Nonresidential Buildings
What's Changed in 2022?

What Does this Fact Sheet Cover?

This fact sheet describes changes made to the 2019 Title 24, Part 6 Building Energy Efficiency Standards (Energy Code or Title 24, Part 6) and incorporated in the 2022 Energy Code for nonresidential buildings.

As in the 2019 Energy Code, the 2022 Energy Code classifies hotels and motels as nonresidential buildings.

The 2022 Energy Code has moved high-rise multifamily buildings to the new multifamily building type. In the 2019 Energy Code, high-rise multifamily buildings had been placed in the nonresidential building type.

When & How to Use this Fact Sheet

Use this fact sheet if you need to examine the language of the Energy Code for nonresidential buildings.

- Energy Code changes are organized by building feature.
- Each building feature section includes explanatory notes on all applicable sections.
- When language has been added or substantially revised, the intent of the language of the 2022 Energy Code is included.
- Notes are provided in the Subtitle & Notes columns as needed.
- For a summary, refer to the *Nonresidential Buildings: What's New in 2022* Fact Sheet.
- To review Energy Code updates for other occupancy types, refer to these fact sheets: *Multifamily Buildings: What's Changed in 2022* and *Single-family Buildings: What's Changed in 2022.*

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Why Did the Energy Code Change?

The 2022 Energy Code is an important part of California's work to reduce carbon emissions and fight climate change. The Energy Code is updated every three years with the mandate to increase building energy efficiency while staying cost-effective for building owners over the lifespan of a building.

Increases in energy efficiency and on-site generation:

- Reduce utility bills
- Improve indoor comfort and air quality
- Increase market value
- Reduce greenhouse gas emissions (GHG)

The California Energy Commission (CEC) estimates that over 30 years the 2022 Energy Code will provide $1.5 billion in consumer benefits and reduce 10 million metric tons of GHG – equivalent to taking nearly 2.2 million gas cars off the road for a year.

The CEC estimates that the 2022 Energy Code improvements in efficiency for new nonresidential buildings and covered processes, plus the move toward all-electric design, will reduce net CO_2 emissions by 142,858 metric tons per year compared to the 2019 Energy Code, the equivalent of taking 32,051 gas cars off the road each year.

BENEFITS OF THE 2022 ENERGY CODE ACROSS ALL BUILDING TYPES

- Increases on-site renewable energy generation from solar
- Increases electric load flexibility to support grid reliability
- Reduces emissions from newly constructed buildings
- Reduces air pollution for improved public health
- Encourages adoption of environmentally beneficial efficient electric technologies

Decarbonization Goals

California is aiming to reduce its greenhouse gas emissions (GHG) while creating an energy system that is resilient to climate risks, spurring innovation and a low-carbon transition nationally and internationally. Per the CEC Energy Assessment, California has some of the most ambitious climate and energy goals in the world.

GHG Emission Reduction Goals

Assembly Bill 32:

1990 levels by 2020

Senate Bill 32:

40% below 1990 levels by 2030

Executive Order S-3-05:

80% below 1990 levels by 2050

This can be achieved through a variety of measures, such as incremental steps toward "carbon neutral" buildings, and timely balancing of onsite energy production and consumption in support of a healthy, stable grid. The Energy Code supports reaching these goals.

Learn more from the CEC Building Decarbonization Assessment at bit.ly/CEC-building-decarbonization

2022 ENERGY CODE: ✳ *NEW* ➤ *MAJOR REVISION* *ITALICS in Change Summaries indicate substantial text changes in the Energy Code*

Mechanical Systems: Nonresidential and Hotel/Motel Occupancies

Building Application	Mandatory		Prescriptive	Performance	Additions Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Nonresidential Occupancy Subchapter 3 (§§120.0-120.10)	Subchapter 5 (§§140.0, 140.2-10)	Subchapter 5 (§§140.0-1)	Subchapter 6 (§§141.0-1)	
General	§§100.0, 100.1-2, 110.0, 110.1	§120.0	§§140.0, 140.2	§§140.0-1	§141.0	JA1 Definitions JA2 Weather/Climate JA3 TDV
Heating, Ventilation and Air Conditioning (HVAC) (conditioned spaces)	§§110.2, 110.5	§§120.0-5, 120.8	§140.4			JA5 OCST Thermostats JA6 FDD NA1 NR HERS NA2 NR HERS Test Procedures NA3 Fan Motor Efficiencies NA4 Relocatable School Building NA7 Installation/Acceptance NR
Water Heating	§110.3	§§120.3, 120.8-9	§140.5			N/A
Pool and Spa	§§110.4-5	N/A	N/A	N/A		N/A

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 1 Article 1 – ENERGY BUILDING REGULATIONS			
Section 10-103 – PERMIT, CERTIFICATE, INFORMATIONAL, AND ENFORCEMENT REQUIREMENTS FOR DESIGNERS, INSTALLERS, BUILDERS, MANUFACTURERS, AND SUPPLIERS			
Minor	**10-103(a)4B**	*Certificate of Acceptance*	Certificate of Acceptance forms are to be recorded by an Acceptance Test Technician Certification Provider (ATTCP) and not through any data registry(s) that may be approved by the California Energy Commission (CEC).
Section 10-103.2 – NONRESIDENTIAL MECHANICAL ACCEPTANCE TEST TRAINING AND CERTIFICATION			
✳ New	**10-103.2(c)3H**	*Electronic Database System*	The ATTCP shall maintain, or by suitable contractual requirements cause to be maintained, an electronic database system approved by the CEC meeting minimum requirements dictated within this code section.

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 1 – ALL OCCUPANCIES – GENERAL PROVISIONS			
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION			
Revised	100.1(b)		**Air, Makeup** has an added mechanical feature, "compensating outdoor air," that is considered makeup air per this definition.
New			**Boiler System** is one or more boilers and their piping and controls that work together to supply steam or hot water to heat output devices remote from the boiler.
New		*See new covered process requirements for conditioned greenhouses.*	**Conditioned Greenhouse** is a greenhouse that is provided with wood heating, mechanical heating that has a capacity exceeding 10 Btu/hr-ft², or mechanical cooling that has a capacity exceeding 5 Btu/hr-ft². **Controlled Environment Horticulture (CEH) Space** is a building space dedicated to plant production by manipulating indoor environmental conditions, such as through electric lighting, mechanical heating, mechanical cooling, or dehumidification. CEH space does not include building space where plants are grown solely to decorate that same space.
New			**Combined Energy Efficiency Ratio (CEER)** is the ratio of net cooling capacity (in Btu/hr) to total rate of electrical energy input (in watts) of a cooling system under designated operating conditions, including standby mode, as determined using the applicable test method in the Appliance Efficiency Regulations.
New		*New dedicated outdoor air system definitions support the new requirements of §§140.4(p)-(q).*	**Dedicated Outdoor Air System (DOAS)** is a ventilation system which delivers 100% outdoor air and delivers ventilation supply air to each space, either directly or in conjunction with local or central space-conditioning systems serving those same spaces such as a DX-DOAS, HRV, ERV, or custom ventilation only unit.
			DX-Dedicated Outdoor Air System Units (DX-DOAS) is a type of air-cooled, water-cooled, or water-source DOAS unit that dehumidifies 100 percent outdoor air and includes reheat that is capable of controlling the supply dry-bulb temperature of the dehumidified air to the designed supply air temperature. This conditioned outdoor air is then delivered directly or indirectly to the conditioned spaces. It may precondition outdoor air by containing an enthalpy wheel, sensible wheel, desiccant wheel, plate heat exchanger, heat pipes, or other heat or mass transfer apparatus.
			Integrated Seasonal Coefficient of Performance (ISCOP) is a seasonal efficiency number that is a combined value based on the formula listed in AHRI Standard 920 of the two COP values for the heating season of a DX-DOAS unit water or air source heat pump, expressed in W/W.
New			**Drain Water Heat Recovery (DWHR)** is a system that recovers heat from effluent in waste piping and uses it to preheat water in a domestic or service water heating system in order to reduce water heating energy usage.
New			**Dual-fuel Heat Pump** is an electric heat pump with gas furnace supplemental heat that alternates between the two fuel sources.
New			**Duct Wall Penetrations** are openings to the duct wall made by pipes, holes, conduit, tie rods, or wires.

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION (continued)			
New	100.1(b)		**Economizer, Pumped Refrigerant** is a system by which the supply air of a cooling system is cooled directly by refrigerant pumped between indoor and outdoor units during cooler ambient temperatures in order to reduce or eliminate the need for mechanical cooling.
New			**Enthalpy Recovery Ratio (ERR)** Is a ratio of the change in enthalpy of the outdoor air supply to the difference in enthalpy between the entering supply airflow and the entering exhaust airflow, with no adjustment to account for that portion of the psychometric change in the leaving supply airflow that is the result of leakage of entering exhaust airflow rather than exchange of heat or moisture between the airstreams.
New		*New definitions support the new fan energy index requirements of §§120.10 and 140.4(c).*	**Fan Arrays** are multiple fans in parallel and in a single enclosure between two plenum sections in an air distribution system, where plenum means a compartment or chamber that forms a part of the air distribution system, and that is not used for occupancy or storage. **Fan, Embedded** is a fan that is part of a manufactured assembly where the assembly includes functions other than air movement. **Fan Energy Index (FEI)** is the ratio of the electric input power of a reference fan to the electric input power of the actual fan as calculated per ANSI/AMCA 208-18 at fan system design conditions. **Fan Electrical Input Power (FAN kWdesign)** is the electrical input power in kilowatts required to operate an individual fan or fan array at design conditions. It includes the power consumption of motor controllers, if present. **Fan Nameplate Electrical Input Power (kW)** is the nominal electrical input power rating stamped on a fan assembly nameplate. **Fan System** includes all the fans that contribute to the movement of air through a point of a common duct, plenum, or cabinet. **Fan System, Complex** means a fan system that combines a single-cabinet fan system with other supply fans, exhaust fans, or both. **Fan System, Exhaust / Relief** is a fan system dedicated to the removal of air from interior spaces to the outdoors. **Fan System, Multi-Zone Variable Air Volume (VAV)** is a fan system that serves three or more space-conditioning zones where airflow to each zone is individually controlled based on heating, cooling and/or ventilation requirements, indoor fan airflow varies as a function of load, and the sum of the minimum zone airflows is 40% or less of the fan system design conditions. **Fan System, Return** is a fan system dedicated to removing air from interior where some or all the air is to be recirculated except during economizer operation. **Fan System, Supply-only** is a fan system that provides supply air to interior spaces and does not recirculate the air. **Fan System, Single-cabinet** is a fan system where a single fan, single fan array, a single set of fans operating in parallel, or fans or fan arrays in series and embedded in the same cabinet, that both supplies air to a space and recirculates the air. **Fan System, Transfer** is a fan system that exclusively moves air from one occupied space to another. **Fan System Airflow (CFM)** is the sum of the airflow of all fans with fan electrical input power greater than 1 kW at fan system design conditions, excluding the airflow that passes through downstream fans with fan input power less than 1 kW. **Fan System Design Conditions** are operating conditions that can be expected to occur during normal system operation that result in the highest supply airflow rate to or from the conditioned spaces served by the fan system. **Fan System Electrical Input Power (Fan kWdesign, system)** is the sum of the fan electrical input power (Fan kWdesign) in kilowatts of all fans that are required to operate at fan system design conditions to supply air from the heating or cooling source to the conditioned spaces, return it to the source, exhaust it to the outdoors, or transfer it to another space.

2022 ENERGY CODE: ***NEW*** ***MAJOR REVISION*** ***ITALICS in Change Summaries indicate substantial text changes in the Energy Code***

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION (continued)			
New	100.1(b)	*New definitions support the new heat pump water heater requirements of §170.2(d) applicable to hotel/motels.*	**Heat Pump Water Heater (HPWH)** is a water heater that transfers thermal energy from one temperature level to a higher temperature level for the purpose of heating water, including all ancillary equipment such as fans, storage tanks, pumps, or controls necessary for the device to perform its function. **Single-pass Heat Pump Water Heater** is an HPWH in which the cold water passes through the heat pump(s) once and is heated to the intended storage temperature. **Multi-pass Heat Pump Water Heater** is an HPWH in which the cold water passes through the heat pump(s) multiple times, each time gaining a temperature increase, until the tank reaches the intended storage temperature.
Revised		*Revised and new definitions support the new energy recovery ventilation and heat recovery ventilation requirements of §140.4.*	**Mechanical Cooling** is lowering the temperature within a space using refrigerant compressors or absorbers, desiccant dehumidifiers, or other systems that require energy to directly condition the space. *Systems that are solely energy recovery ventilation (ERV) or heat recovery ventilation (HRV) are not considered mechanical cooling.* In nonresidential, multifamily buildings, and hotel/motel buildings, cooling of a space by direct or indirect evaporation of water alone is not considered mechanical cooling. **Mechanical Heating** is raising the temperature within a space using electric resistance heaters, fossil fuel burners, heat pumps, or other systems that require energy to directly condition the space. *Systems that only use solar energy or heat recovery as the heat source are not mechanical heating systems.*
New		*More occupancy types are considered "multifamily" and align with the California Building Code. See* Multifamily Buildings: What's Changed in 2022 *for more information.*	**Multifamily Building** is any of the following: a building of Occupancy Group R-2, other than a hotel/motel building or timeshare property; a building of Occupancy Group R-3 that is a nontransient congregate residence other than boarding houses of more than 6 guests and alcohol or drug abuse recovery homes of more than 6 guests; or a building of Occupancy Group R-4.
New			**Sensible Energy Recovery Ratio** is a ratio of the change in the dry-bulb temperature of the outdoor air supply to the difference in dry-bulb temperature between the outdoor air and entering exhaust airflow, with no adjustment to account for that portion of the dry-bulb temperature change in the leaving supply airflow that is the result of leakage of entering exhaust airflow rather than heat exchange between the airstreams.
New			**Uniform Energy Factor (UEF)** of a water heater is a measure of overall water heater efficiency, as determined using the applicable test method in the Appliance Efficiency Regulations.
New			**Zonal** describes characterized by or relating to a zone or zones.
Section 100.2 – CALCULATION OF TIME DEPENDENT VALUATION (TDV) ENERGY: No change			

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 2 – ALL OCCUPANCIES – MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS			
Section 110.0 – SYSTEMS AND EQUIPMENT – GENERAL: No change			
Section 110.1 – MANDATORY REQUIREMENTS FOR APPLIANCES: No change			
Section 110.2 – MANDATORY REQUIREMENTS FOR SPACE-CONDITIONING EQUIPMENT			
Minor New	110.2(a)	**Revised Efficiency Tables**	Updated efficiencies on tables include: ◊ 110.2-A Air Conditioners and Condensing Units ◊ 110.2-B Heat Pumps ◊ 110.2-E Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps ◊ 110.2-F (formerly 110.2-G) Heat Rejection Equipment ◊ 110.2-H (formerly 110.2-I) Electrically Operated Variable Refrigerant Flow Air-to-Air and Applied Heat Pumps ◊ 110.2-I (formerly 110.2-J) Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units ◊ 110.2-J (formerly 110.2-K) Gas and Oil-Fired Boilers New efficiencies on tables include: ◊ 110.2-K DX-DOAS Units, Single Package and Remote Condenser ◊ 110.2-M Ceiling-Mounted AC and Condensing Units Serving Computer Rooms ◊ 110.2-N Heat Pump and Heat Recovery Chillers
Minor	110.2(e)	**Open and Closed Circuit Cooling Towers**	An exception has been clarified in which "open and closed cooling" towers with rated capacity < 150 tons are exempt from these cycle of concentration requirements.
Section 110.3 – MANDATORY REQUIREMENTS FOR SERVICE WATER-HEATING SYSTEMS AND EQUIPMENT: No change			
Section 110.4 – MANDATORY REQUIREMENTS FOR POOL AND SPA SYSTEMS AND EQUIPMENT: No change			
Section 110.5 – NATURAL GAS CENTRAL FURNACES, COOKING EQUIPMENT, POOL AND SPA HEATERS, AND FIREPLACES: PILOT LIGHTS PROHIBITED: No change			

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 3 – NONRESIDENTIAL, HOTEL/MOTEL OCCUPANCIES, AND COVERED PROCESSES – MANDATORY REQUIREMENTS			
Section 120.0 – GENERAL: No change			
Section 120.1 – REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY			
Minor	120.1(a)	**General Requirements**	Multifamily occupancies are removed.
Minor	120.1(b)	**Reserved**	Language for multifamily occupancies is moved to §160.2.
➤ Revised	120.1(c)	**Nonresidential and Hotel/ Motel Buildings** *Ventilation rate is based on Equation 120.1-F only, and an alternate method based on the number of occupants is limited to spaces with fixed seating or subject to California Building Code §1004.5.*	1. **Air Filtration** a. **Mechanical Systems:** Revisions clarify when air filtration is required for recirculated and outdoor air to occupied spaces before passing through any thermal conditioning component for mechanical space-conditioning, supply-only ventilation, and supply side of balanced ventilation systems. There is a new exception for energy recovery ventilation (ERV) and heat recovery ventilation (HRV) in which the filters may be located downstream if ancillary filtration is located upstream of the thermal-conditioning system. b. **Air Filter Efficiency:** No change c. **Air Filters:** Minor changes supporting new location of Equation 120.1-A. d. **Filter Racks:** Filter racks or grilles now must use gaskets, sealing or other means to close gaps around inserted filters and prevent air from bypassing the filter. 2. **Natural Ventilation:** No change 3. **Mechanical Ventilation:** Minimum ventilation requirements to the zone must be no less than Equation 120.1-F, with a new exception for spaces designed to exception California Building Code §1004.5-6 and spaces with fixed seating that requires the larger airflow derived per Equation 120.1-G (Vz = The larger of $R_p \times P_z$ or $R_a \times A_z$). 4. **Exhaust Ventilation:** No change
➤ Revised	120.1(d)	**Operation and Control Requirements for Minimum Quantities of Outdoor Air**	1-4. No change 5. **Occupant Sensor Ventilation Control Devices:** It is clarified when and how ventilation must be controlled, when allowed per Table 120.1-A and when lighting occupancy sensors are required for the space per §130.1(c)5,6,7 (Occupancy Sensor Lighting Controls). Occupancy sensor control device requirements depend on the vacancy of the space(s) and the zone(s) subject to the space-conditioning system design parameters. When occupancy sensors indicate that all the spaces within the zone are "unoccupied" when the zone is scheduled to be "occupied," in ≤ 20 minutes the zone must be placed in *occupied standby mode.* In ≤ 5 minutes of entering *occupied standby mode,* the ventilation must be shut off (when mechanical ventilation is shut off to the zone, the ventilation system serving the zone must reduce the system outside air rate by the amount of outside air required for the zone) and, if the space-conditioning system is used for ventilation also, the space-conditioning zone setpoints must be reset per §120.2(e)3 (Occupancy Sensing Zone Controls) until the space is "occupied" or when ventilation is needed to provide space conditioning. All other requirements remain the same.
No Change	120.1(e)	**Ducting for Zonal Heating and Cooling Units**	No change

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 120.1 – REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY (continued)			
Revised	120.1(f)	**Design and Control Requirements for Quantities of Outdoor Air**	1. Designed minimum outdoor air must operate at no less than the larger of the minimum per §120.1(c)3 (Mechanical Ventilation) or the rate required for an exempt or covered process make-up exhaust system(s). 2. Variable air volume (VAV) systems must be capable of maintaining measured outside air rates within 10% of the designed minimum. 3. All mechanical ventilation and space-conditioning systems (not just constant volume as was the requirement in 2019) must be tested to confirm that they operate within 10% of the designed minimum outside air rate.
Minor	120.1(g)	**Air Classification and Recirculation Limitations**	Air class definitions per ASHRAE 62.1 are provided to support the understanding of each class type.
New	120.1(h)	**Ventilation Only Mechanical Systems**	Ventilation systems without mechanical space-conditioning also must be required to meet the minimum ventilation airflow rates of Table 120.1-A.
Section 120.2 – REQUIRED CONTROLS FOR SPACE-CONDITIONING SYSTEMS			
Minor	120.2(a)-(d)		Language for multifamily occupancies is moved to §160.3.
Revised	120.2(e)	**Shut-off and Reset Controls for Space-conditioning Systems**	1. No change 2. No change 3. **Occupant-sensing Zone Controls:** For clarification, edits were made that are similar to §120.1(d) (Operation and Control Requirements for Minimum Quantities of Outdoor Air).
No Change	120.2(f)-(h)		No change
Revised	120.2(i)	**Economizer Fault Detection and Diagnostics**	Newly installed air handlers with mechanical cooling capacity over 33,000 Btuh and an air economizer must meet the fault detection and diagnostics (FDD) requirements of this section (changed from 2019 Energy Code trigger of 54,000 Btuh).
Minor	120.2(j)	**Direct Digital Controls**	Additional references to §110.12 (Mandatory Requirements for Demand Management) support how direct digital controls (DDC) must interact with demand-responsive controllability.
No Change	120.2(k)	**Optimum Start/Stop Controls**	No change
Section 120.3 – REQUIREMENTS FOR PIPE INSULATION: No change			
Section 120.4 – REQUIREMENTS FOR AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS			
No Change	120.4(a)	**California Mechanical Code Compliance**	No change
Revised	120.4(b)	**Duct and Plenum Materials**	**Factory-fabricated and Field-fabricated Duct Systems:** There are new requirements that all ductwork and plenums with pressure class ratings must meet Seal Class A with an exception for exposed ductwork in occupied space.
No Change	120.4(c)-(f)		No change

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 120.4 – REQUIREMENTS FOR AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS (continued)			
New	120.4(g)	**Duct Sealing**	New duct systems have new testing requirements in which ducts must either: 1. Be tested per Reference Nonresidential Appendix NA7.5.3 to verify that there is no more than 6% leakage of the nominal air handler airflow rates of a constant volume, single zone system that serves < 5,000 ft² AND has more than 25% of the duct surface outside the conditioned space AND is not serving a healthcare facility; OR 2. Meet the California Mechanical Code requirements of §603.9.2 if they cannot meet the requirements above.
Section 120.5 – REQUIRED NONRESIDENTIAL MECHANICAL SYSTEM ACCEPTANCE			
Revised	120.5(a)		New language is added to support new Mandatory duct testing requirements of §120.4(g) (Duct Sealing) and for Alterations §141.0(b)2D.
Section 120.9 – MANDATORY REQUIREMENTS FOR COMMERCIAL BOILERS			
Revised	120.9		(a)-(b) No change (c) There is an exception for newly installed boilers ≥ 5 MMBtuh stack gas oxygen concentration limits, and combustion air requirements apply to boilers with steady full-load combustion efficiency of ≥ 90% (revised from 85% per the 2019 Energy Code).
Section 120.10 – MANDATORY REQUIREMENTS FOR FANS			
New	120.10(a)		Each fan, or fan array, must meet a fan energy index (FEI) of ≥ 1 at fan design conditions, when the combined motor nameplate horsepower is > 1.00 hp, or fan nameplate electrical input power is > 0.89 kW. Each VAV fan, or fan array, that meets §140.4(c)2 (Fan Systems) must have an FEI of ≥ 0.95 at fan system design conditions. Additional requirements apply, along with the following exceptions. EXCEPTIONS: 1. Embedded fans that are part of equipment listed under §110.2, §110.1, computer room air conditioners (CRACs) as defined in 10 CFR 431, and DX-Dedicated Outdoor Air System Units (DX-DOAS) units 2. Embedded fans and fan arrays with a combined motor nameplate horsepower of ≤ 5 hp or with a fan system electrical input power of ≤ 4.1 kW 3. Circulation fans, ceiling fans and air curtains 4. Fans that are intended to only operate during emergency conditions

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Level of Change	Section	Subtitle & Notes	Performance Change Summaries
Section 140.0 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES: Minor changes			
Section 140.1 – PERFORMANCE APPROACH: ENERGY BUDGETS: Minor changes			

Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Title 24, Part 6 Subchapter 5 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR ACHIEVING ENERGY EFFICIENCY			
Section 140.2 – PRESCRIPTIVE APPROACH: No change			
Section 140.4 – PRESCRIPTIVE REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS			
Revised	140.4(a)	**Sizing, Equipment Selection and Type** *New Prescriptive heat pump equipment requirements apply to certain building space types and may differ based on Climate Zone and equipment sizing.*	1. **Sizing and Equipment Selection:** No change 2. **Single Zone Space-conditioning System Type:** New When single zone space-conditioning with direct expansion (DX) cooling with rated cooling capacity ≤ 240,000 Btuh is used, the following building spaces are Prescriptively required to use heat pump equipment, or must meet the Performance compliance requirements of §140.1. All other equipment does not have this Prescriptive requirement but must meet all other Energy Code requirements. EXCEPTION applies to systems utilizing recovered heat for space heating.
Minor	140.4(b)	**Calculations**	Language for multifamily occupancies is moved to §170.2(c)2, otherwise no changes.

Building Space Type	Climate Zone	Space-conditioning Requirements
Retail and Grocery	2-15	Heat pump
	1 and 16	Cooling capacity < 65,000 Btuh: Air conditioner with furnace
		Cooling capacity ≥ 65,000 Btuh: Dual-fuel heat pump
School	2-15	Heat pump
	1 and 16	Dual-fuel heat pump
Office, Financial Institution and Library	1-15	Heat pump
	16	Cooling capacity < 65,000 Btuh: Air conditioner with furnace
		Cooling capacity ≥ 65,000 Btuh: Dual-fuel heat pump
Office Spaces in Warehouses	1-16	Heat pump

Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Section 140.4 – PRESCRIPTIVE REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS (continued)			
➤ Revised	140.4(c)	**Fan Systems** *New fan power requirements are triggered for fan systems with input power ≥ 1 kW which includes new tables and equations.* **EXCEPTIONS to §140.4(c):** 1. Fan system power caused solely by process loads: No change 2. REMOVED: Licensed healthcare facilities are no longer exempt.	1. **Fan Power Budget:** For each fan system that is moving air into, out of or between conditioned or circulating air for the purpose of conditioning air within a space and includes at least one fan or fan array with fan electrical input power ≥ 1 kW, the fan system electrical input power must not exceed kW budgets at the fan system design airflow. A. **Calculating Fan Power Budget:** ***Fan System Airflow x Sum of the Fan Power Allowances / 1000 = Fan Power kW Budget**** *For building sites at elevations > 3,000 ft, multiply Fan Power kW Budget by correction factor in Table 140.4-C. Each fan system airflow is used to determine fan power allowance(s) using the appropriate allowance table. For a given component, if only a portion of the fan system airflow passes through the component, calculate the Fan Power Allowance for that component per Equation 140.4-A. **Fan System Type** / **Fan System Power Allowance Tables** Single-cabinet: Table 140.4-A and Table 140.4-B Supply-only: Table 140.4-A Relief: Table 140.4-B Exhaust, Return and Transfer: Table 140.4-B Complex Supply, Return/Exhaust: ✦ Separately calculate the fan power allowances for supply and return/exhaust systems and then sum them. ✦ Airflow allowance: ◊ Supply: Use Table 140.4-A for each fan using design conditions. ◊ Return/exhaust: Use Table 140.4-B for each fan at design conditions. B. **Determining Designed Fan Power:** Fan input power must be calculated with mid-life filter pressure drop, which is the mean of the clean filter pressure drop and design final filter pressure drop. If variable speed drives are used, their efficiency losses must be included. Each fan or fan array designed fan power must be determined using one of the following methods. There is no requirement to use the same method for all fans in a fan system to determine the total Designed Fan Power. i. Fan power per Table 140.4-D, cannot be used for complex fans. ii. Fan power is provided by the manufacturer of the fan, fan array or equipment that includes the fan or fan array calculated per USDOE 10 CFR Part 430, USDOE 10 CFR Part 431, ANSI/AMCA Standard 208-2018, ANSI/AMCA Standard 210-2016, AHRI Standard 430-2020, AHRI Standard 440-2019, or ISO 5801-2017. iii. Fan power is provided by the manufacturer, calculated at fan system design conditions per ANSI/AMCA 208-2018 §5.3. iv. Fan power is determined using the maximum electrical input power provided on the motor nameplate. 2. **VAV Systems:** No change 3. **Fractional HVAC Motors for Fans:** No change
➤ Revised	140.4(d)	**Space-conditioning Zone Controls**	1. No change 2. VAV systems change (all other requirements have no changes): A. In zones with direct digital controls (DDC), the volume of primary air in the deadband must not exceed design zone outdoor airflow as specified by §120.1(c)3. (20% of peak primary airflow is no longer an option.)

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Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Section 140.4 – PRESCRIPTIVE REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS (continued)			
➤ Revised	140.4(e)	**Economizers**	Each cooling air handler with a design total mechanical cooling capacity over 33,000 Btuh (no longer 54,000 Btuh) is Prescriptively required to provide an air or water economizer. Except for clarifications in Table 140.4-F (Economizer Trade-Off Table for Cooling Systems), all other requirements remain the same. EXCEPTIONS: 1-2. No change 3. This exception applies only to hotel/motel rooms. (Language for multifamily occupancies is moved to §170.2(c)4C.) 4-5. No change 6. Revised: Economizers are exempt when, in all Climate Zones, each air handler meets all of the following criteria: The air handler must have a design total mechanical cooling capacity < 54,000 Btuh where ventilation is provided by a dedicated outdoor air system (DOAS) with exhaust air heat recovery in accordance with §140.4(p) (Dedicated Outdoor Air Systems [DOAS]); AND the DOAS unit must meet the exhaust air heat recovery ratio as specified in §140.4(q)1 (Exhaust Air Heat Recovery) AND include bypass or control to disable energy recovery as specified in §140.4(q)2; AND the DOAS unit must provide at least the minimum ventilation airflow rate as specified in §120.1(c)3 (Mechanical Ventilation) AND provide no less than 0.3 CFM/ft² airflow during economizer conditions. 7. New: Air economizer(s) in controlled environment horticulture (CEH) spaces will affect carbon dioxide enrichment systems.
No Change	140.4(f)	**Supply Air Temperature Reset Controls**	No change
No Change	140.4(g)	**Electric Resistance Heating**	No change
No Change	140.4(h)	**Heat Rejection Systems**	No change
No Change	140.4(i)	**Minimum Chiller Efficiency**	No change
No Change	140.4(j)	**Limitation of Air-cooled Chillers**	No change
➤ Revised	140.4(k)	**Hydronic System Measures**	1-7. No change 8. High-capacity Space-heating Gas Boiler Systems: In Climate Zones 1-6, 9-14 and 16 with a gas hot water boiler system with total system input between 1 MMBtuh and ≤ 10 MMBtuh used for space heating must have a boiler thermal efficiency of ≥ 90%. Multiple boilers may provide input capacity-weighted average thermal efficiency ≥ 90%. For boilers federally regulated by combustion efficiency, the calculation for the input capacity-weighted average thermal efficiency must use the combustion efficiency value. Hot water distribution design must be designed so that: • Coils and other heat exchangers must be selected so that, at design conditions, the hot water return temperature entering the boilers is ≤ 120°F; AND • Under all operating conditions, the water temperature entering the boiler is ≤ 120°F, OR the flow rate of supply hot water that recirculates directly into the return system, such as by three-way valves or minimum flow bypass controls, must be ≤ 20% of the design flow of the operating boilers. EXCEPTIONS: 1. 25% of the annual space-heating requirement is provided by on-site renewable energy, site-recovered energy or heat recovery chillers. 2. Space-heating boilers are installed in individual dwelling units. 3. ≥ 50% of the design heating load is served using perimeter convective heating, radiant ceiling panels or both. 4. Individual gas boilers with input capacity < 300,000 Btuh must not be included in the calculations of the total system input or total system efficiency.

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Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Section 140.4 – PRESCRIPTIVE REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS (continued)			
Revised	140.4(l)	**Air Distribution System Duct Leakage Sealing**	REMOVED: This is now a Mandatory requirement per §120.4(g) (Duct Sealing).
No Change	140.4(m)	**Fan Control**	No change
Minor	140.4(n)	**Mechanical System Shut-off**	Language for multifamily occupancies is moved to §170.2(c)4L. Otherwise, there are no changes.
No Change	140.4(o)	**Exhaust System Transfer Air**	No change
New	140.4(p)	**Dedicated Outdoor Air Systems**	HVAC systems which utilize a dedicated outdoor air system (DOAS) such as a DX-DOAS, HRV or ERV unit to condition, temper or filter 100% outdoor air separate from local or central space-conditioning systems serving the same space must meet the following criteria: 1. DOAS unit fan systems with input power < 1 kW must not exceed a total combined fan power of 1.0 W/CFM. DOAS with fan power ≥ 1 kW must meet the requirements of §140.4 (c); AND 2. The DOAS supply air must be delivered directly to the occupied space or at the outlet of any terminal heating or cooling coils and must cycle off any zone heating and cooling equipment fans, circulation pumps and terminal unit fans when there is no call for heating or cooling in the zone WITH EXCEPTIONS: 1. Active chilled beam systems 2. Sensible-only cooling terminal units with pressure-independent variable-airflow regulating devices limiting the DOAS supply air to the greater of latent load or minimum ventilation requirements 3. Any configuration where a DOAS unit provides ventilation air to a downstream fan (a terminal box, air handling unit or other space-conditioning equipment) where the total system airflow can be reduced to ventilation minimum or the downstream fan power is ≤ 0.12 W/CFM when space temperatures are within the thermostat deadband (at low speed per manufacturer's literature) 3. DOAS supply and exhaust fans must have a minimum of three speeds to facilitate system balancing; AND 4. DOAS with mechanical cooling providing ventilation to multiple zones and operating in conjunction with zone heating and cooling systems must not use heating or heat recovery to warm supply air above 60°F when representative building loads or outdoor air temperature indicate that the majority of zones require cooling.

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Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Section 140.4 – PRESCRIPTIVE REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS (continued)			
New	140.4(q)	**Exhaust Air Heat Recovery**	Fan systems designed to operate to the criteria listed in either Table 140.4-J or Table 140.4-K must include an exhaust air heat recovery system which meets the following: 1. There is a sensible energy recovery ratio of ≥ 60% or enthalpy recovery ratio of ≥ 50% at cooling and heating design conditions and rated per AHRI 1060. 2. Energy recovery bypass or control directly economizes with ventilation air based on outdoor air temperatures limits specified in Table 140.4-G. For energy recovery systems where the transfer of energy cannot be stopped, the bypass must prevent the total airflow rate of either outdoor air or exhaust air through the energy recovery exchanger from exceeding 10% of the full design airflow rate. EXCEPTION: DOAS units with the capability to shut off when a separate space-conditioning system serving the same space meets the economizer requirements per §140.4(e)1A EXCEPTIONS: 1. Systems meeting §140.9(c) (Prescriptive Requirements for Laboratory and Factory Exhaust Systems) 2. Systems serving spaces that are not cooled and that are heated < 60°F 3. In Climate Zone 16 when > 60% of the outdoor air heating energy is provided from site-recovered energy 4. In Climate Zone 15 sensible recovery ratio requirements at heating design conditions 5. In Climate Zone 1 sensible recovery ratio requirements at cooling design conditions 6. Where the sum of the airflow rates exhausted and relieved within 20 feet of each other is < 75% of the design outdoor airflow rate, excluding exhaust air that is either used for another energy recovery system, or when not allowed by California Mechanical Code (Title 24, Part 4) for use in energy recovery systems with leakage potential, or Class 4 as specified in §120.1(g) (Air Classification and Recirculation Limitations) 7. Systems expected to operate < 20 hours per week
Section 140.5 – PRESCRIPTIVE REQUIREMENTS FOR SERVICE WATER HEATING SYSTEMS			
Revised	140.5(a)	**Nonresidential Occupancies**	Service water-heating systems for school buildings < 25,000 ft² and < 4 stories in Climate Zones 2-15 must use a heat pump water heater meeting requirements of §§110.1, 110.3 and 120.3. EXCEPTION: A water heater serving an individual bathroom space may be an instantaneous electric resistance water heater. All other occupancies have no Prescriptive service water-heating requirements but still must meet the requirements of §§110.1, 110.3, 120.3 and 140.5(c).
Minor	140.5(b)	**Hotel/Motel Occupancies**	Multifamily occupancy requirements are moved to §170.2(d) to which hotel/motel buildings are subject.
New	140.5(c)	**High-capacity Service Water-heating Systems**	Gas service hot water-heating system(s) with total system input ≥ 1 MMBtuh must have a thermal efficiency of ≥ 90%. Multiple units may provide input capacity-weighted average thermal efficiency ≥ 90%. EXCEPTIONS: 1. 25% of the annual service water-heating requirement is provided by site-solar energy or site-recovered energy. 2. Water heaters are installed in individual dwelling units. 3. Individual gas water heaters with input capacity ≤ 100,000 Btuh must not be included in the calculations of the total system input or total system efficiency.

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Title 24, Part 6 Subchapter 6 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – ADDITIONS, ALTERATIONS, AND REPAIRS					
Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING NONRESIDENTIAL AND HOTEL/MOTEL BUILDINGS, TO EXISTING OUTDOOR LIGHTING, AND TO INTERNALLY AND EXTERNALLY ILLUMINATED SIGNS					
Revised	141.0(a)	**Additions**	1. **Prescriptive Approach:** No change 2. **Performance Approach:** No change EXCEPTIONS: 1- 4. No change 5. A gas hot water boiler system with a total system input of at least 1 MMBtuh but no more than 10 MMBtuh added to an existing building is exempt from the requirements of §140.4(k)8 (High-Capacity Space Heating Gas Boiler Systems). 6. A gas water-heating system with a total system input of at least 1 MMBtuh added to an existing building is exempt from the requirements of §140.5(c) (High Capacity Service Water Heating Systems). 7. New space-conditioning systems or components are exempt from §140.4(a)2 (Single Zone Space Conditioning System Type).		
Revised	141.0(b)1	**Alterations: Mandatory**	D. **Fan Energy Index (FEI):** New fan systems serving an existing building must meet the requirements of §120.10 (Mandatory Requirements for Fans).		
Revised	141.0(b)2	**Alterations: Prescriptive** *The new Table 141.0-D supports the fan energy index as it applies to fan system Alterations.*	C. **New or replacement space-conditioning systems or components other than new or replacement space-conditioning system ducts** must meet the requirements of §140.4 (Prescriptive Requirements for Space Conditioning Systems) applicable to the systems or components being altered. Additional Fan Power Allowances are available when determining the Fan Power Budget as specified in Table 141.0-D. These values can be added to the Fan Power Allowance values in Table 140.4-A and Table 140.4-B. EXCEPTIONS: 1. §140.4(a)2 (Prescriptive Single Zone Space Conditioning System Type) does not apply to new or replacement space-conditioning systems or components. 2. No change: §141.0(b)2 does not apply to replacement of electric reheat of equivalent or lower capacity electric resistance space heaters when natural gas is not available. 3. No change: §140.4(n) (Mechanical System Shut-off) is not applicable to new or replacement space-conditioning systems. 4. §140.4(e) (Economizers) does not apply to an HVAC system that has a cooling capacity < 54,000 Btuh and includes either a single package air-cooled commercial unitary air conditioner, a heat pump or both. 5. A new or replacement gas hot water boiler system with a total system input of at least 1 MMBtuh but no more than 10 MMBtuh need not comply with the requirements of §140.4(k)8 (High-Capacity Space Heating Gas Boiler Systems). *(Continued)*		

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING NONRESIDENTIAL AND HOTEL/MOTEL BUILDINGS, TO EXISTING OUTDOOR LIGHTING, AND TO INTERNALLY AND EXTERNALLY ILLUMINATED SIGNS					
Revised	141.0(b)2	**Prescriptive** *New high-capacity service water heating system requirements of §140.5(c) are not required for Alterations.*	*(continued)* D. **Altered Duct Systems:** New or replacement space-conditioning system ducts installed to serve an existing building must meet the requirements of §120.4(a) through (f) AND either i, ii or iii. i. Entirely new or complete replacement duct systems installed as part of an Alteration must be leakage tested in accordance with §120.4(g). Entirely new or complete replacement duct systems installed as part of an Alteration must be constructed of at least 75% new duct material, and up to 25% may consist of reused parts from the building's existing duct system, including registers, grilles, boots, air handlers, coils, plenums and ducts, if the reused parts are accessible and can be sealed to prevent leakage. ii. If the new ducts are an extension of an existing duct system and the combined new and existing duct system meets the criteria in Subsections 1, 2, 3 and 4 below, the duct system must be sealed to a leakage rate ≤ 15% of the nominal air handler airflow rate as confirmed through HERS field verification and diagnostic testing, in accordance with the applicable procedures in Reference Nonresidential Appendix NA7.5.3. 1. The duct system does not serve a healthcare facility. 2. The duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system. 3. The space-conditioning system serves < 5,000 ft² of conditioned floor area. 4. The combined surface area of the ducts located outdoors or in unconditioned space is > 25% of the total surface area of the entire duct system. EXCEPTIONS: 1. When it is not possible to achieve the duct leakage criterion in §141.0(b)2Dii, then all accessible leaks must be sealed and verified through a visual inspection and a smoke test performed by a certified HERS Rater utilizing the methods specified in Reference Nonresidential Appendix NA2.1.3.2.2. 2. Existing duct systems that are extended, which are constructed, insulated or sealed with asbestos are exempt from the requirements §141.0(b)2Dii. iii. If new ducts installed as part of an Alteration are exempt from leakage testing according to §141.0(b)2Di or §141.0(b)2Dii, then the new ducts must meet the duct leakage testing requirements of California Mechanical Code §603.10.1. E. **Altered Space-conditioning Systems** i. No change ii. The duct system that is connected to the new or replaced space-conditioning system equipment must be sealed in accordance with §141.0(b)2Dii. EXCEPTIONS: 1. Buildings are altered so that the duct systems no longer meet the criteria of §141.0(b)2Dii. 2. Duct systems are documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2. 3. No change: Duct Sealing: Existing duct systems constructed, insulated or sealed with asbestos are exempt from the requirements of §141.0(b)2Eii. N. **Service Water-heating Systems:** These systems must meet requirements of §§140.5(a)2 (Nonresidential Occupancy Prescriptive Requirements) and 140.5(b) (Hotel/Motel Prescriptive Requirements) not including the solar water-heating requirements.	
Minor	141.0(b)3	**Performance Approach**	Minor changes		

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Envelope and Commissioning: Nonresidential and Hotel/Motel Occupancies

Building Application	Mandatory		Prescriptive Subchapter 5 (§§140.0, 140.2-10)	Performance Subchapter 5 (§§140.0-1)	Additions Alterations Subchapter 6 (§§141.0-1)	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Nonresidential Occupancy Subchapter 3 (§§120.0-120.10)				
General	§§100.0, 100.1-2	§120.0	§§140.0, 140.2	N/A	N/A	JA1 Definitions JA2 Weather/Climate JA3 TDV
Commissioning	N/A	§120.8	N/A			N/A
Envelope (conditioned)	§§110.6-8	§120.7	§140.3	§§140.0-1	§141.0	JA4 U-factor/C-Factor/Thermal Mass NA4 Relocatable School Building NA6 Alternate Fenestration Method (COG) NA7 Installation/Acceptance NR
Envelope (unconditioned, process spaces)	N/A *See "What's Changed - Covered Processes" for new controlled environment horticulture requirements.*		§140.3(c)			

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 1 – ALL OCCUPANCIES – GENERAL PROVISIONS			
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION			
Revised	**100.1(b)**		**Curtain Wall/Storefront** is an external non-bearing wall intended to separate the exterior nonconditioned and interior conditioned spaces. It also consists of any combination of framing materials, fixed glazing, opaque glazing, operable windows, or other in-fill materials. *Note: Window wall is also included as part of the curtain wall/storefront fenestration category.*
New		*More occupancy types are considered "multifamily" and align with the California Building Code.*	**Multifamily Building** is any of the following: a building of Occupancy Group R-2, other than a hotel/motel building or timeshare property; a building of Occupancy Group R-3 that is a nontransient congregate residence other than boarding houses of more than 6 guests and alcohol or drug abuse recovery homes of more than 6 guests; or a building of Occupancy Group R-4.
New		*Definitions support new roof Alteration requirements.*	**Roof Recover** is the process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.
			Roof Replacement is the process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.
Section 100.2 – CALCULATION OF TIME DEPENDENT VALUATION (TDV) ENERGY: No change			

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 2 – ALL OCCUPANCIES – MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS			
Section 110.6 – MANDATORY REQUIREMENTS FOR FENESTRATION PRODUCTS AND EXTERIOR DOORS			
Revised	110.6(a)	**Certification of Fenestration Products and Exterior Doors Other than Field-fabricated**	1. **Air leakage:** No change 2. **U-factor:** The NA6 formula can ONLY be used for skylights < 200 ft² and is not allowed for new vertical fenestration but is allowed for any amount of Alterations to vertical fenestration. 3. **Solar heat gain coefficient (SHGC):** The NA6 formula can ONLY be used for skylights < 200 ft² and is not allowed for new vertical fenestration but is allowed for any amount of Alterations to vertical fenestration. 4. **Visible transmittance (VT):** The NA6 formula can ONLY be used for skylights < 200 ft² and is not allowed for new vertical fenestration but is allowed for any amount of Alterations to vertical fenestration. 5. **Labeling:** No change 6. **Fenestration acceptance requirements:** No change for nonresidential or hotel/motel occupancies
Section 110.7 – MANDATORY REQUIREMENTS TO LIMIT AIR LEAKAGE: No change			
Section 110.8 – MANDATORY REQUIREMENTS FOR INSULATION, ROOFING PRODUCTS AND RADIANT BARRIERS: Minor changes			
Title 24, Part 6 Subchapter 3 – NONRESIDENTIAL, HOTEL/MOTEL OCCUPANCIES, AND COVERED PROCESSES – MANDATORY REQUIREMENTS			
Section 120.0 – GENERAL: No change			
Section 120.7 – MANDATORY INSULATION REQUIREMENTS: Minor changes			
Section 120.8 – NONRESIDENTIAL BUILDING COMMISSIONING: Minor changes			

Level of Change	Section	Subtitle & Notes	Performance Change Summaries
Section 140.0 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES: Minor changes			
Section 140.1 – PERFORMANCE APPROACH: ENERGY BUDGETS: Minor changes			

Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Title 24, Part 6 Subchapter 5 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR ACHIEVING ENERGY EFFICIENCY			
Section 140.2 – PRESCRIPTIVE APPROACH: No change			
Section 140.3 – PRESCRIPTIVE REQUIREMENTS FOR BUILDING ENVELOPES			
➤ Revised	140.3(a)	**Envelope Component Requirements** *Changes are made to roofing requirements for steep-sloped roofs and U-factor requirements for metal-framed walls.*	1. **Exterior Roofs and Ceilings** A. **Roofing Products:** Steep-sloped roofs have new rated roof requirements, see table below. In addition, Table 140.3 (Roof/Ceiling Insulation Tradeoff for Aged Solar Reflectance) wood-framed tradeoff option now includes Climate Zones 6-9. (Formerly, it included only Climate Zones 6 and 7.) **Roofing Product Requirements for Steep-sloped Roofs** *(see table below)* 2. **Exterior Walls:** Metal-framed wall U-factor requirements in Tables 140.3-B, C and D have changed for all Climate Zones; Climate Zone 1, 6-7 = 0.060 (was 0.069); Climate Zone 2, 4-5, 8-16 = 0.055 (was 0.062); Climate Zone 3 = 0.071 (was 0.082). Otherwise, there are no changes. 3. **Demising Walls:** No change 4. **Exterior Floors and Soffits:** No change *(continued)*

Climate Zone	Aged Solar Reflectance	Thermal Emittance	SRI
1 and 3	≥ 0.20	≥ 0.75	≥ 16
2, 4-16	*≥ 0.25*	*≥ 0.80*	*≥ 23*

Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Section 140.3 – PRESCRIPTIVE REQUIREMENTS FOR BUILDING ENVELOPES (continued)			
➤ Revised	140.3(a)	**Envelope Component Requirements** *Fenestration is now dependent upon Climate Zone, and is NO LONGER the same in all Climate Zones.*	*(continued)* 5. **Exterior Windows:** See Table 140.3-B for Nonresidential, Table 140.3-C for Hotel/Motel and 140.3-D for Relocatable School Buildings. Fenestration requirements have not changed in Tables 140.3-C and 140.3-D.

Table 140.3-B Envelope Component Package – Fenestration

Fenestration Type	Efficiency Type	Climate Zone	Efficiency
Fixed	U-factor	1-8, 10, 16	0.36
		9, 11-15	0.34
	RSHGC	1-8, 10, 16	0.25
		9,11-15	0.22
	VT	1-16	0.42
Curtain Wall/Storefront	U-factor	1, 7	0.38
		2-6, 8-16	0.41
	RSHGC	1, 7	0.25
		2-6, 8-16	0.26
	VT	1-16	0.46
Operable (no change)	U-factor	1-16	0.46
	RSHGC	1-16	0.22
	VT	1-16	0.32
Glazed Door (no change)	U-factor	1-16	0.45
	RSHGC	1-16	0.23
	VT	1-16	0.17
Maximum Window-to-Wall Ratio (no change)		1-16	40%
RSHGC = relative solar heat gain coefficient; VT= visible transmittance.			

Clarity is provided that conditioned greenhouses are to use requirements of §120.6(h)4 (Environment Horticulture). Exterior horizontal slats are included as a feature that can be used to calculate Relative Solar Heat Gain Coefficient (RSHGC), which is reflected in revised Equations 140.3-A and 140.3-B.

(continued)

Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Section 140.3 – PRESCRIPTIVE REQUIREMENTS FOR BUILDING ENVELOPES (continued)			
Revised	140.3(a)	**Envelope Component Requirements** *There are new air barrier efficiency requirements in addition to new design criteria.*	*(continued)* 6. **Skylights:** No change 7. **Exterior doors:** If an opaque door has > 25% of its surface area as glazing, the entire rough opening is considered fenestration – glazed door. 8. **Relocatable Public School Buildings:** In Climate Zones 2, 4-16. steep-sloped roofing requirements have changed the solar reflectance to 0.25 and the thermal emittance to 0.80. Climate Zones 1 and 3 have remained as 0.20 for solar reflectance and 0.75 for thermal emittance as per Table 140.3-B. 9. **Air Barrier:** Per Table 140.3-B/C, an air barrier is now required in all Climate Zones except for hotel/motel guestrooms in Climate Zone 7. A. **Design:** Construction documents must include air barrier boundaries, interconnections and penetrations, and associated square foot calculations for all sides of the air barrier. B. **Acceptable Materials and Assemblies:** The air barrier must be sealed at all joints for its entire length and must be composed of either i or ii: i. **Materials** that have an air permeance not exceeding 0.004 CFM/ft², under a pressure differential of 0.3 in. of water (1.57 psf) (0.02 L/(sec-m²) at 75 pa), when tested in accordance with ASTM E2178, use materials in Table 140.3-A (Materials Deemed to Comply) OR ii. **Assemblies** of materials and components that have an average air leakage not exceeding 0.04 CFM/ft², under a pressure differential of 0.3 in. of water (1.57 psf) (0.02 L/(sec-m²) at 75 pa), when tested in accordance with ASTM E2357, ASTM E1677, ASTM E1680, or ASTM E283. EXCEPTIONS: Concrete masonry walls that have at least two coatings of paint or at least two coatings of sealer coating; concrete masonry walls with integral rigid board insulation; structurally insulated panels; Portland cement or Portland sand parge, or stucco, or a gypsum plaster, each with minimum ½" thickness. C. **Verification:** i. *If verification is performed (it is a choice, not a requirement),* then the entire building shall meet one of the following requirements: a. **Testing per New NA5 Field** Verification and Diagnostic Testing of Whole Building Air Leakage procedure ensures that air leakage is ≤ 0.40 CFM/ft²; OR b. **Buildings > 50,000 ft² CFA** can use sampling as described in this section; OR ii. **When air leakage is NOT ≤ 0.40 CFM/ft²** then visual inspection and diagnostic evaluation per Reference Nonresidential Appendix NA5.7 can be used. EXCEPTION: Relocatable public school buildings are excepted.
	140.3(b)		RESERVED
No Change	140.3(c)	**Minimum Daylighting Requirement for Large Enclosed Spaces**	No change
	140.3(d)	**Daylighting Design Power Adjustment Factors (PAFs)**	See "What's Changed – Electrical Systems."

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Title 24, Part 6 Subchapter 6 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES–ADDITIONS, ALTERATIONS, AND REPAIRS					
Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING NONRESIDENTIAL AND HOTEL/MOTEL BUILDINGS, TO EXISTING OUTDOOR LIGHTING, AND TO INTERNALLY AND EXTERNALLY ILLUMINATED SIGNS					
Minor	141.0(a)	**Additions**	Minor changes		
➤ Revised	141.0(b)1	**Alterations**	It is clarified that compliance requirements for wall and floor insulation are based on an area-weighted average U-factor.		
➤ Revised	141.0(b)2	**Prescriptive Approach**	A. **Fenestration:** No change B. **Roofs:** For roofs in which > 50% of roof area or > 2,000 ft² (whichever is less) of roof is replaced, recovered or recoated, i and ii apply: i. Meet §140.3(a)1A (Roofing Products). EXCEPTIONS: 1. **Low-sloped Roofs:** Aged solar reflectance < 0.63 is allowed if meeting requirements of Table 141.0-B. Roof U-factor requirements of Table 141.0-B have changed for all Climate Zones to qualify for tradeoff. 2. The exception for **integrated PV or solar thermal panels** has not changed. 3. The exception for ≥ 25 lb/ft² roof construction has not changed. ii. **Roof/Ceiling Insulation for Low-sloped Roofs:** Roof recover and replacement must be insulated per Table 141.0-C in Climate Zones 1-5 and 9-16: R-value=R-23 / U-factor=0.037 utilizing ≥ R-10 above roof deck; in Climate Zones 6-8: R-value=R-17 / U-factor=0.047 utilizing ≥ R-10 above roof deck). EXCEPTIONS: 1. **Roof Recovers:** If new ≥ R-10 is added above the roof deck, U-factor requirements of Table 141.0-C are NOT required. 2. **Roof Replacements:** If existing mechanical equipment is not being disconnected or lifted, either ≥ R-10 or the insulation thickness compliant with the manufacturer's instructions for minimum base flashing heights, whichever is greater, must be installed. 3. **Drains:** Tapered insulation to drains or any other low point is allowed as long as overall weighted R-value per Table 141.0-C is achieved. 4. **Roof recoat:** This project is not required to meet these insulation requirements. R. **Exterior Doors:** New exterior opaque door area must meet U-factor requirements of §140.3(a)7.		
Minor	141.0(b)3	**Performance Approach**	Minor changes		

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Electrical Systems: Lighting, Demand Management and Electrical Distribution

Building Application	Mandatory		Prescriptive	Performance	Additions Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Residential Occupancy Subchapters 3-4 (§§120.0-130.5)	Subchapter 5 (§§140.0, 140.2-10)	Subchapter 5 (§§140.0-1)	Subchapter 6 (§§141.0-1)	
General	§§100.0, 100.1-2	§120.0	N/A	N/A	§141.0	JA1 Definitions JA3 TDV
Demand Management	§110.12	N/A				
Electrical Distribution	§110.11	§§130.4, 130.5				
Indoor Lighting (conditioned, process spaces)	§110.9 *See "What's Changed - Covered Processes" for new controlled environment horticulture requirements.*	§§120.8, 130.0, 130.1, 130.4	§§140.3(c), 140.6	§§140.0-1		JA8 Residential High Efficacy Light JA10 Residential JA8 Flicker NA4 Relocatable School Building NA7 Installation/Acceptance NR NA8 Default Luminaire Power
Indoor Lighting (unconditioned, parking garages)				N/A		
Outdoor Lighting		§§130.0, 130.2, 130.4	§140.7			
Sign Lighting (indoor and outdoor)		§§130.0, 130.3	§140.8			NA7 Installation/Acceptance NR

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 1 Article 1 – ENERGY BUILDING REGULATIONS			
Section 10-103 – PERMIT, CERTIFICATE, INFORMATIONAL, AND ENFORCEMENT REQUIREMENTS FOR DESIGNERS, INSTALLERS, BUILDERS, MANUFACTURERS, AND SUPPLIERS			
Minor	10-103(a)4B	**Certificate of Acceptance**	Certificate of Acceptance forms are to be recorded by an Acceptance Test Technician Certification Provider (ATTCP) and not through any data registry(s) that may be approved by the California Energy Commission (CEC).
Section 10-103.1 – NONRESIDENTIAL LIGHTING CONTROLS ACCEPTANCE TEST TRAINING AND CERTIFICATION			
✳ New	10-103.1(c)3H	**Electronic Database System**	The ATTCP shall maintain, or by suitable contractual requirements cause to be maintained, an electronic database system approved by the CEC meeting minimum requirements dictated within this code section.

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 10-114 – DETERMINATION OF OUTDOOR LIGHTING ZONES AND ADMINISTRATIVE RULES FOR USE			
Revised	10-114	**Lighting Zones** *Changes are made about how lighting zones apply.*	Changes to Table 10-114-A include new scope of how lighting zones apply to projects: ✦ **LZ0 (Very low):** No change ✦ **LZ1 (Low):** Statewide default location description: *Rural areas, as defined by the 2010 U.S. Census. These areas include: single or dual family residential areas, parks, and agricultural zone districts,* developed portion of government designated parks, recreation areas, and wildlife preserves. Those that are wholly contained within a higher lighting zone may be considered by the local government as part of that lighting zone. *Retail stores, located in a residential neighborhood, and rural town centers, as defined by the 2010 U.S. Census, can be designated as LZ2 if the business operates during hours of darkness.* ✦ **LZ2 (Moderate):** *Urban clusters,* as defined by the 2010 U.S. Census: *The following building types may occur here: multifamily housing, mixed use residential neighborhoods, religious facilities, schools, and light commercial business districts or industrial zoning districts.* ✦ **LZ3 (Moderately High):** Urban areas, as defined by the 2010 U.S. Census: *The following building types may occur here: high intensity commercial corridors, entertainment centers, and heavy industrial or manufacturing zone districts.* ✦ **LZ4 (High):** No change
Title 24, Part 6 Subchapter 1 – ALL OCCUPANCIES – GENERAL PROVISIONS			
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION			
Revised	100.1(b)		Lighting definitions have had an overhaul to clean up and rearrange alphabetically versus in subcategories . Some existing definitions also have been revised to provide clarity.
Revised			**Accent Lighting** is directional lighting to emphasize a particular object or surface feature, or to draw attention to a part of the field of view. It can be recessed, surface mounted, or mounted to a pendant, stem, or track, and can be display lighting. *It shall not provide general lighting.*
New		*Clarifications are made to support lighting alteration projects.*	**Luminaire Alteration** is adding luminaires, removing and reinstalling luminaires, or combined replacement of lamps and ballasts or drivers. Luminaire alterations do not include repairs, such as replacing lamps only, ballasts or drivers only, diffusers, shades, or luminaire covers. **One-to-One Alteration** is either replacement of whole luminaires one for one, in which the only electrical modification involves disconnecting the existing luminaire and reconnecting the replacement luminaire, or when components of a luminaire are modified without replacing the entire luminaire.
New		*More occupancy types are considered "multifamily" and align with the California Building Code.*	**Multifamily Building** is any of the following: a building of Occupancy Group R-2, other than a hotel/motel building or timeshare property; a building of Occupancy Group R-3 that is a nontransient congregate residence other than boarding houses of more than 6 guests and alcohol or drug abuse recovery homes of more than 6 guests; or a building of Occupancy Group R-4.
New		*This new definition supports the Specific Lighting Allowance.*	**Security Cameras** are any operational camera used to enhance the safety and security within a general hardscape area.

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION (continued)			
✳ New	100.1(b)		**Tunable Lighting** are light sources with the ability to alter their luminous flux and/or spectral power distribution. Tunable lighting includes the following types: **Dim-to-warm** (also known as warm dim) light source is capable of simultaneously decreasing its correlated color temperature as its light output decreases, typically resembling the change in color temperature of an incandescent lamp as it dims. **Tunable White** light source is capable of adjusting its correlated color temperature while maintaining its relative light output and capable of adjusting its light output while maintaining its correlated color temperature. **Color Tunable** light source is capable of emitting highly saturated light of varying hues, as well as white light, for example by varying the relative intensity of individual emitters within the light source.
➤ Revised			**Nonresidential Function Areas:** ***Barber,* Beauty Salon, *Spa* Area** is a room or area in which the primary activity is manicures, pedicures, facials, or the cutting or styling of hair. ***Manufacturing,* Commercial and Industrial Work Area** is a room or area in which an art, craft, assembly or manufacturing operation is performed.
Section 100.2 – CALCULATION OF TIME DEPENDENT VALUATION (TDV) ENERGY: No change			
Title 24, Part 6 Subchapter 2 – ALL OCCUPANCIES – MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS			
Section 110.0 – SYSTEMS AND EQUIPMENT–GENERAL: No change			
Section 110.1– MANDATORY REQUIREMENTS FOR APPLIANCES: No change			
Section 110.9 – MANDATORY REQUIREMENTS FOR LIGHTING CONTROLS			
No Change	110.9(a)	**Lighting Control Devices and Systems**	No change
➤ Revised	110.9(b)	**All Lighting Controls**	1. **Time-switch Lighting Controls:** Minor changes 2. **Daylighting Controls:** No change 3. **Dimmers:** No change 4. **Occupant-sensing Controls:** No change 5. **Part-Night Outdoor Lighting Controls:** REMOVED 6. **Sensors Used to Detect Occupants:** No change 7. **Indicator Lights:** No change
No Change	110.9(c)	**Track Lighting Integral Current Limiter**	No change
No Change	110.9(d)	**Track Lighting Supplementary Overcurrent Protection Panel**	No change
Section 110.11 – MANDATORY REQUIREMENTS FOR ELECTRICAL POWER DISTRIBUTION SYSTEM: No change			

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 110.12 – MANDATORY REQUIREMENTS FOR DEMAND MANAGEMENT			
Revised	110.12(a)	**Demand-responsive Controls**	When demand-responsive controls are installed (required or voluntary), they must be capable of communicating with *the virtual end node (VEN) using a wired or wireless bi-directional communication pathway.* Otherwise, there are no other changes.
No Change	110.12(b)	**Demand-responsive Zonal HVAC Controls**	No change
Revised	110.12(c)	**Demand-responsive Lighting Controls** *There is a new trigger based on lighting wattage not ft².*	When lighting (general and all other) subject to the multilevel requirements of §130.1(b) (Multilevel Controls) for a project is ≥ 4,000 watts, that general lighting must be capable of automatically reducing the general lighting power in response to a demand response signal in a manner consistent with uniform level of illumination requirements of Table 130.1-A. (All other lighting can also be included but is not required.) Compliance testing, per Reference Nonresidential Appendix NA7.6.3, must demonstrate ≥ 15% reduction of total installed lighting power (no change). The exception still applies for general lighting in spaces where health or life safety statute, ordinance or regulation applies.
No Change	110.12(d)	**Demand-responsive Electronic Message Center Control**	No change
New	110.12(e)	**Demand-responsive Controlled Receptacles** *The trigger is tied to the demand-responsive lighting controls of §110.12(c).*	Controlled receptacles in buildings must be capable of automatically turning off all loads connected to the receptacle in response to a demand response signal. EXCEPTIONS: 1. Buildings that are not required to have demand-responsive lighting controls 2. Spaces where a health or life safety statute, ordinance or regulation does not permit the receptacles to be automatically controlled
Title 24, Part 6 Subchapter 3 – NONRESIDENTIAL, HOTEL/MOTEL OCCUPANCIES, AND COVERED PROCESSES – MANDATORY REQUIREMENTS			
Section 120.0 – GENERAL: No change			
Title 24, Part 6 Subchapter 4 – NONRESIDENTIAL, HOTEL/MOTEL OCCUPANCIES, AND COVERED PROCESSES – MANDATORY REQUIREMENTS FOR LIGHTING SYSTEMS AND EQUIPMENT, AND ELECTRICAL POWER DISTRIBUTION SYSTEMS			
Section 130.0 – LIGHTING SYSTEMS AND EQUIPMENT, AND ELECTRICAL POWER DISTRIBUTION SYSTEMS – GENERAL			
No Change	130.0(a)	**Design and Installation of All Lighting Systems**	No change
Revised	130.0(b)	**Functional Areas Where Compliance with the Residential Lighting Standards Is Required**	Language on multifamily dwelling units, dormitory and senior housing is moved to new multifamily subchapters. Otherwise, there are no changes.
Revised	130.0(c)	**Luminaire Classification and Power**	1. **Luminaire wattage must be labeled:** No change 2. **For luminaires with line voltage lamp holders not served by drivers, ballasts or transformers:** The wattage of such luminaires *shall be determined as the maximum rated wattage as labeled in accordance with* §130.0(c)1. (50 watt per socket and JA8 wattage are no longer utilized.) 3-7. Minor changes
No Change	130.0(d)	**Lighting Controls**	No change
No Change	130.0(e)	**Energy Management Control System (EMCS)**	No change

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 130.1 – MANDATORY INDOOR LIGHTING CONTROLS			
Revised	130.1(a)	**Manual Area Controls** *There are new exceptions, and the egress lighting exception is reduced from 0.20 w/ft² to 0.10 w/ft².*	1. **Readily accessible:** The expanded exception includes *areas of the building intended for access, or use by the public,* in addition to restrooms with ≥ 2 stalls, parking areas and stairwells. 2. **Located in the same enclosed area with the lighting it controls:** The expanded exception also includes *main entry lobbies and dining areas.* All other exempted spaces remain the same. 3. **Separate controls:** Provide separate controls of general, floor display, wall display, window display, case display, ornamental and special effects lighting, such that each type of lighting can be turned on or off without turning on or off other types of lighting. *Scene controllers may comply with this requirement provided that at least one scene turns on general lighting only, and the control provides a means to manually turn off all lighting.* The exception for egress lighting per California Building Code §1008 is reduced to *0.10 watts per ft²* (previously, 0.20 w/ft²).
Revised	130.1(b)	**Multilevel Lighting Controls**	The exception for a classroom with a connected general lighting load of ≤ 0.6 w/ft² allowed one control step between 30-70% of full rated power is moved from a footnote in Table 130.1-A to this code section. Otherwise, things are moved around but remain the same. Table 130.1-A includes slightly revised luminaire types and uniform level of illuminance options.
Revised	130.1(c)	**Shut-off Controls**	All installed indoor lighting must be equipped with controls able to automatically reduce lighting power when the space is typically unoccupied. 1. **In addition to §§130.1(a) and (b),** the following is required: A. Control by an occupant-sensing control, automatic time-switch control or other control capable of automatically shutting off all of the lighting when the space is typically unoccupied B. Separate controls for the lighting on each floor, other than lighting in stairwells C. Separate controls for a space enclosed by ceiling height partitions not exceeding 5,000 ft² EXCEPTION: The area controlled may not exceed 20,000 ft² in the following function areas: malls, auditoriums, single tenant retail, industrial, convention centers and arenas. ~~D. Separate controls for general, display, ornamental, and display case lighting~~ REMOVED ~~E. Automatic time switch controls – May include a manual-on mode~~ REMOVED EXCEPTIONS: 1-2. No change *3.* **0.1 w/ft² for Egress:** *Lighting providing means of egress illumination, as the term is used in the California Building Code, must be configured to provide no less than the amount of light required by California Building Code §1008 while in the partial-off mode.* 4-5: No change 2. **Countdown Timers:** No change **3-4. If Using Automatic Time-switch Controls:** Spaces that can exceed 2-hour override now include laboratories. Otherwise, there are no changes. **5. Occupant-sensing Controls Are Required:** It is clarified that after ≤ 20 minutes of the control zone being unoccupied, the general lighting will be reduced by: ◊ 100% using occupancy sensors allowed for offices ≤ 250 ft², multipurpose rooms < 1,000 ft², classrooms, conference rooms and restrooms of any size when multilevel lighting control is NOT required per §130.1(b) ◊ 50-70% using vacancy or partial-on occupancy sensors when multilevel lighting control is required per §130.1(b) *(continued)*

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 130.1 – MANDATORY INDOOR LIGHTING CONTROLS (continued)			
➤ Revised	130.1(c)	**Shut-Off Controls** *There are new partial-off occupancy sensor requirements for offices > 250 ft² (Open Offices).*	*(continued)* 6. **Full- or Partial-OFF Occupant-sensing Controls:** A-C. In aisle ways and open areas in warehouses, library book stack aisles, corridors and stairwells in which general lighting must be automatically reduced by ≥ 50% when the space is unoccupied, each aisle way must be controlled separately from other aisle ways. D. Offices > 250 ft² must have separately controlled zones ≤ 600 ft² that reduce full power by ≥ 80% within ≤ 20 minutes of the control zone being unoccupied. (When using embedded sensors on luminaires, each luminaire is considered a zone if it can be controlled independently from the other luminaires.) Additionally, all lighting power must be off within ≤ 20 minutes of the entire office space being unoccupied. 100% lighting power is allowed when a control zone is occupied, but all unoccupied lighting control zones are limited to ≤ 20% lighting power. EXCEPTION: Under-shelf or furniture-mounted task lighting controlled by a local switch and either a time switch or an occupancy sensor 7. **Partial-OFF Occupant-sensing Controls:** Minor changes 8. **Hotel/Motel Guest Rooms:** Minor changes
➤ Revised	130.1(d)	**Automatic Daylighting Controls** *Secondary daylighting controls are now Mandatory, and lighting in daylit non-parking lot areas must be able to reduce by ≥ 90%.*	General lighting in skylit, primary sidelit and secondary sidelit zones is now subject to the Mandatory requirements for daylighting controls. (The 2019 Energy Code included only primary daylit zones, and the secondary were a Prescriptive requirement.) General lighting must be able to reduce by ≥ 90% in non-parking lot areas and by 100% in parking lot areas. (The 2019 Energy Code required only ≥ 65% reduction in non-parking lot areas.) Additional guidance is provided on determining and controlling lighting in primary versus secondary daylit zones in which general lighting in overlapping primary and secondary sidelit daylit zones must be controlled as part of the primary sidelit daylit zone. Linear LED and other solid state lighting (SSL) light sources in linear form may be treated as linear lamps in increments of 4-ft segments or smaller, and each segment must be separately controlled based on the type of the daylit zone in which the segment is primarily located. All photosensors must be located so that they are not readily accessible to unauthorized personnel. (The 2019 Energy Code required only one sensor.) EXCEPTIONS: 1-2. No change 3. It is clarified that rooms where the combined total installed wattage of the general lighting in the skylit and primary sidelit zones < 120 watts are not required to have daylighting controls for those zones. Rooms where the total installed wattage of the general lighting in the secondary sidelit zones is < 120 watts are not required to have daylighting controls for those zones. 4-7. In parking garages, only luminaires in the daylight adaption zone are exempt. (The dedicated ramps are removed from the exemption.) Otherwise, there are no changes.
➤ Revised	130.1(e)	**Demand-responsive Controls**	See §110.12(c) for the new requirements associated with lighting and §110.12(e) for demand-responsive controlled receptacles.
➤ Revised	130.1(f)	**Control Interactions**	1-7. No change 8. RESERVED 9. When lighting occupancy sensors are required per §130.1(c)5, 6 or 7 (Occupancy Sensor Lighting Controls) AND Table 120.1-A allows the ventilation in the space to be reduced to zero in occupied stand-by mode, the occupancy sensor ventilation requirements of §120.2(e)3 apply. These spaces include office spaces (≤ 250 ft² and > 250 ft²), multipurpose rooms < 1,000 ft², lecture or postsecondary classrooms, conference rooms, corridors and stairwells.

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 130.2 – OUTDOOR LIGHTING CONTROLS AND EQUIPMENT			
Revised	130.2(b)	**Luminaire Shielding Requirements**	There is a new exception for public art. Otherwise, there are no changes.
Revised	130.2(c)	**Controls for Outdoor Lighting**	1. **Daylight Availability:** No change 2. **Automatic Scheduling Controls:** Minor changes 3. **Motion-sensing Controls:** It is clarified that no more than 1,500 watts of lighting power shall be controlled by a single sensor or as a single zone. EXCEPTIONS: No change
Section 130.3 – SIGN LIGHTING CONTROLS			
No Change	130.3(a)	**Controls for Sign Lighting**	No change
Section 130.4 – LIGHTING CONTROL ACCEPTANCE AND INSTALLATION CERTIFICATE REQUIREMENTS			
Revised	130.4(a)	**Lighting and Receptacle Control Acceptance Requirements**	There are new acceptance testing requirements for §110.12(e) demand-responsive controlled receptacles per Reference Nonresidential Appendix NA7.6.5.
Revised	130.4(b)	**Lighting Control Installation Certificate Requirements**	Installation Certificates (NRCI forms) are no longer required for track lighting integral current limiter and track lighting supplementary overcurrent protection panel(s).
No Change	130.4(c)		
Section 130.5 – ELECTRICAL POWER DISTRIBUTION SYSTEMS			
Minor	130.5(a) – (d)		
Revised	130.5(e)	**Demand-responsive Controls and Equipment**	See §110.12 for demand-responsive control requirements including the new requirements for demand-responsive controlled receptacles.

Level of Change	Section	Subtitle & Notes	Performance Change Summaries
Section 140.0 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES: Minor changes			
Section 140.1 – PERFORMANCE APPROACH: ENERGY BUDGETS: Minor changes			

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Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Title 24, Part 6 Subchapter 5 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR ACHIEVING ENERGY EFFICIENCY			
Section 140.2 – PRESCRIPTIVE APPROACH: No change			
Section 140.6 – PRESCRIPTIVE REQUIREMENTS FOR INDOOR LIGHTING			
Revised	140.6(a)	**Calculation of Adjusted Indoor Lighting Power**	1. **Two Interlocked Lighting Systems:** No change 2. **Reduction of Wattage Through Controls:** Table 140.6-C (Lighting Power Adjustment Factors [PAF]): A – G. No change H. **Daylight Continuous Dimming Plus OFF:** This is allowed for luminaires in skylit, primary and secondary sidelit daylit zones only. I. **Open Office Occupancy Sensors:** This applies to open plan office area(s) > 250 ft². J. **Institutional Tuning:** No change K. **Demand-responsive Controls:** This applies when demand-responsive controls are not required by §110.12(c) (when general lighting that is subject to the multilevel requirements of §130.1(b) for a project is ≥ 4,000 watts). L. No change 3. **Lighting Wattage Excluded:** The exception associated with lighting for plant growth or maintenance only applies in non-controlled environmental horticulture spaces. Lighting in controlled environmental horticulture spaces must meet the requirements of §120.6(h). Otherwise, there are no changes. 4. **Luminaire Classification and Power Adjustment:** The Small Aperture Tunable-White and Dim-to-Warm Luminaires Lighting Power Adjustment is now 0.80 x maximum rated wattage. (In the 2019 Energy Code, it was 0.75.) Otherwise, there are no changes.
Revised	140.6(b)	**Calculation of Allowed Indoor Lighting Power: General Rules** *Secondary daylighting requirements are moved and are now a Mandatory requirement. See §130.1(d).*	Allowed indoor lighting power allotment of Complete Building (Table 140.6-B), Area Category (Table 140.6-C) and Tailored (Table 140.6-D/E/F/G) Methods lighting power density (LPD) allowances have been reduced for many building and space types. Additional lighting power allowances has removed "ornamental" and replaced it with "decorative" supporting the change in the definition of this lighting function.
No Change	140.6(c)	**Calculation of Allowed Indoor Lighting Power: Specific Methodologies**	No change
Revised	**140.6(d)**		Removed
Section 140.7 – PRESCRIPTIVE REQUIREMENTS FOR OUTDOOR LIGHTING			
Revised	140.7(a)-(d)	**Outdoor Lighting** *The Lighting Zone application of Title 24 Part §10-114 has changed.*	Table 140.7-A (General Hardscape Lighting Power Allowance) has revised wattage allowances and has removed concrete vs. asphalt allowances. An additional allowance for security cameras is added to Table 140.7-B (Additional Lighting Power Allowance for Specific Applications) that applies when a security camera is installed within two mounting heights of the general hardscape area and mounted > 10 ft away from a building.
Section 140.8 – PRESCRIPTIVE REQUIREMENTS FOR SIGNS: No change			

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Title 24, Part 6 Subchapter 6 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – ADDITIONS, ALTERATIONS, AND REPAIRS					
Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING NONRESIDENTIAL AND HOTEL/MOTEL BUILDINGS, TO EXISTING OUTDOOR LIGHTING, AND TO INTERNALLY AND EXTERNALLY ILLUMINATED SIGNS					
Minor	141.0(a)	**Additions**	Minor changes		
No Change	141.0(b)2H	**Alterations – New Signs**	No change		
Revised	141.0(b)2I	**Alterations - Indoor**	Changes are made to Table 141.0-F (Control Requirements for Indoor Lighting System Alterations). Indoor lighting alterations meeting the requirements of §141.0(b)2Lii (using ≤ 80% of allowed wattage allowance of §140.6) or §141.0(b)2Liii (one-for-one reduce wattage ≥ 40% for buildings/TI's ≤ 5,000 ft²) do not have to meet the new occupancy sensor requirements for offices ≥ 250 ft² (§130.1(c)6D). Otherwise, there are no changes.		
Minor	141.0(b)2L	**Alterations – Outdoor**	Minor changes		
No Change	141.0(b)2M	**Alterations – Altered Signs**	No change		
No Change	141.0(b)2P	**Alterations - Electrical Power Distribution Systems**	No change		

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Photovoltaic and Battery Storage Systems and Solar Ready: Nonresidential and Hotel/Motel Occupancies

Building Application	Mandatory		Prescriptive	Performance	Additions Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Residential Occupancy Subchapters 3-4 (§§120.0-130.5)	Subchapter 5 (§§140.0, 140.2-10)	Subchapter 5 (§§140.0-1)	Subchapter 6 (§§141.0-1)	
Photovoltaic (PV) and Battery Storage Systems	N/A	N/A	§140.10	§§140.0, 140.1	N/A	JA11 PV Qualifications JA12 Battery Qualifications NA4 Relocatable School Building
Solar Ready	§110.10	N/A				N/A

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 1 Article 1 – ENERGY BUILDING REGULATIONS			
Section 10-115 – COMMUNITY SHARED SOLAR ELECTRIC GENERATION SYSTEM OR COMMUNITY SHARED BATTERY STORAGE SYSTEM COMPLIANCE OPTION FOR ON-SITE SOLAR ELECTRIC GENERATION OR BATTERY STORAGE REQUIREMENTS			
➤ Revised	10-115(a)	**Community-shared Solar Electric Generation System or Battery Storage System Offset**	1. **Enforcement Agency:** No change 2. **Energy Performance:** No change 3. **Participating Building Energy Savings Benefits:** Revised 4. **Durability, Participation and Building Opt-out:** Revised 5. **Additionality:** Revised 6. **Location:** *New.* The community-shared solar electric generation system and/or community-shared battery storage system must be located on a distribution system of the load serving entity providing service to the participating buildings. 7. **Size:** *New.* The community-shared solar electric generation system and/or community-shared battery storage system must not be served by any individual source larger than 20 MW. **8. Accountability and Recordkeeping:** Revised
➤ Revised	10-115(b)	**Application for Commission Approval**	New requirements for applications from public agencies shall be submitted to the California Energy Commission (CEC) only after public review through at least one public meeting within the jurisdiction of the public entity or service area of the load-serving entity and adoption by the public agency. The CEC has the authority to not approve any application that it determines to be inconsistent with the requirements of §10-115. Otherwise, there are no changes.

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 10-115 – COMMUNITY SHARED SOLAR ELECTRIC GENERATION SYSTEM OR COMMUNITY SHARED BATTERY STORAGE SYSTEM COMPLIANCE OPTION FOR ON-SITE SOLAR ELECTRIC GENERATION OR BATTERY STORAGE REQUIREMENTS (continued)			
✳ New	10-115(c)	**Executive Director Approval of Revised Applications**	The Administrator of an approved community-shared solar electric generation system and/or community shared battery storage system must submit a revised application demonstrating compliance with the §10-115 requirements to the CEC Executive Director for approval, when: 1. A new renewable resource is proposed to be added to a community-shared solar electric generation system and/or community-shared battery storage system; AND/OR 2. The CEC modifies the requirements of §10-115 in a building standards rulemaking. Such modified requirements would not apply retroactively to the buildings for which building permit applications are submitted prior to the effective date of the modified standards or to the continued use of previously approved renewable resources developed to serve a community-shared solar electric generation system and/or community-shared battery storage system. Within 60 days of receiving a revised application, the CEC Executive Director may either: ◊ Approve the revised application by letter if the Executive Director concludes that the requirements of §10-115 will be met. ◊ Request that the Administrator resubmit a revised application with changes. ◊ Disapprove the application. If the Executive Director disapproves the application, the applicant may request that the CEC review the Executive Director's determination. ◊ The petition must be filed in writing in accordance with Title 20, California Code of Regulations, Section 1208 within 15 days of the date of the filing of the Executive Director's determination and must state the basis for requesting review of the Executive Director's determination. ◊ Within 45 days of receiving a request for review, the CEC will issue a written decision affirming or modifying the Executive Director's determination. If the CEC does not issue a written decision within 45 days, the request for review will be deemed denied. ◊ The Administrator has the burden of proof to establish that its revised application should be approved.
Title 24, Part 6 Subchapter 1 – ALL OCCUPANCIES – GENERAL PROVISIONS			
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION			
✳ New	100.1(b)		**Azimuth** is the degrees of clockwise rotation from true north.
✳ New			**Energy Storage System (ESS)** is one or more devices, assembled together, that are capable of storing energy used for safely supplying electrical energy to selected loads at a future time. **ESS Ready Interconnection Equipment** is equipment, including but not limited to an ESS ready panelboard, that can accommodate the connection of a distributed energy resource or an ESS capable of either automatic or manual isolation from the utility power source. **ESS Ready Panelboard** is a panelboard that can accommodate either automatic or manual switching between a utility power source to a distributed energy resource or an energy storage system, such as a split bus panelboard.
Title 24, Part 6 Subchapter 2 – ALL OCCUPANCIES – MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS			
Section 110.10 – MANDATORY REQUIREMENTS FOR SOLAR READINESS			
➤ Revised	110.10(a)		3-4. **Hotel/Motel and Nonresidential Buildings:** Required when no photovoltaic (PV) system is installed.

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Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Title 24, Part 6 Subchapter 5 NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR ACHIEVING ENERGY EFFICIENCY			
Section 140.10 – PRESCRIPTIVE REQUIREMENTS FOR PHOTOVOLTAIC AND BATTERY STORAGE SYSTEMS			
New	140.10(a)	**Photovoltaic Requirements** ***Equation 140.10-A PV Direct Current Size*** ***kW_{PVdc} = (CFA x A)/1000*** *WHERE:* *kW_{PVdc} = Size of the PV system in kW* *CFA = Conditioned floor area in square feet* *A = PV capacity factor specified in Table 140.10-A for the building type*	All newly constructed building types specified in Table 140.10-A or mixed occupancy buildings where one or more of these building types constitute at least 80% of the floor area of the building must have a PV system meeting the minimum qualification requirements of Reference Joint Appendix JA11. The PV size in kWdc must not less than the smaller of either the PV system size determined by Equation 140.10-A or the total of all available **Solar Access Roof Areas (SARA)** multiplied by 14 W/ft². ***Table 140.10-A PV Capacity Factors*** **Building Type** / **Factor A – Minimum PV Capacity (W/ft² of conditioned floor area)**: CZ 1,3,5,16 / CZ 2,4,6-14 / CZ 15 Grocery: 2.62 / 2.91 / 3.53 Highrise Multifamily: 1.82 / 2.21 / 2.77 Office, Financial Institutions, Unleased Tenant Space: 2.59 / 3.13 / 3.80 Retail: 2.62 / 2.91 / 3.53 School: 1.27 / 1.63 / 2.46 Warehouse: 0.39 / 0.44 / 0.58 Auditorium, Convention Center, Hotel/Motel, Library, Medical Office Building/Clinic, Restaurant, Theater: 0.39 / 0.44 / 0.58 *CZ=Climate Zone; PV = photovoltaic.* Where the building includes more than one of the space types listed in Table 140.10-A, the total PV system capacity for the building must be determined by applying Equation 140.10-A to each of the listed space types and summing the capacities determined for each. 1. **SARA includes** the area of the building's roof space capable of structurally supporting a PV system and the area of all roof space on covered parking areas, carports and all other newly constructed structures on the site that are compatible with supporting a PV system per Title 24, Part 2, §1511.2. 2. **SARA does NOT include:** A. Any area that has < 70% annual solar access: Annual solar access is determined by dividing the total annual solar insolation (accounting for shading obstructions) by the total annual solar insolation if the same areas were unshaded by those obstructions. For all roofs, all obstructions, including those that are external to the building and obstructions that are part of the building design and elevation features, may be considered for the annual solar access calculations. B. Occupied roofs as specified by California Building Code §503.1.4 C. Roof space that is otherwise not available due to compliance with other building code requirements if confirmed by the CEC Executive Director EXCEPTIONS: 1. The total of all available SARA is < 3% of the conditioned floor area. 2. The required PV system size is < 4 kWdc. 3. The SARA contains < 80 contiguous ft². 4. A building has an enforcement-authority-approved roof design, where the enforcement authority determines it is not possible for the PV system (including panels, modules, components, supports and attachments to the roof structure) to meet ASCE 7-16, Chapter 7, Snow Loads. 5. A multi-tenant building is in an area where a load-serving entity does not provide either a Virtual Net Metering (VNEM) or community solar program.

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Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Section 140.10 – PRESCRIPTIVE REQUIREMENTS FOR PHOTOVOLTAIC AND BATTERY STORAGE SYSTEMS (continued)			
New	140.10(b)	**Battery Storage System Requirements** ***Equation 140.10-B* Battery Storage Rated Energy Capacity** $kWh_{batt} = kW_{PVdc} \times B / D^{0.5}$ *WHERE:* kWh_{batt} = *Rated Usable Energy Capacity of the battery storage system in kWh* kW_{PVdc} = *PV system capacity required by §140.10(a) in kWdc* *B = Battery energy capacity factor specified in Table 140.10-B for the building type* *D = Rated single charge-discharge cycle AC to AC (round-trip) efficiency of the battery storage system* ***Equation 140.10-C* Battery Storage Rated Power Capacity** $kW_{batt} = kW_{PVdc} \times C$ *WHERE:* kW_{batt} = *Power capacity of the battery storage system in kWdc* kW_{PVdc} = *PV system capacity required by §140.10(a) in kWdc* *C = Battery power capacity factor specified in Table 140.10-B for the building type*	All buildings that are required by §140.10(a) to have a PV system must also have a battery storage system meeting the minimum qualification requirements of Reference Joint Appendix JA12. The rated energy capacity and the rated power capacity must be not less than the values determined by Equation 140.10-B and Equation 140.10-C. Where the building includes more than one of the space types listed in Table 140.10-B, the total battery system capacity for the building must be determined by applying Equations 140.10-B and 140.10-C to each of the listed space types and summing the capacities determined for each space type and equation. **Table 140.10-B *Battery Storage Capacity Factors*** **Building Type** / **Factor B – Energy Capacity Wh/W** / **Factor C – Power Capacity W/W** Grocery: 1.03 / 0.26 Highrise Multifamily: 1.03 / 0.26 Office, Financial Institutions, Unleased Tenant Space: 1.68 / 0.42 Retail: 1.03 / 0.26 School: 1.87 / 0.46 Warehouse: 0.93 / 0.23 Auditorium, Convention Center, Hotel/Motel, Library, Medical Office Building/Clinic, Restaurant, Theater: 0.93 / 0.23 EXCEPTIONS: 1. The installed PV system size is < 15% of the size determined by Equation 140.10-A. 2. A building has battery storage system requirements with < 10 kWh rated capacity. 3. For single-tenant buildings with < 5,000 ft² of conditioned floor area and for multi-tenant buildings, the energy capacity and power capacity of the battery storage system are based on the tenant spaces with > 5,000 ft² of conditioned floor area. For multi-tenant buildings, energy capacity and power capacity must be based on tenant spaces with > 5,000 ft² of conditioned floor area. Single-tenant buildings with < 5,000 ft² of conditioned floor area, do not require battery storage systems. 4. In Climate Zone 1, no battery storage system is required for offices, schools and warehouses. .

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Level of Change	Section	Subtitle & Notes	Performance Change Summaries
Title 24, Part 6 Subchapter 6 - NONRESIDENTIAL, AND HOTEL/MOTEL OCCUPANCIES — ADDITIONS, ALTERATIONS, AND REPAIRS			
Section 140.0 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES: Minor changes			
Section 140.1 – PERFORMANCE APPROACH: ENERGY BUDGETS			
Minor	140.1(a)	**Energy Budget for the Standard Design Building**	PV and battery storage systems have been added as features that set the "standard" energy budget.
Minor	140.1(b)	**Energy Budget for the Proposed Design Building**	PV and battery storage systems have been added as features that are considered in the "proposed" energy budget. An EXCEPTION is added for PV and battery when a CEC-approved community system meeting all of the community program requirements is used.
No Change	140.1(c)	**Calculation of Energy Budget**	No change

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Title 24, Part 6 Subchapter 6 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – ADDITIONS, ALTERATIONS, AND REPAIRS					
Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING NONRESIDENTIAL AND HOTEL/MOTEL BUILDINGS, TO EXISTING OUTDOOR LIGHTING, AND TO INTERNALLY AND EXTERNALLY ILLUMINATED SIGNS					
		Additions	PV is not required. New battery and electric appliance-ready requirements are not required either. Be aware of new Addition and Alterations requirements for HVAC and water-heating systems.		
		Alterations			

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Covered Processes

Building Application	Mandatory		Prescriptive	Performance	Additions Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Residential Occupancy Subchapter 3 (§§120.0-120.10)	Subchapter 5 (§§140.0, 140.2-10)	Subchapter 5 (§§140.0-1)	Subchapter 6 (§§141.0-1)	
Nonresidential Envelope (unconditioned process space)	N/A	§120.0	§140.3(c)	§140.1	§§120.6, 140.9, 141.1	JA1 Definitions NA3 Fan Motor Efficiencies NA7 Installation/Acceptance Covered Process
Covered Processes (envelope, ventilation and process loads)	§§100.1, 110.2	§120.6	§140.9			

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 1 – ALL OCCUPANCIES – GENERAL PROVISIONS			
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION			
✳ New	100.1(b)		**Air Curtain Unit** means equipment providing a directionally-controlled stream of air moving across the entire height and width of an opening that reduces the infiltration or transfer of air from one side of the opening.
✳ New			**Alternating Current-Output Uninterruptible Power Supply (AC-OUTPUT UPS)** is a combination of converters, switches, and energy storage devices, such as batteries, constituting a power system for maintaining continuity of load power in case of input power failure. Input power failure occurs when voltage and frequency are outside rated steady-state and transient tolerance bands or when distortion or interruptions are outside the limits specified for the uninterruptible power supply. An AC-output UPS is an uninterruptible power supply that supplies power with a continuous flow of electric charge that periodically reverses direction.
✳ New			**Carbon Dioxide Enrichment** is injection of additional carbon dioxide into the CEH spaces for the purpose of stimulating plant growth.
➤ Revised			**Computer Room** is a room within a building whose primary function is to house electronic equipment and that has a design information technology equipment (ITE) equipment power density exceeding 20 watts/ft^2 (215 watts/m^2) of conditioned floor area.
✳ New			**Conditioned Greenhouse** is a greenhouse that is provided with wood heating, mechanical heating that has a capacity exceeding 10 Btu/hr-ft², or mechanical cooling that has a capacity exceeding 5 Btu/hr-ft².

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION (continued)			
New	100.1(b)		**Controlled Environment Horticulture (CEH) Space** is a building space dedicated to plant production by manipulating indoor environmental conditions, such as through electric lighting, irrigation, mechanical heating, mechanical cooling, or dehumidification. CEH space does not include building space where plants are grown solely to decorate that same space.
New			**Desiccant Dehumidification System** is a mechanical dehumidification technology that uses a solid or liquid desiccant to remove moisture from the air.
New			**Dehumidifier** is a product other than a portable air conditioner, room air conditioner, or packaged terminal air conditioner that is a self-contained, electrically operated, and mechanically encased assembly consisting of 1) a refrigerated surface (evaporator) that condenses moisture from the atmosphere, 2) a refrigerating system, including an electric motor, 3) an air-circulating fan, and 4) a means for collecting or disposing of the condensate.
New			**Dry Cooler** is a fan-powered heat rejection device that includes a water or glycol circuit connected by a closed circulation loop refrigerant condenser and is air-cooled.
New			**Economizer, Pumped Refrigerant,** is a system by which the supply air of a cooling system is cooled directly by refrigerant pumped between indoor and outdoor units during cooler ambient temperatures in order to reduce or eliminate the need for mechanical cooling.
New			**Horticultural Lighting** consists of luminaires used for plant growth and maintenance. Horticultural luminaires may have either plug-in or hard-wired connections for electric power.
New			**Indoor Growing** is a type of CEH space in a building with a Skylight Roof Ratio less than 50 percent. Growing plants in a warehouse with or without skylights is an example of indoor growing.
New			**Information Technology Equipment (ITE)** includes computers, data storage, servers, and network/communication equipment located in a computer room.
New			**ITE Design Load** is the combined power of all the ITE loads for which the ITE cooling system is designed.
New			**Photosynthetic Photon Efficacy (PPE)** is photosynthetic photon flux divided by input electric power in units of micromoles per second per watt, or micromoles per joule as defined by ANSI/ASABE S640. **Photosynthetic Photon Flux (PPF)** is the rate of flow of photons between 400 to 700 nanometers in wavelength from a radiation source as defined by ANSI/ASABE S640.
Revised			**Process, Covered** is a process that is regulated under Part 6, §§120.6 and 140.9, which includes computer rooms, data centers, elevators, escalators and moving walkways, laboratories, enclosed parking garages, commercial kitchens, refrigerated warehouses, commercial refrigeration, compressed air systems, and process boilers, and controlled environment horticultural spaces.

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 2 – ALL OCCUPANCIES – MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS			
Section 110.2 – MANDATORY REQUIREMENTS FOR SPACE-CONDITIONING EQUIPMENT			
Minor ✳ New	110.2(a)	**Revised Efficiency Tables**	Updated efficiencies on tables: • 110.2-A Air Conditioners and Condensing Units • 110.2-B Heat Pumps • 110.2-E Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps • 110.2-F (formerly 110.2-G) Heat Rejection Equipment • 110.2-G (formerly 110.2-H) Electrically Operated Variable Refrigerant Flow Air Conditioners • 110.2-H (formerly 110.2-I) Electrically Operated Variable Refrigerant Flow Air-to-Air and Applied Heat Pumps • 110.2-I (formerly 110.2-J) Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units • 110.2-J (formerly 110.2-K) Gas and Oil-Fired Boilers New efficiencies on tables: • 110.2-K DX-DOAS Units, Single Package and Remote Condenser • 110.2-M Ceiling-Mounted AC and Condensing Units Serving Computer Rooms • 110.2-N Heat Pump and Heat Recovery Chillers
Minor	110.2(e)	**Open and Closed Cooling Towers**	The exception has been clarified in which "open and closed cooling" towers with rated capacity < 150 tons are exempt from these cycle of concentration requirements.

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 3 – NONRESIDENTIAL, HOTEL/MOTEL OCCUPANCIES, AND COVERED PROCESSES – MANDATORY REQUIREMENTS			
Section 120.6 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES			
Revised	120.6(a)	**Mandatory Requirements for Refrigerated Warehouses** *There are new transcritical CO_2 gas cooler and automatic door closer requirements.*	1. **Insulation Requirements:** Minor changes 2. **Underslab Heating:** No change 3. **Evaporators:** No change 4. **Condensers:** The exception associated with evaporative-cooled, water-cooled, air-cooled and adiabatic gas is revised to apply when > 20% of refrigeration load is for quick chilling/*freezing of products (space with design cooling capacities > 240 Btuh-ft²)* or process refrigeration cooling for other than a refrigerated space. All other exceptions remain the same. 5. **Compressors:** A. Compressors serving refrigeration systems that are not transcritical CO_2 must be designed to operate at a minimum condensing temperature of ≤ 70°F. B. In new compressor requirements, transcritical CO_2 refrigeration systems must be designed to operate at a minimum condensing temperature of ≤ 60°F. EXCEPTION: Compressors with a design saturated suction temperature ≥ 30°F must be designed to operate at a minimum condensing temperature of ≤ 70°F. C. (formerly B) Exception 2 is revised for open-drive screw compressors in which compressors and condensers on a refrigeration system for which > 20% of the total design refrigeration cooling load is for quick chilling/*freezing of products (space with design cooling capacities > 240 Btuh-ft²) (2 tons per 100 ft²)* or process refrigeration cooling for other than a refrigerated space. D. (formerly C) No change 6. **Infiltration Barriers:** No change 7. **Refrigeration Warehouse Acceptance:** There are new requirements that transcritical CO_2 refrigeration systems must be tested in accordance with Reference Nonresidential Appendix NA7.20.1. 8. **Transcritical CO_2 Gas Coolers:** New fan-powered gas coolers on all new transcritical CO_2 refrigeration: A. Air-cooled gas coolers are prohibited in Climate Zones 9-15. B. Design leaving gas temperature for air-cooled gas coolers must be less than or equal to the design dry-bulb temperature plus 6°F. EXCEPTION: Design leaving gas temperature for air-cooled gas coolers in Climate Zones 2, 4 and 8 must be less than or equal to the design dry-bulb temperature plus 8°F. C. Design leaving gas temperature for adiabatic gas coolers necessary to reject the design total heat of rejection of a refrigeration system assuming dry mode performance must be less than or equal to the design dry-bulb temperature plus 15°F. D. All gas cooler fans must be continuously variable speed, with the speed of all fans serving a common condenser high side controlled in unison. E. While operating below the critical point, the gas cooler pressure must be controlled in accordance to §120.6(a)4F. F. While operating above the critical point, the gas cooler pressure setpoint must be reset based on ambient conditions to maximize the system efficiency. G. The minimum condensing temperature setpoint must be ≤ 60°F for systems utilizing air-cooled gas coolers, evaporative-cooled gas coolers, adiabatic gas coolers, air- or water-cooled fluid coolers or cooling towers for heat rejection. EXCEPTION: Transcritical CO_2 refrigeration systems with a design intermediate saturated suction temperature ≥ 30°F must have a minimum condensing temperature setpoint of ≤ 70°F. H. Fan-powered gas coolers must meet the gas cooler efficiency requirements listed in Table 120.6-C. 9. **Automatic Door Closers:** Doors designed for the passage of people that are between freezers and higher-temperature spaces, or between coolers and nonrefrigerated spaces, must have automatic door closers.

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 120.6 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES (continued)			
Revised	120.6(b)	**Mandatory Requirements for Commercial Refrigeration** *There are new transcritical CO_2 gas cooler requirements.* *Acceptance testing includes new requirements.*	These requirements apply to retail food *and beverage stores* ≥ 8,000 ft² CFA. 1. **Condensers Serving Refrigeration Systems:** No change 2. **Compressor Systems:** In new compressor requirements transcritical CO_2 refrigeration systems must be designed to operate at a minimum condensing temperature of ≤ 60°F. EXCEPTION: Compressors with a design saturated suction temperature ≥ 30°F must be designed to operate at a minimum condensing temperature of ≤ 70°F. All other requirements remain the same. 3. **Refrigerated Display Cases:** No change 4. **Refrigeration Heat Recovery:** There is a new exception to the heat recovery requirements for stores where the design total heat of rejection of all refrigeration systems is ≤ 500,000 Btuh. There are no other changes. 5. **Transcritical CO_2 Gas Coolers.** New fan-powered gas coolers on all new transcritical CO_2 refrigeration: A. Air-cooled gas coolers are prohibited in Climate Zones 10-15. B. Design leaving gas temperature for air-cooled gas coolers must be less than or equal to the design dry-bulb temperature plus 6°F. C. Design leaving gas temperature for adiabatic gas coolers necessary to reject the design total heat of rejection of a refrigeration system assuming dry mode performance must be less than or equal to the design dry-bulb temperature plus 15°F. D. All gas cooler fans must be continuously variable speed, with the speed of all fans serving a common condenser high side controlled in unison. E. While operating below the critical point, the gas cooler pressure must be controlled in accordance to §120.6(b)1A. F. While operating above the critical point, the gas cooler pressure setpoint must be reset based on ambient conditions to maximize the system efficiency. G. The minimum condensing temperature setpoint must be less than or equal to 60°F for systems utilizing air-cooled gas coolers, evaporative-cooled gas coolers, adiabatic gas coolers, air or water-cooled fluid coolers or cooling towers. EXCEPTION: Transcritical CO_2 refrigeration systems with a design intermediate saturated suction temperature ≥ 30°F must have a minimum condensing temperature setpoint of ≤ 70°F. H. Fan-powered gas coolers must meet the gas cooler efficiency requirements listed in Table 120.6-E. 6. **Commercial Refrigeration Acceptance:** Per Reference Nonresidential Appendix NA7, Transcritical CO_2 refrigeration systems per NA7.20.1
No Change	120.6(c)	**Mandatory Requirements for Enclosed Parking Garages**	No change
Revised	120.6(d)	**Mandatory Requirements for Process Boilers**	1. **Combustion Air Positive Shut-off:** No change 2. **Process Boiler Combustion Air Fans:** No change 3. **Newly Installed Process Boilers** with an input capacity > 5 MMBtuh must maintain (stack-gas) oxygen concentrations at ≤ 3.0% by volume on a dry basis over firing rates of 20 to 100%. Combustion air volume must be controlled with respect to measured flue gas oxygen concentration. Use of a common gas and combustion air control linkage or jack shaft is prohibited. (The 2019 Energy Code trigger was an input capacity of 10 MMBtuh.) New EXCEPTION: There is an exception for boilers with steady state full-load combustion efficiency ≥ 90%.

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Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 120.6 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES (continued)			
Revised	120.6(e)	**Mandatory Requirements for Compressed Air Systems**	1. **Trim Compressor and Storage:** There are no changes to the requirements, but exceptions to altered systems have changed. EXCEPTIONS: 1. The total combined added or replaced compressor horsepower is less than the average per-compressor horsepower of all compressors in the system. 2. All added or replaced compressors are variable speed drive (VSD) compressors, and the compressed air system includes primary storage of at least one gallon per actual cubic feet per minute (ACFM) of the largest trim compressor. 3. A compressed air system has been approved by the CEC Executive Director as having demonstrated that the system serves loads for which typical air demand fluctuates < 10%. 4. Alterations to existing compressed air systems include one or more centrifugal compressors. 2. **Controls:** Compressed air systems with three or more compressors and a combined horsepower rating of > 100 hp must operate with controls that are able to choose the most energy efficient combination and loading of compressors within the system based on the current compressed air demand. Sensors are no longer required. (The 2019 Energy Code trigger was over one compressor.) 3. **Monitoring:** Compressed air systems having a combined horsepower rating ≥ 100 hp must have an energy and air demand monitoring system with the following minimum requirements: A. Measurement of system pressure B. Measurement of amps or power of each compressor C. Measurement or determination of total airflow from compressors in CFM D. Data logging of pressure, power in kW, airflow in CFM, and compressed air system specific efficiency in kW/100 CFM at intervals of ≤ 5 minutes E. Maintained data storage of at least the most recent 24 months F. Visual trending display of each recorded point, load and specific energy 4. **Leak Testing of Compressed Air Piping:** Compressed air system piping > 50 adjoining feet in length must be pressure tested after being isolated from the compressed air supply and end uses. The piping must be pressurized to the design pressure, and test pressures must be held for a length of time at the discretion of the authority having jurisdiction, but in no case for less than 30 minutes, with no perceptible drop in pressure. If dial gauges are used for conducting this test, these gauges must conform with California Plumbing Code §§318.3, 318.4, and 318.5. Piping ≤ 50 adjoining feet in length must be pressurized and inspected. Connections must be tested with a noncorrosive leak-detecting fluid or other leak-detecting methods at the discretion of the authority having jurisdiction. 5. **Pipe Sizing:** Compressed air piping > 50 adjoining feet in length must be designed and installed to minimize frictional losses in the distribution network. These piping installations must meet the requirements of §120.6(e)5A and either §120.6(e)5B or 120.6(e)5C: A. **Service Line Piping Diameter:** Service line piping must have inner diameters ≥ ¾ inch. Service line piping are pipes that deliver compressed air from distribution piping to end uses. B. **Piping Section Average Velocity:** Compressor room interconnection and main header piping must be sized so that at coincident peak flow conditions, the average velocity in the segment of pipe is no greater than 20 ft/sec. Compressor room interconnection and main header piping are the pipes that deliver compressed air from the compressor outlets to the inlet to the distribution piping. Each segment of distribution and service piping must be sized so that, at coincident peak flow conditions, the average velocity in the segment of pipe is no greater than 30 ft/sec. Distribution piping are pipes that deliver compressed air from the compressor room interconnection piping or main header piping to the service line piping. C. **Piping Total Pressure Drop:** Piping must be designed such that piping frictional pressure loss at coincident peak loads is < 5% of operating pressure between the compressor and end use or end use regulator. 6. **Compressed Air System Acceptance:** No change

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 120.6 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES (continued)			
No Change	120.6(f)	**Mandatory Requirements for Elevators**	No change
No Change	120.6(g)	**Mandatory Requirements for Escalators and Moving Walkway**	No change
New	120.6(h)	**Mandatory Requirements for Controlled Environment Horticulture (CEH) Spaces**	1. **Indoor Growing, Dehumidification:** One of the following is required: A. Dehumidifiers subject to regulation under federal appliance standards tested in accordance with 10 CFR 430.23(z) and Appendix X or X1 to Subpart B of 10 CFR Part 430 as applicable and complying with 10 CFR 430.32(v)2 B. Integrated HVAC system with on-site heat recovery designed to fulfill at least 75% of the annual energy for dehumidification reheat C. Chilled water system with on-site heat recovery designed to fulfill at least 75% of the annual energy for dehumidification reheat D. Solid or liquid desiccant dehumidification system for system designs that require dewpoint of ≤ 50°F 2. **Indoor Growing, Horticultural Lighting:** In a building with CEH spaces and > 40 kW of aggregate horticultural lighting load, the electric lighting systems used for plant growth and plant maintenance must meet all of the following requirements: A. The horticultural lighting systems must have a photosynthetic photon efficacy (PPE) rated in accordance with ANSI/ASABE S640 for wavelengths from 400 to 700 nanometers and meet one of the following requirements: i. Integrated, non-serviceable luminaires must have a rated PPE of at least 1.9 micromoles per joule. ii. Luminaires with removable or serviceable lamps must have lamps with a rated PPE of at least 1.9 micromoles per joule. B. Time-switch lighting controls must be installed and comply with §§110.9(b)1, 130.4(a)4 and applicable sections of Reference Nonresidential Appendix NA7.6.2. C. Multilevel lighting controls must be installed and comply with §130.1(b). 3. **Indoor Growing, Electrical Power Distribution Systems:** Electrical power distribution system serving CEH spaces must be designed so that a measurement device is capable of monitoring the electrical energy usage of aggregate horticultural lighting load. 4. **Conditioned Greenhouses, Building Envelope:** Conditioned greenhouses must meet the following requirements: A. Opaque wall and opaque roof assembly must meet the requirements of §120.7. B. Non-opaque envelope features (such as fenestration) must have two or more glazings separated by either air or gas fill. 5. **Conditioned Greenhouses, Space-conditioning Systems:** Space-conditioning systems used for plant production must comply with all applicable requirements. 6. **Greenhouses, Horticultural Lighting:** In a greenhouse with > 40 kW of aggregate horticultural lighting load, the electric lighting system used for plant growth and plant maintenance must meet all of the following requirements: A. The horticultural lighting systems must have a photosynthetic photon efficacy (PPE) rated in accordance with ANSI/ASABE S640 for wavelengths from 400 to 700 nanometers and meet one of the following requirements: i. Integrated, non-serviceable luminaires must have a rated PPE of at least 1.7 micromoles per joule. ii. Luminaires with removable or serviceable lamps must have lamps with a rated PPE of at least 1.7 micromoles per joule. B. Time-switch lighting controls must be installed and comply with §§110.9(b)1, 130.4(a)4 and applicable sections of Reference Nonresidential Appendix NA7.6.2. C. Multilevel lighting controls must be installed and comply with §130.1(b).

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries
Section 120.6 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES (continued)			
New	120.6(i)	**Mandatory Requirements for Steam Traps**	Installed steam trap operating pressure is the steam pressure entering the steam trap during normal design operating conditions. Steam traps in new industrial facilities and new steam traps added to support new, non-replacement, process equipment in existing industrial facilities where the installed steam trap operating pressure is > 15 psig and the total combined connected boiler input rating is > 5 Million Btuh must meet the following requirements: 1. **Central Steam Trap Fault Detection and Diagnostics Monitoring:** Steam trap systems must be equipped with a central steam trap monitoring system that: A. Provides a status update of all steam trap fault detection sensors at no greater than 8-hour intervals. B. Automatically displays an alarm that identifies which steam trap has fault once the system has detected a fault. 2. **Steam Trap Fault Detection:** Steam traps must be equipped with automatic fault detection sensors that must communicate their operational state to the central steam trap monitoring system as described in §120.6(i)1. 3. **Steam Trap Strainer Installation:** Steam traps must either: A. Be equipped with an integral strainer and blow-off valve. B. Be installed downstream with 3 feet of a strainer and blow-off valve. 4. **Steam Trap System Acceptance:** Before an occupancy permit is granted for steam trap systems subject to §120.6(i), the equipment and systems must be certified as meeting the Acceptance Requirement for Code Compliance, as specified by the Reference Nonresidential Appendix NA7.19. EXCEPTION: There is an exception for steam traps where steam is diverted to a steam system of lower pressure for use when the steam trap fails open.
New	120.6(j)	**Mandatory Requirements for Computer Rooms** *See §140.9(a) for the Prescriptive computer room requirements*	Space-conditioning systems serving a computer room must meet the following requirements: 1. **Reheat:** Each computer room zone must have controls that prevent reheating, recooling and simultaneous provisions of heating and cooling to the same zone, such as mixing or simultaneous supply of air that has been previously mechanically heated and air that has been previously cooled, either by cooling equipment or by economizer systems. 2. **Humidification:** Humidification must be adiabatic. Nonadiabatic humidification, including but not limited to steam and infrared, is prohibited. 3. **Fan Control:** Each unitary air conditioner with mechanical cooling capacity exceeding 60,000 Btuh and each chilled water fan system must be designed to vary the airflow rate as a function of actual load. Fan motor demand must not exceed 50% of design wattage at 66% of design fan speed.

2022 ENERGY CODE: ***NEW*** ***MAJOR REVISION*** ***ITALICS in Change Summaries indicate substantial text changes in the Energy Code***

Level of Change	Section	Subtitle & Notes	Prescriptive Change Summaries
Title 24, Part 6 Subchapter 5 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR ACHIEVING ENERGY EFFICIENCY			
Section 140.9 – PRESCRIPTIVE REQUIREMENTS FOR COVERED PROCESSES			
Revised	140.9(a)	**Prescriptive Requirements for Computer Rooms**	A computer room with a power density > 20 W/ft² must meet the following requirements: 1. **Economizers:** Each individual cooling system primarily serving computer rooms must include either: A. An ***integrated air economizer*** capable of providing partial cooling even when additional mechanical cooling is required and capable of providing 100% of the expected system cooling load at 65°F to 80.6°F supply air temperature at outside air temperatures of ≤ 65°F dry-bulb or ≤ 50°F wet-bulb and equipped with a fault detection and diagnostic system as specified by §120.2(i) B. An ***integrated water economizer*** capable of providing partial cooling even when additional mechanical cooling is required and capable of providing 100% of the expected system cooling load at 65°F to 80.6°F supply air temperature at outside air temperatures of ≤ 50°F dry-bulb or ≤ 45°F wet-bulb EXCEPTIONS: 1. Individual computer rooms with an information technology equipment (ITE) design load under 5 tons (18 kW) are located in a building that does not have any economizers. 2. A computer room with an ITE design load < 20 tons (70 kW) may be served by a second fan system without an economizer if it is also served by a fan system with an economizer that also serves other spaces within the building, provided that all of the following are met: i. The economizer system is sized to meet the design cooling load of the computer room when the other spaces within the building are at 50% of their design load at outside air temperatures of 65°F dry-bulb and below or 50°F wet-bulb and below; AND ii. The economizer system has the ability to serve only the computer rooms connected to it (e.g., to shut off flow to other spaces within the building when unoccupied). 2. **Power Consumption of Fans:** The total fan power at design conditions of each fan system ≤ 27 W/kBtuh of net sensible cooling capacity. 3. **Air Containment:** Computer rooms with air-cooled computers in racks and with a ITE design load > 10 kW/ (2.8 tons) per room must include air barriers such that there is no significant air path for computer discharge air to recirculate back to computer inlets without passing through a cooling system. EXCEPTIONS: 1. Expansions of existing computer rooms 2. Computer racks with a design load < 1 kW (0.28 tons) per rack 3. Equivalent energy performance based on computational fluid dynamics or other analysis 4. **Alternating Current-output Uninterruptible Power Supplies (UPS):** Alternating current-output UPS systems serving a computer room must meet or exceed minimum average efficiencies in Table 140.9-B. Minimum average efficiency for alternating current-output UPS must meet or exceed calculation and testing requirements identified in ENERGY STAR Program Requirements for Uninterruptible Power Supplies (UPSs) – Eligibility Criteria Version 2.0. EXCEPTION: Alternating current-output UPS that utilizes standardized NEMA 1-15P or NEMA 5-15P input plug, as specified in ANSI/NEMA WD-6-2016.
No Change	140.9(b)	**Prescriptive Requirements for Commercial Kitchens**	No change
Revised	140.9(c)	**Prescriptive Requirements for Laboratory and Factory Exhaust Systems**	Revisions are made to the anemometer detection for all contaminants (not just those detectable per the 2019 Energy Code) and/or signal failure requirements including requirements for the ECMS or fault management system to log errors and their times. A requirement is added for automatic checks of anemometer failures, including wind speed and wind direction readings which must be sampled at least 10 times per minute. If the difference between the maximum and minimum readings from the average of either the wind direction or the wind speed over a one minute period is less than 10% of the average value, the measurements must be considered a signal failure and any other signals sent by the anemometer to be errors. All other changes are specific to including requirements for consideration of all contaminants (not just those detectable as in the 2019 Energy Code).

2022 ENERGY CODE: ***NEW*** ***MAJOR REVISION*** ***ITALICS in Change Summaries indicate substantial text changes in the Energy Code***

Level of Change	Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Title 24, Part 6 Subchapter 6 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – ADDITIONS, ALTERATIONS, AND REPAIRS					
Section 141.1 – REQUIREMENTS FOR COVERED PROCESSES IN ADDITIONS, ALTERATIONS TO EXISTING NONRESIDENTIAL, AND HOTEL/MOTEL BUILDINGS					
Minor	141.1(a)	**Lab and Process Facility Exhaust Systems**	Minor changes		
New	141.1(b)	**Computer Rooms**	All newly installed computer room cooling systems and uninterruptible power supply systems in Additions or Alterations must meet the requirements of §§120.6(j) (Mandatory Requirements for Computer Rooms), 140.9(a)2 (Power Consumption of Fans), and 140.9(a)4 (Alternating Current-Output Uninterruptible Power Supplies (UPS)) and comply with item 1 below. 1. Economizers: Each individual cooling system primarily serving computer rooms must include either: A. An ***integrated air economizer*** capable of providing partial cooling even when additional mechanical cooling is required and capable of providing 100% of the expected system cooling load up to 80°F room supply air temperature at outside air temperatures of ≤ 55°F dry-bulb or ≤ 50°F wet-bulb and equipped with a fault detection and diagnostic system as specified by §120.2(i) (Economizer Fault Detection and Diagnostics (FDD)) B. An ***integrated water economizer*** capable of providing partial cooling even when additional mechanical cooling is required and capable of providing 100% of the expected system cooling load up to 80°F supply air temperature at outside air temperatures of ≤ 40°F dry-bulb or ≤ 35°F wet-bulb EXCEPTIONS: 1. Individual computer rooms with an ITE design load under 5 tons (18 kW) are located in a building that does not have any economizers. 2. New cooling systems serve an existing computer room in an existing building with an ITE design load up to a total of 50 tons (176 kW). 3. New cooling systems serve a new computer room in an existing building with an ITE design load up to a total of 20 tons (70 kW).		
New	141.1(c)	**Controlled Environment Horticulture Spaces**	1. **Indoor Growing, Space-conditioning Systems and Dehumidification:** All newly installed heating, ventilation, air conditioning systems or dehumidification systems in buildings with indoor growing must meet the applicable requirements of §§120.6(h)1 (Indoor Growing, Dehumidification) and applicable requirements of 120.0 through 120.10 (Mandatory Space Conditioning requirements) and 140.4 (Prescriptive Space Conditioning requirements). 2. **Greenhouses, Building Envelope and Space-conditioning Systems:** A greenhouse being converted to a conditioned greenhouse or Additions to a conditioned greenhouse must meet the requirements of §120.6(h)5 (Conditioned Greenhouses, Space-Conditioning Systems) and 120.6(h)4 (Conditioned Greenhouses, Envelope). 3. **Indoor Growing and Greenhouses, Horticultural Lighting:** When Alterations to horticultural lighting systems increase lighting wattage or include adding, replacing or altering ≥ 10% of the horticultural luminaires serving an enclosed space, the newly installed, replaced or altered lighting must meet the requirements of §120.6(h)2 for indoor growing or §120.6(h)6 for greenhouses.		

Licensed Healthcare Exceptions

Building Application	Mandatory		Prescriptive	Performance	Additions Alterations
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Nonresidential Occupancy Subchapters 3-4 (§§120.0-130.5)	Subchapter 5 (§§140.0, 140.2-10)	Subchapter 5 (§§140.0-1)	Subchapter 6 (§§141.0-1)
◊ = Applies / X = Exempt					
Commissioning and Design Review	N/A	§120.8 Commissioning ◊ Use California Administrative Code Chapter 7	N/A	N/A	N/A
General Provisions for All Buildings	§100.0(a) I-1 and I-2 subject to Title 24, Part 6 with specific exceptions listed.				
Envelope (conditioned)	§110.6 Mandatory Fenestration/Exterior Doors ◊ Requirements apply §110.7 Mandatory Limit Air Leakage ◊ Requirements apply §110.8 Mandatory Insulation, Roofing Products, Radiant Barrier ◊ Requirements apply	§120.7 Mandatory Insulation ◊ Requirements apply	§140.3 Prescriptive Envelope ◊ Requirements apply	§140.0 Compliance Approaches ◊ Requirements apply §140.1 Performance Approach ◊ Requirements apply	◊ §141.0 Additions X §141.0 Alterations exempt

Licensed Healthcare Exceptions *(continued)*

Building Application	Mandatory: All Occupancy Subchapters 1-2 (§§100.0-110.12)	Mandatory: Nonresidential Occupancy Subchapters 3-4 (§§120.0-130.5)	Prescriptive Subchapter 5 (§§140.0, 140.2-10)	Performance Subchapter 5 (§§140.0-1)	Additions Alterations Subchapter 6 (§§141.0-1)
◊ = Applies / X = Exempt (continued)					
Heating, Ventilation and Air Conditioning (HVAC)	§110.2 Mandatory Efficiency ◊ Requirements apply §110.5 Pilot Light Prohibited ◊ Requirements apply	§120.1 Ventilation and Indoor Air Quality (IAQ) ◊ Use California Mechanical Code §120.2 Required Controls ◊ §120.2(a) Thermostatic controls each zone ◊ §120.2(b) Thermostatic remote capability X §120.2(b) Deadband capabilities and automatic demand shed controls ◊ §120.2(d) Heat pump control X §120.2(e) Shut-off and reset controls ◊ §120.2(f) Dampers ◊ §120.2(g) Isolation area devices ◊ §120.2(i) Economizer fault detection and diagnostics (FDD) ◊ §120.2(j) Direct digital controls (DDC) ◊ §120.2(k) Optimum stop/start controls §120.4 Ducts and Plenums X Use California Mechanical Code §120.5 Mechanical Acceptance X Use California Administrative Code Chapter 7 §120.10(a) Fans ◊ **New** Fan energy index requirements apply	§140.4 HVAC X §140.4(a)1 Sizing: Use California Mechanical Code ◊ §140.4(a)2 **New** Single zone heat pump requirements for offices spaces X §140.4(b) Calculations: Use California Mechanical Code ◊ §140.4(c) **New** Fan system requirements apply and are NO longer exempt X §140.4(d) Zone controls ◊ §140.4(e) Economizers X §140.4(f) Supply air temperature reset controls ◊ §140.4(g) Electric resistance not allowed ◊ §140.4(h) Heat rejection systems ◊ §140.4(i) Chiller efficiency X §140.4(j) Air-cooled chiller limitations ◊ §140.4(k) Hydronic systems all except #4 X §140.4(k)4 Temperature reset controls X §140.4(m) Fan control X §140.4(n) Mechanical system shut-off X §140.4(o) Exhaust system transfer air ◊ §140.4(p) **New** Dedicated outdoor air system (DOAS) ◊ §140.4(q) **New** Exhaust air heat recovery	§140.0 Compliance Approaches ◊ Requirements apply §140.1 Performance Approach ◊ Requirements apply	◊ §141.0 Additions X §141.0 Alterations exempt

Licensed Healthcare Exceptions *(continued)*

Building Application	Mandatory		Prescriptive	Performance	Additions Alterations
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Nonresidential Occupancy Subchapters 3-4 (§§120.0-130.5)	Subchapter 5 (§§140.0, 140.2-10)	Subchapter 5 (§§140.0-1)	Subchapter 6 (§§141.0-1)
◊ = Applies / X = Exempt (continued)					
Water Heating	§110.3 Mandatory Requirements X §110.3(a) Temp. controls: Use California Plumbing Code Table 613.1 ◊ §110.3(b) Efficiency X §110.3(c)1 Outlet temp. controls: Applicable California Plumbing Code §613.0 take precedence X §110.3(c)2 hot water distribution controls ◊ §110.3(c)3 Insulation requirements ◊ §110.3(c)3 Recirculation loop ◊ §110.3(c)6 Isolation valve	§120.3 Pipe Insulation ◊ Requirements apply §120.9 Commercial Boilers ◊ Requirements apply	§140.5 Prescriptive Service Water Heating X §140.5(a) **New** Heat pump water heater system ◊ §140.5(b) **New** High-capacity service water heating	§140.0 Compliance Approaches ◊ Requirements apply §140.1 Performance Approach ◊ Requirements apply	
Indoor Lighting (conditioned)		§130.0 General Lighting and Electrical Power Distribution Requirements ◊ Requirements apply §130.1 Mandatory Indoor Lighting Controls X §130.1(a) Manual area controls can be placed anywhere in which in the space will pose health and safety hazards X §130.1(b) Multilevel control X §130.1(c) Shut-off control ◊ §130.1(d) Daylighting including new secondary daylighting requirements §130.4 Acceptance Testing X Use California Department of Health Care Access and Information (HCAI)			◊ §141.0 Additions X §141.0 Alterations exempt
Indoor Lighting (unconditioned and parking garages)	§110.9 Mandatory Lighting Controls ◊ Requirements apply		§140.6 Prescriptive Indoor Lighting ◊ Requirements apply	N/A	

Licensed Healthcare Exceptions *(continued)*

Building Application	Mandatory		Prescriptive	Performance	Additions Alterations
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Nonresidential Occupancy Subchapters 3-4 (§§120.0-130.5)	Subchapter 5 (§§140.0, 140.2-10)	Subchapter 5 (§§140.0-1)	Subchapter 6 (§§141.0-1)
◊ = Applies / X = Exempt (continued)					
Outdoor Lighting	§110.9 Mandatory Lighting Controls ◊ Requirements apply	§130.0 General Lighting and Electrical Power Distribution Requirements ◊ Requirements apply §130.1 Mandatory Outdoor Lighting Controls ◊ Requirements apply §130.4 Acceptance Testing X Use HCAI	§140.7 Prescriptive Outdoor Lighting ◊ Requirements apply	N/A	
Sign Lighting	§110.9 Mandatory Lighting Controls X Sign controls exempt	§130.0 General Lighting and Electrical Power Distribution Requirements ◊ Requirements apply §130.3 Sign Lighting Controls X §130.3 Sign lighting control §130.4 Acceptance Testing X Use HCAI	§140.8 Prescriptive Sign Lighting ◊ Requirements apply		◊ §141.0 Additions X §141.0 Alterations exempt
Electrical Power Distribution	§110.11 Mandatory Electrical Power Distribution ◊ Requirements apply §110.12 Demand Management X §110.12 Demand management	§130.5 Electrical Power Distribution X §130.5(a) Metering: Use California Electrical Code Article 517 X §130.5(b) Separation: Use California Electrical Code Article 517 ◊ §130.5(c) Voltage drop required unless regulated by California Electrical Code §§647.4, 695.6, 695.7 X §130.5(d) Circuit control X §130.5(e) Demand-responsive controls	N/A		

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Licensed Healthcare Exceptions *(continued)*

Building Application	Mandatory		Prescriptive	Performance	Additions Alterations
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Nonresidential Occupancy Subchapters 3-4 (§§120.0-130.5)	Subchapter 5 (§§140.0, 140.2-10)	Subchapter 5 (§§140.0-1)	Subchapter 6 (§§141.0-1)
◊ = Applies / X = Exempt (continued)					
Pool and Spa Systems	§110.4 Mandatory Pool & Spa ◊ Requirements apply §110.5 Pilot Light Prohibited ◊ Requirements apply	N/A	N/A	N/A	
Solar Ready	§110.10 Solar Readiness X §110.10 Solar Readiness				
Covered Process	§110.2 Mandatory Efficiency ◊ Requirements apply	§120.6(a) Refrigerated Warehouses ◊ Requirements apply when applicable §120.6(c) Parking Garages ◊ Requirements apply when applicable §120.6(d) Process Boilers ◊ Requirements apply when applicable §120.6(e) Compressed Air X Exempt §120.6(f) Elevators X Exempt §120.6(j) Computer Rooms ◊ **New** Computer room requirements	§140.9(a) Computer Rooms ◊ **New** Computer room requirements apply (no longer exempt) §140.9(b) Commercial Kitchens X Exempt §140.9(c) Lab/Factory Exhaust X Exempt	N/A	◊ §141.0 Additions X §141.0 Alterations exempt
New PV and Battery Storage	N/A	N/A	§140.10 Prescriptive Photovoltaic (PV)/Battery X Not an applicable building type		N/A

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