

(This foreword is provided for information only and is not part of the draft addendum.)

FOREWORD

Draft Addendum 90.1a1 – Publication Draft. The purpose of this addendum is to present a number of proposed substantive changes for public review. These modifications are the result of change proposals made pursuant to the continuous maintenance procedures contained in the *Manual for Processing ASHRAE Standards*. Contained within Addendum 90.1a1 is 90.1a1-1 through 90.1a1-3 and each of these changes is preceded by a rationale statement which is provided for information only.

Addendum 90.1a1 (I-P and SI Editions)

90.1a1-1

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RATIONALE:

The term “mechanical refrigeration” is used just once, but the term “mechanical cooling” is used in multiple locations, including in the definition of “mechanical refrigeration” itself. Changing all to “mechanical cooling” will define the term and make usage consistent.

Addendum 90.1a1-1

SECTIONS 3 AND 6.3.2.1:

Modify definition:

mechanical cooling: reducing the temperature of a gas or liquid by using vapor compression, absorption, desiccant dehumidification combined with evaporative cooling, or other energy-driven thermodynamic cycle. Indirect or direct evaporative cooling alone are not considered mechanical cooling.

Modify 6.3.2.1:

6.3.2.1 Zone Controls. *Zone* thermostatic controls shall be capable of operating in sequence the supply of heating and cooling energy to the *zone*. Such controls shall prevent (1) *reheating*, (2) *recooling*, (3) mixing or simultaneously supplying air that has been previously mechanically heated and air that has been previously cooled, either by mechanical cooling or by economizer systems, and (4) other simultaneous operation of heating and cooling systems to the same *zone*.

90.1a1-2

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RATIONALE:

Nameplate horsepower is nameplate regardless of efficiency. Note that this phrase was added here but not to the analogous “fan system power” definition.

Addendum 90.1a1-2

SECTION 3:

Revise definition to read:

pump system energy demand (pump system power): the sum of the nominal power demand (nameplate horsepower) of motors of all pumps that are required to operate at design conditions to supply fluid from the heating or cooling source to all heat transfer devices (e.g., coils, heat exchanger) and return it to the source.

90.1a1-3

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RATIONALE:

Several changes here:

- 1) Definitions are added for balancing to make sure the terms are understood. Important issues are that automatic balancing is acceptable.
- 2) All mention of variable flow system balancing is deleted from the HVAC section. The issue is handled in the definitions of balancing instead. (The terms like “upstream” etc. were confusing anyway.)
- 3) The requirement for 10% balancing is deleted as agreed by the HVAC panel in June.
- 4) The exceptions on pumps are clarified so that they exempt only impeller trimming. These systems will still have to be balanced.
- 5) The test port requirement is deleted. First this is not the right location for such a requirement – this section addresses balancing, not construction. Second, it is not always necessary for balancing – a flow control valve or other flow-measuring device would do just as well or better. Hence this is not really an energy issue and does not belong in 90.1.

Addendum 90.1a1-3

SECTIONS 3 AND 6.2.5.3:

Add definitions of balancing:

balancing, air. adjusting air flow rates through air distribution system devices, such as fans and diffusers, by manually adjusting the position of dampers, splitter vanes, extractors, etc., or by using automatic control devices, such as constant air volume or variable air volume boxes.

balancing, hydronic. adjusting water flow rates through hydronic distribution system devices, such as pumps and coils, by manually adjusting the position of valves, or by using automatic control devices, such as automatic flow control valves.

Modify 6.2.5.3:

6.2.5.3 System Balancing

6.2.5.3.1 General. Construction documents shall require that all HVAC systems be balanced in accordance with generally accepted engineering standards (see Appendix F).

Construction documents shall require a written balance report be provided to a representative of the owner for HVAC systems serving zones with a total conditioned area exceeding 5000 ft² (460 m²).

6.2.5.3.2 Air System Balancing. Air systems shall be balanced in a manner to first minimize throttling losses; then for fans with *fan system power* greater than 1 hp (0.75 kW), fan speed shall be adjusted to meet design flow conditions.

6.2.5.3.3 Hydronic System Balancing. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions.

Exception to 6.2.5.3.3: Impellers need not be trimmed nor pump speed adjusted:

- (a) For pumps with pump motors of 10 hp (7.5 kW) or less.
- (b) When throttling results in no greater than 5% of the nameplate horsepower draw, or 3 hp, whichever is greater, above that required if the impeller were trimmed.