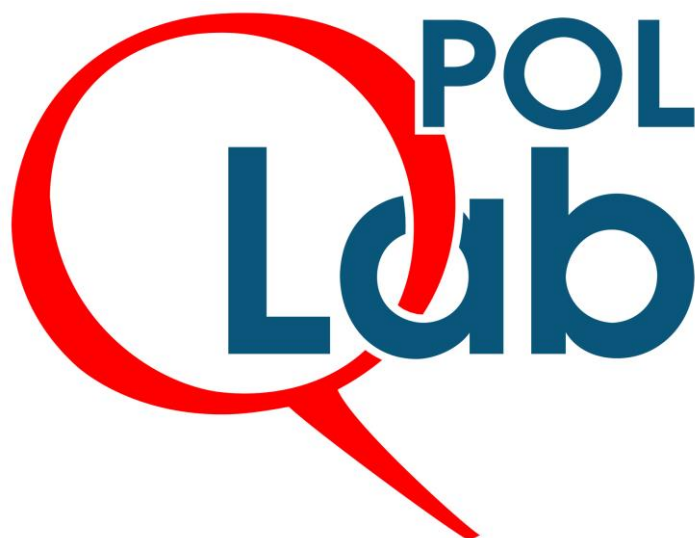


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Technical Specification

Laminated Fume Cupboard Q-Optimal

Type:

DSL 12.00
DSL 15.00
DSL 18.00
DSL 21.00



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1. General description

Fume cupboards 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, with the exception of explosive substances i.e. ether with hydrofluoric or hydrosiliconfluoric compounds.

The Q-Optimal fume cupboards are based on an epoxy powder-coated steel frame. The cupboards walls are made of high-density chipboard, covered with high-pressure laminate, with sides covered with 2mm PVC.

The work chamber is made from laminated chipboard panels (for laboratories with low requirements for chemical and thermal resistance). For work with aggressive chemicals, concentrated acids and alkalis or hydrofluoric acid other linings are available and recommended. The exhaust slot system is always made completely of the same material as used for work chamber lining (with the exception of laminated chipboard work chamber, where the baffle is made of Max Resistance phenolic resin).

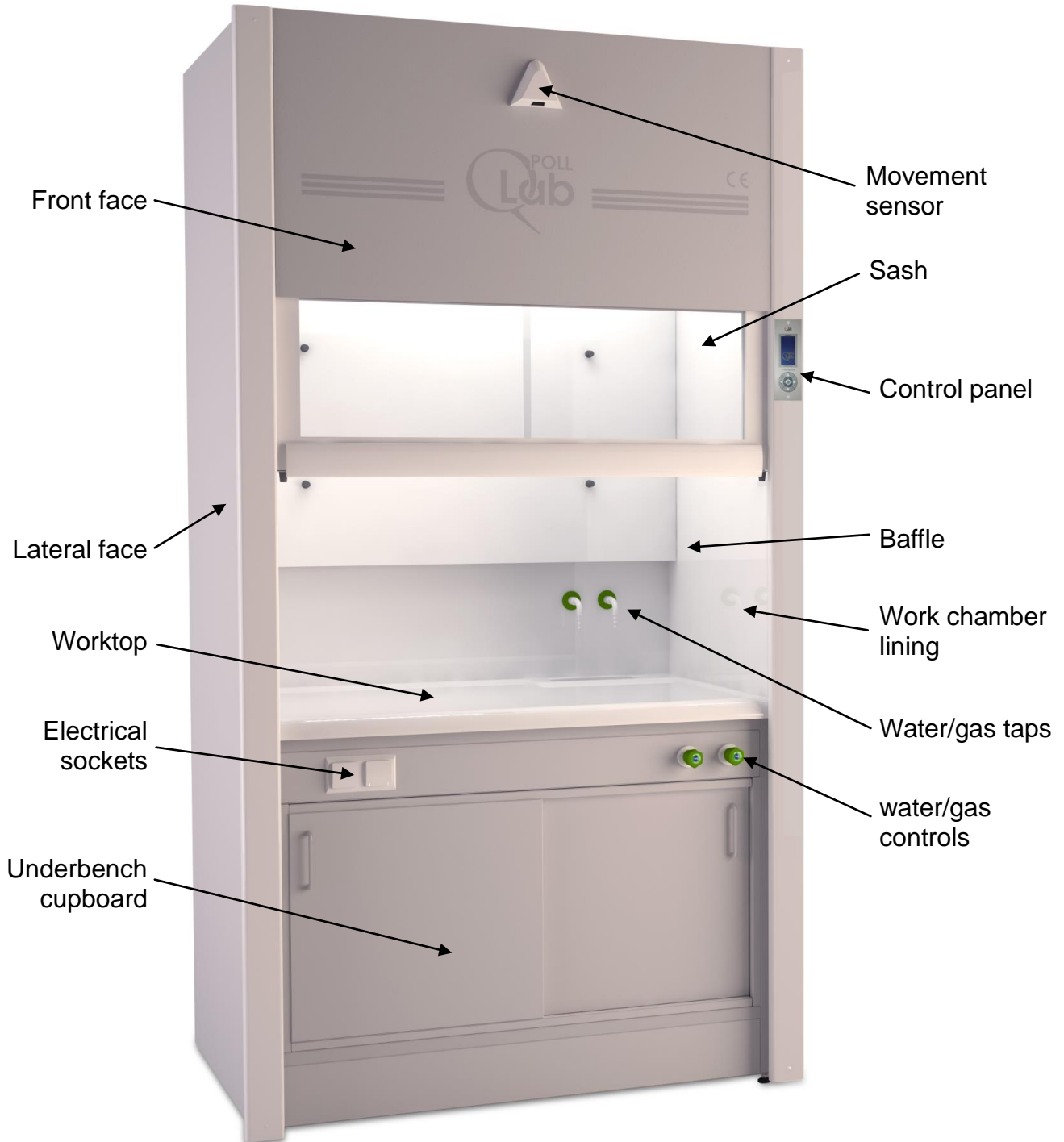
A sink and two water taps, operated from the front panel are fitted as standard, however a fume cupboard without sink or water taps can be produced on request. Other taps (for gases, vacuum and other) are available and their controls are also mounted below the worktop.

The built-in under-bench laminated chipboard cupboard is connected to the fume cupboard ventilation system, providing a safe place for short-term storing of chemicals during work. For long term storing of reagents special chemical storage cabinets should be used.

The sash may be equipped with a stop-lock at 500 mm opening height for maximum safety.

Sufficient lighting is provided by a double glow discharge tube lamp. The lamp cover also performs the role of a safety hatch, allowing a safe shock wave pressure release in case of an explosion in the work chamber.

The Q-Optimal fume cupboards meet the requirements of:
EN 14175, EN 61010-1, EN 12600:2002, EN 12665, ISO 2813, EN 14056:2003.



2. Technical Data

Dimensions				
Model	1200	1500	1800	2100
Width (mm)	1270	1570	1870	2170
Depth (mm)	930			
Height closed/open sash (mm)	2400 / 2470			
Worktop height (mm)	900			
Workspace dimensions:				
width (mm)	1150	2050	1750	2050
depth (mm)	700	700	700	700
height (mm)	1350	1350	1350	1350
Maximum sash opening (mm)	720			
Recommended air flow speed at front face (m/s)	0,3 - 0,5			
Extract-air manifold (mm)	Ø160	Ø200	Ø250	Ø250

Variants		
Element	Standard	Optional
Worktop (for details see chapter 3.4)	<ul style="list-style-type: none"> • Solid Ceramics 	<ul style="list-style-type: none"> • Durcon epoxy resin • Polypropylene • Stainless steel • Phenolic resins • Quartz-Granite conglomerate
Work chamber lining (for details see chapter 3.5)	<ul style="list-style-type: none"> • Laminated chipboard 	<ul style="list-style-type: none"> • Large-size Buchtal ceramics • Polypropylene • Max Resistance phenolic resins
Sash window	<ul style="list-style-type: none"> • MDF frame with two sliding glass panes 	<ul style="list-style-type: none"> • Aluminium frame with single glass pane • Polycarbonate panes available for both frame types
Flow control (for details see chapter 3.6)	<ul style="list-style-type: none"> • Q-Flow Advanced 	<ul style="list-style-type: none"> • Q-Flow Compact • Schneider FM 100

3.6)		<ul style="list-style-type: none"> • Schneider FM 500 • Schneider iCM • Q-Flow Advanced EXT
Sash operation	<ul style="list-style-type: none"> • Manual 	<ul style="list-style-type: none"> • Manual with motion detector and sash open signalling (Manual Protect) • Automated with motion detector (Auto Protect)
Lighting	<ul style="list-style-type: none"> • Fluorescent lamp with 2 tubes 	<ul style="list-style-type: none"> • EX explosion-proof lamp with 2 tubes
Fittings (for details see chapter 8)	<ul style="list-style-type: none"> • Two water taps in the back wall, operated from the front panel • Sink made of the same material as worktop • Two 230V 16A sockets on the front panel 	<ul style="list-style-type: none"> • Up to 4/6/8/12 (1200/1500/1800/2100 model) gas taps for flammable and inflammable gases, vacuum, air and other, installed in the work chamber, all operated from the front panel • Additional 230V 16A sockets • 400V socket • Scaffolding inside the work chamber
Side panel glazing	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Available for one or both sides
Underbench cupboards	<ul style="list-style-type: none"> • Laminated chipboard ventilated cupboard with sliding doors • PVC internal lining • 1 shelf 	<ul style="list-style-type: none"> • Lock • Polypropylene cupboard
Guarantee	<ul style="list-style-type: none"> • 24 months 	<ul style="list-style-type: none"> • 36 months

3. Electrical installation

The Q-Flow control system electrical installation consists of:

- Air flow sensor - integrated on the mainboard
- Open sash sensor - circuit-breaker switch indicating sash opening above 50 cm
- Power adaptor - integrated on the mainboard
- Lighting control circuit - integrated on the mainboard
- Ventilation fan control circuit - relay output on the mainboard
- External alarm signalling devices control circuit - - relay output on the mainboard (optional)
- Electrical sockets control circuit - relay output on the mainboard (the sockets may also be installed with this relay bypassed - power always on)

The fume cupboards' wiring system consists of:

- Two 230V 16A electrical sockets
- Fluorescent lighting with two glow discharge tubes type JP54 (2x36W)
- Electrical wiring 1,5 mm²

The lighting power supply may be connected to the same phase as the control system, in which case the L and L1 power inputs on the mainboard should be bridged.

The phase on input L1 feeds the lighting.

The Q-Flow control system user manual is attached in a separate document.

4. Technical requirements

Installation instructions

Fume cupboard installation is performed by the manufacturer, together with water, sewage, ventilation and electrical connections. The user is obliged to install a residual-current device on the power line.

The fume cupboard should be stored in a safe place before installation, and steps should be taken to minimise the risk of damaging the cupboard in any way. Similar precautions should be taken if there is any structural work to be done in the vicinity of the cupboard. The recommendations supplied by the manufacturer should be complied with at all time.

Prior to the delivery the possible access to the laboratory should be inspected (preferably using the "Delivery checklist" supplied by the manufacturer) and a suitable storage place for storing the cupboards before installation should be prepared. If the corridors do not provide a sufficient access way, an outside scaffolding for access through the window might be necessary.

When evaluating the possible access, special attention should be drawn to:

- a) door dimensions;
- b) staircases and landings;
- c) lift load capacity and dimensions;
- d) corridor dimensions, corridor bends and potential obstacles

The receiver should give the installation crew full information on the access way to the desired installation place.

Fume cupboards may be installed in premises at least 2,75m high and have to be connected to an operational forced ventilation system.

Fume cupboard cannot be installed if the air temperature or humidity is significantly different from the temperature or humidity at the storage place. Storing is only allowed in the following conditions:

- a) air temperature -10°C to $+30^{\circ}\text{C}$
- b) relative humidity at 20°C : 40-70%

If it is necessary to install the fume cupboards before drying of the building, after finishing the works the building should be heated and dehumidified for a couple of days. It is recommended to use dehumidifiers instead of just heating devices, if this is not possible, the premises should be well ventilated during the process.

It is recommended that all the room surfaces, including ones that will be covered by the fume cupboard are renovated before installation. This will reduce the need for renovation if the laboratory should be rearranged in the future. It is recommended to finish all the construction works before installing the fume cupboards. If not possible, the cupboards should be well protected from damage before commissioning.

The fume cupboard's supports have adjustable feet, that allow levelling of the worktop. This should be done each time the cupboard is moved, before commencing work in it. There is a possibility of fixing the fume cupboard to the wall, using a method recommended by the manufacturer.

The placement of the cupboard should provide sufficient space for the arrangement of service devices. The service devices should be divided and coded into the following groups:

- a) electrical;
- b) communication;
- c) water;
- d) water-vapour, steam and condensate;
- e) each gas;
- f) sewage.

The cold and hot water and steam pipes need to have thermal insulation. All the pipes should be fixed in a way preventing them from deformation during use.

The power feeding devices placement depends on the fume cupboard positioning. Placing the electrical connections on the ground should be avoided. Wall connections should be easily accessible.

The sockets' openings (including typical voltage electric networks, electric networks of atypical voltage, computer and communication networks) should be covered and

protected from liquid penetration. The sockets have to be made in conformity with national technical standards and have to be cased in a metal or plastic housing.

If electric equipment is built into the fume cupboard, one has to assume the possibility of contact with liquids and corrosives, mechanical impact or contact with flammable gases and fumes and choose an adequate way of securing the equipment.

Installation conditions:

1. Ventilation

Before installation of the fume cupboards the client is obliged to provide an exhaust ventilation system, allowing adequate air exchange rate according to a project, prepared by a qualified designer. The installation should be commissioned by an authorised supervision inspector. The ventilation system should comply with the EN 14175-2 regulations.

2. Water supply

The water output should consist of a ½" ball valve behind the fume cupboard and at the height of no more than 50–60 cm from the floor.

3. Sewage

The sewage input should be released from the floor or a wall behind the cupboard with a PP pipe connection 50 mm in diameter, placed approximately 20-25 cm above the floor.

4. Electrical installation

An electrical (230V, 50Hz) installation should be prepared, with YDYP 3x2,5 mm² cable, ending with an electrical box at 50cm above the floor, behind the fume cupboard.

5. Gases

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

5. Operating conditions

Fume cupboards 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.

Fume cupboards should be used only in places secured from the risk of fire, explosion, high temperatures or influence of magnetic and electromagnetic fields.

Fume cupboard should be used only in places where it is not necessary to use

personal protection, according to Health and Safety at Work rules.

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

Gas	Concentration (mg/l)
SO ₂	0,025
H ₂ S	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.

6. Fume cupboard functioning

Fume cupboard performs two tasks:

- Primary - contains and conveys potentially dangerous or irritating fumes from the fume cupboard workspace to an outside discharge point where it can be safely dispersed at low concentration.
- Secondary - the underbench ventilated cupboard designed for short-term storing of chemicals and reagents

The work chamber is ventilated through a baffle system, with slots for full width of the cupboard situated on the back wall just above the worktop (for heavy gases and fumes collection) and at the top of work chamber (for light gases and fumes collection). On the front face the work chamber has a sash, with single non-moveable glass pane or two horizontally moveable panes (depending on frame type). The sash has limiters, that leave an air intake gap between the sash and worktop after the sash is closed.

All media controls and electric sockets are located on a panel below the worktop.

The Q-Flow monitoring and control system is installed as standard. Other systems from Poll Lab or Schneider Electronics are also available.

The Q-Flow is available with the following functionality:

- flow monitoring with optical and acoustic signalling of insufficient airflow
- LCD display showing the air flow rate in m³/h and current time when in standby mode
- sash opening height of >50cm monitoring and signalling
- monitoring and signalling of alarm states
- "Night mode" - for monitoring work with reduced flow rate (lower minimum flow speed alarm level)

- output for external alarm signalling devices (optional)
- fume cupboard lighting switch with timer
- battery backup with battery protection
- battery work control LED
- timer with acoustic signalling
- different buzzer sounds for different alarm states
- 230V sockets control switch with programmable switch-off time (optional)
- ventilation fan power-on control
- connections for in-room temperature and humidity sensors
- connections for workspace temperature and humidity sensors (caution - sensors not resistant to aggressive work environment)

Information regarding other available control and monitoring systems may be found in appropriate system's specifications.

There are two additional safety systems available for Q-Flow:

Manual protect - consists of a motion sensor monitoring the presence of the operator in front of the fume cupboard, sash height sensor and a signalling LED on the control panel. If no motion is recorded in front of the fume cupboard for a defined time and the sash is open, the LED begins to flash, signalling that the sash should be lowered for improved safety.

Auto protect - consists of a motion sensor working similarly to the one in Manual protect, sash height sensor and an electric motor capable of moving the sash. If no motion is recorded in front of the fume cupboard for a defined time and the sash is open, the motor closes the sash to improve safety and limit the required air flow, what helps reduce the running costs. A light barrier in the sash stops the movement if any obstacles, protruding through the sash opening are found. This may also be used to stop the sash by hand. The system has three operating buttons - "Up", "Down" and "Stop", all positioned on the side panel. These can be used to move the sash, although it also incorporates movement initialisation by sliding the sash by hand.

7. Fume cupboard operation

- Before commencing work in the cupboard it is required to switch on the light, ventilation and control systems;
- After finishing work, the ventilation should keep working until all fumes are removed.

Rules of conduct during work

- The bigger the range of different activities performed in the fume cupboard, the higher the risk of explosion;
- Closed sash is the best way to protect from contaminants and possible explosion;
- The sash should be opened only when it is necessary for the current activity;
- During work when the sash is lifted, it is recommended to avoid fast and violent moving through the air flow, to prevent the contaminants from the fume cupboard from leaking out of it and into the laboratory;
- Experimental work conducted in the fume cupboard should be limited only to the necessary;
- It is required to regulate the air flow through the work chamber, according to currently performed actions and used chemicals;
- Work chamber should be periodically cleaned from the residues left after work;
- The baffle and ventilation system should be periodically cleaned.

Prohibited actions:

- It is forbidden to conduct work in the fume cupboard without prior connecting to the ventilation system;
- The maximum permissible heat loads should never be exceeded;
- Heating devices should be positioned on distance feet
- It is forbidden to conduct work in the fume cupboard with improper chemical load;
- The minimal distance between a heat source and work chamber walls should never be exceeded;
- The fume cupboard should never be considered a storage place for reagents, flammable substances, acids and alkalis;

8. Conservation

Fume cupboard conservation includes:

- Keeping all the surfaces clean;
- Periodically checking all the earthing connections, especially ones for ventilation shaft, underbench cupboard and chassis;
- Temporarily securing any scratches and damages to prevent corrosion;
- The sash is held by a counterweight in any position. The counterweight and sash are connected by steel cables covered in plastic. The cables should be checked once a year and changed if any signs of damage are found;
- The air flow monitoring system should be checked at least once a year. If any inconsistency between the readings and measurements is found, the system and alarm levels have to be recalibrated.

Cleaning

- Each time after finishing work, but at least once a day the cupboard should be cleaned from any liquid splashes, especially inside the work chamber;
- Once a week all the cupboard's surfaces should be cleaned with warm water with addition of a surface-active agent, then washed off with warm water and wiped dry;
- When necessary but at least once every 3 months the sash sliding guides should be lubricated with vaseline;
- Common household and technical cleaners (including alcohol-based, ethyl or propyl alcohol) may be used for cleaning the cupboard;
- If stains occur benzine or kerosene should be used
- It is prohibited to use organic solvents with medium polarization like acetone, ethylene or chlorinated water with carbon;
- It is prohibited to use scrubbing cleaners, as they may have an adverse effect on furniture surface smoothness.

Electrical, water and sewage installation repairs

- For access to these installations the underbench cupboard should be taken out of the fume cupboard chassis. Limited access is also available after removing the side back covering panel.

9. Health and Safety

It is required to assure conformity with all health and safety and fire prevention rules mandatory in the laboratory and other common rules, like:

- Making the workplace safe and eliminating or controlling health risks;
- Ensuring the premise and machinery are safe and that all work safety systems are set and followed;
- Providing adequate health and welfare facilities;
- Giving the workers information, instructions, training and supervision necessary for their health and safety;
- Consulting the workers on health and safety matters;

Any repairs of the electrical, gas or water installations may be performed only by authorised personnel and after disconnecting from the supply installation.

10. Warranty and repairs

Pol-Lab Sp. z o.o. sp. k. guarantees the product for the time of 24 months from the selling date, provided that it is used properly and according to instructions. The manufacturer is obligated to repair the device in 14 days, unless there is a necessity of delivering parts from abroad. All the repairs have to be performed by authorised service personnel.

11. CE Declaration of Conformity



DEKLARACJA ZGODNOŚCI Declaration of Conformity



My niżej podpisani (producent):

We, the undersigned (manufacturer)

Nazwa firmy: POL-LAB Sp. z o.o. Sp. k.
Company name

Adres: 19 E. Kwiatkowskiego St, 43-365 Wilkowice
Address

Kraj: POLAND
Country

Telefon/fax: +48 33 814 06 93 / +48 33 810 16 28
Phone/Fax number

Adres e-mail: biuro@poll.pl
e-mail

Niniejszym deklarujemy ponosząc za to pełną odpowiedzialność że poniższe urządzenie:
Hereby declare under our sole responsibility that the product listed below:

Nazwa urządzenia: Dygestoria serii Q-Optimal
Product name Fume hoods, Q-Optimal series

Typ: DSL-12.00 DSL-15.00 DSL-18.00 DSL-21.00
Type:

do którego odnosi się niniejsza deklaracja, spełnia wszystkie postanowienia **Dyrektywy 2006/42/WE** oraz jest zgodne z wymogami zasadniczymi zawartymi w normach:
to which this declaration relates, fulfills all Directive 2006/42/WE provisions and is in conformity with the essentials requirements of standards:

PN-EN 61010-1:2011	Wymagania bezpieczeństwa dotyczące elektrycznych przyrządów pomiarowych, automatyki i urządzeń laboratoryjnych. Część 1 – Wymagania ogólne. Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements
PN-EN 60529:2003	Stopnie ochrony zapewnianej przez obudowy. (Kod IP) Degrees of protection provided by enclosures (IP code)
PN-EN 61140:2005	Ochrona przed porażeniem prądem elektrycznym - Wspólne aspekty instalacji i urządzeń Protection against electric shock - Common aspects for installation and equipment
PN-EN 61293:2000	Znakowanie urządzeń elektrycznych danymi znamionowymi dotyczącymi zasilania elektrycznego - Wymagania bezpieczeństwa Marking of electrical equipment with ratings related to electrical supply - Safety requirements
PN-EN 14175: 2006	Wyciągi laboratoryjne Fume cupboards
PN-EN 14056:2005	Meble laboratoryjne. Zalecenia dotyczące projektowania i instalowania. Laboratory furniture - Recommendations for design and installation
PN-EN 13792:2003	Kod barwny do oznaczania zaworów w obsłudze laboratoriów. Colour coding of taps and valves for use in laboratories
PN-IEC 60364-7-713:2005	Instalacje elektryczne w obiektach budowlanych. Wymagania dotyczące specjalnych instalacji lub lokalizacji. Meble.

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Document reference no.

Osoba odpowiedzialna: **Wojciech Łaszczok**

Name of responsible person

Za Spółkę POL-LAB
Spółka z ograniczoną odpowiedzialnością sp. k.

Wojciech Łaszczok
Komplementariusz

Data: **24.06.2016**

Date

Podpis:

Signature:

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