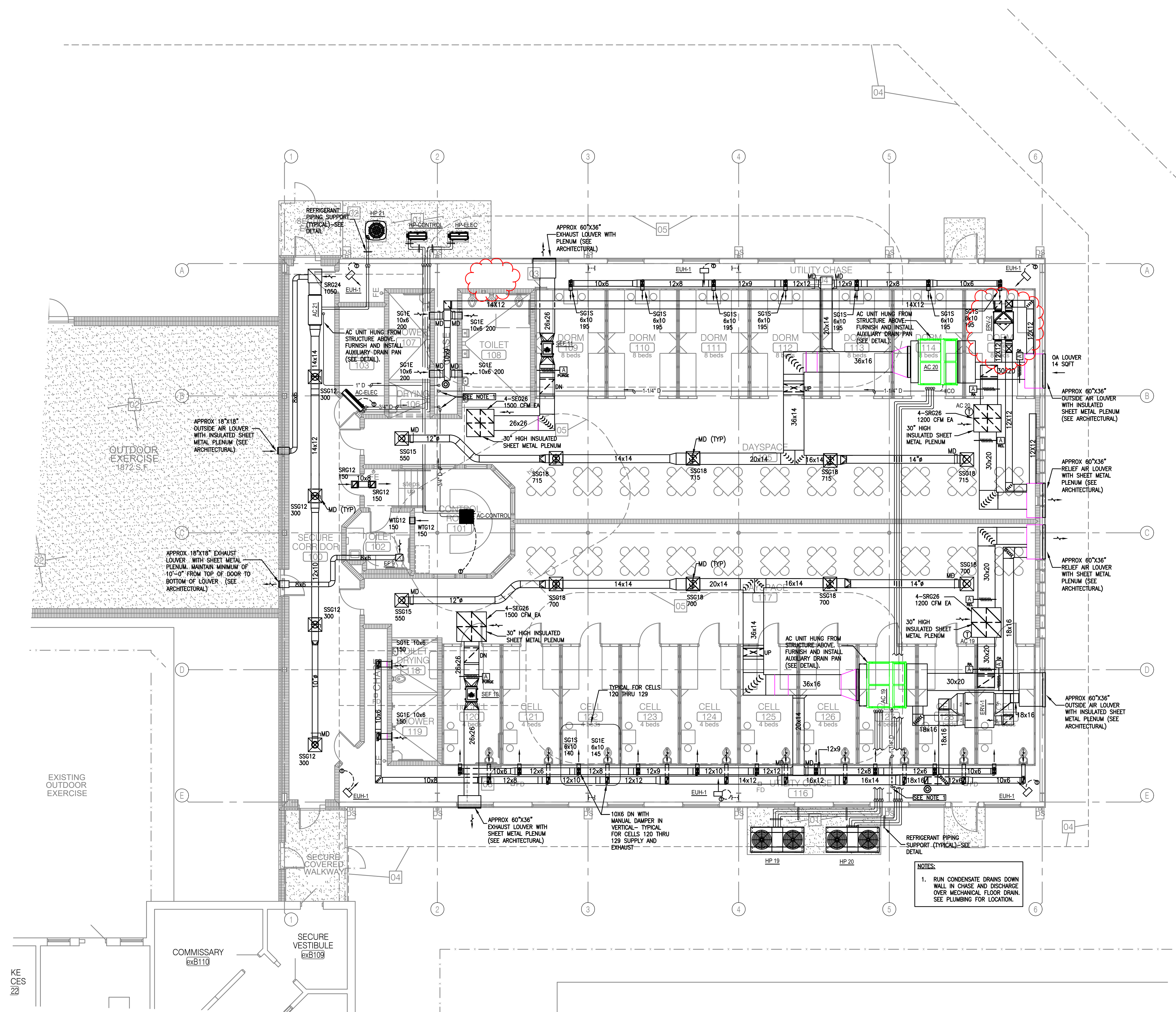
**TYPICAL EXHAUST FAN AC UNIT INTERLOCK CONTROLS DIAGRAM**  
 NOT TO SCALE

FAN OPERATION SHALL BE INTERLOCKED WITH AC UNIT SUPPLY AIR FAN OPERATION AND SHALL RUN ANYTIME THE SUPPLY AIR FAN IS OPERATING. THE BAS SHALL MONITOR THE RUN STATUS OF THE FANS AND SHALL ALARM THE WORKSTATION IF THE FAN FAILS TO RUN

ISSUE DATE	DESCRIPTION
Preliminary 04-27-2022	
Final 08-09-2022	
BID SET 10-10-2022	

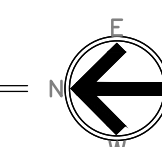
Dekalb County Jail Addition  
 for the Dekalb County Commission  
 Fort Payne, Alabama  
 DCM Project No. 2021577  
 GMC Project No. ABHM190069  
 Construction Drawings





**FLOOR PLAN**  
 SCALE: 1/8" = 1' - 0"

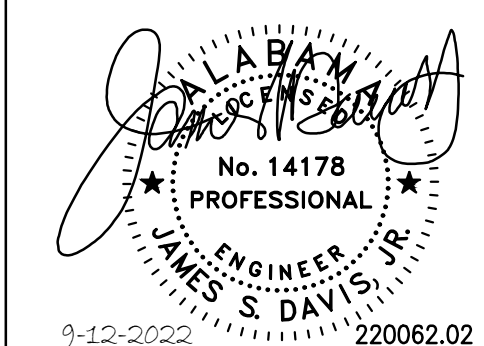
8,956 SQ. FT.  
 96 - BEDS



ISSUE DATE
Preliminary 04-27-2022
Final 08-19-2022
BID SET 10-10-2022

DeKalb County Jail Addition  
 for the DeKalb County Commission  
 For Payne, Alabama

DCM Project No. 2021577  
 GMC Project No. ABHM190069  
 Construction Drawings



9-12-2022 220062.02

HVAC FLOOR PLAN

M1.0  
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