

ANSI/AHRI Standard 1210-2023 (SI/I-P)

Performance Rating of Variable Frequency Drives



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IMPORTANT

SAFETY DISCLAIMER

AHRI does not set safety standards and does not certify or guarantee the safety of any products, components or systems designed, tested, rated, installed, or operated in accordance with this standard/guideline. It is strongly recommended that products be designed, constructed, assembled, installed, and operated in accordance with nationally recognized safety standards and code requirements appropriate for products covered by this standard/guideline.

AHRI uses its best efforts to develop standards/guidelines employing state-of-the-art and accepted industry practices. AHRI does not certify or guarantee that any tests conducted under its standards/guidelines will be non-hazardous or free from risk.

ICS Code: 27.200

Note:

This standard supersedes AHRI Standard 1210-2019 (I-P) and AHRI Standard 1211 (SI)-2019.

AHRI CERTIFICATION PROGRAM DISCLAIMER

AHRI Standards are developed independently of AHRI Certification activities and can have scopes that include products that are not part of the AHRI Certification Program. The scope of the applicable AHRI Certification Program can be found on the AHRI website at www.ahrinet.org.

Intent

This standard is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors, and users.

Review and Amendment

This standard is subject to review and amendment as technology advances.

2023 Edition

This edition of AHRI Standard 1210 (SI/I-P), *Performance Rating of Variable Frequency Drives*, was prepared by the Power Drive Systems Standards Technical Committee (STC). The standard was approved by the Applied Standards Subcommittee (SCC) on 16 November 2023. This standard was approved as an American National Standard (ANS) on 5 December 2023.

Origin and Development of AHRI Standard 1210

The initial publication was ANSI/AHRI 1210 (I-P)-2011, *Performance Rating of Variable Frequency Drives* and ANSI/AHRI (SI) 1211 (SI)-2011, *Performance Rating of Variable Frequency Drives*. Subsequent revisions were:

ANSI/AHRI Standard 1210 (I-P)-2011 with Addendum 1, *Performance Rating of Variable Frequency Drives*
ANSI/AHRI Standard 1211 (SI)-2011 with Addendum 1, *Performance Rating of Variable Frequency Drives*
AHRI Standard 1210 (I-P)-2011 (with Addendum 1 and 2, *Performance Rating of Variable Frequency Drives*
AHRI Standard 1211 (SI)-2011 (with Addendum 1 and 2), *Performance Rating of Variable Frequency Drives*
AHRI Standard 1210 (I-P)-2017, *Performance Rating of Variable Frequency Drives*
AHRI Standard 1211 (SI)-2017, *Performance Rating of Variable Frequency Drives*
AHRI Standard 1210-2019 (I-P), *Performance Rating of Variable Frequency Drives*
AHRI Standard 1211-2019 (SI), *Performance Rating of Variable Frequency Drives*

Summary of Changes

AHRI Standard 1210-2023 (SI/I-P) contains the following updates to the previous edition:

- Created a joint-unit SI/I-P document by consolidating AHRI Standard 1211 into AHRI Standard 1210
- Updated the standard to the current style guide
- Updated power source requirement section to align with ASHRAE 222
- Added reference for synchronous motors
- Updated drive system efficiency to *power drive system efficiency*
- Updated Test Motor section (Section [5.4](#))
- Updated utilization voltages
- Updated references
- Updated *motor thermal equilibrium* definition to align with ASHRAE standard

Committee Personnel
Power Drive Systems Standards Technical Committee

Company/Organization	Participant	Voting Role
Voting Organizations		
Danfoss	Joe Horn, Chair	Primary
	Todd Hanson	Alternate
Daikin Applied Americas Inc.	Henry Ernst	Primary
ebm-papst Inc.	Armin Hauer	Primary
Nidec Motor Corporation	Tim Albers	Primary
	Tim Johnson	Alternate
2050 Partners	Nazme Mohsina	Primary
Nonvoting Organization		
Advanced Energy	Michael Lyda	Nonvoter
Greg Kalinyak		AHRI Staff Liaison

Power Drive Systems Standards Technical Committee Scope:

The Power Drive Systems Standards Technical Committee (STC) is responsible for the development and maintenance of AHRI standards and guidelines pertaining to Power drive systems.

Out of scope for this STC are systems/standards that are not related to Power Drive Systems.

Applied Standards Subcommittee

Company/Organization	Participant	Voting Role
Voting Organizations		
Johnson Controls, Inc.	Patrick Marks, Chair	Primary
Carrier Corporation	Jeff deRoos	Primary
Copeland	Jennifer Butsch	Primary
Daikin Applied Americas Inc.	Henry Ernst	Primary
Desert Aire Corp.	Craig Burg	Primary
ebm-papst Inc.	Armin Hauer	Primary
Energistics Laboratory	Brandon Bates	Primary
GE Appliances, a Haier Company	Jeffrey Kellow	Primary
Mitsubishi Electric Cooling & Heating	Dana Fischer	Primary
Swegon North America Inc.	Tom McDermott	Primary
Trane U.S. Inc.	Darcy Lee	Primary
Karl Best		AHRI Staff Liaison

Applied Standards Subcommittee Scope:

The scope of the Applied Standards Subcommittee is standards and guidelines related to the end products that are part of the AHRI Applied Industry Sector. (The definition of and list of products associated with each sector are found on AHRI's [website](#).)

These lists represent the membership at the time the Standards Technical Committee and Standards Subcommittee were balloted on the final text of this edition. Since that time, changes in the membership may have occurred. Membership on these committees shall not in and of itself constitute an endorsement by the committee members or their employers of any document developed by the committee on which the member serves.

Applied Consensus Body

Participant	Voting Member Role	Interest Category Classification
Joe Pessa Dynamic Air Quality Solutions	Primary	Component Manufacturer
Sebastian Wejchert Swiss Rotors Inc.	Primary	Component Manufacturer
Aniruddh Roy Energy Solutions	Primary	General Interest
Douglas Mischley APV North America Heat Transfer (SPX Flow Inc.)	Primary	Product Manufacturer
Satheesh Kulankara Johnson Controls, Inc.	Primary	Product Manufacturer
Doug Tucker Mitsubishi Electric Cooling & Heating	Primary	Product Manufacturer
James Lee Zhongshan Saiver-Welaire Air Conditioning Equipment Co., Ltd.	Primary	Product Manufacturer
Ronald Balneg California Energy Commission	Primary	Regulatory Agency
Aaron Gunzner Air Movement and Control Association International, Inc.	Primary	Testing Laboratory
Curtis Eichelberger Eichelberger Acoustics LLC	Primary	Testing Laboratory
Byron Horak Intertek	Primary	Testing Laboratory
Caroline Henley UL Solutions	Primary	Testing Laboratory