Technical Specification

Compact Line Fume Hood







models: **800*; 1200; 1500; 1800**
versions: **DCL, DLC tabletop*, DLC walk-in**

Before using the unit, it is imperative to read the Technical Specification!

Version 1.0

2022.08.22

PN-EN ISO 9001
ISOCERT CERTYFIKAT

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1. Content scope

This document contains all neccesary informations about Compact Line Fume Hoods produced by Pol-Eko Aparatura. Those informations include operation, maintenance, safety guide and technical specifications of different fume hood types with standard equipment. Avaiable non-standard equipment (e.g „Schuko" electric socket) may differ from the one used in standard configuration. For non-standard electric and mechanical components the technical and operational documentation are provided separately in form of supplementing attachments.

2. Instructions and symbols

The following symbols are used in this technical specification:

Symbol	Description
	It is essential to follow the instructions in this manual, in particular those bearing the warning symbol, both for the sake of the User's safety and proper operation of the fume hood. The manufacturer is not liable for damages resulting from not following the instructions provided in the instructions
	A symbol for tips and information to help you operate the device

The instructions contained in this document should be followed, in particular those bearing the warning symbol, both for the safety of the User and the correct operation of the fume hood. The manufacturer is not responsible for damages resulting from non-compliance with the instructions contained in this document.

3. Safety informations

Important information on the safe use of the products has been provided in the following technical specification.

	Before undertaking any activities related to installation, commissioning and use, read the manual carefully.
	For maintenance and repair work, remove the plug from the power socket.

In addition to this technical specification, you must follow the applicable regulations in your laboratory, health and safety instructions, fire-fighting instructions, subassembly instructions and other regulations and rules, including health and safety at work rules.

The technical specification should be:

- made available to every operator
- stored for the entire period of use
- always passed together with fume hood.

3.1. General safety informations

- Check the technical conditions of the station before starting work
- Do not make repairs by yourself..
- Use personal protection equipment (eg glasses, gloves)
- All windows (horizontal and vertical) should be closed if there is noone working under the fume hood.
- There should be no sticking-out objects beyond working chamber of the fume hood.
- Do not use fume hood working chamber as a storage, use underbench cabinets instead.
- Do not work with potentialy explosive chemicals under the fume hood
- Use dedicated legs to the heating plates, Do not put heating plates directly on the worktop
- During the work, pay attention to the fume hood lining, possible heat load and excessive usage of strong chemicals can have impact on lining condition.
- ensure that all the warning signs on the fume hood are legible, clearly visible and clean.
- Fume hood should be operated by qualified staff
- For maintenance and repair work, remove the plug from the power socket

- Make sure that the voltage stated on the nameplate corresponds to the mains voltage.

In addition, all local and national regulations and safety recommendations must be followed.

3.2. Electrical safety

The electrical safety of the fume hood is only guaranteed if it is connected to a power source equipped with a PE protective conductor, this basic security is absolutely required. If in doubt, have the installation checked by a qualified electrician. The installation should be protected by an overcurrent switch and a residual current device. Do not use extension cords, distributors or adapters to power the fume hood. Do not operate the station if the electrical wiring or plug are damaged. Do not immerse the electric wires or the plug in water. In the event of a water or gas system leak, disconnect the device from the power source. It is forbidden to pull the electric cord when removing the plug from the socket. Keep the power cord away from hot surfaces. Avoid operating the stand with wet parts of the body. Do not touch live parts. Disconnect the power source of the station before starting maintenance work.

3.3. Qualifications of employees:

- employees operating the fume hood should:
    - comply the company rules , OHS and fire safety instructions
    - comply the technical specifications rules,
    - have the appropriate qualifications,
    - keep the fume hood in order and cleanliness.
    - be be familiarized with the procedure in the event of an accident
- before starting work, the employee should use the personal protective gear compliant with lab-specific PPE requirements.
- it is unacceptable for the employee operating the fume hood to be intoxicated
- or with symptoms of psychotropic disorders.

4. General description of the fume hood construction

Due to the construction type, metal fume cupboards are divided into 3 groups:

- **DCL** – standard type of general purpose fume hood with maximum expandability.
- **DCL table top** – designed to be placed directly on the work table top in laboratories with limited space.
- **DCL walk-in** – provide the maximum size of the working chamber. This is especially needed in laboratories where it is required to install large fittings or units with large dimensions - especially height.

Fume hoods are used to protect the laboratory personnel from the toxic or stinking fumes, gases and ashes that occur during work with aggressive and caustic substances. The operation of the fume hood consists in the flow of air into its working chamber through the oppened window, which reduces the risk of operating person contack with toxic vapours.

The fume hoods produce by POL-EKO have a completely metal structure and are built without using any wood derivatives. This increases the heat and fire resistance of the cupboards and makes them an obvious choice whenever fire-proofing is required.

The work chamber is finished with galvanized epoxy powder-coated steel as standard, which provides sufficient chemical resistance for a wide spectrum of applications. For work with aggressive chemicals like concentrated acids and alkalis or hydrofluoric acid other linings are available and recommended. The exhaust slot is always made completely of the same material as used for work chamber lining.

The appropriate level and uniformity of lighting is ensured by energy-saving LED linear lighting separated from the working chamber by a transparent cover. Natural character (4000K) of the light, reflects well the color of illuminated objects and has a positive impact on the comfort of work.

The safety flap valve in the ceiling provides decompression at the moment of uncontrolled pressure increase (explosion) in the working chamber.

As a standard, each fume hood is equipped with monitoring system (Schneider brand) in accordance with PE-EN 14175 ensures e.g:

- optical and acoustic warning when the window is set at a level above 50cm
- optical and acoustic low/high airflow velocity warning in the fume hood window
- controling the fume hood lighting
- fan control (ON/OFF).

The 4mm thick tempered glass window at the height of 500mm is equipped in accordance to current regulations with a stop-lock (not applicable to the Walk-in version), to fully open the sash one must first release the lock, which secures from accidentally opening the sash over the safe opening height. Window lifting mechanism moves in the guides and is equipped with a system that prevents the window from falling uncontrollably. Opening the window is supported by a counterweight connected to the window by acid-resistant steel ropes in a chemical-resistant plastic cover.

DCL version only:

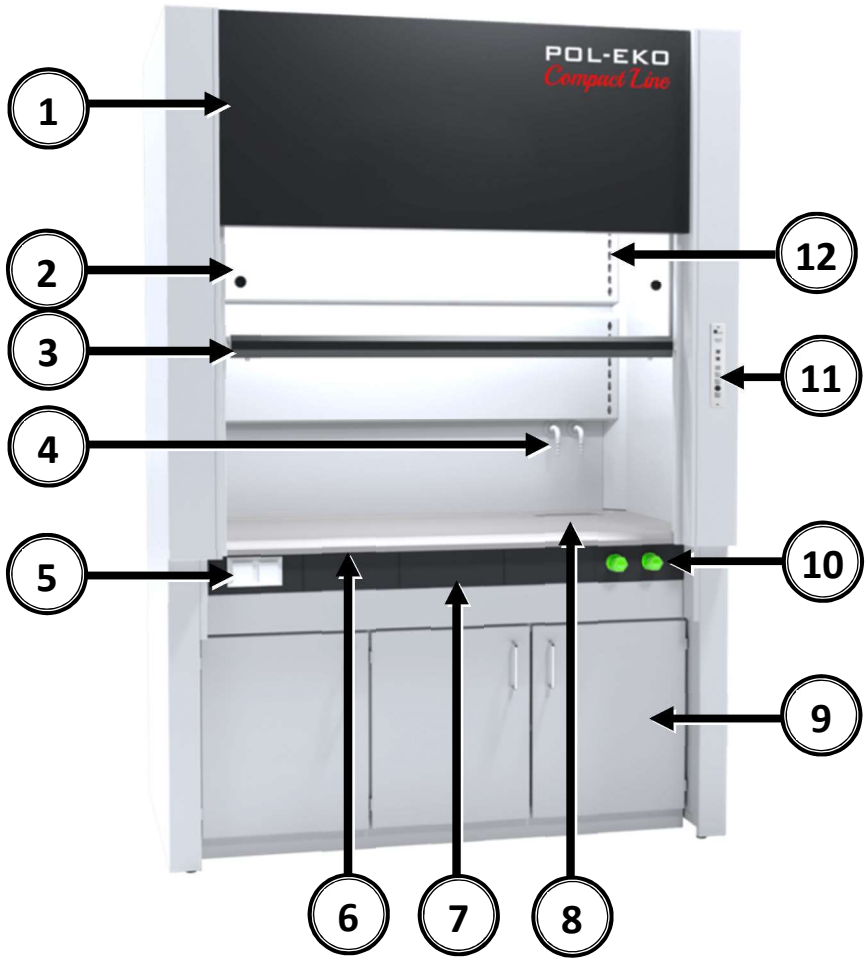
Marine edge, monolithic ceramics worktop is located at a height of 900mm.Exchangable front panels located under the worktop are equipped with 2x electrical socked 230V/16A with grounding prong in a IP44 housing. After lock release, window can be opened to the height of 810mm (measured from the worktop). Small horizontal sliding windows facilitate work in the fume hood.

A sink and two water taps, operated from the front panel are fitted as standard, however a fume cupboard without sink or water taps can be produced on request. Other taps (for gases, vacuum and other) are available and their controls are also mounted below the worktop. The exchangeable front panels make it easy to adjust the fume cupboard equipment and controls to any request. The built-in under-bench metal cabinet is connected to the fume hood ventilation system, providing a safe place for short-term chemicals storage. For long term storing of reagents special chemical storage cabinets should be used..

5. Fume hood exterior

5.1 DCL version

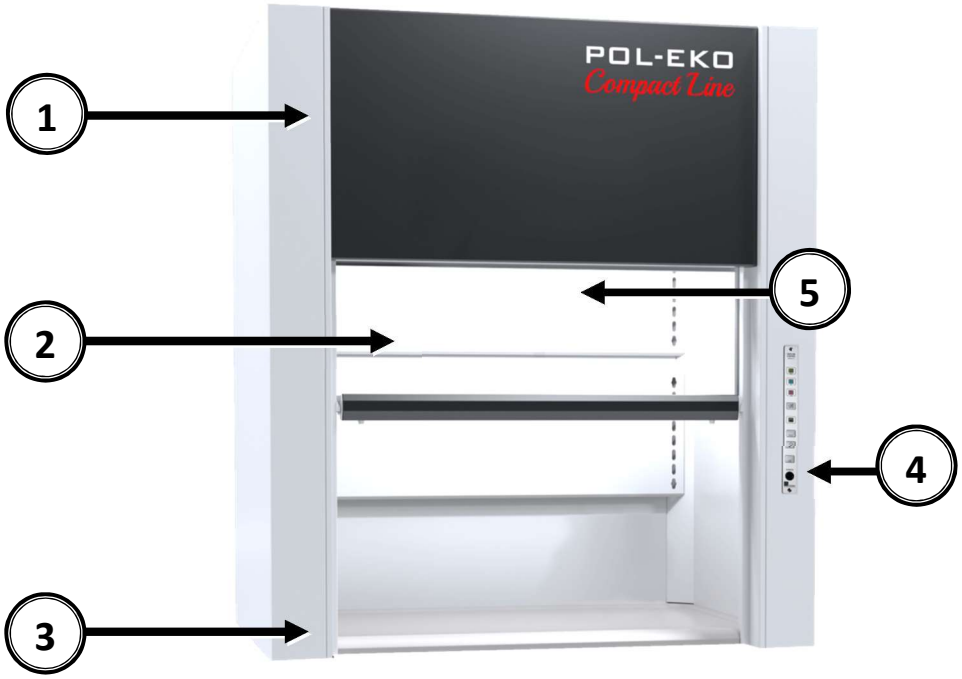
(on the example of DCL 1500 with additional underbench cabinet)



1. front cover,
2. horizontal sliding windows (right/left),
3. sash window made of tempered glass,
4. 2x water taps,
5. 2x electrical sockets IP44 230V/16A,
6. marine edge, monolythic ceramic worktop,
7. exchangeable panels (adapted to client needs),
8. ceramic sink 280x80mm with siphon,
9. underbench cabinet (option),
10. 2x water valves,
11. control panel (FA-0025-3 in standard version),
12. double rear wall system with exhaust fissures.

5.2 DCL tabletop version

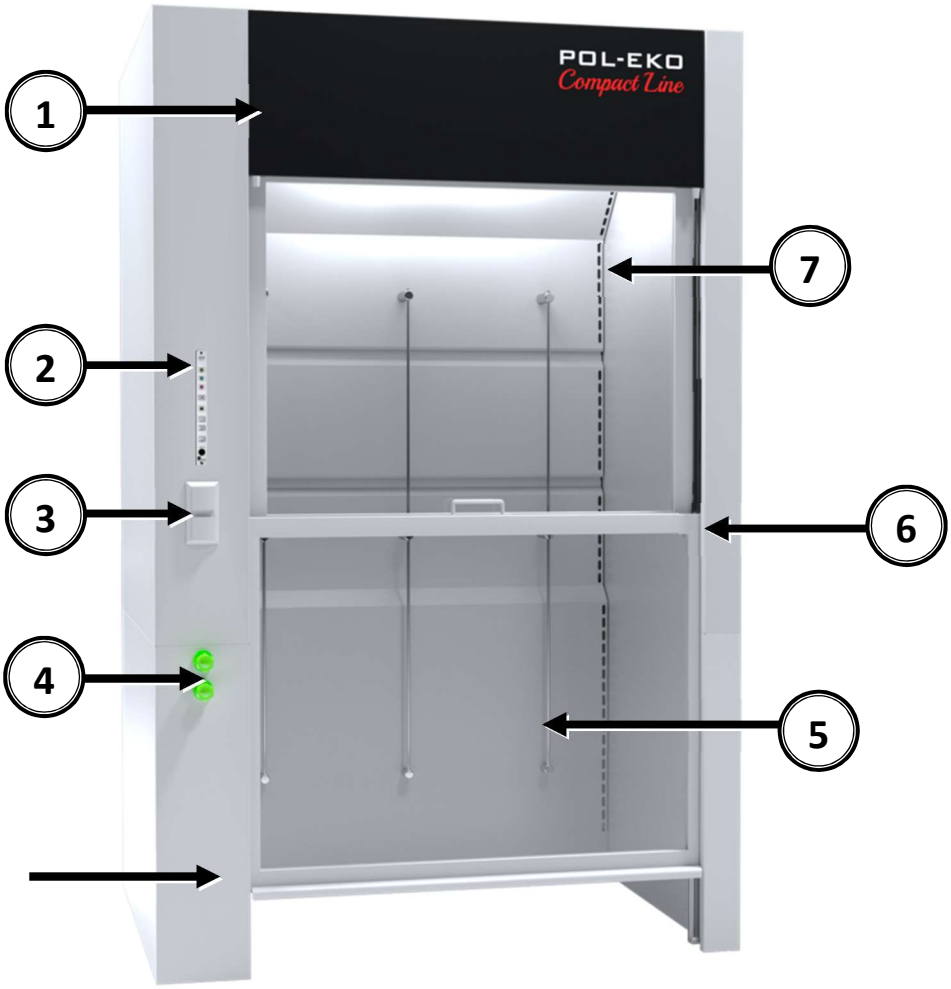
(on the example of DCL tabletop 1500)



1. front cover,
2. sash window made of tempered glass,
3. marine edge, monolythic ceramic worktop (option) ,Buchtal ceramic tile worktop (option)
4. control panel (FA-0025-3 in standard),
5. double rear wall system with exhaust fissures.

5.3 DCL walk-in version

(on the example of DCL walk-in 1500)



1. front cover,
2. control panel (FA-0025-3 in standard),
3. 2x electrical sockets IP44 230V/16A (option)
4. 2x water taps (option),
5. stainless steel scaffolds (option),
6. double sash window made of tempered glass
7. double rear wall system with exhaust fissures.

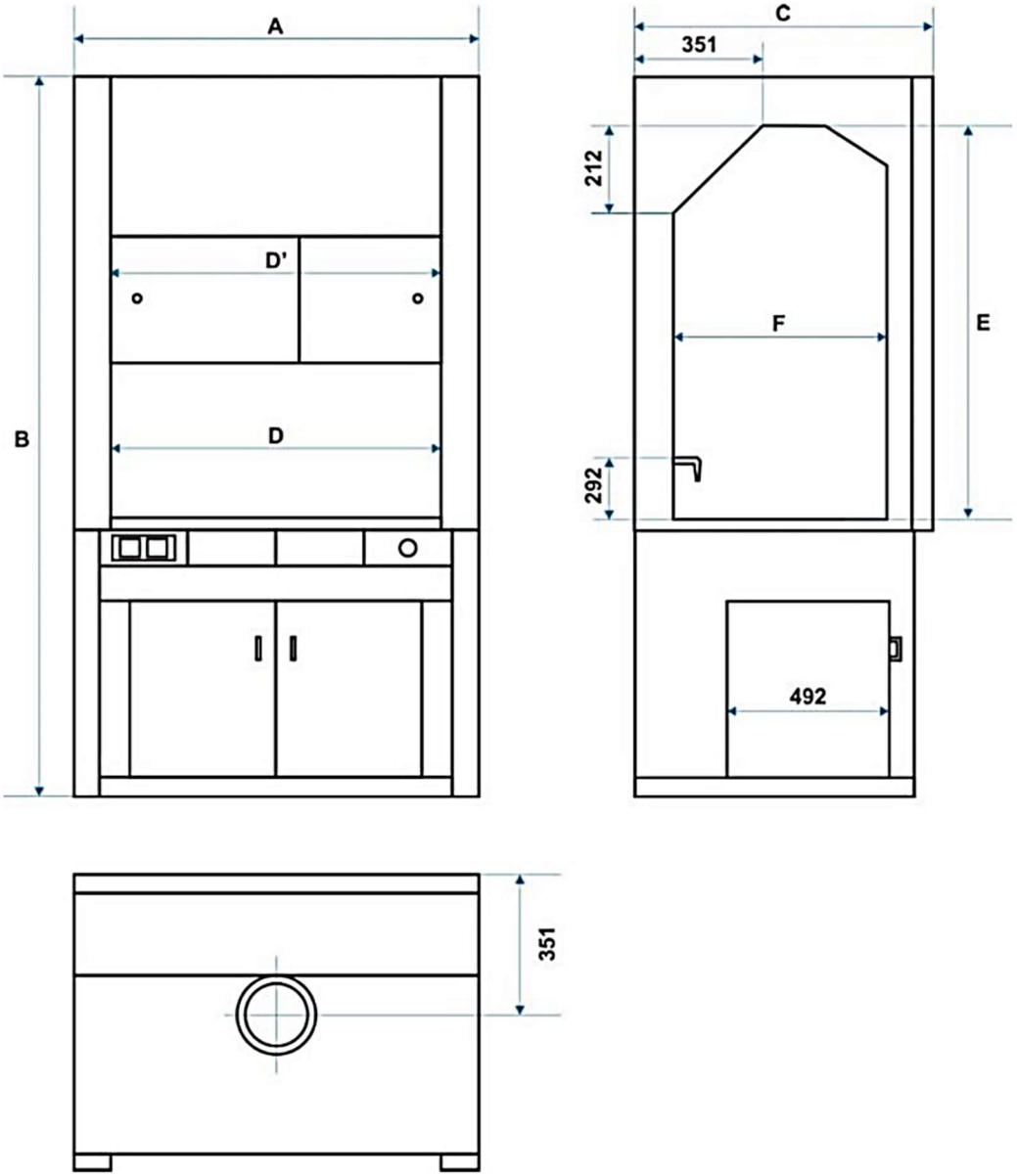
6.Technical data and accesories

6.1 DCL version

TECHNICAL DATA				
Parameter \ Typ		DCL 1200	DCL 1500	DCL 1800
External dimensions	Width [mm] (A)	1280	1580	1880*
	Height open/closed sash [mm] (B)	2325/2600		
	Depth [mm] (C)	960		
Worktop height (mm)		900		
Workspace dimensions	Width [mm] (D)	1150	1450	1750
	Sash width [mm] (D1)	965	1265	1565
	Height [mm] (E)	1220		
	Depth [mm] (F)	750		
	Depth measured from the sash [mm]	635		
Maximum sash opening [mm]		810		
Recommended airflow with sash open [m^3/h]		600-950	750-1200	900-1500
Recommended air flow speed at front face [m/s]		0,3 - 0,5		
Extract-air manifold diameter [mm]		Ø200	Ø200	Ø250
Standard airflow sensor compatible with PN-EN 14175-2		yes		
Ligh control ON/OFF		via control panel		
Fan control ON/OFF				
Water supply		G 1/2"		
Sewage connection [mm]		Ø 50		
Rated power* [W]		46	82	82
Electrical inslutaion		Class I		
Supply voltage		230VAC 50Hz lub 115VAC 60Hz**		
Warranty		24 months		

*- rated power does not include the eletrical load on electrical sockets

** - must be choosed before placing an order


A
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C
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212
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E
292
492
351

VARIANTS		
Element	**Standard**	**Option**
Worktop	• marine edge, monolythic ceramic	• Epoxy resin • Phenolic resin • Stainless steel AISI 304, 316
Work chamber lining	• Galvanized epoxy powder-coated steel (SS).	• Phenolic resin (LM) • Polipropylene (PP) • Large-size Buchtal ceramic tileds (CR) • Stainless steel AISI 304, 316
Main structure material	• Galvanized steel	• -
Exterior lining	• Galvanized epoxy powder-coated steel	• -
Sash window	• Galvanized epoxy powder-coated steel frame with single tempered glass	• Polycarbonate wndows (only for HF hydrofluoric acid)
Underbench cabinet	• -	• Galvanized epoxy powder-coated steel ventilated cabinet with 1 shelf and PP cuvette, • Cabinet for acids and bases made of foamed PCV • ASECOS cabinets with enhanced fire performance (30 or 90 min fire resistance) .
Fume hood controller	• FM550 (controller) AFS100 (flow sensor) FA-0025-3 (operator panel)	• ICM 500-F-EU controller with airflow control • ICM 500-FP-EU controller with airflow control and BMS connection • iM50 controller other controllers, operation panels or sensors available for request.
Sash operation	• Manual with counterweight	• SC 500* - Auto Protect system – with foot switch • SC 500* - Auto Protect system – with switch mounted on front panel *with motion detector – automatic window closing in the absence of the operator
Lighting	• 2x LEDLight tubes model 1200 – 2x1260lm, 4000K, 2x9W model 1500/1800 – 2x2520lm, 4000K, 2x18W	• 2 x Light tubes with EX-housing model 1200 –2x18W model 1500/1800 –2x36W
Electric instalations	• 2x 230V max.16A (IP44) electric socket in the exchangeable panel	• Additional 230V 16A (IP44) electric sockets in the exchangeable panel • 230V 16A electric sockets in the working chamber

		• 400V electric sockets • Main power switch • Over current protection switch • Safety switch • Battery backup system for controller • Electric socket equipped with timer • Manual Protect System • EX - electric sockets • Temperature sensor mounted inside the fume hood air duckt outlet (signaling temperature exceed)
Water/gas instalation	• 2x water taps mounted on the rear wall (2x operating valves mounted on the exchangeable panel) • Ceramic sink (same material as worktop)	• Up to 4/6/8 (model 1200/1500/1800) gas taps for flammable or non-flammable gases, vacuum, air and others , (gas valves mounted on the exchangeable panel) • Stainless steel sink
Side panel glazing	• -	• Avaiable for both sides
Other additional equipment	• -	• Stainless steel scaffold • Key lock for steel underbench cabinet • Round inspection hatch • Cable management brush strip • Laboratory handles

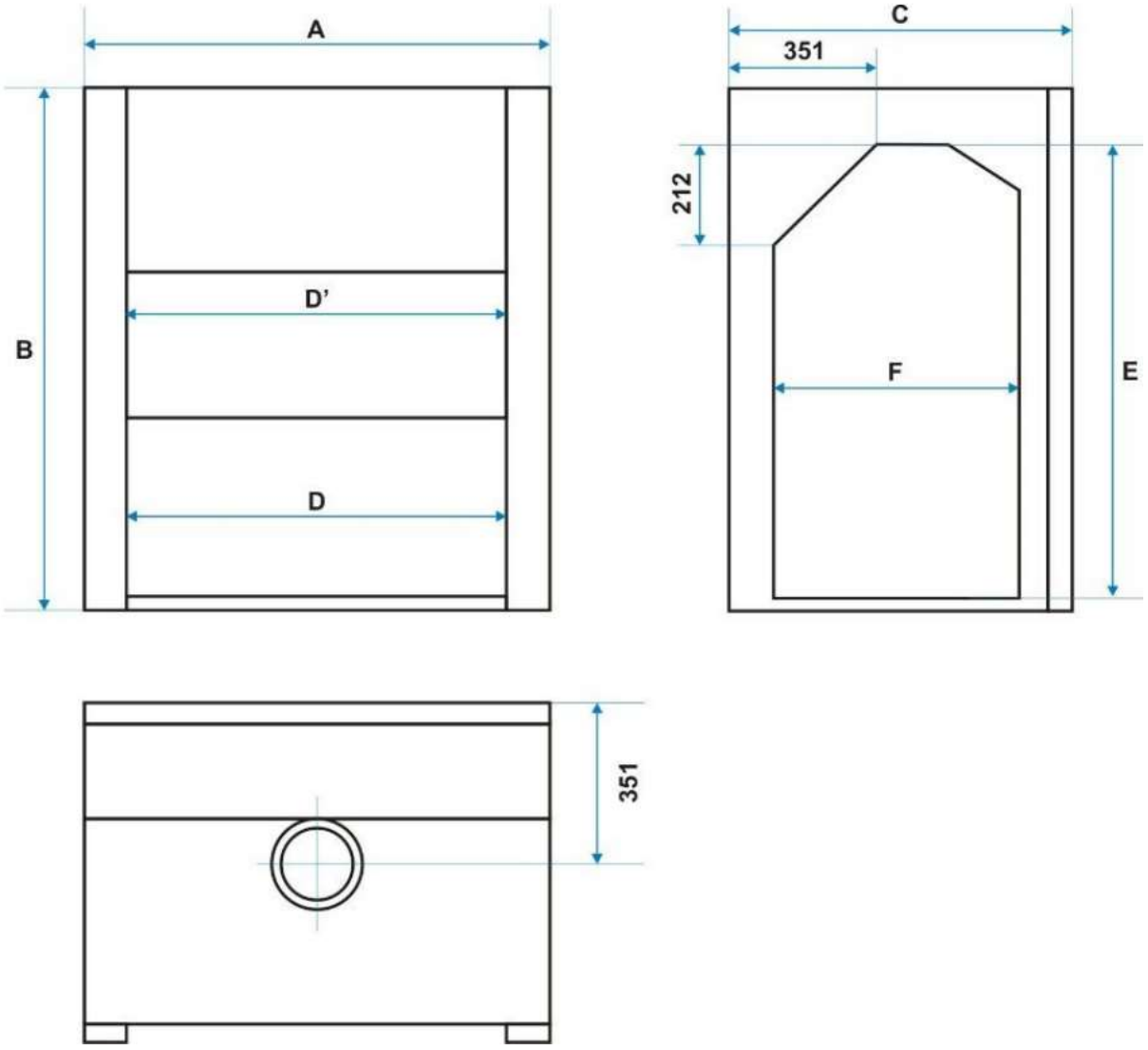
It is possible to customize the fume hood to individual customer needs.

6.2 DLC tabletop version

TECHNICAL DATA				
Parameter / Type		DCL tabletop 800	DCL tabletop 1200	DCL tabletop 1500
External dimensions	Width [mm] (A)	800	1200	1500
	Height open/closed sash [mm] (B)	1235/1320		
	Depth [mm] (C)	700		
Workspace dimensions	Width [mm] (D)	734	1134	1434
	Sash width [mm] (D1)	654	1054	1354
	Height [mm] (E)	1000		
	Depth [mm] (F)	430		
Recommended airflow with sash open [m3 /h]		400-650	600-950	750-1200
Recommended air flow speed at front face [m/s]		0,3 - 0,5		
Extract-air manifold [mm]		Ø160	Ø200	Ø200
Standard airflow sensor compatible with PN-EN 14175-2		Yes		
Ligh control ON/OFF		via control panel		
Fan control ON/OFF				
Rated power* [W]		46	46	82
Electrical inslutaion		class I		
Supply voltage		230VAC 50Hz or 115VAC 60Hz**		
Warranty		24 months		

*- rated power does not include the eletrical load on electrical sockets

** - must be choosed before placing an order


A
B
D'
D
C
351
212
F
E
351

VARIANTS		
Element	**Standard**	**Option**
worktop	•	• Epoxy resin • Phenolic resin • Stainless steel AISI 304, 316 • Large-size Buchtal ceramic tiles Marine edge, monolythic ceramic
Work chamber lining	• Galvanized epoxy powder-coated steel (SS).	• Phenolic resin (LM) • Polipropylene (PP) • Large-size Buchtal ceramic tiles (CR) • Stainless steel AISI 304, 316
Main structure material	• Galvanized steel	• -
Exterior lining	• Galvanized epoxy powder-coated steel	• -
Sash window	• Aluminum frame with single tempered glass	• Polycarbonate windows (only for HF hydrofluoric acid)
Fume hood controller	• FM550 (controller) AFS100 (flow sensor) FA-0025-3 • (operator panel)	• ICM 500-F-EU controller with airflow control • ICM 500-FP-EU controller with airflow control and BMS connection • iM50 controller other controllers, operation panels or sensors available for request.
Sash operation	• Manual with counterweight	• SC 500* - Auto Protect system – with foot switch • SC 500* - Auto Protect system – with switch mounted on front panel *with motion detector – automatic window closing in the absence of the operator (does not include DCL 800)
Lighting	• 2x Light tubes model 1200 – 2x1260lm, 4000K, 2x9W model 1500/1800 – 2x2520lm, 4000K, 2x18W	• 2 x Light tubes with EX-housing model 1200 –2x18W model 1500/1800 –2x36W
Electric instalations	• -	• Additional 230V 16A (IP44) electric sockets in the exchangeable panel • 230V 16A electric sockets in the working chamber • 400V electric sockets • Main power switch • Over current protection switch • Safety switch • Battery backup system for controller • Electric socket equipped with timer • Manual Protect System

		• EX - electric sockets • Temperature sensor mounted inside the fume hood air duckt outlet (signaling temperature exceed)
Water/gas instalation	• -	• Up to 4/6/8 (model 1200/1500/1800) gas taps for flammable or non-flammable gases, vacuum, air and others , (gas valves mounted on the exchangeable panel) • Stainless steel sink
Side panel glazing	• -	• Avaiable for both sides
Other additional equipment	• -	• Stainless steel scaffold • Round inspection hatch • Cable management brush strip • Steel frame on castors • Laboratory handles

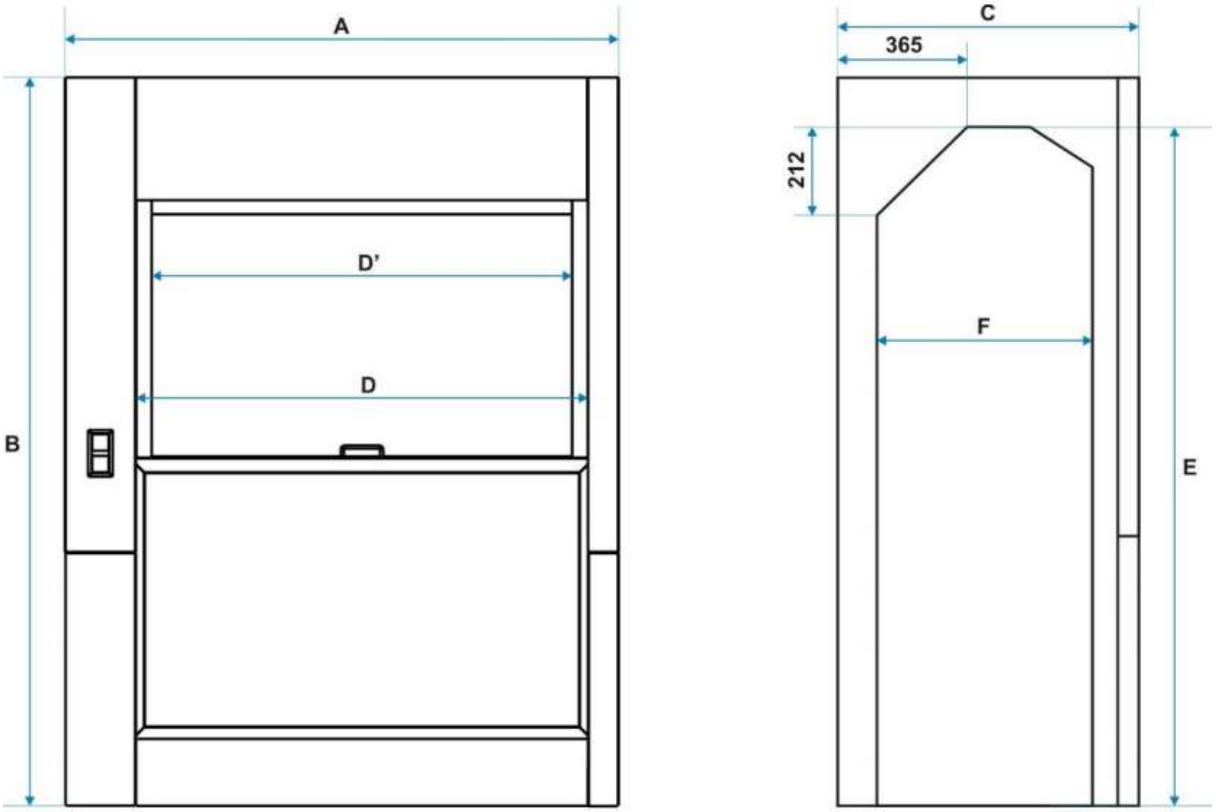
It is possible to customize the fume hood to individual customer needs.

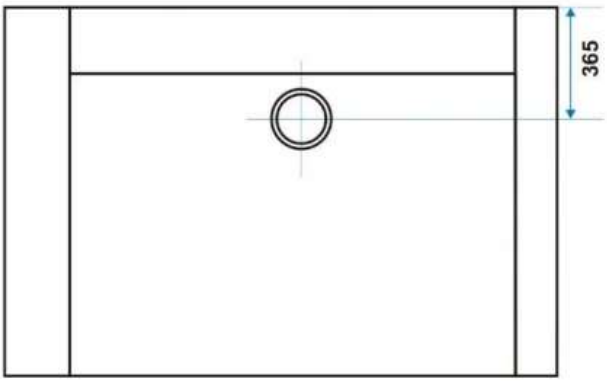
6.3 DCL walk-in version

TECHNICAL DATA				
Parameter \ Type		DCL 1200 walk-in	DCL 1500 walk-in	DCL 1800 walk-in
External dimensions	Width [mm] (A)	1200	1500	1880*
	Height open/closed sash [mm] (B)	2385/2850		
	Depth [mm] (C)	1200		
Workspace dimensions	Width [mm] (D)	870	1170	1750
	Sash width [mm] (D1)	810	1110	1565
	Height [mm] (E)	2145		
	Depth [mm] (F)	845		
Maximum sash opening [mm]		1850		
Recommended airflow with sash open [m^3/h]		0,3 - 0,5		
Extract-air manifold [mm]		Ø250	Ø250	Ø250
Standard airflow sensor compatible with PN-EN 14175-2		Yes		
Ligh control ON/OFF		via control panel		
Fan control ON/OFF				
Rated power* [W]		46	82	82
Electrical inslutaion		Class I		
Supply voltage		230VAC 50Hz lub 115VAC 60Hz**		
Warranty		24 months		

*- rated power does not include the eletrical load on electrical sockets

** - must be choosed before placing an order


A
B
D'
D
C
365
212
F
E


365

VARIANTS		
Element	**Standard**	**Option**
Worktop	• -	• Epoxy resin • Phenolic resin • Stainless steel AISI 304, 316
Work chamber lining	• Galvanized epoxy powder-coated steel (SS).	• Phenolic resin (LM) • Polipropylene (PP) • Large-size Buchtal ceramic tileds (CR) • Stainless steel AISI 304, 316
Main structure material	• Galvanized steel	• -
Exterior lining	• Galvanized epoxy powder-coated steel	• -
Sash window	• Aluminum frame with single tempered glass	• Polycarbonate windows (only for HF hydrofluoric acid)
Fume hood controller	• FM550 (controller) AFS100 (flow sensor) FA-0025-3 • (operator panel)	• ICM 500-F-EU controller with airflow control • ICM 500-FP-EU controller with airflow control and BMS connection • iM50 controller other controllers, operation panels or sensors available for request.
Sash operation	• Manual with counterweight	• -
Lighting	• 2x Light tubes model 1200 – 2x1260lm, 4000K, 2x9W model 1500/1800 – 2x2520lm, 4000K, 2x18W	• 2 x Light tubes with EX-housing model 1200 –2x18W model 1500/1800 –2x36W
Electric instalations	• -	• Additional 230V 16A (IP44) electric sockets in the exchangeable panel • 230V 16A electric sockets in the working chamber • 400V electric sockets • Main power switch • Over current protection switch • Safety switch • Battery backup system for controller • Electric socket equipped with timer • Manual Protect System • EX - electric sockets • Temperature sensor mounted inside the fume hood air duckt outlet (signaling temperature exceed)
Water/gas instalation	• -	• Up to 4/6/8 (model 1200/1500/1800) gas taps for flammable or non-flammable gases, vacuum, air and

		others , (gas valves mounted on the exchangeable panel) • Stainless steel sink • Ceramic sink
Side panel glazing	• -	• Avaiable for both sides
Other additional equipment	• -	• Stainless steel scaffold • Round inspection hatch • Cable management brush strip • Laboratory handles

It is possible to customize the fume hood to individual customer needs.

7.Monitoring system-controllers

(standard equipment)

The airlfow velocity control system manufactured by the Schneider consists of 3 elements:

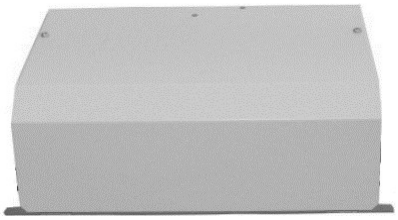
- AFS100 airflow velocity sensor (pt.7.1),
  (connection to the FM550 controller by X19 connector)



- FA-0025-3 operator panel (pt.7.2),
  (connection to the FM550 controller by X15 connector)



- FM550 controller (pt.7.3).



System meet the PN-EN 14175-2 requirements.

(optional equipment)

Instruction manual for regulated airflow control system (Schneider ICM 500) is an attachment to this document.

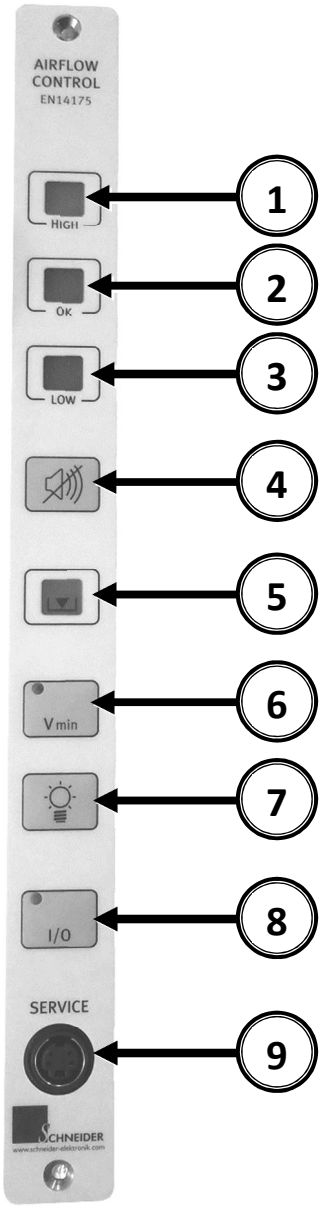
7.1 AFS100

The airfrlow velocity sensor AFS100 in mounted in the fume hood transparent lighting cover. The air should freely flow through the sensor. The sensor must be clean and well visible from the work chamber , it can't be covered.



Operating range: 0- 1m/s

7.2 FA-0025-3



1 LED diode *HIGH* – to high air flow velocity
2 LED diode *OK* – correct air flow velocity
3 LED diode *LOW* – to low air flow velocity
4 Mute buton – disable sound alarm
5 LED diode SASH – signaling of raised window (above 50 cm
6 Vmin mode button – minimal sustained ventilation for underbench cabinet, „night mode" (disabled by default)
7 Light button – ON/OFF the light in worspace
8 Controller buton – ON/OFF the controller
9 Service connector – for service only

Time functions:

- low air flow velocity alarm delay:

  10s by default
- low air flow velocity alarm duration:

  600s by default
- low air flow velocity alarm delay for sash opened above 50cm

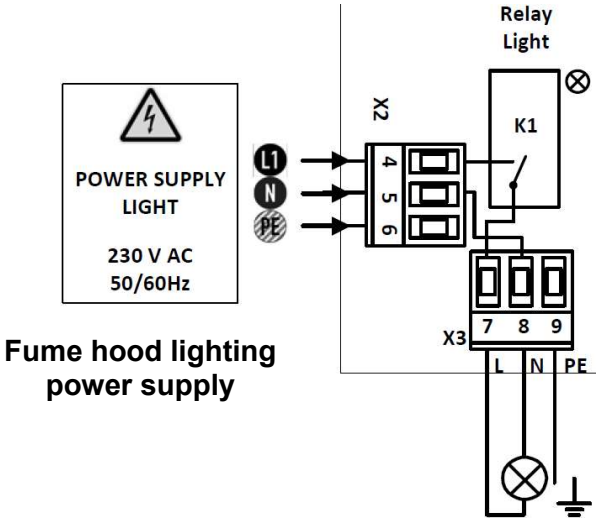
  60s by default

7.3 FM550

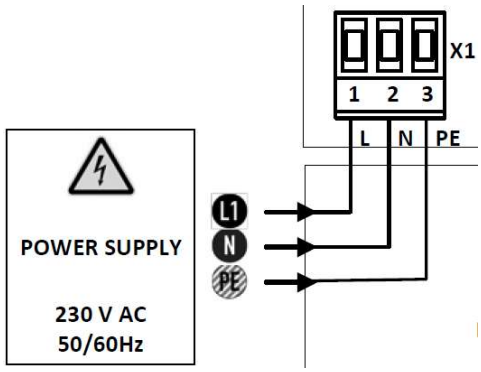
	Electrical installation and wiring may only be performed by qualified electricians

Power supply

By default, the FM550 controller power supply and the fume hood lighting power supply are connected to the same circuit. The power supply for the fume hood lighting can be connected to an independent circuit, e.g. laboratory room emergency power supply.



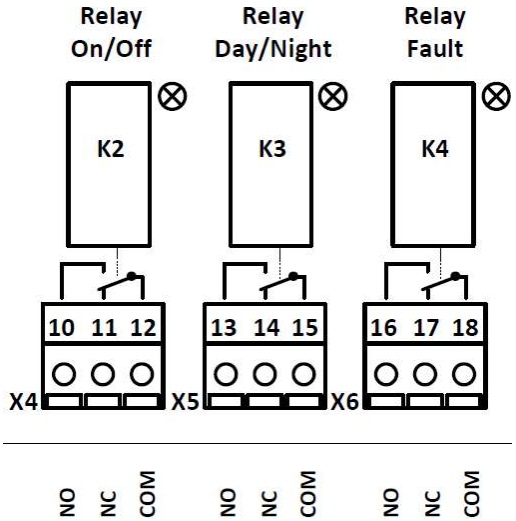
Fume hood lighting power supply



Fume hood controller power supply

	By default, the FM550 controller power supply and the fume hood lighting power supply are connected to the same circuit. Details are shown on the electrical diagram.

Potential free contacts



K1 – relay reserved for fume hood lighting control

K2 – fume hood controller signal ON/OFF

logic states:

closed circuit – controller ON

opened circuit – controller OFF



K3 –V*min mode (for closed window)*

logic states:

closed circuit –V*min mode ON („night mode")*

opened circuit – Normal mode ON („day mode")



	By default Vmin mode is disabled. To enable Vmin mode IN3 (X11:41 and 42) circuit must be closed

K4 – Fume hood malfuction alarm

Logic states:

closed circuit – malfunction

opened circuit – correct work



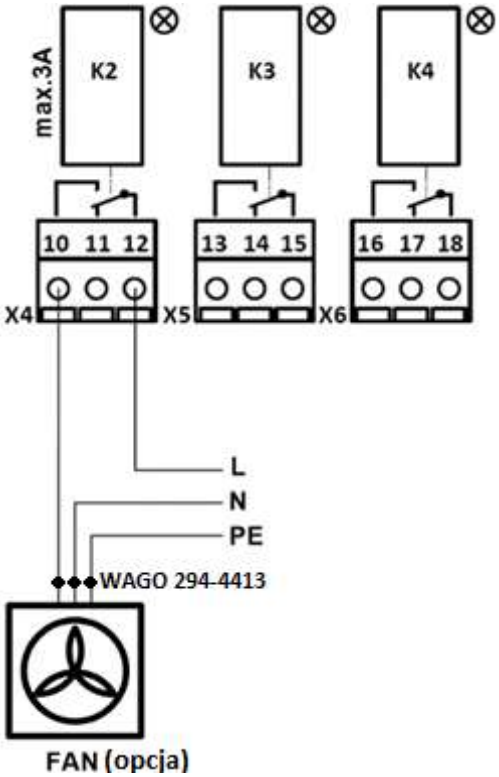
Maximum load of potential free contacts:

K2, K3, K4 – max 3A 230VAC or 30VDC

Example 1

Parallel start of the „1-speed” fan with the controller (start of the controller starts the fan)





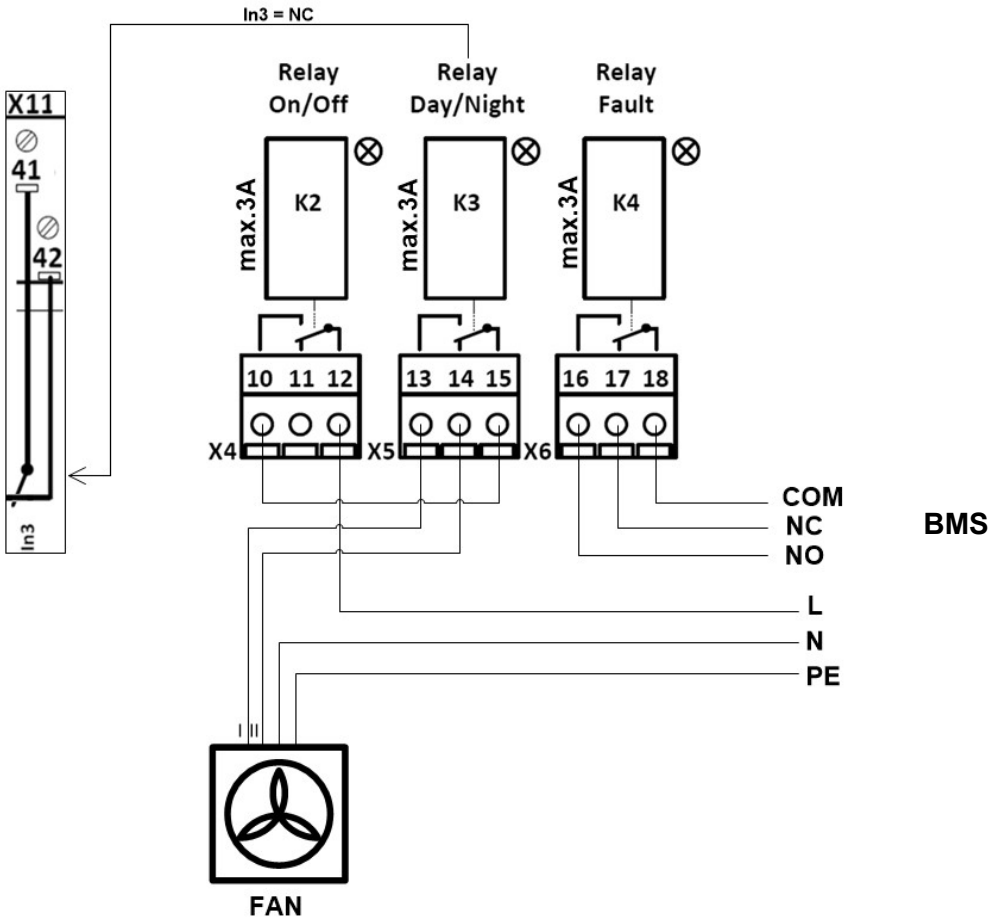
	The standard airflow velocity control system (FM550) installed in the fume hood only allows the fume hood exhaust fan to be switched on/off. To manipulate the airflow through the fume hood , an optional iCM 500 controller must be purchased.

Example 2

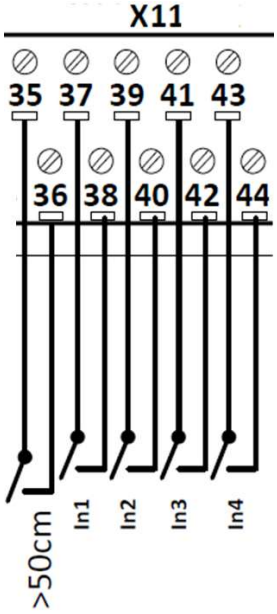
Parallel start of the „2-speed" fan with the controller (starting the controller 

starts the fan). In normal working conditions, with the presence of operator, the fan is working on higher speed. Short-term storage of chemicals (in the underbench cabinet) with closed window does not need the fan to work on highest speed. *Vmin* 

mode enable the fan to work on lower speed in order to save energy. Additionaly connection to BMS - K4 (Building Management System), allow the preview fume hood status (malfunction signaling).



Digital outputs



Digital outputs allows remote control of the fume hood. Maximum cable lenght is: 5m (24VDC/10mA)

>50cm – input reserved for connecting the window sensor of the fume hood.

In1 – fume hood controller signal ON/OF

logic states:

Closed circuit – Controller OF

Opened circuit – enables manual sontroller startup

	Restart is only possible from the operator panel .

In2 – V*min* mode (for closed window)

Logic state

closed circuit –V*min mode ON („night mode")*

opened circuit – Normal mode ON („day mode")

In3 – enables the V*min* button (for closed window)  on the operator panel

Closed circuit – button active

Opened circuit – button disabled

→ *Vmin*  diode behaviour:

- pulsating –*Vmin function* acivated from the operator
- continous – *Vmin function* acivated from the digital input

In4 – enables control of LED HIGH velocity diode

logic states:

closed circuit – LED *HIGH* diode is active 

opened circuit – LED *HIGH* diode is inactive 

Air flow limits::

„Day mode", „normal work"):

<0,3m/s – LED LOW alarm start

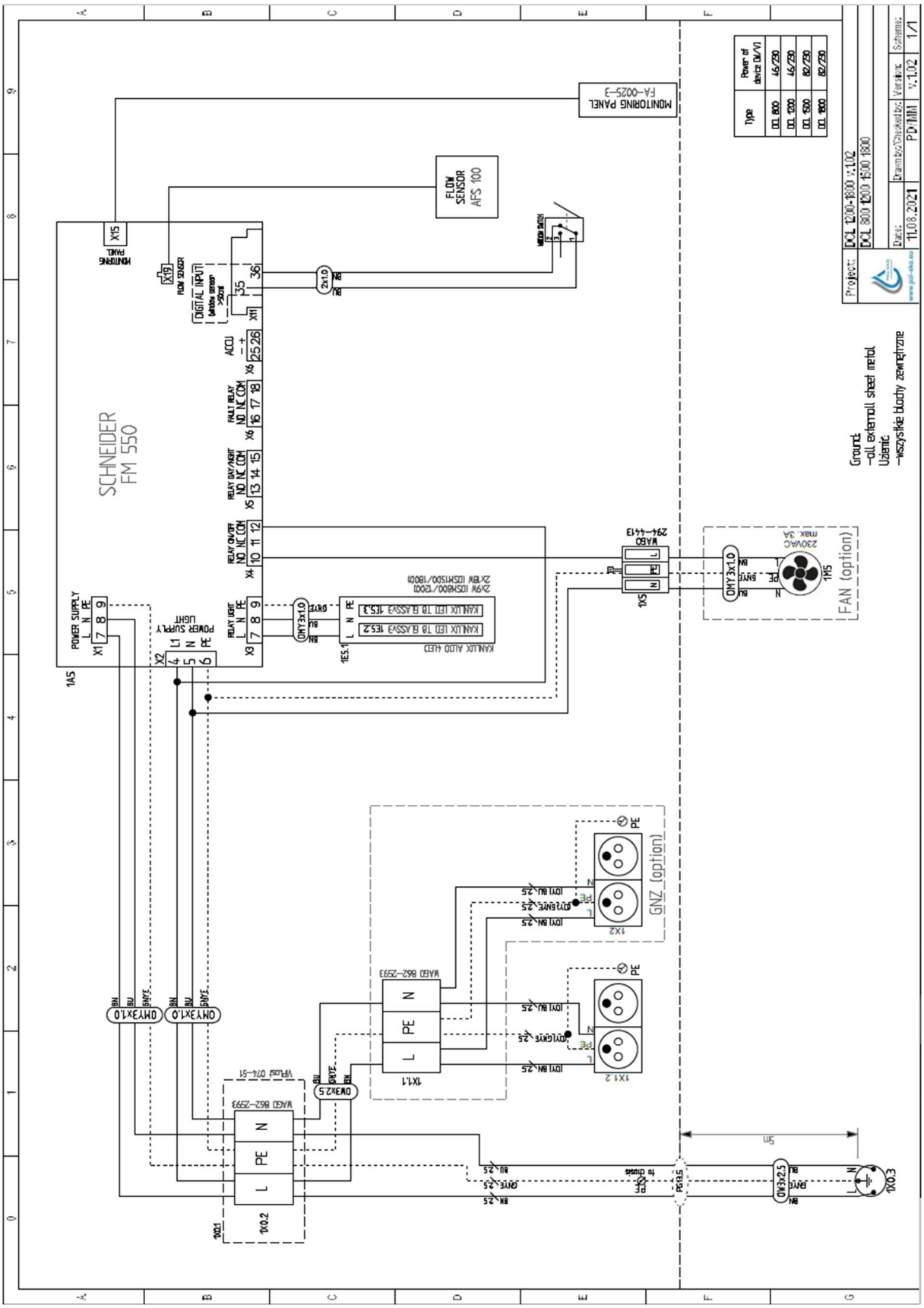
V*min mode* („night mode" ,closed window):

<0,2m/s – LED LOW alarm start

	Work in V*min*  mode on, with opened window is not allowed. V*min* mode can only be used for short-term („night time") storage of chemical in the underbech cabinet.

8. Electric scheme

(standard version)



9. Instalation

	Fume hood instalation should be performed by manufacturer or authorised distributor.
	Manufacturer did not conduct fume hood type examination. If necessary, the User can perform their own workplace examination (fuje hood) according to 14175-4.

9.1 Storage and delivery

Before delivery, check whether the route of access to the laboratory is sufficient and whether there is a place for temporary storage of fume hood components. Particular attention should be paid to the following::

- Doors dimensions;
- Staircases and platfroms;
- Elevator dimensions and maximium workload ;
- Corridor dimensions, potential obstacles.

The recipient of the fume cupboard should provide the installer with informations on the space needed to bring the fume hood to the destination place (in the case of installation by the manufacturer or by an authorized company).

Before installation, the fume hood should be stored in a safe place and steps should be taken to minimize the risk of damage or deterioration its condition. Fume hood should be well protected while laboratory is modernized.

Storage condition:

- Air temperature from -10°C to +30°C,
- Relative air humidity at 20°C from 40% to 70%,
- On solid and stable ground.

If it is necessary to install the fume hood before drying the building after carrying out the works, the building should be slowly heated for several days and dehumidification should be carried out. It’s recommended to use dehumidifying devices instead of heaters. If only heating is used, proper ventilation is necessary.

It is recommended to first complete the restoration of the room before instaling the fume hood. In the event when the fume hood has already been installed, it must be effectively protected..

The place where the fume hood is installed should meet the below conditions:

- Minimum height of the room is 2.75m*
- Recommended ambient temperature is from +10°C to +30°C,
- Recommended relative air humidity up to 80% (without condensation),
- Fume hood is standing on the solid and stable ground,
- Fume hood working place should not be exposed to the sunlight and heat sources
- Fume hood must be connected to the working and checket air ventilation system
- Utilities must be provided to the specific place (see section 9.2)

It is forbidden to instal the fume hood:

- outdoors,
- at moistened and/or exposed to flooding places,
- in the vicinity of volatile and flamable substances,
- in the vicinity of stron/concentraded acids and corrosive vapours.
- If the air temperature and relavite humidity is significantly higher than the temperature and humidity of the place where the fume hood was stored.

Cold/hot water and steam pipes must have thermal insulation. All pipes must be mounted in such way that there is no deformation during use. The arrangement of the connection points of the instalation depends on the layout of the fume hood. Placing electrical connections in the wall should be avoided and connection in the wall should be accesible.

** does not apply to the lowered version*

9.2 Utility instalation requirements

Before installing the fume hood , the user is obliged to prepare following installlations.

Ventilation

Before connecting the fume hood, the user is obliged to prepare an exhaust system ensuring the appropriate amount of exhaust air exchanges according to the design made by an authorized designer. The installation must be by an authorised surveillance inspector. The installation should meet the European standard:

PN-EN 14175-2

Minimum required volumetric airflow with the window open at a height of 50cm:

Size / Version	**800**	**1200**	**1500**	**1800**
DCL	-	600-950 m^3/h	750-1200 m^3/h	900-1500 m^3/h
DCL Tabletop	400-650 m^3/h			-
DCL walk-in	-			900-1500 m^3/h

or minimum required air flow velocity with the window open at a heigh of 50cm:

0,3m/s

Extract-air manifold diameter :

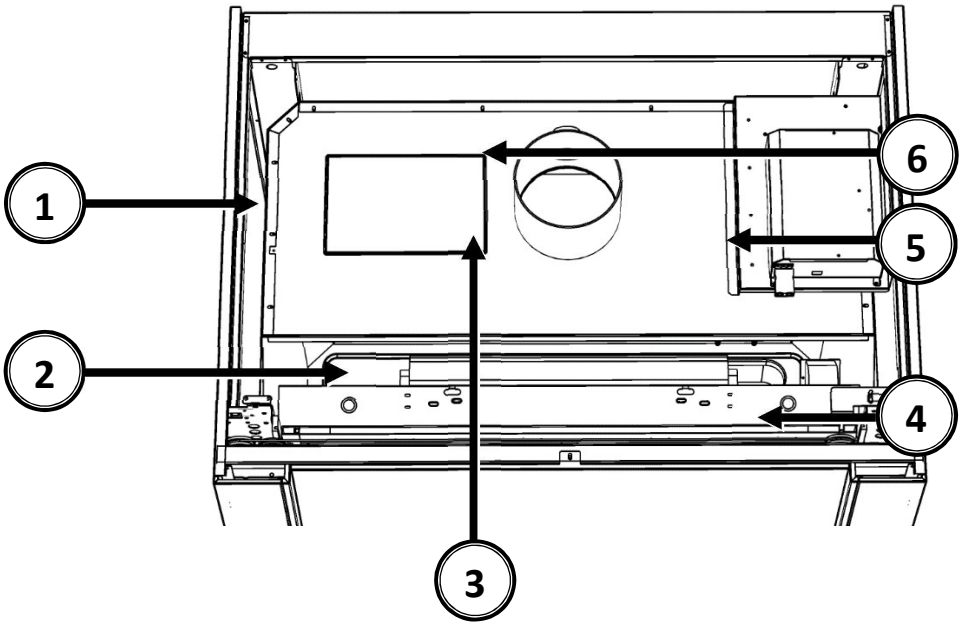
Rozmiar / Version	**800**	**1200**	**1500**	**1800**
DCL	-	200mm	200mm	250mm
DCL tabletop	160mm			-
DCL walk-in	-	250mm	250mm	250mm

Approximate pressure drop in the fume hood - 60Pa.



The exhaust fan is not included in delivery

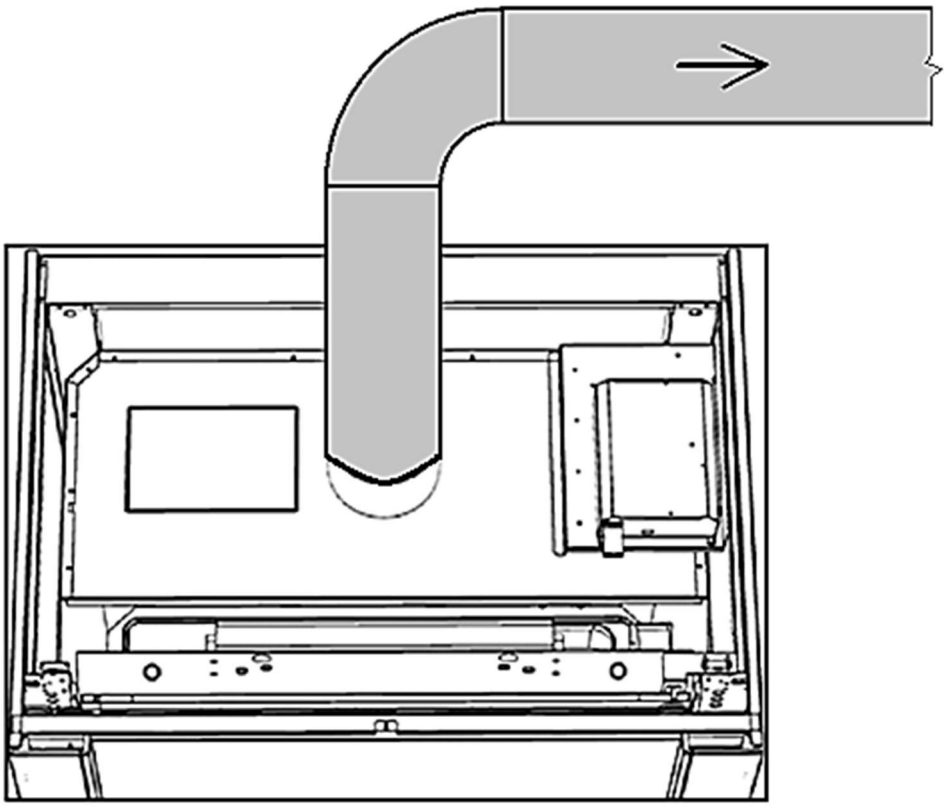
DCL1200 fume hood – view from above



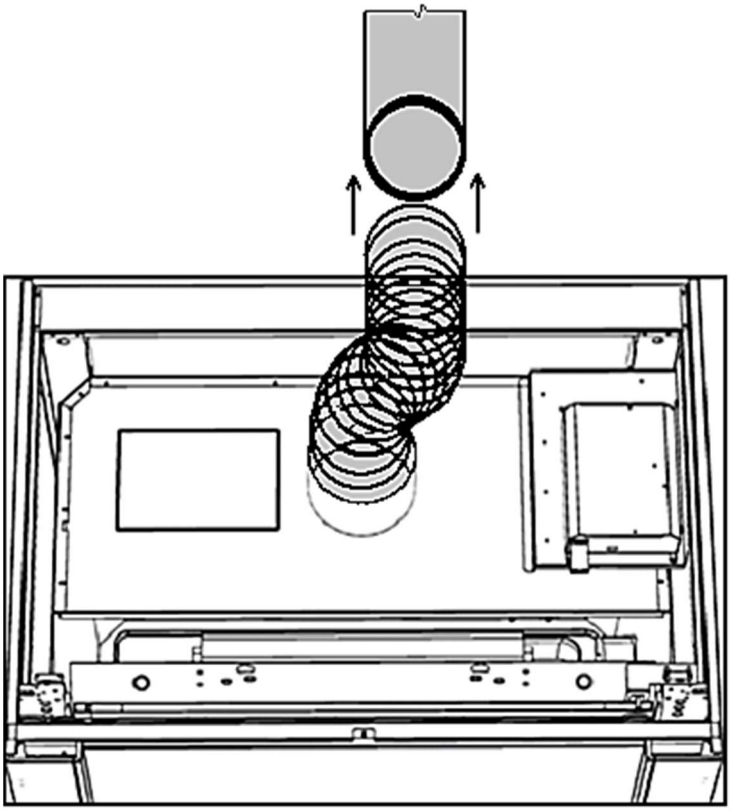
1. Safety flap,
2. Workspace lighting,
3. Extract-air manifold,
4. Open window sensor (above 50 cm)
5. FM550 controller,
6. Underbench cabinet ventilation system connnection (option).

Connecton of the fume hood to main ventilation system

Example.1 Connection using solid pipe



Example.2 Connection using flexible aluminium pipe (Spiro)



	Flexible aluminium pipe (Spiro) is not included in delivery

Flexible aluminium pipe (Spiro) requirements:

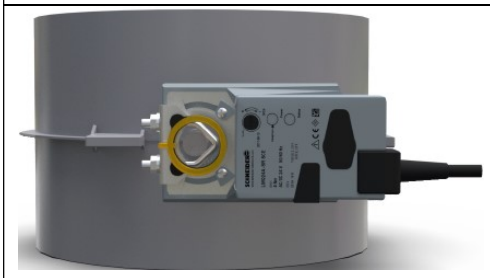
Lenght: 1m

Maximum working temperature: 85ºC (temporary 95 ºC)

Minimal bend radius :

Size / Version	**800**	**1200**	**1500**	**1800**
DLC	-	120mm	120mm	175mm
DCL tabletop	96mm			-
DCL walk-in	-	175mm	175mm	175mm

iCM500 controller is mounted together with one of the throttles shown below::

iCM 500-F-EU	iCM 500-FP-EU
Regulating damper	Flow control regulator VAV
	
Regulating damper regulates the air flow through the fume hood working chamber in cooperation with a window air velocity sensor AFS100	Flow control regulator VAV measures and regulates volumetric air flow in the fume hood working chamber

Water instalation

Water installation should be mounted in the wall behind the designed fume hood at a height of 50 cm from the floor. Shutting valves (ball type) wich provide water to fume hood should be in an easily accessible place.

Installation should be ended with ½ external coupling . The number of endings depends on the number of taps installed in the fume hood.

Example: The fume hood is equipped with 3 cold water taps. In this case, the water supply system should be ended with three ½ external couplings.



Flexible hoses used to connect the fume hood with the water supply system are 1500mm long (700mm inside the fume hood structure). Flexible hoses are delivered together with fume hoods as standard.

Sewerage system

The sewerage input should stick from the floor or a wall behind the fume hood. The sewerage PVC pipe connection should end with self-socket (50mm in diameter), placed approximately 50 cm from the floor.

Electrical instalation

It is necessary to prepare an electrical socket (230V, 50Hz) with B16 overcurrent protection and a residual current circuit breaker with rated residual current IΔn = 30mA. The fume hood is equipped with a 3m power cord terminated with a plug.

Gas instalation (option)

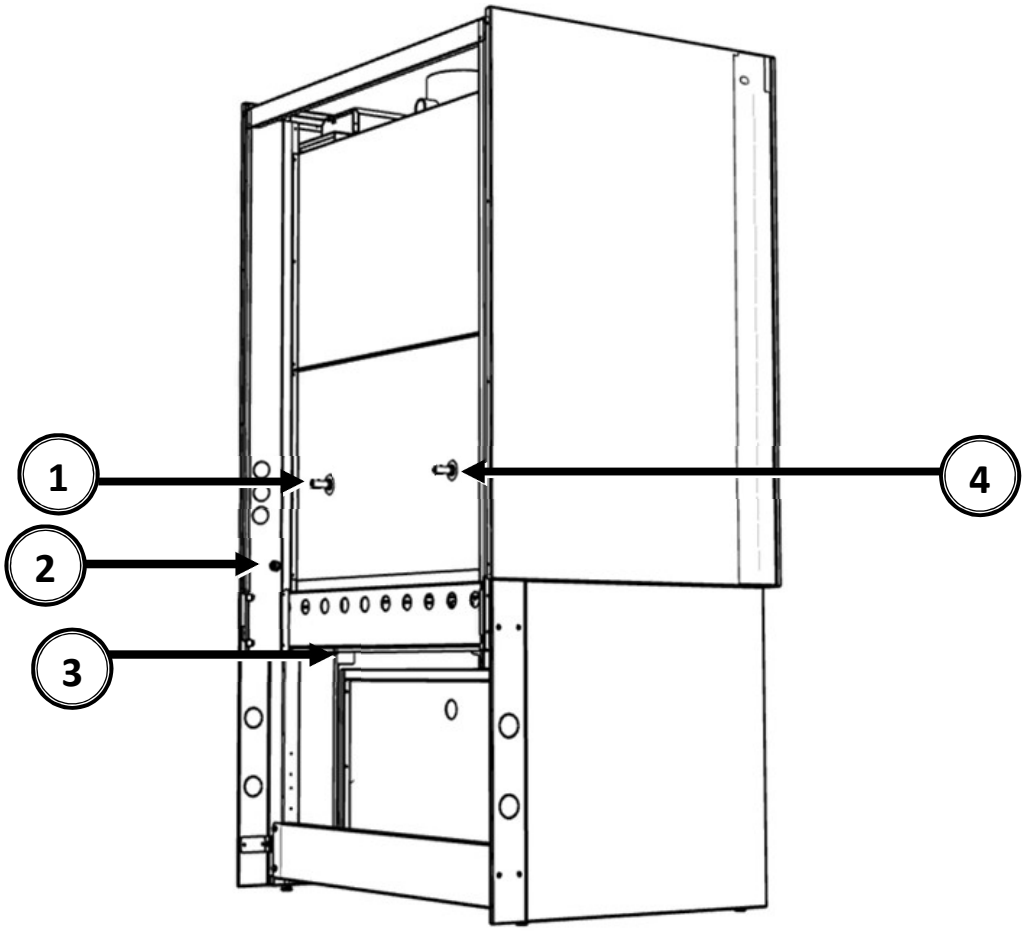
The possible natural gas or other technical gas installations (12-15mm diameter) should be mounted on the the wall (behind the fume hood) at no more than 50cm from the floor. A cut-off valve should be mounted outside of the fume hood and easily accessible.

Example

DCL 1200 – Fume hood equipped with:

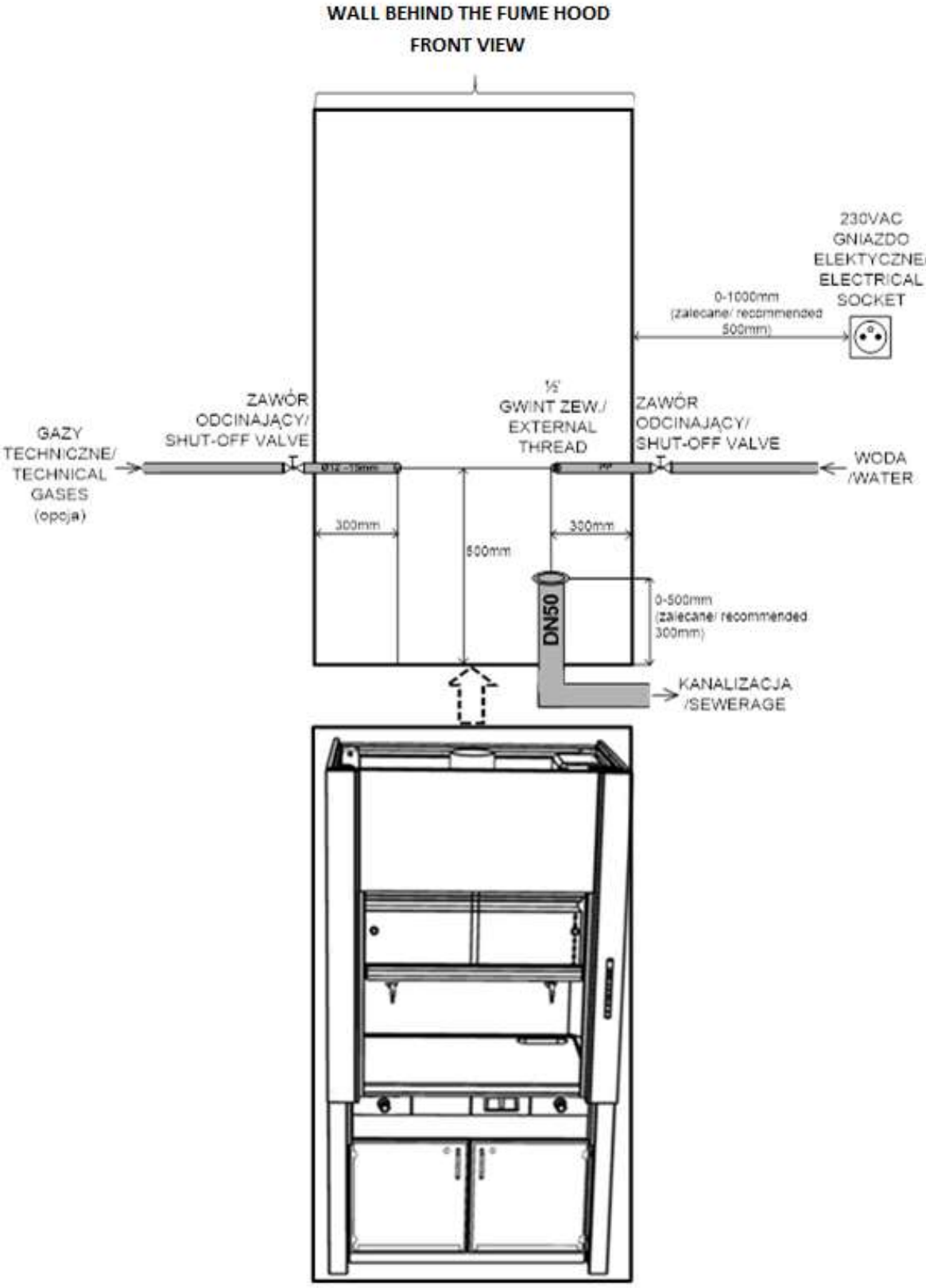
- 2 x electrical socket (230V max.16A IP44 mounted on the exchangeable panel))
- 1 x water tap mounted on the working chamber rear wall , with a valve mounted on the exchangeable panel
- sink,
- 1 x gas tap (flammable/non-flammable/vacuum), with a valve mounted on the exchangeable panel

Rear view of the fume hood



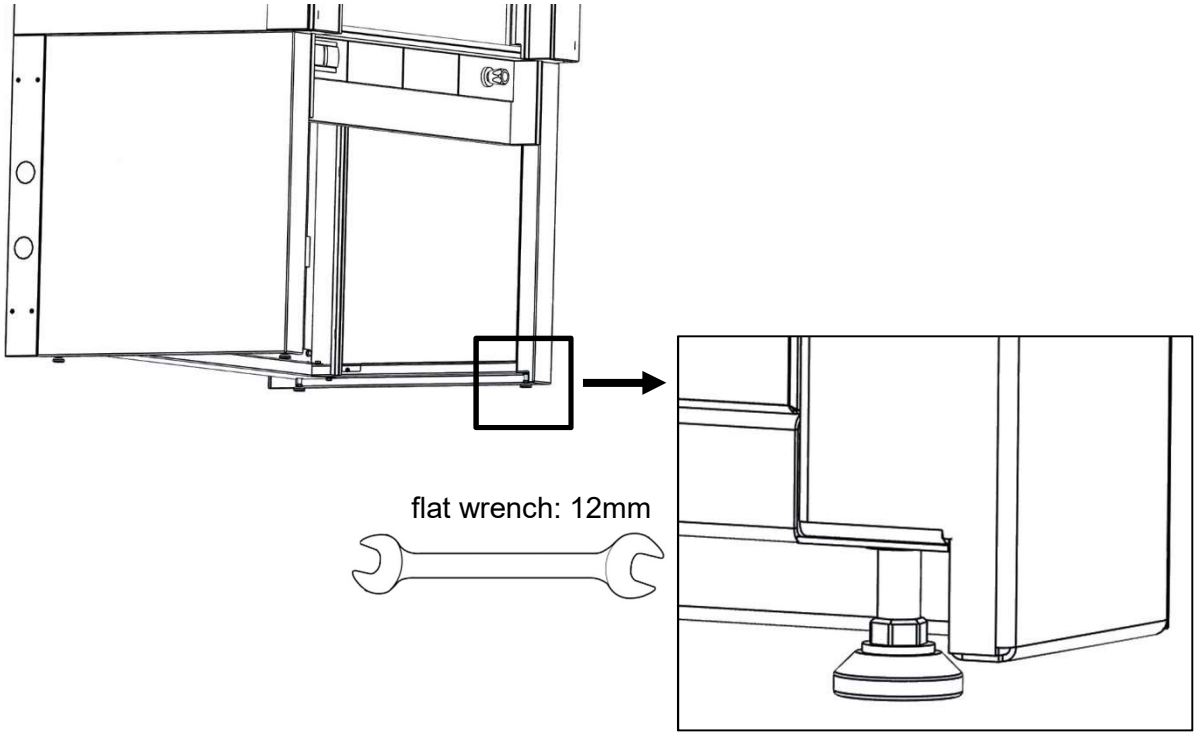
1. Water connection
2. Power cord output,
3. Drain from ceramic sink,
4. Gas connection (option).

	Quantity and type of connections are customized for the client needs


WALL BEHIND THE FUME HOOD
FRONT VIEW
230VAC
GNIAZDO
ELEKTYCZNE/
ELECTRICAL
SOCKET
0-1000mm
(zalecane/ recommended
500mm)
½"
GWINT ZEW./
EXTERNAL
THREAD
ZAWÓR
ODCINAJĄCY/
SHUT-OFF VALVE
ZAWÓR
ODCINAJĄCY/
SHUT-OFF VALVE
GAZY
TECHNICZNE/
TECHNICAL
GASES
(opcja)
WODA
/WATER
300mm
500mm
300mm
DN50
0-500mm
(zalecane/ recommended
300mm)
KANALIZACJA
/SEWERAGE

9.3 Fume hood leveling

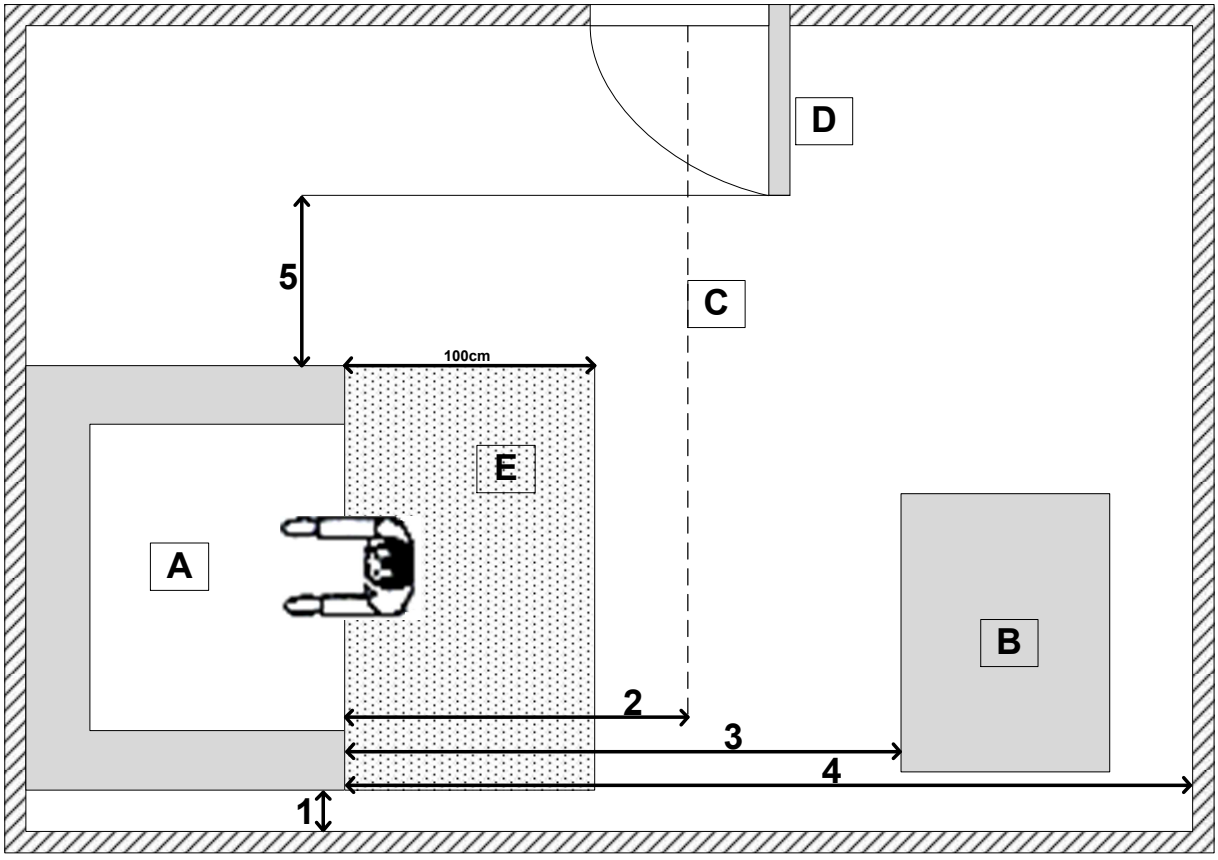
The elements of the fume hood standing on the floor have the ability to adjust the height (does not apply to the table top version). After each fume hood relocation, it must be leveled before starting work.



10. Fume hood positioning recommendations

The method of placing the fume hood inside the room may affect its ability to contain dangerous substances, therefore it is recommended to avoid placing it near the elements that may disturb the proper operation of the fume hood. These elements include: walls, columns, cabinets, worktops and other elements that may disturb the air flow, and communication routes..

Recommended distances from individual elements of the fume hood environment are shown in the diagram below.



A. Fume hood
B. Table positioned next to the fume hood
C. Communication route
D. Doors
E. Undisturbed operator zone - approx.:(width of cupboard) x 100 cm

Nr	Element	Zalecana minimalna odległość (cm)
1	Distance from side of the fume hood to a nearest wall or significant body (i.e. cabinets, column etc.) Note: This does not include a second fume hood	30
2	Distance from the fume hood front to a traffic route..	130
3	Distance from the fume hood front to a table.	150
4	Distance from the fume hood front to a opposite wall	200
5	Distance between undisturbed zone and any regularly opening door. Escape routes which are not in normal use are excluded from this requirement.	100

11. Operating conditions

Fume hood should work in laboratories, heated or ventilated equipment rooms, heated or ventilated halls. It is forbidden to locate them in places exposed to vibrations, high temperature or mechanical impacts.

Maximum permissible concentration of gases (for a single gas) is

Gas	**Concentration [mg/l]**
SO_2	0,025
H_2S	0,025
Cl_2	0,003
NO	0,035
NO_2	0,035
NH_3	0,040

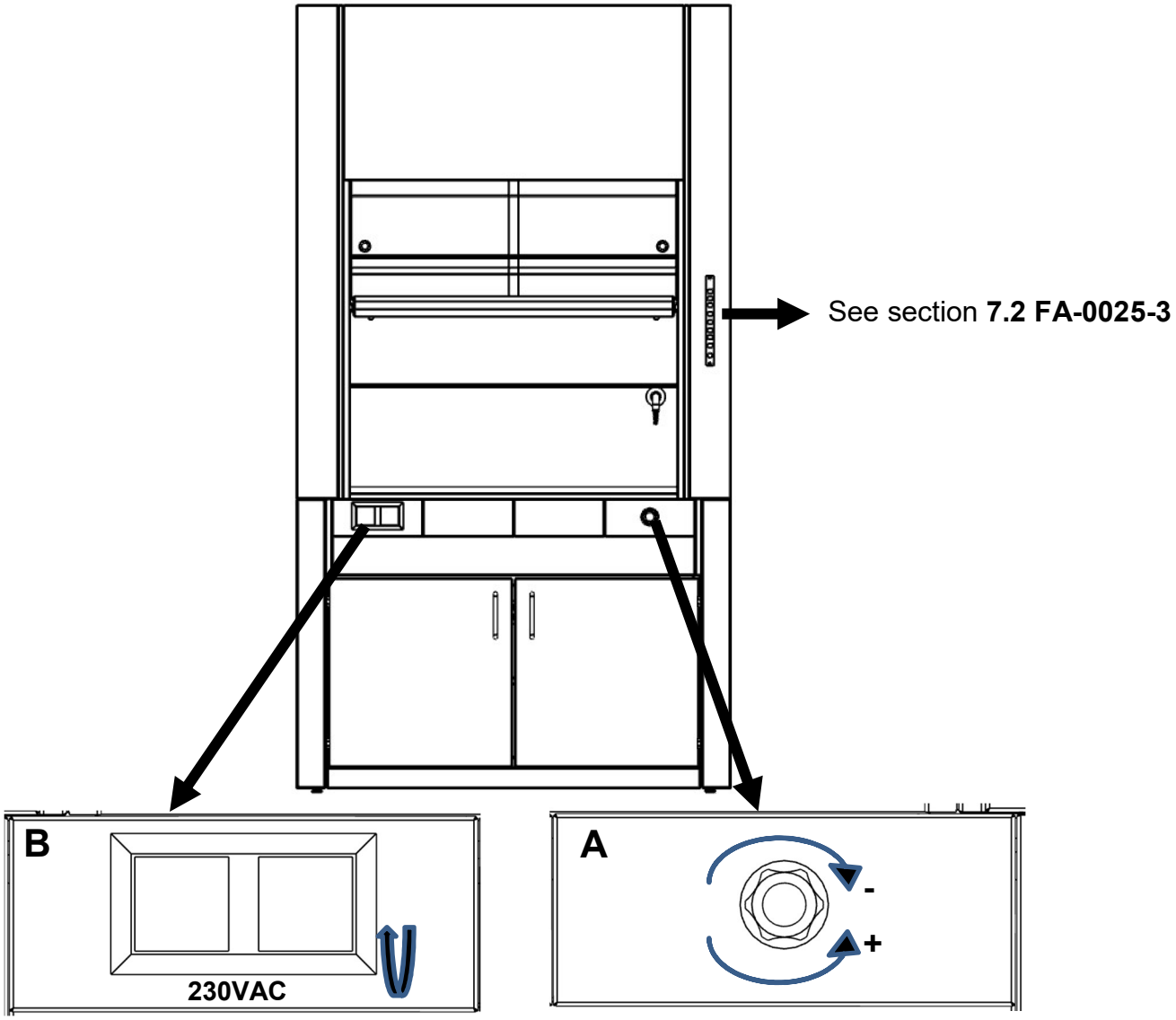
In the case of gas mixtures, the total of concentrations for all of the component gases, defined in percent, cannot be higher than 100% of maximum permissible concentration.

12. Fume hood operation

- Before starting work in the working chamber, turn on the lighting and start the exhaust fan. Easy access to the chamber without lifting the entire window ensures the possibility of moving the windows that make up the window.
- After finishing work, the fan should remain on until all accumulated vapors are removed from the chamber.
- Closed fume hood window protects against the effects of possible explosions in the working chamber.
- Open the window only when it is necessary at work.
- When carrying out laboratory work, when the panes are open or the window is open, avoid moving quickly relative to the air inlet, both in the chamber and in the fume hood itself, to avoid contaminated air from the working chamber to the room..
- Keeping experimental work should be limited to the most-needed ones
- Depending on the work carried out and the chemicals used, the air flow through the working chamber must be adjusted accordingly.
- Heating devices should be separated from the fume cupboard eg with feet
- Keep an adequate distance between the heat source and the walls.

Illegal activities and restrictions:

- Do not work in a fume hood without first connecting it to the ventilation system
- It is not possible to work in a fume cupboard with improper chemical load.
- The fume cupboard can not be treated as a place for storing various reagents, flammable substances, acids and bases.
- Fume cupboards in accordance with DIN 12924 part 1, can not be used for work with aggressive chemicals in open systems.
- You can not use organic solvents with medium polarity such as, for example, acetone, ethylene or chlorinated water with carbon.
- Do not use agents whose use destroys the surface layer of the furniture.



A.

Taps installed on the back wall of the working chamber are controlled by valves mounted on the exchangeable panel.The specific tap control valve is located underneath it and has the same colored ring. Markings of the colored rings – see section 14. The valves must be connected to the taps using appropriate couplings. In some versions of the valves, it's required to first press and then turn the valve (Press & Turn system)

B.

The voltage of 230VAC or 115VAC* in the plug-in sockets is present continuously. Maximum total load of all 15A fume hood sockets *. The sockets are protected against splashing with liquids - they have a degree of protection IP44 in accordance with EN 60529.

* the load and voltage can be configured according to individual requirements, so it may differ from the above values

13. Maintenance



Before proceeding with any cleaning and maintenance operations, disconnect the fume cupboard power plug.

Maintenance

- Keep all surfaces clean.
- Protect all areas of paint damage from corrosion.
- At least once a year, inspect the condition of the steel cables between the window and the counterweight. The cables are located in a plastic cover. If they are damaged, they should be replaced.
- Check the air draft values at least once a year. If there are discrepancies with factory settings values, the functioning of alarm systems must be adjusted.

Cleaning and washing

- Each time after finishing work, but at least once a day the fume hood should be cleaned from any liquid splashes, especially inside the work chamber;
- Once a week all the fume hood surfaces should be cleaned with warm water with addition of a surface-active agent, then washed off with warm water and wiped dry;
- Common household and technical cleaners may be used for cleaning the fume hood;
- Clean the chemical vapor drainage channels regularly.

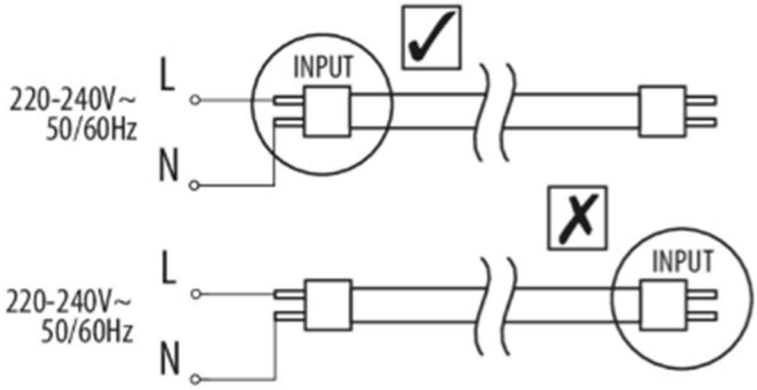
13.1 LED tube replacing

Consumable: LED tube , G13, T8, single-sided power supply 220-240VAC

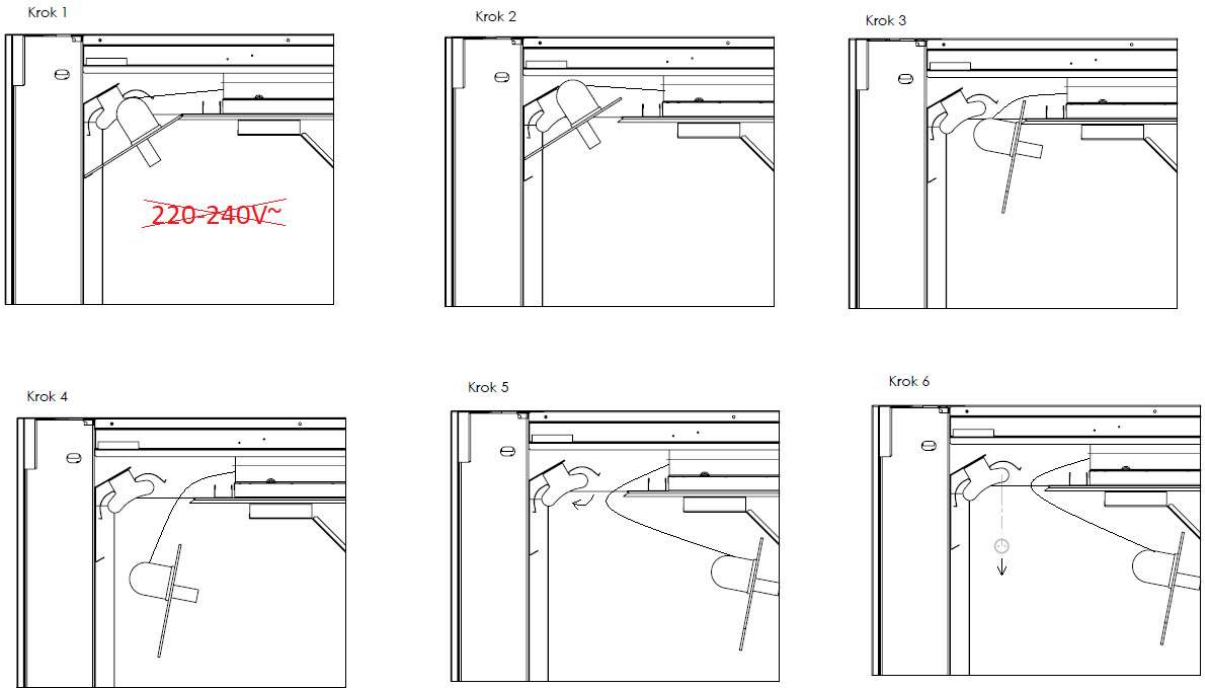
LED tube sizes:

Size / Version	800	1200	1500	1800
DLC	-	600mm	1200mm	1200mm
DCL tabletop	600mm			-
DCL walk-in	-	600mm	1200mm	1200mm

	LED tube in EX-housing have different properties



	The use of a LED tube with double-sided power supply or incorrect installation of a LED tube causes permanent damage to the control system.



Step 1

Turn off the power supply to the fume hood by removing the plug from the power outlet.

Step 2

The LED tube is replaced from the foom hood working chamber side

Step 3

Raise the LED tube cover with the upper edge upwards and lower the lower edge towards the tabletop.

Step 4

Take special care not to damage the AFS100 air velocity sensor cable.

Step 5

Turn the LED tube until released from the handles

Step 6

Remove and replace the LED tube.

Step 7

Assembly the lamp and insert electric plug into electric socket.

14. Marking and labeling

According to EN 14175-2, the following inscriptions appear on the sliding window:

If possible sliding window should be closed.

Do not open vertical and horizontal windows at the same time

Labels are made as standard in Polish or English.

The tap valves are marked according to the colour code (EN 13792) which represents flowing medium.The fittings markings consist of 3 colored rings where the middle one indicates the international name of the medium , e.g. WPC.

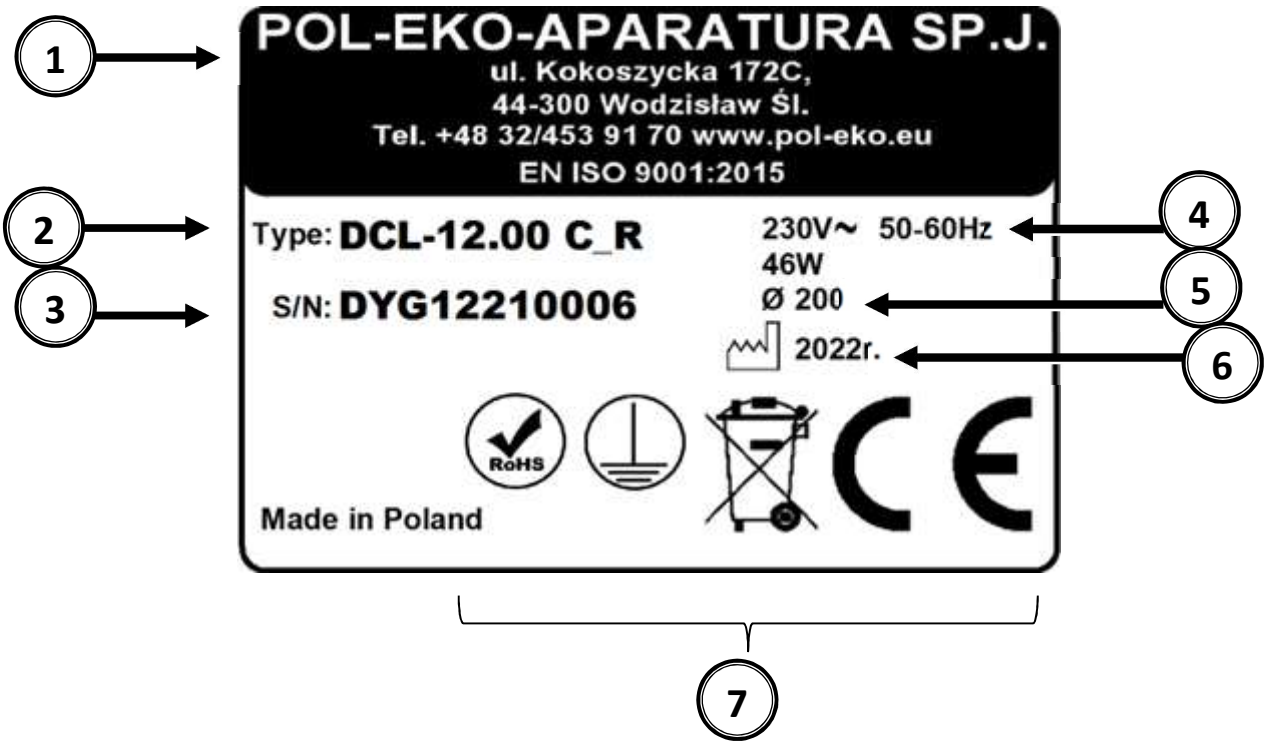
Outer ring colour :

COLOUR	MEDIUM
Green	Water
Yellow	Flammable and gaseous hydrocarbons
Red	Other flammable gases and gas mixtures
Blue	Non-flammable gases including oxidising gases
Black	Toxic gases
Grey	Vacuum
White	Other



Depending on the carried out work and used chemical reagents, the User is obliged to mark the fume cupboard with appropriate warning signs (pictograms).

The product identification plate is located on the front of the fume hood. Example of a plate shown below.



1. Manufacturer's data
2. Unit type
3. Serial number
4. Supply voltage
5. Extract-air manifold diameter
6. Year of manufacture
7. Other markings (RoHS, WEE2, CE)

15. Periodic inspections

Periodic inspections should be carried out by POL-EKO Aparatura sp.j. or by authorized company. The frequency of inspections depends on the conditions and intensity of fume hood operation and is subject to individual customer assessment. Recommended time period after which the periodic inspection should be carried out is **up to 12 months**.

Request for periodic inspection see section **16. Warranty and repairs**

List of paid parts which should be exchanged during periodic inspection..

DCL version*			
No.	Name	Catalogue number	Quantity
1	Stainless steel line PVC braided 2/3mm 7x7	DQ-PP 2/3mm 7x7	~7 m
2	Polyamide roller Ø 52mm compatible with Ø 6 mm steel line,	Marlon C52/6Ł	3pcs.
3	First slide for the fume food window (mounted in the fume hood)	POL-EKO PRT-1017798	2pcs.
4	Second slide for the fume hood window (mounted in the sash)	POL-EKO PRT-1017800	2pcs..

DCL table top version*			
No.	Name	Catalogue number	Quantity
1	Stainless steel line PVC braided 2/3mm 7x7	DQ-PP 2/3mm 7x7	~7m
2	Polyamide roller Ø 52mm compatible with Ø 6 mm steel line,	Marlon C52/6Ł	3pcs
3	First slide for the fume food window (mounted in the fume hood)	POL-EKO PRT-1017798	2pcs.
4	Second slide for the fume hood window (mounted in the sash)	POL-EKO PRT-1017800	2pcs..

DCl walk-in version*			
No.	Name	Catalogue number	Quantity
1	Stainless steel line PVC braided 2/3mm 7x7	DQ-PP 2/3mm 7x7	~12m*
2	Polyamide roller Ø 52mm compatible with Ø 6 mm steel line,	Marlon C52/6Ł	10pcs.
3	slide for the fume food window	POL-EKO PRT-1038951	2pcs.
4	slide for the fume food window	POL-EKO PRT-1038920	1pcs.
5	slide for the fume food window	POL-EKO PRT-1038924	1pcs.
6	Slide guide	POL-EKO PRT-1026684	2pcs.

7	Slide guide	POL-EKO PRT-1026686	2pcs.
8	Slide guide	POL-EKO PRT-1026678	4pcs.

** does not apply to the version with reduced height.*

List of other spare parts ** (standard version)

No.	Name	Catalogue number	Quantity
Sensors and controllers			
1	Airflow velocity sensor AFS 100 with FA-0025-3 control panel	Schneider FM 550-A-0-E	1pcs.
2	Opened window sensor	Bolarus AE-E3111CAGYGY	1pcs.
Lighting*			
4	LED tube housing; T8; G13; single-sided power supply	Elgo RIGAstar 60-2/1 or Elgo RIGAstar 120-2/1	1pcs.
5	Luminaire reflector; RIGAstar 60-2/1; double or Luminaire reflector; RIGAstar 120-2/1; double	OP-RS2T8S-06 or OP-RS2T8S-12	1pcs.
Electrical sockets			
6	Electrical socket AC (single); white; with flap	Simon 54 Premium DGSZ1BZ.01v/11A	2pcs.
7	White double socket frame	Simon 54 Premium DR2/11	1pcs.
Water instalation			
8	Water valve	Broen 25115011001	2pcs.
9	90mm tap - water	Broen 2511 131 1001	2pcs.
10	1200mm hose; water; couplings: Uniflex-Uniflex (valve-tap)	Broen 93 V 2020 1200	2pcs.
11	1500mm hose; water; couplings: Uniflex-GW1/2" (valve-connection)	Broen 93 V 4020 1500	2pcs
12	0-20mm Uniflex tap connector	Broen 1521036	2pcs
13	RWC90 elbow tap connector	Broen 1521052	2pcs
14	Rosette	Broen 1521057G	2pcs
15	Siphoon for the sink 1.1/2”x50mm	HC7	1pcs

Names that are registered names/trademarks are used in this documentation for informational purposes only and are the property of their respective companies or institutions.

** catalogue numer depends on fume hood size*

*** the manufacturer reserves the right to make changes at any time regarding characteristics of the product and components used*

16. Warranty and repairs

"POL-EKO-APARATURA" guarantees the warranty of the unit within 24 months from the date of sale, provided that it is properly used in accordance with this manual. In order to maintain the warranty on the fume hood, it is necessary to observe periodic inspections, including checking the correct operation of fume hood electronics and inspecting the condition of safety-critical elements (window links together with the guidance system, extraction gap, connection to ventilation, alarm signaling).

The model service request and warranty conditions are set out on the manufacturer's website

PL	ENG
http://www.pol-eko.com.pl/serwis	https://www.pol-eko.com.pl/service/

Warranty repairs should be reported to the following address

POL-EKO-APARATURA Sp.j.
ul. Kokoszycka 172 C
44-300 Wodzisław Śl.

Contact:

PL	ENG
Tel: 32 453 91 70 E-mail: serwis@pol-eko.com.pl	Tel: +48 32 453 90 30 E-mail: export.service@pol-eko.com.pl

Despite all efforts made, the manufacturer reserves the right to encounter errors in this documentation. In case of ambiguity, please contact the manufacturer to consult them.

17. Appendices

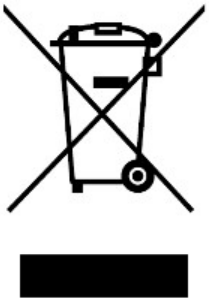
Appendices are attached in accordance with the order and are delivered with the device

18. Reprocessing

Worn out components and consumables must be disposed of in a manner consistent with applicable environmental regulations. The rate of wear of particular elements and consumables depends on the working conditions as well as on the intensity of use.

ENVIRONMENTAL PROTECTION AND EQUIPMENT DISPOSAL

The packaging protects the device against damage during transport. The materials used on packaging are harmless to the environment and can be reused. Please remove the packaging in an environmentally compatible manner or have it recycled. Our device is also made of materials that, after use, can be recycled to recover valuable raw materials.



The product is marked in accordance too the European WEEE 2 regulations on used electrical and electronic devices (waste electrical and electronic equipment). These provisions set the framework conditions for the return and recycling of used equipment valid throughout the European Union.

19. Registry of services

Lp.	Data	Opis przeglądu	Wykonawca	Podpis
1				
2				
3				
4				
5				
6				
7				
8				

20. CE certificate

DEKLARACJA ZGODNOŚCI UE

EU DECLARATION OF CONFORMITY

Produkt:	***Product:***
Dygestorium	*Fume hood*
Model:	***Model:***
DCL-1200; DCL-1500; DCL-1800 DCL-800 nastołowe; DCL 1200 nastołowe; DCL -1500 nastołowe DLC-1200 walk-in; DLC-1500 walk-in; DLC-1800 walk-in	
w wersjach:	***in version:***
-	
Nazwa i adres producenta:	***Name and address of the manufacturer:***
POL-EKO-APARATURA sp.j. A. Polok-Kowalska, S. Kowalski ul. Kokoszycka 172c 44-300 Wodzisław Śl.	
Niniejsza deklaracja zgodności wydana zostaje na wyłączną odpowiedzialność producenta.	***This declaration of conformity is issued under the sole responsibility of the manufacturer.***
Wymieniony powyżej przedmiot niniejszej deklaracji jest zgodny z odnośnymi wymaganiami unijnego prawodawstwa harmonizacyjnego:	***The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:***
LVD 2014/35/UE RoHS 2015/863 WEEE 2012/19/UE	LVD 2014/35/EU RoHS 2015/863 WEEE 2012/19/EU
Odniesienia do odnośnych norm zharmonizowanych, które zastosowano, lub do innych specyfikacji technicznych, w stosunku, do których deklarowana jest zgodność:	***References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:***
LVD	PN-EN 61010-1:2011
RoHS	PN-EN IEC 63000:2019-01
Oraz normy (*And norms:)*	PN-EN 14056:2005 PN-EN 13150:2004 PN-EN 14175-1:2006 PN-EN 14175-2:2006

POL-EKO-APARATURA sp.j.
DYREKTOR
Sebastian Kowalski

Wodzisław Śl. 24.05.2021 (Director)

anufacturer of laboratory equipment
and authorized distributor of:
WTW, Thermo Scientific, Knick.

ISOCERT CERTYFIKAT

POL-EKO-APARTATURA sp.j.
A. Polok-Kowalska, S. Kowalski
ul. Kokoszycka 172 c, 44-300 Wodzisław Śląski
tel. 32 453 91 70, fax 32 453 91 85

e-mail: info@pol-eko.com.pl
web: https://www.pol-eko.com.pl/home-en/ * https://smart4lab.eu/smart-en/

We produce:

- thermostatic cabinets
- laboratory refrigerators
- laboratory incubators
- devices with photoperiod and phytotron system
- drying ovens and sterilizers
- drying ovens with nitrogen blow
- laboratory freezers
- ultra-low freezers
- climatic chambers
- Caldera fluid and blanket warmers
- colony counters
- laboratory shakers
- stationary samplers
- Hydromat water dispensers
- Eurodrop stations
- FEKO+ waste water receipt station
- heating ovens
- cooled incubators
- Compact lab designing
- fume hoods

We offer portable, laboratory and on-line equipment:

- pH-meters
- ionmeters
- dissolved oxygen meters
- conductivity meters
- photometers and spectrophotometers
- thermo reactors
- turbidity metres
- pH electrodes
- conductivity sensors
- oxygen probes
- heavy metals trace analyzers
- water baths
- autoclaves
- pH buffer solutions
- conductivity standards
- photometric tests
- laboratory accessories
- consumables

We organize:

- regional trainings
- individual trainings
- seminars

We provide:

- warranty and post-warranty service
- consultancy in the selection, maintenance and operation of laboratory equipment

POL-EKO LAB is Accredited by the Polish Centre for Accreditation (a member of ILAC) and provides accredited calibration of:

- thermostatic and climatic chambers (incubators, drying ovens, thermostatic cabinets, climatic chambers, freezers)
- water baths and thermo reactors
- autoclaves
- electric and electronic thermometers
- data loggers
- high temperature laboratory furnaces
- thermohygrometers
- laboratory sieves

PCA Polskie Centrum Akredytacji WZORCOWANIE
AP 115

Calibration is confirmed with the issue of 'Calibration Certificate'.

Services outside the scope of accreditation:

- checking equipment for physicochemical measurements (meters and probes),
- carrying out IQ, OQ, PQ qualification procedures,
- mapping of temperature and humidity in the rooms