



**BSR/ASHRAE Addendum *b* to
ANSI/ASHRAE Standard 205-2023**

Public Review Draft

**Proposed Addendum *b* to
Standard 205-2023, Representation
of Performance Data for HVAC&R
and Other Facility Equipment**

**First Public Review (November 2023)
(Draft shows Proposed Changes to Current Standard)**

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ASHRAE, 180 Technology Parkway NW, Peachtree Corners, GA 30092

Proposed BSR/ASHRAE Addendum *b* to ANSI/ASHRAE Standard 205-2023, *Representation of Performance Data for HVAC&R and Other Facility Equipment*

(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

Foreword to Addendum *b*

This proposed addendum simplifies equipment rating information that may be included in representations conforming to Standard 205-2023. Standard 205 purpose focuses on representing equipment performance. In this context, equipment ratings are useful as documentation but are otherwise not needed for modeling performance.

*Addendum *b* proposes to drop part-load rating information and retain only primary ratings. This reduces the effort required to publish Standard 205 conforming representations with minimal loss of utility for users of those representations.*

[**Note to Reviewers:** This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and strikethrough (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum *b* to Standard 205-2023

Section 6.3.3.5 revised as follows:

6.3.3.5 Rating. If appropriate, a representation specification shall define data groups that includes data elements that represent standard ratings. If the equipment is certified according to a rating procedure, the rating data in the representation's description data group shall be consistent with the certified rating.

6.3.3.5.1 Recalculation of the Ratings with Performance Data. ~~If a representation specification includes a `Rating` data group, the data group shall contain a Boolean data element called `rating_recalculatable_from_performance_data` that denotes whether the performance data included in the representation can be used to recalculate the published standard rating data in the data group within the tolerance of the rating standard used to determine the rating. The data group shall contain a string data element called `rating_recalculatable_explanation` to allow for an explanation of `rating_recalculatable_from_performance_data`.~~

Informative note: Representation data conveys typical performance at various operating conditions. Rating conditions and operating modes may or may not occur during installed operation. Standard 205 and ratings have different purposes; it is not possible to achieve consistency in all cases.

Section RS0001.1 revised as follows (the schema_version and Date will depend on the order of publication of the addenda and will be completed at the time of publication):

RS0001.1 Identification and History. schema: RS0001

schema_version	Date	Initial Approved Standard	Notes
1.0.0	2023	2023	Initial publication
		<u>2023 - Addendum B</u>	

Section RS0001.3.1 revised as follows:

RS0001.3.1 Data Group Hierarchy. A representation implementation conforming to this representation specification shall consist of the following data groups:

- RS0001
 - Metadata
 - Description*
 - ProductInformation*
 - RatingAHRI550590*
 - ~~- PartLoadRatingPoint550590*~~
 - RatingAHRI551591*
 - ~~- PartLoadRatingPoint551591*~~
 - Performance
 - PerformanceMapCooling
 - GridVariablesCooling
 - LookupVariablesCooling
 - PerformanceMapStandby
 - GridVariablesStandby
 - LookupVariablesStandby

where * indicates data groups that are not required to be present in a representation conforming to this representation specification.

Informative note: Required data elements of an optional data group are only required when the data group is present in a representation.

Informative note: When multiple chillers are designed to operate in concert, such as in a series counterflow arrangement, the performance of the chiller system can be represented in a single file. Other designs with multiple chillers operating independently should be represented with multiple files.

Table RS00001-7 revised as follows:

Table RS0001-7 Rating AHRI550590

Name	Description	Data Type	Units	Constraints	Req	Notes
certified_reference_number	AHRI certified reference number	String			✓	
test_standard_year	Year of the AHRI test standard	<AHRI550590TestStandardYear>			✓	
rating_source	Source of this rating data	String				Used by data publisher to document methods (e.g., software and version) used to generate rating data
net_refrigerating_capacity	Rated net refrigeration capacity	Numeric	Btu/h	≥0.0	✓	The capacity of the evaporator available for cooling of the thermal load external to the chiller; calculated using only the sensible heat transfer
input_power	Combined power input of all components of the unit, including auxiliary power and excluding integral pumps	Numeric	kW	≥0.0	✓	
cop	Ratio of the net refrigerating capacity to the total input power at the rating conditions	Numeric	-	>0.0	✓	
part_load_value	Rated part load efficiency on the basis of weighted operation at various partial load capacities	Numeric	-		✓	Represents the IPLV, IP or NPLV, IP

<u>iplv_ip</u>	<u>The Integrated Part-Load Value efficiency of merit calculated at the standard rating conditions.</u>	Numeric				
<u>nplv_ip</u>	<u>The Non-Standard Part-Load Value efficiency of merit calculated at the conditions other than the IPLV/IP conditions.</u>	Numeric				
<u>part_load_rating_points</u>	<u>The four measured data points used to calculate the part load rating value</u>	{{RatingAHRIS50590PartLoadPoint}} {4}				The measured data for all 4 points used to calculate the IPLV or NPLV rating point
<u>full_load_evaporator_liquid_volumetric_flow_rate</u>	<u>Evaporator liquid volumetric flow rate at the full load design point rating condition</u>	Numeric	gpm	>0.0	✓	Density calculations shall be made at the inlet temperature of the heat exchanger at full load rating conditions
<u>full_load_evaporator_liquid_entering_temperature</u>	<u>Liquid temperature at the entry flange of the evaporator at the full load design rating conditions</u>	Numeric	F	> 459.67	✓	
<u>full_load_evaporator_liquid_leaving_temperature</u>	<u>Liquid temperature at the exit flange of the evaporator at the full load design rating conditions</u>	Numeric	F	> 459.67	✓	
<u>full_load_evaporator_liquid_differential_pressure</u>	<u>Pressure difference across the evaporator at the full load design rating conditions</u>	Numeric	ft of water	>0.0	✓	Evaporator pressure difference as defined in the rating standard
<u>full_load_evaporator_fouling_factor</u>	<u>Factor of heat transfer inhibition due to evaporator heat exchanger fouling layer at the full load design rating condition</u>	Numeric	h-ft ² -F/Btu	≥0.0	✓	Evaporator fouling factor at which the full load rating was measured

full_load_condenser_liquid_volumetric_flow_rate	Condenser liquid volumetric flow rate at the full load design rating conditions	Numeric	gpm	>0.0	✓	Density calculations shall be made at the inlet temperature of the heat exchanger at full load rating conditions
full_load_condenser_liquid_entering_temperature	Liquid temperature at the entry flange of the condenser at the full load design rating conditions	Numeric	F	>=459.67	✓	
full_load_condenser_liquid_leaving_temperature	Liquid temperature at the exit flange of the condenser at the full load design rating conditions	Numeric	F	>=459.67	✓	
full_load_condenser_liquid_differential_pressure	Pressure difference across the condenser at the full load design rating conditions	Numeric	ft of water	>0.0	✓	Condenser pressure difference as defined in the rating standard
full_load_condenser_fouling_factor	Factor of heat transfer inhibition due to condenser heat exchanger fouling layer at the full load design rating conditions	Numeric	h-ft ² -F/Btu	≥0.0	✓	Condenser fouling factor at which the full load rating condition was measured
rating_recalculatable_from_performance_data	Whether this rating can be recalculated using the performance data in the representation	Boolean			✓	True if the rating values in this table can be recalculated using the performance data in the representation within the tolerance of the rating standard
rating_recalculatable_explanation	An explanation of the value for rating_recalculatable_from_performance_data	String				

Table RS00001-8 deleted as follows:

Table RS0001-8 Rating AHR1550590 Part Load Point

Name	Description	Data Type	Units	Constraints	Req	Notes
percent_full_load_capacity	Percent full load cooling capacity	Numeric	%	$\geq 0.0, \leq 100.0$	✓	
cooling_capacity	The actual cooling capacity	Numeric	Btu/h	≥ 0.0	✓	
input_power	Combined power input of all components of the unit, including auxiliary power and excluding integral pumps	Numeric	kW	≥ 0.0	✓	
evaporator_liquid_volumetric_flow_rate	Evaporator liquid volumetric flow rate	Numeric	gpm	≥ 0.0	✓	Density calculations shall be made at the inlet temperature of the heat exchanger
evaporator_liquid_entering_temperature	Liquid temperature at the entry flange of the evaporator	Numeric	F	≥ -459.67	✓	
evaporator_liquid_leaving_temperature	Liquid temperature at the exit flange of the evaporator	Numeric	F	≥ -459.67	✓	
evaporator_liquid_differential_pressure	Pressure difference across the evaporator	Numeric	ft of water	≥ 0.0	✓	
evaporator_fouling_factor	Factor of heat transfer inhibition due to evaporator heat exchanger fouling layer	Numeric	$\text{h-ft}^2\text{-F/Dtu}$	≥ 0.0	✓	
condenser_liquid_volumetric_flow_rate	Condenser liquid volumetric flow rate	Numeric	gpm	≥ 0.0	✓	Density calculations shall be made at the inlet temperature of the heat exchanger
condenser_liquid_entering_temperature	Liquid temperature at the entry flange of the condenser	Numeric	F	≥ -459.67	✓	

condenser_liquid_leaving_temperature	Liquid temperature at the exit flange of the condenser	Numeric	F	>-459.67	✓	
condenser_liquid_differential_pressure	Pressure difference across the condenser	Numeric	ft of water	>0.0	✓	
condenser_fouling_factor	Factor of heat transfer inhibition due to condenser heat exchanger fouling layer	Numeric	h-ft ² -F/Dtu	≥0.0	✓	

Table RS00001-9 revised as follows:

Table RS0001-9 Rating AHRI551591

Name	Description	Data Type	Units	Constraints	Req	Notes
certified_reference_number	AHRI certified reference number	String			✓	
test_standard_year	Year of the AHRI test standard	<AHRI551591TestStandardYear>			✓	
rating_source	Source of this rating data	String				Used by data publisher to document methods (e.g., software and version) used to generate rating data
net_refrigerating_capacity	Rated net refrigeration capacity	Numeric	kW	≥0.0	✓	The capacity of the evaporator available for cooling of the thermal load external to the chiller; calculated using only the sensible heat transfer
input_power	Combined power input of all components of the unit, including auxiliary power and excluding integral pumps	Numeric	kW	≥0.0	✓	

cop	Ratio of the net refrigerating capacity to the total input power at the rating conditions	Numeric	-	>0.0	✓	
part_load_value	Rated part load efficiency on the basis of weighted operation at various partial load capacities	Numeric	-		✓	Represents the IPLV.SI or NPLV.SI
iplv_si	The Integrated Part-Load Value efficiency of merit calculated at the standard rating conditions.	Numeric				
nplv_si	The Non-Standard Part-Load Value efficiency of merit calculated at the conditions other than the IPLV.SI conditions.	Numeric				
part_load_rating_points	The four measured data points used to calculate the part load rating value	{{RatingAHR1551591PartLoadPoint}} {4}				The measured data for all 4 points used to calculate the IPLV or NPLV rating point
full_load_evaporator_liquid_volumetric_flow_rate	Evaporator liquid volumetric flow rate at the full load design rating conditions	Numeric	l/s	>0.0	✓	Density calculations shall be made at the inlet temperature of the heat exchanger at full load rating conditions
full_load_evaporator_liquid_entering_temperature	Liquid temperature at the entry flange of the evaporator at the full load design rating conditions	Numeric	°C	>-273.15	✓	
full_load_evaporator_liquid_leaving_temperature	Liquid temperature at the exit flange of the evaporator at the full load design rating conditions	Numeric	°C	>-273.15	✓	
full_load_evaporator_liquid_differential_pressure	Pressure difference across the evaporator at the full load design rating conditions	Numeric	kPa	>0.0	✓	Evaporator pressure difference as defined in the rating standard
full_load_evaporator_fouling_factor	Factor of heat transfer inhibition due to evaporator heat exchanger fouling layer at the full load design rating conditions	Numeric	m ² ·K/kW	≥0.0	✓	Evaporator fouling factor at which the full rating was measured

full_load_condenser_liquid_volumetric_flow_rate	Condenser liquid volumetric flow rate at the full load design rating conditions	Numeric	l/s	>0.0	✓	Density calculations shall be made at the inlet temperature of the heat exchanger at full load rating conditions
full_load_condenser_liquid_entering_temperature	Liquid temperature at the entry flange of the condenser at the full load design rating conditions	Numeric	°C	>=273.15	✓	
full_load_condenser_liquid_leaving_temperature	Liquid temperature at the exit flange of the condenser at the full load design rating conditions	Numeric	°C	>=273.15	✓	
full_load_condenser_liquid_differential_pressure	Pressure difference across the condenser at the full load design rating conditions	Numeric	kPa	>0.0	✓	Condenser pressure difference as defined in the rating standard
full_load_condenser_fouling_factor	Factor of heat transfer inhibition due to condenser heat exchanger fouling layer at the full load design rating conditions	Numeric	m ² ·K/kW	≥0.0	✓	Condenser fouling factor at which the full rating was measured
rating_recalculatable_from_performance_data	Whether this rating can be recalculated using the performance data in the representation	Boolean			✓	True if the rating values in this table can be recalculated using the performance data in the representation within the tolerance of the rating standard
rating_recalculatable_explanation	An explanation of the value for rating_recalculatable_from_performance_data	String				

Table RS00001-10 deleted as follows:

Table RS0001-10 Rating AHRI551591PartLoadPoint

Name	Description	Data Type	Units	Constraints	Req	Notes
percent_full_load_capacity	Percent full load cooling capacity	Numeric	%	$\geq 0.0, \leq 100.0$	✓	
cooling_capacity	The actual cooling capacity	Numeric	kW	≥ 0.0	✓	
input_power	Combined power input of all components of the unit, including auxiliary power and excluding integral pumps	Numeric	kW	≥ 0.0	✓	
evaporator_liquid_volumetric_flow_rate	Evaporator liquid volumetric flow rate	Numeric	l/s	> 0.0	✓	Density calculations shall be made at the inlet temperature of the heat exchanger
evaporator_liquid_entering_temperature	Liquid temperature at the entry flange of the evaporator	Numeric	°C	> -273.15	✓	
evaporator_liquid_leaving_temperature	Liquid temperature at the exit flange of the evaporator	Numeric	°C	> -273.15	✓	
evaporator_liquid_differential_pressure	Pressure difference across the evaporator	Numeric	kPa	> 0.0	✓	
evaporator_fouling_factor	Factor of heat transfer inhibition due to evaporator heat exchanger fouling layer	Numeric	$m^2 \cdot K/kW$	≥ 0.0	✓	
condenser_liquid_volumetric_flow_rate	Condenser liquid volumetric flow rate	Numeric	l/s	> 0.0	✓	Density calculations shall be made at the inlet temperature of the heat exchanger
condenser_liquid_entering_temperature	Liquid temperature at the entry flange of the condenser	Numeric	°C	> -273.15	✓	
condenser_liquid_leaving_temperature	Liquid temperature at the exit flange of the condenser	Numeric	°C	> -273.15	✓	

condenser_liquid_differential_pressure	Pressure difference across the condenser	Numeric	kPa	>0.0	✓	
condenser_fouling_factor	Factor of heat transfer inhibition due to condenser heat exchanger fouling layer	Numeric	m ² ·K/kW	≥0.0	✓	

Section RS0002.1 revised as follows (the schema_version and Date will depend on the order of publication of the addenda and will be completed at the time of publication):

RS0002.1 Identification and History. schema: RS0002

schema_version	Date	Initial Approved Standard	Notes
1.0.0	2023	2023	Initial publication
		<u>2023 - Addendum B</u>	

Table RS00002-11 revised as follows:

Table RS0002-11 Rating AHRI210240

Name	Description	Data Type	Units	Constraints	Req	Notes
certified_reference_number	AHRI certified reference number	String			✓	
test_standard_year	Year of the AHRI test standard	<AHRI210240TestStandardYear>			✓	
rating_source	Source of this rating data	String				Used by data publisher to document methods (e.g., software and version) used to generate rating data
staging_type	Type of compressor staging	<AHRI210240CompressorStagingType>			✓	

seer	Seasonal Energy Efficiency Ratio	Numeric	Btu/W·h	>0.0	✗	Represents SEER2 for the 2023 version of test standard Used for versions of the test standard up through 2017
seer2	Seasonal Energy Efficiency Ratio	Numeric	Btu/W·h	>0.0		Used for versions of the test standard from 2023
eer	Full stage Energy Efficiency Ratio (at 'A' operating conditions)	Numeric	Btu/W·h	>0.0		Used for versions of the test standard up through 2017
eer_a_full_eer2	Full stage Energy Efficiency Ratio (at 'A' operating conditions)	Numeric	Btu/W·h	>0.0	✗	Represents EER2_{A-Full} for the 2023 version of test standard Used for versions of the test standard from 2023
eer_b_full	Full stage Energy Efficiency Ratio (at 'B' operating conditions)	Numeric	Btu/W·h	>0.0	if_staging_type!=SINGLE_STAGE	
cooling_a_full_capacity_cooling_capacity	Full stage net total cooling capacity (at 'A' operating conditions)	Numeric	Btu/h	≥0.0	✗	At high stage for multi-stage equipment.
cooling_b_full_capacity	Full stage net total cooling capacity (at 'B' operating conditions)	Numeric	Btu/h	≥0.0	if_staging_type!=SINGLE_STAGE	
cooling_b_low_capacity	Low stage net total cooling capacity (at 'B' operating conditions)	Numeric	Btu/h	≥0.0	if_staging_type!=SINGLE_STAGE	
cooling_f_low_capacity	Low stage net total cooling capacity (at 'F' operating conditions)	Numeric	Btu/h	≥0.0	if_staging_type!=SINGLE_STAGE	

cooling_g_low_capacity	Low stage net total cooling capacity (at 'G' operating conditions)	Numeric	Btu/h	≥0.0	if_staging_type=VARIABLE_STAGE and test_standard_year=IP_2023	
cooling_i_low_capacity	Low stage net total cooling capacity (at 'I' operating conditions)	Numeric	Btu/h	≥0.0	if_staging_type=VARIABLE_STAGE and test_standard_year=IP_2023	
cooling_a_full_power	Full stage net total cooling power (at 'A' operating conditions)	Numeric	W	≥0.0	if_staging_type!=SINGLE_STAGE	
cooling_b_full_power	Full stage net total cooling power (at 'B' operating conditions)	Numeric	W	≥0.0	if_staging_type!=SINGLE_STAGE	
cooling_b_low_power	Low stage net total cooling power (at 'B' operating conditions)	Numeric	W	≥0.0	if_staging_type!=SINGLE_STAGE	
cooling_f_low_power	Low stage net total cooling power (at 'F' operating conditions)	Numeric	W	≥0.0	if_staging_type!=SINGLE_STAGE	
cooling_g_low_power	Low stage net total cooling power (at 'G' operating conditions)	Numeric	W	≥0.0	if_staging_type=VARIABLE_STAGE and test_standard_year=IP_2023	
cooling_i_low_power	Low stage net total cooling power (at 'I' operating conditions)	Numeric	W	≥0.0	if_staging_type=VARIABLE_STAGE and test_standard_year=IP_2023	
cooling_full_fan_power	Power of the indoor fan at full load	Numeric	W	>0.0	✓	
cooling_full_air_volumetric_flow_rate	Standard air volumetric rate of the indoor fan at full load	Numeric	cfm	>0.0	✓	
cooling_low_fan_power	Power of the indoor fan at low stage	Numeric	W	>0.0	if_staging_type!=SINGLE_STAGE	
cooling_low_air_volumetric_flow_rate	Standard air volumetric rate of the indoor fan at low stage	Numeric	cfm	>0.0	if_staging_type!=SINGLE_STAGE	

rating_recalculatable_from_performance_data	Whether this rating can be recalculated using the performance data in the representation	Boolean			✓	True if the rating values in this table can be recalculated using the performance data in the representation within the tolerance of the rating standard
rating_recalculatable_explanation	An explanation of the value for rating_recalculatable_from_performance_data	String				

Table RS0002-12 revised as follows:

Table RS0002–12 Rating AHRI340360

Name	Description	Data Type	Units	Constraints	Req	Notes
certified_reference_number	AHRI Certified Reference Number	String			✓	
test_standard_year	Name and version of the AHRI test standard	<AHRI340360TestStandardYear>			✓	
rating_source	Source of this rating data	String				Used by data publisher to document methods (e.g., software and version) used to generate rating data
capacity_control_type	Type of capacity control	<AHRI340360CapacityControlType>			✓	
ieer	Integrated Energy Efficiency Ratio	Numeric	Btu/W·h	>0.0	✓	
eer	Energy Efficiency Ratio at Standard Rating Conditions	Numeric	Btu/W·h	>0.0	✓	
cooling_capacity	Net total cooling capacity at Standard Rating Conditions	Numeric	Btu/h	≥0.0	✓	

part_load_points	Four part load rating points	{{RatingAHRI340360CoolingPartLoadPoint}} {4}				
rating_recalculatable_from_performance_data	Whether this rating can be recalculated using the performance data in the representation	Boolean			✓	True if the rating values in this table can be recalculated using the performance data in the representation within the tolerance of the rating standard
rating_recalculatable_explanation	An explanation of the value for rating_recalculatable_from_performance_data	String				

Table RS00002-13 deleted as follows:

Table RS0002-13 RatingAHRI340360CoolingPartLoadPoint

Name	Description	Data Type	Units	Constraints	Req	Notes
capacity	Net total cooling capacity	Numeric	Btu/h	>0.0	✓	
net_power	Net cooling power (including the indoor fan motor, controls, and other auxiliary loads)	Numeric	W	>0.0	✓	
indoor_fan_power	Power of the indoor fan motor	Numeric	W	>0.0		
auxiliary_power	Power of the control circuit and any other auxiliary loads	Numeric	W	>0.0	✓	
air_volumetric_flow_rate	Standard air volumetric rate of the indoor fan	Numeric	cfm	>0.0	✓	