Submit a comment

Proposed Change 2105

Code Reference(s):	**NECB25 Div.B Table 5.2.12.1.H (first printing)**
Subject:	Heating, Ventilating and Air-conditioning Systems - Other
Title:	Change SCOP to "Net Sensible COP" in Table 5.2.12.1.-H as the Metric Used for Computer Room Air Conditioners
Description:	This proposed change replaces the minimum performance metric "sensible coefficient of performance (SCOP)" with the "net sensible COP (NSenCOP)" in Table 5.2.12.1.-H to harmonize with the metric used in AHRI 1360 (I-P), AHRI 1361 (SI) and ANSI/ASHRAE/IES 90.1-2022.
Related Code Change Request(s):	CCR 1873

This change could potentially affect the following topic areas:

- ☐ Division A
- ☐ Division C
- ☐ Building operations
- ☐ Small Buildings
- ☐ Fire Protection
- ☐ Accessibility
- ☐ Building Envelope
- ☑ Heating, Ventilating and Air Conditioning
- ☑ Division B
- ☑ Design and Construction
- ☐ Housing
- ☑ Large Buildings
- ☐ Occupant safety in use
- ☐ Structural Requirements
- ☑ Energy Efficiency
- ☐ Plumbing
- ☐ Construction and Demolition Sites

Problem

Table 5.2.12.1.-H in Part 5 of Division B of the National Energy Code of Canada for Buildings (NECB) was developed based on the minimum performance requirements for comparable cooling equipment. Since then, ANSI/ASHRAE/IES 90.1-2022, "Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings," adopted the "net sensible coefficient of performance (NSenCOP)" as the standard efficiency metric

for computer room air conditioners. The U.S. Department of Energy is also considering adopting ANSI/ASHRAE/IES 90.1, which would further solidify NSenCOP as the standard reference metric.

However, NECB 2025 Table 5.2.12.1.-H continues to use the outdated term "sensible coefficient of performance (SCOP)," despite referencing efficiency values aligned with ANSI/ASHRAE/IES 90.1. This terminology mismatch creates unnecessary confusion, especially since the Table and the standard:

- reference the same performance testing methods (AHRI 1360 (I-P) and AHRI 1361 (SI)); and
- define the metric identically as the net sensible cooling capacity divided by total power input, excluding re-heaters and humidifiers.

In essence, the NECB and ANSI/ASHRAE/IES 90.1 use the same performance metric but call it by different names. To prevent confusion and maintain alignment with ASHRAE and AHRI terminology, this proposed change would replace "SCOP" with "NSenCOP" in NECB Table 5.2.12.1.-H.

Justification

Replacing SCOP with NSenCOP in the NECB, as adopted in ANSI/ASHRAE/IES 90.1, would reduce market confusion and support consistent enforcement of Code requirements by aligning the NECB with the terminology used by major standards development organizations.

Moreover, SCOP is commonly understood to mean "seasonal coefficient of performance," which is a distinct metric widely used in the context of heat pumps. Continuing to use SCOP for computer room air conditioners risks misinterpretation by designers, regulators and manufacturers. Replacing SCOP with NSenCOP in Table 5.2.12.1.-H would clarify the intent of the NECB provisions and ensure consistency with ASHRAE and AHRI terminology.

PROPOSED CHANGE

Table [5.2.12.1.-H] 5.2.12.1.-H
Performance Requirements for Computer Room Air Conditioners
Forming Part of Sentences 5.2.12.1.(1), 6.2.2.4.(2), 6.2.2.5.(1) and 8.4.5.18.(6)

Type of Equipment	Cooling or Heating Capacity, kW	Performance Testing Standard	Rating Conditions	Minimum Performance (1)
Air-cooled, floor-mounted, with or without fluid economizer	< 23	AHRI 1361 (SI)	Downflow or upflow, ducted	NSenCOP~~SCOP~~ = 2.67
	≥ 23 and < 86			NSenCOP~~SCOP~~ = 2.55
	≥ 86			NSenCOP~~SCOP~~ = 2.33
	< 23		Upflow, non-ducted	NSenCOP~~SCOP~~ = 2.09
			Horizontal	NSenCOP~~SCOP~~ = 2.65
	≥ 23 and < 70		Upflow, non-ducted	NSenCOP~~SCOP~~ = 1.99
			Horizontal	NSenCOP~~SCOP~~ = 2.55
	≥ 70		Upflow, non-ducted	NSenCOP~~SCOP~~ = 1.81
			Horizontal	NSenCOP~~SCOP~~ = 2.47
Water-cooled, floor-mounted, with or without fluid economizer	< 23		Downflow or upflow, ducted	NSenCOP~~SCOP~~ = 2.74
	≥ 23 and < 86			NSenCOP~~SCOP~~ = 2.65
	≥ 86			NSenCOP~~SCOP~~ = 2.61

Type of Equipment	Cooling or Heating Capacity, kW	Performance Testing Standard	Rating Conditions	Minimum Performance (1)
	< 23		Upflow, non-ducted	NSenCOP~~SCOP~~ = 2.44
			Horizontal	NSenCOP~~SCOP~~ = 2.71
	≥ 23 and < 70		Upflow, non-ducted	NSenCOP~~SCOP~~ = 2.34
			Horizontal	NSenCOP~~SCOP~~ = 2.60
	≥ 70		Upflow, non-ducted	NSenCOP~~SCOP~~ = 2.24
			Horizontal	NSenCOP~~SCOP~~ = 2.54
Glycol-cooled, floor-mounted, with or without fluid economizer	< 23		Downflow or upflow, ducted	NSenCOP~~SCOP~~ = 2.48
	≥ 23 and < 86			NSenCOP~~SCOP~~ = 2.16
	≥ 86			NSenCOP~~SCOP~~ = 2.12
	< 23		Upflow, non-ducted	NSenCOP~~SCOP~~ = 2.34
			Horizontal	NSenCOP~~SCOP~~ = 2.44
	≥ 23 and < 70		Upflow, non-ducted	NSenCOP~~SCOP~~ = 1.99
			Horizontal	NSenCOP~~SCOP~~ = 2.10
	≥ 70		Upflow, non-ducted	NSenCOP~~SCOP~~ = 1.94
			Horizontal	NSenCOP~~SCOP~~ = 2.10

Type of Equipment	Cooling or Heating Capacity, kW	Performance Testing Standard	Rating Conditions	Minimum Performance (1)
Air-cooled, ceiling-mounted, free air discharge condenser, with or without fluid economizer	< 8.5		Ducted	NSenCOP~~SCOP~~ = 2.01
			Non-ducted	NSenCOP~~SCOP~~ = 2.04
	≥ 8.5 and < 19		Ducted	NSenCOP~~SCOP~~ = 1.97
			Non-ducted	NSenCOP~~SCOP~~ = 2.00
	≥ 19		Ducted	NSenCOP~~SCOP~~ = 1.87
			Non-ducted	NSenCOP~~SCOP~~ = 1.89
Air-cooled, ceiling-mounted, ducted condenser, with or without fluid economizer	< 8.5		Ducted	NSenCOP~~SCOP~~ = 1.82
			Non-ducted	NSenCOP~~SCOP~~ = 1.68
	≥ 8.5 and < 19		Ducted	NSenCOP~~SCOP~~ = 1.78
			Non-ducted	NSenCOP~~SCOP~~ = 1.81
	≥ 19		Ducted	NSenCOP~~SCOP~~ = 1.68
			Non-ducted	NSenCOP~~SCOP~~ = 1.70
Water-cooled, ceiling-mounted, with or without fluid economizer	< 8.5		Ducted	NSenCOP~~SCOP~~ = 2.33
			Non-ducted	NSenCOP~~SCOP~~ = 2.36
	≥ 8.5 and < 19		Ducted	NSenCOP~~SCOP~~ = 2.23
			Non-ducted	NSenCOP~~SCOP~~ = 2.26

Type of Equipment	Cooling or Heating Capacity, kW	Performance Testing Standard	Rating Conditions	Minimum Performance (1)
	≥ 19		Ducted	NSenCOP~~SCOP~~ = 2.13
			Non-ducted	NSenCOP~~SCOP~~ = 2.16
Glycol-cooled, ceiling-mounted, with or without fluid economizer	< 8.5		Ducted	NSenCOP~~SCOP~~ = 1.92
			Non-ducted	NSenCOP~~SCOP~~ = 1.95
	≥ 8.5 and < 19		Ducted	NSenCOP~~SCOP~~ = 1.88
			Non-ducted	NSenCOP~~SCOP~~ = 1.93
	≥ 19		Ducted	NSenCOP~~SCOP~~ = 1.73
			Non-ducted	NSenCOP~~SCOP~~ = 1.76

Note to Table [5.2.12.1.-H] 5.2.12.1.-H:

(1) The symbols and abbreviations that appearin this column have the following meanings:

NSenCOP~~SCOP~~ = net sensible *coefficient of performance*. The NSenCOP~~SCOP~~ isa ratio that is calculated by dividing the net sensible cooling capacity,in W, by the total power input, in W (excluding re-heaters and humidifiers).

Impact analysis

This proposed change is expected to be cost neutral as it would not change the intent of the provision or the performance requirements; it simply would align the NECB with ASHRAE and AHRI terminology.

Enforcement implications

This proposed change could be enforced by the existing infrastructure for enforcing the NECB, without requiring additional resources. This proposed change would help reduce market confusion and streamline enforcement efforts.

Who is affected

Designers, engineers, architects, manufacturers, builders, specification writers and building officials.

OBJECTIVE-BASED ANALYSIS OF NEW OR CHANGED PROVISIONS

N/A