

## APPLICATION

### Extraction and filtration in clean and cleanliness rooms

CR systems are used wherever increasing requirements placed on products and quality have promoted the relocation of production into clean room cabins (ISO 14644) or cleanliness rooms (VDA 19 or ISO 16232). Thanks to the structure of these systems and the special contamination-free filter replacement as well as thanks to the qualification possibilities, they are suitable for applications complying with up to ISO class 5 (DIN EN ISO 14644-1).

Their compact size allows the systems to be integrated into the respective areas of application without attracting the attention, without any problems and in an either mobile or stationary manner. They ensure optimum functionality and safety in highly sensitive production processes.

#### AREAS OF APPLICATION:

- Pharmaceutical production
- Food/packaging industries
- Laser processing
- Decanting / processing
- Semiconductor industry
- Production of medical devices

#### THE SYSTEM INCLUDES NUMEROUS FEATURES:

- Tested according to DIN EN 14644-1 / EG-GMP guideline and approved by CGI for use up to ISO class 5
- Option of process verification for the entire system after filter replacement
- Made of clean room-compatible, low-contamination materials
- Contamination-free filter replacement is optionally available
- Powerful electronics



*Similar to image*

## FUNCTIONAL PRINCIPLE

The contaminated air is collected by the collection unit (hood, hose) and is transported into the filter unit by a pipe, a flexible hose or a suction arm. In the filter unit, the contaminant particles are filtered in different filter systems according to their filter classes. Filter units that are equipped with a molecular sieve (for example activated carbon filters) also remove the majority of gaseous contaminants. The cleaned air is then circulated back into the workspace or, depending on the application, diverted outdoors through an exhaust duct.

## PRODUCT FEATURES

### THE CR SERIES: TESTED ACCORDING TO DIN EN ISO 14644-1

Compliance with the DIN EN ISO 14644-1 standard for clean rooms and clean room areas was confirmed by CCI (Contamination Control Instruments) in Stuttgart. Consequently, the CR series is specified for the following clean-room classes: ISO classes 5 - 9.

### VERIFYING THE SYSTEM IN THE PRODUCTION AREA

In the CR series, the filter cartridge is placed on a seal-seat testing frame. This allows the interface between the filter cartridge and the basic housing to be tested for leaks – overpressure test (Fig. 1).



Fig. 1

### MODULAR DESIGN FOR SIMPLE, CONTAMINATION-FREE FILTER REPLACEMENT

The filter systems of the CR Series can be equipped with different filter cartridges depending on the application. The filter cartridge already contains both the suction pipe and extendible protective tubing (Fig. 2). If the suction pipe is disconnected, the protective tubing can be extended somewhat, covering the point of disconnection (Fig. 3). This means that the protective tubing can be joined or welded over the open air inlet so that the filter cartridge's air inlet is still shielded from dust in the environment (Fig. 4). The filter is removed by sealing the protective plastic film in advance to prevent contamination.



Fig. 2



Fig. 3

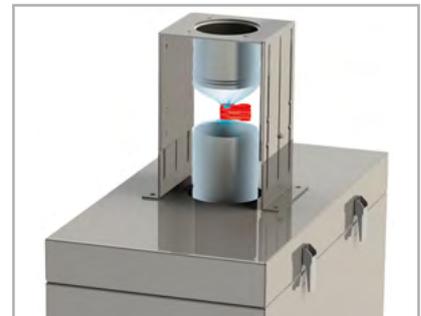


Fig. 4

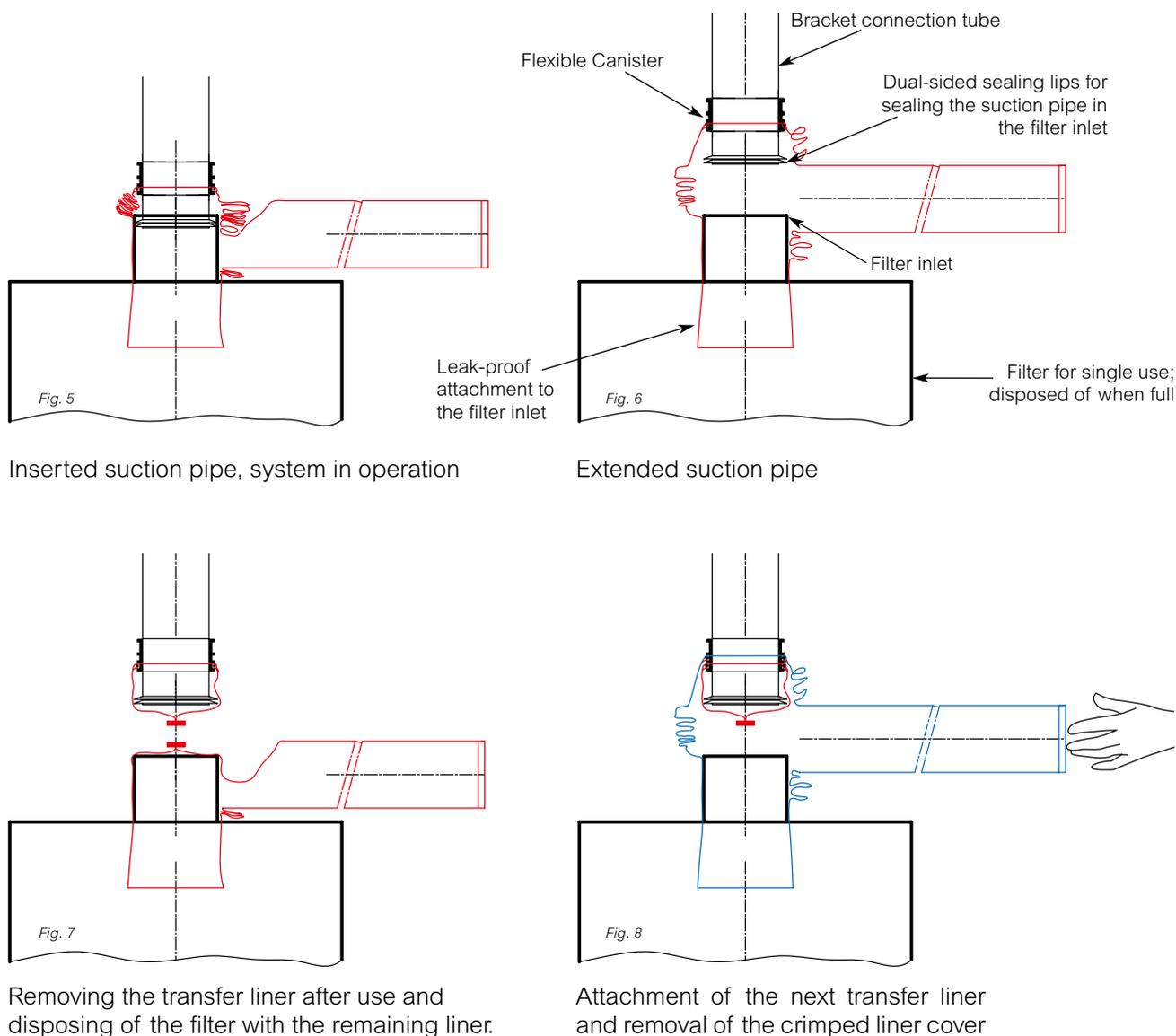
The contamination-free filter replacement does not only prevent the contamination of clean rooms with particles. It also ensures the maintenance personnel do not come into contact with extracted substances posing a hazard to health.

## SAFECHANGE TUBULAR FILM

For increased safety requirements during filter replacements. This option must be ordered with the filter of your choice.

### TECHNICAL DESCRIPTION

Flexible Canister silicone ring configured for the exact dimensions required by TBH. The canister adapter is a silicone ring that is fitted onto the suction arm's connection pipe before the sealing lips are mounted during production by TBH. Each of the filter cartridges is equipped with its own liner. When the system is assembled, the cartridges are closely connected to the grooves of the silicone canister.



### MADE OF CLEAN ROOM-COMPATIBLE, LOW-CONTAMINATION MATERIALS

Clean rooms are now defined based on clean room classes. The individual classes specify the maximum concentration of air-borne particles, or germs or CFUs (colony-forming units), permitted in a clean room. The classes can now be checked using a standardised measuring technique. This means that the air quality is a constant that documents the affect of measures to ensure that a certain air quality is achieved in production facilities.

ROOM CLASSIFICATION	DIN EN ISO 14644-1						EG-GMP		REVOKED / OLD STANDARD	
	Cn = max count of particles per cubic meter and particle diameter						Room classification	colony forming units KBE/m <sup>2</sup>	US FEDERAL STANDARD 209E	
	0.1 μm/m <sup>3</sup>	0.2 μm/m <sup>3</sup>	0.3 μm/m <sup>3</sup>	0.5 μm/m <sup>3</sup>	1.0 μm/m <sup>3</sup>	5.0 μm/m <sup>3</sup>			English Unit ft <sup>3</sup>	Metric SI Unit m <sup>3</sup>
ISO 1	10	2								
ISO 2	100	24	10	4						
ISO 3	1000	237	102	35	8			1	M 1.5	
ISO 4	10000	2370	1020	352	83			10	M 2.5	
ISO 5	100000	23700	10200	3520	832	29	A / B	< 1	100	M 3.5
ISO 6	1000000	237000	102000	35200	8320	293	(B)	10	1000	M 4.5
ISO 7				352000	83200	2930	C	100	10000	M 5.5
ISO 8				3520000	832000	29300	(C) / D / E / F	200	100000	M 6.5
ISO 9				35200000	8320000	293000	with employees			

### ADSORPTION OF GASEOUS SUBSTANCES

Two complimentary filter materials are used for the adsorption of gaseous substances. The activated carbon facilitates the physical adsorption process while the BAC granules facilitate a chemical adsorption process. Neutralisation of specific gaseous substances is achieved through chemical binding with the reaction substance that is deposited on the carrier material. Because the physical and chemical adsorption processes are complementary, an extremely wide range of gases and odours can be collected.

Activated carbon



BAC granules



Activated carbon/BAC



### DOUBLED SAFETY THANKS TO POLICE FILTERS

As standard, CR-GL265 is equipped with a police filter at the system blow-out area. This additional filter installed downstream of the normal filter pack ensures doubled safety and protection against harmful particles as well as the contamination of clean rooms in case of a leaking main filter.

## POWERFUL CONTROL ELECTRONICS

The CR-GL 265 is equipped with **INSPIRE** control electronics and a comprehensive interface. This allows controlling and monitoring the following functions:

- Switching between run/standby
- Manual adjustment of the rotation speed
- Filter-saturation indicator of the extraction system
- Visual and acoustic display of the filter saturation
- Fault display and notification

### INTERFACE:

- System start/stop
- Warning at a filter saturation of 75%
- Visual and acoustic display of the filter saturation
- Collective fault output (rotation speed, temperature, filter full 100%)
- External adjustment of the rotation speed
- Error memory improves the coordination between the customer and the TBH service
- Parameterization access for the activation of custom functions



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### OPERATING ELEMENTS:

- A) Switching between run/standby
  - B) Manual adjustment of the rotation speed
- 1) Filter-saturation indicator
  - 2) System status indicator
  - 3) Performance-setting indicator/ operating-hours meter
  - 4) Temperature and turbine-malfunction indicator
  - 5) Filter status indicator

