CLAIRE PRO - SAFETY CABINET

Experience infinite variety

berner

PERFECT SYMBIOSIS
PROTECTION & DESIGN

FOR YOUR SAFETY
WE DO RESEARCH

“Made in Germany“ stands for over 60 years of quality, reliability and innovative technology worldwide. The development and production of safety cabinets in Germany is our core competence for over three decades.

We are setting new standards with an entirely new and groundbreaking generation of safety cabinets. The combination of well-established standard technology together with innovative solutions based on research – this is what distinguishes the new generation. Protection at the highest level, intuitive operation, low energy consumption and a detection system for air flow disruption are making these safety cabinets even more efficient and safer.

The Shield Design imparts protection, simplifies useage, facilitates the operation, and is an indicator of technological progress.

Awarded with the renowned quality seal for high design quality: The reddot and German Design Award!

Dipl.-Ing. Thomas Hinrichs
Managing Partner

MADE IN GERMANY
QUALITY, RELIABILITY & INNOVATIVE TECHNOLOGY FOR THREE DECADES

The prime goal during the development of the new generation was to make working at safety cabinets easier and more intuitive- while raising safety at the same time. In development projects, our engineers and designers have collected and tested many ideas for several years, as well as implementing results from our research. Form and function entered a perfect symbiosis as the new “Shield Design“. The combination of proven and new technologies, plus the production and quality “Made in Germany“ have made these safety cabinets to be something very special - a premium product.

Research
In cooperation with research institutes we develop new solutions.

Development
Our engineers, technicians and experts implement solutions from research in our manufacturing facility.

Production
Virtually all parts and components come from regional suppliers in Germany.

Design
In close cooperation with a German agency for industrial design.

RESEARCH
SOLUTIONS FOR THE FUTURE

Research always forms the basis for innovation. For this reason, since 2002, Berner International has has a private research laboratory at its site in Germany. In numerous research projects, the teams of Berner International develop new solutions and improved products for working safely in the laboratory, including projects funded by the Federal Ministry for Economics and Technology.

Well-established microbiological test methods, derived from DIN EN 12469, DIN 12980 or NSF 49 are applied for testing the safety functions. The examination of special constructions is also possible using these methods.

Several examples of accomplished research projects include:

- → Movements as interference factors in the laboratory
- → Safe cytostatic preparations in an isolator
- → Optimisation of airflow in particle filters
- → Realistic testing methods of safety cabinets
- → Contamination of safety cabinet filters with cytostatics
- → Performance capacity of safety cabinets in correlation with airflow

Supported by:

Federal Ministry
of Economics
and Technology

on the basis of a decision
by the German Bundestag

CLAIRE PRO
NONE CAN DO MORE

Touch Display
Intuitive operation and user-friendly menu navigation.

Innovative LED light technology
Apart from the LED lighting of the working space, laterally arranged LED light bands and the illuminated window edge in the view of the user visualise the operating state or alarms and guarantee the highest security.

Custom-made
Using our own research, development and construction, we can implement individual customised requirements. For selected examples please see pages 26-27.

Protection Shield
The multiple award-winning "Shield Design" testifies high quality design, which combines by way of example innovation with form and function.

Movement-Measurement-System
Detection system for the movements of persons and resulting air perturbation near the work opening creates clear warnings and raises awareness of the laboratory personnel.

Quality seal
Multiple award-winning product design in the selection criteria - degree of innovation, safety, sustainability, aesthetics, industrial feasibility and implementation.

Ergonomics
Particularly quiet, bright operating conditions, individually adjustable work surface height and optimum legroom even for 3-filter cabinets due to the particularly compact design of the first main filter.

Filter technology
New HEPA cartridge filters for even lower sound levels and energy consumption.

GreenTec
Innovative technology & Auto On-Off function reduces the operating costs by up to 84%.

GOOD, BETTER, CLAIRE PRO
NEW STANDARDS FOR SAFETY AND DESIGN

The Claire pro sets completely new standards for safety cabinets by the sum of the presented components and features in terms of performance, function and design.

The combination of the broadest spectrum of options up to customer-specific unique designs opens up limitless possibilities for individual applications and highest safety levels, achieved by no other product on the market.

MORE PROGRESSIVE

34 **YEARS**
experience in the development and production of safety cabinets

MORE INTELLIGENT

128 **SENSORS**
in the safety cabinet detect movements of people

MORE INNOVATIVE

4 **AWARDS**
awards for excellent and ground-breaking product design

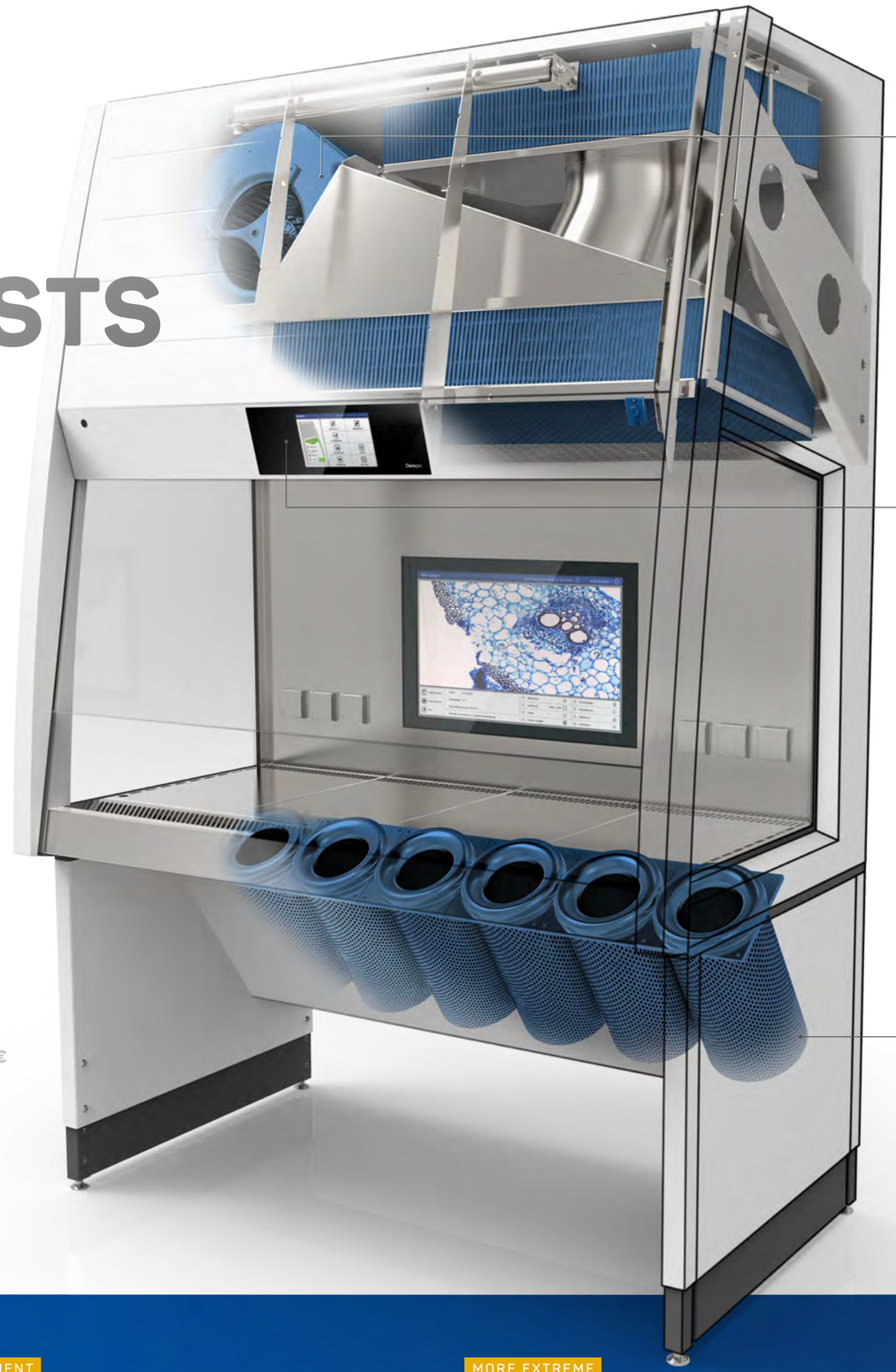
MORE SUSTAINABLE

84 **PERCENT**
eduction in energy costs and greenhouse gas emission of CO_2 possible

GREENTEC
84% LOWER OPERATING COSTS

INNOVATIVE TECHNOLOGY
INNER VALUES MATTER

During the development of the new generation, emphasis was placed value on top quality components, low operating costs and an environmentally friendly feature - GreenTec. This is an especially interesting aspect when considering an expected economic life expectancy of about 15 years and steadily rising electricity costs of around 5 % in the past 10 years [1]. The investment for the new generation of energy efficient safety cabinets breaks even much earlier thanks to lower operating costs.



Fluid mechanics
Air distribution, cross-sections and filters have been optimised resulting in the lowest possible flow resistance in order to achieve a more efficient air-flow. This reduces the load on the fans which saves valuable energy.

Top quality components
Premium quality components like EC-fans, LED lighting technology and a LED touch display reduce the active energy consumption enormously.

Eco Mode
Intelligent control and monitoring technology reduces all consumers with one touch to a minimum.

Auto-On-Off Function
A needs-tailoured and patented control of energy consumption through an automated On and Off switch. If no one is located within the detection range of the presence sensor system in front of the safety cabinet, the front window closes automatically after the "Safety-Clean Cycle ". All consumers are switched off to save valuable energy. If a person re-enters the detection range the original operating state is reactivated. The operation costs are considerably reduced.

New HEPA cartridge filters
Improved operating characteristics significantly reduce energy consumption and sound level thanks to new suction nozzle and air distribution. Resulting longer service life of filters saves additional costs.

1) Federal Statistical Office, http://www.destatis.de; Preise-Daten zur Energiepreisentwicklung; Wiesbaden; 03.2016
2) Working price (gross): 0.2256 €/kWh; Source: www.eon.de, tariff for businesses based on Elmshorn, Germany; 04.2016

SAFE INVESTMENT

INVESTMENT SAFETY
Already meets requirements of the new DIN 12980:2016

MORE EFFICIENT

REAL 0.45 M/S
Operating modes for GMP applications

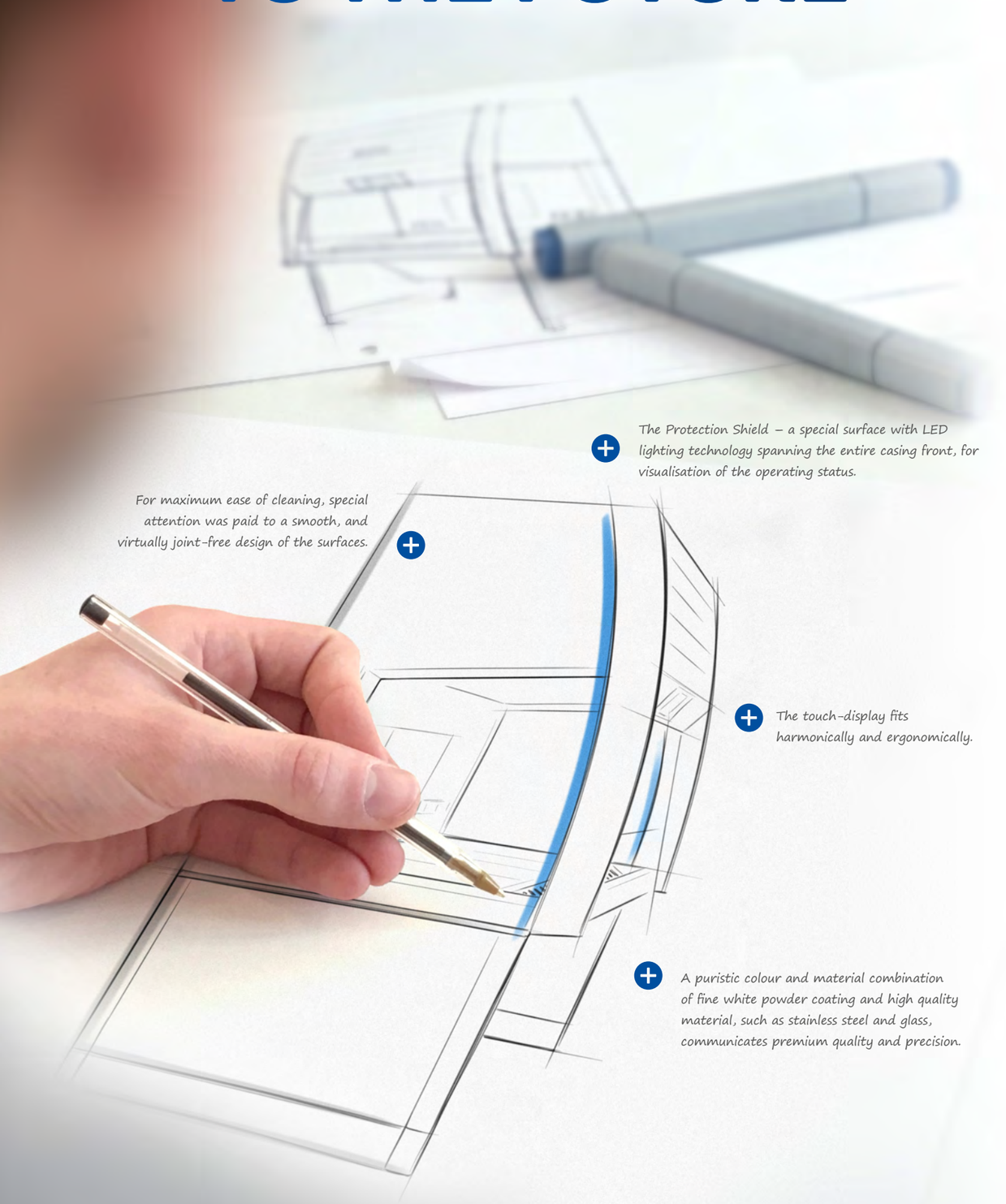
MORE EXTREME

BERNER IN HIGH SECURITY LABORATORY
SCs in S4 laboratory of the Bernhard-Nocht-Institute in Hamburg and Friedrich-Löffler-Institute Riems

ENVIRONMENTALLY FRIENDLY

84% LESS CO_2
Reduces the CO_2 pollution by up to 84% and positively contributes to climate protection

LEADING THE WAY TO THE FUTURE



The Protection Shield – a special surface with LED lighting technology spanning the entire casing front, for visualisation of the operating status.

For maximum ease of cleaning, special attention was paid to a smooth, and virtually joint-free design of the surfaces.

The touch-display fits harmonically and ergonomically.

A puristic colour and material combination of fine white powder coating and high quality material, such as stainless steel and glass, communicates premium quality and precision.

SHIELD DESIGN
VISUALISATION OF TECHNOLOGICAL PROGRESS

The design is convincing with a clear-cut and slender appearance. The side profile forms an attractive surface continuing across the whole of the front casing – the Protection-Shield. Just above the front window is a touch display which is positioned to fit in harmonically as well as ergonomically. Both of the side verticals visually encompass the workspace, which has been designed with maximum safety in mind, and above all fulfill a crucial functional aspect. The recessed light band, highly visible from afar, informs through its colour coding about the current operating state and gives the user a clear and highly visible warning signal of potential dangers. This effect is reinforced by the intelligent illumination of the front window lower edge, which encloses the completely glazed and optimally visible workspace made from high grade stainless steel.

Award ceremony of the Ecodesign prize with the German Federal Environment Minister Dr. Barbara Hendricks in the German Federal Ministry in Berlin.

German Design Award
Winner 2015

The German Design Award awards innovative products and projects, producers and designers that truly represent pioneering contributions to the German and international design landscape. The safety cabinet combines attractive aesthetics, safety and functionality.

RedDot Design Award
Winner 2013

Characterised by the vaulted housing front, the named Protection-Shield, and the adapted touchscreen, Claire combines an in it self-contained design with innovative lighting technology.

Bundespreis ecodesign
Nominated 2014

By eliminating plastic, the automatic switching mode on saving mode when not in use and a reduction of the electricity usage of 500W on 85W and the reduction of the sound level minimise pollution.

Fraunhofer Clean!
Winner 2014

Claire convinced the jury in the selection criteria innovation leap, sustainability, enabler technology for application fields/ technologies and the industrial feasibility / implementation.

TOUCH DISPLAY
INTUITIVE USE AND EASY TO USE MENU NAVIGATION

The touch display is the central interface and control unit for the user. The touch display of the new generation is intuitive in its operation with a self-explanatory menu. Premium quality pictograms and a puristic design speak a clear language. The superior TFT-display with LED background lighting is arranged in a central position and within easy reach. The display can be easily read from a sitting as well as a standing position. All safety-related parameters such as airflow velocities and front screen position are displayed as large graphical images. Errors are shown clearly, and potential corrective actions are suggested.

The distinguishing feature of the touch display of the new generation of safety cabinets is the intuitive operation and extremely user-friendly menu navigation- it's easy!

INTUITIVE OPERATION

Individual
Own PIN code protected user profiles (language, connection/ disconnection of certain equipment, etc.) and display surfaces can be created.

Flexible
Four function keys can be individually assigned to different functions- specific to your needs.

State of the Art
High quality TFT display with dimmable LED backlight and excellent visibility from all directions.

Clearly arranged
Generous graphics display of temperature, humidity, flow velocities, etc. Implementation and display of data from external devices, for example particle counter or sensors are possible.

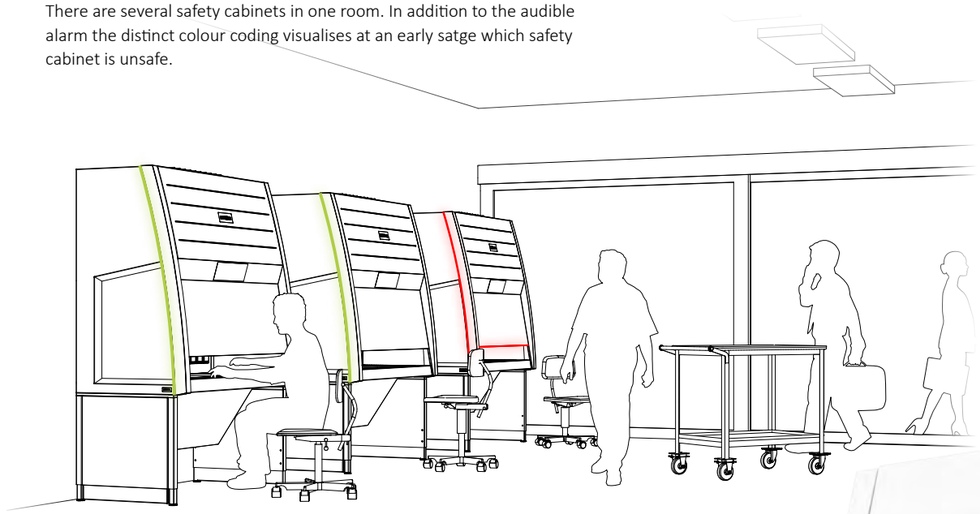
Precise
Display of current operating mode, normal, cleaning, energy saving or night mode.

Safe
Display of alarm with specific error diagnosis and suggested solutions.

Intuitive
Simple and self-explanatory menu navigation in puristic design make the operation simple.

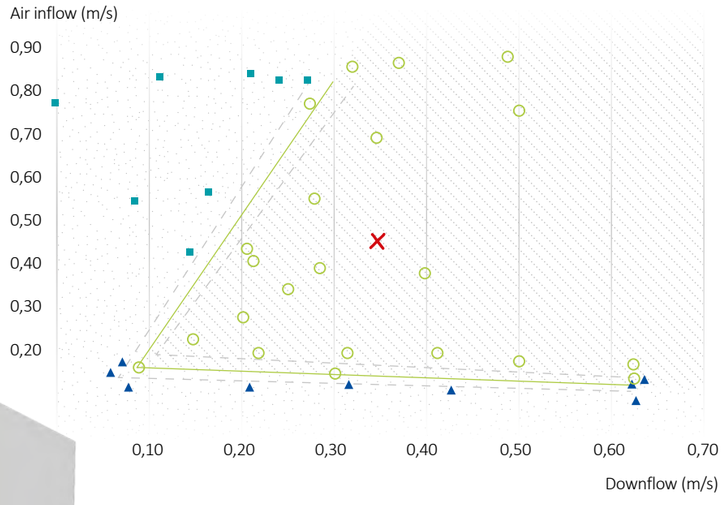
Informative
Comprehensive quick guide in pictorial form facilitate instructions considerably.

SOLUTIONS FROM RESEARCH
There are several safety cabinets in one room. In addition to the audible alarm the distinct colour coding visualises at an early satge which safety cabinet is unsafe.



PERFORMANCE-ENVELOPE-TESTING
Airflows were changed to verify the personal and product protection in accordance to DIN EN 12469, DIN 12980, NSF 49 at a total of 42 setpoints.
Result: An outstanding performance and great flexibility in airflows.

- ✕ Setpoint
- ○ Personal- and product protection
- □ Optimum personal and product protection
- ▲ No personal protection
- ■ No product protection
- □ No personal and/or product protection



CLEAR-WARNING -SYSTEM

SAFE STATE

SAFETY
PROVEN TECHNOLOGIES COMBINED WITH SOLUTIONS FROM RESEARCH

The LED light bands set into the side panels of the new generation safety cabinets and the illuminated glass edge provide information about the current operating state using colour coding. You will be warned at a much earlier stage and more clearly about an unsafe operating state, as compared to standard monitoring systems.

As early as 2002, we were the first European manufacturer to use the microbiological test method in accordance with DIN 12980, EN 12469 and NSF 49 for the verification of the protection functions. On the basis of this method, most frequently used worldwide, we test and optimise the protection potential of our safety cabinets.

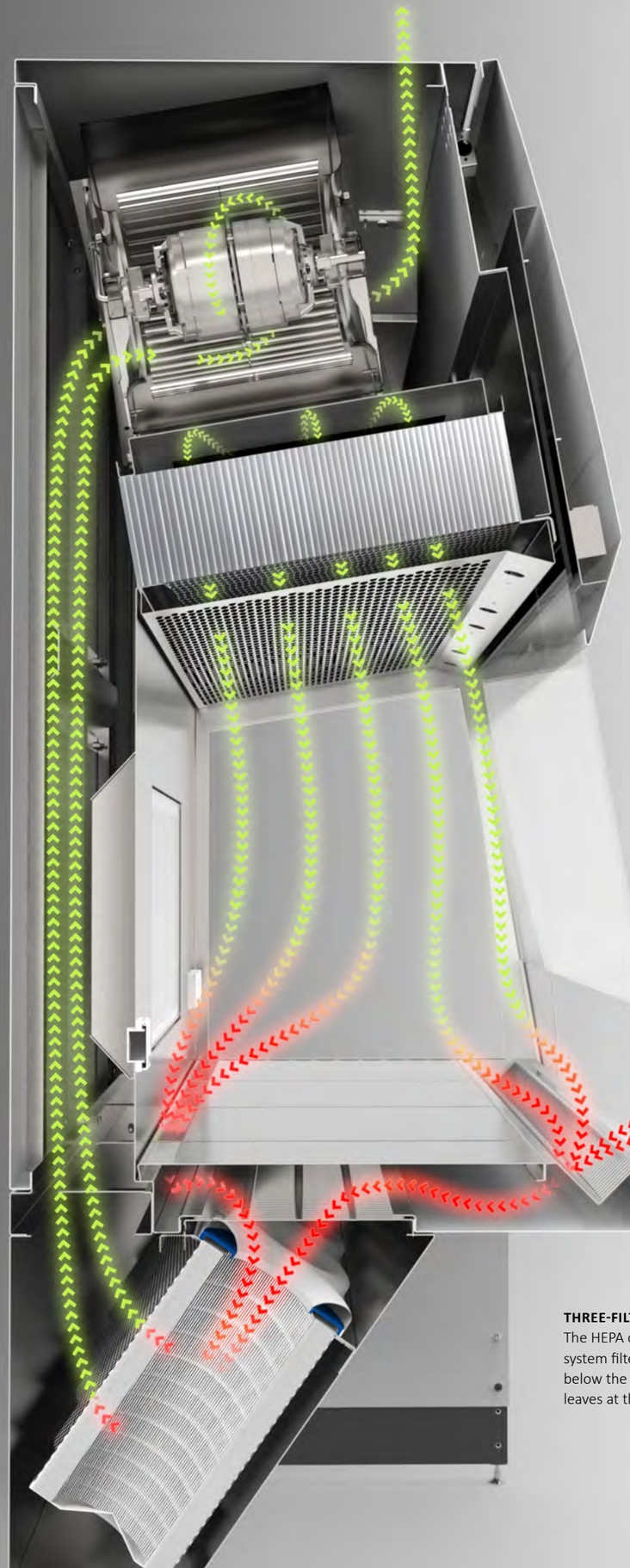
The personal, product and cross-contamination protection of a safety cabinet has the highest priority.

Highly efficient air flows are next to the filtration properties of crucial importance in relation to the protection potential of a safety cabinet. The „Performance Envelope Test (PET)“ in our own research laboratory has shown, that Claire owing to its innovative design demonstrates a high bandwidth in the performance of the protection functions. This unique property allows for a great flexibility in the choice of set points while guaranteeing maximum protection. That is why tested operations points can be achieved with real 0.45 m/s in accordance with GMP or low flow conditions for other applications. [1) 2)]

1) Christiansen, S.; Gragert, S.; Hinrichs, T.; Karpinska, R.; Leistungsgrenzen von Sicherheitswerkbänken; Onkologische Pharmazie; 12. Jahrgang; 01.2010

2) Christiansen, S.; Gragert, S.; Hinrichs, T.; Karpinska, R.; Performance Envelope Testing – or where are the performance limits of safety cabinets; labor & more; 02.2009

OPTIMAL AIRFLOW



THREE-FILTER-SYSTEM
The HEPA cartridge filter contained in a 3-filter system filter contaminated air (red) directly below the work surface. Filtered air (green) leaves at the clean air side.

FILTER TECHNOLOGY
NEW HEPA-CARTRIDGE FILTERS FOR EVEN LOWER SOUND LEVELS AND ENERGY CONSUMPTION

Filters are the most safety relevant components in safety cabinets. They make up the most important barrier for people, the environment and the product.

As part of a research project we were able to fluid mechanically optimize the HEPA-cartridge filters used in the 3-filter systems. Thanks to a newly designed intake port and air ducts the operating properties have been improved. Noise level and energy consumption have been reduced. The filter life has been optimised.

Proven properties have remained the same:

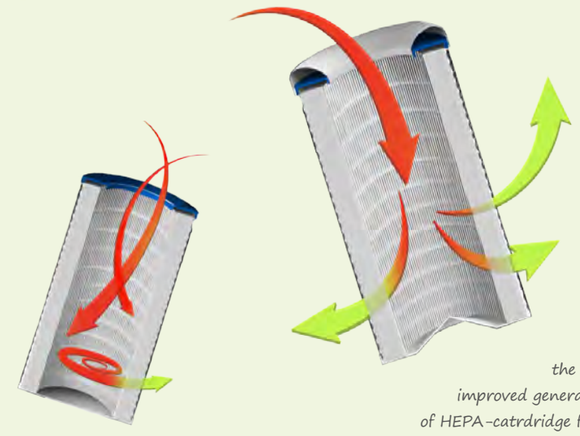
- → Small size and compact design
- → Maximum legroom in 3-filter-systems
- → 50% reduced changing and test expenditure compared to traditional filter systems
- → Possibility of a low contamination filter change in accordance to DIN 12980:2016
- → Fit into many standard waste disposal containers or autoclaves

RESEARCH

Solutions for the future

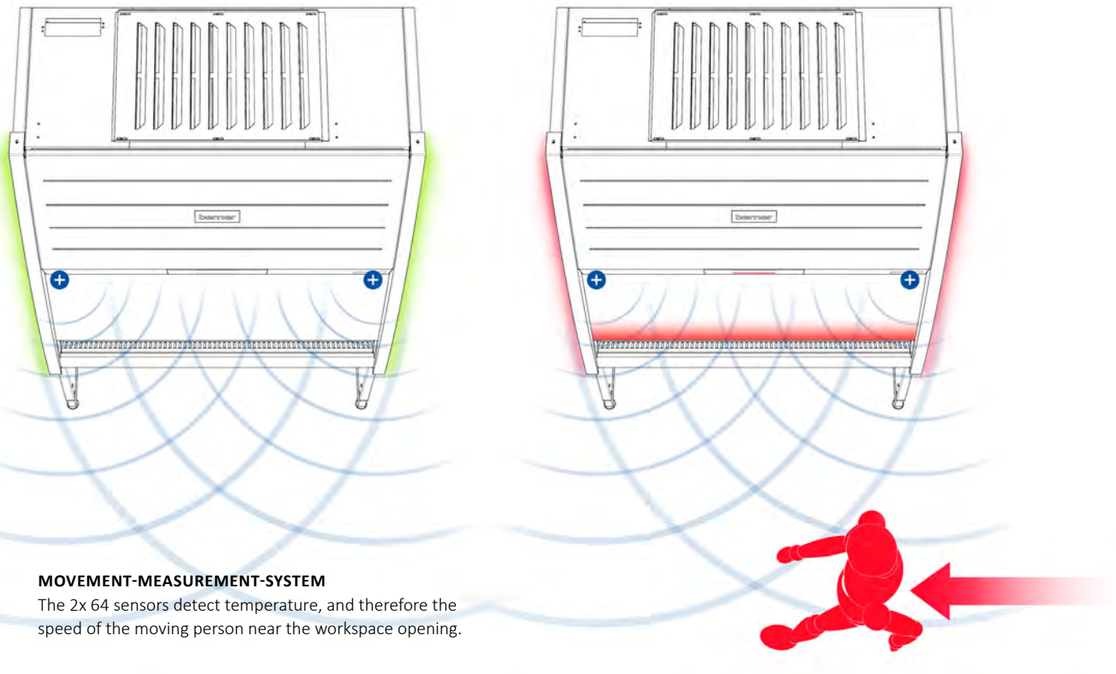
SMALL DETAIL – GREAT EFFECT

Thanks to the newly designed intake port and optimized air channels the flow resistance has been reduced. The air flows more evenly through the HEPA cartridge filter.



the previous generation of HEPA-cartridge filter

the new improved generation of HEPA-catrdridge filter



MOVEMENT-MEASUREMENT-SYSTEM
The 2x 64 sensors detect temperature, and therefore the speed of the moving person near the workspace opening.

RAISING AWARENESS

DETECTION SYSTEM
CLEAR WARNING SIGNALS FOR MORE SAFETY

The patent-pending detection system "Movement- Measurement-System" registers movements of people and the resulting disrupted airflow near the work opening and creates a clear warning signal in the display, the lower pane edge and on the lateral LED strip light.

The monitoring system warns you in time for potential dangers and raises the awareness of the laboratory personnel.

ALARM NOTICE IN DISPLAY
Clear warning notice with red header and pictogram and proposed solution. "Info"-Icon for additonal information on the situation.

RESEARCH

Solutions for the future

MOVEMENTS OF PEOPLE CLOSE TO THE FRONT WORKING APERTURE

Supported by:
Federal Ministry of Economics and Technology
on the basis of a decision by the German Bundestag

Current research findings have shown that the movements of a person close to the front working aperture can have a considerable impact on the protection functions. [3) 4)]

The graphic below shows the test status “Dynamic interference and the effect on the protective function of safety cabinets” in the Berner Safety research and development laboratory.

Moving board simulates a passing person and causes air turbulence

Microbiological testing of personal protection according to DIN 12980, DIN EN 12469, NSF 49.

3) Gragert, S.; Harder, M.; Hinrichs, T.; Kamdem Medom, B.; Dynamische Störungen und deren Einfluss auf die Schutzfunktion von Sicherheitswerkbänken; Onkologische Pharmazie; 15. Jahrgang; 01.2013

4) Hinrichs, T., Gragert, S.; Klein, M.; Biological Safety Cabinets: Simulation and Quantifying of Airflow Perturbation Caused by Personnel Activities; Applied Biosafety; March 17, 2016

THE HUMAN IN FOCUS

The touch display can be seen clearly and is easily reached in the sitting as well as the standing position

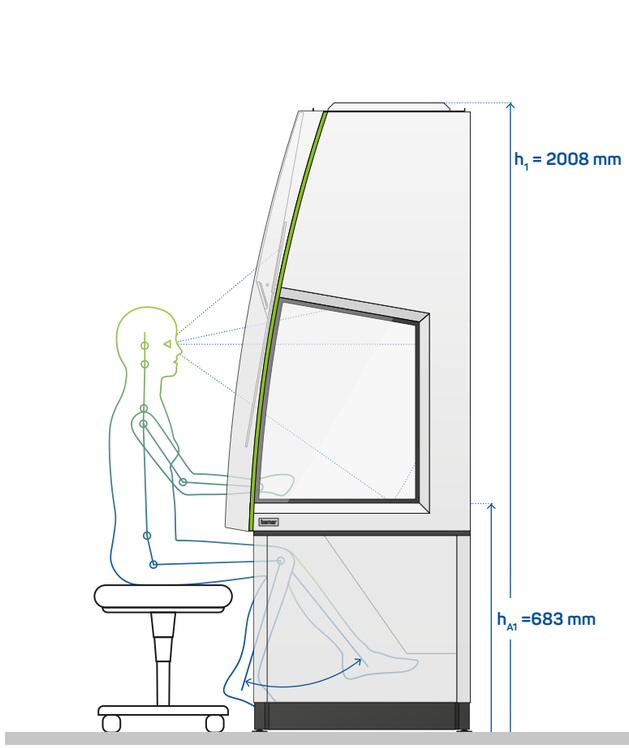
Sitting dynamically with a flexible seating position allows comfortable working and prevents postural damage.

The compact first filter stage provides the user with significantly more legroom.

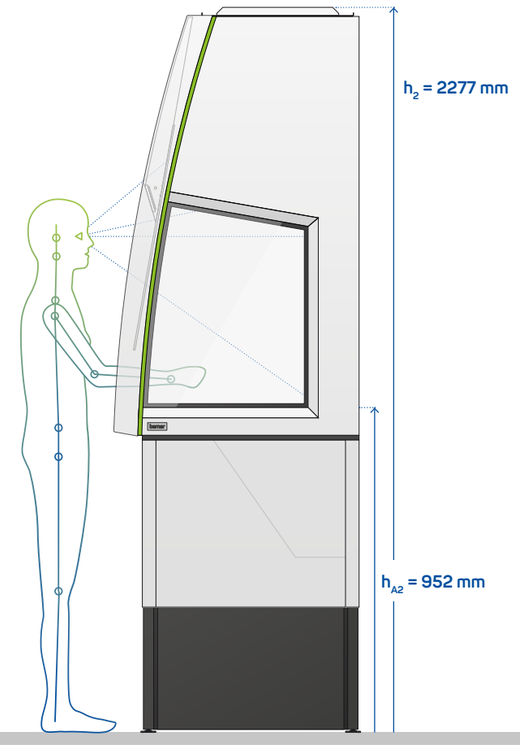
ERGONOMICS
VERY QUIET, OPTIMALLY ILLUMINATED AND HEIGHT ADJUSTABLE

The new generation of safety cabinets is the result of decades of experience, German engineering innovation, as well as the utilisation of the most up-to-date available technologies- “Made in Germany”.

- Very quiet and pleasant working conditions with a sound pressure level of up to 49dB [A].
- Bright and uniform illumination of the working area thanks to high quality and dimmable LED technology.
- Sitting or standing workplace: Seven worktop heights of 683-953 mm are available during installation with the standard base frame.
- The height-adjustable base frame of 700-1000 mm with memory position and an individual user profile. It allows flexible switching between sitting and standing activity and therefore automatically prevents forced postures. Your perfect working height with one touch.
- Exceptional legroom for the 3-filter system.
- Good for precision work: armrest and work surface at one height. Therefore, the entire height of the work aperture is available for ease of movement.



MEMORY FUNCTION
Electrically adjustable base frame with memory function in individual user profile.



STANDING AND SITTING WORKPLACE
Whether standing or sitting - always at the optimum ergonomic working height.

WASTE TRANSFER AEROSOL-TIGHT

CLAIRE PRO & SEALSAFE® SENSOR+
THE PERFECT SYMBIOSIS FOR SAFE WASTE MANAGEMENT

Dangerous chemical and biological waste from safety cabinets deserve special attention. The ability to transfer waste **without** leaving the safe workspace of the safety cabinet is the key to minimising cross-contamination.

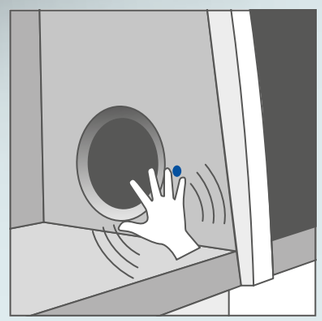
The, for the Claire specially adapted, waste disposal unit BERNER SealSafe® Sensor+ has been designed for receiving and air-tight sealing of waste.

Automatic transport of foil tube sealing after sealing process. Electrically operated sliding pane closes the waste chute safely.

Extension provides additional storage space for foil tubes, single-use material, PPE etc

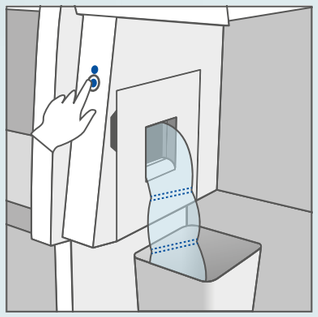
Convenient pull-out waste container

USEAGE



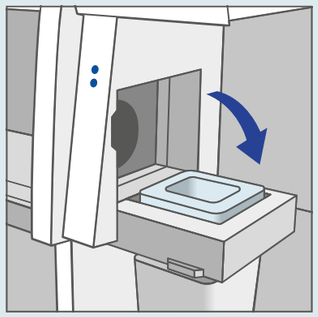
Contactless operation

Using sensor technology, LED illumination function of the deposit chute, lateral deposit chute is easily accessible. Deposit chute on left or right.



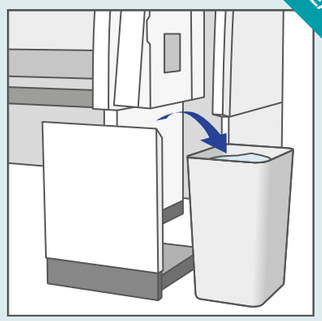
Cut and seal facility

No cross-contamination protection and spill risk. Minimises release of aerosols and cross-contamination. Waste disposal in sterile and safe environment.



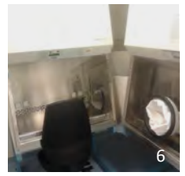
Easy change of foil tube

Individual waste bag sizes possible. 3-layer polyethylene foil tube with high barrier properties (e.g. for cytostatics > 7 days).

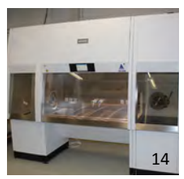


Safe Waste Management

Safe transfer and storage, up to inactivation in the aerosol-tight foil tube. No dangerous waste in any work areas.



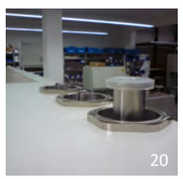
1: Integrated monitor- and weighing worktop; 2: Exhaust air cooler; 3: Integrated RTP-Port; 4: Solutions for compounder; 5: Window in back panel; 6: SC-sluice-isolator corner solution; 7: Traning-SC with computer workstation for two people; 8: IV-bar in workspace; 9: Integrated microscope



10: SC in stainless steel finish; 11: FlexDuc for connection to exhaust air system; 12: Connected safety cabinets; 13: Integrated basin into the workspace ; 14: Adapted BSS-Claire-transfer port

INDIVIDUALITY IS OUR STRENGTH

15: Media- and reactor connections;
16: Lateral integrated drying cabinet;
17: Integrated microscope;
18: Connection between two SC;
19: Two microscopes integrated into the SC;
20: Reactor connections;
21: SC-Isolator



SPECIAL DESIGNS
CUSTOMISED SOLUTIONS

We have been offering special equipment and complex, customised constructions for the Berner FlowSafe® generation for many years and continue these services for Claire pro and our customers in the future!

- → Compounder & pipetting robot
- → Side extensions for Claire pro
- → Containment sections
- → Sample access through the floor
- → Sampling from barrels
- → Media- and reactor connections
- → Drying cabinet
- → Back panel integration of 2 monitors
- → Exhaust air cooling
- → USV in safety cabinet
- → Combinations of SC-isolator, SC-SC
- → Stainless steel version

ACCESSORIES & OPTIONS
FOR SAFETY CABINETS

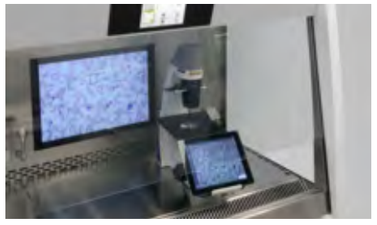
Assemble your safety cabinet according to your personal preferences and individual needs – the choice is yours! Make use of our webinar, which provides you with an overview of the structural adjustments and the integrated additional functions and particularly suitable devices. In addition to theoretical information, the webinar also includes practical demonstrations at the safety cabinet.
For more information: www.berner-safety.de/webinar

Interfaces
Integration of devices

Numerous interfaces variants of USB, CAT5 or 6, HDMI and many more for connecting peripheral equipment.

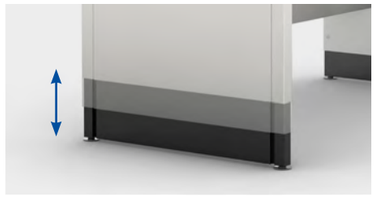
Monitor work station
16:9, integrated into the rear wall of the safety cabinet

Jointless integrated monitors up to 22 "allow the use of e.g. programs for gravimetric preparations, microscope applications or visualisation of work instructions etc.



Mikroscope workplaces
Optimal integration with perfect product and personal protection

Whether classical microscopes with special opening apertures or modern versions with integrated camera and monitor useage.

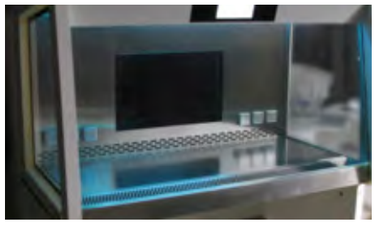


Electric height adjustable base frame
Individual working height

The height-adjustable base frame of 700-1050 mm worktop height with memory position and individual user profile for adjusting to multiple operators. Comfortable operation via touch display.

High-speed infrared sterilisation
Sterilising without an open flame

Berner International offers the high-speed infrared steriliser for fast and efficient annealing or sterilising of inoculation loops and micro-instruments without an open gas flame. This compact device is ideal for applications directly in the safety cabinet without impairing the protection function of the SC. The device is controlled via the easy to use touch panel and the high quality stainless steel and safety glass ensures excellent and easy cleaning.



UV-C Light
Programmable, efficient and safe

The fixed UV-C sterilisation system disinfects thanks to its high performance and shadow-free irradiation with large effectiveness the workspace. A high irradiance at a wavelength of 254 nm ensures a rapid killing of microorganisms (e.g. about 220µW / cm² according to the manufacturers specifications of UV lamps for models with a width of 190 cm). Operation is simple via the touch display, incl. timer function.

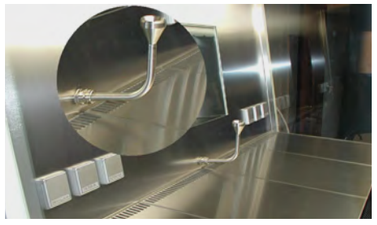
Weighing worktop
Low-Vibration-System

The weighing worktop finished as a spring-mass system offers an extremely stable and vibration-free work surface, e.g. for operating balances or vibration-sensitive analyzers. The weighting worktop has a size of 313 x 600 mm and consists of 1.5 mm thick stainless steel "V2A". The vibration (RMS) has been significantly reduced with the **Low-Vibration-System**, below the normative conditional value of 5µm. For easy orientation the weighing worktop is marked at the front with a pictogram.

Abbildung ähnlich

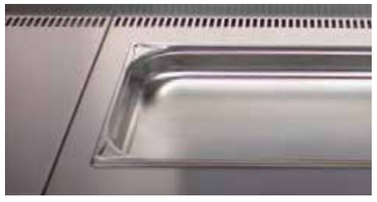
USV-units
Safe electricty supply

The device unit for uninterruptible power supply (UPS) is used to ensure the maintenance and protection of critical electrical loads and disturbances in the power network. The USV can compensate for local variations in the mains voltage and frequency or even complete blackouts.



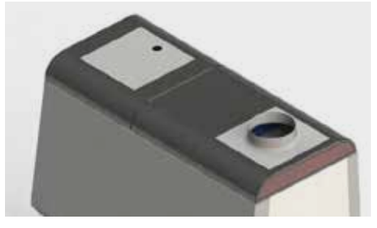
Media connections and particle monitoring
Media connections and particle monitoring

Connections for a variety of gaseous and liquid media can be easily integrated. There are mobile or fixed stationary solutions for continuous particle monitoring in the workspace available.



Special coatings and sinks
Safe working with liquids

Whether specially coated surfaces of worktops (e.g. Teflon, Halar®), integrated sinks or suspension devices, as well as complete stainless steel safety cabinets for high security laboratories (S3, S4) or pharmaceutical laboratories- many special requests can be integrated into the Claire pro.



Exhaust air connection FlexDuc
Without backflow, very flat and can be combined with the electrical base frame

FlexDuc for connection and operation of exhaust air systems.

Claire pro 130

Claire pro 160

Claire pro 190

CONSTRUCTION & INSTALLATION OF BERNER CLAIRE PRO

→ Low overall height

The very low overall height (2008-2277 mm) favours the operation in room with low ceilings, the connection to an exhaust air system or exhaust cooler and allows for easy testing of the exhaust filter.

→ High quality working space

First class and solid construction made completely of stainless steel. Jointless and made of one piece. Durable and easy to clean.

→ Easy transport and assembly

Fast & easily transportable and capable of being set up in one piece. Fits through nearly every door. Height up to 1946 mm. This saves on valuable installation time.

Safety cabinets of Berner International meet the highest quality requirements and are intensively tested before delivery to the customer. From product development to manufacture to installing in your laboratory - quality "Made in Germany".

Berner Safety Hotline: +49 4121 - 43 560

Various illustrations include optional accessories, customised solutions and equipment, which are not included in the basic configuration. All technical changes reserved. Copyright Berner International GmbH.

TECHNICAL INFORMATION FOR BERNER CLAIRE PRO

General data	
Device	Laboratory device
Type of device	Cytostatic safety cabinet or biological safety cabinet
Type of construction	DIN 12980; DIN EN 12469; NSF 49
Marking	CE
Quality management system	DIN EN ISO 9001:2008
Certified test mark	TÜV-GS (all models except Claire pro B/C-3-160)

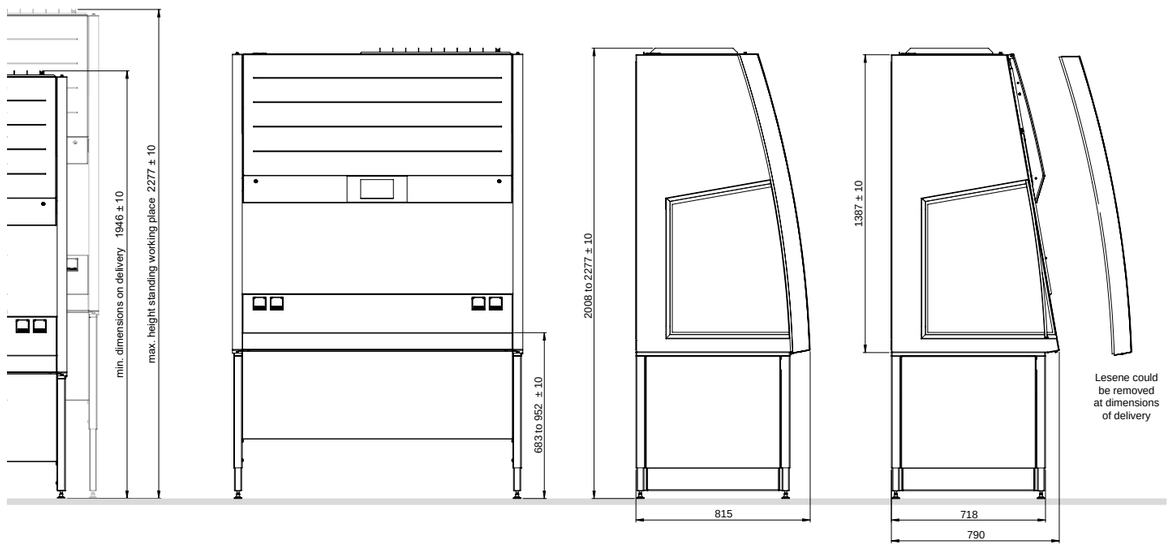
General technical data	
Nominal illuminance	0-1.100 lux
Vibration (RMS) on worktops	≤ 5µm
Sound pressure level to ISO 11201	49 to 59 dB(A)

Material specific data	
Material workspace	1.5 mm stainless steel „V2A“, material no.: 1.4301
Surface finish work space	320 grit fine finish, mean roughness index Ra ≈ 1.6 µm
Material casing	Powder-coated 1.5 mm Zincor steel sheet, material no.: 1.0330
Front-, side and back panel	Multi-layer safety glass with UV-light absorbing interlayer

Electrical data	
Rated voltage/ Rated frequency	230 V AC / 50/60 Hz
Power consumption	85 – ca. 600 W [1]

Mechanical data	
Width, outer	1352, 1654 and 1957 mm
Height	2008-2277 mm
Depth	815 mm
Installation dimension	1996 x 815 mm
Worktop height	(7 levels) 683-952 mm

Ventilation data	
Flow rate of exhaust or inflow air	330 – 490 m³/h [2]
Flow rate of exhaust air (with feedback-free duct connection)	450 – 600 ± 50 m³/h [2]
Filter classes (with main-, recirculation & exhaust filter	Min. H 14 (Filtration rate: E ≥ 99,995%), in acc. to DIN EN 1822-1 [3]
Cleanroom class in workspace	EG-GMP-Guidelines; DIN EN ISO 14644-1: ISO-class 5



[1] Depending on operating mode, type of application and model size, without internal consumers
[2] Depending on operating mode and model size
[3] Integral degree of filtration as minimum filtration efficiency for max. penetration, with particles of the Most Penetrating Particle Size (MPPS)

German Design Award WINNER 2015

reddot design award winner 2013

Bundespreis ecodesign nominiert 2014

CLEAN! 2014

V1-16/04/EN

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