



**Fraunhofer**

**TESTED<sup>®</sup>  
DEVICE**

Bosch Rexroth AG  
Lift Module F1000/H410/180°  
**Report No. BO 2304-1420**

DUPLICATE

Statement of  
Qualification

Single product  
Particle Emission

Customer	Bosch Rexroth AG Löwentorstrasse 74 70376 Stuttgart Germany
Component tested	
Category:	Automation Components
Subcategory:	Positioning Systems
Product name:	Lift Module F1000 LIFT 410MM 180° (3842 564 849) (manufacturing date: 1/2023; weight: 6.6 kg; part number: 3842 564 849; serial number: 4009601519 and 4009601525)

Random sampling of particle emissions (airborne) at representative sites

Standards/Guidelines:	ISO 14644-1, -14 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 $\geq 0.1\text{ }\mu\text{m}$ , $\geq 0.2\text{ }\mu\text{m}$ , $\geq 0.3\text{ }\mu\text{m}$ , $\geq 0.5\text{ }\mu\text{m}$ , $\geq 1.0\text{ }\mu\text{m}$ and $\geq 5.0\text{ }\mu\text{m}$
Test environment parameters:	<ul style="list-style-type: none"><li>Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1</li><li>Airflow velocity:.....0.45 m/s</li><li>Airflow pattern:..... vertical laminar flow</li><li>Temperature: .....22 °C <math>\pm</math> 0.5 °C</li><li>Relative humidity: ..... 45 % <math>\pm</math> 5 %</li></ul>
Test procedure parameters:	<ul style="list-style-type: none"><li>Control unit supplied by customer</li><li>Installation position: .....vertical (180°)</li><li>Cycle time: ..... <math>t_c = 15.0\text{ s}</math></li><li>Minutes per Cycle: ..... <math>n = 10\text{ min}</math></li><li>Break: ..... <math>t_b = 545\text{ s}</math></li><li>Test load: ..... <math>m = 180\text{ kg}</math></li><li>Velocity: ..... <math>v = 25\text{ mm/s}</math></li><li>Stroke: ..... <math>s = 410\text{ mm}</math></li><li>Low limit position: ..... <math>s_L = 31\text{ mm}</math></li><li>High limit position: ..... <math>s_H = 405\text{ mm}</math></li></ul>

Test result / Classification	When operated under the specified test conditions, the Lift Module F1000 LIFT 410MM 180° (3842 564 849) is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Class according to ISO 14644-1:
------------------------------	--

Test parameter(s)	Air Cleanlines Class
Installation position: vertical (180°) Cycle time: 15.0s Minutes per cycle: 10 min Break: 545s Test load: 180 kg Velocity: 25 mm/s Stroke: 410 mm	7
Overall result	

Please note: Transport damages, incorrect installation, oil leakage, aging behavior, corrosion etc. can influence the test result.

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.

Detailed information and parameters of the test environment can be found in the Fraunhofer IPA test report.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA	BO 2304-1420 Report No. first document	Stuttgart, June 23, 2023 Place, date of first document issued
Department of Ultraclean Technology and Micromanufacturing	-- Report No. current document	-- Place, current date
Nobelstrasse 12 70569 Stuttgart Germany	on behalf of Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA	