

CTL DECISION SHEET (DSH)

Standard(s) (incl. year)	Subclause(s)	Tracking No.	Publication date
IEC 60335-2-34 :2012/AMD1:2015 /AMD2:2016 IEC 60335-2-34:2021	-	DSH 2181	2023.
Category			
HOUS			
Subject	Keywords	Developed by	
Evaluation of motor-compressors using a motor-compressor control system	- Motor-compressor - Motor-compressor control system	ETF 1	
Question			
<p>The standard covers motor-compressors including speed regulated (multi-speed or variable speed) motor-compressors using an electronic motor-compressor control system.</p> <p>In its introduction the standard specifies that the “requirements apply to motor-compressors with their associated starting, cooling capacity control and protection systems, tested separately under the most severe conditions of the refrigerating system operation which, within reasonable limits, could occur in the applications for which they are used”.</p> <p>Clause 6.103 contains an indication that protective electronic circuits can be provided in the end-product but there are no specifications or otherwise anything to indicate that for motor-compressors needing a motor-compressor control system to operate, the motor-compressor control system can be evaluated without that control system.</p> <p>Does IEC 60335-2-34 allow for testing and certification of motor-compressors specifically intended for use with an electronic motor-compressor control system, without including the motor-compressor control system as part of the evaluation and testing?</p>			
Decision			
<p>Motor compressor without integrated or associated electronic motor-compressor protection system and/or electronic motor-compressor control system can be tested and verified according to IEC 60335-2-34 except clauses 11 and 19. The motor-compressor and its intended motor-compressor protection system and/or motor-compressor control system shall be tested in the end-product standard for clause 11 and 19.</p>			
Explanatory notes			
<p>Many motor-compressors today are constructed as variable speed compressors using an electronic controller often referred to as an inverter. The electronic motor controller (motor-compressor control system) is typically attached directly on the outside of the compressor housing or is in a separate enclosure and connected to the compressor through an interconnection cord.</p> <p>While the intent of the standard in our opinion is clear and the electronic control system must be included as part of the testing and evaluation of the motor-compressor, there seem to be differing opinions between CBTL’s in this regard and therefore to ensure consistency in application, a decision is necessary.</p> <p>This especially becomes relevant as technology goes more and more towards using compressors with brushless DC (BLDC) motors/permanent magnet rotor motors. This type of motor requires the use of a specific motor control system that is designed to closely match the parameters of the motor. Compressors with this type of motor cannot operate unless they are connected to the specifically intended motor control system. Connection of the compressor to anything other than the specifically intended control system, including direct connection to the supply mains, may result in a hazard.</p>			

Evaluating the compressor while connected to the specific control system provides the means to determine compliance with the relevant requirements. The test results obtained and the parameters for certain tests within the standard are dependent on the motor control system. An example is the working voltage necessary for determining the clearances and creepage distances within the compressor and for the electric strength tests.

As such, an evaluation of the compressor without the corresponding motor-control system does not allow for the evaluation of all applicable requirements throughout the standard. In fact, compliance with only a minimal subset of applicable requirements can be evaluated, primarily limited to mechanical aspects such as evaluation of marking requirements, static pressure test and insulation material/oil/refrigerant compatibility tests.

Any such subset of requirements does not provide for a meaningful certification of the compressor and does not meet the intent of the standard requirements.