



**Fraunhofer**

**TESTED<sup>®</sup>  
DEVICE**

Atlas Copco IT AB  
Screwdriver QMC21-10-HM4  
**Report No. AT 1605-823**

DUPLICATE

Statement of  
Qualification

Particle Emission

# Statement of Qualification

**Customer** Atlas Copco Industrial Technique AB  
105 23 Stockholm  
Sweden

**Component tested**

Category: Working Place and Operator

Subcategory: Work Equipment

Product name: Fixtured electric motor unit QMC21-10-HM4  
(manufacturing date: 8/2/2016; color: black; serial number: Z8400002)

## Test result / Classification

When operated under the specified test conditions, the fixtured electric motor unit QMC21-10-HM4 is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Class according to ISO 14644-1:

Test parameter(s)	Air Cleanliness Class
Load = none Installation position = horizontal Speed = 500 rpm Rotation angle = 10000 ° Cycles per minute = 11	4
<b>Overall result</b>	<b>4</b>

## Random sampling of particle emissions (airborne) at representative sites

Standards/Guidelines: VDI 2083-9.1; ISO 14644-1  
The norms stated generally refer to the version valid at the time of the tests.

Test devices: Optical particle counter:  
LasAir II 110 and LasAir III 110 with measuring ranges  $\geq 0.1 \mu\text{m}$ ,  $\geq 0.2 \mu\text{m}$ ,  $\geq 0.3 \mu\text{m}$ ,  $\geq 0.5 \mu\text{m}$ ,  $\geq 1.0 \mu\text{m}$  and  $\geq 5.0 \mu\text{m}$

Test environment parameters:

- Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1
- Airflow velocity:.....0.45 m/s
- Airflow pattern:..... vertical laminar flow
- Temperature: .....22 °C  $\pm$  0.5 °C
- Relative humidity: ..... 45 %  $\pm$  5 %

Test procedure parameters:

- Load: .....none
- Installation position: ..... horizontal
- Speed: ..... 500 rpm
- Rotation angle: ..... 10000 °
- Cycles per minute:..... 11

The measuring devices used for the qualification tests are calibrated at regular intervals; their results can be traced back to national and international standards. In cases where no national standards exist, the test procedure implemented complies with the technical regulations and norms applicable at the time of the test. The relevant documentation can be viewed on request at any time.

For further information about the test environment and parameters, please refer to the Fraunhofer IPA test report.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA

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Stuttgart, July 11, 2016

Place, date of first document issued

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Place, current date

on behalf of   
Frank Bürger, Project Manager Fraunhofer IPA