Proposal Summary

Compressed Air Drying

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Measure Description

This proposal would add the following requirements for new and replacement air dryers:

1. Trim air compressors would have a dedicated air dryer separate from those for baseload compressors.
2. Where necessary plant dewpoints are greater than 35°F, refrigerated dryers would be specified. A non-cycling air dryer may be specified for baseload air compressors while cycling refrigerated dryers would be specified for trim air compressors.
3. All desiccant dryers would have dew point measurement display and controls that reduce regeneration consumption based on load. Air compressor systems with a target dewpoint greater than or equal to -100°F would use a heated desiccant dryer (inclusive of heated blower purge dryers).
4. Air dryer field verification testing that confirms:
    a. Dryer schedules overlap with plant and air compressor schedules.
    b. Desiccant dryer dewpoint setpoints and demand-based regeneration are commissioned properly.

An “X” indicates the proposed code change is relevant.

Building Type(s)		single family	**Construction Type(s)**	X	new construction
		multifamily		X	additions
	X	nonresidential		X	alterations
Type of Change	X	mandatory	**Updates to Compliance Software**	X	no updates
		prescriptive			update existing feature
		performance			add new feature
Third Party Verification		no changes to third party verification			
		update existing verification requirements			
	X	add new verification requirements			

Justification for Proposed Change

Air compressor systems were first covered by Title 24 Part 6 in 2013 thanks to efforts by the California Statewide Codes and Standards Enhancement (CASE) Program team. Mandatory covered process measures were added that stipulated sizing and control requirements for baseload and trim air compressors. Through another CASE Program effort, additional compressed air system requirements were added as part of the 2022 code cycle with a focus on optimization and sustained efficiency of the distribution and load-side components. This CASE effort added mandatory pipe sizing, monitoring, and leak testing measures to Title 24 Part 6.

The proposed 2025 air dryer code measure additions originated during the development of compressed air system measures for the 2022 energy code cycle. Air dryer measures were not pursued at that time, although not due to any technical or cost-effectiveness barriers. Rather, dryers were excluded simply because the selected measures focused on the distribution system and load-side of compressed air, of which dryers were not considered. Air dryer requirements were identified as a possible measure during discussion and measure selection amongst the Statewide CASE team but were not prioritized at the time and were instead reserved for future efforts.

The team is not aware of any ongoing appliance or energy efficiency standards that cover compressed air dryers or their selection. Air dryer types and selection are discussed in industry documents such as the Compressed Air and Gas Handbook from the Compressed Air and Gas Institute, but no standards or code language yet exists.

Data Needs / Information Requests

The Statewide CASE Team is seeking any relevant information to inform the code change proposal. Data may be provided anonymously. To participate or provide information, please email Joe Vukovich at joevukovich@2050partners.com and M M Valmiki at valmiki@askenergyinc.com and copy info@title24stakeholders.com. Desired information includes:

- Whether dryer rated performance matches actual, in-field performance
- Factors affecting the type and capacity of selected dryer equipment, including any perceived issues affecting categories of products
- How often air dryers are paired with a specific trim compressor
- Dryer performance perspective including efficiency, purge rates, and load-following

control abilities

- Market share and costs of various dryer technologies

Draft Code Language

1.1 Guide to Marked Up Language

The proposed changes to the Standards and Reference Appendices are provided below. Changes to the 2025 documents are marked with blue underlining (new language) and ~~strikethroughs~~ (deletions).

1.2 Title 24, Part 1

There are no proposed changes to Title 24, Part 1.

1.3 Title 24, Part 6

(e) Mandatory requirements for compressed air systems.

All new compressed air systems and all additions or alterations of compressed air systems where the total combined horsepower (hp) of the compressor(s) is 25 hp or more shall meet the requirements of Subsections 1 through ~~5~~7. These requirements apply to the compressors, dryers, related piping, and related controls that provide compressed air and do not apply to any equipment or controls that use or process the compressed air.

Exception 1 to Section 120.6(e): Medical gas compressed air systems serving healthcare facilities.

[Sections 120.6(e)1 through 120.6(e)6 unchanged and excluded for brevity]

7. Compressed air dryers. Compressed air dryers and their controls shall comply with Subsections A, B, C and D below:

A. Trim air compressors shall have a dedicated air dryer separate from that of baseload compressors. Each dryer shall be sized to their respective air compressor rated output at the operating conditions.
B. Where required plant dewpoints are greater than 35°F, refrigerated dryers shall be specified. A non-cycling air dryer may be specified for baseload air compressors while cycling refrigerated dryers shall be specified for trim air compressors.
C. All desiccant dryers shall have dew point measurement display and controls that

reduce regeneration consumption based on load. Air compressor systems with a target dewpoint greater than or equal to -100°F shall use a heated desiccant dryer.

D. All compressed air dryers shall be sized such that the capacity is within [TBD]% of the paired air compressor's nameplate capacity.

Exception to Section 120.6(e)7: [To be determined.]

1.4 Reference Appendices

Appendix NA7 – Installation and Acceptance Requirements for Nonresidential Buildings and Covered Processes.

7.13.3 Compressed Air Drying System

Code Language to be determined. Acceptance testing, performed by a field technician, would be added for all newly installed desiccant air dryers to verify that the software controlling the system is suitable to ensure that:

a. regeneration purge airflow and heating elements are switched off after regeneration is complete; and
b. desiccant tank switching is performed only when the active tank outlet dew point begins to rise above a maximum operating threshold.