CAGI
Compressed Air & Gas Institute

TECH SHEET

Industrial Compressors and the UL 1450 Standard

UL 1450, Standard for Safety for Motor-Operated Air Compressors, Vacuum Pumps, and Painting Equipment was developed to provide a means of testing smaller, household and contractor-type compressors that are manufactured in relatively large quantities and batches. The UL standard and the UL listing process are well suited to this type of equipment, in which there is not a significant amount of variation in options or features within a particular manufacturer's model families. A test of sample units and file review lead to results that apply to a relatively large number of units. Larger, industrial compressors are not produced in the same fashion. Quantities are much smaller, and the amount of variation in customer-specified options or features is quite large. In many cases, each unit is a unique combination of features and options that meet the needs of a particular customer. Different customers may end up purchasing units that are constructed identically, but the manufacturer does not maintain a large inventory of units that are bought off the shelf. Often industrial compressors are made to order due to the large number of options and configurations that are available.

Products that are produced in the way industrial compressors are produced do not fit into the UL standards and listing model. Instead of applying to a large number of units, the tests and file reviews lead to results that apply to a very small number of units, or even to one unit. This introduces significant delays and costs that make application of the UL testing and listing model infeasible, or impossible.

As a result of increasing application of the UL 1450 standard to industrial compressors, to which the standard was never intended to apply, the UL 1450 Standards Technical Panel revised the scope of the UL 1450 standard to specifically exclude industrial compressors from the scope of the standard. Some components of industrial compressors are still tested to UL standards, but the entire compressor package cannot be tested to the UL 1450 standard, as the scope of the standard specifically excludes industrial compressors.

Other standards are used to evaluate the safety of industrial compressors. A list of some of the standards that may apply can be found on the following page.

Safety and Industry Standards that Apply to Industrial Compressors

There are several standards regarding compressor safety that have been developed specifically for industrial compressors and compressed air systems, including ANSI/CAGI B19.1, EN 1012, and ISO 5388. A new international standard series for product safety under development (ISO 18623-1 and ISO 18626-2) is intended to ultimately replace all three legacy US national, Euronorm and international standards.

Industrial compressors may be required to comply with a host of additional standards, depending on where they will be put into service, including several UL standards. Following is a list applicable in the United States, but this is not a definitive guide:

- ANSI B11.0 - Safety of Machinery
- ANSI B11.19 - Performance Requirements for Risk Reduction Measures: Safeguarding
- ANSI B19.3 - Safety Standards for Compressors for Process Industry
- ANSI Z535 - Warning labels, Operator and Maintenance Instructions
- NFPA 70 - National Electric Code
- NFPA 79 - Electrical Standard for Industrial Machinery
- ASME Section VIII Pressure Vessel Code
- UL/CSA (various) Electrical components
- UL 508A - Electrical panels are listed and marked
- ISO 1217 - Displacement Compressors - Acceptance Tests (Annex C and Annex E)
- ISO 5389 – Turbo-compressors - Performance Test Code
- ISO 18740 - Turbo-compressors - Performance Test Code - Simplified Acceptance Test
- CAGI BL300 - Performance Test Code for Electric Driven Low Pressure Air Compressor Packages
- ISO 2151 - Acoustics - Noise Test Code for Compressors and Vacuum Pumps

Compressors that are supplied in member countries of the European Economic Area (EEA) must comply with the following regulations/directives

- 2014/35/EU Low-Voltage Directive
- 2006/42/EC (with amendments) Machinery Directive
- 2014/68/EU Pressure Equipment Directive
- 2014/29/EU Simple Unfired Pressure Vessel Directive
- 2014/30/EU Electromagnetic Compatibility Directive
- 2000/14/EC Outdoor Noise Directive

The United Kingdom of Great Britain and Northern Ireland (UK) has left the European Union and ceased being a member of EEA at end of the transition period (31 December 2020). The UK continues to accept product with CE marking and declarations through 1 January 2023. The UK has subsequently introduced its own product safety labelling scheme (UKCA) that initially mirrors the EU regulations and references these UK specific regulations.

- The Electrical Equipment (Safety) Regulations 2016, SI 3260 (equivalent to 2014/35/EU)
- Supply of Machinery (Safety) (Amendment) Regulations 2011, SI 2157 (equivalent to 2006/42/EC)
- Pressure Equipment (Safety) Regulations 2016, SI 1105 (equivalent to 2014/68/EU)
- The Simple Pressure Vessels (Safety) (Amendment) Regulations 2016, SI 1092 (equivalent to 2014/29/EU)
- Electromagnetic Compatibility Regulations 2016, SI 3418 (equivalent to 2017/30/EU)
- Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001, SI 1701 (equivalent to 2000/14/EC)