CleanControlling®

PARTICLE SUCTION EXTRACTION SYSTEM

C|PS²

C|PS² robotics

FOCUS ON PARTICLES

C|PS² – PARTICLE SUCTION EXTRACTION SYSTEM

This new, non-destructive, mobile test method with suction extraction enables the economical, faster and application-oriented particle extraction on large-area components or directly in the process environment.

The extraction procedure of the suction extraction is determined and qualified analogously to the qualification examination described in the VDA 19.1 / ISO 16232 by means of decay measurement and thus leads to reproducible and comparable results of the following microscopic analysis according to VDA 19.1. The dry extraction process with air also allows automated robotic suction extraction, e.g. for in-line testing, ensuring reproducible extraction processes (page 6-7).

Compared to the wet extraction (as described in VDA 19.1 / ISO 16232) this innovative extraction method opens up decisive advantages in various applications:

Application

Cleanliness tests using suction extraction

- of large-scale components with dry-adhering particles
- within the logistics, e.g. load carriers
- of non-wet extractable components or materials, e.g. electronic components, cable harness, styrodur containers, etc.
- in the production process, e.g. workpiece carriers in assembly plants, in the process environments, etc.
- for verification of cleaning processes (suction) within the production process
- to check component cleanliness within the manufacturing process between individual assembly steps

Your benefit

- Non-destructive testing due to extraction with dry air
- Reduced time and logistic efforts for large parts compared to wet extraction
- On-site inspections on the component or in the process environment by the mobile, self-sufficient system
- Avoidance of long process interruptions due to fast particle extraction
- Immediate microscopic evaluation directly after particle extraction on the analysis filter
- Full-surface inspection including holes, etc. in the process environment (compared to particle stamps)
- Exactly separate testing of separate control areas without any special additional effort (for example masking)
- Qualified, meaningful analysis results by microscopic evaluation according to VDA 19.1
- Application-oriented testing of components that do not come into contact with liquid media in their intended function or liquid media can remove non-relevant impurities from the component material and distort the result.
- Low operating costs due to elimination of liquid extraction media and media filtration

Function

The cleanliness test is carried out by suction of the dry adhering particles from large surfaces or from specific control areas on workpiece carriers or process environments. The particles are detached from the surface by means of a suction nozzle, brush nozzle or surface nozzle and are sucked off and selectively collected or separated. The system allows two methods of particle separation:

Suction extraction via cyclone unit

The aspirated particles are collected in a clean laboratory bottle via the cyclone unit. In addition, the filter unit ensures overload protection by means of a special analysis filter (> 5 µm) for protection against excessive particle load. For the subsequent analysis, the particles collected in the laboratory flask are transferred to analysis filters by secondary extraction (with aqueous medium) and then analyzed microscopically and gravimetrically.

The suction extraction via the cyclone unit is particularly suitable for large component surfaces with higher particle load. In comparison to wet extraction, this non-destructive particle extraction is very economical due to the elimination of liquid extraction media, the reduced logistics effort and the control areas that are easy to isolate

Suction extraction via filter unit

The particles are sucked off directly via the filter unit and separated out of the air stream by means of a special analysis filter (> 5 µm). The analysis filter can then be fed directly to the microscopic analysis. With the flushing unit, the filter assignment can be prepared for the microscopic analysis.

The suction extraction directly via the filter unit is suitable for small surfaces with low particle load, for example in the process environment on workpiece carriers or on circuit boards. Particle collection is fast, minimizing process interruptions.

Flushing unit

- The specially developed flushing unit enables the optimization of a homogeneous filter assignment. The manual flushing takes place after the suction extraction with the aid of an aqueous medium. The analysis filter can be fed directly to the microscopic analysis after drying.
- For the extraction of higher particle load, the flushing unit can possibly be also used as a filter cascade (e.g. 5 µm / 60 µm).

Operation by suction unit

- Easy adaptation and handling of the included suction unit to the particle suction extraction system.
- The system cases of the particle suction extraction system can be combined with the suction unit.
- The suction unit is operated ergonomically via a bluetooth remote control directly on the suction hose of the particle suction extraction system.

Airflow Monitoring

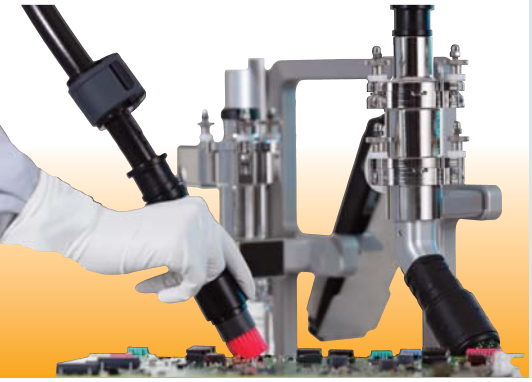
- Factory setting to the optimum airflow (operating point).
- Monitoring of the air flow is carried out during operation by means of differential pressure measurement after the filter unit compared to ambient pressure.
- The measurement is carried out by means of differential pressure measuring instrument Testo 526-1, with freely selectable measuring rate and recording of measurement data

Grounding equipment to avoid electrostatic effects

- Grounding is provided via a 2,4 m long earthing cable
- The earthing cable is attached to the device via a push

Hoses / suction, brush and surface nozzles

- Suction hose in different lengths
- Plug-in sleeves at the hose ends for easy joining with cyclone and filter unit and the handpiece with suction nozzle
- Suction nozzles can be adapted individually to specific requirements of the component (on request)



Case System

- The particle suction extraction system, the suction hoses and the connection hose can be safely stowed in the transport case.
- All system cases can be combined with the suction unit.
- The particle suction extraction system can be adapted to the system cases at a suitable working height.
- The analysis and extraction equipment, as well as the measuring and cleaning equipment are arranged in a system case with separate and compartmented drawers.

The consumables for analysis and cleaning can be ordered quickly and easily via the CleanControlling-eShop at **shop.cleancontrolling.com**.

C|PS² ESD

Non-destructive cleanliness inspections of electronic components and battery systems

The particle extraction system C|PS² is particularly suitable for particle extraction for cleanliness testing of electronic components and battery systems that do not come into contact with liquid media even in their final use. Here, suction extraction by means of air is much more suitable than liquid extraction media, since components or coatings on printed circuit boards may not be resistant to liquids. In addition, individual control areas can be sampled in a targeted manner without the need for costly pre-cleaning or masking of excluded areas.

This is also a fundamental prerequisite for non-destructive testing.

Why ESD protection?

If high-quality and expensive electronic components and battery systems are to be returned to the production batch after testing, ESD protection is indispensable in this case. Tests directly on the production line in ESD areas also require the test system to be fully ESD-capable.

C|PS² - ESD - The ideal solution for cleanliness tests of electronic components and battery systems - also in ESD areas - in the field of e-mobility!

ESD-compatible according to IEC 61340-5-1

The appropriate use of ESD compatible materials and constructive design ensures optimum discharge and thus prevents electrostatic discharges during suction extraction on the component. The complete system is ESD-capable according to IEC 61340-5-1 and has ESD-capable surfaces and protection for all function-contacting components including grounding via the power connection.

ESD Trolley

The C|PS² suction extraction system equipped with ESD-capable materials is mounted on an ESD trolley in a discharge-capable manner. The suction unit is housed inside the ESD trolley and is therefore ESD protected.

ZERTIFIKAT

ESD-Konformität

IEC 61340-5-1:2016

KEINATH Electronic

MASCHINEN- ANLAGENÜBERPRÜFUNG

CleanControlling GmbH

Objekt

Partikelabsaugmobilsystem CPS² ESD

CPS² ESD: Seriennummer 38, ESD-Wagen: Seriennummer 6

Standort

78576 Emmingen-Liptingen, Gehrenstraße 11a

Hiermit wird bescheinigt, dass o.g. Anlage die Anforderungen für den Einsatz in einem ESD-relevanten Bereich erfüllt. Der Nachweis wurde im Rahmen einer Anlagenüberprüfung vom 09.09.2020 erbracht.

Datum der Zertifizierung: 09.09.2020

Zertifikat-Registrier-Nr.: KCS/203701

KEINATH Electronic

Direct access to analysis equipment

The extraction and analysis equipment is directly accessible in special drawers below the work surface and the extraction unit. Precisely fitting drawer inserts ensure cleanliness and tidiness in the drawers.

Robot-assisted suction extraction for reproducible cleanliness tests

C|PS² robotics

The novel, robot-guided suction extraction system **C|PS²robotics** enables absolutely reproducible and economical particle extraction for component cleanliness inspections. The extraction process of the particle extraction system C|PS² provides the ideal basis for the collection of particles from the components to be tested, e.g. also directly in the process environment for in-line tests.

Due to the modular and mobile design and with targeted extension options, component sizes or control areas up to 800 x 300 x 300 mm (L x W x H) and in the largest version up to 2,000 x 800 x 300 mm (L x W x H) can be tested.

Instead of complex and complicated robot programming with a high demand for training and familiarization, teaching of the extraction movements with the suction extraction system is astonishingly easy and distinguishes the system from standard robots. The compact system allows teaching of the extraction movements even on complex 3D geometries within seconds. The suction nozzle is guided by hand along the component surface to be extracted and the movements are taught in within a very short time.

The collaborative design allows the operation of the system next to the employee. The cleanroom-compatible design allows use in cleanrooms of class 5 and the ESD-compliant design allows use in sensitive electrostatically protected areas.

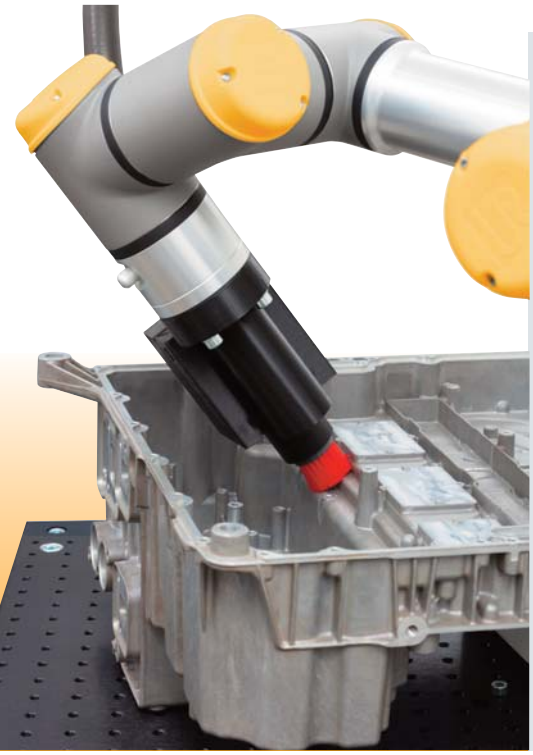
C|PS²robotics - The ideal solution for in-line testing of electronic components and large components, e.g. from the area of battery technology in the field of e-mobility!

Engineered by

ING worx

Function

The particle extraction is carried out according to the suction principle of the particle suction extraction system C|PS² and allows particle separation via the cyclone unit into the laboratory flask or via the filter unit directly onto the analysis filter. The collaborative robot performs the reproducible extraction movements of the suction nozzle along the component surface to be tested with high reproducibility.



Product description

- Mobile and flexible robot-assisted suction extraction system for collaborative and coexistent applications according to EN ISO 13849-1, Cat.3, PL d, and EN ISO 10218-1
- Complete integration of the suction extraction system C|PS²
- Programming by simple, one-time manual teaching of the extraction movement
- Extractable component sizes:
    - 450 x 450 mm (without optional extension surface)
    - 800 x 300 mm (with optional extension surface)
    - Further sizes up to 2,000 x 800 mm on demand
- Testing of three-dimensional surfaces by 6 degrees of freedom
- Repeat accuracy of the movement: < 0,03 mm
- Maximum movement speed: 1 m/sec.
- ISO cleanroom classification: 5 (acc. ISO 14644)
- CE mark

Your benefit

- Simple programming of the movements by recording the manually guided movement of the suction nozzle
- Reproducible motion sequences regarding extraction path and movement speed
- Very high repeatability of the extraction process
- Higher productivity through automated process

Advantages of collaborative robotics

- Very easy to program by the operator without prior knowledge
- No separating protective housing required
- Small space requirement for collaborative applications
- Multiple locations possible through mobile and flexible systems
- Easy adaptation to new requirements
- Short amortization times, even with high variety of parts

Please request further information material at info@cleancontrolling.com.

Please find further information as well as the entire product range with article numbers and prices in the CleanControlling-eShop at **shop.cleancontrolling.com**

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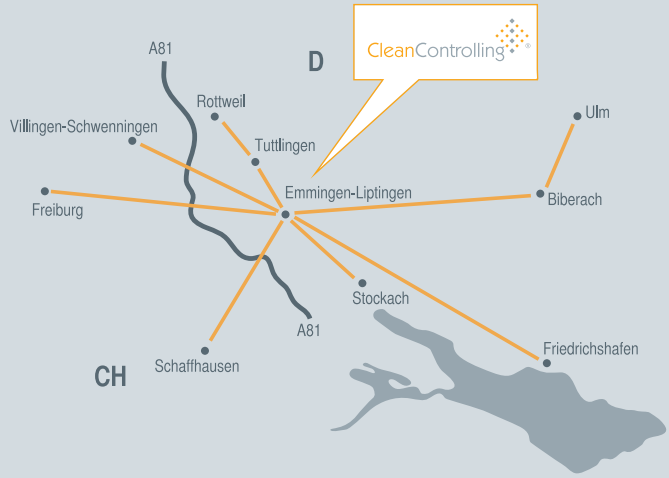

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Oktober 2020