ERRATA SHEET FOR
ANSI/ASHRAE/IES STANDARD 90.1-2016 (I-P Edition)
Energy Standard for Buildings Except Low-Rise Residential Buildings

June 19, 2019

The corrections listed in this errata sheet apply to ANSI/ASHRAE/IES Standard 90.1-2016, I-P Edition. The first printing is identified on the outside back cover of the standard as "Product code: 86274 10/16". Shaded items have been added since the previously published errata sheet dated March 18, 2019 was distributed.

NOTICE: ASHRAE now has a list server for Standing Standards Project Committee 90.1 (SSPC 90.1). Interested parties can now subscribe and unsubscribe to the list server and be automatically notified via e-mail when activities and information related to the Standard and the User's Manual is available. To sign up for the list server please visit **Project Committee List Servers for Standard** on the Technology / Standards section of the ASHRAE website at https://www.ashrae.org/technical-resources/standards-and-guidelines/project-committee-list-servers.

Page(s)	Erratum
10	**Footnote 1 (bottom of page).** Change the URL for the schedules and internal loads as shown below. 1. Schedules and internal loads by *building* area type are at http://sspc901.ashraepcs.org/documents.php.
13	**3.2 Definitions.** Under the definition for *daylight area, secondary sidelighted area*, last sentence, insert a space between "ftor" so it reads "5 ft or higher".
38	**3.3 Abbreviations and Acronyms.** Change IES from "Illumination Engineering Society of North America" to "Illuminating Engineering Society".
70	**5.9.1 Inspections.** Insert the following informative note immediately after Section 5.9.1. *(Note: Additions are shown in underline.)* ***Informative Note:*** See Appendix E for commissioning references.
83	**6.4.3.11.1 Monitoring.** Revise the last sentence in Section 6.4.3.11.1 as shown below. *(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)* The *efficiency* shall be calculated in ~~tons (*COP*)~~ kW/ton (see Appendix E).
85	**6.4.4.2.2 Duct Leakage Tests.** Correct the equation in Section 6.4.4.2.2 as shown below. *(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)* $$L_{max} = C_L P^{0.65}$$ where L_{max} = maximum permitted leakage, cfm~~/~~ per 100 ft^2 of duct surface area

C_L = 4, duct leakage class, cfm~~/~~ per 100 ft^2 of duct surface area ~~at 1~~per in. of water$^{0.65}$

P = test pressure, which shall be equal to the design duct pressure class rating, in. of water

97 **6.5.3.6 Fractional Horsepower Fan Motors.** Revise item 3 of the Exceptions to 6.5.3.6 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Exceptions to 6.5.3.6
…
3. Motors covered by Table 10.8-3 or Table 10.8-4 ~~Table 10.8-4 or Table 10.8-5~~.

99 **6.5.4.4 Chilled- and Hot-Water Temperature Reset Controls.** In the Exceptions to 6.5.4.4, Exception 3, change the reference to "Section 6.5.4.1" to "Section 6.5.4.2".

120 **Table 6.8.1-10 Electrically Operated Variable-Refrigerant-Flow and Applied Heat Pumps – Minimum *Efficiency* Requirements (*Continued*).** Revise the equipment type subcategory for "*VRF* groundwater source (cooling mode)" as shown in the attached Table 6.8.1-10.
(Note: Deletions are shown in ~~strikethrough~~.)

127 **Table 6.8.3-1 Minimum *Piping* Insulation Thickness Heating and Hot Water Systems[a,b,c,d,e] (Steam, Steam Condensate, Hot-Water Heating and Domestic Water *Systems*).** Revise Note e of Table 6.8.3-1 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

e. The table is based on steel pipe. Nonmetallic pipes schedule 80 thickness or less shall use the table values. For other nonmetallic pipes having *thermal resistance* greater than that of steel pipe, reduced insulation thicknesses are permitted if documentation is provided showing that the pipe with the proposed insulation has no more heat transfer per foot ~~metre~~ than a steel pipe of the same size with the insulation thickness shown in the table.

143 **Exception to 9.4.1.1(g).** Revise the Exception to 9.4.1.1(g) as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Exception to 9.4.1.1(g)
This requirement does not have to be complied with in *spaces* that meet all four ~~three~~ of the following requirements:

1. The *space* has an installed *LPD* of no more than 0.80 W/ft^2.
2. The *space* is lighted by *HID lamp*.
3. The *general lighting* power in the *space* is automatically reduced by at least 30% within 20 minutes of all occupants leaving the *space*.
4. Lighting load does not exceed 0.02 W/ft^2 multiplied by the *gross lighted area* of the *building*.

144 **94.1.1 Interior Lighting Controls.** Add the following exception to the Exceptions to 9.4.1.1(h) as shown below.

4. Lighting load not exceeding 0.02 W/ft^2 multiplied by the *gross lighted area* of the *building.*

183 **12. Normative References.** In Section 12 make the following correction.
(Note: Deletions are shown in ~~strikethrough~~.)

AHRI 340/360-2015 ~~(I-P) and AHRI 341/361-2015 (SI)~~ Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment

249 **Footnote 2 (bottom of page).** Change the URL for the schedules and internal loads as shown below.

2. Schedules and internal loads by *building* area type are found at http://sspc901.ashraepcs.org/documents.php.

257 **Informative Appendix E Informative References.** In the table in Informative Appendix E make the following corrections. See attached.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

282 **G3.1.3.11 Heat Rejection (Systems 7, 8, 9, 12, and 13).** In Section G3.1.3.11 replace "water-side economizer" with "fluid economizer" in two places.

285 **Table G3.1.1.-3 Baseline *HVACV System* Types.** In the first column of Table G3.1.1-3 change "residential" to "nonresidential" in three places. See attached.

311 **Table H-1 Addenda to ANSI/ASHRAE/IES Standard 90.1-2013 *(Continued).*** For Addendum ad in Table H-1 change "unlabled" to "unlabeled".

376 **Section Annex1-1: ASHRAE Standard 169-2013, Section A3: Climate Zone Definitions.** In Section A3, sentence immediately following item b.3 delete the extra "the" from the first word "Userthe" so the sentence reads "Use the third criteria below for determining the Dry/Humid threshold if not Marine (C)".

Table 6.8.1-10 Electrically Operated Variable-Refrigerant-Flow and Applied Heat Pumps— Minimum *Efficiency* Requirements *(Continued)*

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum *Efficiency*	Test Procedure
VRF groundwater source (cooling mode)	<135,000 Btu/h	All	*VRF* multisplit *system* ~~with heat recovery~~ 59°F entering water	16.2 *EER*	AHRI 1230
			VRF multisplit *system* with heat recovery 59°F entering water	16.0 *EER*	
	≥135,000 Btu/h		*VRF* multisplit *system* ~~with heat recovery~~ 59°F entering water	13.8 *EER*	
			VRF multisplit *system* with heat recovery 59°F entering water	13.6 *EER*	

Informative Appendix E
Informative References

Subsection No.	Reference	Title/Source
5.9.1	ASTM E2947-14	Standard Guide for Building Enclosure Commissioning
5.9.1	ASTM E2813-12	Standard Practice for Building Enclosure Commissioning
~~6.7.2.3~~ 6.7.2.4	NEBB Procedural Standards—2013	Procedural Standards for Building Systems Commissioning
6.7.2.3.1	AABC 2002	Associated Air Balance Council, National Standards for Total System Balance
6.7.2.3.1	ASHRAE Standard 111-2008	Measurement, Testing, Adjusting and Balancing of Building HVAC Systems
6.7.2.4	ASHRAE Standard 202-2013	Commissioning Process for Buildings and Systems
6.7.2.4	ASHRAE Guideline 0-2013	The Commissioning Process

Table G3.1.1-3 Baseline *HVAC System* Types

***Building* Type, Number of *Floors*, and Gross Conditioned Floor Area**	**Climate Zones 3B, 3C, and 4 to 8**	**Climate Zones 0 to 3A**
Residential	*System* 1—*PTAC*	*System* 2—*PTHP*
Public assembly <120,000 ft^2	*System* 3—PSZ-AC	*System* 4—PSZ-HP
Public assembly ≥120,000 ft^2	*System* 12—SZ-CV-HW	*System* 13—SZ-CV-ER
Heated-only storage	*System* 9—Heating and *ventilation*	*System* 10—Heating and *ventilation*
Retail and 2 *floors* or fewer	*System* 3—PSZ-AC	*System* 4—PSZ-HP
Other *nonresidential* and 3 *floors* or fewer and <25,000 ft^2	*System* 3—PSZ-AC	*System* 4—PSZ-HP
Other *nonresidential* and 4 or 5 *floors* and <25,000 ft^2 or 5 *floors* or fewer and 25,000 ft^2 to 150,000 ft^2	*System* 5—Packaged *VAV* with *reheat*	*System* 6—Packaged *VAV* with PFP boxes
Other *nonresidential* and more than 5 *floors* or >150,000 ft^2	*System* 7—*VAV* with *reheat*	*System* 8—*VAV* with PFP boxes