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RESOLUTION NO. 7122

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RIALTO, CALIFORNIA, AUTHORIZING THE EXECUTION AND DELIVERY OF AN EQUIPMENT LEASE-PURCHASE AGREEMENT, AN ESCROW AGREEMENT AND EQUIPMENT SCHEDULE WITH RESPECT TO THE ACQUISITION, PURCHASE, FINANCING, AND LEASING OF CERTAIN EQUIPMENT FOR THE PUBLIC BENEFIT; AUTHORIZING THE EXECUTION AND DELIVERY OF DOCUMENTS REQUIRED IN CONNECTION THEREWITH; AND AUTHORIZING THE TAKING OF ALL OTHER ACTIONS NECESSARY TO THE CONSUMMATION OF THE TRANSACTIONS CONTEMPLATED BY THIS RESOLUTION.

WHEREAS, the City of Rialto (the "*Lessee*"), a political subdivision of the State of California, is authorized by the laws of the State of California to purchase, acquire, and lease personal property for the benefit of the Lessee and those it provides services to and to enter into contracts with respect thereto;

WHEREAS, the Lessee desires to purchase, acquire and lease certain equipment constituting personal property necessary for the Lessee to perform essential governmental functions; including without limitation various energy conservation measures to be installed pursuant to an Installation Agreement dated May 9, 2017, between Alliance Building Solutions, Inc. ("*Alliance*") and Lessee (the "*Installation Agreement*," attached as Exhibit A), and all other equipment Lessee's Designated Officers (as hereinafter defined) may deem necessary and/or desirable in an amount not more than \$6,900,000.00 (the "*Equipment*");

WHEREAS, in order to acquire such Equipment, the Lessee proposes to enter into one or more Equipment Lease-Purchase Agreements (together with the Equipment Schedules and all related exhibits, schedules, and certificates attached thereto, the "*Lease Agreements*") with Holman Capital Corporation (the "*Lessor*") and one Escrow Agreement (together with the Disbursement/Payment Request Form and Acceptance Certificate attached thereto, the "*Escrow Agreement*") with the Lessor the escrow agent, the forms of which the Designated Officer shall determine for the Lessee as herein provided;

1 **WHEREAS**, Government Code sections 4217.10 through 4217.18 authorize the Lessee
2 to enter into one or more energy service contracts with any person or entity, pursuant to which
3 that person or entity will provide electrical or thermal energy or conservation services to the
4 Lessee, which may comprise or include an energy conservation facility, if the anticipated cost
5 to the Lessee for thermal or electrical energy or conservation services provided under the
6 contract(s) is less than the anticipated marginal cost to the Lessee of thermal, electrical, or
7 other energy that would have been consumed by the Lessee in the absence of those energy
8 service contracts (the "*Savings*");

9 **WHEREAS**, Government Code sections 4217.10 through 4217.18 authorize the Lessee
10 to enter into one or more facility financing contracts if funds for the repayment thereof are
11 projected to be available from the Savings, representing funds that otherwise would have been
12 used for purchase of electrical, thermal, or other energy required by the Lessee in the absence
13 of the energy conservation services and facilities financed by proceeds available through the
14 facility financing contracts;

15 **WHEREAS**, Government Code sections 4217.10 through 4217.18 require that a public
16 hearing be held, and public comment be taken, at a regularly scheduled meeting of the Lessee
17 at which meeting the Lessee may consider and adopt findings regarding Savings and award
18 energy services contracts and facility financing contracts based thereon, and that notice
19 thereof be must have been given at least two weeks prior to the meeting;

20 **WHEREAS**, the Lessee approved at its April 25, 2017 Council meeting a motion to set
21 and give notice for a public hearing, and previously gave notice of its intent to conduct a public
22 hearing and take public comment upon the subject of the energy conservation project two
23 weeks prior to the regularly scheduled public meeting of the City Council of the Lessee (the
24 "*Council*") on May 9, 2017, at which the Council has held a public hearing and taken public
25 comment;

26 **WHEREAS**, Alliance assessed the feasibility of various potential energy conservation
27 measures to reduce the Lessee's energy consumption and expense and recommended
28 specific energy conservation measures based thereon (the "*Analysis*," attached as Exhibit B),

1 which the Council and Lessee's administration and staff herein validate and approve;

2 **WHEREAS**, Alliance has offered to enter into the Installation Agreement to provide
3 energy conservation services to implement the recommended energy conservation measures
4 for the price stated therein and to guarantee performance of the energy conservation services;
5 Whereas, the Analysis demonstrates that the cost of the Installation Agreement to the Lessee
6 for the thermal or electrical energy or conservation services provided thereunder will create
7 Savings;

8 **WHEREAS**, the Analysis indicates that funds for the repayment of the Lease Agreement
9 are anticipated to be available from the Savings, representing funds that otherwise would have
10 been used for purchase of electrical, thermal, or other energy required by the Lessee in the
11 absence of the energy conservation services provided under the Contract;

12 **WHEREAS**, the governing body of the Lessee deems it for the benefit of the Lessee
13 and for the efficient and effective administration thereof to enter into the Installment
14 Agreement, and Lease Agreements (together, with such other documents as are necessary to
15 complete the transaction contemplated herein as authorized below, the "*Transaction*
16 *Documents*") for the purchase, acquisition, and leasing of the Equipment to be therein
17 described on the terms and conditions herein provided;

18
19
20 **NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE CITY OF**
21 **RIALTO AS FOLLOWS:**

22 **Section 1. *Energy Conservation Services Contract Findings.*** The Lessee finds that, as
23 demonstrated in the Analysis, the cost of the Contract to the Lessee for the thermal or electrical
24 energy or conservation services provided thereunder is less than the anticipated marginal cost
25 to the Lessee of thermal, electrical, or other energy that would have been consumed by the
26 Lessee in the absence of the Contract and that it is in the best interest of the Lessee to approve
27 and enter into the Contract.
28

1 **Section 2. *Energy Conservation Services Contract Approval.*** The form of the Installation
2 Agreement by and between the Lessee and Alliance, presented herewith is hereby approved,
3 subject to final approval by the Mayor, City Administrator, and Assistant to the City
4 Administrator/Director of Administrative Services of the Lessee, and such other persons as
5 he/she/they may delegate in writing (the "*Designated Officer*") and Lessee's counsel. The
6 Designated Officer is hereby authorized and directed, for and in the name of and on behalf of
7 the Lessee, to execute and deliver to Alliance the Installation Agreement and related documents
8 as necessary to carry out the Installation Agreement, subject to such changes as the Designated
9 Officer may require and approve to best implement the energy conservation measures under
10 the Contract (the "*Project*"), with the approval of Lessee's counsel.

11 **Section 3. *Lease Agreements Findings.*** The Lessee finds that funds for the repayment of the
12 Lease Agreements are projected to be available from the Savings, representing funds that
13 otherwise would have been used for purchase of electrical, thermal, or other energy required
14 by the Lessee in the absence of the energy conservation services provided under the Contract.

15 **Section 4. *Lease Agreements as New Clean Renewable Energy Bonds.*** The Lessee has
16 determined that that the Project would be likely to qualify for a new clean renewable energy
17 bonds allocation and that it is in the interests of Lessee to submit an application for such
18 allocation. The Lessee authorizes the Designated Officer to prepare and submit an application
19 for an allocation of new clean renewable energy bonds in an amount of not to exceed
20 \$6,900,000.00.

21 Upon receipt of a new clean renewal energy bonds allocation, the Lease Agreements shall be
22 designated as new clean renewable energy bonds and will use all or a portion of the allocation.
23 Lessee acknowledges it is permitted to use no more than two percent of the proceeds for costs
24 of issuance.

25 The Lessee authorizes the Designated Officers or their designees to take such actions as are
26 necessary or appropriate to comply with 26 U.S.C. 54(A) and 54(C), and to enable payment
27 from the United States Treasury of the applicable federal credit payments in respect of the
28 Lease Agreements including but not limited to the timely filing with the Internal Revenue

1 Service of Form 8038-CP or any other required form in the manner prescribed by the Internal
2 Revenue Service or entering into calculation agency agreement, if any, relating to such
3 payments.

4 **Section 5. *Lease Agreements and Binding Commitment Approval, Execution and Delivery.***

5 The Designated Officer is hereby authorized and directed, for and in the name of and on behalf
6 of the Lessee, to solicit proposals and accept a bank's offer and select an escrow agent,
7 subject to compliance with the limitations provided in this section; to determine the form of,
8 subject to compliance with the limitations provided in this section, execute and deliver the
9 Lease Agreements; to execute and deliver the Escrow Agreement, the Binding Commitments
10 for Equipment Lease-Purchase Agreement (the "Binding Commitments") between the Lessee,
11 Lessor, and the bank, that will establish the conditions under which the Bank will acquire
12 Holman Capital Corporation's rights under the Lease Agreement and thereby fund the
13 transaction, and such other financing and related documents as necessary to complete the
14 transaction contemplated by the Lease Agreements and the Binding Commitments with such
15 changes therein as the Designated Officer may require and approve; provided that the total
16 principal component of the Lessee's Rental Payments under the Lease Agreements shall not
17 exceed \$6,900,000.00 and interest with respect thereto shall accrue at an annual rate not
18 exceeding 2.50%. The execution of the foregoing by the Designated Officer shall constitute
19 conclusive evidence of such officer's and the Lessee's approval of any such changes,
20 insertions, revisions, corrections, or amendments to the respective forms of agreements
21 presented to this meeting.

22 **Section 6. *Other Actions Authorized.*** The officers and employees of the Lessee shall take all
23 action necessary or reasonably required by the parties to the Transaction Documents to carry
24 out, give effect to, and consummate the transactions contemplated thereby (including the
25 execution and delivery of Certificates of Acceptance and Disbursement/Payment Requests,
26 Notice and Acknowledgements of Assignments, and any tax certificate and agreement, each
27 with respect to and as contemplated in the Agreement and/or Escrow Agreement) and to take
28 all action necessary in conformity therewith, including, without limitation, the execution and

1 delivery of any closing and other documents required to be delivered in connection with the
2 Transaction Documents. The Designated Officers and all other officers and employees of the
3 Lessee are hereby directed and authorized to take and shall take all action necessary or
4 reasonably required in order to select, purchase, and take delivery of the Equipment. All
5 actions heretofore taken by officers, employees, and agents of the Lessee that are in
6 conformity with the purposes and intent of this resolution are hereby approved, confirmed, and
7 ratified.

8 **Section 7. No General Liability.** Nothing contained in this **Resolution No. 7122**, the
9 Transaction Documents, nor any other instrument shall be construed with respect to the
10 Lessee as incurring a pecuniary liability or charge upon the general credit of the Lessee or
11 against its taxing power, nor shall the breach of any agreement contained in this **Resolution**
12 **No. 7122**, the Transaction Documents, or any other instrument or document executed in
13 connection therewith impose any pecuniary liability upon the Lessee or any charge upon its
14 general credit or against its taxing power, except to the extent that the rental payments payable
15 under the Transaction Documents are special limited obligations of the Lessee as provided
16 therein.


17 **Section 8. Appointment of Authorized Lessee Representatives.** The Designated Officers are
18 each hereby designated to act as authorized representatives of the Lessee for purposes of the
19 Transaction Documents until October 31, 2017, or such time as the governing body of the
20 Lessee shall designate any other or different authorized representative for purposes of the
21 Transaction Documents.

22 **Section 9. Severability.** If any section, paragraph, clause, or provision of this Resolution shall
23 for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such
24 section, paragraph, clause, or provision shall not affect any of the remaining provisions of this
25 **Resolution No. 7122**.

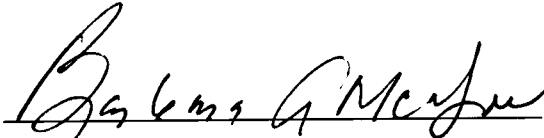
26 **Section 10. Repealer.** All bylaws, orders, and resolutions or parts thereof, inconsistent
27 herewith, are hereby repealed to the extent only of such inconsistency. This repealer shall not
28 be construed as reviving any bylaw, order, resolution, or ordinance or part thereof.

1 **Section 11. Effective Date.** This **Resolution No. 7122** shall be effective immediately upon
2 its approval and adoption.

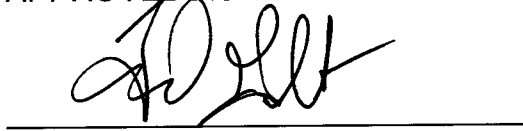
3 The foregoing Resolution was duly passed and adopted at a meeting of the governing body of
4 the City of Rialto held on May 9, 2017, by the following vote:

5
6 
7 DEBORAH ROBERTSON, Mayor

8
9 ATTEST:

10 
11
12 BARBARA A. McGEE, City Clerk

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14
15 APPROVED AS TO FORM:

16 
17
18 FRED GALANTE, Esq., City Attorney

1 STATE OF CALIFORNIA)
2 COUNTY OF SAN BERNARDINO) ss
3 CITY OF RIALTO)

4 I, Barbara McGee, City Clerk of the City of Rialto, do hereby certify that the foregoing
5 Resolution No. **7122** was duly passed and adopted at a regular meeting of the City Council of
6 the City of Rialto held on the 9th day of May, 2017.

7 Upon motion of Council Member Baca Jr., seconded by Council Member Carrizales, the
8 foregoing Resolution No. **7122** was duly passed and adopted.

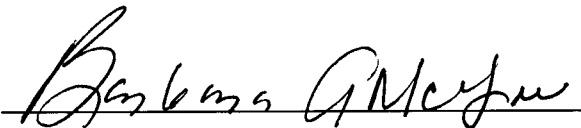
9 Vote on the motion:

10 AYES: Mayor Robertson, Council Members: Scott, Baca Jr., Trujillo, Carrizales

11 NOES: None

12 ABSENT: None

13
14 IN WITNESS WHEREOF, I have hereunto set my hand and the Official Seal of the
15 City of Rialto this 11th day of May, 2017.

16
17 
18 BARBARA A. MCGEE, CITY CLERK

***INSTALLATION AGREEMENT
FOR
City of Rialto***

TERMS AND CONDITIONS

ATTACHMENTS:

- Attachment A – Scope of Work
- Attachment B – Lighting Submittal
- Attachment C – HVAC Submittal
- Attachment D – Controls and Monitoring Submittal
- Attachment E – Self Generation Submittal

express written consent. "ABS" will commence work upon receipt of a Notice to Proceed from the City with respect to each project or portion thereof.

2. INVOICING AND PAYMENTS. "ABS" understands and agrees that this Agreement is subject to and conditioned upon "Purchaser" entering into a:

☒ **FINANCE OPTION:** dated _____ (this "Lease") is by and between **HOLMAN CAPITAL**, a corporation duly organized and existing under the laws of the State of California ("Corporation") as lessor and **City of Rialto**, the City duly organized and existing under the laws of the State of California ("Lessee") as lessee Agreement. The following will be the process for the funding to "ABS". All payments are processed through an Escrow account via wire transfer through Community of Santa Maria Bank and Mohave State Bank. Alliance Building Solutions will submit an invoice to the City of Rialto. The City of Rialto will inspect the work completed and approve it by completing and signing the Certificate of Acceptance and Payment Request. The City emails the signed Certificate of Acceptance and Payment Request form along with the invoice from ABS to The Bank/Escrow Agent and copies Holman Capital. The Bank/Escrow Agent disburses the requested amount from the escrow account to pay the invoice to "ABS". Once funds have been transferred the Bank/Escrow Agent provides the City of Rialto a statement accounting for deposits and withdrawals in the escrow account.

☐ **PURCHASE OPTION:** ABS" may invoice the "Purchaser" for mobilization upon signing the contract for 30% of the contract value due within 15 days. "ABS" will submit an SOV for review and approval within 45 days of contract signing for remaining scheduled payments. "Purchaser" agrees to pay "ABS" amounts invoiced 30 days after invoice received per agreed schedule of values (SOV). Waivers of lien will be furnished upon request, as the work progresses; to the extent payments are received. If "ABS" invoices are not paid within 30 days of its issuance, it is delinquent and "ABS" may add 1% interest per month, onto delinquent amounts.

- 3. INDEPENDENT CONTRACT.** It is agreed between "Purchaser" and "ABS" that "ABS" shall perform the work as an independent contractor. "ABS" may use subcontractors to perform work hereunder, provided "ABS" shall fully pay said subcontractors and in all instances remain fully responsible for (a) the proper completion of this agreement and (b) supervising such subcontractor's work and for the quality of the work they produce.
- 4. MATERIALS.** All materials shall be new, in compliance with all applicable laws and codes, and shall be covered by a manufacturer's warranty, if appropriate. If the materials or equipment included in this agreement become temporarily or permanently unavailable, the time for performance of the work shall be extended to the extent thereof, and case of permanent unavailability, "ABS" shall (a) be excused from furnishing said materials or equipment, and (b) be reimbursed for the difference between the cost of the materials or equipment permanently unavailable and the cost of a reasonable substitute therefore. All equipment installed shall meet or exceed the performance of the proposed equipment shown in the attachments.
- 5. PREVAILING WAGE.** In accordance with the provisions of the California Labor Code, Division 2, Part 7, Chapter 1, Articles 1 and 2, ABS and any subcontractor under ABS is required to pay not less than the general prevailing rate of per diem wages to all workmen employed in the performance of this Contract, for work of a similar character in the locality in which the public work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work. In that regard, pursuant to the California Labor Code, the Director of the Department of Industrial Relations of the State of California has determined such general prevailing rates of per diem wages. Copies of such prevailing rates of per diem wages are on file in the office of the Engineering Division, _____, Rialto, California, and are available to any interested party upon request; or may be obtained online from the Department of Industrial Relations website at <http://www.dir.ca.gov>. ABS shall cause a copy of such determinations to be posted at the job site. ABS shall comply with all applicable prevailing wage laws and regulations. ABS and any subcontractor under ABS is subject to forfeiture of penalties to City, as provided under the provision of Section 1775 of the California Labor Code for each worker employed, for each calendar day or portion thereof, if such

- i. "Purchaser" may desire a mid-job change in the specifications or scope that would add time and cost to the specified work or inconvenience "ABS".
 - ii. Other provisions of the agreement may be difficult to carry out because of unforeseen events, such as material shortage or labor strikes. If these are other events beyond the control of the parties reasonably required adjustments to this agreement, the parties shall make a good faith attempt to agree on all necessary particulars. Such agreements shall be put in writing, signed by the parties and added to this agreement. Failure to reach agreement shall be deemed a dispute to be resolved as agreed in section 18 of this agreement.
- 13. TAX DEDUCTIONS.** Unless otherwise stated in the contract, all eligible tax deductions associated with the work, that "Purchaser" is not eligible for, are agreed to be 100% the property of "ABS" or their designee. The paperwork, inspections and verification required to collect these incentives are the sole responsibility of "ABS". In the event the customer incurs expenses related to the processing of the applications, "ABS" shall reimburse these direct costs.
- 14. COMPLIANCE WITH LAWS.** "ABS" shall comply with all applicable Federal, State and local laws and regulations. All licenses and permits required for the prosecution of the work shall be obtained and paid for by "ABS".
- 15. INSURANCE.** "ABS" will maintain comprehensive liability and other insurance in the amount not less than those set forth below.
- a. General Liability Insurance. A policy of commercial general liability insurance, written on an "occurrence" basis, providing coverage with not less than \$1,000,000 per occurrence for bodily injury, personal injury & property damage and must include a separate endorsement naming the City, its elected officials, its officers, agents and employees as additional insurance ("General Liability Policy"). The General Liability Policy shall include coverage for the contractual liability assumed by the ABS pursuant to this Agreement.
 - b. Vehicle Liability Insurance. A policy of business vehicle liability insurance, written on an "occurrence" basis, with a combined single limit of not less than \$1,000,000 per accident for bodily injury and property damage ("vehicle Liability Policy"). The vehicle Liability Policy shall include coverage for owned, hired, and non-owned automobiles.
 - c. Worker's Compensation Insurance. Worker's compensation insurance as required by State law and employer's liability insurance with coverage in an amount not less than \$1,000,000. Notwithstanding the insurer rating standards set forth in this Agreement, coverage provided by the State Compensation Insurance Fund shall be deemed, with respect to the workers' compensation insurance, to satisfy such insurer rating standards.
 - d. Professional Liability Insurance. Professional liability insurance with coverage in an amount of not less than \$1,000,000 (Professional Liability Policy"), which the City or Purchaser acknowledges shall be written on a "claims made" basis.
 - e. Duration of Insurance. Except as provided in this Agreement with respect to insurance written on a "claims made" basis, the ABS shall maintain the insurance required pursuant to this Agreement in effect at least until the date that is one year following final payment to the ABS pursuant to this Agreement.
 - f. Professional Liability Insurance. The Professional Liability Policy shall provide coverage for claims arising out of the performance of the Scope of Services pursuant to this Agreement. If an aggregate limit applies, such aggregate limit in the Professional Liability Policy shall not be less than \$2,000,000. Prior to commencing the Scope of Services, and, if applicable, upon replacing the original Professional Liability Policy, the ABS shall provide to the City or Purchaser a copy of any and all applicable claims-reporting requirements. Notwithstanding anything to the contrary; (i) the ABS shall have the Professional Liability Policy, as described herein, in full force and effect prior to commencing the Scope of Services; (ii) each renewal or replacement of the Professional Liability Policy shall have a retroactive date that is prior to the date the ABS commenced the Scope of Services; and (iii) as a condition to final payment to the ABS pursuant to this Agreement. If the claims reporting period applicable to the scope of Services, as specified in or determined

- I. **Review of Coverage.** The City or Purchaser may at any time request that the ABS provide a full and complete copy of any or all policies of insurance to be maintained by the contractor pursuant to this Agreement, and the ABS shall provide a copy of each requested policy to the City or Purchaser within ten days of the City or Purchaser's request. The City or Purchaser shall review the insurance policies, along with the Certificate of Insurance and endorsements also provided by the ABS, to determine whether the ABS's insurance companies with the insurance-related requirements of this Agreement. However, no failure by the City or Purchaser to conduct such review, to properly or completely conduct such review, or to identify any non-compliance with the requirements of this Part 3, shall be deemed or construed to relieve the ABS from any of its obligations in regard to such insurance-related requirements. Notwithstanding anything else in this Agreement, any failure by the consultant to comply with such insurance-related requirements shall be deemed a material breach by the ABS of its obligations pursuant to this Agreement and not as a waiver of any such insurance-related requirement.

Subcontractor's Insurance. The ABS shall require that each of its Subcontractor's independently comply with all requirements of this section relating to insurance covering their activities for the benefit of the City or Purchaser. The ABS shall require in its agreements with its subcontractors that each Subcontractor be subject to, and that it comply with, the requirements set forth in this section, except to the extent the City or Purchaser has approved any different standards or requirements applicable to any particular subcontractor.

16. **BONDING.** Bonds are subject to the procurement and installation portion of the contract. Payment and Performance Bonds are required 10 days prior to start of procurement or installation. Pursuant to provisions of the California Civil Code, the payment bond must be in an amount not less than one hundred percent (100%) of the contract price and, as the performance bond should be in a similar amount to insure completion of the project. All M&V Agreements and Energy Savings Guarantees are specifically excluded.
17. **INDEMNITY.** City, its elected officials, officers, agents and employees, shall not be answerable or accountable in any manner for any loss or damage that may happen to the Work or any part thereof, or for any of the materials or other things used or employed in performing the Work, or for injury or damage to any person or persons, either worker, employees of ABS or his subcontractors or the public, or for damage to adjoining or other property from any cause whatsoever arising out of or in connection with the performance of the Work. ABS shall be responsible for any damage or injury to any person or property resulting from defects or obstructions or from any cause whatsoever, except the active negligence or willful misconduct of City, its employees, servants, or independent contractors who are directly responsible to City during the progress of the Work, or at any time before its completion and final acceptance.

ABS will indemnify City, its elected officials, officers, agents and employees against and will hold and save them harmless from any and all actions, claims, damages to persons or property, penalties, obligations, or liabilities that may be asserted or claimed by any person, firm, entity, corporation, political subdivision, or other organization arising out of or in connection with this Contract, the Work, operation, or activities of ABS, his agents, employees, subcontractors, or invitees provided for herein, whether or not there is concurrent passive negligence, but excluding such actions, claims, damages to persons or property, penalties, obligations, or liabilities arising from the active negligence or willful misconduct of City, its employees, servants, or independent contractors who are directly responsible to City, and in connection therewith:

ABS will defend any action or actions filed in connection with any of said claims, damages, penalties, obligations, or liabilities and will pay all cost and expenses, including attorney's fees incurred in connection therewith.

ABS will promptly pay any judgment rendered against ABS, or City, or its elected officials, agents or employees, covering such claims, damages, penalties, obligations and liabilities arising out of or in connection with such work, operations, or activities of ABS hereunder, and ABS agrees to save and hold the same harmless therefrom.



City of Rialto

Signature

Title

Date

Alliance Building Solutions, Inc.




Signature

Title



Date

Civic Center



Lighting

-  Replace existing interior fluorescent and incandescent lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and comfort, as well as eliminate fluorescent ballast noise and lamp flickering. LED systems have instant start capabilities and provide substantially longer equipment life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Replace existing exterior high intensity discharge (HID) lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and outdoor security. The exterior LED systems have fixture mounted photocells to ensure the lights are only active when required. LED systems also have instant start capabilities and provide substantially longer effective life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Install occupancy sensors in select areas to automatically turn off the lighting systems when no activity is detected after an extended amount of time. Please refer to the Lighting Submittal for specific quantities and locations.


Controls and Monitoring

-  Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
-  Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use on site. The system will allow for users to view and monitor real-time energy consumption and control of select electrical circuits. Where the system is installed, the scope will also include 5 years of measurement and verification services to identify possible energy savings measures and assistance with implementation of additional energy savings measures. Refer to the Controls & Monitoring Submittal for details.

Controls and Monitoring



-  Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
-  Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use on site. The system will allow for users to view and monitor real-time energy consumption and control of select electrical circuits. Where the system is installed, the scope will also include 5 years of measurement and verification services to identify possible energy savings measures and assistance with implementation of additional energy savings measures. Refer to the Controls & Monitoring Submittal for details.

Self-Generation

-  Install a new solar photovoltaic (PV) system. The site currently receives 100% of its electricity from the utility company. The system will help reduce electricity cost, avoid future cost increases, protect the existing roofing system, and reduce the environmental impact of electricity generation. The new system shall include 10 years of system services and maintenance. Please refer to the Self Generation Submittal for further details of system location and information.

Fire Station #1 (Headquarters)

Lighting

-  Replace existing interior fluorescent and incandescent lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and comfort, as well as eliminate fluorescent ballast noise and lamp flickering. LED systems have instant start capabilities and provide substantially longer equipment life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Replace existing exterior high intensity discharge (HID) lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and outdoor security. The exterior LED systems have fixture mounted photocells to ensure the lights are only active when required. LED systems also have instant start capabilities and provide

capabilities and provide substantially longer equipment life. Please refer to the Lighting Submittal for specific quantities and locations.

- ☐ Replace existing exterior high intensity discharge (HID) lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and outdoor security. The exterior LED systems have fixture mounted photocells to ensure the lights are only active when required. LED systems also have instant start capabilities and provide substantially longer effective life. Please refer to the Lighting Submittal for specific quantities and locations.
- ☐ Install occupancy sensors in select areas to automatically turn off the lighting systems when no activity is detected after an extended amount of time. Please refer to the Lighting Submittal for specific quantities and locations.

Controls and Monitoring

- ☐ Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
- ☐ Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use on site. The system will allow for users to view and monitor real-time energy consumption and control of select electrical circuits. Where the system is installed, the scope will also include 5 years of measurement and verification services to identify possible energy savings measures and assistance with implementation of additional energy savings measures. Refer to the Controls & Monitoring Submittal for details.

Self-Generation

- ☐ Install a new solar photovoltaic (PV) system. The site currently receives 100% of its electricity from the utility company. The system will help reduce electricity cost, avoid future cost increases, protect the existing roofing system, and reduce the environmental impact of electricity generation. The new system shall include 10 years of system services and maintenance. Please refer to the Self Generation Submittal for further details of system location and information.

Self-Generation

- ☐ Install a new solar photovoltaic (PV) system. The site currently receives 100% of its electricity from the utility company. The system will help reduce electricity cost, avoid future cost increases, protect the existing roofing system, and reduce the environmental impact of electricity generation. The new system shall include 10 years of system services and maintenance. Please refer to the Self Generation Submittal for further details of system location and information.

Fire Station #4

Lighting

- ☐ Replace existing interior fluorescent and incandescent lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and comfort, as well as eliminate fluorescent ballast noise and lamp flickering. LED systems have instant start capabilities and provide substantially longer equipment life. Please refer to the Lighting Submittal for specific quantities and locations.
- ☐ Replace existing exterior high intensity discharge (HID) lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and outdoor security. The exterior LED systems have fixture mounted photocells to ensure the lights are only active when required. LED systems also have instant start capabilities and provide substantially longer effective life. Please refer to the Lighting Submittal for specific quantities and locations.
- ☐ Install occupancy sensors in select areas to automatically turn off the lighting systems when no activity is detected after an extended amount of time. Please refer to the Lighting Submittal for specific quantities and locations.

Controls and Monitoring

- ☐ Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
- ☐ Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use

Heating, Ventilation and Air Conditioning (HVAC)

- ☐ Replace (1) HVAC unit with new high efficiency unit of similar size and capacity. The existing equipment is past its useful effective life, suffers from efficiency losses, and creates maintenance issues for facility staff. Replacement shall include demolition of existing equipment and turn-key installation of new equipment, including start-up and testing of the new equipment installation. Refer to the HVAC Submittal for details, including specific units identified for replacement, equipment information, locations, capacities and ages.

Controls and Monitoring

- ☐ Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
- ☐ Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use on site. The system will allow for users to view and monitor real-time energy consumption and control of select electrical circuits. Where the system is installed, the scope will also include 5 years of measurement and verification services to identify possible energy savings measures and assistance with implementation of additional energy savings measures. Refer to the Controls & Monitoring Submittal for details.

Self-Generation

- ☐ Install a new solar photovoltaic (PV) system. The site currently receives 100% of its electricity from the utility company. The system will help reduce electricity cost, avoid future cost increases, protect the existing roofing system, and reduce the environmental impact of electricity generation. The new system shall include 10 years of system services and maintenance. Please refer to the Self Generation Submittal for further details of system location and information.




Human Resources / M&O

Lighting



- ☐ Replace existing interior fluorescent and incandescent lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and comfort, as well as eliminate

Library



Lighting

-  Replace existing interior fluorescent and incandescent lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and comfort, as well as eliminate fluorescent ballast noise and lamp flickering. LED systems have instant start capabilities and provide substantially longer equipment life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Replace existing exterior high intensity discharge (HID) lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and outdoor security. The exterior LED systems have fixture mounted photocells to ensure the lights are only active when required. LED systems also have instant start capabilities and provide substantially longer effective life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Install occupancy sensors in select areas to automatically turn off the lighting systems when no activity is detected after an extended amount of time. Please refer to the Lighting Submittal for specific quantities and locations.


Controls and Monitoring

-  Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
-  Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use on site. The system will allow for users to view and monitor real-time energy consumption and control of select electrical circuits. Where the system is installed, the scope will also include 5 years of measurement and verification services to identify possible energy savings measures and assistance with implementation of additional energy savings measures. Refer to the Controls & Monitoring Submittal for details.

Controls and Monitoring



-  Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
-  Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use on site. The system will allow for users to view and monitor real-time energy consumption and control of select electrical circuits. Where the system is installed, the scope will also include 5 years of measurement and verification services to identify possible energy savings measures and assistance with implementation of additional energy savings measures. Refer to the Controls & Monitoring Submittal for details.

Self-Generation

-  Install a new solar photovoltaic (PV) system. The site currently receives 100% of its electricity from the utility company. The system will help reduce electricity cost, avoid future cost increases, protect the existing roofing system, and reduce the environmental impact of electricity generation. The new system shall include 10 years of system services and maintenance. Please refer to the Self Generation Submittal for further details of system location and information.

Police Department




Lighting

-  Replace existing interior fluorescent and incandescent lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and comfort, as well as eliminate fluorescent ballast noise and lamp flickering. LED systems have instant start capabilities and provide substantially longer equipment life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Replace existing exterior high intensity discharge (HID) lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and outdoor security. The exterior LED systems have fixture mounted photocells to ensure the lights are only active when required. LED systems also have instant start capabilities and provide



system. Installation shall include turn-key installation of new equipment, including start-up and testing of the new equipment. Please refer to the Self Generation Submittal for further details of system location and information.

Police Annex



Lighting

-  Replace existing interior fluorescent and incandescent lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and comfort, as well as eliminate fluorescent ballast noise and lamp flickering. LED systems have instant start capabilities and provide substantially longer equipment life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Replace existing exterior high intensity discharge (HID) lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and outdoor security. The exterior LED systems have fixture mounted photocells to ensure the lights are only active when required. LED systems also have instant start capabilities and provide substantially longer effective life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Install occupancy sensors in select areas to automatically turn off the lighting systems when no activity is detected after an extended amount of time. Please refer to the Lighting Submittal for specific quantities and locations.


Controls and Monitoring

-  Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
-  Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use on site. The system will allow for users to view and monitor real-time energy consumption and control of select electrical circuits. Where the system is installed, the scope will also include 5 years of measurement and verification services to identify possible energy savings measures and assistance with implementation of

Controls and Monitoring



-  Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
-  Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use on site. The system will allow for users to view and monitor real-time energy consumption and control of select electrical circuits. Where the system is installed, the scope will also include 5 years of measurement and verification services to identify possible energy savings measures and assistance with implementation of additional energy savings measures. Refer to the Controls & Monitoring Submittal for details.

Self-Generation



-  Install a new solar photovoltaic (PV) system. The site currently receives 100% of its electricity from the utility company. The system will help reduce electricity cost, avoid future cost increases, protect the existing roofing system, and reduce the environmental impact of electricity generation. The new system shall include 10 years of system services and maintenance. Please refer to the Self Generation Submittal for further details of system location and information.

Racquet & Fitness Center


Lighting

-  Replace existing interior fluorescent and incandescent lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and comfort, as well as eliminate fluorescent ballast noise and lamp flickering. LED systems have instant start capabilities and provide substantially longer equipment life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Replace existing exterior high intensity discharge (HID) lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and outdoor security. The exterior LED systems have fixture mounted photocells to ensure the lights are only active when required. LED systems also have instant start capabilities and provide



capabilities and provide substantially longer equipment life. Please refer to the Lighting Submittal for specific quantities and locations.

-  Replace existing exterior high intensity discharge (HID) lighting systems with high efficiency light emitting diode (LED) systems. The LED systems shall provide equal or better color rendering to increase visual clarity and outdoor security. The exterior LED systems have fixture mounted photocells to ensure the lights are only active when required. LED systems also have instant start capabilities and provide substantially longer effective life. Please refer to the Lighting Submittal for specific quantities and locations.
-  Install occupancy sensors in select areas to automatically turn off the lighting systems when no activity is detected after an extended amount of time. Please refer to the Lighting Submittal for specific quantities and locations.

Heating, Ventilation and Air Conditioning (HVAC)

-  Replace (13) HVAC units with new high efficiency units of similar size and capacity. The existing equipment is past its useful effective life, suffers from efficiency losses, and creates maintenance issues for facility staff. Replacement shall include demolition of existing equipment and turn-key installation of new equipment, including start-up and testing of the new equipment installation. Refer to the HVAC Submittal for details, including specific units identified for replacement, equipment information, locations, capacities and ages.

Controls and Monitoring

-  Install network based smart thermostats to control HVAC equipment. The new smart thermostats shall be a networked system and will include a single point of access to adjust equipment schedules and space temperature setpoints across all connected thermostats. Heating and cooling setpoints will be user adjustable by the occupant within a preprogrammed amount during occupied times, and allow for afterhours operation with user input. Refer to the Controls & Monitoring Submittal for details, including specific equipment information and locations.
-  Install an energy monitoring and management system. The system includes a combination of building, panel, and circuit level monitoring to track electricity use on site. The system will allow for users to view and monitor real-time energy consumption and control of select electrical circuits. Where the system is installed, the scope will also include 5 years of measurement and verification services to identify possible energy savings measures and assistance with implementation of additional energy savings measures. Refer to the Controls & Monitoring Submittal for details.

Attachment B – Lighting Submittal

Sites

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Civic Center - Lighting Inventory (Continued)

Existing Equipment										Proposed Equipment		
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts		
31	Planning Building - Office Greg	32W 4L4'T8 (Wraps)	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	50		
32	Planning Building - Women's Restroom	32W 2L4'T8 (Wrap)	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26		
33	Planning Building - Men's Restroom	32W 2L4'T8 (Wrap)	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26		
34	Planning Building - Office Gina	32W 2L 2x4 T8 (Troffer) Single Switch	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
35	Planning Building - Conference Room	34W 4L4'T12 Single Switch	2	T12	4	8	144	12W 4L4'T8 plug n play	LED	50		
36	Planning Building - James Carl	32W 4L4'T8 (Wrap)	3	T8	4	12	115	12W 4L4'T8 plug n play	LED	50		
37	Planning Building - James Carl	32W 4L4'T8 (Wrap)	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	50		
38	Planning Building - Utility Room	32W 2L 1x4 T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26		
39	Planning Building - Kitchen	32W 2L4'T8 (Wrap)	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26		
40	Planning Building - Office Hub	32W 4L4'T8 (Wrap)	12	T8	1	12	115	New 40w LED wraps	LED	40		
41	Planning Building - Printer Room	32W 4L 2x4 T8 wood box surface mount	1	T8	4	4	115	12W 4L4'T8 plug n play	LED	50		
42	Planning Building - Printer Room	32W 2L 1x4 T8	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
43	Planning Building - Office John D	34W 4L 2x4 T12 (Troffer) Single Switch	2	T12	4	8	144	12W 4L4'T8 plug n play	LED	50		
44	Planning Building - Exterior	150W Wallpack	1	HID	1	1	185	60W Wallpack LED	LED	60		
45	Planning Building - Exterior	150w HID ceiling box canopy	2	HID	2	4	185	60W HID Ceiling Box Canopy LED	LED	60		
46	Planning Building - Exterior	42w CFL Recessed 10" cans	4	CFL	4	16	44	12w LED recessed can retro	LED	12		
47	Planning Building - Exterior	70W HPS Wallpack	1	HID	1	1	90	40W Wallpack LED	LED	28		
48	Planning Building - Exterior	CFL 42W Wallpack	1	CFL	1	1	44	30W Wallpack LED	LED	28		
49	Radio Live Bldg - Lobby	13w Globe CFL	2	CFL	1	2	15	5w Lunera plug in	LED	5		
50	Radio Live Bldg - Counter	32W 4L 2x4 T8 (Troffer)	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	50		
51	Radio Live Bldg - Hub	32W 4L 2x4 T8 (Troffer)	24	T8	4	96	115	12W 4L4'T8 plug n play	LED	50		
52	Radio Live Bldg - hub	32W 4L 2x4 T8 (Troffer)	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	50		
53	Radio Live Bldg - Shields	32W 4L 2x4 T8 (Troffer)	1	T8	4	4	115	12W 4L4'T8 plug n play	LED	50		
54	Radio Live Bldg - Badin	32W 4L 2x4 T8 wood box surface mount	2	T8	4	8	60	12W 4L4'T8 plug n play	LED	50		
55	Radio Live Bldg - Carrillo	32W 4L 2x4 T8 (Troffer)	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	50		
56	Radio Live Bldg - Diaz	32W 4L 2x4 T8 (Troffer)	3	T8	4	12	115	12W 4L4'T8 plug n play	LED	50		
57	Radio Live Bldg - Men's Restroom	32W 2L4'T8 (Wraps)	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
58	Radio Live Bldg - Women's Restroom	32W 2L4'T8 (Wraps)	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
59	Radio Live Bldg - Johnson	32W 4L 2x4 T8 wood box surface mount	2	T8	4	8	60	12W 4L4'T8 plug n play	LED	50		
60	Radio Live Bldg - Office	32W 4L 2x4 T8 wood box surface mount	2	T8	4	8	60	12W 4L4'T8 plug n play	LED	50		

Community Center - Lighting Inventory

Existing Equipment										Proposed Equipment		
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts		
1	Gym	High Bay 400W HID	48	HID	1	48	454	150W High Bay LED	LED	168		
2	Gym Office	40W 4L4'T12	4	T12	4	16	144	12W 4L4'T8 plug n play	LED	50		
3	Men/Women Restroom	40W 4L4'T12	2	T12	4	8	144	12W 4L4'T8 plug n play	LED	50		
4	Men/Women Restroom	40W 2L4'T12	1	T12	4	4	72	12W 2L4'T8 plug n play	LED	26		
5	Gym Storage	32W 3L4'T8	4	T8	3	12	88	12W 3L4'T8 plug n play	LED	38		
6	Electrical Room	40W 2L4'T12	1	T12	2	2	72	12W 2L4'T8 plug n play	LED	26		
7	Hallway by Gym Restroom	HID 250W Wallpack	1	HID	1	1	290	80W Wallpack LED	LED	90		
8	Main Office Front Desk	40W 2L4'T12	4	T12	2	8	72	12W 2L4'T8 plug n play	LED	26		
9	Hallway to the Right	40W 2L4'T12	2	T12	2	4	72	12W 2L4'T8 plug n play	LED	50		
10		40W 4L4'T12	1	T12	4	4	144	12W 4L4'T8 plug n play	LED	50		
11	Office to the Right	40W 4L4'T12	2	T12	4	8	144	12W 4L4'T8 plug n play	LED	50		
12	Copy Room	40W 4L4'T12	1	T12	4	4	144	12W 4L4'T8 plug n play	LED	50		
13	Hallway to the Left	40W 2L4'T12	2	T12	2	4	72	12W 2L4'T8 plug n play	LED	26		
14	Kitchen	40W 2L4'T12	1	T12	2	2	72	12W 2L4'T8 plug n play	LED	26		
15	Perry Brent's Office	40W 4L4'T12	2	T12	4	8	144	12W 2L4'T8 plug n play	LED	26		
16	Hallway Office 1 to the Left	40W 4L4'T12	1	T12	4	4	144	12W 2L4'T8 plug n play	LED	26		
17		40W 4L4'T12	1	T12	4	4	144	12W 4L4'T8 plug n play	LED	50		
18	Conference Room	40W 4L4'T12	4	T12	4	16	144	12W 4L4'T8 plug n play	LED	50		
19	Class Room 201	32W 4L4'T8	6	T8	4	24	115	12W 4L4'T8 plug n play	LED	50		
20	Class Room 202	32W 4L4'T8	6	T8	4	24	115	12W 4L4'T8 plug n play	LED	50		
21	Class Room 203	32W 4L4'T8	6	T8	4	24	115	12W 4L4'T8 plug n play	LED	50		
22	Class Room 305	32W 2L4'T8	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		
23	Class Room 304	32W 2L4'T8	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		
24	Class Room 303	32W 2L4'T8	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		
25	Class Room 301	32W 2L4'T8	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		
26	Class Room 306	40W 2L8'T12	6	T12	2	12	130	12W 2L4'T8 plug n play	LED	26		
27	Class Room 404	40W 2L8'T12	6	T12	2	12	130	12W 2L4'T8 plug n play	LED	26		
28	Class Room 403	40W 4L4'T12	6	T12	4	24	144	12W 2L4'T8 plug n play	LED	26		
29	Class Room 402	40W 4L4'T12	6	T12	4	24	144	12W 2L4'T8 plug n play	LED	26		
30	Class Room 401	40W 2L8'T12	6	T12	2	12	130	12W 2L4'T8 plug n play	LED	26		

Fire Station 1 (HQ) - Lighting Inventory

Existing Equipment										Proposed Equipment		
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts		
1	Fire Station - Lobby	32W 2L 2x4 T8	16	T8	2	32	60	12W 2L4'T8 plug n play	LED	26		
2	Fire Station - Lobby	32W 2L 2x4 T8	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
3	Fire Station - Lobby	32W 2L4'T8 (Wrap)	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26		
4	Fire Station - Lobby	32w 1L4'T8 slim recessed	2	T8	1	2	32	12W 1L4'T8 plug n play	LED	14		
5	Fire Station - Chief	32W 3L 2x4 T8 (Troffer) Single Switch	6	T8	2	12	88	12W 3L4'T8 plug n play	LED	38		
6	Fire Station - Hall	32W U6 2x2 Box	2	T8	2	4	32	16.5W 2L4'T8 plug n play	LED	35		
7	Fire Station - Hall	32W 2L 2x4 Box Lens (Troffer)	12	T8	2	24	60	12W 2L4'T8 plug n play	LED	26		
8	Fire Station - Office	32W 2L 2x4 Box Lens (Troffer)	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26		
9	Fire Station - Battalion Chief	32W 2L 2x4 Box Lens (Troffer)	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26		
10	Fire Station - Office	32W 2L 2x4 Box Lens (Troffer)	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26		
11	Fire Station - EMSC	32W 2L 2x4 Box Lens (Troffer)	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26		
12	Fire Station - Men's Restroom	32W 2L 2x4 Box	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26		
13	Fire Station - Women's Restroom	32W 2L 2x4 Box	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
14	Fire Station - Back Door Canopy	10" Rec. Can 70W HID	1	HID	1	1	90	12w LED retro can	LED	12		
15	Fire Station - Locked Closet	23w ceiling drum fixtures	1	HID	1	1	25	15w LED drum fixture	LED	15		
16	Fire Station - Hub	32W 2L 2x4 Box	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		
17	Fire Station - Office	32W 4L 2x4 eggcrate	4	T8	4	16	115	12W 4L4'T8 plug n play	LED	50		
18	Fire Station - Storage	32W 2L 2x4 eggcrate	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
19	Fire Station - Storage	34w 2L4'T12	1	T12	2	2	72	12W 2L4'T8 plug n play	LED	26		
20	Fire Station - Lobby Public	32W 1L 4'T8	16	T8	1	16	32	12W 1L4'T8 plug n play	LED	14		
21	Fire Station - Lobby Public	32W 1L 4'T8	12	T8	1	12	32	12W 1L4'T8 plug n play	LED	14		
22	Basement - IT Room	32W 2L4'T8 (Indust.)	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26		
23	Basement - Gym	32W 2L 2x4 Box	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		
24	Basement - Conference Room	32W 2L 2x4 Box	16	T8	2	32	60	12W 2L4'T8 plug n play	LED	26		
25	Basement - Conference Room	32W 2L4'T8 EGG	12	T8	2	24	60	12W 2L4'T8 plug n play	LED	26		
26	Basement - Counter	Can 90W PAR38 8" recessed can	2	HID	1	2	90	12w LED retro can	LED	12		
27	Basement - Hall	32W 1L 4'T8	14	T8	1	14	32	12W 1L4'T8 plug n play	LED	12		
28	Basement - Office/Conference	32W 2L 2x4 Box Lens Single Switch	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		
29	Basement - Office Frig area	32W 2L 2x4 Box Lens Single Switch	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		
30	Basement - Fire inventory	32W 2L 2x4 Box Lens Single Switch	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		

Fire Station 1 (HQ) - Lighting Inventory (Continued)

Existing Equipment											Proposed Equipment		
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts			
61	Dorm Areas - Room 9	32W 2L 2x4 T8 (Troffer)	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26			
62	Dorm Areas - Room 9	6" Rec. CFL 23W	1	CFL	1	1	25	12W 6" LED Can	LED	12			
63	Dorm Areas - Room 10	32W 2L 2x4 T8 (Troffer)	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26			
64	Dorm Areas - Room 10	6" Rec. CFL 23W	1	CFL	1	1	25	12W 6" LED Can	LED	12			
65	Dorm Areas - Room 11	32W 2L 2x4 T8 (Troffer)	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26			
66	Dorm Areas - Room 11	6" Rec. CFL 23W	1	CFL	1	1	25	12W 6" LED Can	LED	12			
67	Dorm Areas - Storage	2L2'T5 (Strip)	1	T5	2	2	58	New 40w LED radial ALEO	LED	40			
68	Dorm Areas - IT Room	32W 4L 4'T8 EGG	3	T8	4	12	115	12W 4L4'T8 plug n play	LED	50			
69	Dorm Areas - Stairs High	32W 3L 2x4 Box	4	T8	3	12	88	12W 3L4'T8 plug n play	LED	38			
70	Dorm Areas - Ice Room	32W 2L 2x4 T8 Box	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26			
71	Dorm Areas - Lockers	32W U6 2x2	13	T8	2	26	60	16.5W 2L4'T8 plug n play	LED	35			
72	Dorm Areas - Showers	32W 2L4'T8	5	T8	2	10	60	12W 2L4'T8 plug n play	LED	26			
73	Dorm Areas - Mirrors	Rec. 6" Can 23W	5	CFL	1	5	25	12W 6" LED Can	LED	12			
74	Dorm Areas - Urinals Ceiling	Rec. 6" Can 23W	1	CFL	1	1	25	12W 6" LED Can	LED	12			
75	Womens locker - Room	32W U6 2L 2x2	4	T8	2	8	60	16.5W 2L4'T8 plug n play	LED	35			
76	Womens locker - Showers	6" Rec. CFL 23W	2	CFL	1	2	23	12W 6" LED Can	LED	12			
77	Womens locker - Mirrors	6" Rec. CFL 23W	3	CFL	1	3	23	12W 6" LED Can	LED	12			
78	Upstairs Break Area - Foyer	32W U6 2x2	1	T8	2	2	32	16.5W 2L4'T8 plug n play	LED	35			
79	Upstairs Break Area - TV Area	32w 1L 4ft Eggcrate	18	T8	1	18	32	12W 1L4'T8 plug n play	LED	12			
80	Upstairs Break Area - Kitchen	32W 2L 2x4 Recess Lens	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26			
81	Upstairs Break Area - TV area	32W 2L 2x4 Box	8	T8	2	16	60	12W 2L4'T8 plug n play	LED	26			
82	Upstairs Break Area - H2O Room	60w inca keyless socket screw in	1	INC	1	1	60	9.5W A19 LED	LED	9.5			
83	City Clerks Office - Exterior	42W Canopy surface box	1	HID	1	1	44	30W LED canopy fixture	LED	20			
84	City Clerks Office - Exterior	6" recess LED	6	LED	1	6	12	NONE	LED				
85	City Clerks Office - Entry	Recessed 50W Drums	2	HID	1	2	50	New Drums 30w LED	LED	30			
86	City Clerks Office - Hub/Lobby	32W 2L 2x4 Lens (Troffer)	16	T8	2	32	60	12W 2L4'T8 plug n play	LED	26			
87	City Clerks Office - Men's Restroom	32W 2L4'T8 (Wraps)	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26			
88	City Clerks Office - Women's Restroom	32W 2L4'T8 (Wraps)	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26			
89	City Clerks Office - Kitchen	32W 2L4'T8 (Wraps)	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26			
90	City Clerks Office - Meeting room	32W 2L4'T8 (Wraps)	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26			

Fire Station 2 - Lighting Inventory

Line	Location Served	Existing Equipment					Proposed Equipment			
		Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts
1	Turn Out Room	32W 2L4'T8	5	T8	2	10	60	12W 2L4'T8 plug n play	LED	26
2	BC Dormitory	32W 2L4'T8	5	T8	2	10	60	12W 2L4'T8 plug n play	LED	26
3	Shop	32W 2L4'T8	8	T8	2	16	60	12W 2L4'T8 plug n play	LED	26
4	Communication Room	32W 2L4'T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26
5	Laundry	32W 2L4'T8	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26
6	Mechanical Room	32W 2L4'T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26
7	EMS Room	32W 2L4'T8	3	T8	2	6	60	12W 2L4'T8 plug n play	LED	26
8	Restroom by Engine Bay	32W 2L4'T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26
9	Engine Bay	32W 2L4'T8	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26
10	All Around Building	HID 250W Wallpack	20	HID	1	20	290	80W HID Wallpack LED	LED	60
11	Parking Lots	HID 150W Poles	5	HID	1	5	190	60W HID Poles LED	LED	52
12	Parking Canopies	32W 2L4'T8	10	T8	2	20	60	12W 2L4'T8 plug n play	LED	26
13	All Around Building	6" Can 13W	5	CFL	1	5	15	12W 6" Can Light LED	LED	12
14	Community Room	32W 2L4'T8	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26
15	Office	32W 2L4'T8	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26
16	Hallway	32W 2L4'T8	11	T8	2	22	60	12W 2L4'T8 plug n play	LED	26
17	Mechanical Room	40W 2L4'T12	1	T12	2	2	72	12W 2L4'T8 plug n play	LED	26
18	Captain's Office	32W 2L4'T8	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26
19	Captain's Office	CFL 18W 6" Can	1	CFL	1	1	20	12W 6" Can Light LED	LED	12
20	Hallway	CFL 18W 6" Can	2	CFL	1	2	20	12W 6" Can Light LED	LED	12
21	Day Room	CFL 18W 6" Can	20	CFL	1	20	20	12W 6" Can Light LED	LED	12
22	Dormitory 3	CFL 18W 6" Can	2	CFL	1	2	20	12W 6" Can Light LED	LED	12
23	Dormitory 3	32W 2L 2x4 T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26
24	Dormitory 3	32W 2L 1x4 T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26
25	Exercise Room	32W 2L4'T8	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26
26	Kitchen	32W 2L4'T8	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26
27	Dining	32W 2L4'T8	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26
28	Dining	CFL 18W 6" Can	4	CFL	1	4	20	12W 2L4'T8 plug n play	LED	26
29	Back of Building	CFL 18W 6" Can	1	CFL	1	1	20	12W 2L4'T8 plug n play	LED	26
30	Truck Bay	32W 2L4'T8	18	T8	2	36	60	12W 2L4'T8 plug n play	LED	26

Fire Station 3 - Lighting Inventory

Existing Equipment										Proposed Equipment		
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts		
1	Front	MH 400W HID Pole Lights (Round)	19	HID	1	19	454	150W HID Pole Lights (Round) LED	LED	111		
2	Front	75PAR38	3	HID	1	3	75	13.5W Par38 LED	LED	13.5		
3	Front	HID 150W Pole	2	HID	1	2	190	80W HID Pole LED	LED	72		
4	Wall Around Building	HID 100W Wall Lights	12	HID	1	12	130	40W HID Wall Lights LED	LED	40		
5	Conference Room	60BR30 Track Lights	5	HID	1	5	60	10BR30 LED screw in	LED	10		
6	Conference Room	32W 3L4'T8	18	T8	3	54	88	12W 3L4'T8 plug n play	LED	38		
7	Outside Conference Room	32W 4'T8	3	T8	1	3	32	12W 1L4'T8 plug n play	LED	14		
8	Women's/Men's Restroom	32W 2L4'T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26		
9	Office Supplies	32W 4L4'T8	1	T8	4	4	115	12W 4L4'T8 plug n play	LED	50		
10	Offices	32W 2L4'T8	3	T8	2	6	60	12W 2L4'T8 plug n play	LED	26		
11	Office	32W 3L4'T8	6	T8	3	18	88	12W 3L4'T8 plug n play	LED	38		
12	Hallway	CFL 18W Can Lights	4	CFL	1	4	20	12W Can Light LED	LED	12		
13	Roof Access Room	32W 2L4'T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26		
14	Kitchen	32W 2L4'T8	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26		
15	Dining Area	32W 3L4'T8	6	T8	3	18	88	12W 2L4'T8 plug n play	LED	26		
16	Gym	32W 3L4'T8	4	T8	3	12	88	12W 2L4'T8 plug n play	LED	26		
17	Lions Den Room	32W 4L4'T8	6	T8	4	24	115	12W 4L4'T8 plug n play	LED	50		
18	Restroom on the Back	32W 2L4'T8	1	T8	2	2	60	12W 3L4'T8 plug n play	LED	38		
19	Parking Engine Garage	32W 2L4'T8	19	T8	2	38	60	12W 2L4'T8 plug n play	LED	26		
20	Engine Garage	32W 4L4'T8	18	T8	4	72	115	12W 4L4'T8 plug n play	LED	50		
21	Electrical Room	32W 2L4'T8	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
22	Dorm Room	CFL 13W 6" Can	3	CFL	1	3	15	12W 6" Can Light LED	LED	12		
23	Women's Restroom By Dorm	32W 2L4'T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26		
24	Women's Restroom By Dorm	CFL 15W 6" Can	5	CFL	1	5	17	12W 2L4'T8 plug n play	LED	12		
25	Work Shop	32W 2L4'T8	3	T8	2	6	60	12W 2L4'T8 plug n play	LED	26		
26	Hallway By Restroom	CFL 26W 6" Can	3	CFL	1	3	28	12W 6" Can Light LED	LED	12		
27	Men's Restroom	CFL 26W 6" Can	6	CFL	1	6	28	12W 6" Can Light LED	LED	12		
28	Men's Restroom	32W 2L4'T8	3	T8	2	6	60	12W 2L4'T8 plug n play	LED	26		
29	Behind Building	HID 250W Wallpack	4	HID	1	4	290	12W 2L4'T8 plug n play	LED	90		
30	Back Parking Lot	HID 400W Pole Lights	10	HID	1	10	454	150W HID Pole Lights LED	LED	111		

Fleet Services, ITS, Purchasing - Lighting Inventory

		Existing Equipment					Proposed Equipment			
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts
1	Exterior	250W Wallpack	12	HID	1	12	290	80W Wallpack LED	LED	80
2	Exterior	32W 4L 2x4 T8 (Troffer)	6	T8	4	24	115	12W 4L4'T8 plug n play	LED	50
3	Exterior	32W 2L U6 2x2 T8 (Troffer)	1	T8	2	2	60	16.5w 2LT8U6 plug n play	LED	35
4	Office PA	32W 4L 2x4 T8 (Troffer)	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	50
5	Office PA	32W 4L 2x4 T8 (Troffer)	1	T8	4	4	115	12W 4L4'T8 plug n play	LED	50
6	Men's Restroom	34W 2L4'T12 (Wrap)	2	T12	2	4	72	12W 2L4'T8 plug n play	LED	26
7	Women's Restroom	34W 2L4'T12 (Wrap)	2	T12	2	4	72	12W 2L4'T8 plug n play	LED	26
8	Zen Room	2L 71w Inca fixture	1	INC	1	1	142	Calm Deco dimmable LED	LED	15
9	warehouse	2L8'T12 (Indust.)	10	T12	1	10	130	68W LED 8' retrofit w radial lens	LED	68
10	warehouse	2L8'T12 (Indust.) w motion sensor	11	T12	1	11	130	68W LED 8' retrofit w radial lens	LED	68
11	Exterior	250W Wallpack	2	HID	1	2	290	80W Wallpack LED	LED	80
12	IT room	34W 4L4'T12 (Wrap) Single Switch	4	T12	4	16	144	12W 4L4'T8 plug n play	LED	50
13	Various offices	32W 4L 2x4 T8 (Troffer)	19	T8	4	76	115	12W 4L4'T8 plug n play	LED	50
14	Mens Restrooms	34W 4L8'T12wrap	1	T12	1	1	144	40w LED wrap ALEO	LED	40
15	Girls Restrooms	34W 4L8'T12wrap	1	T12	1	1	144	40w LED wrap ALEO	LED	40
16	Training Room	32W 4L 2x4 T8 (Troffer)	4	T8	4	16	115	12W 4L4'T8 plug n play	LED	50
17	Misc. Office	32W 4L 2x4 T8 (Troffer)	16	T8	4	64	115	12W 4L4'T8 plug n play	LED	50

Library - Lighting Inventory

Existing Equipment										Proposed Equipment		
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts		
1	Lobby	32W 2L8'T8	8	T8	2	16	60	12W 2L4'T8 plug n play	LED	26		
2	Lobby	32W 4L4'T8 (Wrap)	1	T8	4	4	115	12W 4L4'T8 plug n play	LED	50		
3	Lobby	BR40 23W Recess Can	1	CFL	1	1	25	12w LED recessed can	LED	12		
4	Lobby	PL 13W 2L Drum	1	CFK	2	2	28	15w LED Drum ceiling fixture	LED	15		
5	Men's Restroom	6" recess LED already	3	LED	0	0	12	NONE	LED			
6	Women's Restroom	6" recess LED already	3	LED	0	0	12	NONE	LED			
7	Conference Room	32W 2L4'T8 (Wrap) Single Switch	5	T8	2	10	60	12W 2L4'T8 plug n play	LED	26		
8	Council Chambers	50w recessed can lights	13	CFL	1	13	50	12w LED recessed can	LED	12		
9	Council Chambers	32w CFL screw in	5	CFL	1	5	34	9.5W A19 LED	LED	9.5		
10	Council Chambers	32W 2L4'T8 Cloud	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
11	Council Chambers	23w Wall Sconce	3	CFL	1	3	25	13w Lunera 4Pin plug in	LED	13		
12	Council Chambers	50w Track Heads	12	CFL	1	12	50	12w BR30 LED screw in dimmable	LED	12		
13	Council Chambers hall	13w Globe CFL	1	CFL	1	1	15	5w Lunera plug in	LED	5		
14	Mike Story City Admin	32W 4L 2x4 T8 deco wood box	3	T8	4	12	115	12W 4L4'T8 plug n play	LED	50		
15	Joe Bala Jr Mayor Pro Tem	32W 8L8'T8 (Wrap) Single Switch	1	T8	1	2	256	2 new 40w LED wrap end to end	LED	80		
16	Ed Scott	32W 8L8'T8 (Wrap) Single Switch	1	T8	1	2	256	2 new 40w LED wrap end to end	LED	80		
17	Mayor Deborah Roberston	32W 4L 2x4 T8 troffers	4	T8	4	4	115	36w LED Inserts	LED	36		
18	Hallway	23W Globe	9	CFL	1	9	25	13w Lunera 4Pin plug in	LED	13		
19	Ed Palmer Council	32W 32W 4L 2x4 T8 deco wood	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	50		
20	Exterior	250W Wallpack	1	HID	1	1	290	80W Wallpack LED	LED	60		
21	Exterior	LED already at Entry exterior ceiling	2	LED	0	0	12	NONE	LED			
22	Lobby	32W 2L 2x4 (Troffer) Reflector Single Switch	4	T8	2	8	60	12W 2L4'T8 plug n play	LED	26		
23	Back of House BOH	32W 2L4'T8 (Wraps)	5	T8	2	10	60	12W 2L4'T8 plug n play	LED	26		
24	Office	32W 2L 2x4 (Troffer) Reflector	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
25	Back of House BOH	32W 4L 2x4 T12 wood box	2	T12	4	8	115	12W 4L4'T8 plug n play	LED	50		
26	Office	32W 2L 2x4 (Troffer) Reflector	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26		
27	File Storage	32W 4L 2x4 T8 wood box surface mount	1	T8	4	4	115	12W 4L4'T8 plug n play	LED	50		
28	Drawing storage	32W 4L 2x4 T8 wood box surface mount	4	T8	4	16	115	12W 4L4'T8 plug n play	LED	50		
29	office Steve	32W 4L 2x4 T8 wood box surface mount	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	50		
30	Hall	23w ceiling drum fixtures	7	INC	1	7	25	15w LED Drum ceiling fixture	LED	15		

Police Department - Lighting Inventory

Existing Equipment										Proposed Equipment		
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts		
1	Restroom at Lobby	32W 2L4'T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	24		
2	Lobby	32W 4'T8	1	T8	1	1	32	12W 1L4'T8 plug n play	LED	12		
3	Lobby	32W 2L4'T8	18	T8	2	36	60	12W 2L4'T8 plug n play	LED	24		
4	Lobby	32W Ulamp T8	1	T8	2	2	60	16.5W U6 2L4'T8 plug n play	LED	34		
5	Finance	32W 2L4'T8	5	T8	2	10	60	12W 2L4'T8 plug n play	LED	24		
6	Hallway to the Right	32W 4L4'T8	4	T8	4	16	115	12W 4L4'T8 plug n play	LED	48		
7	Gina Karol	32W 4L4'T8	5	T8	4	20	115	12W 4L4'T8 plug n play	LED	48		
8	William Wilson	32W 4L4'T8	5	T8	4	20	115	12W 4L4'T8 plug n play	LED	48		
9	Janitor's Room	60A19	1	INC	1	1	60	9.5W A19 LED	LED	10		
10	Randy L.	32W 4L4'T8	10	T8	4	40	115	12W 4L4'T8 plug n play	LED	48		
11	Office	32W 4L4'T8	5	T8	4	20	115	12W 4L4'T8 plug n play	LED	48		
12	Office	32W 4L4'T8	3	T8	4	12	115	12W 4L4'T8 plug n play	LED	48		
13	Storage Room 1	32W 4L4'T8	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	48		
14	Sargent Office	32W 4L4'T8	6	T8	4	24	115	12W 2L4'T8 plug n play	LED	48		
15	Next to Sargent Office	32W 4L4'T8	6	T8	4	24	115	12W 2L4'T8 plug n play	LED	48		
16	Interview Office	32W 4L4'T8	1	T8	4	4	115	12W 2L4'T8 plug n play	LED	48		
17	Next to Sargent 2	32W 2L4'T8	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	24		
18	Office	32W 4L4'T8	4	T8	4	16	115	12W 4L4'T8 plug n play	LED	48		
19	Office	32W 2L4'T8	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	24		
20	Office	32W 4L4'T8	3	T8	4	12	115	12W 4L4'T8 plug n play	LED	48		
21	SGT James Mills	32W 4L4'T8	8	T8	4	32	115	12W 4L4'T8 plug n play	LED	48		
22	SGT	32W 4L4'T8	2	T8	4	8	115	12W 4L4'T8 plug n play	LED	48		
23	Dispatch Room	32W 2L4'T8	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	24		
24	Dispatch Room	32W 4L4'T8	11	T8	4	44	115	12W 2L4'T8 plug n play	LED	48		
25	Dispatch Room	50PAR20	6	CFL	1	6	50	12W 2L4'T8 plug n play	LED	12		
26	Server Computer Room	32W 2L4'T8	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	24		
27	I.T Services	32W 4L4'T8	4	T8	4	16	115	12W 2L4'T8 plug n play	LED	48		
28	Hallways by Dispatch	32W 4L4'T8	4	T8	4	16	115	12W 2L4'T8 plug n play	LED	48		
29	Hallways Downstairs	32W 2L4'T8	11	T8	2	22	60	12W 2L4'T8 plug n play	LED	24		
30	Squad Room	32W 4L4'T8	9	T8	4	36	115	12W 4L4'T8 plug n play	LED	48		

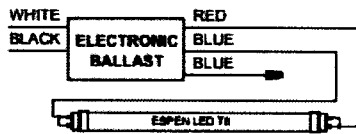
Public Works, Engineering - Lighting Inventory

Existing Equipment											Proposed Equipment		
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts			
1	Office	34W 4L4'T12 (Troffer)	7	T12	4	28	144	12W 4L4'T8 plug n play	LED	50			
2	Office	34W 4L4'T12 (Troffer)	1	T12	4	4	144	12W 4L4'T8 plug n play	LED	50			
3	Restrooms	CFL 13W	1	CFL	1	1	15	5w Lunera	LED	5			
4	Electrical	A19 60W Drum	1	INC	1	1	60	15w LED drum fixture	LED	15			
5	Office	55W 4L Cloud	1	INC	3	3	220	New 40w LED wrap fixture ALEO	LED	40			
6	Office	55W 4L Cloud	1	INC	3	3	220	New 40w LED wrap fixture ALEO	LED	40			
7	Office	32W 2L4'T8 Wraps	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26			
8	Electrical	55W 4L Wrap	1	INC	4	4	220	New 40w LED wrap fixture ALEO	LED	40			
9	warehouse	34W 2L8'T12 (Strip)	4	T12	4	16	72	12W 2L4'T8 plug n play	LED	26			
10	Exterior	250W Wallpack	2	HID	1	2	250	80W Wallpack LED	LED	80			
11	Exterior	175W Wallpack	2	HID	1	2	175	80W Wallpack LED	LED	80			
12	Bay	2L8'T12 (Strip)	4	T12	0	0	130	68W LED 8' retrofit ALEO w lens	LED	68			
13	Exterior	HPS 250W Wallpack	6	HID	1	6	250	80W Wallpack LED	LED	80			
14	Bay	2L8'T12 (Strip)	1	T12	1	1	130	68W LED 8' retrofit ALEO w lens	LED	68			
15	Bay	2L8'T12 (Strip)	3	T12	1	3	130	68W LED 8' retrofit ALEO w lens	LED	68			
16	Bay	2L8'T12 (Strip)	1	T12	1	1	130	68W LED 8' retrofit ALEO w lens	LED	68			
17	Bay	2L8'T12 (Strip)	4	T12	1	4	130	68W LED 8' retrofit ALEO w lens	LED	68			
18	Offices	34W 4L4'T12 (Wrap)	3	T12	4	12	144	12W 2L4'T8 plug n play	LED	50			
19	offices	32W 4L4'T8 (Troffer)	6	T8	4	24	115	12W 4L4'T8 plug n play	LED	50			
20	Bays	2L8'T12 (Strip)	2	T12	1	2	130	68W LED 8' Fixture	LED	68			
21	Bays	500w Quartz wall pack interior	2	HID	1	2	500	80W Wallpack LED	LED	80			
22	Bays	2L8'T12 (Strip)	5	T12	1	5	130	68W LED 8' Fixture	LED	68			
23	Bays	2L8'T12 industrial	4	T12	1	4	130	68W LED 8' Fixture	LED	68			
24	Bays	2L8'T12 industrial	4	T12	1	4	130	68W LED 8' Fixture	LED	68			
25	Bays	2L8'T12 industrial	6	T12	1	6	130	68W LED 8' Fixture	LED	68			
26	Maintenance Office	32W 2L4'T8 lens missing	1	T8	2	2	60	12W 2L4'T8 plug n play ADD lens	LED	26			
27	Maintenance Office	32W 2L4'T8 (Troffer)	2	T8	2	4	60	12W 2L4'T8 plug n play	LED	26			

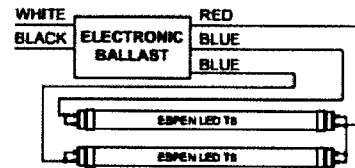
Senior Center - Lighting Inventory

Existing Equipment										Proposed Equipment		
Line	Location Served	Existing Description	Qty	Lamp Type	Lamps per Fixture	Total Lamp Qty	Fixture Watts	Proposed Description	Lamp Type	Fixture Watts		
1	Parking Lot	HID 400W Shoe Boxes Poles	17	HID	1	17	454	125W Shoe Box Poles LED	LED	111		
2	Rightside of Building	HID 400W Wall Pack	2	HID	1	2	454	150W HID Wallpack LED	LED	90		
3	In Front of Building	HID 100W Wall Sconce	7	HID	1	7	130	40W HID Wall Sconce	LED	40		
4	Lobby	CFL 18W Lanterns	19	CFL	1	19	20	9.5W A19 LED	LED	9.5		
5	Lobby	2L BIAx 24w ES PL-L 4Pin 2x2	9	T8	1	9	52	25w LED 2x2 conversion insert	LED	25		
6	Hallway in Front of Rialto Room	2L BIAx 24w ES PL-L 4Pin 2x2	9	T8	1	9	52	25w LED 2x2 conversion insert	LED	25		
7	Hallway in Front of Solvene Room	2L BIAx 24w ES PL-L 4Pin 2x2	5	T8	1	5	52	25w LED 2x2 conversion insert	LED	25		
8	Rialto Room	32W 2L4'T8 2x4 Fixt.	13	T8	2	26	60	12W 2L4'T8 plug n play	LED	26		
9	Hallway in Front of Solvene Room	CFL 18W 6" Can	9	CFL	1	9	20	12W 6" Can Light LED	LED	10		
10	Sloven Room	32W 2L4'T8 2x4 Fixt.	10	T8	2	20	60	12W 2L4'T8 plug n play	LED	26		
11	Sloven Room	21A19 CFL Pendant	9	CFL	1	9	21	9.5W A19 LED Pendant	LED	9.5		
12	MBR	32W 2L4'T8	3	T8	2	6	60	12W 2L4'T8 plug n play	LED	26		
13	MBR	CFL 13W 6" Can	1	CFL	1	1	15	12W 6" Can Light LED	LED	10		
14	Midges Nook	32W 2L Ulamp 2x2 Fixt.	6	T8	2	12	60	12W 2L4'T8 plug n play	LED	26		
15	Riverside Room	32W 3L4'T8 2x4 Fixt.	12	T8	3	36	88	12W 2L4'T8 plug n play	LED	26		
16	Riverside Room	CFL 13W 6" Can	4	CFL	1	4	15	12W 2L4'T8 plug n play	LED	26		
17	Senior's 2000 Room	32W 2L4'T8 2x4 Fixt.	20	T8	2	40	60	12W 2L4'T8 plug n play	LED	26		
18	Boutique	32W 2L Ulamp 2x2 Fixt.	4	T8	2	8	60	16.5W U6 2L4'T8 plug n play	LED	35		
19	Berglund B.	32W 2L Ulamp 2x2 Fixt.	20	T8	2	40	60	16.5W U6 2L4'T8 plug n play	LED	35		
20	Berglund B.	CFL 13W 6" Can	7	CFL	1	7	15	12W 6" Can Light LED	LED	10		
21	Berglund A.	32W Ulamp T8 2x2 Fixt.	30	T8	1	30	32	16.5W U6 2L4'T8 plug n play	LED	35		
22	Berglund A.	CFL 13W 6" Can	16	CFL	1	16	15	12W 6" Can Light LED	LED	10		
23	Kitchen at Berglund	32W 3L4'T8 2x4 Fixt.	11	T8	3	33	88	12W 2L4'T8 plug n play	LED	26		
24	Kitchen	32W 3L4'T8	6	T8	3	18	88	12W 2L4'T8 plug n play	LED	26		
25	Cooler	13A19	2	CFL	1	2	13	A19 LED LAMP	LED	9.5		
26	Office at Berglund	32W 3L4'T8 2x4 Fixt.	4	T8	3	12	88	12W 2L4'T8 plug n play	LED	26		
27	Lunch at Berglund	32W 3L4'T8 2x4 Fixt.	1	T8	3	3	88	12W 2L4'T8 plug n play	LED	26		
28		32W 2L4'T8	1	T8	2	2	60	12W 2L4'T8 plug n play	LED	26		
29	Table Storage	32W 3L4'T8 2x4 Fixt.	1	T8	3	3	88	12W 2L4'T8 plug n play	LED	26		
30	Table Storage 2	32W 3L4'T8 2x4 Fixt.	1	T8	3	3	88	12W 3L4'T8 plug n play	LED	38		

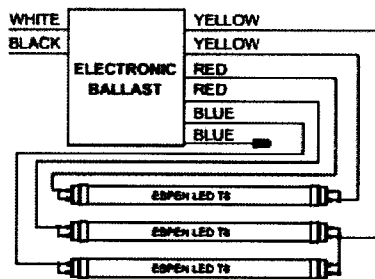
1-LAMP Instant Start Electronic Ballast



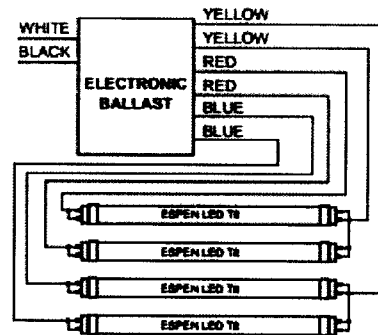
2-LAMP Instant Start Electronic Ballast



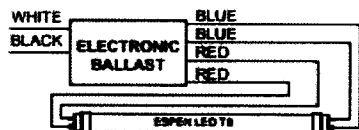
3-LAMP Instant Start Electronic Ballast



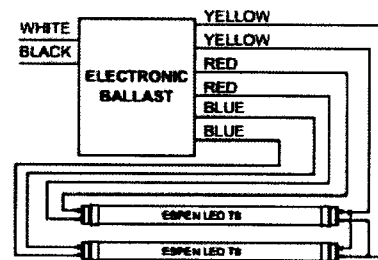
4-LAMP Instant Start Electronic Ballast



1-LAMP Programmed Start Electronic Ballast



2-LAMP Programmed Start Electronic Ballast



* Not compatible with products equipped with battery backup and/or emergency ballasts.

* Please refer to "Ballast Compatibility List" on Related Downloads.

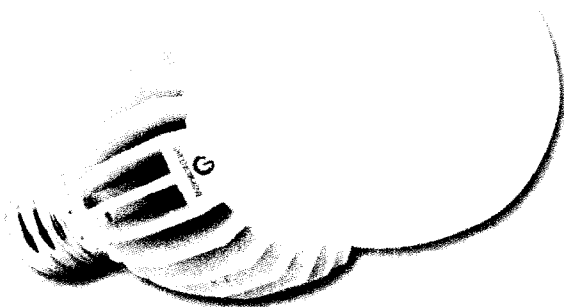
Specification data is based on tests performed in a controlled environment and represents relative performance. Actual performance can vary depending on operating conditions. Application and performance data subject to change without notice. All specifications are nominal unless noted otherwise.

HID LED 18.5W HO 277V

TITANIUM LED SERIES



PRO



Optional Lamp Extender

18.5W REPLACES



50-70W
HID

70% Energy Savings

\$67 Savings
per lamp*

- ⌚ Direct line voltage 120-277V - Not compatible with ballasts
- ⌚ ENERGY STAR® certified
- ⌚ Exceptional efficacy 108 LPW in Warm White
- ⌚ Frosted diffuser maintains low glare
- ⌚ Optional lamp extender available for use in larger fixtures
- ⌚ Suitable for use in totally enclosed fixtures



40,000 H



UNIVERSAL



EFFICACY



WARRANTY



CRI (Ra)



ENCLOSED**

LM 79

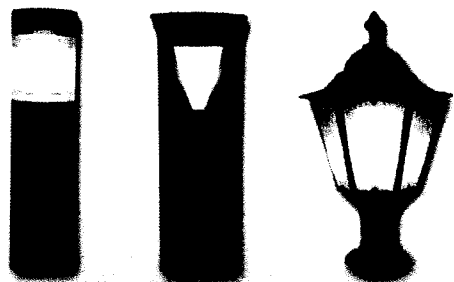
LM 80

TM 21



HID LED PRODUCT FEATURES

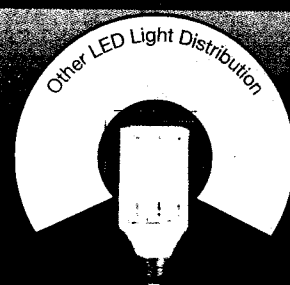
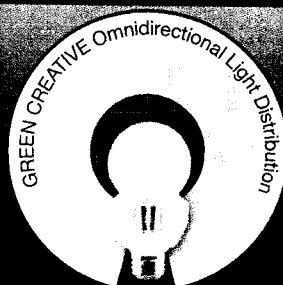
Suitable for Enclosed Fixtures



This HID LED lamp replaces a 50-70W HID and is suitable for use in enclosed fixtures. Its high lumen output and exceptional efficacy make it an ideal choice for bollard, post top and other outdoor applications. An optional lamp extender is also available for use in larger fixtures.

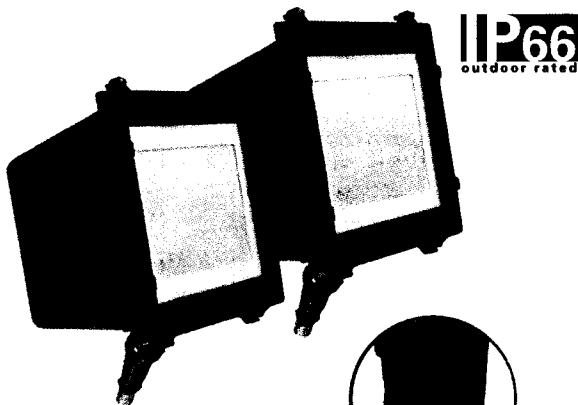
Omnidirectional Lighting

This HID LED meets the new ENERGY STAR® V1.1 requirements for omnidirectional bulbs by providing 330° of evenly distributed light intensity. In the 135° to 180° zone, this lamp emits 65% more lumens than what is required by ENERGY STAR, providing a fuller light than other LED lamps.



naturalLED®

Turning Light into Savings ▶▶▶



Wide angle adjustable
Knuckle mount with
indication of 30°, 60° or 90°



FDL Floodlight 29W, 58W

naturalLED® outdoor lighting's classic floodlight provides energy efficient floodlighting solutions with a wide distribution. These powerful floodlights are available in two wattages, providing a versatile choice for applications such as facade, area and sign lighting.

Our FDL floodlights attach with knuckle mount providing a wide angle adjustable position from 30 to 90 degrees.

Key Features & Benefits

- ▶ Architectural & Spot Luminaires
- ▶ Long life LED chips
- ▶ Uniform and consistent color
- ▶ Excellent thermal design
- ▶ Power factor > 0.95
- ▶ CRI 70
- ▶ 120-277V
- ▶ 50,000 hrs rated average life
- ▶ Operating temp: -22°F~122°F
- ▶ 1/2" knuckle mount

Applications

- ▶ Area Lighting
- ▶ Spot Luminaires
- ▶ Architectural Lighting
- ▶ General Site Illumination
- ▶ Signage Lighting

Color Choices



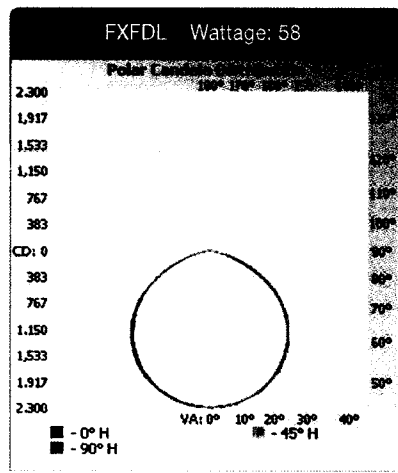
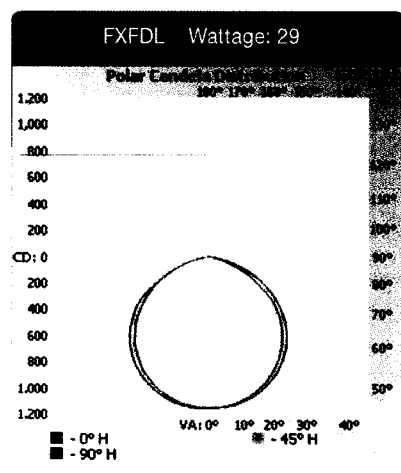
Qualifications



► Dimensions

	Wattage	A	B	C	D	E
	29 / 58	11.75-in	10.25-in	7.00-in	8.50-in	7.25-in
	F	G	H	J	J	K
	2.75-in	9.00-in	2.00-in	1.50-in	0.75-in	0.75-in

► Illuminance Distribution



Illuminance at a Distance

Center Beam fc	Beam Width
3.0ft	128.4 fc 9.4 ft 9.4 ft
6.0ft	32.1 fc 18.7 ft 18.8 ft
9.0ft	14.3 fc 28.1 ft 28.2 ft
12.0ft	8.0 fc 37.5 ft 37.5 ft
15.0ft	5.1 fc 46.9 ft 46.9 ft

■ Vert. Spread: 114.7°
■ Horiz. Spread: 114.8°

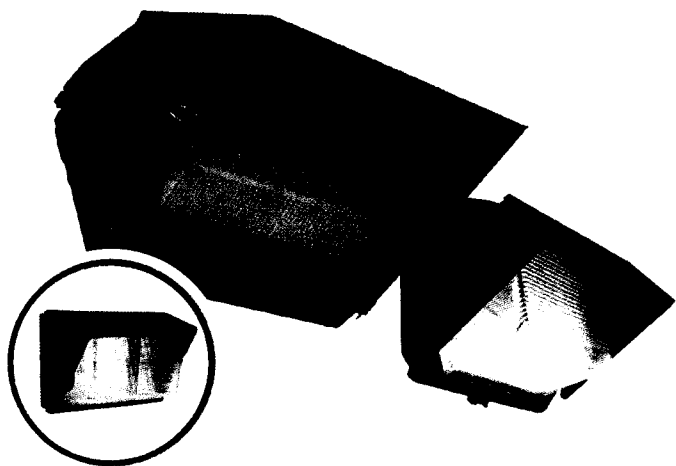
Illuminance at a Distance

Center Beam fc	Beam Width
3.0ft	253.5 fc 9.4 ft 9.4 ft
6.0ft	63.4 fc 18.9 ft 18.9 ft
9.0ft	28.2 fc 28.3 ft 28.3 ft
12.0ft	15.8 fc 37.7 ft 37.8 ft
15.0ft	10.1 fc 47.1 ft 47.2 ft

■ Vert. Spread: 115.1°
■ Horiz. Spread: 115.1°

natural^{led}

Turning Light into Savings ▶▶▶



Visor for Full Cutoff application Included
Require for DLC qualification

TWP Traditional Wallpack 28W, 40W, 60W, 90W

naturalLED® TWP traditional wallpack comes in rugged cast-aluminum housing with excellent thermal design. DesignLights Consortium certified, our TWP product offers a popular but classic appearance for your needs.

Delivering it up to 9,000 lumens by replacing up to 400-watt metal halide luminaires, with energy saving up to 80%. The traditional shape maintains an aesthetic appearance and will replace any building's wall pack, or perimeter lighting.

Our TWP is ideal for outdoor applications such as carports, loading areas, driveways, parking area and pathways. Designed for wall mounting above four feet from ground.

Key Features & Benefits

- ▶ DesignLights Consortium Certified
- ▶ Long Life LED Chip
- ▶ Uniform and consistent color
- ▶ Excellent thermal design
- ▶ 15-30 foot height performance
- ▶ Shatter resistant glass
- ▶ Universal Voltage 120-277V
- ▶ Operating Temp: -22°F~122°F
- ▶ 50,000 Hours rated average life
- ▶ Photocell sensor compatible

Applications

- ▶ Area Lighting
- ▶ Security Lighting
- ▶ Pathway Lighting
- ▶ Perimeter Lighting
- ▶ Entryway Lighting

Color Choices

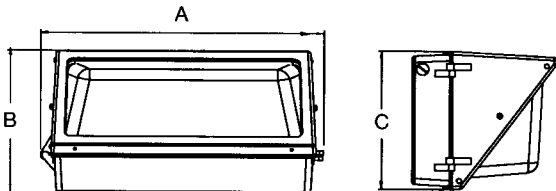


Bronze

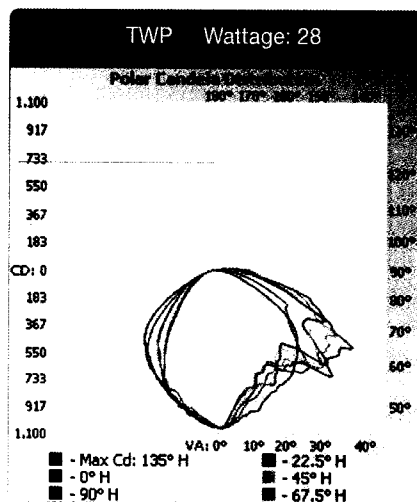
Qualifications



► Dimensions

	Wattage	A	B	C	Weight (lbs)
	28	8.75-in	9.00-in	7.25-in	5.75
	40	14.50-in	7.50-in	9.00-in	9.50
	60	18.50-in	9.25-in	9.00-in	16.00
	90	18.50-in	9.25-in	9.00-in	18.60

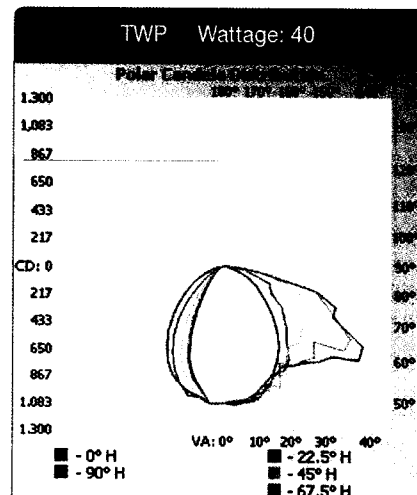
► Illuminance Distribution



Illuminance at a Distance

Center Beam fc	Beam Width
4.0 ft	65.5 ft
8.0 ft	16.4 ft
12.0 ft	7.3 ft
16.0 ft	4.1 ft
20.0 ft	2.6 ft

■ Vert. Spread: 111.1°
■ Horiz. Spread: 112.6°



Illuminance at a Distance

Center Beam fc	Beam Width
4.0 ft	68.0 ft
8.0 ft	17.0 ft
12.0 ft	7.6 ft
16.0 ft	4.3 ft
20.0 ft	2.7 ft

■ Vert. Spread: 125.4°
■ Horiz. Spread: 99.5°

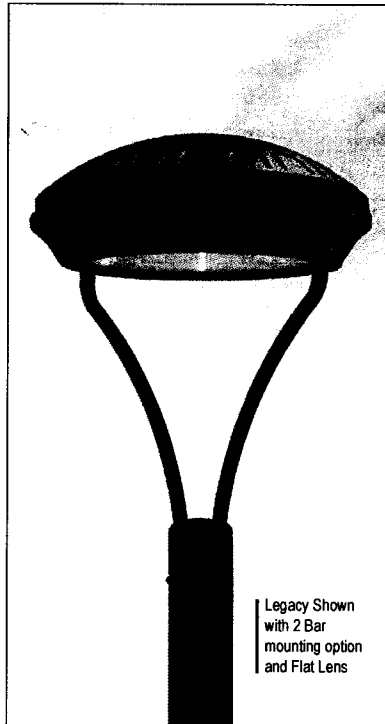
How can an outdoor luminaire possibly deserve the name "Legacy," which features breakthrough Lighting technology? The answer is simple. There are at least three distinct reasons; Performance, design and function.

The Legacy is the perfect luminaire designed to replace existing post top fixtures saving seventy five percent energy while meeting IES minimum foot candle levels while improving light distribution and uniformity.

The Full Cutoff Dark Sky Legacy luminaire features LEDs recessed deep into the luminaire eliminating any direct glare. The Legacy also features a clear tempered safety glass lens with silicone gasket which improves fixture reliability.

Legacy is available from 18 to 102 watts and its scale is perfect to replace any wattage between 70-400 watt HID. The Legacy throws light four to five mounting heights in all directions which is a major light distribution improving existing optical technology. The Legacy features the Star Power Reflector system, a diffused 95 percent reflective low glare optical material.

Legacy is available in two different Kelvin temperatures of 3000, 4000 and 5500 in both Type 3 and 5 light distributions.



Legacy Shown
with 2 Bar
mounting option
and Flat Lens



Legacy Shown
with optional
Fluted Holder +
Arms (FH).



STAR POWER™ OPTICAL SYSTEM

The Star Power™ reflector is an excellent system which provides great value and performance.

LED WATTAGE CHART

	16L	32L	48L	64L
350 milliamps	18w	33w	51w	66w
530 milliamps	28w	54w	80w	102w

Project Name: City of Upland							Type:		
LEG-1	T5	32L	53	55K	UNV	TBD	TBD	TBD	
Cat #	Light Dist.	# of LED	Milliamps	Kelvin	Volts	Mounting	Color	Tenon	Options
Legacy (LEG-1)	Type 3 (T3)	16 (16L)	350	3000K	120-277	Post Top	Bronze	Over 2 3/8 O.D.	Bird Spikes
		32 (32L)	(35)	(30K)	(UNV)	Mount 2 Bar	(BRZ)	(T2R)	(BS)
	Type 5 (T5)	48 (48L)	530	4000K		Post Top	White	Over 3 O.D.	Marine Grade Finish
		64 (64L)	(53)	(40K)		Mount 3 Bar	(WHT)	(T3R)	(MGF)
				5500K		Pole Mount	Silver		Photocell
				(55K)		(PTM3)	(SVR)		(PC)
							Hunter Green		*Must Specify Voltage
							(HGN)		Motion Sensor
						Pole Mount	Black		Surge Protector
						Mast Arm Fitter	(BLK)		(10K)
						(MAF)	Graphite		House Side Shield
						*2-3/8" OD Fitter	(GPH)		(HSS)
							Grey		Front Side Shield
							(GRY)		(FSS)
							Custom		Convex Lens
							(CS)		(CVX)
									Fluted Holder + Arms
									(FH)



83216PC

LED MINI WALL PACK/17W

TECHNICAL DATA SHEET



FEATURES



OUTDOOR WALL-MOUNTED AREA LUMINAIRES

- Easy installation
- Replaces 25W HID
- With photo cell

HOUSING

- Sealed die-casting profile for outdoor applications.
- Polycarbonate optical lens with UV stabilizers.
- Damp and Wet Locations

APPLICATION

- Security, pathway and perimeter lighting
- Building entry ways and walkways



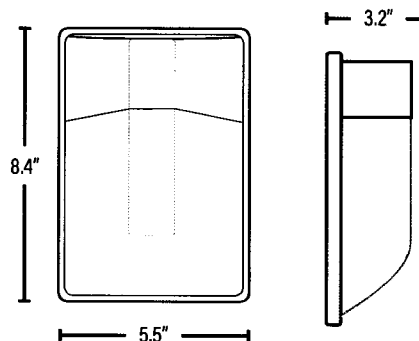
SPECIFICATIONS

Power Consumption	17W
Input Voltage	120V
Power Factor	0.9
Lumens	1685
Luminous Efficiency	96 Lm/W
Color Temperature	4000K
CRI	83
Housing	Aluminum Alloy; Grade ADC12
Lens	PC Cover
Finish	Black
Dimensions (Inches)	8.4"(L) x 5.5"(W) x 3.2"(D)

LIFESPAN & ENVIRONMENT

Average Life	50,000
Operating Temperature	-25°C ~ 40°C

DIMENSIONS



ORDERING

ITEM#	DESCRIPTION	WATTS	COLOR	LUMENS	CRI	VOLTS	HOUSING	HOURS	CASE
83216PC	LED MINI WALL PACK/BLACK/17W/40K/PHOTO CELL/120V - SL* DLC	17	4000K	1685	83	120	BLACK	50,000	12

Please check DLC website for the most current list of approved items • www.designlights.org
Published lumens on LED products are approximate and may vary slightly.

PRODUCT SPECIFICATIONS

Housing: Aluminum.

LED: Luxeon M Series by Lumileds

Optics: Optics Type T2, T3, T4, T5 and Tennis (TT)

Watts: 28-594 Watts

L70: 96,000 to 161,000

UL: UL 1598 Listed

Driver: Dimming driver as standard by Advance or ULT

Kelvin: 4000, or 5500

Finish: 5 Millimeters Powder Coat

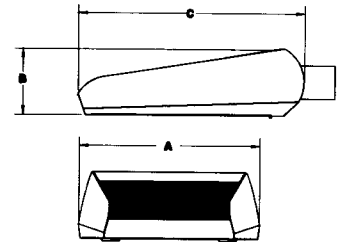
Warranty: Standard Warranty is 5 years for Driver and LEDs

PRODUCT DIMENSIONS

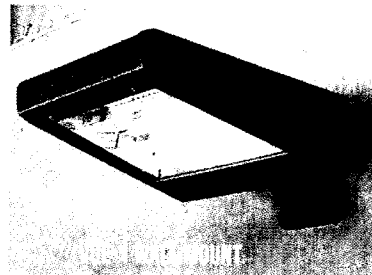
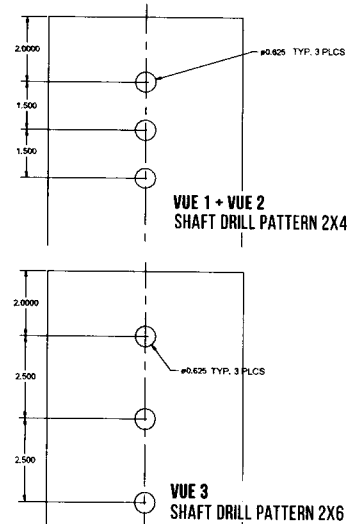
VUE - LUMEN DATA CHART

PART NUMBER	T2 OPTIC	Lm/W	T3 OPTIC	Lm/W	T4 OPTIC	Lm/W	T5 OPTIC	Lm/W	TT Optic	Lm/W	Calculated L70 Hours	SYSTEM WATTS
VUE-1-32L-53-40K	5994	111	5886	109	6048	112	5562	103	5940	110		54
VUE-1-32L-53-55K	6480	120	6372	118	6588	122	6048	112	6480	120		54
VUE-1-32L-7-40K	7384	104	7242	102	7455	105	6887	97	7313	103	142,000	71
VUE-1-32L-7-55K	7952	112	7881	111	8165	115	7526	106	8023	113	142,000	71
VUE-1-32L-1-40K	10706	101	10388	98	10918	103	9540	90	10706	101	148,000	106
VUE-1-32L-1-55K	11660	110	11130	105	11554	109	10176	96	11342	107	148,000	106
VUE-1-48L-53-40K	8284	109	8132	107	8360	110	7676	101	8208	108		76
VUE-1-48L-53-55K	8968	118	8816	116	9120	120	8360	110	8968	118		76
VUE-1-48L-7-40K	10712	103	10504	101	11024	106	10088	97	10816	104	143,000	104
VUE-1-48L-7-55K	11544	111	11336	109	12064	116	10816	104	11856	114	143,000	104
VUE-1-48L-1-40K	15444	99	15444	99	16224	104	14196	91	15912	102	153,000	156
VUE-1-48L-1-55K	16692	107	16536	106	17160	110	15132	97	16848	108	153,000	156
VUE-1-64L-53-40K	10914	107	10710	105	11016	108	10098	99	10812	106		102
VUE-1-64L-53-55K	11832	116	11628	114	12036	118	11016	108	11832	116		102
VUE-1-64L-7-40K	13736	101	13736	101	13600	100	14144	104	13464	99	145,000	136
VUE-1-64L-7-55K	14824	109	14824	109	14960	110	15776	116	14824	109	145,000	136
VUE-1-64L-1-40K	20295	99	20090	98	19680	96	20090	98	19475	95	156,000	205
VUE-1-64L-1-55K	21730	106	21525	105	21320	104	21320	104	20910	102	156,000	205
VUE-2-80L-53-40K	14208	111	13952	109	14464	113	13184	103	14080	110		128
VUE-2-80L-53-55K	15360	120	15104	118	15616	122	14208	111	15232	119		128
VUE-2-80L-7-40K	17472	104	17136	102	17808	106	16128	96	17304	103	149,000	168
VUE-2-80L-7-55K	18816	112	18480	110	19152	114	17472	104	18648	111	149,000	168
VUE-2-80L-1-40K	26563	101	26037	99	26826	102	24459	93	26300	100	153,000	263
VUE-2-80L-1-55K	28930	110	28404	108	29456	112	26826	102	28667	109	153,000	263
VUE-2-96L-53-40K	16983	111	16677	109	17289	113	15759	103	16830	110		153
VUE-2-96L-53-55K	18360	120	18054	118	18666	122	16983	111	18207	119		153
VUE-2-96L-7-40K	20800	104	20400	102	21200	106	19200	96	20600	103	151,000	200
VUE-2-96L-7-55K	22400	112	22000	110	22800	114	20800	104	22200	111	151,000	200
VUE-2-96L-1-40K	31916	101	31284	99	32232	102	29388	93	31600	100	157,000	316
VUE-2-96L-1-55K	34760	110	34128	108	35392	112	32232	102	34444	109	157,000	316
VUE-2-112L-53-40K	18939	107	18585	105	19293	109	17523	99	18762	106		177
VUE-2-112L-53-55K	20532	116	20178	114	20886	118	18939	107	20178	114		177
VUE-2-112L-7-40K	24543	101	24057	99	24786	102	22599	93	24300	100	152,000	243
VUE-2-112L-7-55K	26487	109	26001	107	26973	111	24543	101	26244	108	152,000	243
VUE-2-128L-53-40K	21614	107	21210	105	22018	109	19998	99	21412	106		202
VUE-2-128L-53-55K	23432	116	23028	114	23836	118	21614	107	23028	114		202
VUE-2-128L-7-40K	26765	101	26235	99	27030	102	24645	93	26500	100	152,000	265
VUE-2-128L-7-55K	28885	109	28355	107	29415	111	26765	101	28620	108	152,000	265
VUE-2-144L-53-40K	24075	107	23625	105	24525	109	22275	99	23850	106		225
VUE-2-144L-53-55K	26100	116	25650	114	26550	118	24075	107	25650	114		225
VUE-2-144L-7-40K	30300	101	29700	99	30600	102	27900	93	30000	100	153,000	300
VUE-2-144L-7-55K	32700	109	32100	107	33300	111	30300	101	32400	108	153,000	300
VUE-3-112L-1-40K	31350	95	31020	94	32010	97	29040	88	31350	95	161,000	330
VUE-3-112L-1-55K	33990	103	33330	101	34650	105	31680	96	33990	103	161,000	330
VUE-3-128L-1-40K	38037	93	37628	92	38855	95	35174	86	38037	93	150,000	409
VUE-3-128L-1-55K	40900	100	40491	99	42127	103	38037	93	41309	101	150,000	409
VUE-3-144L-1-40K	42136	92	41678	91	43052	94	39388	86	42136	92	138,000	458
VUE-3-144L-1-55K	45342	99	44884	98	46716	102	42594	93	45800	100	138,000	458
VUE-3-160L-7-40K	36180	108	35510	106	36850	110	33835	101	36180	108	150,000	335
VUE-3-160L-7-55K	39530	118	38860	116	40200	120	36515	109	39530	118	150,000	335
VUE-3-160L-1-40K	46460	92	45955	91	47470	94	43430	86	46460	92	123,000	505
VUE-3-160L-1-55K	49995	99	49490	98	51510	102	46965	93	50500	100	123,000	505
VUE-3-176L-7-40K	39055	107	38325	105	39785	109	36500	100	39055	107	152,000	365
VUE-3-176L-7-55K	42705	117	41975	115	43435	119	39785	109	42705	117	152,000	365
VUE-3-176L-1-40K	50141	91	49590	90	51243	93	46835	85	50141	91	105,000	551
VUE-3-176L-1-55K	53998	98	53447	97	55651	101	50692	92	54549	99	105,000	551
VUE-3-192L-7-40K	41976	106	41184	104	42768	108	38808	98	41976	106	153,000	396
VUE-3-192L-7-55K	45936	116	45144	114	46728	118	42372	107	45936	116	153,000	396
VUE-3-192L-1-40K	53460	90	52866	89	54648	92	49896	84	53460	90	96,000	594
VUE-3-192L-1-55K	58212	98	57618	97	59400	100	54648	92	58212	98	96,000	594

DIMENSION	VUE-1	VUE-2	VUE-3
A	16.99 in	21.56 in	26.17 in
B	6.38 in	8.00 in	8.36 in
C	21.48 in	27.06 in	32.94 in
Weight	27 lbs.	34 lbs.	62 lbs.



EPA	VUE-1	VUE-2	VUE-3
Single	.72	1.16	1.42
Double	1.44	2.32	2.86
Triple	2.24	2.5	4.78
Quad	2.6	3.6	4.88



DesignLights Consortium (DLC) qualified Product. Some configurations of this product family may not be DesignLights Consortium (DLC) listed, please refer to the DLC qualified products list to confirm listed configurations. <http://www.designlights.org>


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PRODUCT SPECIFICATIONS

Housing: Aluminum.
LED: Luxeon M Series by Lumileds
Optics: Optics Type T2, T3, T4, T5 and Tennis (TT)
Watts: 28-594 Watts
L70: 96,000 to 161,000

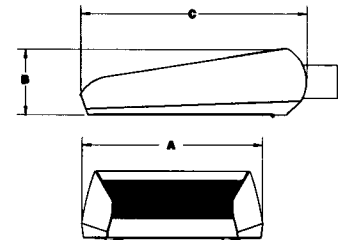
UL: UL 1598 Listed 
Driver: Dimming driver as standard by Advance or ULT
Kelvin: 4000, or 5500
Finish: 5 Millimeters Powder Coat
Warranty: Standard Warranty is 5 years for Driver and LEDs

PRODUCT DIMENSIONS

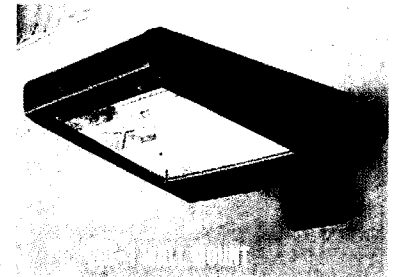
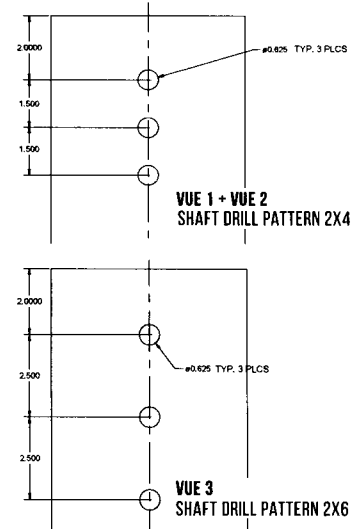
VUE - LUMEN DATA CHART

PART NUMBER	T2 OPTIC	Lm/W	T3 OPTIC	Lm/W	T4 OPTIC	Lm/W	T5 OPTIC	Lm/W	TT Optic	Lm/W	Calculated L70 Hours	SYSTEM WATTS
VUE-1-32L-53-40K	5994	111	5886	109	6048	112	5562	103	5940	110		54
VUE-1-32L-53-55K	6480	120	6372	118	6588	122	6048	112	6480	120		54
VUE-1-32L-7-40K	7384	104	7242	102	7455	105	6887	97	7313	103	142,000	71
VUE-1-32L-7-55K	7952	112	7881	111	8165	115	7526	106	8023	113	142,000	71
VUE-1-32L-1-40K	10706	101	10388	98	10918	103	9540	90	10706	101	148,000	106
VUE-1-32L-1-55K	11660	110	11130	105	11554	109	10176	96	11342	107	148,000	106
VUE-1-48L-53-40K	8284	109	8132	107	8360	110	7676	101	8208	108		76
VUE-1-48L-53-55K	8968	118	8816	116	9120	120	8360	110	8968	118		76
VUE-1-48L-7-40K	10712	103	10504	101	11024	106	10088	97	10816	104	143,000	104
VUE-1-48L-7-55K	11544	111	11336	109	12064	116	10816	104	11856	114	143,000	104
VUE-1-48L-1-40K	15444	99	15444	99	16224	104	14196	91	15912	102	153,000	156
VUE-1-48L-1-55K	16692	107	16536	106	17160	110	15132	97	16848	108	153,000	156
VUE-1-64L-53-40K	10914	107	10710	105	11016	108	10098	99	10812	106		102
VUE-1-64L-53-55K	11832	116	11628	114	12036	118	11016	108	11832	116		102
VUE-1-64L-7-40K	13736	101	13736	101	13600	100	14144	104	13464	99	145,000	136
VUE-1-64L-7-55K	14824	109	14824	109	14960	110	15776	116	14824	109	145,000	136
VUE-1-64L-1-40K	20295	99	20090	98	19680	96	20090	98	19475	95	156,000	205
VUE-1-64L-1-55K	21730	106	21525	105	21320	104	21320	104	20910	102	156,000	205
VUE-2-80L-53-40K	14208	111	13952	109	14464	113	13184	103	14080	110		128
VUE-2-80L-53-55K	15360	120	15104	118	15616	122	14208	111	15232	119		128
VUE-2-80L-7-40K	17472	104	17136	102	17808	106	16128	96	17304	103	149,000	168
VUE-2-80L-7-55K	18816	112	18480	110	19152	114	17472	104	18648	111	149,000	168
VUE-2-80L-1-40K	26563	101	26037	99	26826	102	24459	93	26300	100	153,000	263
VUE-2-80L-1-55K	28930	110	28404	108	29456	112	26826	102	28667	109	153,000	263
VUE-2-96L-53-40K	16983	111	16677	109	17289	113	15759	103	16830	110		153
VUE-2-96L-53-55K	18360	120	18054	118	18666	122	16983	111	18207	119		153
VUE-2-96L-7-40K	20800	104	20400	102	21200	106	19200	96	20600	103	151,000	200
VUE-2-96L-7-55K	22400	112	22000	110	22800	114	20800	104	22200	111	151,000	200
VUE-2-96L-1-40K	31916	101	31284	99	32232	102	29388	93	31600	100	157,000	316
VUE-2-96L-1-55K	34760	110	34128	108	35392	112	32232	102	34444	109	157,000	316
VUE-2-112L-53-40K	18939	107	18585	105	19293	109	17523	99	18762	106		177
VUE-2-112L-53-55K	20532	116	20178	114	20886	118	18939	107	20178	114		177
VUE-2-112L-7-40K	24543	101	24057	99	24786	102	22599	93	24300	100	152,000	243
VUE-2-112L-7-55K	26487	109	26001	107	26973	111	24543	101	26244	108	152,000	243
VUE-2-128L-53-40K	21614	107	21210	105	22018	109	19998	99	21412	106		202
VUE-2-128L-53-55K	23432	116	23028	114	23836	118	21614	107	23028	114		202
VUE-2-128L-7-40K	26765	101	26235	99	27030	102	24645	93	26500	100	152,000	265
VUE-2-128L-7-55K	28885	109	28355	107	29415	111	26765	101	28620	108	152,000	265
VUE-2-144L-53-40K	24075	107	23625	105	24525	109	22275	99	23850	106		225
VUE-2-144L-53-55K	26100	116	25650	114	26550	118	24075	107	25650	114		225
VUE-2-144L-7-40K	30300	101	29700	99	30600	102	27900	93	30000	100	153,000	300
VUE-2-144L-7-55K	32700	109	32100	107	33300	111	30300	101	32400	108	153,000	300
VUE-3-112L-1-40K	31350	95	31020	94	32010	97	29040	88	31350	95	161,000	330
VUE-3-112L-1-55K	33990	103	33330	101	34650	105	31680	96	33990	103	161,000	330
VUE-3-128L-1-40K	38037	93	37628	92	38855	95	35174	86	38037	93	150,000	409
VUE-3-128L-1-55K	40900	100	40491	99	42127	103	38037	93	41309	101	150,000	409
VUE-3-144L-1-40K	42136	92	41678	91	43052	94	39388	86	42136	92	138,000	458
VUE-3-144L-1-55K	45432	99	44884	98	46716	102	42594	93	45800	100	138,000	458
VUE-3-160L-7-40K	36180	108	35510	106	36850	110	33835	101	36180	108	150,000	335
VUE-3-160L-7-55K	39530	118	38860	116	40200	120	36515	109	39530	118	150,000	335
VUE-3-160L-1-40K	46460	92	45955	91	47470	94	43430	86	46460	92	123,000	505
VUE-3-160L-1-55K	49995	99	49490	98	51510	102	46965	93	50500	100	123,000	505
VUE-3-176L-7-40K	39055	107	38325	105	39785	109	36500	100	39055	107	152,000	365
VUE-3-176L-7-55K	42705	117	41975	115	43435	119	39785	109	42705	117	152,000	365
VUE-3-176L-1-40K	50141	91	49590	90	51243	93	46835	85	50141	91	105,000	551
VUE-3-176L-1-55K	53998	98	53447	97	55651	101	50692	92	54549	99	105,000	551
VUE-3-192L-7-40K	41976	106	41184	104	42768	108	38808	98	41976	106	153,000	396
VUE-3-192L-7-55K	45936	116	45144	114	46728	118	42372	107	45936	116	153,000	396
VUE-3-192L-1-40K	53460	90	52866	89	54648	92	49896	84	53460	90	96,000	594
VUE-3-192L-1-55K	58212	98	57618	97	59400	100	54648	92	58212	98	96,000	594

DIMENSION	VUE-1	VUE-2	VUE-3
A	16.99 in	21.56 in	26.17 in
B	6.38 in	8.00 in	8.36 in
C	21.48 in	27.06 in	32.94 in
Weight	27 lbs.	34 lbs.	62 lbs.



EPA	VUE-1	VUE-2	VUE-3
Single	.72	1.16	1.42
Double	1.44	2.32	2.86
Triple	2.24	2.5	4.78
Quad	2.6	3.6	4.88



DesignLights Consortium (DLC) qualified Product. Some configurations of this product family may not be DesignLights Consortium (DLC) listed, please refer to the DLC qualified products list to confirm listed configurations.
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PRODUCT SPECIFICATIONS

Housing: Aluminum.

LED: Luxeon M Series by Lumileds

Optics: Optics Type T2, T3, T4, T5 and Tennis (TT)

Watts: 28-594 Watts

L70: 96,000 to 161,000

UL: UL 1598 Listed

Driver: Dimming driver as standard by Advance or ULT

Kelvin: 4000, or 5500

Finish: 5 Millimeters Powder Coat

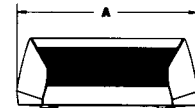
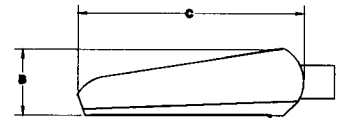
Warranty: Standard Warranty is 5 years for Driver and LEDs

PRODUCT DIMENSIONS

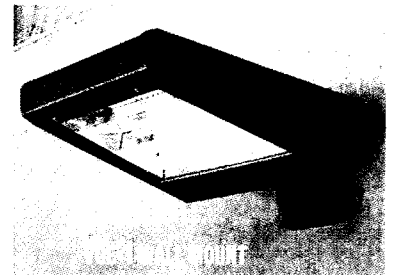
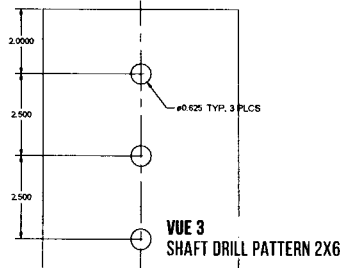
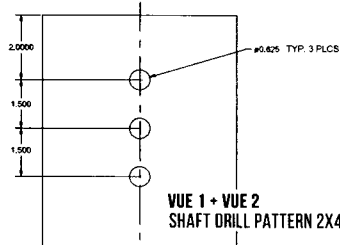
VUE - LUMEN DATA CHART

PART NUMBER	T2 OPTIC	Lm/W	T3 OPTIC	Lm/W	T4 OPTIC	Lm/W	T5 OPTIC	Lm/W	TT Optic	Lm/W	Calculated L70 Hours	SYSTEM WATTS
VUE-1-32L-53-40K	5994	111	5886	109	6048	112	5562	103	5940	110		54
VUE-1-32L-53-55K	6480	120	6372	118	6588	122	6048	112	6480	120		54
VUE-1-32L-7-40K	7384	104	7242	102	7455	105	6887	97	7313	103	142,000	71
VUE-1-32L-7-55K	7952	112	7881	111	8165	115	7526	106	8023	113	142,000	71
VUE-1-32L-1-40K	10706	101	10388	98	10918	103	9540	90	10706	101	148,000	106
VUE-1-32L-1-55K	11660	110	11130	105	11554	109	10176	96	11342	107	148,000	106
VUE-1-48L-53-40K	8284	109	8132	107	8360	110	7676	101	8208	108		76
VUE-1-48L-53-55K	8968	118	8816	116	9120	120	8360	110	8968	118		76
VUE-1-48L-7-40K	10712	103	10504	101	11024	106	10088	97	10816	104	143,000	104
VUE-1-48L-7-55K	11544	111	11336	109	12064	116	10816	104	11856	114	143,000	104
VUE-1-48L-1-40K	15444	99	15444	99	16224	104	14196	91	15912	102	153,000	156
VUE-1-48L-1-55K	16692	107	16536	106	17160	110	15132	97	16848	108	153,000	156
VUE-1-64L-53-40K	10914	107	10710	105	11016	108	10098	99	10812	106		102
VUE-1-64L-53-55K	11832	116	11628	114	12036	118	11016	108	11832	116		102
VUE-1-64L-7-40K	13736	101	13736	101	13600	100	14144	104	13464	99	145,000	136
VUE-1-64L-7-55K	14824	109	14824	109	14960	110	15776	116	14824	109	145,000	136
VUE-1-64L-1-40K	20295	99	20090	98	19680	96	20090	98	19475	95	156,000	205
VUE-1-64L-1-55K	21730	106	21525	105	21320	104	21320	104	20910	102	156,000	205
VUE-2-80L-53-40K	14208	111	13952	109	14464	113	13184	103	14080	110		128
VUE-2-80L-53-55K	15360	120	15104	118	15616	122	14208	111	15232	119		128
VUE-2-80L-7-40K	17472	104	17136	102	17808	106	16128	96	17304	103	149,000	168
VUE-2-80L-7-55K	18816	112	18480	110	19152	114	17472	104	18648	111	149,000	168
VUE-2-80L-1-40K	26563	101	26037	99	26826	102	24459	93	26300	100	153,000	263
VUE-2-80L-1-55K	28930	110	28404	108	29456	112	26826	102	28667	109	153,000	263
VUE-2-96L-53-40K	16983	111	16677	109	17289	113	15759	103	16830	110		153
VUE-2-96L-53-55K	18360	120	18054	118	18666	122	16983	111	18207	119		153
VUE-2-96L-7-40K	20800	104	20400	102	21200	106	19200	96	20600	103	151,000	200
VUE-2-96L-7-55K	22400	112	22000	110	22800	114	20800	104	22200	111	151,000	200
VUE-2-96L-1-40K	31916	101	31284	99	32232	102	29388	93	31600	100	157,000	316
VUE-2-96L-1-55K	34760	110	34128	108	35392	112	32232	102	34444	109	157,000	316
VUE-2-112L-53-40K	18939	107	18585	105	19293	109	17523	99	18762	106		177
VUE-2-112L-53-55K	20532	116	20178	114	20886	118	18939	107	20178	114		177
VUE-2-112L-7-40K	24543	101	24057	99	24786	102	22599	93	24300	100	152,000	243
VUE-2-112L-7-55K	26487	109	26001	107	26973	111	24543	101	26244	108	152,000	243
VUE-2-128L-53-40K	21614	107	21210	105	22018	109	19998	99	21412	106		202
VUE-2-128L-53-55K	23432	116	23028	114	23836	118	21614	107	23028	114		202
VUE-2-128L-7-40K	26765	101	26235	99	27030	102	24645	93	26500	100	152,000	265
VUE-2-128L-7-55K	28885	109	28355	107	29415	111	26765	101	28620	108	152,000	265
VUE-2-144L-53-40K	24075	107	23625	105	24525	109	22275	99	23850	106		225
VUE-2-144L-53-55K	26100	116	25650	114	26550	118	24075	107	25650	114		225
VUE-2-144L-7-40K	30300	101	29700	99	30600	102	27900	93	30000	100	153,000	300
VUE-2-144L-7-55K	32700	109	32100	107	33000	111	30300	101	32400	108	153,000	300
VUE-3-112L-1-40K	31350	95	31020	94	32010	97	29040	88	31350	95	161,000	330
VUE-3-112L-1-55K	33990	103	33330	101	34650	105	31680	96	33990	103	161,000	330
VUE-3-128L-1-40K	38037	93	37628	92	38855	95	35174	86	38037	93	150,000	409
VUE-3-128L-1-55K	40900	100	40491	99	42127	103	38037	93	41309	101	150,000	409
VUE-3-144L-1-40K	42136	92	41678	91	43052	94	39388	86	42136	92	138,000	458
VUE-3-144L-1-55K	45342	99	44884	98	46716	102	42594	93	45800	100	138,000	458
VUE-3-160L-7-40K	36180	108	35510	106	36850	110	33835	101	36180	108	150,000	335
VUE-3-160L-7-55K	39530	118	38860	116	40200	120	36515	109	39530	118	150,000	335
VUE-3-160L-1-40K	46460	92	45955	91	47470	94	43430	86	46460	92	123,000	505
VUE-3-160L-1-55K	49995	99	49490	98	51510	102	46965	93	50500	100	123,000	505
VUE-3-176L-7-40K	39055	107	38325	105	39785	109	36500	100	39055	107	152,000	365
VUE-3-176L-7-55K	42705	117	41975	115	43435	119	39785	109	42705	117	152,000	365
VUE-3-176L-1-40K	50141	91	49590	90	51243	93	46835	85	50141	91	105,000	551
VUE-3-176L-1-55K	53998	98	53447	97	55551	101	50692	92	54549	99	105,000	551
VUE-3-192L-7-40K	41976	106	41184	104	42768	108	38808	98	41976	106	153,000	396
VUE-3-192L-7-55K	45936	116	45144	114	46728	118	42372	107	45936	116	153,000	396
VUE-3-192L-1-40K	53460	90	52866	89	54648	92	49896	84	53460	90	96,000	594
VUE-3-192L-1-55K	58212	98	57618	97	59400	100	54648	92	58212	98	96,000	594

DIMENSION	VUE-1	VUE-2	VUE-3
A	16.99 in	21.56 in	26.17 in
B	6.38 in	8.00 in	8.36 in
C	21.48 in	27.06 in	32.94 in
Weight	27 lbs.	34 lbs.	62 lbs.



EPA	VUE-1	VUE-2	VUE-3
Single	.72	1.16	1.42
Double	1.44	2.32	2.86
Triple	2.24	2.5	4.78
Quad	2.5	3.6	4.88



DesignLights Consortium (DLC) qualified Product. Some configurations of this product family may not be DesignLights Consortium (DLC) listed, please refer to the DLC qualified products list to confirm listed configurations.
<http://www.designlights.org>

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nlsighting.com

PRODUCT SPECIFICATIONS

Housing: Aluminum.

LED: Luxeon M Series by Lumileds

Optics: Optics Type T2, T3, T4, T5 and Tennis (TT)

Watts: 28-594 Watts

L70: 96,000 to 161,000

UL: UL 1598 Listed

Driver: Dimming driver as standard by Advance or ULT

Kelvin: 4000, or 5500

Finish: 5 Millimeters Powder Coat

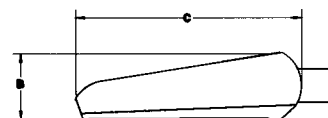
Warranty: Standard Warranty is 5 years for Driver and LEDs

PRODUCT DIMENSIONS

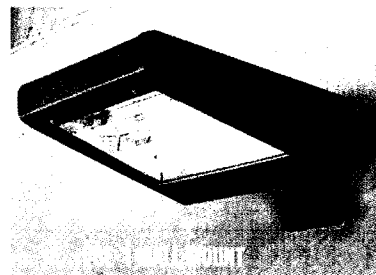
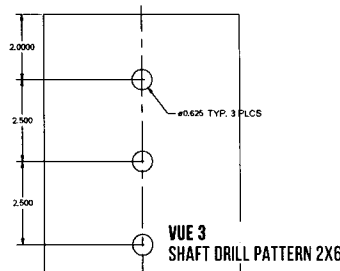
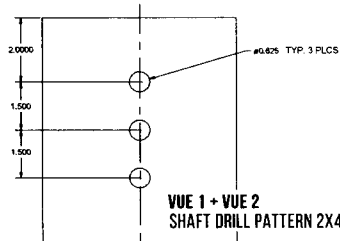
VUE - LUMEN DATA CHART

PART NUMBER	T2 OPTIC	Lm/W	T3 OPTIC	Lm/W	T4 OPTIC	Lm/W	T5 OPTIC	Lm/W	TT OPTIC	Lm/W	Calculated L70 Hours	SYSTEM WATTS
VUE-1-32L-53-40K	5994	111	5886	109	6048	112	5562	103	5940	110		54
VUE-1-32L-53-55K	6480	120	6372	118	6588	122	6048	112	6480	120		54
VUE-1-32L-7-40K	7384	104	7242	102	7455	105	6887	97	7313	103	142,000	71
VUE-1-32L-7-55K	7952	112	7881	111	8165	115	7526	106	8023	113	142,000	71
VUE-1-32L-1-40K	10706	101	10388	98	10918	103	9540	90	10706	101	148,000	106
VUE-1-32L-1-55K	11440	110	11130	105	11554	109	10176	96	11342	107	148,000	106
VUE-1-48L-53-40K	8284	109	8132	107	8360	110	7676	101	8208	108		76
VUE-1-48L-53-55K	8968	118	8816	116	9120	120	8360	110	8968	118		76
VUE-1-48L-7-40K	10712	103	10504	101	11024	106	10088	97	10816	104	143,000	104
VUE-1-48L-7-55K	11544	111	11336	109	12064	116	10816	104	11856	114	143,000	104
VUE-1-48L-1-40K	15444	99	15444	99	16224	104	14196	91	15912	102	153,000	156
VUE-1-48L-1-55K	16692	107	16536	106	17160	110	15132	97	16848	108	153,000	156
VUE-1-64L-53-40K	10914	107	10710	105	11016	108	10098	99	10812	106		102
VUE-1-64L-53-55K	11832	116	11628	114	12036	118	11016	108	11832	116		102
VUE-1-64L-7-40K	13736	101	13736	101	13600	100	14144	104	13464	99	145,000	136
VUE-1-64L-7-55K	14824	109	14824	109	14960	110	15776	116	14824	109	145,000	136
VUE-1-64L-1-40K	20295	99	20090	98	19680	96	20090	98	19475	95	156,000	205
VUE-1-64L-1-55K	21730	106	21525	105	21320	104	21320	104	20910	102	156,000	205
VUE-2-80L-53-40K	14208	111	13952	109	14464	113	13184	103	14080	110		128
VUE-2-80L-53-55K	15360	120	15104	118	15616	122	14208	111	15232	119		128
VUE-2-80L-7-40K	17472	104	17136	102	17808	106	16128	96	17304	103	149,000	168
VUE-2-80L-7-55K	18816	112	18480	110	19152	114	17472	104	18648	111	149,000	168
VUE-2-80L-1-40K	26563	101	26037	99	26826	102	24459	93	26300	100	153,000	263
VUE-2-80L-1-55K	28930	110	28404	108	29456	112	26826	102	28667	109	153,000	263
VUE-2-96L-53-40K	16983	111	16677	109	17289	113	15759	103	16830	110		153
VUE-2-96L-53-55K	18360	120	18054	118	18666	122	16983	111	18207	119		153
VUE-2-96L-7-40K	20800	104	20400	102	21200	106	19200	96	20600	103	151,000	200
VUE-2-96L-7-55K	22400	112	22000	110	22800	114	20800	104	22200	111	151,000	200
VUE-2-96L-1-40K	31916	101	31284	99	32232	102	29388	93	31600	100	157,000	316
VUE-2-96L-1-55K	34760	110	34128	108	35392	112	32232	102	34444	109	157,000	316
VUE-2-112L-53-40K	18939	107	18585	105	19293	109	17523	99	18762	106		177
VUE-2-112L-53-55K	20532	116	20178	114	20886	118	18939	107	20178	114		177
VUE-2-112L-7-40K	24543	101	24057	99	24786	102	22599	93	24300	100	152,000	243
VUE-2-112L-7-55K	26487	109	26001	107	26973	111	24543	101	26244	108	152,000	243
VUE-2-128L-53-40K	21614	107	21210	105	22018	109	19998	99	21412	106		202
VUE-2-128L-53-55K	23432	116	23028	114	23836	118	21614	107	23028	114		202
VUE-2-128L-7-40K	26765	101	26235	99	27030	102	24645	93	26500	100	152,000	265
VUE-2-128L-7-55K	28885	109	28355	107	29415	111	26765	101	28620	108	152,000	265
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Autobahn Series ATBM

Roadway

ORDERING INFORMATION

Example: ATBM A MVOLT R2

Series	Performance Packages	Voltage	Optics	Mounting
ATBM Autobahn LED Roadway	A 7,000 lumens B 8,000 lumens C 9,000 lumens D 11,600 lumens E 13,400 lumens F 15,700 lumens G 16,600 lumens H 17,400 lumens	MVOLT Multi-volt, 120-277V 347 347V 480 480V	R2 Roadway Type II R3 Roadway Type III R4 Roadway Type IV R5 Roadway Type V	(Blank) 2 Bolt Mounting 4B 4 Bolt Mounting

Options			
<u>Color Temperature (CCT)</u> (Blank) 4000K CCT, 70 CRI Min. 5K 5000K CCT, 70 CRI Min. <u>Paint</u> (Blank) Gray BK Black BZ Bronze DDB Dark Bronze GI Graphite WH White <u>Surge Protection</u> (Blank) Acuity SPD MP MOV Pack ¹ IL SPD with Indicator Light ¹ <u>Miscellaneous Options</u> HSS House Side Shield NL NEMA Label Indicating Wattage XL Not CSA Certified – No Terminal Block Cover	<u>Control Options</u> (Blank) 3 Pin NEMA Photocontrol Receptacle P5 5 Pin Photocontrol Receptacle (dimmable driver included) ² P7 7 Pin Photocontrol Receptacle (dimmable driver included) ² NR No Photocontrol Receptacle ³ A0 Field Adjustable Output ⁴ DM 0-10V Dimmable Driver ⁵ PCSS Solid-State Lighting Photocontrol ⁶ PCLL Solid-State Long Life Photocontrol PCCC Solid-State Long Life Photocontrol with remote control on/off ⁷ SH Shorting Cap <u>Packages</u> (Blank) Standard Pack JP Job Pack (36/pallet)	<u>Accessories</u> ATBMHSS House Side Shield ATBMLTS Light Trespass Shield RKATBMMVOLTSPD ATBM Acuity SPD Replacement Kit MVOLT RKATBMHVSPD ATBM Acuity SPD Replacement Kit 347/480V RKATBMMVOLTMP ATBM MOV Pack Replacement Kit RKATBMMVOLTIL ATBM IL SPD Replacement Kit	

Notes:

- Not available with G and H performance packages
- Dimmable Driver included. Not available with A0, DM or NR
- Not available with P5, P7
- Not available with DM, P5 or P7
- Controls by others. Not available with A0
- MVOLT only
- Not available with PCSS or PCLL



AEL Headquarters, 3825 Columbus Road, Granville, OH 43023
 www.americanelectriclighting.com
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Warranty Five-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
 Actual performance may differ as a result of end-user environment and application. Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

ATBM

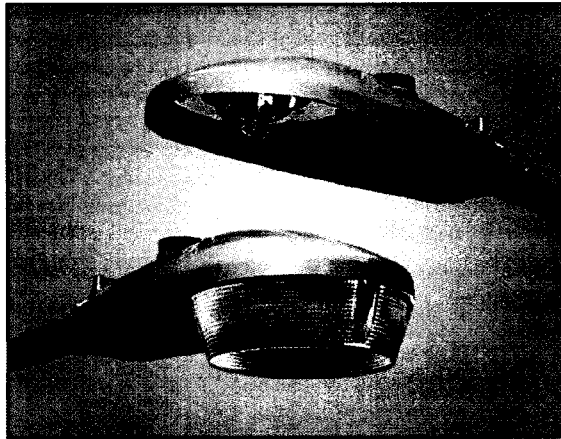


Consistent with LEED® goals
& Green Globes™ criteria
for light pollution reduction

Autobahn Series ATBS

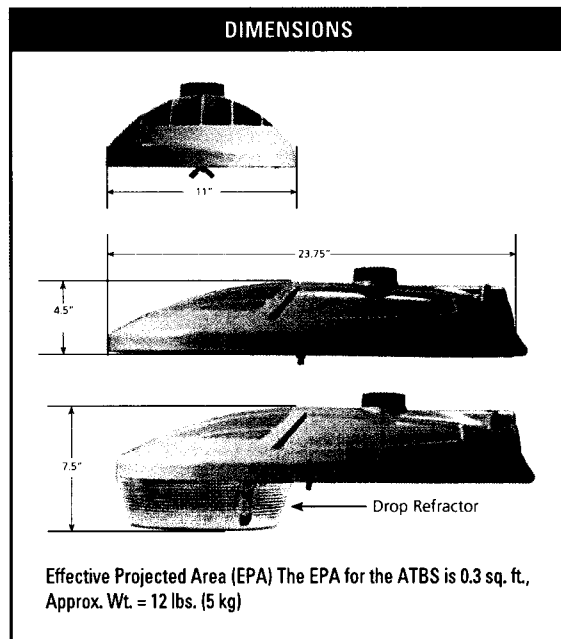
Roadway & Security Lighting

PRODUCT OVERVIEW



Applications:

Residential streets
Parking lots
General security lighting



Features:

OPTICAL

Same Light: Performance is comparable to 50W – 150W HPS and up to 175W Mercury Vapor roadway and security lighting luminaires.

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, III, and V roadway distributions. When used with the optional acrylic refractor the unit provides approximately 10% uplight and increased vertical foot-candles

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40-60% over comparable HID luminaires.

Robust Surge Protection: Three different surge protection options provide a minimum of IEEE/ANSI C62.41 Category C (10kV/5kA) protection.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt clamping mechanism provides 3G vibration rating per ANSI C136.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 5 pin and 7 pin receptacles optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life)

Extreme long life solid state locking-style photocontrol – PCL1 (20 year rated life)

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

STANDARDS

Rated for -40°C to 40°C ambient

CSA Certified to U.S. and Canadian standards

Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

Note: Specifications subject to change without notice. Actual performance may differ as a result of end-user environment and application.

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AEL American
Electric
Lighting®

Autobahn Series ATBS

Roadway & Security Lighting

PERFORMANCE PACKAGE

Performance Package	Distribution	Lumens	Input Watts	LPW	50K Hours	LLD @ 25°C 75K Hours	100K Hours
A	R2	1,978	19	104	0.93	0.89	0.85
	R3	1,972		104			
	R5	2,033		107			
	D2	1,884		99			
	D3	1,860		98			
	D5	1,933		102			
B	R2	2,611	27	97	0.93	0.89	0.85
	R3	2,603		96			
	R5	2,694		100			
	D2	2,487		92			
	D3	2,456		91			
	D5	2,564		95			
E	R2	4,196	40	105	0.93	0.89	0.85
	R3	3,977		99			
	R5	4,282		107			
	D2	3,996		100			
	D3	3,752		94			
	D5	4,091		102			
F	R2	4,661	47	99	0.93	0.89	0.85
	R3	4,821		103			
	R5	4,666		99			
	D2	4,439		94			
	D3	4,548		97			
	D5	4,554		97			
G	R2	6,235	50	125	0.94	0.92	0.90
	R3	6,101		122			
	R5	6,404		128			
	D2	5,938		119			
	D3	5,756		115			
	D5	6,193		124			
H	R2	7,194	60	120	0.94	0.92	0.90
	R3	7,141		119			
	R5	7,508		125			
	D2	6,851		114			
	D3	6,737		112			
	D5	7,150		119			
I	R2	8,653	76	114	0.94	0.92	0.90
	R3	8,525		112			
	R5	9,003		118			
	D2	8,241		108			
	D3	8,042		106			
	D5	8,574		113			

Note: Information shown above is based on 4000K nominal system data. Individual fixture performance may vary. Specifications subject to change without notice.

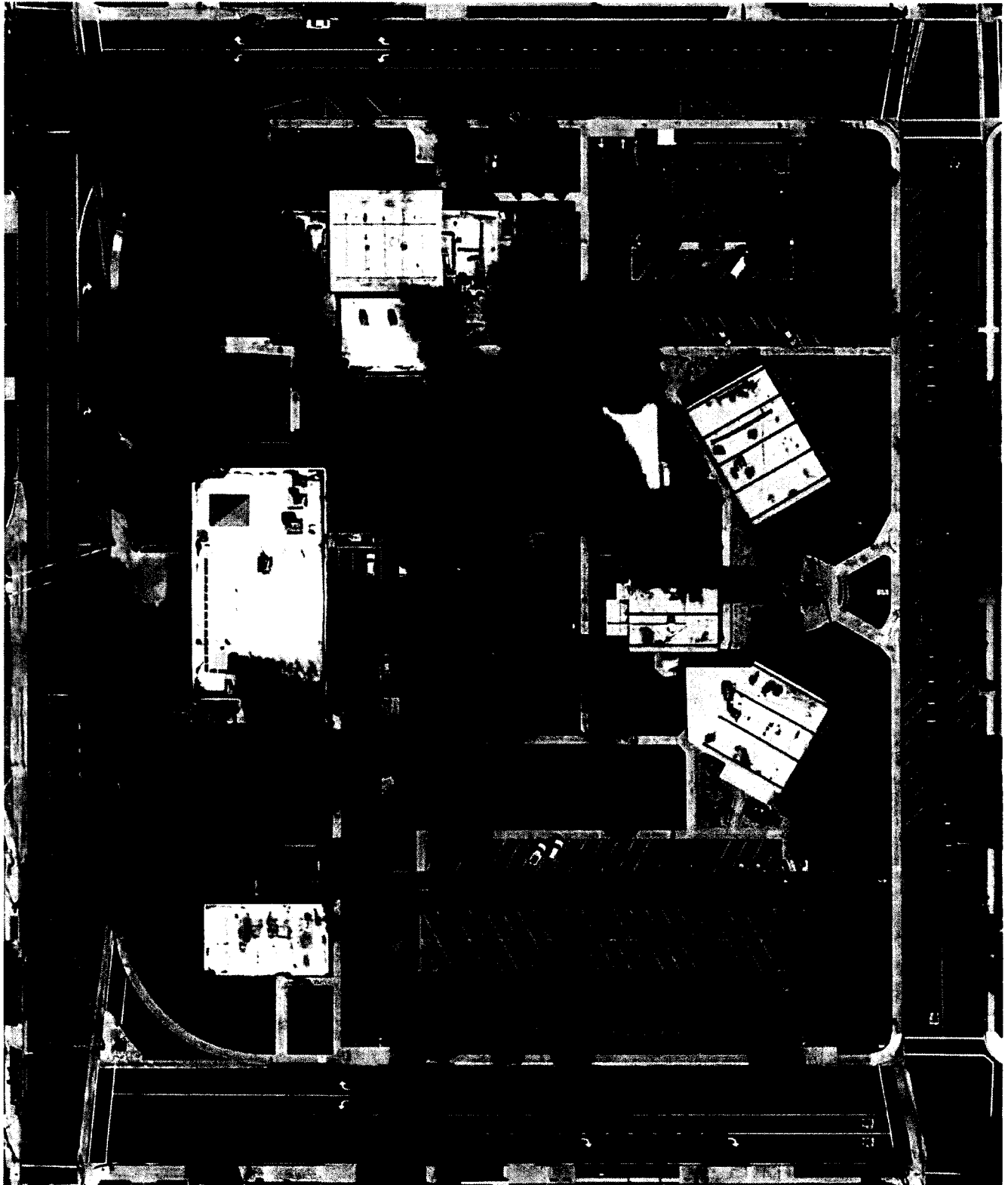


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Warranty Five-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
 Actual performance may differ as a result of end-user environment and application.
 All values are design or typical values, measured under laboratory conditions at 25 °C.
 Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

Civic Center: 150 S. Palm Avenue, Rialto, CA 92376



Civic Center - HVAC Inventory

Map ID	Unit Tag	Location Served	Existing Equipment					Proposed Equipment				
			Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number
1		Administration	Carrier	38AUZA12A0A5A0A0A0	234C94301	10.0-ton	2014	208/230V-3ph	Prog Tstat	No		
2		Administration	Carrier	38MVQ018-301	3010V39800	1.5-ton	2010	208/230V-1ph	Man Tstat	No		
3		Administration	Carrier	48GSN0600090501	2303G41185	5.0-ton	2003	208/230V-3ph	Prog Tstat	No		
4		Dev. Services	Carrier	38ARZ012-501	2003G40012	10.0-ton	2003	208/230V-3ph	Prog Tstat	No		
5		Dev. Services	Carrier	48XPN0600090511	2906G12277	5.0-ton	2006	208/230V-3ph	Prog Tstat	No		
6		Studio	Marair	AVPA36HPA050NU-100	EA-G12454104	3.0-ton	2011	208/230V-1ph	Prog Tstat	No		
7		Studio	Marair	AVPA36HPA050NU-100	EA-F12454107	3.0-ton	2011	208/230V-1ph	Prog Tstat	No		
8		Studio	Marair	AVPA36HPA050NU-100	EA-F12454101	3.0-ton	2011	208/230V-1ph	Prog Tstat	No		
9		Finance	Carrier	38AUZA08A0A5A0A0A0	2214C94065	7.5-ton	2014	208/230V-3ph	Prog Tstat	No		
10		Finance	Mitsubishi	MUY-D36NA	6000124T	3.0-ton	2006	208/230V-1ph	Prog Tstat	No		
11		Finance	Mitsubishi	MUY-D36NA	6000123T	3.0-ton	2006	208/230V-1ph	Prog Tstat	No		
12		Finance	ICP	RGSD060HLCAD0AAAA	C123051363	5.0-ton	2012	208/230V-3ph	Prog Tstat	No		
13		Clerk's Office	Carrier	24ABB360W320	1311E13394	3.0-ton	2011	208/230V-1ph	Prog Tstat	No		
14		Clerk's Office	Carrier	24ABB360W320	NA	3.0-ton	2011	208/230V-1ph	Prog Tstat	No		

Community Center - HVAC Inventory

Existing Equipment														Proposed Equipment			
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency			
1	AC-5	Gym	Packaged Gas / Elec	Trane	YHH300F3RLA04070	145210090D	25.0-ton	2014	208/230V-3ph	MT w/ Twist							
2	AC-4	Gym	Packaged Gas / Elec	Trane	YHH300F3RLA04070	145210104D	25.0-ton	2014	208/230V-3ph	MT w/ Twist							
3	AC-3	Gym Offices	Packaged Gas / Elec	ICP	PGD360090H001C1	C132826171	5.0-ton	2013	208/230V-3ph	MT w/ Twist							
4	AC-2	Gym Conf Rm	Packaged Gas / Elec	ICP	PGD336060H001C1	C123902966	3.0-ton	2012	208/230V-3ph	MT w/ Twist							
5	AC-1	Gym Office	Packaged Gas / Elec	ICP	PGD342090H001C1	C132648473	3.5-ton	2013	208/230V-3ph	MT w/ Twist							
6		100 Building	Evap Cooler							MT w/ Twist							
7		100 Building	Packaged Gas / Elec	ICP	PGD348090H001C1	C132926966	4.0-ton	2013	208/230V-3ph	MT w/ Twist							
8		100 Building	Packaged Heat Pump	Carrier	50IS-060-301	3504G11916	5.0-ton	2004	208/230V-1ph	MT w/ Twist	Yes	Trane	WSC060	14SEER			
9		101 Building	Packaged Gas / Elec	Carrier	48ESNA6009050	4410C14596	5.0-ton	2010	208/230V-3ph	MT w/ Twist							
10		100 Building	Packaged Heat Pump	Carrier	50IS-060-301	3304G12375	5.0-ton	2004	208/230V-1ph	MT w/ Twist	Yes	Trane	WSC060	14 SEER			
11		200 Building	Packaged Gas / Elec	Carrier	48GSN036060511	3304G31418	3.0-ton	2004	208/230V-1ph	MT w/ Twist	Yes	Trane	YHC037	15 SEER			
12		200 Building	Packaged Gas / Elec	Carrier	48GSN060090501	3404G12302	5.0-ton	2004	208/230V-1ph	MT w/ Twist	Yes	Trane	YHC067	15 SEER			
13		300 Building	Packaged Gas / Elec	ICP	PGD330040K001C1	C131703105	2.5-ton	2013	208/230V-1ph	MT w/ Twist							
14		300 Building	Packaged Gas / Elec	ICP	PGD324040K001C1	C132814832	2.0-ton	2013	208/230V-1ph	MT w/ Twist							
15		300 Building	Packaged Gas / Elec	Carrier	48XPN036060511	2706G51376	3.0-ton	2006	208/230V-3ph	MT w/ Twist	?						
16		300 Building	Packaged Gas / Elec	Carrier	48ESNA3606050	1314C23292	3.0-ton	2014	208/230V-3ph	MT w/ Twist							
17		400 Building	Packaged Gas / Elec	Carrier	48ESNA3606050	3710C04005	3.0-ton	2010	208/230V-3ph	MT w/ Twist							
18		400 Building	Packaged Gas / Elec	Carrier	48ESNA3606050	5210C25087	3.0-ton	2010	208/230V-3ph	MT w/ Twist							
19		400 Building	Packaged Gas / Elec	Carrier	48GSN060090311	1605G21345	5.0-ton	2005	208/230V-1ph	MT w/ Twist	?						
20		400 Building	Packaged Gas / Elec	Carrier	48GSN036060511	2806G12628	3.0-ton	2006	208/230V-3ph	MT w/ Twist	?						
21		500 Building	Packaged Gas / Elec	Carrier	48XPN036060511	2406G51460	3.0-ton	2006	208/230V-3ph	MT w/ Twist	?						
22		500 Building	Packaged Gas / Elec	Carrier	48XPN036060511	1307G31355	3.0-ton	2007	208/230V-3ph	MT w/ Twist	?						
23		500 Building	Packaged Gas / Elec	ICP	PGD342090H001C1	C132648470	3.5-ton	2013	208/230V-3ph	MT w/ Twist							
24		500 Building	Packaged Gas / Elec	ICP	PGD336060H001C1	C130718881	3.0-ton	2013	208/230V-3ph	MT w/ Twist							

Fire Station 1 HQ - HVAC Inventory

Map ID	Unit Tag	Existing Equipment						Proposed Equipment						
		Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency
1	AC-1		Packaged Gas / Elec	Carrier	48TCDD14A2A5A0	0211G40722	12.0-ton	2011	208/230V-3ph	Prog Tstat	No			
2	AC-2		Packaged Gas / Elec	Carrier	48ESNA6009050	0711C37507	5.0-ton	2011	208/230V-3ph	Man Tstat	No			
3	AC-3	Computer Rm	Packaged Gas / Elec	Carrier	48ESNS4206050	2810C89389	3.5-ton	2010	208/230V-3ph	Prog Tstat	No			
4	AC-4		Packaged Gas / Elec	Carrier	48HCLA04A2A5A0	4315C52624	3.0-ton	2015	208/230V-3ph	Prog Tstat	No			
5	AC-5	Dorms	Packaged Gas / Elec	Carrier	48VLNA4809050	1012C27587	4.0-ton	2012	208/230V-3ph	Prog Tstat	No			
6	AC-6	Dorms	Packaged Gas / Elec	Carrier	48HJM004-541	1907G50469	3.0-ton	2007	208/230V-3ph	Prog Tstat	No			

Fire Station 2 - HVAC Inventory

Existing Equipment														Proposed Equipment		
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency		
1	AC-1		Packaged Gas / Elec	Trane	YHC048E3RLA0202A2C	112111453L	4.0-ton	2011	208/230V-3ph	Prog Tstat						
2	AC-2		Packaged Gas / Elec	Trane	YHC036E3RLA1202A2C	112111279L	3.0-ton	2011	208/230V-3ph	Prog Tstat						
3	AC-3		Packaged Gas / Elec	Trane	4VCY4024A1064AB	11222JTS9H	2.0-ton	2011	208/230V-3ph	Prog Tstat						
4	AC-4		Packaged Gas / Elec	Trane	YHC048E3RLA0202A2C	112111268L	4.0-ton	2011	208/230V-3ph	Prog Tstat						
5	AC-5		Packaged Gas / Elec	Trane	4VCY4024A1064AB	11214J1C9H	2.0-ton	2011	208/230V-1ph	Prog Tstat						
6	AC-6		Packaged Gas / Elec	Trane	4VCY4024A1064AB	11222JH9H	2.0-ton	2011	208/230V-1ph	Prog Tstat						
7	AC-7		Packaged Gas / Elec	Trane	YHC036E3RLA1202A2C	112111269L	3.0-ton	2011	208/230V-3ph	Prog Tstat						
8	AC-8		Packaged Gas / Elec	Trane	4VCY4024A1064AB	11214J7S9H	2.0-ton	2011	208/230V-1ph	Prog Tstat						
9	AC-9		Packaged Gas / Elec	Trane	4VCY4024A1064AB	11213H449H	2.0-ton	2011	208/230V-1ph	Prog Tstat						
10	AC-10		Split Sys Heat Pump	Trane	4TCC3018A1000AA	111712183L	1.5-ton	2011	208/230V-1ph	Prog Tstat						

Fire Station 3 - HVAC Inventory

Existing Equipment											Proposed Equipment			
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency
1		Offices	Packaged Heat Pump	Carrier	50TCQD08A2ASA0A0	0811G20618	7.5-ton	2011	208/230V-3ph	Man Tstat				
2		Garage	Evap Cooler							Man Tstat				
3		Offices	Packaged Gas / Elec	Carrier	48TCDA08A2ASA0A0	2009G20423	7.5-ton	2009	208/230V-3ph	Man Tstat				
4		Garage	Evap Cooler							Man Tstat				
5		Dorms	Packaged Gas / Elec	Carrier	48HJL006-541	2508G40930	5.0-ton	2008	208/230V-3ph	Man Tstat				

Fire Station 4 - HVAC Inventory

Map ID	Unit Tag	Location Served	Existing Equipment					Proposed Equipment					
			Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number
1	Panel A	Offices	Packaged Gas / Elec	Carrier	48TCDD08A2A5A0A0	1111G20556	7.5-ton	2011	208/230V-3ph	Man Tstat			
2	Panel B	Offices	Packaged Heat Pump	Carrier	50TCQA05A2A5A0A0	1311G30116	4.0-ton	2011	208/230V-3ph	Man Tstat			
3		Garage	Evap Cooler							Man Tstat			
4		Garage	Evap Cooler							Man Tstat			
5		Dorms	Packaged Gas / Elec	Carrier	48TCLA06A2A5A0A0	1914C61437	5.0-ton	2014	208/230V-3ph	Man Tstat			

Fleet Services_IT_Purchasing - HVAC Inventory

Existing Equipment															Proposed Equipment			
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency				
1		Garage Office	Split Sys Gas / Elec	Carrier	24ABB360A520	2214E20128	3.0-ton	2014	208/230v-3ph	Man Tstat								
2			Evap Cooler															
3			Evap Cooler															
4		Purchasing	Wall AC & Furnace															
5		Purchasing	Wall AC															
6		Purchasing	Evap Cooler															
7		IT	Packaged Gas / Elec	Carrier	48ESNA6009030	1314C26448	5.0-ton	2014	208/230v-1ph	Man Tstat								
8		IT	Packaged Heat Pump	Rheem	RQKA-A024JK	5528F119711418	2.0-ton	1997	208/230v-1ph	Man Tstat	Yes	Trane	4WCC4024	14 SEER				

Human Resources_MO - HVAC Inventory

Map ID	Unit Tag	Location Served	Existing Equipment					Proposed Equipment				
			Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer
1		Human Resources	Packaged Gas / Elec	Carrier	48TCLA06A2A5A0A0	4913C86752	5.0-ton	2013	208/230V-3ph	Prog Tstat		
2		Human Resources	Packaged Gas / Elec	Carrier	NA	NA	5.0-ton	2013		Prog Tstat		
3		Human Resources	Packaged Gas / Elec	Carrier	48TCLA06A2A5A0A0	0814C85683	5.0-ton	2014	208/230V-3ph	Prog Tstat		
4		Human Resources	Packaged Gas / Elec	Carrier	48ESNA3004050	1111C47543	2.5-ton	2011	208/230V-3ph	Prog Tstat		
5		Human Resources	Packaged Gas / Elec	Carrier	48HJM004-541	0708G10378	3.0-ton	2008	208/230V-3ph	Prog Tstat		
6		Human Resources	Packaged Gas / Elec	Carrier	48HJM004-541	0808G50422	3.0-ton	2008	208/230V-3ph	Prog Tstat		
7		M&O Office	Split Sys Gas / Elec	Carrier			3.0-ton	2013		Prog Tstat		
8		M&O Garage	Evap Cooler							Man Tstat		
9		M&O Garage	Evap Cooler							Man Tstat		

Library - HVAC Inventory

Existing Equipment														Proposed Equipment			
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency			
1		Library East E	Packaged Gas / Elec	Carrier	48ESN036060511	0309G50776	3.0-ton	2009	208/230V-3ph	Prog Tstat	No						
2		Library East M	Packaged Gas / Elec	Carrier	48ESNAG6009050	4910C21274	5.0-ton	2010	208/230V-3ph	Prog Tstat	No						
3		Library East W	Packaged Gas / Elec	Carrier	48ESNAG6009050	0811C39553	5.0-ton	2011	208/230V-3ph	Prog Tstat	No						
4		Library Middle	Packaged Heat Pump	Carrier	50TCQA04A0F3A1F1	0111G10367	3.0-ton	2011	208/230V-1ph	Prog Tstat	No						
5		Library Middle	Packaged Heat Pump	Carrier	50TCQA05A0F3A0F1	0111G10368	4.0-ton	2011	208/230V-1ph	Prog Tstat	No						
6		Library West E	Packaged Gas / Elec	Carrier	48ESN56009050	4910C21275	5.0-ton	2010	208/230V-3ph	Prog Tstat	No						
7		Library West M	Packaged Gas / Elec	Carrier	48ESN54809050	3810C05179	4.0-ton	2010	208/230V-3ph	Prog Tstat	No						
8		Library West W	Packaged Gas / Elec	Carrier	48XPN060090511	2808G11372	5.0-ton	2008	208/230V-3ph	Prog Tstat	No						

Metrolink Depot - HVAC Inventory

Existing Equipment															Proposed Equipment			
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency				
1			Packaged Gas / Elec	Carrier	38HDC060-521	3005X47105	5.0-ton	2005	208/230V-3ph	Prog Tstat								
2			Packaged Gas / Elec	Carrier	38HDC060-521	3297X44503	5.0-ton	1997	208/230V-3ph	Prog Tstat	Yes	Trane	YHC067	15 SEER				
3			Packaged Gas / Elec	Carrier	38HDC060-521	NA	5.0-ton	1997		Prog Tstat	Yes	Trane	YHC067	15 SEER				
4			Packaged Gas / Elec	Carrier	38HDC060521	1703X66769	5.0-ton	2003	208/230V-1ph	Prog Tstat								

Police Department - HVAC Inventory

Existing Equipment														Proposed Equipment			
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency			
1		AHU-1	Condensing Unit	Carrier	38APD0606HA18020	4211Q43632	60.0-ton	2011	460V-3ph	Honeywell							
	B-1	HHW	Air Handling Unit (VFD)	Team Air	CAH2400D	060711360-AHU1	10 hp	2011	460V-3ph	Honeywell							
	P-1	HHW	Boiler	Raypak	H3-0502B	1103322091	500 kbtuh			Honeywell							
		DHW	Pump	Bell & Gossett	FVN 48T17D1738P		3/4 hp			Honeywell							
2		Server Rm	DHW Heater	AO Smith	75 230	GB97-3488401-S06	75 kbtuh	1997									
		Server Rm	Split Sys Heat Pump	Mitsubishi	MUY-D36NA	8001274	3.0-ton	2008	208/230V-1ph	Prog Tstat							
		Server Rm	Fan Coil Unit	Mitsubishi	MSY-D36NA	8001346		2008									
3			Split Sys Cooling	Carrier	38MVQ009-101	3710V42928	0.8-ton	2010	115V-1ph	Prog Tstat							
4			Split Sys Cooling	Carrier	38MVQ009-101	5010V43794	0.8-ton	2010	115V-1ph	Prog Tstat							
5		Modular 1	Wall Mount HP	Bard	WH361-A05	125K072384505-02	3.0-ton	2007	208/230V-1ph	Prog Tstat							
6		Modular 1	Wall Mount HP	Bard	WH361-A05	309D133008450-02	3.0-ton	2013	208/230V-1ph	Prog Tstat							
7		Modular 2	Wall Mount HP	Marvair	AVPA36HPA050NU	EA-F124541-03	3.0-ton	2011	208/230V-1ph	Prog Tstat							
8		Modular 2	Wall Mount HP	Marvair	AVPA36HPA050NU	EA-F124541-02	3.0-ton	2011	208/230V-1ph	Prog Tstat							
9		Modular 2	Wall Mount HP	Marvair	AVPA36HPA050NU	EA-F124541-06	3.0-ton	2011	208/230V-1ph	Prog Tstat							
10		Modular 2	Wall Mount HP	Marvair	AVPA36HPA050NU	EA-F124541-05	3.0-ton	2011	208/230V-1ph	Prog Tstat							
11		Modular 3	Wall Mount HP	NA	NA	NA	3.0-ton		208/230V-1ph	Prog Tstat							
12		Modular 3	Wall Mount HP	NA	NA	NA	3.0-ton			Prog Tstat							

Police Annex - HVAC Inventory

Map ID	Unit Tag	Location Served	Existing Equipment							Proposed Equipment			
			Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number
1			Split Sys Heat Pump	Carrier	38YCG0606A	1608X83437	5.0-ton	2008	460V-3ph	Prog Tstat			
2			Split Sys Heat Pump	Carrier	38MVC012-301	0111V06739	1.0-ton	2011	208/230V-1ph	Prog Tstat			
3			Split Sys Heat Pump	Carrier	25HBC360A600	4610E03247	5.0-ton	2010	460V-3ph	Prog Tstat			
4			Split Sys Heat Pump	Carrier	25HCB318A300	1110E15449	1.5-ton	2010	208/230V-1ph	Prog Tstat			
5			Split Sys Heat Pump	Carrier	25HBC360A600	NA	5.0-ton	2010		Prog Tstat			

Public Works_Engineering - HVAC Inventory

Existing Equipment														Proposed Equipment			
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency			
1	AC-1		Packaged Gas / Elec	Carrier	48ESNA2404030	1811C67502	2.0-ton	2011	208/230V-1ph	Honeywell							
2	AC-2		Packaged Gas / Elec	Carrier	48ESNA3606050	1916C23126	3.0-ton	2016	208/230V-3ph	Honeywell							
3	AC-3		Packaged Gas / Elec	Carrier	48ESNA4809030	1811C65545	4.0-ton	2011	208/230V-1ph	Honeywell							
4	AC-4		Packaged Gas / Elec	Carrier	48ESNA3004030	1811C67617	2.5-ton	2011	208/230V-1ph	Honeywell							
5	AC-5		Packaged Gas / Elec	Carrier	48ESNA4809050	4415C25599	4.0-ton	2015	208/230V-3ph	Honeywell							
6	AC-6		Packaged Gas / Elec	Carrier	48GSN036060311	3403G21068	3.0-ton	2003	208/230V-1ph	Prog Tstat	Yes	Trane	YHC037	15 SEER			
7			Packaged Gas / Elec	Carrier	48GSN03606050-	1811C67879	3.0-ton	2011	208/230V-3ph	Prog Tstat							

Racquet and Fitness - HVAC Inventory

Existing Equipment														Proposed Equipment			
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency			
1	AC-1		Packaged Gas / Elec	Carrier	48TCLA06A2ASAOA0A0	2114C78038	5.0-ton	2014	208/230V-3ph	Honeywell							
2	AC-2		Packaged Gas / Elec	Carrier	48TCLA06A2ASAOA0A0	1914C61438	5.0-ton	2014	208/230V-3ph	Honeywell							
3	AC-3		Packaged Gas / Elec	ICP	RG5060HLCA0AAAA	C142765554	5.0-ton	2014	208/230V-3ph	Honeywell							
4	AC-4	Raquetball N N	Packaged Gas / Elec	Carrier	48ESNA3606050-	5210C25084	3.0-ton	2010	208/230V-3ph	Honeywell							
5	AC-5	Raquetball N M	Packaged Gas / Elec	Carrier	48ESNA3606050-	5210C25089	3.0-ton	2010	208/230V-3ph	Honeywell							
6	AC-6	Raquetball N S	Packaged Gas / Elec	Carrier	48ESNA3606050-	5210C25093	3.0-ton	2010	208/230V-3ph	Honeywell							
7	AC-7	Lobby North Pit	Packaged Gas / Elec	Carrier	48XPN036060311-	2506G12088	3.0-ton	2006	208/230V-1ph	Honeywell							
8	AC-8	Lobby South Pit	Packaged Gas / Elec	Carrier	48ESNA36060300	2410C83005	2.5-ton	2010	208/230V-1ph	Honeywell							
9		Lobby	Split Sys Heat Pump	ICP	NXH560GKA100	E122521908	5.0-ton	2012	208/230V-1ph								
10	AC-9	Raquetball S N	Packaged Gas / Elec	Carrier	48ESNA3606050-	3610C02943	3.0-ton	2010	208/230V-3ph	Honeywell							
11	AC-10	Raquetball S M	Packaged Gas / Elec	Carrier	48ESNA3606050-	3510C00694	3.0-ton	2010	208/230V-3ph	Honeywell							
12	AC-11	Raquetball S S	Packaged Gas / Elec	Carrier	48ESNA3606050-	5210C25090	3.0-ton	2010	208/230V-3ph	Honeywell							
13	AC-12	Community Playhouse	Packaged Gas / Elec	Carrier	48XPN060090311-	2906G12258	5.0-ton	2006	208/230V-1ph	Honeywell							
14	AC-13	Community Playhouse	Packaged Gas / Elec	Carrier	48ESNA3606030-	0414C11751	3.0-ton	2014	208/230V-1ph	Honeywell							
15	AC-14	Community Playhouse	Packaged Gas / Elec	Carrier	48ESNA2404030-	1414C00314	2.0-ton	2014	208/230V-1ph	Honeywell							
16	AC-15	Theater	Packaged Gas / Elec	Carrier	48TCD1A2ASAOA0A0	3010G40651	10.0-ton	2010	208/230V-3ph	Honeywell							
17	AC-16	Theater East	Packaged Gas / Elec	Carrier	48ESNA6009050-	0711C37505	5.0-ton	2011	208/230V-3ph	Honeywell							
18		Pool Lobby	Split Sys Heat Pump	Mitsubishi	MUY-GE18NA	5001913T	1.5-ton		208/230V-1ph								
19		Pool Office	Split Sys Heat Pump	Mitsubishi	MUH15TN	4000676T	1.2-ton		208/230V-1ph								
20		Pool Area	Evap Cooler & Furnace	Reznor													
21		Pool Area	Evap Cooler & Furnace	Reznor													
		Pool	DHW Heater	Lochinvar	CPN1262	B15H00275070	1.26 MbtuH										
		Pool	Pump	Emerson	CN05		25 hp		208/230V-3ph								
		Pool	DHW Heater	Bradford White	D100L199E3N	DC8973241	200 kbtuH										
		Jacuzzi	DHW Heater	Raypak	C-R407A-EN-C	1002306098											
		Jacuzzi	Pump	AO Smith	B49	30910CH	1.5 hp										
		Jacuzzi	DHW Heater	AO Smith	BT100112	G05M004747	75 kbtuH	2005									
		Jacuzzi	DHW Heater	AO Smith	BT100112	G05M009548	75 kbtuH	2005									

Senior Center - HVAC Inventory

Existing Equipment															Proposed Equipment			
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Manufacturer	Model Number	Min Efficiency				
1	AC-1		Packaged Gas / Elec	Trane	YHC060A4RMA14D2A0	308100924L	5.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC067	15 SEER				
2	AC-2		Packaged Gas / Elec	Trane	YHC036A4RMA02D2A0	308100873L	3.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC037	15 SEER				
3	AC-3		Packaged Gas / Elec	Trane	YHC048A4RMA11D2A0	308100729L	4.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC047	15 SEER				
4	AC-4		Packaged Gas / Elec	Trane	YHC060A4RMA14D2A0	308100890L	5.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC067	15 SEER				
5	AC-5		Packaged Gas / Elec	Trane	YHC048A4RMA11D2A0	308100874L	4.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC047	15 SEER				
6	AC-6		Packaged Gas / Elec	Trane	YHC036A4RMA02D2A0	308100915L	3.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC037	15 SEER				
7	AC-7		Packaged Gas / Elec	Trane	YHC060A4RMA14D2A0	308100937L	5.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC067	15 SEER				
8	AC-8		Packaged Gas / Elec	Trane	YHC072A4RMA05D0A0	308100745L	6.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC072	11.2 EER				
9	AC-9		Packaged Gas / Elec	Trane	YHC102A4RMA02D0A0	308100771L	8.5-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC102	11.2 EER				
10	AC-10		Packaged Gas / Elec	Trane	YCD151C4LAAA	308100314D	12.5-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC151	11.2 EER				
11	AC-11		Packaged Gas / Elec	Trane	YHC060A4RMA14D2A0	308100941L	5.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC067	15 SEER				
12	AC-12		Packaged Gas / Elec	Trane	YHC036A4RMA02D2A0	308100709L	3.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC037	15 SEER				
13	AC-13		Packaged Gas / Elec	Trane	YHC060A4RMA14D2A0	308100764L	5.0-ton	2003	460V-3ph	Honeywell	Yes	Trane	YHC067	15 SEER				
14		Heating Ventilator		Sterling	E3H-RT1502C01					Honeywell								



Introduction

Packaged Heat Pumps

Trane® customers demand products that provide exceptional reliability, meet stringent performance requirements, and are competitively priced.

Precedent™ features cutting edge technologies: reliable compressors, Trane® engineered ReliaTel™ controls, computer-aided run testing, and Integrated Comfort™ Systems. So, whether you're the contractor, the engineer, or the owner you can be certain Precedent™ Products are built to meet your needs.

Through the years, Trane® has designed and developed the most complete line of Packaged Rooftop products available in the market today. Trane® was the first to introduce the Micro—microelectronic unit controls—and has continued to improve and revolutionize this design concept.

Electromechanical controls are available for simpler applications, and for the more sophisticated, ReliaTel™ microprocessor controls.

The ReliaTel™ control platform offers the same great features and functionality as the original Micro, with additional benefits for greater application flexibility.

With its sleek, compact cabinet, Precedent™ continues to provide the highest standards in quality and reliability, comfort, ease of service, and the performance of Trane® light commercial products.

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Revision History

- For 13 SEER information, please reference the previous version, (March 2016) of this catalog
- Updated catalog to include new 14SEER heat pumps, WSC***H

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Features and Benefits

Options¹

Factory Installed Options

- Air-Fi™ Wireless Communication Interface
- Black Epoxy Pre-Coated Coils
- CO₂ Sensor (Wiring Only)
- Condensate Overflow Switch
- Fault Detection & Diagnostics (FDD); Meets CA Title 24 Requirements
- Hinged Access Doors
- Human Interface - 5 inch Color Touchscreen
- Multi-Speed Indoor Fan System
- Powered or Unpowered Convenience Outlet
- Single Zone Variable Air Volume (SZVAV)
- Stainless Steel Drain Pan
- Supply, Return or Plenum Air Smoke Detector
- Through-the-Base Electrical Access
- Through-the-Base Electrical with Circuit Breaker
- Through-the-Base Electrical with Disconnect Switch
- 2" MERV 8 Filters or 2" MERV 13 Filters with Filter Removal Tool

Factory or Field Installed Options

- Barometric Relief
- Clogged Filter/Fan Failure Switch
- Discharge Air Temperature Sensing Kit
- Economizer: Standard and Low Leak
- Electric Heaters
- Froststat™
- Hail Guards
- High Static Motor
- LonTalk® Communications Interface (LCI)
- BACnet® Communications Interface (BCI)
- Reference or Comparative Enthalpy
- Trane® Communications Interface (TCI)

Field Installed Options

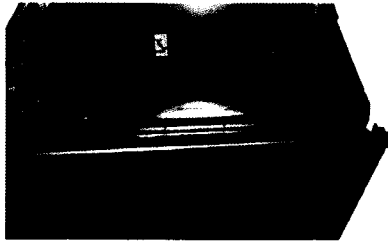
- CO₂ Sensor Only Kit / CO₂ Sensor and Wiring Kit
- Dual Thermistor Remote Zone Sensor
- Economizer: Low Leak
- High Altitude Kit
- High Static Drive

¹ Refer to Model Number Description for option availability.



Features and Benefits

Condenser Coil

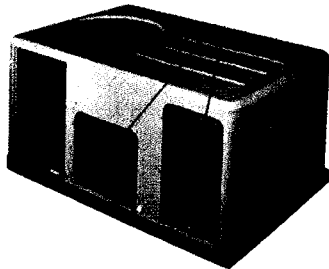


Precedent™ boasts a patent-pending 1+1+1 condenser coil, permanently gapped for easy cleaning.

Controls – ReliaTel™

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

Convertible Units



The units ship in a downflow configuration. They can be easily converted to horizontal by simply moving two panels.

Units come complete with horizontal duct flanges so the contractor doesn't have to field fabricate them. These duct flanges are a time and cost saver.

Cooling

Standard or High Efficiency cooling available.

Crankcase Heaters

These band heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions.

IAQ Dual Sloped, Plastic, Removable, Reversible Drain Pans



Every Precedent™ unit has a plastic, removable, dual-sloped drain pan that's easy to clean and reversible to allow installation of drain trap on either side of the unit.

Easy Access Low Voltage Terminal Board

Precedent's™ low voltage terminal board is external to the electrical control cabinet. It is extremely easy to locate and attach the thermostat wire and test operation of all unit functions. This is another cost and time saving installation feature.



Features and Benefits

Variety of Options

Factory Installed Options¹

Trane® Air-Fi™ Wireless

Trane® Air-Fi™ wireless communication is a reliable, flexible solution that frees you from the hassles associated with wired components for your building controls system. With Air-Fi™ wireless, you get easy problem solving, efficient performance, and cost savings over the life of the equipment.

Black Epoxy Pre-Coated Coils

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

Circuit Breaker (Required with Through-the-Base Electrical)



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

CO₂ Sensor Wiring

Factory-installed CO₂ sensor wiring saves time and ensures proper unit connections for the field installed CO₂ sensor kits.

Condensate Overflow Switch

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

Disconnect Switch (Available with Through-the-Base Electrical)

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

Codes require a method of assured unit shutdown for servicing. Field-installed disconnects sometimes interfere with service access. Factory installation of unit disconnects reduces costs, assures proper mounting and provides the opportunity to upgrade to unit circuit breaker protection.

Fault Detection & Diagnostics (FDD)

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.

High Efficiency Filtration

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

¹ Refer to Model Number Description for option availability.



Features and Benefits

24. The result is an optimized balance between zone temperature control and system energy savings. Depending on your specific application, energy savings can be as much as 20+%.

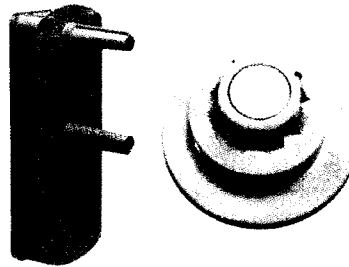
Note: Building system modeling in energy simulation software like TRACE is recommended to evaluate performance improvements for your application.

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

Stainless Steel Drain Pan

For excellent corrosion and oxidation resistance, the optional stainless steel drain pan provides a cleanable surface that complement other IAQ solutions such as high efficiency filtration (MERV 8 or 13) and demand control ventilation (CO₂).

Supply, Return, and Plenum Air Smoke Detector



With this option installed, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. In order for the supply air smoke detector or return air smoke detector to properly sense smoke in the supply air stream or the return air stream, the air velocity entering the smoke detector unit must be between 500 - 4000 feet per minute. Equipment covered in this manual will develop an airflow velocity that falls within these limits over the entire airflow range specified in the evaporator fan performance table. Supply and/or return smoke detectors may not be used with the plenum smoke detector.

Note: Plenum smoke detectors have no auxiliary contacts for external connections.

Through-the-Base Electrical Utility Access



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

Factory provided through-the-base openings simplify wiring and piping. Because these utility openings frequently minimize the number of roof penetrations, the integrity of roofing materials is enhanced.

Factory or Field Installed Options¹

Barometric Relief

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

¹ Refer to Model Number Description for option availability.



Features and Benefits

Reference or Comparative Enthalpy

Measures and communicates humidity while maximizing comfort control.

Field Installed Options¹

CO₂ Sensing Kits

Two field installed kits are offered: CO₂ sensor and wiring or CO₂ sensor only. The CO₂ sensor only kit should be ordered with factory installed CO₂ sensor wiring. Factory installed CO₂ sensor wiring saves set-up time and ensures proper unit connections for the CO₂ sensor.

The CO₂ sensor has the ability to monitor space occupancy levels within the building by measuring the parts per million of CO₂ (Carbon Dioxide) in the air. As the CO₂ levels increase, the outside air damper modulates to meet the CO₂ space ventilation requirements.

High Static Drive

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

Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (3 cfm/ft²@1" wg exterior air, 4 cfm/ft²@1" wg return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. Available on downflow units only.

Quick Adapt Curbs

Enables easy conversion of existing Voyager™ 3 to 10 ton units to Precedent™ units on replacement jobs.

Roof Curbs

Available for downflow units. Only three roof curbs for the entire line simplifies curb selection.

Remote Potentiometer

When properly installed in the economizer control circuitry, this accessory provides a remote variable resistance to enable the operator to adjust the minimum damper position.

Ventilation Override Accessory

With the ventilation override accessory installed, the unit can be set to transition to up to 3 different pre-programmed sequences for smoke purge, pressurization, and exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard wired relay output from a smoke detector or fire control panel. The ventilation override kit is available as a field installed accessory.

Zone Sensors/Thermostats

Available in programmable, automatic and manual styles.

Other Benefits

Airflow Distribution

Airflow is outstanding. Precedent™ can replace an older machine with old ductwork and, in many cases, improve the comfort through better air distribution.

¹ Refer to Model Number Description for option availability.



Features and Benefits

Some zone sensor options have central control panel lights which indicate the mode the unit is in and possible diagnostic information (dirty filters for example).

Other ReliaTel™ Benefits

The ReliaTel™ built-in anti-shortcycle timer, time delay relay and minimum “on” time control functions are factory tested to assure proper operation.

ReliaTel™ softens electrical “spikes” by staging on fans, compressors and heaters.

Intelligent fallback is a benefit to the building occupant. If a component fails, the unit will continue to operate at predetermined temperature setpoint.

Intelligent anticipation is a standard ReliaTel™ feature. It functions continuously as ReliaTel™ and zone sensor(s) work together in harmony to provide much tighter comfort control.

The same ReliaTel™ board fits all heat pump models. This provides standardization of parts for contractors. Less money is tied up in inventory with ReliaTel™.

Unit Cabinet

The compact cabinet with rounded corners takes up less room and is less costly to ship. The beveled and ribbed top is not only aesthetically pleasing, it is designed to prevent water from pooling.

Rigorous Testing

All of Precedent's™ designs were rigorously rain tested at the factory to ensure water integrity.

Actual shipping tests were performed to determine packaging requirements. Units were test shipped around the country to determine the best packaging. Factory shake and drop tests were used as part of the package design process to help assure that the unit arrives at the job site in top condition.

Rigging tests include lifting a unit into the air and letting it drop one foot, assuring that the lifting lugs and rails hold up under stress.

We perform a 100% coil leak test at the factory. The evaporator and condenser coils are leak tested at 600 psig. The assembled unit is leak tested to 465 psig.

All parts are inspected at the point of final assembly. Sub-standard parts are identified and rejected immediately.

Every unit receives a 100% unit run test before leaving the production line to make sure it lives up to rigorous Trane® requirements.



Selection Procedure

Cooling Capacity

Step 1.

Calculate the building's total and sensible cooling loads at design conditions. Use the Trane® calculation methods or any other standard accepted method.

Factors used in unit selection:

- Total Cooling Load: 71 MBh
- Sensible Cooling Load: 450 MBh
- Airflow: 2400 cfm
- Electrical Characteristics: 460/60/3
- Summer Design Conditions: Entering
- Evaporator Coil: 80 DB, 67 WB Outdoor Ambient: 95
- External Static Pressure: 0.47 in. wg
- Downflow Configuration
- Economizer

Step 2.

As a starting point, a rough determination must be made of the size of the unit. The final selection will be made after examining the performance at the given conditions. Divide the total cooling load by nominal BTUH per ton (12 MBh per ton); then round up to the nearest unit size.

71 MBh / 12 MBh = approx. 6 tons

Step 3.

Table 6, p. 28 shows that a WSC072E4 has a **gross** cooling capacity of 78.01 MBh and 56.74 MBh sensible capacity at 2400 cfm and 95 DB outdoor ambient with 80 DB, 67 WB air entering the evaporator.

To Find Capacity at Intermediate Conditions not in the table.

When the design conditions are between two numbers that are in the capacity table, interpolation is required to approximate the capacity.

Note: Extrapolation outside of the table conditions is not recommended.

Step 4.

In order to select the correct unit which meets the building's requirements, the fan motor heat must be deducted from the gross cooling capacity. The amount of heat that the fan motor generates is dependent on the effort by the motor - cfm and static pressure. To determine the total unit static pressure:

External Static Duct System	0.47 wg
Economizer from Table 23, p. 40 (100% Outside Air)	0.11 wg
Electric Heater Size 9 kW from Table 30, p. 48	0.02 wg
(reference "Heating Capacity" section on this page for determination of heater size)	
Total Static Pressure	0.60 wg

With 2400 cfm and 0.60 wg. Table 12, p. 34 shows 0.75 bhp for this unit. Note below the table gives a formula to calculate Fan Motor Heat,

$$2.829 \times \text{bhp} + 0.4024 = \text{MBh}$$

$$2.829 \times 0.75 + 0.4024 = 2.98 \text{ MBh}$$

Now subtract the fan motor heat from the gross cooling capacity of the unit:

Net Total Cooling Capacity
= 78.0 MBh - 2.98 = 75.02 MBh

Net Sensible Cooling Capacity
= 56.74 MBh - 2.98 = 53.76 MBh



Model Number Description

Digit 1 - Unit Type

W Packaged Heat Pump³

Digit 2 - Efficiency

S Standard Efficiency

Digit 3 - Airflow

C Convertible

Digit 4,5,6 - Nominal Gross Cooling Capacity (MBh)

036 3Ton
048 4Ton
060 5Ton
072 6Ton
090 7.5Ton, Single Compressor
120 10Ton

Digit 7 - Major Design Sequence

Digit 8 - Voltage Selection

3 208-230/60/3
4 460/60/3
W 575/60/3

Digit 9 - Unit Controls

R ReliaTel™ Microprocessor

Digit 10 - Heating Capacity

0 No Electric Heat
A 5 kW (1 phase)¹
B 6 kW
C 9 kW
E 12 kW
G 18 kW
J 23 kW
K 27 kW
N 36 kW
P 54 kW

Digit 11 - Minor Design Sequence

A First Sequence

Digit 12,13 - Service Sequence

** Factory Assigned

Digit 14 - Fresh Air Selection

0 No Fresh Air
A Manual Outside Air Damper 0-50%²
B Motorized Outside Air Damper 0-50%¹¹
C Economizer, Dry Bulb 0-100% without Barometric Relief⁵
D Economizer, Dry Bulb 0-100% with Barometric Relief⁵
E Economizer, Reference Enthalpy 0-100% without Barometric Relief⁵
F Economizer, Reference Enthalpy 0-100% with Barometric Relief⁵
G Economizer, Comparative Enthalpy 0-100% without Barometric Relief⁵
H Economizer, Comparative Enthalpy 0-100% with Barometric Relief⁵
K Low Leak Economizer with Barometric Relief
M Low Leak Economizer with Reference Enthalpy with Barometric Relief

P Low Leak Economizer with Comparative Enthalpy with Barometric Relief

Digit 15 - Supply Fan/Drive Type/Motor

0 Standard Drive⁴
1 Oversized Motor
2 Optional Belt Drive Motor
6 Single Zone Variable Air Volume (SZVAV)¹⁵
7 Multi-Speed Indoor Fan¹³

Digit 16 - Hinged Service Access/ Filters

0 Standard Panels/Standard Filters
A Hinged Access Panels/Standard Filters
B Standard Panels/2" MERV 8 Filters
C Hinged Access Panels/2" MERV 8 Filters
D Standard Panels/2" MERV 13 Filters
E Hinged Access Panels/2" MERV 13 Filters

Digit 17 - Condenser Coil Protection

0 Standard Coil
1 Standard Coil with Hail Guard
2 Black Epoxy Pre-Coated Condenser Coil
3 Black Epoxy Pre-Coated Condenser Coil with Hail Guard

Digit 18 - Through-the-Base Provisions

0 No Through-the-Base Provisions
A Through-the-Base Electric⁶

Digit 19 - Disconnect/Circuit Breaker (three-phase only)

0 No Disconnect/No Circuit Breaker
1 Unit Mounted Non-Fused Disconnect⁵
2 Unit Mounted Circuit Breaker⁶

Digit 20 - Convenience Outlet

0 No Convenience Outlet
A Unpowered Convenience Outlet
B Powered Convenience Outlet (three-phase only)⁷

Digit 21 - Communications Options

0 No Communications Interface
1 Trane® Communications Interface
2 LonTalk® Communications Interface
6 BACnet® Communications Interface
7 Air-Fi™ Wireless Communications¹⁶

Digit 22 - Refrigeration System Option

0 Standard Refrigeration System⁸

Digit 23 - Refrigeration Controls

0 No Refrigeration Control³
1 Froststat™¹²
2 Crankcase Heater¹⁷
3 Froststat and Crankcase Heater^{12,17}

Digit 24 - Smoke Detector

0 No Smoke Detector
A Return Air Smoke Detector⁹
B Supply Air Smoke Detector
C Supply and Return Air Smoke Detectors⁹
D Plenum Smoke Detector

Digit 25 - System Monitoring Controls

0 No Monitoring Control
1 Clogged Filter Switch
2 Fan Failure Switch
3 Discharge Air Sensing Tube
4 Clogged Filter Switch and Fan Fail Switch
5 Clogged Filter Switch and Discharge Air Sensing Tube
6 Fan Fail Switch and Discharge Air Sensing Tube
7 Clogged Filter and Fan Fail Switches and Discharge Air Sensing Tube
A Condensate Drain Pan Overflow Switch
B Clogged Filter Switch and Condensate Drain Pan Overflow Switch
C Fan Failure Switch and Condensate Drain Pan Overflow Switch
D Discharge Air Sensing and Condensate Drain Pan Overflow Switch
E Clogged Filter Switch, Fan Failure Switch and Condensate Drain Pan Overflow Switch
F Clogged Filter Switch, Discharge Air Sensing Tube and Condensate Drain Pan Overflow Switch
G Fan Failure Switch, Discharge Air Sensing Tube and Condensate Drain Pan Overflow Switch
H Clogged Filter Switch, Fan Failure Switch, Discharge Air Sensing and Condensate Drain Pan Overflow Switch

Digit 26 - System Monitoring Controls

0 No Monitoring Controls
A Demand Control Ventilation (CO₂)¹⁴
B Low Leak Economizer with FDD (Fault Detection & Diagnostics)
C FDD (Fault Detection & Diagnostics) with DCV (Demand Control Ventilation)

Digit 27 - Unit Hardware Enhancements

0 No Enhancements
1 Stainless Steel Drain Pan



General Data

Table 1. General data - 3 to 4 tons - standard efficiency

	3 Tons	4 Tons	5 Tons
	WSC036H3,4,W	WSC048H3,4,W	WSC060H3,4,W
Cooling Performance^(a)			
Gross Cooling Capacity	39,500	50,000	61,000
EER/SEER ^(b)	12.0/14.0	12.0/14.0	12.0/14.0
Nominal cfm/AHRI Rated cfm	1,200/1,200	1,600/1,600	2,000/2,000
AHRI Net Cooling Capacity	39,000	49,000	60,000
System Power (kW)	3.25	4.08	5.00
Heating Performance^(c)			
High Temp. Btuh Rating	36,000	47,500	59,000
System Power kW/COP	3.01/3.50	3.98/3.50	4.94/3.50
Low Temp. Btuh Rating	20,600	26,000	35,000
System Power kW/COP	2.74/2.20	3.31/2.30	4.46/2.30
HSPF (Btu/Watts-hr)	8.00	8.20	8.20
Compressor			
Number/Type	1/Scroll	1/Scroll	1/Scroll
Sound			
Outdoor Sound Rating (dB) ^(d)	79	80	87
Outdoor Coil - Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.33	12.33	17.00
Rows/FPI	2/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Indoor Coil - Type	Lanced	Lanced	Lanced
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	8.74	8.74	9.27
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan - Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/22	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3,600	4,050	5,130
Motor hp	0.25	0.33	0.40
Motor rpm	1,100	1,100	1,100
Indoor Fan - Type (Standard)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/11x11	1/11x11	1/11x11
Drive Type/No. Speeds/rpm	Direct/5 ^(e)	Direct/5 ^(e)	Direct/5 ^(e)
Motor hp (standard/oversized)	0.75/1.5	1.0/1.5	1.0/1.5
Motor Frame Size (standard/oversized)	48/48	48/48	48/48
Filters^(f) - Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(2) 20x35x2	(2) 20x35x2	(4) 16x25x2

continued on next page



General Data

Table 2. General data - 6 to 10 tons - standard efficiency (continued)

	6 Tons	7.5 Tons	10 Tons
	WSC072E3,4,W	WSC090E3,4,W	WSC120E3,4,W
Outdoor Fan - Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/26	1/26	1/30
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	5,800	6,200	6,900
Motor hp	0.70	0.75	0.75
Motor rpm	1,100	1,100	1,100
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	BC Plenum
Number Used/Diameter (in.)/Width (in.)	1/12x12	1/15 x 15	1/19.7 x 15
Drive Type/No. Speeds/rpm	Belt/Variable/1,750	Belt/Variable/1,750	Direct/Variable ^(f)
Motor hp (Standard/Oversized)	1.0/2.0	1.0/3.0	3.75/—
Motor Frame Size (Standard/Oversized)	56/56	56/56	—/—
Filters^(g) - Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 16x25x2	(4) 20x25x2	(3) 20x25x2 (2) 20x30x2
Refrigerant Charge^(h)			
Pounds of R-410A	12.00	13.80	9.75/9.31

(a) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 340/360.

(b) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.

(c) Integrated Efficiency Ratio (IEER) is rated in accordance with AHRI Standard 340/360. The IEER rating requires that the unit efficiency be determined at 100%, 75%, 50% and 25% load (net capacity) at the specified in AHRI Standard.

(d) Heating performance is rated at 47°F ambient with 43°F wet bulb, 70°F entering dry bulb, 60°F entering wet bulb. High Temp. Btuh Rating includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI Standard 340/360.

(e) Outdoor Sound Rating shown is tested in accordance with AHRI Standard 270. For additional information reference the outdoor sound power level data in the performance section.

(f) For multispeed direct drive rpm values, reference the direct drive, evaporator fan performance table.

(g) Optional 2" MERV 8 and MERV 13 filters also available.

(h) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.



Introduction

Packaged Rooftop Air Conditioners

Trane customers demand products that provide exceptional reliability, meet stringent performance requirements, and are competitively priced. Trane delivers with Precedent™.

Precedent features cutting edge technologies: reliable compressors, Trane engineered ReliaTel controls, computer-aided run testing, and Integrated Comfort™ Systems. So, whether you're the contractor, the engineer, or the owner you can be certain Precedent products are built to meet your needs.

Through the years, Trane has designed and developed the most complete line of Packaged Rooftop products available in the market today. Trane was the first to introduce the Micro—microelectronic unit controls—and has continued to improve and revolutionize this design concept.

Electromechanical controls are available for simpler applications, and for the more sophisticated, ReliaTel™ microprocessor controls.

The ReliaTel™ control platform offers the same great features and functionality as the original Micro, with additional benefits for greater application flexibility.

With its sleek, compact cabinet, Precedent continues to provide the highest standards in quality and reliability, comfort, ease of service, and the performance of Trane light commercial products.

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Revision History

- Added Trane® Air-Fi™ Wireless Communication Interface
- General data, 3 to 5 tons, standard efficiency updates
- General data, 6 to 7½ tons, high efficiency updates
- Electrical data updates
- Mechanical specs, indoor fan update



Features and Benefits

Standard Features

- 5-year Limited Compressor Warranty
- 5-year Limited Heat Exchanger Warranty
- 1-year Limited Parts Warranty
- Anti-Short Cycle Timer (Standard with ReliaTel™)
- Colored and Numbered Wiring
- Convertible Airflow
- Crankcase Heaters¹
- Direct Drive Plenum Fan²
- Easy Access Low Voltage Terminal Board (LTB)
- Electromechanical or ReliaTel Microprocessor Controls
- Filters are Standard on all Units
- Foil-Faced and Edge Captured Insulation
- High Pressure Control
- IAQ Dual Sloped, Plastic, Removable, Reversible Drain Pan
- Liquid Line Refrigerant Drier
- Low Ambient Cooling to 0°F on Microprocessor Models
- Low Ambient Cooling to 40°F on Electromechanical Models
- Low Pressure Control
- Microchannel Coils³
- Multispeed Direct Drive Motors
- Operating Charge of R-410A
- Plastic Drain Pan
- Patent-Pending Hybrid Condenser Coil for easy cleaning
- Phase Loss Protection
- Phase Monitor
- Phase Reversal Protection
- Phase Balance Protection
- Progressive Tubular Aluminized Steel Heat Exchanger
- Provisions for Through-the-Base Gas and Condensate Drain Connections
- Quick Access Panels
- Quick Adjust Fan Motor Mounting Plate
- Single Point Power
- Single Side Service
- Standardized Components
- Thermal Expansion Valve

¹ Crankcase heaters are optional on (T/Y)SC (033, 036, 043, 048, 060, 063, 072, 090, 102, 120); standard on (T/Y)HC (036, 048, 060, 072, 074, 092, 102, 120)

² Standard on: (T/Y)SC120F, (T/Y)HC074, 092, 102F, (T/Y)HC120F

³ The microchannel type condenser coil is standard for T/YSC(072,090,092,102,120)F, T/YHC(048,060,072,074,092,102,120)F and (T/Y)SC (033,036,043,048,060,063)G models.



Features and Benefits

- BACnet® Communications Interface (BCI)
- Reference or Comparative Enthalpy
- Tool-less Hail Guards
- Trane Communications Interface (TCI)

Field Installed Options

- CO₂ Sensor¹
- Dual Thermistor Remote Zone Sensor
- Economizer: Low Leak
- High Altitude Kit
- High Static Drive
- Humidity Sensor/Humidistat
- LP Conversion Kit
- Manual Outside Air Damper
- Motorized Outside Air Dampers
- Powered Exhaust
- Quick Adapt Curbs
- Quick Start Kit
- Remote Potentiometer
- Roof Curb
- Thermostat
- Ventilation Override Accessory
- Wireless Zone Sensor
- Zone Sensor

Other Benefits

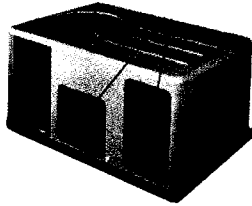
- Cabinet design ensures water integrity
- Ease of Service, Installation and Maintenance
- Mixed model build enables “fastest in the industry” ship cycle times
- Outstanding Airflow Distribution
- ReliaTel™ Controls
- Unmatched Product Support is one of our finest assets. Trane Sales Representatives are a Support Group that can assist you with:
 - Product
 - Application
 - Service
 - Training
 - Special Applications
 - Specifications
 - Computer Programs and much more

¹ CO₂ sensor always field installed; associated with demand control ventilation



Features and Benefits

Convertible Units



The units ship in a downflow configuration. They can be easily converted to horizontal by simply moving two panels.

Units come complete with horizontal duct flanges so the contractor doesn't have to field fabricate them. These duct flanges are a time and cost saver.

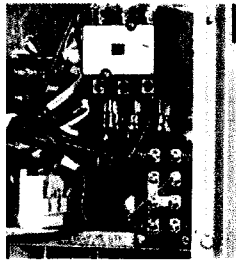
Cooling

Standard or high efficiency cooling available.

Crankcase Heaters¹

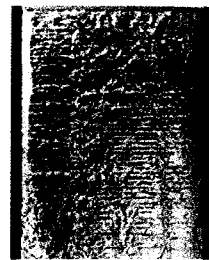
These band heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions.

Easy Access Low Voltage Terminal Board



Precedent's low voltage terminal board is external to the electrical control cabinet. It is extremely easy to locate and attach the thermostat wire and test operation of all unit functions. This is another cost and time saving installation feature.

Foil Faced Insulation



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

Heat Exchanger

The compact cabinet features a progressive tubular heat exchanger in low, medium and high heat capacities.

The heat exchanger is fabricated using stainless steel burners and corrosion-resistant aluminized steel tubes as standard on all models. It has an induced draft blower to pull the gas mixture through the burner tubes. The heater has a direct spark ignition system which doubles as a safety device to prove the flame.

High Pressure Control

All units include high pressure control as standard.

IAQ Dual Sloped, Plastic, Removable, Reversible Drain Pans



Every Precedent™ unit has a plastic, removable, dual-sloped drain pan that's easy to clean and reversible to allow installation of drain trap on either side of the unit.

¹ Crankcase heaters are optional on (T/Y)SC (033, 0643, 063, 036, 048, 060, 072, 090, 102, 120); standard on (T/Y)HC (036, 048, 060, 072, 074, 092, 102, 120)



Features and Benefits

Variety of Options

Factory Installed Options¹

Trane® Air-Fi™ Wireless

Trane® Air-Fi™ wireless communication is a reliable, flexible solution that frees you from the hassles associated with wired components for your building controls system. With Air-Fi™ wireless, you get easy problem solving, efficient performance, and cost savings over the life of the equipment.

Belt Drive Motors (Three-phase)



For additional static requirements, Precedent™ 3 to 5 tons, high efficiency (15 SEER) units offer an optional belt drive motor to meet a wide range of airflow needs.

Black Epoxy Pre-Coated Coils²

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

CO₂ Sensor Wiring

This unit wiring for field installed CO₂ sensors. Factory-installed CO₂ sensor wiring saves time and ensures proper unit connections for the field installed CO₂ sensor kits.

CompleteCoat™ Condenser Coil

These coils provide excellent corrosion resistance as well as uniformity of coverage and coating thickness. This option is available for both fin-tube and microchannel condenser coils.

Condensate Overflow Switch

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

Fault Detection & Diagnostics (FDD)

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.

High Efficiency Filtration

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

Novar Unit Controls

Novar 3051 and 2024 are available for Precedent™ gas and electric heat models.

¹ Refer to Model Number Description for option availability.

² Not available on microchannel condenser coils.



Features and Benefits

Multi-Speed Indoor Fan System

Multi-speed indoor fan system is designed for use in applications for meeting the minimum requirement of CA Title 24.

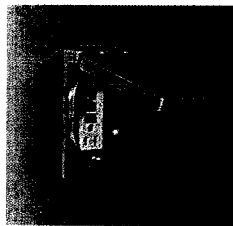
This system incorporates a multi-speed fan control to change the speed of the fan to 66% of full airflow based off of compressor stages.

Multiple-Zone VAV Control

A multiple-zone VAV (MZVAV) system consists of a packaged rooftop unit that serves several individually controlled zones. Each zone is equipped with a VAV terminal unit that varies the quantity of air delivered to maintain the desired temperature in that zone. The rooftop unit controller varies the speed of the indoor fan to maintain the static pressure in the supply ductwork at a setpoint, ensuring that all zones receive the necessary quantity of air. In addition, cooling capacity is cycled to maintain the supply air temperature at the desired setpoint.

For decades, Trane has been an industry leader in rooftop VAV systems. Now, multiple-zone VAV control is available in the light commercial rooftop platform (3-25 tons).

Powered or Unpowered Convenience Outlet



This option is a GFCI, 120V/15amp, 2 plug, convenience outlet, either powered or unpowered. This option can only be ordered when through-the-base electrical with either the disconnect switch or circuit breaker option is ordered.

Note: Not available on 575V units.

Note: Not available on 3 to 5 ton high efficiency units with direct drive indoor motor.

Single Zone VAV – One Zone Variable Air Volume Mode

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

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

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

Stainless Steel Drain Pan

For excellent corrosion and oxidation resistance, the optional stainless steel drain pan provides a cleanable surface that complement other IAQ solutions such as high efficiency filtration (MERV 8 or 13), demand control ventilation (CO₂), and hot gas reheat.



Features and Benefits

Discharge Air Temperature Sensing Kit

Provides true discharge air temperature sensing in heating models. The kit is functional only with the ReliaTel™ options module.

Economizer (Standard)

This accessory shall be available with or without barometric relief. The assembly includes fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control. The barometric relief shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment "off" cycle. Optional solid state or differential enthalpy control shall be available for either factory or field installation. The economizer arrives in the shipping position and shall be moved to the operating position by the installing contractor.

Electric Heaters

Electric heat modules are available within the basic unit. If ordering the through-the-base electrical option with an electrical heater, the heater must be factory installed.

Fresh Air Options – Dampers and Economizer

0 - 25% manual or 0 - 50% motorized outside air hoods are available.

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

Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (3 cfm/ft²@1" wg exterior air, 4 cfm/ft²@1" wg return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. This option can be paired with or without fault detection & diagnostics (FDD) to meet current mandatory CA Title 24 requirements. Available on downflow units only.

The economizers come with three control options, dry bulb and reference or comparative enthalpy (optional).

Frostat™

This capillary bulb embedded in the face of the evaporator coil or thermostat on the suction line monitors coil temperature to prevent evaporator icing and protect the compressor. Recommended for applications with low leaving air temperatures, low airflow and or high latent load applications. Frostat™ is standard on all single-zone VAV and multiple-zone VAV models and T/YSC033 to 063G electromechanical control units.

LonTalk® Communications Interface

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

BACnet® Communications Interface

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

Reference or Comparative Enthalpy

Measures and communicates humidity while maximizing comfort control.



Features and Benefits

Quick Start Kits

Single phase equipment to enable startup and prevent building lighting dimming during low voltage.

Roof Curbs

Available for downflow units. Only three roof curbs for the entire line simplifies curb selection.

Remote Potentiometer

When properly installed in the economizer control circuitry, this accessory provides a remote variable resistance to enable the operator to adjust the minimum damper position.

Ventilation Override Accessory

With the ventilation override accessory installed, the unit can be set to transition to up to 3 different pre-programmed sequences for smoke purge, pressurization, and exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard wired relay output from a smoke detector or fire control panel. The ventilation override kit is available as a field installed accessory.

Zone Sensors/Thermostats

Available in programmable, automatic and manual styles.

Other Benefits

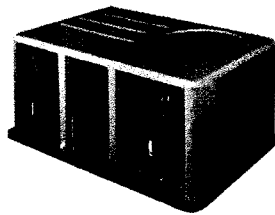
Easy to Install, Service and Maintain

Because today's owners are very cost-conscious when it comes to service and maintenance, the Precedent™ was designed with direct input from service contractors. This valuable information helped to design a product that would get the service person off the job quicker and save the owner money. Precedent™ offers outstanding standard features enhanced by a variety of factory and field installed options, multiple control options, rigorously tested proven designs and superior product and technical support.

Airflow Distribution

Airflow is outstanding. Precedent™ can replace an older machine with old ductwork and, in many cases, improve the comfort through better air distribution.

Cabinet Integrity



For added water integrity, Precedent™ has a raised 1 1/8" lip around the supply and return of the downflow units to prevent water from blowing into the ductwork.

Flexibility

Precedent offers ultimate flexibility. Units are built to order in our standard "shortest in the industry" ship cycle time.

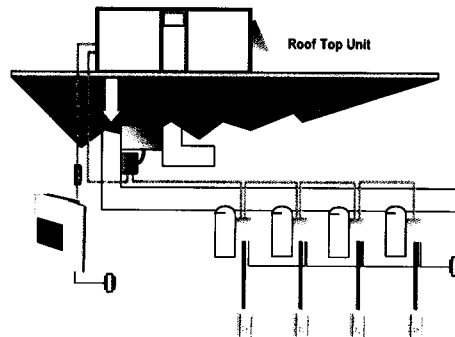


Features and Benefits

Unit Cabinet

The compact cabinet with rounded corners takes up less room. The beveled and ribbed top is aesthetically pleasing and designed to prevent water from pooling.

VariTrac® – Changeover-Bypass System



A changeover-bypass system consists of a packaged rooftop unit that serves several individually controlled zones. Each zone is equipped with a damper that varies the quantity of air delivered to maintain the desired temperature in that zone. However, unlike a conventional multiple-zone system, the fan inside the rooftop unit operates at a constant speed. Any unneeded air is diverted to the return air stream through a bypass damper.

The term “changeover” refers to how this system handles the cooling and heating requirements of the building. The central rooftop unit can provide either cooled or heated air, and it makes this decision by periodically “polling” the zones.

Note: VariTrac® is for Precedent™ units with constant-speed indoor fan control. It is not for use with multiple-speed indoor fan control, single-zone VAV control, or multiple-zone VAV control.

Rigorous Testing

All of Precedent’s designs were rigorously rain tested at the factory to ensure water integrity.

Actual shipping tests were performed to determine packaging requirements. Units were test shipped around the country to determine the best packaging design. Factory shake and drop tests were used as part of the package design process to help assure that the unit arrives at the job site in top condition.

Rigging tests include lifting a unit into the air and letting it drop one foot, assuring that the lifting lugs and rails hold up under stress.

We perform a 100% coil leak test at the factory. The evaporator and condenser coils are leak tested at 600 psig. The assembled unit is leak tested to 465 psig.

All parts are inspected at the point of final assembly. Sub-standard parts are identified and rejected immediately.

Every unit receives a 100% unit run test before leaving the production line to make sure it meets rigorous Trane requirements.



Application Considerations

Heating Operation

The heat exchanger is manufactured with aluminized steel. To prevent condensation within the heat exchanger, do not exceed 50% outside air or a minimum mixed air temperature of 40°F.

Low Airflow Operation

Units equipped electric heat or staged gas heat may not be selected for supply airflow less than 320 cfm/ton. Cooling-only units can be used in applications designed for supply airflow below 320 cfm/ton. The units must be high-efficiency models with dehumidification (hot gas reheat) or be equipped with a TXV, Froststat™, and crankcase heaters.

Units selected with multiple-speed indoor fan control, single-zone VAV control, or multiple-zone VAV control are capable of operating at supply airflows below 320 cfm/ton at part-load conditions, but design (or "full") airflow must be set to 320 cfm/ton or higher.

Low Ambient Cooling

The Precedent™ line features, with ReliaTel™ microprocessor controls, low ambient cooling down to 0°F. With electromechanical controls, Precedent features low ambient cooling to 40°F. The following features or options need to be included/considered when low ambient applications are required: continuous fan operation, crankcase heaters, thermal expansion valves, Froststat™.

Contact a local Trane representative for more assistance with low ambient cooling applications.

Optional Stainless Steel Heat Exchanger

The optional stainless steel heat exchanger is manufactured with 409 stainless steel. To prevent corrosion and prolong heat exchanger reliability, the minimum mixed air temperature allowed across the heat exchanger is 20°F.

The stainless steel heat exchanger option is an excellent option that compliments the dehumidification package. Whenever high outside air or outside applications exist, these options should be utilized.

VariTrac®

VariTrac is for Precedent™ units with constant-speed indoor fan control. It is not for use with Multiple-speed indoor fan control, single-zone VAV control, or multiple-zone VAV control.

Unit Pitch

The unit has a reversible sloped condensate drain pans. The unit must be installed level. Any unit slope must be toward the side of unit where condensate drain is connected.



Selection Procedure

With 2000 cfm and 0.47 wg.

Table 34, p. 83 shows 0.58 bhp for this unit.

Note: Below the table is the formula to calculate Fan Motor Heat

$$2.87 \times \text{bhp} + 0.15 = \text{MBh}$$

$$2.87 \times 0.575 + 0.15 = 1.8 \text{ MBh}$$

Now subtract the fan motor heat from the gross cooling capacity of the unit:

Net Total Cooling Capacity

$$= 60 \text{ MBh} - 1.8 = 58.2 \text{ MBh}$$

Net Sensible Cooling Capacity

$$= 49 \text{ MBh} - 1.8 = 47.2 \text{ MBh}$$

Subtracting Sensible from Total Capacity to find Latent Capacity

Net Latent Capacity

$$= 60.5 - 46.3 = 11 \text{ MBh}$$

Step 5.

Compare your resulting capacities to the building load. If the performance will not meet the required load of the building's total or sensible cooling load, try a selection at the next higher size unit.

Heating Capacity

Note: Heating capacity procedure DIFFERS for electric heat (T°C) and gas heat (Y°C) units

Step 1.

Calculate the building heating load using the Trane calculation form or other standard accepted method.

Step 2.

Size the system heating capacity to match the calculated building heating load. The following are building heating requirements:

Total heating load of 15 MBh

2000 cfm

T°C units with optional electric heat: 460V/3 phase Power Supply

The electric heat accessory capacities are listed in Table 131, p. 176. From the table, a 6 kW heater will deliver 20.48 MBh at 480 volts. In order to determine capacity at 460 volts, the heater voltage correction factor from Table 132, p. 177 must be used. Therefore, $20.48 \text{ MBh} \times 0.918$ (voltage correction factor) = 18.8 MBh.

Y°C units with gas heat: Fuel- natural gas.

60 MBh, 80 MBh, 120 MBh, and 130 MBh input models shown in Table 129, p. 174. The output capacities of these furnaces are 49.2 MBh, 65.6 MBh, 98.4 MBh, and 106.6 MBh respectively. The low heat model with 49.2 MBh best matches the building requirements.

Air Delivery Selection

Note: Air Delivery procedure is the same for electric heat and gas heat units.)

External static pressure drop through the air distribution system has been calculated to be 0.5 inches of water. Enter Table 34, p. 83 for a TSC060G4 at 2000 cfm and 0.47 static pressure. The standard direct drive motor will give the desired airflow at a rated bhp of 0.58 and 924 rpm.



Selection Procedure

Subtract your sensible Δ temp from the entering db and latent Δ temp from the entering wb to determine the leaving evaporator db & wb (temperatures without the addition of fan heat).

52.7°F db
52.7°F wb
52.7°F dp

Step 3b:

Determine leaving unit temperature in standard cooling mode

Repeat Step 3a substituting **net** sensible or latent capacity for **gross** sensible or latent capacity to find the leaving unit temperature including fan heat.

53.7°F db
53.1°F wb

Step 4:

Determine reheat temperature rise

Using the leaving evaporator temp (SA'), go to Table 135, p. 179 and determine the reheat temperature rise for that particular cfm: $\approx 19.0^\circ\text{F db}$

Note: Reheat temperature rise is based on **supply airflow** and leaving **evaporator coil** temperature.

Step 5:

Determine leaving unit sensible temperature with reheat active (SA)

Reheat temperature (obtained in step 4) + (SA' + fan heat) = SA

(SA' + fan heat) = leaving unit temperature in standard cooling mode from step 3b.

$19.0^\circ\text{F db} + 53.7^\circ\text{F} = 72.7^\circ\text{F db}$

SA=72.7°F

Since reheat adds only sensible heat, the dewpoint temperature will remain constant so follow the dewpoint temperature line across the psychrometric chart to find the new wb temperature.

$\approx 60.5^\circ\text{F wb}$
52.7 dp
49.9% RH

If the space relative humidity is equal to or above the space relative humidity setpoint, the Dehumidification option will:

- Energize compressor or both compressors (2 stage compressor units).
- Hot gas reheat valve is energized and hot gas is diverted to the reheat coil.
- Dehumidification/reheat is terminated when space humidity is reduced to 5% below relative humidity setpoint.

At MA air enters the RTU. The RTU filters, cools, and dehumidifies the air as it moves through the evaporator coil. Air leaves the evaporator coil saturated at the preset dew point condition (SA') and is reheated by the hot gas reheat coil to deliver 72.7°F (SA) supply air to the space.



Model Number Description

Digit 25 - System Monitoring Controls

- 0 No Monitoring Control¹⁴
- 1 Clogged Filter Switch¹⁴
- 2 Fan Failure Switch¹⁴
- 3 Discharge Air Sensing Tube¹⁴
- 4 Clogged Filter Switch and Fan Failure Switch¹⁴
- 5 Clogged Filter Switch and Discharge Air Sensing Tube¹⁴
- 6 Fan Failure Switch and Discharge Air Sensing Tube¹⁴
- 7 Clogged Filter Switch, Fan Failure Switch and Discharge Air Sensing Tube¹⁴
- 8 Novar Return Air Sensor (NOVAR 2024)^{15,31}
- 9 Novar ZoneTemp Sensor (NOVAR 3051)^{19,31}
- A Condensate Drain Pan Overflow Switch
- B Clogged Filter Switch¹⁴ and Condensate Drain Pan Overflow Switch
- C Fan Failure Switch¹⁴ and Condensate Drain Pan Overflow Switch
- D Discharge Air Sensing¹⁴ and Condensate Drain Pan Overflow Switch
- E Clogged Filter Switch¹⁴, Fan Failure Switch¹⁴ and Condensate Drain Pan Overflow Switch
- F Clogged Filter Switch¹⁴, Discharge Air Sensing Tube¹⁴ and Condensate Drain Pan Overflow Switch
- G Fan Failure Switch, Discharge Air Sensing Tube¹⁴ and Condensate Drain Pan Overflow Switch
- H Clogged Filter Switch¹⁴, Fan Failure Switch¹⁴, Discharge Air Sensing¹⁴ and Condensate Drain Pan Overflow Switch

Digit 26 - System Monitoring Controls

- 0 No Monitoring Controls
- A Demand Control Ventilation (CO₂)^{32,33}
- B Low Leak Economizer with FDD (Fault Detection & Diagnostics)
- C FDD (Fault Detection & Diagnostics) with DCV (Demand Control Ventilation)

Digit 27 - Unit Hardware Enhancements

- 0 No Enhancements
- 1 Stainless Steel Drain Pan

Digit 31 - Advanced Unit Controls

- 0 Standard Unit Controls
- 1 Human Interface

Model Number Notes

- 1. Available on 3 to 5 ton models.

- 2. Crankcase heaters are optional on (T,Y)SC (036, 048, 060, 072, 090, 102, 120); standard on (T,Y)HC (036, 048, 060, 072, 074, 092, 102, 120).
- 3. Not available with electromechanical controls.
- 4. Manual outside air damper will ship factory supplied within the unit, but must be field installed.
- 5. High pressure control is standard on all units.
- 6. Multi-speed, direct drive motor with no belt drive option is standard on 3 to 5 ton, standard efficiency, 13/14 SEER units. Multi-speed, direct drive motor with a belt drive option is available for 3 to 5 ton, 15 SEER units. On 6 to 10 tons, multispeed direct drive is standard on all 10 ton and 6 (074) to 8½ ton high efficiency. Belt drive is standard on all other units.

Digit 15 = 0

Standard Efficiency
3 Phase (3 to 5 Ton) = Multispeed Direct Drive Motor
3 Phase (6 to 8½ Ton) = Belt Drive
3 Phase (10 Ton) = Ultra High Efficiency Direct Drive Plenum Fan
High Efficiency
1 Phase = High Efficiency Multispeed Direct Drive Motor
3 Phase (3 to 5 ton) = High Efficiency Multispeed Direct Drive Motor
3 Phase (3 to 5 ton w/Dehumidification) = Belt Drive Motor
3 Phase [6 (074) to 10 ton] = Ultra High Efficiency Direct Drive Plenum Fan

- 7. Economizer with barometric relief is for downflow configured units only. Order economizer without barometric relief for horizontal configuration. Barometric relief for horizontal configured units must be ordered as field installed accessory.
- 8. Through-the-base electric required when ordering disconnect/circuit breaker options.
- 9. Requires use of disconnect or circuit breaker.

Not Available

Standard Efficiency
3 to 5 Tons and 10 Ton w/575V
High Efficiency
3 to 5 Tons w/Standard Indoor Motor w/460V
High Efficiency 575V

- 10. Standard metering devices are TXVs.
- 11. Froststat™ cannot be field installed in electro-mechanical units.
- 12. The return air smoke detector may not fit up or work properly on the Precedent™ units when used in conjunction with 3rd party accessories such as bolt on heat wheels, economizers and power exhaust. Do not order the return air smoke detectors when using this type of accessory.
- 13. Return air smoke detector cannot be ordered with Novar controls.
- 14. These options are standard when ordering Novar controls.
- 15. This option is used when ordering Novar controls.
- 16. Includes gas piping and shutoff (field assembly required).
- 17. Not available with high temperature duct sensor accessory.
- 18. Digit 15 = 2
Standard Efficiency
3 Phase = Not Available
High Efficiency
1 Phase = Not Available
3 Phase (3 to 5 tons) = **May be Ordered**
3 Phase (3 to 5 tons w/dehumidification) = Not Available
3 Phase (6 to 10 tons) = Not Available
- 19. Novar sensor utilized with Digit 21 = (4) Novar 3051 controls without zone sensor.
- 20. Available for gas/electric, 3 to 5 tons, high efficiency, single phase models.
- 21. Available for all models except gas/electric, 3 to 5 tons high efficiency, single phase.
- 22. Requires selection of 2" pleated filters (option B or C) for Digit 16.



General Data

Table 1. General data - 3 to 5 tons - standard efficiency

	3 Tons	4 Tons	5 Tons
	T/YSC033G3,4,W	T/YSC043G3,4,W	T/YSC063G3,4,W
Cooling Performance^(a)			
Gross Cooling Capacity	37,000	49,000	60,000
EER/SEER ^(b)	11.2/13.0	10.9/13.0	11.0/13.0
Nominal cfm/AHRI Rated cfm	1,200/1,200	1,600/1,600	2,000/2,000
AHRI Net Cooling Capacity	36,000	48,000	58,500
System Power (kW)	3.21	4.40	5.32
Compressor			
Number/Type	1/Scroll	1/Scroll	1/Scroll
Sound			
Outdoor Sound Rating (dB) ^(c)	79	80	80
Outdoor Coil - Type	Microchannel	Microchannel	Microchannel
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.63	0.63	0.63
Face Area (sq. ft.)	10.50	10.50	10.50
Rows/FPI	1/16	1/16	1/16
Indoor Coil - Type	Microchannel	Microchannel	Microchannel
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.63	0.63	0.63
Face Area (sq. ft.)	6.98	6.98	6.98
Rows/FPI	2/16	2/16	2/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan - Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/22	1/22
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3600	4050	4050
Motor hp	0.25	0.33	0.33
Motor rpm	1100	1100	1100
Indoor Fan - Type (Standard)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1	1	1
Drive Type/No. Speeds/RPM	11x11	11x11	11x11
Number Motors	Direct/5 ^(d)	Direct/5 ^(d)	Direct/5 ^(d)
Motor hp	0.75	1.0	1.0
Motor Frame Size	48/—	48/—	48/—
Filters^(e)	Throwaway	Throwaway	Throwaway
Type Furnished	(2) 20x35x2	(2) 20x35x2	(2) 20x35x2
Number Size Recommended			
Refrigerant Charge^(f)			
Pounds of R-410A	3.2	3.5	3.4

continued on next page



General Data

Table 2. General data - 3 to 5 tons - standard efficiency

	3 Tons	4 Tons	5 Tons
	T/YSC036G3,4,W	T/YSC048G3,4,W	T/YSC060G3,4,W
Cooling Performance^(a)			
Gross Cooling Capacity	37,000	49,000	60,000
EER/SEER ^(b)	12.0/14.0	12.0/14.0	12.0/14.0
Nominal cfm/AHRI Rated cfm	1,200/1,200	1,600/1,600	2,000/2,000
AHRI Net Cooling Capacity	36,000	48,000	58,500
System Power (kW)	3.00	4.00	4.88
Compressor			
Number/Type	1/Scroll	1/Scroll	1/Scroll
Sound			
Outdoor Sound Rating (dB) ^(c)	79	80	81
Outdoor Coil - Type	Microchannel	Microchannel	Microchannel
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.63	0.63	1
Face Area (sq. ft.)	10.50	10.50	11.90
Rows/FPI	1/23	1/23	1/23
Indoor Coil - Type	Microchannel	Microchannel	Microchannel
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.63	0.63	0.81
Face Area (sq. ft.)	6.98	6.98	8.15
Rows/FPI	2/16	2/16	2/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¼ NPT	1¼ NPT	1¼ NPT
Outdoor Fan - Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/22	1/22
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3600	4050	3950
Motor hp	0.25	0.33	0.4
Motor rpm	1100	1100	1100
Indoor Fan - Type (Standard)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1	1	1
Drive Type/No. Speeds/RPM	11x11	11x11	11x11
Number Motors	Direct/5 ^(d)	Direct/5 ^(d)	Direct/5 ^(d)
Motor hp	0.75/—	1.0/—	1.0/—
Motor Frame Size	48/—	48/—	48/—
Filters^(e)			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(2) 20x35x2	(2) 20x35x2	(2) 20x35x2
Refrigerant Charge^(f)			
Pounds of R-410A	3.2	3.5	4.8

continued on next page



General Data

Table 3. General data - 6 to 7½ tons - standard efficiency

	6 Tons	7½ Tons	7½ Tons
	T/YSC072F3,4,W	T/YSC090F3,4,W	T/YSC092F3,4,W
Cooling Performance^(a)			
Gross Cooling Capacity	75,000	89,000	94,000
EER ^(b)	11.2	11.2	11.2
Nominal cfm/AHRI Rated cfm	2,400/2,100	3,000/2,400	3,000/2,625
AHRI Net Cooling Capacity	71,000	83,000	89,000
IEER ^(c)	13.0	12.2	13.0
System Power (kW)	6.36	7.48	7.97
Compressor			
Number/Type	1/Scroll	1/Scroll	2/Scroll
Sound			
Outdoor Sound Rating (dB) ^(d)	89	89	91
Outdoor Coil - Type	Microchannel	Microchannel	Microchannel
Configuration	Full Face	Full Face	Face-Split
Tube Size (in.)	0.71	0.71	0.71
Face Area (sq. ft.)	16.91	16.91	17.31
Rows/FPI	1/23	1/23	1/23
Indoor Coil - Type	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Face-Split
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	9.89	9.89	12.36
Rows/FPI	3/16	4/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan - Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/26	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	6,037	6,037	6,610
Motor hp	0.7	0.7	0.75
Motor rpm	1,100	1,100	1,100
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/12x12	1/12x12	1/15x15
Drive Type/No. Speeds/rpm	Belt/Variable/1,750	Belt/Variable/1,750	Belt/Variable/1,750
Motor hp (Standard/Oversized)	1.0/2.0	1.0/3.0	1.0/3.0
Motor Frame Size (Standard/Oversized)	56/56	56/56	56/56
Filters^(e)			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 16x25x2	(4) 16x25x2	(4) 20x25x2
Refrigerant Charge ^(f)			
Pounds of R-410A	5.5	5.9	3.9/3.6

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General Data

Table 4. General data - 8½ to 10 tons - standard efficiency

	8½ Tons	10 Tons
	T/YSC102F3,4,W	T/YSC120F3,4,W
Cooling Performance^(a)		
Gross Cooling Capacity	102,000	119,000
EER ^(b)	11.2	11.3
Nominal cfm/AHRI Rated cfm	3,400/2,720	4,000/3,500
AHRI Net Cooling Capacity	96,600	113,000
IEER ^(c)	13.0	13.0
System Power (kW)	8.62	10.0
Compressor		
Number/Type	2/Scroll	2/Scroll
Sound		
Outdoor Sound Rating (dB) ^(d)	88	88
Outdoor Coil - Type	Microchannel	Microchannel
Configuration	Face-Split	Face Split
Tube Size (in.)	1	1
Face Area (sq. ft.)	20.77	20.77
Rows/FPI	1/20	1/20
Indoor Coil - Type	Lanced	Lanced
Configuration	Face-Split	Intertwined
Tube Size (in.)	0.3125	0.3125
Face Area (sq. ft.)	12.36	12.36
Rows/FPI	3/16	4/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT
Outdoor Fan - Type	Propeller	Propeller
Number Used/Diameter (in.)	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1
cfm	6,610	6,800
Motor hp	0.75	0.75
Motor rpm	1,100	1,100
Indoor Fan - Type	FC Centrifugal	BC Plenum
Number Used/Diameter (in.)/Width (in.)	1/15x15	1/19.7x15
Drive Type/No. Speeds/rpm	Belt/Variable/1,750	Direct/Variable ^(e)
Motor hp (Standard/Oversized)	2.0/3.0	3.75/—
Motor Frame Size (Standard/Oversized)	56/56	—/—
Filters^(f)		
Type Furnished	Throwaway	Throwaway
Number Size Recommended	(4) 20x25x2	(4) 20x25x2
Refrigerant Charge ^(g)		
Pounds of R-410A	4.7/3.9	5.5/4.2

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General Data

Table 5. General data - 3 to 4 tons - high efficiency

	3 Tons		4 Tons		
	T/YHC036E1	T/YHC036E3,4W ^{(a),(b)}	T/YHC048F1	T/YHC048E3,4W ^(b)	T/YHC048F3,4W ^(b)
Cooling Performance^(c)					
Gross Cooling Capacity	38,490	37,600	48,930	49,930	49,930
EER/SEER ^(d)	13.0/15.2	12.7/15.0 ^(a)	12.55/15.0	14.2	13.35/15.0
Nominal cfm/AHRI Rated cfm	1,200/1,200	1,200/1,200	1,600/1,600	1,600/1,600	1,600/1,600
AHRI Net Cooling Capacity	37,000	37,000	48,000	49,000	49,000
System Power (kW)	2.93	2.99	3.83	3.67	3.67
Compressor					
Number/Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Sound					
Outdoor Sound Rating (dB) ^(e)	81	81	87	87	87
Outdoor Coil - Type	Lanced	Lanced	Microchannel	Lanced	Microchannel
Configuration	Full Face	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.71	0.3125	0.71
Face Area (sq. ft.)	10.96	10.96	16.91	17.00	16.91
Rows/FPI	2/16	2/16	1/23	3/16	1/23
Indoor Coil - Type	Lanced	Lanced	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125	0.3125	0.3125
Face Area (sq. ft.)	7.71	7.71	9.27	9.27	9.27
Rows/FPI	3/16	3/16	3/16	3/16	3/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1 1/4 NPT	1 1/4 NPT	1 1/4 NPT	1 1/4 NPT	1 1/4 NPT
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/22	1/22	1/26	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1	Direct/1
cfm	3,064	3,064	3,986	3,982	3,982
Motor hp	0.2	0.2	0.4	0.4	0.4
Motor rpm	1,075	1,075	1,075	1,075	1,075
Indoor Fan - Type (Standard)^(f)	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/11x11	1/11x11	1/11x11	1/11x11	1/11x11
Drive Type/No. Speeds/rpm	Direct/5(9)	Direct/5(9)	Direct/5(9)	Direct/5(9)	Direct/5(9)
Number Motors	1	1	1	1	1
Motor hp (Standard/Oversized)	0.75	.75	1.0	1.0	1.0
Motor Frame Size (Standard/Oversized)	48	48	48	48	48
Indoor Fan - Type (Optional)		FC Centrifugal		FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	—	1/11x11	—	1/11x11	1/11x11
Drive Type/No. Speeds	—	Belt/Variable	—	Belt/Variable	Belt/Variable
Number Motors	—	1	—	1	1
Motor hp (Standard/Oversized)	—	1.0	—	1.0	1.0
Motor Frame Size (Standard/Oversized)	—	56	—	56	56
Filters^(h)					
Type Furnished	Throwaway	Throwaway	Throwaway	Throwaway	Throwaway
Number Size Recommended	(2) 20x30x2	(2) 20x30x2	(4) 16x25x2	(4) 16x25x2	(4) 16x25x2
Optional Hot Gas Reheat Coil (Type)					
Tube Size (in.) OD	—	0.3125	—	0.3125	—
Face Area (sq. ft.)	—	5.23	—	6.28	—
Rows/FPI	—	1/16	—	1/16	—



General Data

Table 6. General data - 5 tons - high efficiency

	5 Tons		
	T/YH060F1	T/YHC060E3,4W ^(a)	T/YHC060F3,4W ^(a)
Cooling Performance^(b)			
Gross Cooling Capacity	61,000	61,000	61,000
EER/SEER ^(c)	12.85/15.0	14.2	12.85/15.0
Nominal cfm/AHRI Rated cfm	2,000/2,000	2,000/2,000	2,000/2,000
AHRI Net Cooling Capacity	59,500	60,000	60,000
System Power (kW)	4.63	4.67	4.67
Compressor			
Number/Type	1/Scroll	1/Scroll	1/Scroll
Sound			
Outdoor Sound Rating (dB) ^(d)	87	87	87
Outdoor Coil - Type	Microchannel	Lanced	Microchannel
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.71	0.3125	0.71
Face Area (sq. ft.)	16.91	17	16.91
Rows/FPI	1/23	3/16	1/23
Indoor Coil - Type	Lanced	Lanced	Lanced
Configuration	Full Face	Full Face	Full Face
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	9.89	9.89	9.89
Rows/FPI	4/16	4/16	4/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan - Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/26	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	3,953	3,953	3,953
Number Motors/hp	0.40	0.40	0.40
Motor rpm	1,075	1,075	1,075
Indoor Fan - Type (Standard)^(e)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	1/11x11	1/11x11	1/11x11
Drive Type/No. Speeds/rpm	Direct/5 ^(f)	Direct/5 ^(f)	Direct/5 ^(f)
Motor hp	1.0	1.0	1.0
Motor Frame Size	48	48	48
Indoor Fan - Type (Optional)		FC Centrifugal	FC Centrifugal
Number Used/Diameter (in.)/Width (in.)	—	1/11x11	1/11x11
Drive Type/No. Speeds	—	Belt/Variable	Belt/Variable
Motor hp	—	1.0	1.0
Motor Frame Size	—	56	56
Filters^(g)			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 16x25x2	(4) 16x25x2	(4) 16x25x2
Optional Hot Gas Reheat Coil - Type			
Tube Size (in.) OD	—	0.3125	—
Face Area (sq. ft.)	—	6.28	—
Rows/FPI	—	1/16	—
Refrigerant Charge (Lbs. of R-410A)^(h)			
Standard	6.1	—	6.1
Optional Hot Gas Reheat Coil	—	15.7	—

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General Data

Table 7. General data - 6 to 7½ tons - high efficiency

	6 Tons	6 Tons	7½ Tons
	T/YHC072E/F3,4W^(a)	T/YHC074F3,4^(a)	T/YHC092F3,4W^(a)
Cooling Performance^(b)			
Gross Cooling Capacity	72,000	73,000	92,000
EER ^(c)	12.6	13.1	12.6
Nominal cfm/AHRI Rated cfm	2,400/2,100	2,400/2,100	3,000/2,625
AHRI Net Cooling Capacity	68,000	71,000	89,000
IEER ^{(d),(e),(f)}	14.5	15.5 ^{(e),(f)}	14.5
System Power (kW)	5.37	5.42	7.06
Compressor			
Number/Type	1/Scroll	2/Scroll	2/Scroll
Sound			
Outdoor Sound Rating (dB) ^(g)	89	89	88
Outdoor Coil - Type	Microchannel	Microchannel	Microchannel
Configuration	Full Face	Face-Split	Face-Split
Tube Size (in.)	0.71	1	1
Face Area (sq. ft.)	20.77	20.77	20.77
Rows/FPI	1/23	1/20	1/20
Indoor Coil - Type	Lanced	Lanced	Lanced
Configuration	Full Face	Intertwined	Intertwined
Tube Size (in.)	0.3125	0.3125	0.3125
Face Area (sq. ft.)	12.36	12.36	12.36
Rows/FPI	4/16	4/16	4/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection Number/Size (in.)	1¾ NPT	1¾ NPT	1¾ NPT
Outdoor Fan - Type	Propeller	Propeller	Propeller
Number Used/Diameter (in.)	1/26	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
cfm	5,900	5,750	6,800
Motor hp	0.7	0.7	0.75
Motor rpm	1,100	1,100	1,100
Indoor Fan - Type	FC Centrifugal	BC Plenum	BC Plenum
Number Used/Diameter (in.)/Width (in.)	1/15x15	1/19.7x15	1/19.7x15
Drive Type/No. Speeds/rpm	Belt/Variable/1,750	Direct/Variable ^(h)	Direct/Variable ^(h)
Motor hp (Standard/Oversized)	1.0/2.0	3.75/—	3.75/—
Motor Frame Size (Standard/Oversized)	56/56	—/—	—/—
Filters⁽ⁱ⁾			
Type Furnished	Throwaway	Throwaway	Throwaway
Number Size Recommended	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2
Optional Hot Gas Reheat Coil - Type			
Tube Size (in.) OD	—	—	0.3125
Face Area (sq. ft.)	—	—	8.652
Rows/FPI	—	—	1/16
Refrigerant Charge (Lbs. of R-410A)^(j)			
Standard	7.7	5.8/4.1	5.5/4.2
Optional Hot Gas Reheat Coil	—	—	6.2/4.3

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General Data

Table 8. General data - 8½ to 10 tons - high efficiency

	8½ Tons	10 Tons
	T/YHC102F3,4W(a)	T/YHC120F3,4,W(a)
Cooling Performance^(b)		
Gross Cooling Capacity	104,000	116,000
EER ^(c)	12.5 ^(e)	12.4
Nominal cfm/AHRI Rated cfm	3,400/2,720	4,000/3,350
AHRI Net Cooling Capacity	99,000	113,000
IEER ^(d)	14.7 ^{(f)(g)}	14.7 ^(h)
System Power (kW)	7.92	9.11
Compressor		
Number/Type	2/Scroll	2/Scroll
Sound		
Outdoor Sound Rating (dB) ⁽ⁱ⁾	89	87
Outdoor Coil - Type		
Configuration	Microchannel	Microchannel
Tube Size (in.)	Face Split	Face Split
Face Area (sq. ft.)	1	1
Rows/FPI	20.77	26.77
	1/20	1/23
Indoor Coil - Type		
Configuration	Lanced	Lanced
Tube Size (in.)	Intertwined	Intertwined
Face Area (sq. ft.)	0.3125	0.3125
Rows/FPI	12.36	16.65
Refrigerant Control	5/16	4/16
Drain Connection Number/Size (in.)	Thermal Expansion Valve	Thermal Expansion Valve
	1¾ NPT	1¾ NPT
Outdoor Fan - Type		
Number Used/Diameter (in.)	Propeller	Propeller
Drive Type/No. Speeds	1/26	1/30
cfm	Direct/1	Direct/1
Motor hp	6,800	7,540
Motor rpm	0.75	0.75
	1,100	1,100
Indoor Fan - Type		
Number Used/Diameter (in.)/Width (in.)	BC Plenum	BC Plenum
Drive Type/No. Speeds/rpm	1/19.7x15	1/19.7x15
Motor hp (Standard/Oversized)	Direct/Variable ^(j)	Direct/Variable ^(j)
Motor Frame Size (Standard/Oversized)	3.75/—	3.75/—
	—/—	—/—
Filters^(k)		
Type Furnished	Throwaway	Throwaway
Number Size Recommended	(4) 20x25x2	(3) 20x25x2
		(2) 20x30x2
Optional Hot Gas Reheat Coil - Type		
Tube Size (in.) OD	0.3125	0.3125
Face Area (sq. ft.)	8.652	15.225
Rows/FPI	1/16	1/16
Refrigerant Charge (Lbs. of R-410A)^(l)		
Standard	6.3/4.9	7.1/5.0
Optional Hot Gas Reheat Coil	6.6/4.7	8.0/5.0

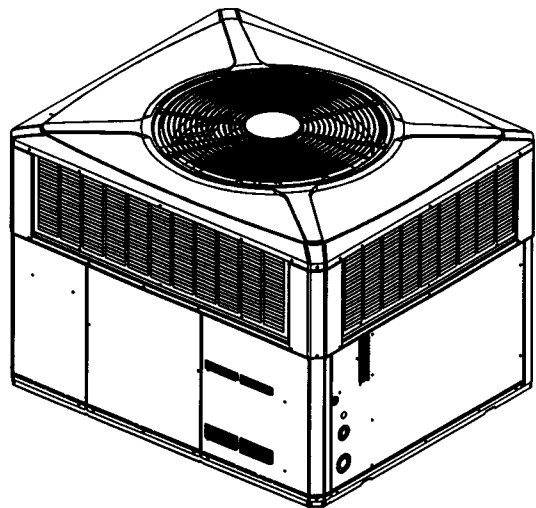
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Product Data

Single Packaged Heat Pump 14 SEER Convertible, 2 — 5 Ton

4WCC4024A1000A
4WCC4030A1000A
4WCC4036A1000A
4WCC4042A1000A
4WCC4048A1000A
4WCC4060A1000A



Note: "Graphics in this document are for representation only. Actual model may differ in appearance."



Single Packaged Heat Pump System

Trane offers a complete family of electric heat pump heating and cooling systems designed to keep you comfortable all year long, regardless of the weather, while keeping your operating costs as low as possible. A heat pump operates efficiently as both an air conditioner and a heater. In the summer, the heat pump cools your home just like any other air conditioner by pulling the heat from the inside and releasing it outdoors. In the winter, it captures the heat that is always present in the outdoor air and transfers it indoors.

Introducing the new Trane Single Heat Pump System

Single Packaged Electric Heat Pumps are easy and versatile to install.

Because cooling and heating functions are all contained in a single cabinet, Trane packaged heat pump systems are easy to install and service. It can be flush mounted beside your home at ground level or placed on the roof for horizontal or downflow installation. When connected to an optional Trane thermostat control, and air distribution ducts, you have a highly efficient, total home comfort system.

Single Packaged Electric Heat Pump Systems are unmatched in quality and reliability.

All major components on these products, including the compressor, have been designed and manufactured for maximum service. Every compressor is designed and manufactured to exacting specifications. Each design is life tested in extreme environments to ensure reliable and long lasting operation in normal applications. Each compressor has internal motor protection for added reliability.

Single Packaged Electric Heat Pump Systems provide better performance.

Our single packaged cooling/heating units offer cooling/heating efficiencies that are unmatched in the industry and provide you with a product far superior in performance than the competition.



Optional Equipment Listing

SUPPLEMENTARY HEATERS (3 PHASE) * = T or W Only	
3.76/5.0 KW Heater (208/240V 3 PH) (4WCY4036-060A3)	BAYHTRV305F []
3.76/5.0 KW Heater (208/240V 3 PH) (4WCY4036-060A3)	BAYHTRV308F []
7.50/10.0 KW Heater (208/240V 3 PH) (4WCY4024-048A3)	BAYHTRV310F []
11.27/15.0 KW Heater (208/240V 3 PH) (4WCY4036-060A3)	BAYHTRV315F []
15.0/20.0 KW Heater (208/240V 3 PH) (4WCY4048-060A3)	BAYHTRV320F []
18.78/25.0 KW Heater (208/240V 3 PH) (4WCY4048-060A1)	BAYHTRV325F []
Single Power Entry Kit ^(e)	BAYSPEK060F []
Single Power Entry Kit ^(e)	BAYSPEK061E []
Single Power Entry Kit ^(e)	BAYSPEK062F []
Single Power Entry Kit ^(e)	BAYSPEK063F []
Single Power Entry Kit ^(e)	BAYSPEK064E []
Single Power Entry Kit ^(e)	BAYSPEK065E []

^(a) Must use internal filter frame when economizer or fresh air kit is used.

^(b) It is the responsibility of the installing dealer to properly size the ductwork for each specific application.

^(c) Dry bulb control standard with economizer.

^(d) Downflow only.

^(e) Must be selected per unit and heater model

Product Specifications

F.L. Amps	2.8	4	4.1
FILTER / FURNISHED	NO	NO	NO
Type Recommended	THROWAWAY	THROWAWAY	THROWAWAY
Recmd. Face Area (sq. ft.) ^(g)	2.7	4.0	4.0
REFRIGERANT	R-410	R-410	R-410
Charge (lbs.)	5.74	7.2	7.2
CHARGING SPECIFICATIONS			
Subcooling	16°	14°	11°
DIMENSIONS	H X D X W	H X D X W	H X D X W
Crated (in.)	46 X 45 X 52	48 X 45 X 52	48 X 45 X 52
WEIGHT			
Shipping (lbs.) / Net (lbs.)	402 / 328	430 / 355	439 / 364

(a) Rated in accordance with AHRI Standard 210/240.

(b) Rated in accordance with D.O.E. test procedure.

(c) Sound Power values are not adjusted for AHRI 270-95 tonal corrections.

(d) Calculated in accordance with currently prevailing Nat'l Electrical Code.

(e) Standard Air — Dry Coil — Outdoor.

(f) Standard Air — Dry Coil — Indoor

(g) Filters must be installed in return air stream. Square footages listed are based on 300 f.p.m. face velocity. If permanent filters are used size per manufacturer's recommendation with a clean resistance of 0.05" W.C.

MODEL	4WCC4042A1000A	4WCC4048A1000A	4WCC4060A1000A
RATED Volts/PH/Hz	208-230/1/60	208-230/1/60	208-230/1/60
Performance Cooling BTUH ^(a)	43000	48000	58000
Indoor Airflow (CFM)	1367	1423	1787
Power Input (KW)	3.5	3.9	4.6
EER/SEER (BTU/Watt-Hr.) ^(b)	12.00 / 14.00	12.00 / 14.00	12.00 / 14.00
Sound Power Rating [dB(A)] ^(c)	71.5	72.5	77.3
PERFORMANCE HEATING			
(High Temp.) BTUH	37,600	43500	54000
Power Input (KW)	3.45	3.7	4.6
(Low Temp.) BTUH	22800	25400	34600
Power Input (KW)	1.94	2.10	2.80
HSPF (BTUH/Watt-Hr)	8.0	8.0	8.0
POWER CONN. — V/Ph/Hz	208-230/1/60	208-230/1/60	208-230/1/60
Min. Brch. Cir. Ampacity ^(d)	28.3	31.9	39.0
Fuse Size — Max. (amps)	45	50	60
Fuse Size — Recmd. (amps)	45	50	60
COMPRESSOR	SCROLL	SCROLL	SCROLL
VOLTS/PH/HZ	208-230/1/60	208-230/1/60	208-230/1/60
R.L. Amps — L.R. Amps	16.7 / 123.9	19.6 / 130.0	24.4 / 144.2
OUTDOOR COIL — TYPE	SPINE FIN	SPINE FIN	SPINE FIN
Rows/F.P.I	2 / 24	2 / 24	2 / 24
Face Area (sq. ft.)	20.54	20.54	22.99
Tube Size (in.)	3/8	3/8	3/8
Refrigerant Control	EXPANSION VALVE	EXPANSION VALVE	EXPANSION VALVE
INDOOR COIL — TYPE	PLATE FIN	PLATE FIN	PLATE FIN
Rows/F.P.I	3 / 15	3 / 15	4 / 15
Face Area (sq. ft.)	5.0	5.0	5.0
Tube Size (in.)	3/8	3/8	3/8

Attachment D – Controls and Monitoring Submittal

Sites

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Community Center - HVAC Inventory

Existing Equipment														Proposed Controls	
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	New Control	Notes		
1	AC-5	Gym	Packaged Gas / Elec	Trane	YHH300F3RLA04070	145210090D	25.0-ton	2014	208/230V-3ph	MT w/ Twist		Smart Tstat			
2	AC-4	Gym	Packaged Gas / Elec	Trane	YHH300F3RLA04070	145210104D	25.0-ton	2014	208/230V-3ph	MT w/ Twist		Smart Tstat			
3	AC-3	Gym Offices	Packaged Gas / Elec	ICP	PGD360090H001C1	C132826171	5.0-ton	2013	208/230V-3ph	MT w/ Twist		Smart Tstat			
4	AC-2	Gym Conf Rm	Packaged Gas / Elec	ICP	PGD336060H001C1	C123902966	3.0-ton	2012	208/230V-3ph	MT w/ Twist		Smart Tstat			
5	AC-1	Gym Office	Packaged Gas / Elec	ICP	PGD342090H001C1	C132648473	3.5-ton	2013	208/230V-3ph	MT w/ Twist		Smart Tstat			
6		100 Building	Evap Cooler							MT w/ Twist		Smart Tstat			
7		100 Building	Packaged Gas / Elec	ICP	PGD348090H001C1	C132926966	4.0-ton	2013	208/230V-3ph	MT w/ Twist		Smart Tstat			
8		100 Building	Packaged Heat Pump	Carrier	50IS-060-301	3504G11916	5.0-ton	2004	208/230V-1ph	MT w/ Twist	Yes	Smart Tstat			
9		101 Building	Packaged Gas / Elec	Carrier	48ESNA6009050	4410C14596	5.0-ton	2010	208/230V-3ph	MT w/ Twist		Smart Tstat			
10		100 Building	Packaged Heat Pump	Carrier	50IS-060-301	3304G12375	5.0-ton	2004	208/230V-1ph	MT w/ Twist	Yes	Smart Tstat			
11		200 Building	Packaged Gas / Elec	Carrier	48GSN036060511	3304G31418	3.0-ton	2004	208/230V-1ph	MT w/ Twist	Yes	Smart Tstat			
12		200 Building	Packaged Gas / Elec	Carrier	48GSN060090501	3404G12302	5.0-ton	2004	208/230V-1ph	MT w/ Twist	Yes	Smart Tstat			
13		300 Building	Packaged Gas / Elec	ICP	PGD330040K001C1	C131703105	2.5-ton	2013	208/230V-1ph	MT w/ Twist		Smart Tstat			
14		300 Building	Packaged Gas / Elec	ICP	PGD324040K001C1	C132814832	2.0-ton	2013	208/230V-1ph	MT w/ Twist		Smart Tstat			
15		300 Building	Packaged Gas / Elec	Carrier	48XPN036060511	2706G51376	3.0-ton	2006	208/230V-3ph	MT w/ Twist	?	Smart Tstat			
16		300 Building	Packaged Gas / Elec	Carrier	48ESNA3606050	1314C23292	3.0-ton	2014	208/230V-3ph	MT w/ Twist		Smart Tstat			
17		400 Building	Packaged Gas / Elec	Carrier	48ESNA3606050	3710C04005	3.0-ton	2010	208/230V-3ph	MT w/ Twist		Smart Tstat			
18		400 Building	Packaged Gas / Elec	Carrier	48ESNA3606050	5210C25087	3.0-ton	2010	208/230V-3ph	MT w/ Twist		Smart Tstat			
19		400 Building	Packaged Gas / Elec	Carrier	48GXN060090311	1605G21345	5.0-ton	2005	208/230V-1ph	MT w/ Twist	?	Smart Tstat			
20		400 Building	Packaged Gas / Elec	Carrier	48GXN036060511	2806G12628	3.0-ton	2006	208/230V-3ph	MT w/ Twist	?	Smart Tstat			
21		500 Building	Packaged Gas / Elec	Carrier	48XPN036060511	2406G51460	3.0-ton	2006	208/230V-3ph	MT w/ Twist	?	Smart Tstat			
22		500 Building	Packaged Gas / Elec	Carrier	48XPN036060511	1307G31355	3.0-ton	2007	208/230V-3ph	MT w/ Twist	?	Smart Tstat			
23		500 Building	Packaged Gas / Elec	ICP	PGD342090H001C1	C132648470	3.5-ton	2013	208/230V-3ph	MT w/ Twist		Smart Tstat			
24		500 Building	Packaged Gas / Elec	CP	PGD336060H001C1	C130718881	3.0-ton	2013	208/230V-3ph	MT w/ Twist		Smart Tstat			

Fire Station 2 - HVAC Inventory

Existing Equipment										Proposed Controls		
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	Notes
1	AC-1		Packaged Gas / Elec	Trane	YHC048E3RLA0202A2C	112111453L	4.0-ton	2011	208/230V-3ph	Prog Tstat		Smart Tstat
2	AC-2		Packaged Gas / Elec	Trane	YHC036E3RLA1202A2C	112111279L	3.0-ton	2011	208/230V-3ph	Prog Tstat		Smart Tstat
3	AC-3		Packaged Gas / Elec	Trane	4VCY4024A1064AB	11222JTS9H	2.0-ton	2011	208/230V-3ph	Prog Tstat		Smart Tstat
4	AC-4		Packaged Gas / Elec	Trane	YHC048E3RLA0202A2C	112111268L	4.0-ton	2011	208/230V-3ph	Prog Tstat		Smart Tstat
5	AC-5		Packaged Gas / Elec	Trane	4VCY4024A1064AB	112141IC9H	2.0-ton	2011	208/230V-1ph	Prog Tstat		Smart Tstat
6	AC-6		Packaged Gas / Elec	Trane	4VCY4024A1064AB	11222JH9H	2.0-ton	2011	208/230V-1ph	Prog Tstat		Smart Tstat
7	AC-7		Packaged Gas / Elec	Trane	YHC036E3RLA1202A2C	112111269L	3.0-ton	2011	208/230V-3ph	Prog Tstat		Smart Tstat
8	AC-8		Packaged Gas / Elec	Trane	4VCY4024A1064AB	11214J7S9H	2.0-ton	2011	208/230V-1ph	Prog Tstat		Smart Tstat
9	AC-9		Packaged Gas / Elec	Trane	4VCY4024A1064AB	11213H449H	2.0-ton	2011	208/230V-1ph	Prog Tstat		Smart Tstat
10	AC-10		Split Sys Heat Pump	Trane	4TCC3018A1000AA	111712183L	1.5-ton	2011	208/230V-1ph	Prog Tstat		Smart Tstat

Fire Station 4 - HVAC Inventory

Existing Equipment											
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Proposed Controls
1	Panel A	Offices	Packaged Gas / Elec	Carrier	48TCDD08A2A5A0A0	1111G20556	7.5-ton	2011	208/230V-3ph	Man Tstat	New Control
2	Panel B	Offices	Packaged Heat Pump	Carrier	50TCQA05A2A5A0A0	1311G30116	4.0-ton	2011	208/230V-3ph	Man Tstat	Smart Tstat
3		Garage	Evap Cooler							Man Tstat	Smart Tstat
4		Garage	Evap Cooler							Man Tstat	Smart Tstat
5		Dorms	Packaged Gas / Elec	Carrier	48TCLA06A2A5A0A0	1914C61437	5.0-ton	2014	208/230V-3ph	Man Tstat	Smart Tstat

Human Resources_MO - HVAC Inventory

Map ID	Unit Tag	Existing Equipment										Proposed Controls		
		Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	New Control	Notes	
1		Human Resources	Packaged Gas / Elec	Carrier	48TCLA06A2A5A0A0	4913C86752	5.0-ton	2013	208/230V-3ph	Prog Tstat		Smart Tstat		
2		Human Resources	Packaged Gas / Elec	Carrier	NA	NA	5.0-ton	2013		Prog Tstat		Smart Tstat		
3		Human Resources	Packaged Gas / Elec	Carrier	48TCLA06A2A5A0A0	0814C85683	5.0-ton	2014	208/230V-3ph	Prog Tstat		Smart Tstat		
4		Human Resources	Packaged Gas / Elec	Carrier	48ESNA3004050	1111C47543	2.5-ton	2011	208/230V-3ph	Prog Tstat		Smart Tstat		
5		Human Resources	Packaged Gas / Elec	Carrier	48HJM004-541	0708G10378	3.0-ton	2008	208/230V-3ph	Prog Tstat		Smart Tstat		
6		Human Resources	Packaged Gas / Elec	Carrier	48HJM004-541	0808G50422	3.0-ton	2008	208/230V-3ph	Prog Tstat		Smart Tstat		
7		M&O Office	Split Sys Gas / Elec	Carrier			3.0-ton	2013		Prog Tstat		Smart Tstat		
8		M&O Garage	Evap Cooler							Man Tstat		Smart Tstat		
9		M&O Garage	Evap Cooler							Man Tstat		Smart Tstat		

Metrolink Depot - HVAC Inventory

Existing Equipment										
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type
1			Packaged Gas / Elec	Carrier	38HDC060-521	3005X47105	5.0-ton	2005	208/230V-3ph	Prog Tstat
2			Packaged Gas / Elec	Carrier	38HDC060-521	3297X44503	5.0-ton	1997	208/230V-3ph	Prog Tstat
3			Packaged Gas / Elec	Carrier	38HDC060-521	NA	5.0-ton	1997		Prog Tstat
4			Packaged Gas / Elec	Carrier	38HDC060521	1703X66769	5.0-ton	2003	208/230V-1ph	Prog Tstat
Proposed Controls										Notes
										New Control
										Smart Tstat
										Smart Tstat
										Smart Tstat
										Smart Tstat

Police Annex - HVAC Inventory

Existing Equipment													Proposed Controls	
Map ID	Unit Tag	Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	New Control	Notes	
1			Split Sys Heat Pump	Carrier	38YCG0606A	1608X83437	5.0-ton	2008	460V-3ph	Prog Tstat		Smart Tstat		
2			Split Sys Heat Pump	Carrier	38MVC012-301	0111V06739	1.0-ton	2011	208/230V-1ph	Prog Tstat		Smart Tstat		
3			Split Sys Heat Pump	Carrier	25HBC360A600	4610E03247	5.0-ton	2010	460V-3ph	Prog Tstat		Smart Tstat		
4			Split Sys Heat Pump	Carrier	25HCB318A300	1110E15449	1.5-ton	2010	208/230V-1ph	Prog Tstat		Smart Tstat		
5			Split Sys Heat Pump	Carrier	25HBC360A600	NA	5.0-ton	2010		Prog Tstat		Smart Tstat		

Racquet and Fitness - HVAC Inventory

Map ID	Unit Tag	Existing Equipment										Proposed Controls			
		Location Served	Equipment	Manufacturer	Model Number	Serial Number	Size	Year	Electrical	Control Type	Replace	New Control	Notes		
1	AC-1		Packaged Gas / Elec	Carrier	48TCLA06A2A5A0A0A0	2114C78038	5.0-ton	2014	208/230V-3ph	Honeywell		Smart Tstat			
2	AC-2		Packaged Gas / Elec	Carrier	48TCLA06A2A5A0A0A0	1914C61438	5.0-ton	2014	208/230V-3ph	Honeywell		Smart Tstat			
3	AC-3		Packaged Gas / Elec	ICP	RGS060HLCA0AAAA	C142765554	5.0-ton	2014	208/230V-3ph	Honeywell		Smart Tstat			
4	AC-4	Racquetball N N	Packaged Gas / Elec	Carrier	48ESNA3606050-	5210C25084	3.0-ton	2010	208/230V-3ph	Honeywell		Smart Tstat			
5	AC-5	Racquetball N M	Packaged Gas / Elec	Carrier	48ESNA3606050-	5210C25089	3.0-ton	2010	208/230V-3ph	Honeywell		Smart Tstat			
6	AC-6	Racquetball N S	Packaged Gas / Elec	Carrier	48ESNA3606050-	5210C25093	3.0-ton	2010	208/230V-3ph	Honeywell		Smart Tstat			
7	AC-7	Lobby North Pit	Packaged Gas / Elec	Carrier	48XPNO36060311-	2506G12088	3.0-ton	2006	208/230V-1ph	Honeywell		Smart Tstat			
8	AC-8	Lobby South Pit	Packaged Gas / Elec	Carrier	48ESNA3606050-	2410C83005	2.5-ton	2010	208/230V-1ph	Honeywell		Smart Tstat			
9		Lobby	Split Sys Heat Pump	ICP	NXH560GKA100	E122521908	5.0-ton	2012	208/230V-1ph			Smart Tstat			
10	AC-9	Racquetball S N	Packaged Gas / Elec	Carrier	48ESNA3606050-	3610C02943	3.0-ton	2010	208/230V-3ph	Honeywell		Smart Tstat			
11	AC-10	Racquetball S M	Packaged Gas / Elec	Carrier	48ESNA3606050-	3510C00694	3.0-ton	2010	208/230V-3ph	Honeywell		Smart Tstat			
12	AC-11	Racquetball S S	Packaged Gas / Elec	Carrier	48ESNA3606050-	5210C25090	3.0-ton	2010	208/230V-3ph	Honeywell		Smart Tstat			
13	AC-12	Community Playhouse	Packaged Gas / Elec	Carrier	48XPNO060090311-	2906G12258	5.0-ton	2006	208/230V-1ph	Honeywell		Smart Tstat			
14	AC-13	Community Playhouse	Packaged Gas / Elec	Carrier	48ESNA3606030-	0414C11751	3.0-ton	2014	208/230V-1ph	Honeywell		Smart Tstat			
15	AC-14	Community Playhouse	Packaged Gas / Elec	Carrier	48ESNA2404030-	1414C00314	2.0-ton	2014	208/230V-1ph	Honeywell		Smart Tstat			
16	AC-15	Theater	Packaged Gas / Elec	Carrier	48TCDAL12A2A5A0A0A0	3010G40651	10.0-ton	2010	208/230V-3ph	Honeywell		Smart Tstat			
17	AC-16	Theater East	Packaged Gas / Elec	Carrier	48ESNA6009050-	0711C37505	5.0-ton	2011	208/230V-3ph	Honeywell		Smart Tstat			
18		Pool Lobby	Split Sys Heat Pump	Mitsubishi	MUY-GE18NA	5001913T	1.5-ton		208/230V-1ph			Smart Tstat			
19		Pool Office	Split Sys Heat Pump	Mitsubishi	MUY-GE18NA	5001913T	1.5-ton		208/230V-1ph			Smart Tstat			
20		Pool Area	Evap Cooler & Furnace	Reznor		4000676T	1.2-ton		208/230V-1ph			Smart Tstat			
21		Pool Area	Evap Cooler & Furnace	Reznor								Smart Tstat			
		Pool	DHW Heater	Lochinvar	CPN1262	B15H00275070	1.26 MbtuH								
		Pool	Pump	Emerson	CN05		25 hp		208/230V-3ph						
		Pool	DHW Heater	Bradford White	D100L199E3N	DC8973241	200 kbtuH								
		Jacuzzi	DHW Heater	Raypak	C-R407A-EN-C	1002306098									
		Jacuzzi	Pump	AO Smith	B49	30910CH	1.5 hp								
		Jacuzzi	DHW Heater	AO Smith	BT100112	G05M004747	75 kbtuH	2005							
		Jacuzzi	DHW Heater	AO Smith	BT100112	G05M009548	75 kbtuH	2005							

CONTROLS AND MONITORING SCOPE AND SERVICES

STATEMENT OF WORK

Project Grooming Services

Owner's Project Requirements (OPR) Document.

Information about City goals, preferences, policies (ex: thermostat scheduling and setpoint adjustment), and general requirements will be gathered and summarized in the 'Owner's Project Requirements' (OPR) document.

As-Built Documentation & Online Systems Manual

Documentation will be updated and organized as follows:

- Existing building drawings (floor plans, HVAC plans, equipment schedules), specifications, equipment manuals, energy studies, and utility bills will be collected, digitized, and systematically organized.
- As-built HVAC equipment inventory (ex: make/model, stages of compressors, presence of auxiliary heat), simple floor plans (including HVAC and lighting zones), and schematics of major systems will be generated and reconciled with site observations.
- City documentation will be shared and hosted online in a secure and centralized "Systems Manual" within the Building VUE software. 0.5 Electrical Circuit Label Update

Electrical panel cards will be updated to accurately document which circuit each *significant* load is connected to.

The Building VUE System

Nodes measure voltage, current, energy, power, power factor, and device temperature at up to 1-minute intervals, while easily-networked gateways and controllers provide communication infrastructure to move data from the electric load to the cloud.

InScope Innovation's Building VUE System includes software-as-a-service (SaaS), by the same name, that provides web-accessible visibility to data, complete with tools and analytic features to increase understanding of performance and automatically control select assets for energy cost savings.

InScope Innovation periodically provides upgrades with new features and firmware updates to enhance performance of existing hardware.

Professional Ongoing Services

Monitoring-Based Commissioning

Experts in building performance will have flexible hours reserved each month to respond to the Cities questions, proactively investigate data and system configuration (ex: setpoints and demand response policies), communicate known issues, identify and prioritize potential improvement projects, and support the implementation of projects underway. Quarterly meetings to discuss progress with ABS and energy management team members will showcase success and provide a venue to discuss and solicit feedback about possible future projects and discrepancies between expectations and measured savings.

Proposed and implemented projects will be documented and tracked from the Building VUE software, on the Energy Savings Measures (ESM) Tab. Projects are summarized in a table where they can be sorted and filtered by status, priority, and financial savings for decision makers. Each measure will include clear, concise actions to be taken and savings and cost projections conservatively estimated from system measurements and industry standards.

Boots-on-the-Ground Support

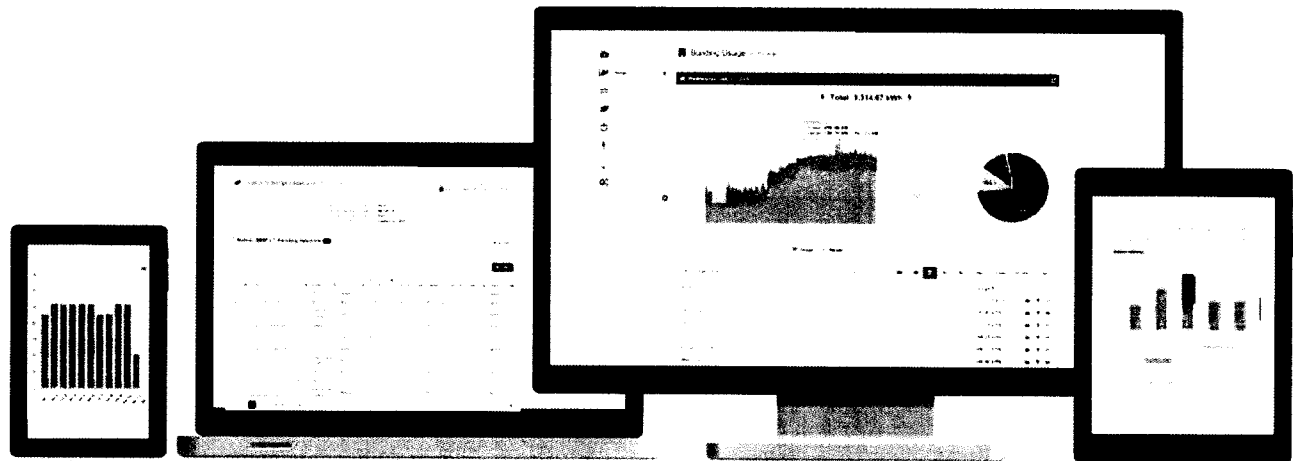
Flexible hours of local contractors will be reserved each month to respond to the requests of the City, ABS, and the monitoring-based commissioning team to investigate issues, update device programming, and implement minor equipment repairs.



Building-Level Metering and Monitoring **CIRCUIT NODES**

Dashboard Access

Data collected from the all installed Circuit Nodes will be displayed on the VUE portal, where users can monitor in real-time and track energy savings opportunities. VUE is secure, cloud-based, and mobile, with role-based authentication and access.



Circuit Node SKUs

InScope Energy offers the following Circuit Node SKUs. For diverse applications which have power requirements in excess of what can be supported by these SKUs, InScope Energy offers External Power Nodes built-to-order (see External Power Node Spec Sheet).

SKU	Circuits	Phases	Voltage	Maximum Current	Control
0E100-001S	2	1	120	20	Yes
0E100-002S	1	2	208/240	20	Yes
0E100-004S	2	1	120	30	Yes
0E100-004U	2	1	120	30	No
0E100-005S	1	2	208/240	30	Yes
0E100-005U	1	2	208/240	30	No
0E100-006S	1	3	208/240	20 GP / 50 Res	Yes
0E100-006U	1	3	208/480	80	No
0E100-007S	1	2	208/240	20 GP / 50 Res	Yes
0E100-007U	1	2	208/480	80	No
0E100-008S	1	1	277	20 GP / 50 Res	Yes
0E100-008U	1	1	277	50	No



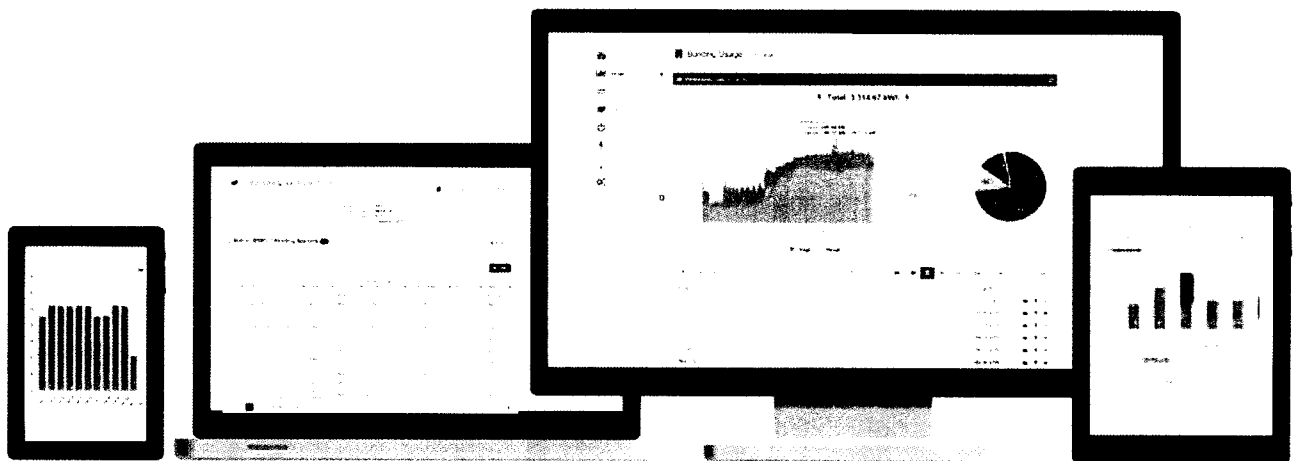
Building-Level Metering and Monitoring CONTROLLER

Communications and Integration with Controls Systems

- ✓ The Controller communicates with External Power Nodes, Panel Nodes, and the Gateway.
- ✓ Node to Controller communications utilize a proprietary RS-485 communications interface. All signals for this interface are local to the Controller and its associated electrical distribution panel and have no interaction with any other communications network.
- ✓ Communication between the Controller and the Enfuse Gateway utilize a standard TCP/IP communications interface that may be deployed over Wi-Fi (802.11b/g/n) or Ethernet (10BaseT or 100BaseT).
- ✓ Communications between Controllers and the Gateway utilize a TCP socket based protocol on port 444. All communications between Controller and Gateway are encrypted using AES128 encryption.
- ✓ Between the Gateway and the Cloud information is transmitted behind a corporate firewall via the TLS protocol, which uses AES256 for secrecy, RSA 1024 based certificates for public key Infrastructure, and SHA-1 for data integrity.
- ✓ Integration with a building's controls environment is available utilizing standard industry protocols such as TCP/IP, BACnet, Modbus, BACnet/IP or other APIs.

Dashboard Access

Data collected from the all installed External Panel and Circuit Nodes will be sent through the Controller to be displayed on the VUE portal, where users can monitor in real-time and track energy savings opportunities. VUE is secure, cloud-based, and mobile, with role-based authentication and access.

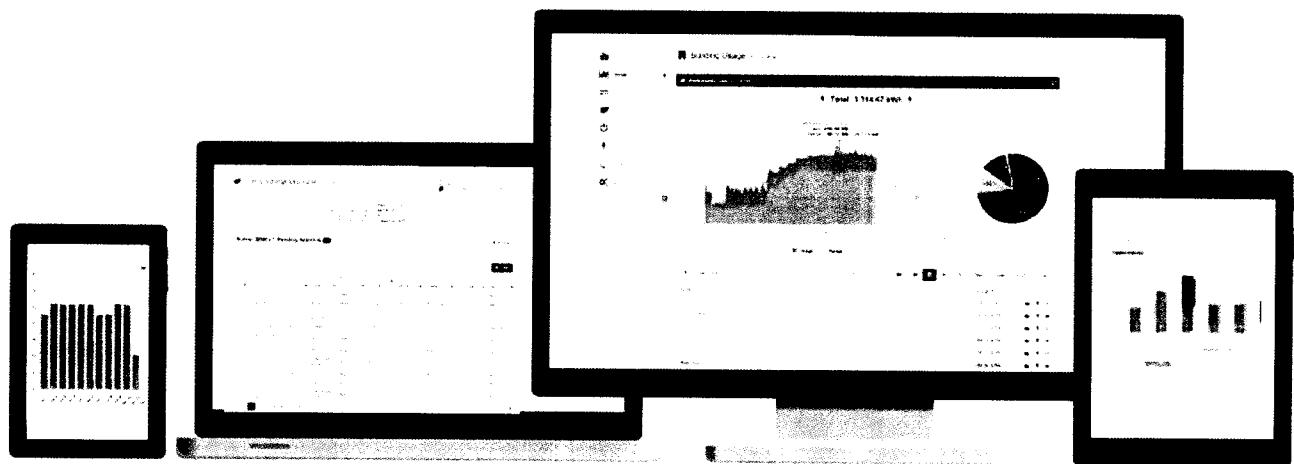


Communications and Integration with Controls Systems

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- ☒ Node to Controller communications utilize a proprietary RS-485 communications interface. All signals for this interface are local to the Controller and its associated electrical distribution panel and have no interaction with any other communications network.
- ☒ Communication between the Controller and the Enfuse Gateway utilize a standard TCP/IP communications interface that may be deployed over Wi-Fi (802.11b/g/n) or Ethernet (10BaseT or 100BaseT).
- ☒ Communications between Controllers and the Gateway utilize a TCP socket based protocol on port 444. All communications between Controller and Gateway are encrypted using AES128 encryption.
- ☒ Between the Gateway and the Cloud information is transmitted behind a corporate firewall via the TLS protocol, which uses AES256 for secrecy, RSA 1024 based certificates for public key Infrastructure, and SHA-1 for data integrity.
- ☒ Integration with a building's controls environment is available utilizing standard industry protocols such as TCP/IP, BACnet, Modbus, BACnet/IP or other APIs.

Dashboard Access

Data collected from the all installed External Panel Nodes will be displayed on the VUE portal, where users can monitor in real-time and track energy savings opportunities. VUE is secure, cloud-based, and mobile, with role-based authentication and access.





CAUTION

Follow the Installation Instructions before proceeding. Set the thermostat mode to “OFF” prior to changing settings in setup or restoring Factory Defaults.

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for an intentional radiator, pursuant to Part 15, subpart C of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference in radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that of the receiver.
- Consult the dealer or an experienced radio or TV technician for help.

Notice: Only peripherals complying with FCC limits may be attached to this equipment. Operation with noncompliant peripherals or peripherals not recommended by Venstar, is likely to result in interference to radio and TV reception. Changes or modifications to the product, not expressly approved by Venstar could void the user's authority to operate the equipment.

FCC - INDOOR Mobile Radio Information:

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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

Get To Know Your Thermostat

Ambient Light Sensor

Optional Wireless Module

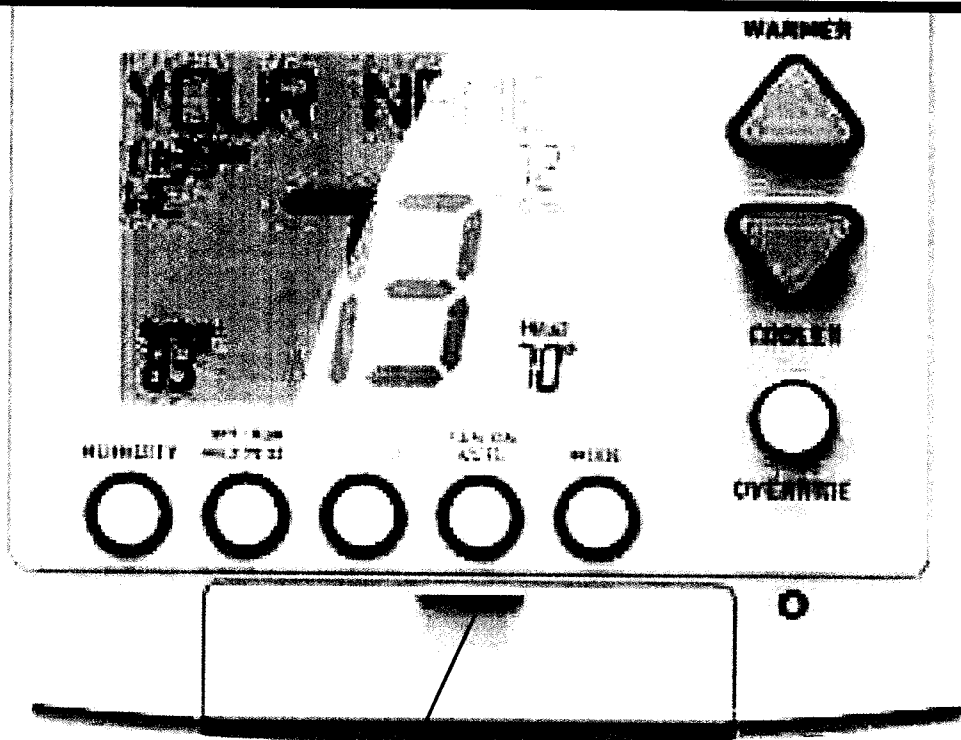
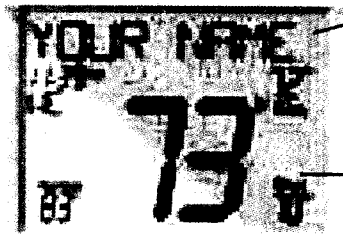
Backlit, Scrolling Display

Backlit Cooler & Warmer Buttons

Backlit LCD Display

Override Button

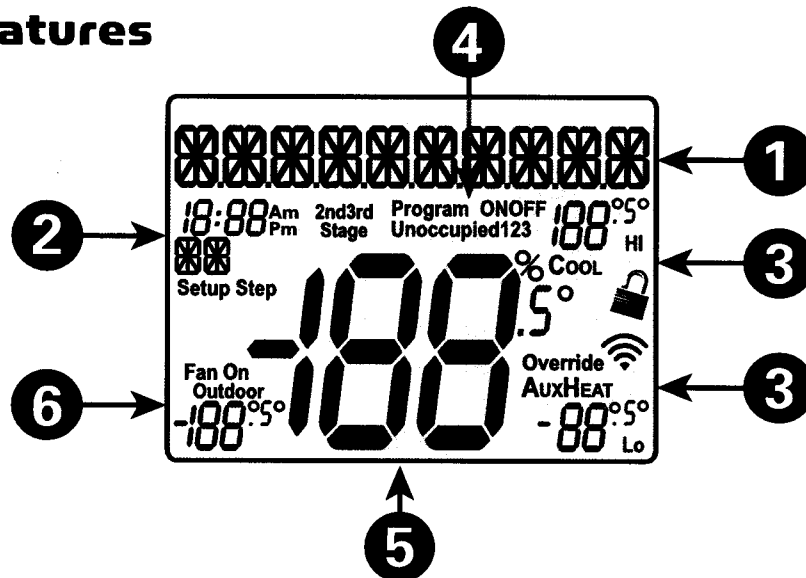
Heat or Cool Demand Indicator
Red = Heat, Green = Cool



Setup Buttons Behind Door

Get To Know Your Thermostat

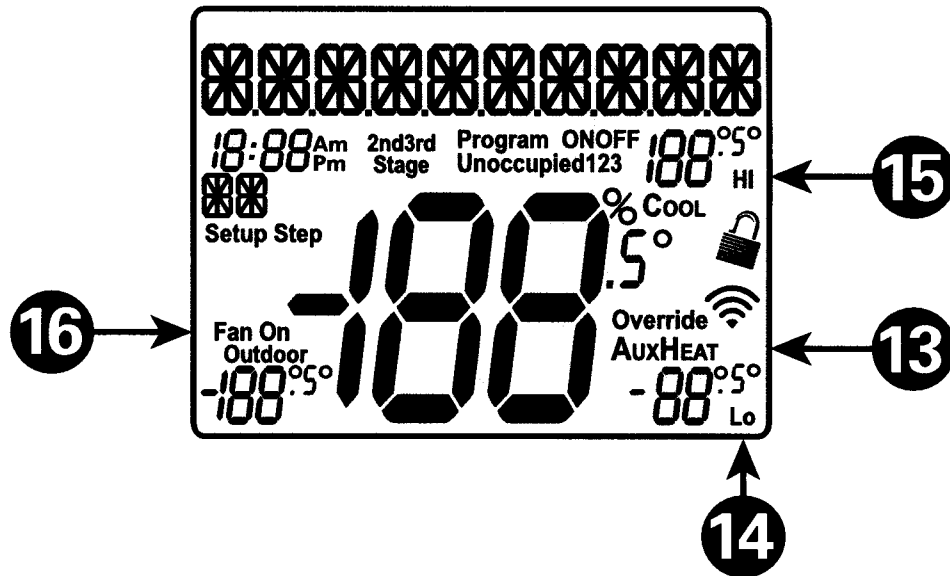
Display Features



- 1 The scrolling display will be used to help you easily navigate the setup screens in the thermostat.
- 2 Clock with Day of the Week
Indicates the current time and day. This clock is also used to program the time period schedules.
- 3 Mode Indicators
Selects the operational mode of the equipment.
HEAT - Indicates the heating mode.
COOL - Indicates the air conditioning mode.
HEAT & COOL - Indicates the system will automatically change-over between heat and cool modes as the temperature varies.
OFF - Indicates heating and cooling is turned off.
- 4 Program icon
Indicates that Time Period Programming is running or is enabled to be set.
- 5 Room Temperature Display
Indicates the current room temperature and displays the outdoor temperature when selected.
- 6 Outdoor icon
Indicates the temperature displayed is from the optional outdoor sensor.

Get To Know Your Thermostat

Display Features



13 AuxHeat icon

Indicates 2nd stage electric strip heat is being used when the thermostat is programmed for Heat Pump operation. Only the Aux icon will appear during Cool to Dehumidify to indicate Reheat operation.

14 Lo icon

Indicates the lowest recorded outdoor temperature for the day.*

15 Hi icon

Indicates the highest recorded outdoor temperature for the day.*

16 Fan On icon

Indicates constant, continuous fan operation.
When **Fan On** is not lit - indicates the fan will only operate when necessary to heat or to cool.

** Hi and Lo Temperatures for the day, reset at midnight.*

Quick Start

Selecting your desired temperature

AUTO-CHANGEOVER MODE - Pressing the WARMER or COOLER buttons in Auto mode will adjust both the heat and cool setpoints simultaneously. To adjust heat and cool setpoints individually, choose HEAT mode to adjust the heat setpoint and COOL mode to adjust the cool setpoint, then return to AUTO mode.

HEAT OR COOL MODE - Pressing the WARMER or COOLER buttons in Heat or Cool mode will adjust only the heat or cool setpoints individually displayed.

Using the Fan Button

Fan On indicates constant fan operation. Fan On is not allowed when the thermostat is in the OFF mode. Pressing the FAN button toggles this feature. If you don't see "Fan On", the fan is in auto mode and will only turn on during a heat or cool demand. The fan is forced into auto mode when running the program and the thermostat shows "unoccupied".

FAN ON
AUTO



Using the Override Button

UNOCCUPIED OPERATION -

During programmed, unoccupied periods, pressing the OVERRIDE button will force the thermostat into Occupied 1 settings for 30 minutes. Each press of the OVERRIDE button will add another 30 minutes of time for up to 4 hours. If the maximum time has been set, the next press of the OVERRIDE button will reset the timer and return the thermostat to the correct time period program for the day



OVERRIDE

NOTE: Override may only be used when the thermostat is set to PROGRAM ON.

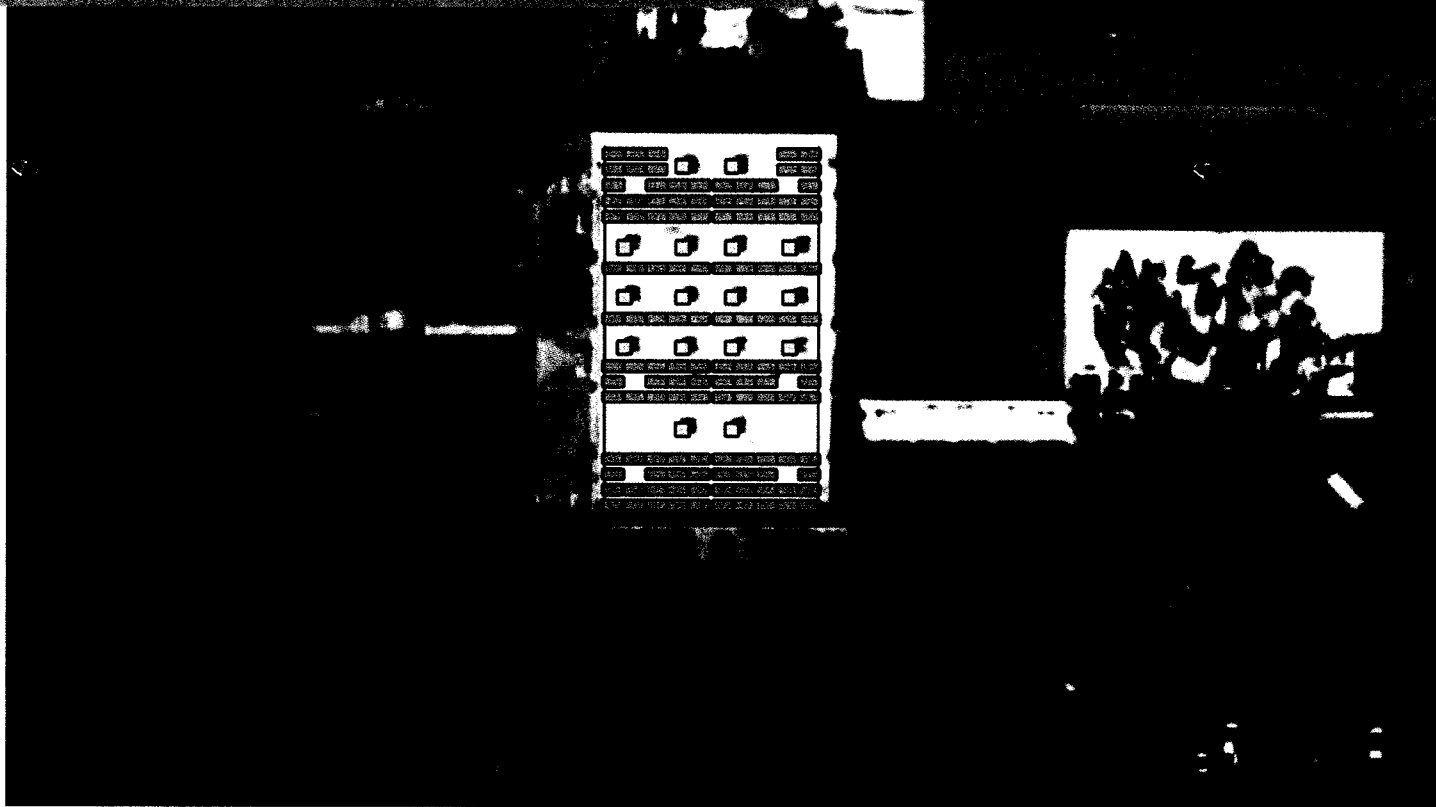
Occupied Operation - During programmed, occupied periods, pressing the OVERRIDE button will force the thermostat into an unoccupied period for the rest of the day. During this forced unoccupied period the OVERRIDE button will operate as described above.

Attachment E – Solar PV Submittal

Sites

Civic Center	Page 1
Community Center	Page 2
Fire Station #1 (Headquarters)	Page 3
Fire Station #2	Page 4
Fire Station #3	Page 5
Fire Station #4	Page 6
Fleet Services / ITS / Purchasing	Page 7
Human Resources / M&O	Page 8
Library	Page 9
Metrolink Depot	Page 10
Police Department	Page 11
Police Annex	Page 12
Public Works	Page 13
Racquet & Fitness Center	Page 14
Senior Center	Page 15
Solar PV O&M Services	Page 16
Solar PV Equipment Cutsheets	Page 19

Community Center

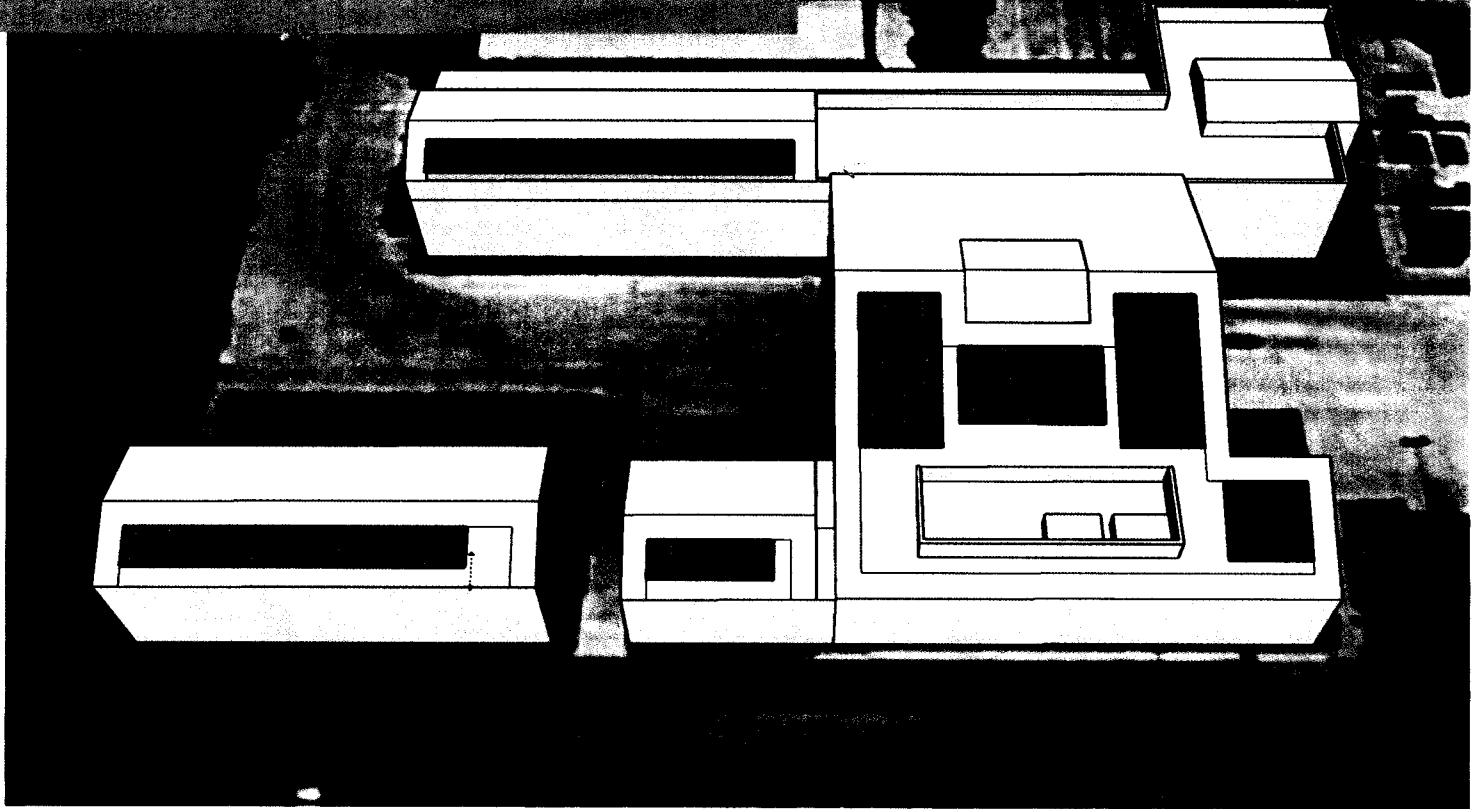


214 N. Palm Ave
Rialto, CA

39.53 kW DC

Year 1 Production: 64,386 kWh

Fire Station #2

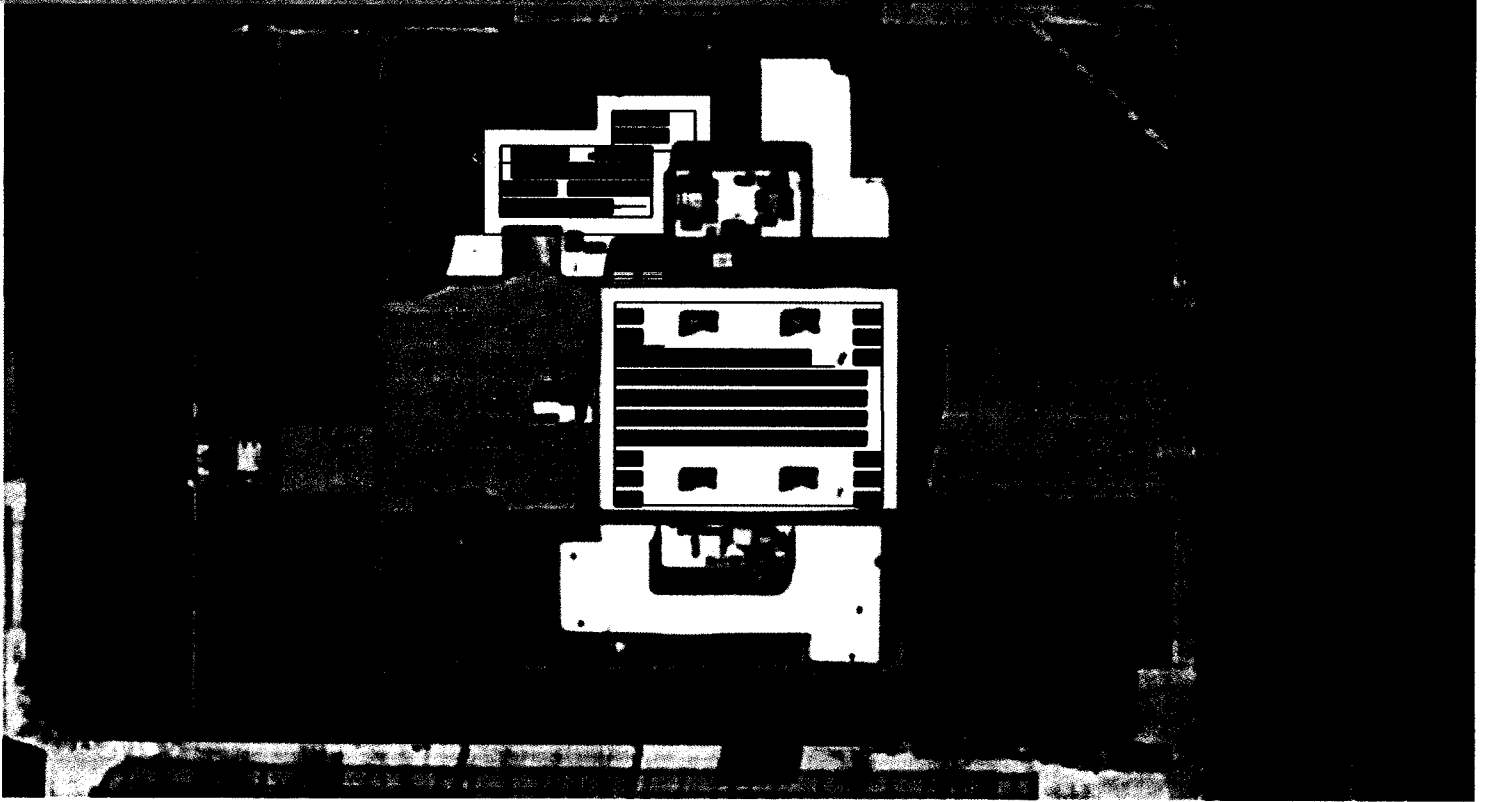


1700 N. Riverside Ave
Rialto, CA

31.35 kW DC

Year 1 Production: 52,829 kWh

Fire Station #4



3288 N. Alder Ave
Rialto, CA

25.46 kW DC

Year 1 Production: 40,240 kWh

Human Resources



246 S. Willow Ave

Rialto, CA

44.56 kW DC

Year 1 Production: 69,149 kWh

Metrolink Depot

Metrolink

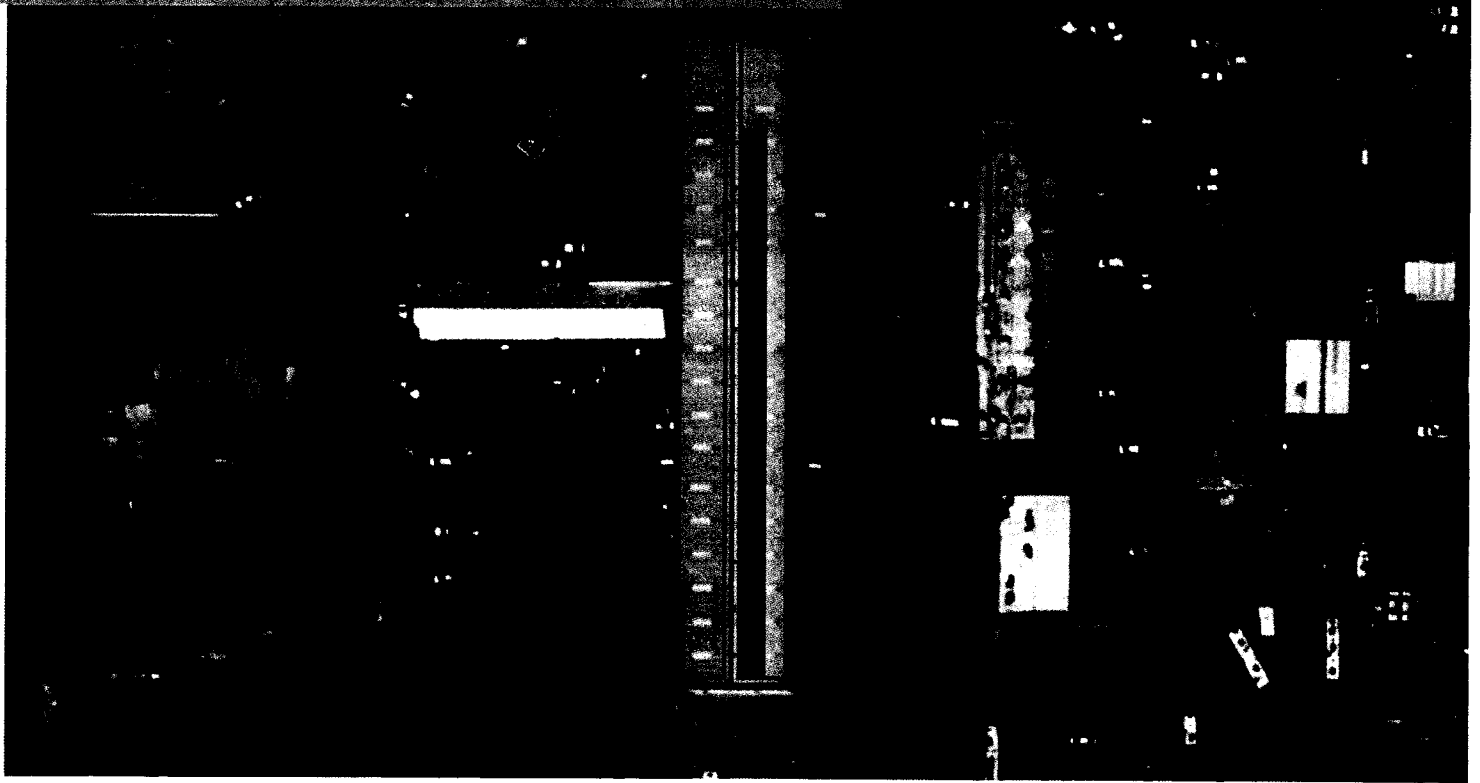
261 S. Palm Ave

Rialto, CA

42.21 kW DC

Year 1 Production: 64,225 kWh

Police Annex



429 W. Rialto Ave

Rialto, CA

58.74 kW DC

Year 1 Production: 88,988 kWh

Racquet & Fitness Center



1243 S. Riverside Ave

Rialto, CA

319.59 kW DC

Year 1 Production: 517,950 kWh

OPERATION AND MAINTENANCE

SERVICES

Basic System Services

Service	Scope
Monitoring System	Contractor will remotely monitor system in order to respond and take action to maximize System performance.
Notifications	Contractor will notify Owner within seven days of any (a) faults, (b) performance 20% below expected performance (weather-adjusted), (c) observed performance warnings or trends which may indicate developing performance problems and will, within such seven-day period, provide Owner with a diagnosis of the problem and proposed remedy
General Requests for System Information	Owner may make reasonable requests and Contractor will provide additional System information.
Licenses and Operating Permits	Contractor will obtain and maintain all required licenses and permits required to operate and maintain the System. Basic Services include specific activities, if any, required by any license or permit governing operation of the System.
Customer Service Support	Contractor will be available by phone/email for technical support and respond to all correspondence within 48 hours.
O&M Manual	Contractor will retain copies of O&M manual and issue updates as required.

Maintenance

Service	Scope
Field Inspection	Contractor will perform one (1) routine field inspection per Contract Year, completing Exhibit C - "Field Inspection Checklist" during each visit.
Maintenance	Contractor will perform all maintenance activities in accordance with the equipment manufacturer recommendations

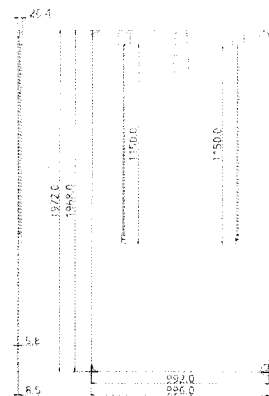
Additional System Services

NOTE: These services are available from Contractor as Additional System Services and are not included in the Basic Service Fee.

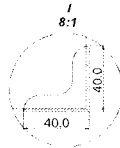
Item
Snow removal
Solar panel cleaning in excess of Once per calendar year
Lawn mowing in excess of two (2) times per calendar year, if applicable
Engagement of any consultant, engineer or attorney to pursue any claim under an Equipment Warranty
Painting the structures due to graffiti or any other non-wear and tear damage
Replace broken solar panels that were not caused by Contractor

ENGINEERING DRAWING (mm)

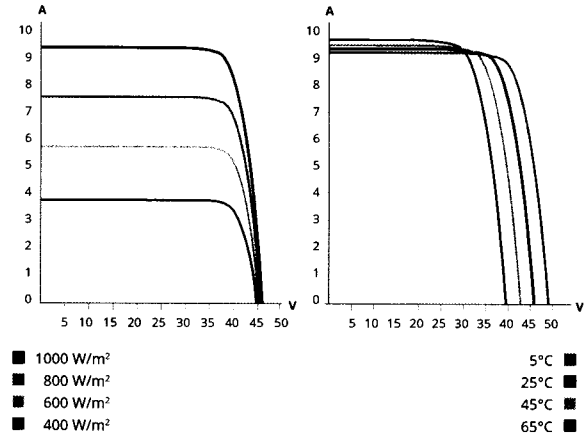
Rear View



Corner Protector Detail



CS6X-335M-FG / I-V CURVES



ELECTRICAL DATA | STC*

CS6X	330M-FG	335M-FG	340M-FG
Nominal Max. Power (Pmax)	330 W	335 W	340 W
Opt. Operating Voltage (Vmp)	37.5 V	37.8 V	37.9 V
Opt. Operating Current (Imp)	8.80 A	8.87 A	8.97 A
Open Circuit Voltage (Voc)	45.9 V	46.1 V	46.2 V
Short Circuit Current (Isc)	9.31 A	9.41 A	9.48 A
Module Efficiency	16.90%	17.16%	17.42%
Operating Temperature	-40°C ~ +85°C		
Max. System Voltage	1500 (IEC) or 1000 V (UL)		
Module Fire Performance	CLASS A (IEC 61730)		
Max. Series Fuse Rating	15 A		
Application Classification	Class A		
Power Tolerance	0 ~ + 5 W		

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C. Measurement uncertainty: ±3 % (Pmax).

ELECTRICAL DATA | NOCT*

CS6X	330M-FG	335M-FG	340M-FG
Nominal Max. Power (Pmax)	238 W	242 W	245 W
Opt. Operating Voltage (Vmp)	34.2 V	34.5 V	34.6 V
Opt. Operating Current (Imp)	6.96 A	7.01 A	7.10 A
Open Circuit Voltage (Voc)	42.1 V	42.3 V	42.4 V
Short Circuit Current (Isc)	7.54 A	7.62 A	7.67 A

* Under Nominal Operating Cell Temperature (NOCT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

PERFORMANCE AT LOW IRRADIANCE

Outstanding performance at low irradiance, average relative efficiency of 96.5 % from an irradiance of 1000 W/m² to 200 W/m² (AM 1.5, 25°C).

The specification and key features described in this datasheet may deviate slightly and are not guaranteed. Due to on-going innovation, research and product enhancement, Canadian Solar Inc. reserves the right to make any adjustment to the information described herein at any time without notice. Please always obtain the most recent version of the datasheet which shall be duly incorporated into the binding contract made by the parties governing all transactions related to the purchase and sale of the products described herein.

Caution: For professional use only. The installation and handling of PV modules requires professional skills and should only be performed by qualified professionals. Please read the safety and installation instructions before using the modules.

MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline, 6 inch
Cell Arrangement	72 (6×12)
Dimensions	1968×992×5.8mm (77.5×39.1×0.23 in) without J-Box and corner protector
(Incl. corner protector)	1972×996×8.5 mm (77.6×39.2×0.33 in) without J-Box
Weight	27.5 kg (60.6 lbs)
Front / Back Glass	2.5 mm heat strengthened glass
Frame	Frameless
J-Box	Split J-Box, IP67, 3 diodes
Cable	4 mm² (IEC) or 4 mm² & 12 AWG 1000 V (UL)
Cable Length	1150 mm (45.3 in), 500 mm (19.7 in) (+) and 350 mm (13.8 in) (-) is optional for portrait installation*
Connectors	Amphenol H4 UTX (IEC)
Per Pallet	30 pieces, 900 kg (1984.1 lbs)
Per container (40' HQ)	660 pieces

* The application of this short length cable can only be used in portrait installation (clamping mounting method) systems in which the distance between modules should be less than or equal to 50 mm. In the event the distance between the PV modules to be installed is more than 50 mm, please make sure to consult our technical team for evaluation and advice.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.41 % / °C
Temperature Coefficient (Voc)	-0.31 % / °C
Temperature Coefficient (Isc)	0.053 % / °C
Nominal Operating Cell Temperature	45±2 °C

PARTNER SECTION



CANADIAN SOLAR INC.

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DC

Maximum DC Input Voltage	1000Vdc	
MPPT Range (full load)	480 - 850Vdc	560-850Vdc
MPPT Range	280 - 950Vdc	
Number of MPPTs	2	
Maximum Short Circuit Current (Isc)	60A*2	
Start-Up Voltage	300Vdc	
Stop Voltage	<280Vdc	
Number of DC Inputs	10	
String Fuses	Positive and Negative	
DC Surge Arrestor	Type III surge arrester (Optional Type II DIN rail surge arrester)	
DC Termination Method	Screw Terminals	
Maximum Cable Size	10AWG, Cu or Al	
AFCI	Yes	
DC Disconnect	Yes	
Insulation Detection	Yes	

AC

Rated AC Power	30000W	36000W
Maximum AC Output Apparent Power	33240VA	39800VA
AC Nominal Voltage	277Vac / 480Vac	
Grid Voltage Range	422 - 528Vac	
Frequency	60Hz	
Frequency Range	57Hz - 63Hz	
AC Output Configuration	3Ø / 3W or 4W + Ground	
Tare Losses	<1W	
THD	<3%(at full load)	
Power Factor	>0.99(at full load)	
Power Factor Range	0.8 leading ~0.8 lagging, (0.9leading ~0.9 lagging, at full power)	
Maximum Output Current	40A	48A
AC Termination Method	Spring Clamp Terminal	
Maximum Cable Size	#4AWG, Cu or Al	
AC Surge Arrestor	Type III surge arrester (Optional Type II DIN rail surge arrester)	
AC Leakage Current Detection	Yes	
AC Disconnect	Optional	

Mechanical and environmental

Enclosure	NEMA 4X Electronics
Installation Feature	Separate Wiring box and Electronics box
Cable Entrance	Plastic Threaded Plug
Weight	65kg 143lb
Relative Humidity	0 - 100%
Noise (dB)	<55dB
Operating Altitude	4000m(>3000m derating) 13000ft(>9800ft derating)
Cooling Method	Smart Forced Air Cooling
Dimensions (W*H*D)	622*880*250mm 25"*34.6"*9.8"

Performance

Maximum Efficiency	98.5%
CEC Efficiency	98.00%
Operating Temperature	-25°C to 60°C -13°F to 140°F
Transformer / Transformerless	Transformerless

Protection

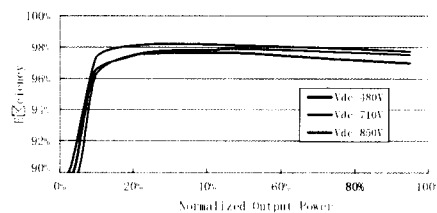
Anti-Islanding	Yes
Low Voltage Ride Through	Standard
DC Arc-Fault Circuit Protection	Certified to UL 1699B

Communication

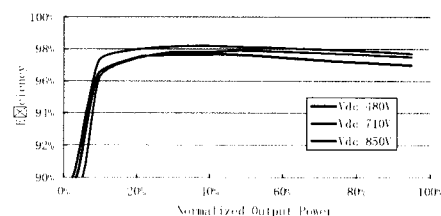
RS485	Standard
I/O Dry Contact	Standard
Protocol	Modbus

Efficiency Curve

SG30KU



SG36KU



DC

Maximum PV Input Voltage	1000V
Start-Up Voltage	300V
Stop Voltage	280V
MPPT Voltage Range	300 - 950V
MPPT Voltage Range for Nominal Power	550 - 850V
String Fuses	Positive and Negative
Number of MPPTs	4
Maximum Number of DC Inputs	16
Maximum DC short circuit current	200A
Maximum Current for Input Connector	12A
Maximum Cable Size	10AWG, Cu or Al
AFCI	Yes
DC Switch	Yes
Insulation Detection	Yes
DC Surge Arrestor	Type II DIN Rail Surge Arrestor (40kA)

AC

Nominal AC Output Power	60000W
Maximum AC Output Apparent Power	66000VA
Maximum AC Output Current	80A
Nominal AC Voltage	3ø/3W or 4W+ Ground, 277/480Vac
AC Voltage Range	422 - 528Vac
Nominal Grid Frequency	60Hz
Grid Frequency Range	55-65Hz
THD	<3% (Nominal Power)
DC Current Injection	<0.5% In
Power Factor	>0.99 @ Default Value at Nominal Power, (Adj. 0.8 Leading -0.8 Lagging)
Maximum Cable Size	2/0AWG, Cu or Al
AC Surge Arrestor	Type II DIN Rail Surge Arrestor

System Data

Maximum Efficiency	98.90%
CEC Efficiency	98.50%
Isolation Method	Transformerless
Ingress Protection Rating	NEMA 4X
Tare Losses	<1W
Operating Ambient	-25°C to 60°C (>45°C derating)
Temperature Range	-13°F to 140°F (>122°F derating)
Allowable Relative Humidity Range	0 - 100%
Cooling Method	Smart Forced Air Cooling
Max. Operating Altitude	4000m(>3000m derating) 13000ft(>9800ft derating)
Display	Graphic LCD
Communication	RS485 / Ethernet
DC Connection Type	Screw Terminals
AC Connection Type	Screw Clamp Terminal
Certification	cCSAus
Safety and EMC Standard	UL1741, IEEE 1547, IEEE1547.1, CSA C22.2 107.1-01-2001, FCC Part 15 Sub-part B Class B Limits

Protection

Anti-Islanding Protection	Yes
Low Voltage Ride Through	Yes
DC Reverse Connection Protection	Yes
AC Short Circuit Protection	Yes
Leakage Current Protection	Yes
AC Switch	Yes

Mechanical Data

Dimensions (WxHxD)	665*915*276mm 26.18" * 36.02" * 10.87"
Mounting Method	Wall bracket
Weight	70kg 154lbs

Communication

RS485	Standard
Ethernet	Standard
I/O Dry Contact	Standard
Protocol	Modbus

Efficiency Curve

