

Keysight PD1500A Double-Pulse Test Rack and Safety Enclosure

Provides detailed information to set-up, operate and maintain the PD1500A Dynamic Power Device Analyzer/Double-Pulse Test Rack and Safety Enclosure. This guide is for system operators and includes safety guidelines.



Operation and
General Maintenance

Notices

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Sales and Technical Support

To contact Keysight for sales and technical support, refer to the support links on the following Keysight websites:

www.keysight.com/find/PD1500A

(product-specific information and support, software and documentation updates)

www.keysight.com/find/assist (world-wide contact information for repair and service)

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The following general safety precautions must be observed during all phases of operation of these instruments. Failure to comply with these precautions or with specific warnings or operating instructions in the product manuals violates safety standards of design, manufacture, and intended use of the instruments. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements.

General

Do not use these instruments in any manner not specified by the manufacturer. The protective features of these instruments must not be impaired if it is used in a manner specified in the operation instructions.

Before Applying Power

Verify that all safety precautions are taken. Make all connections to the instruments before applying power. Note the external markings described under "Safety Symbols".

Ground the Instrument

Keysight instruments are provided with a grounding-type power plug. The instruments must be connected to an electrical ground to minimize shock hazard. The ground pin must be firmly connected to an electrical ground (safety ground) terminal at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

Unless otherwise noted in the specifications, these instruments or system is intended for indoor use in an installation category II, pollution degree 2 environment per IEC 61010-1 and 664 respectively. They are designed to operate at a maximum relative humidity of 50% to 80% at 30 °C or less (non-condensing). These instruments or system are designed to operate at altitudes up to 3000 meters, and at temperatures between 20 and 30 °C.

Do Not Operate in an Explosive Atmosphere Do not operate in the presence of flammable gases or fumes.

Do Not Operate Near Flammable Liquids

Do not operate the instruments in the presence of flammable liquids or near containers of such liquids.

Cleaning

Clean the outside of the Keysight instruments with a soft, lint-free, slightly dampened cloth. Do not use detergent or chemical solvents.

Do Not Remove Instrument Cover

Only qualified, service-trained personnel who are aware of the hazards involved should remove instrument covers. Always disconnect the power cable and any external circuits before removing the instrument cover.

Keep away from live circuits

Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers and shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.

DO NOT operate damaged equipment

Whenever it is possible that the safety protection features built into these instruments have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the instrument until safe operation can be verified by service-trained personnel. If necessary, return the product to a Keysight Technologies Sales and Service Office for service and repair to ensure the safety features are maintained.

DO NOT block the primary disconnect

The primary disconnect device is the appliance connector/power cord when an instrument used by itself, but when installed into a rack or system the disconnect may be impaired and must be considered part of the installation.

Do Not Modify the Instrument

Do not install substitute parts or perform any unauthorized modification to the product. Return the product to a Keysight Sales and Service Office to ensure that safety features are maintained.

In Case of Damage

Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

Measurement Limits

The Truevolt Series DMMs provide protection circuitry to prevent damage to the instrument and to protect against the danger of electric shock, provided the Measurement Limits are not exceeded. To ensure safe operation of the instrument, do not exceed the Measurement Limits shown on the front and rear panel.

The DMMs comply with EN/IEC 61326-2-1, for sensitive test and measurement equipment.

When subjected to transient radiated and/or conducted electromagnetic phenomena, the DMMs may have temporary loss of function or performance which is self-recovering. Recovery may take longer than 10 seconds.

When subjected to continuously present electromagnetic phenomena, some degradation of performance may occur.

Safety and Regulatory Symbols

CAUTION

A CAUTION denotes a hazard. It calls attention to an operating procedure or practice that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING denotes a hazard. It calls attention to an operating procedure or practice, that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Products display the following:



Refer to manual for additional safety information.



Earth Ground.



Chassis Ground.



Alternating Current (AC).



Direct Current (DC).



Standby Power. Unit is not completely disconnected from AC mains when power switch is in standby position



Indicates that antistatic precautions should be taken.



DANGER: High Voltage



Hot Surface; DO NOT Touch!



The CE marking is a registered trademark of the European Community (if accompanied by a year, it is the year when the design was proven). It indicates that the product complies with all relevant EU directives.



The Regulatory Compliance Mark (RCM) is a registered trademark of the Australian Communications and Media Authority.



The CSA mark is a registered trademark of the Canadian Standards Association and indicates compliance to the standards laid out by them. Refer to the product Declaration of Conformity for details.



This symbol represents the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of this product.



Universal recycling symbol. This symbol indicates compliance with the China standard GB 18455-2001 as required by the China RoHS regulations for paper/fiberboard packaging.



R-R-Kst-SP19629

South Korean Certification (KC) mark. It includes the marking's identifier code.

A 급 기기 (업무용 방송통신기자재) 이 기기는 업무용 (A 급) 전자파적합기 기로서 판 매자 또는 사용자는 이 점을 주의하시기 바라 며 , 가정외의 지역에서 사용하는 것을 목적으로 합니다.



Waste Electrical and Electronic Equipment (WEEE)

The crossed-out wheeled bin symbol indicates that separate collection for Waste Electrical And Electronic Equipment (WEEE) is required, as obligated by the EU DIRECTIVE and other National legislation.

Please refer to [keysight.com/go/takeback](https://www.keysight.com/go/takeback) to understand your trade-in options with Keysight in addition to takeback instructions.

Traditional Chinese

根據歐盟指令和其他國家的法律規定，帶有X標誌的帶輪垃圾桶圖案，表示該產品屬於需要進行單獨回收的電子電器產品。

請參考 [keysight.com/go/takeback](https://www.keysight.com/go/takeback)，了解產品回收說明以及Keysight的以舊換新方式。

Simplified Chinese

根據歐盟指令和其他國家的法律規定，帶有X標誌的帶輪垃圾桶圖案，表示該產品屬於需要進行單獨回收的電子電器產品。

請參考 [keysight.com/go/takeback](https://www.keysight.com/go/takeback)，了解產品回收說明以及Keysight的以舊換新方式。

Japanese

車輪付きゴミ箱に×マークは、EU DIRECTIVEやその他の国の法律で義務付けられている廃電気・電子機器 (WEEE) の分別回収が必要であることを示しています。

[keysight.com/go/takeback](https://www.keysight.com/go/takeback) では、製品のテイクバック方法に加えて、Keysight の下取りオプションについてもご紹介しています。

Korean

바퀴달린 쓰레기통의 X 표시는 EU 지침 및 기타 국가 법률에 따라 전기 및 전자 장비 폐기물(WEEE)에 대한 별도 수거가 필요함을 나타냅니다.

제품 회수 지침과 함께 Keysight를 통한 보상 판매 옵션을 이해하려면 [keysight.com/go/takeback](https://www.keysight.com/go/takeback) 을 참조하십시오.

German

Das Symbol der durchgestrichenen Mülltonne auf Rädern weist darauf hin, dass eine getrennte Sammlung von Elektro- und Elektronik-Altgeräten (WEEE) gemäß der EU-RICHTLINIE und anderer nationaler Gesetze erforderlich ist.

Bitte informieren Sie sich unter [keysight.com/go/takeback](https://www.keysight.com/go/takeback) über Ihre Rücknahmeoptionen bei Keysight sowie über die Anweisungen zur Produktrücknahme.

French

Le pictogramme de la poubelle barrée indique que la collecte séparée des déchets d'équipements électriques et électroniques (DEEE) est requise, comme l'oblige la directive européenne et d'autres législations nationales.

Veillez vous référer à [keysight.com/go/takeback](https://www.keysight.com/go/takeback) pour obtenir les options d'échange Keysight en plus des instructions de reprise de produit.

Italian

Il simbolo del bidone barrato indica che è richiesta la raccolta separata dei rifiuti di apparecchiature elettriche ed elettroniche (RAEE), come previsto dalla DIRETTIVA UE e da altre legislazioni nazionali.

Si prega di fare riferimento al sito [keysight.com/go/takeback](https://www.keysight.com/go/takeback) per comprendere le opzioni di Commercializzazione con Keysight oltre alle istruzioni per il ritiro del prodotto.

Spanish

El símbolo del contenedor de basura tachado indica la obligación de recogida selectiva de los residuos de aparatos eléctricos y electrónicos (RAEE), tal y como lo establece la DIRECTIVA de la UE y otras legislaciones nacionales.

Acceda a nuestra página [keysight.com/go/takeback](https://www.keysight.com/go/takeback) para obtener información sobre las opciones de recuperación que ofrece Keysight, y las instrucciones de recuperación del producto.

Portuguese

O símbolo da lata de lixo riscada indica que a necessidade da coleta seletiva dos resíduos de equipamentos eléctricos e electrónicos (REEE) é obrigatória, em consonância com a DIRETIVA da União Europeia (WEEE) e outras legislações nacionais.

Consulte [keysight.com/go/takeback](https://www.keysight.com/go/takeback) para verificar suas opções de "trade in" com o escritório Keysight local, ou para receber as instruções de reciclagem do produto.

Russian

Символ перечеркнутого мусорного контейнера на колесиках указывает на необходимость раздельного сбора отходов электрического и электронного оборудования (WEEE) в соответствии с требованиями ДИРЕКТИВЫ ЕС и других национальных законодательств.

Пожалуйста, обратитесь к сайту [keysight.com/go/takeback](https://www.keysight.com/go/takeback), чтобы узнать о возможностях торговли с компанией Keysight, а также об инструкциях по возврату продукции.

WARNING



HIGH VOLTAGE

is used in the operation of this equipment.

LETHAL VOLTAGE on CONTACT

may be present at measurement terminals if you fail to implement all safety precautions.

- When the **RED** light on the light tower is on inside the Double-Pulse Test Rack and Safety Enclosure, lethal voltage (± 1000 V dc/pulse) may appear at measurement terminals.
- Never attempt to defeat the safety interlock function of the Safety Hood.
- Do not operate the system unless another person is around the work space who is familiar with system operation and hazards or administering first aid.
- Potential voltages less than ± 500 V may cause death under certain conditions. Therefore, adequate preventive measures must be taken at all times!

Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this system. Failure to comply with these precautions or with specific warnings elsewhere in this manual may impair the protections provided by the system. In addition, it violates safety standards of design, manufacture, and intended use of the system. Keysight Technologies assumes no liability for customer's failure to comply with these requirements.

Product manuals are available on the Web. Go to www.keysight.com/find/PD1500A for all documentation.

WARNING



Hazardous voltage: System maximum output voltage may appear at the measurement terminals inside the Safety Hood. Never attempt to bypass the safety interlock and features of the PD1500A Double-Pulse Test System Rack and Safety Enclosure. To avoid contact with extremely high voltages, the rack cabinet must be operated with all side, front, and rear panels in place and the Safety Hood must remain closed. There are no user-serviceable parts inside.

Do not intentionally modify the interlock function of the Safety Hood. While the high voltage indicator is lit, dangerous voltage or residual charge may appear on the measurement terminals.

CAUTION

Some of the material in the safety enclosure can generate static electricity. Take care if you are using ESD sensitive devices in its vicinity.

NOTE

Do not use this system in any manner not specified by the manufacturer. The protective features of this system may be impaired if it is used in a manner not specified in the operation instructions. This system is an INDOOR USE product only.

This system complies with INSTALLATION CATEGORY II for mains input and INSTALLATION CATEGORY I for measurement input terminals, and POLLUTION DEGREE 2 defined in IEC 61010-1.

If an system is marked CAT I (IEC Measurement Category I), or it is not marked with a measurement category, its measurement terminals must not be connected to line-voltage mains.

Safety of any system incorporating the equipment is the responsibility of the assembler of the system.

DANGEROUS PROCEDURE WARNINGS

- Warnings shall be complied. Procedures throughout in this manual prevent you from potential hazardous situations. The instructions contained in the warnings must be followed.

BEFORE APPLYING POWER

- Verify that all safety precautions are taken. Make all connections to the system before applying power. Note the system's external markings described under "Safety and Regulatory Symbols".

GROUND THE RACK

- This is Safety Class I system. To minimize shock hazard, the Rack and Safety Enclosure must be connected to an electrical ground. The power terminal and the power cable must meet International Electrotechnical Commission (IEC) safety standards.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

- Do not operate the system in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

DO NOT REMOVE COVERS

- No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.

IN CASE OF DAMAGE

- Instruments, probes or cables that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel. Return the product to a Keysight Technologies sales or service office for service and repair to ensure that safety features are maintained.

USE ONLY THE SPECIFIC ACCESSORIES

- Specified accessories satisfy the requirements for specific characteristics for using the instruments and the Rack and Safety Enclosure.

CLEANING

- Disconnect the power from the rack before cleaning the Rack and Safety Enclosure. Use only a damp cloth to clean the surfaces of the Rack and Safety Enclosure.

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1 Introduction

This chapter contains:

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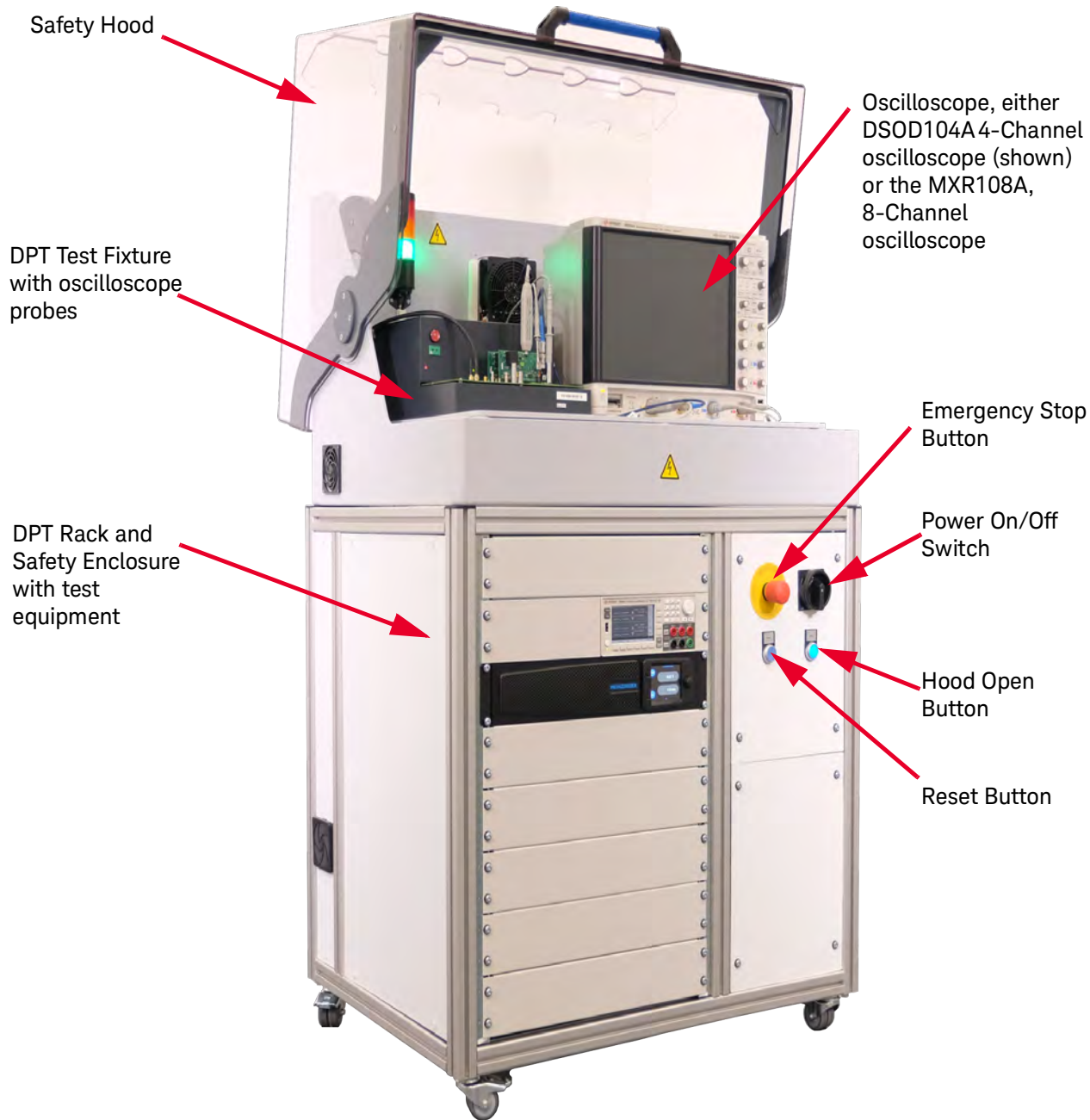


Figure 1 Double-Pulse Test Rack and Safety Enclosure

Plan the Rack and Safety Enclosure Site Installation

Customer Responsibilities

The final location at customer site must meet the following requirements prior to the installation. Details on these requirements are provided in the *PD1500A System Installation Guide*.

-
- Receive the Double-Pulse Test Solution (multiple shipping containers).

 - Ensure the operating environment (space, noise, etc.) is suitable.

 - Electrical and environmental requirements are met.

 - Provide a qualified electrician to do one of the following.
 - permanently hard wire the free end to the AC power sourceor
 - attach an IEC 60309 AC power plug (L+N+P 6h is recommended) to the AC power cable (a matching IEC 60309 AC Power receptacle must also be installed). IEC 60309 connectors are not included with the PD1500A system.

 - Host Computer requirements are met.

 - Additional supplies (host computer, LAN cable, etc.) are not included.
-

The Rack and Safety Enclosure is a free-standing rack with test instruments installed and a Safety Enclosure or hood on top. Consider your anticipated location and requirements to ensure safety and optimize access to test and control instrumentation.

NOTE

A Keysight Application Engineer can come to your site to install the oscilloscope and test fixture in the Rack and Safety Enclosure and test it for functionality. Refer to the *PD1500A System Installation Guide*.

Receiving the Rack

Make sure that all doors, elevators, and passageways in route to the final location are large enough to accommodate the Rack and Safety Enclosure and are capable of carrying the weight. The Rack and Safety Enclosure exceeds 150 kg (plus the weight of the shipping crate). Use a mechanical lift to lift the rack. The rack has casters for moving around on a level floor.

The crated physical specifications for the rack are listed below. Floor elevators and lifting equipment must be of sufficient capacity. If the rack shipping crate is damaged upon receipt, request that the carrier's agent be present when the

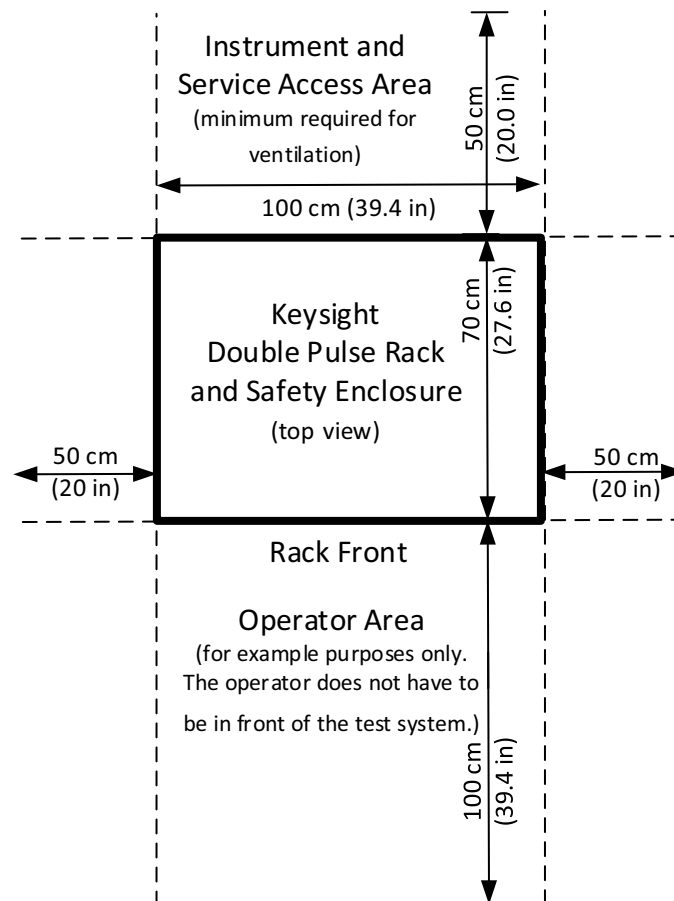
protective covering is removed. Inspect the rack for damage (scratches, dents, bent pieces, etc.). If the rack is damaged, notify the carrier and the nearest Keysight Technologies Sales and Service office immediately.

PD1500A Double-Pulse Tests System Installation Plan

The Rack and Safety Enclosure is a free-standing rack with test instruments installed in the rack and a Safety Enclosure on top. It is the customer's responsibility to consider the anticipated location and requirements to ensure safety and optimize access to test and control instrumentation.

The following figure shows a typical layout for the Rack and Safety Enclosure. Allow a minimum one meter of space in front of the rack for operator access, 50 cm of space behind the system for ventilation and a minimum of 50 cm on either side of the rack for sufficient air flow and cable egress (right side).

Allow a minimum of one meter above the Rack and Safety Enclosure for opening the Safety Enclosure hood.



Electrical and Environmental Requirements

Input Voltage	Operating Temperature	Operating Humidity	Operating Environment
200-240 VAC, $\pm 10\%$, Maximum Power rating 13A, Typical 600 VA, 50/60 Hz	20 °C to +30 °C	50% to 80% RH, Non-condensing	Indoor location only

CAUTION

The Double-Pulse Test Rack and Safety Enclosure is designed to operate on 200 to 240 VAC single phase. Do not attempt to operate the DPT Rack and Safety Enclosure on 120 VAC.

WARNING

Avoid overloading an electrical circuit. Ensure your AC line matches the AC Input requirements. If you need to power down the equipment in an emergency, make sure that you have clear and quick access to the primary disconnect. Refer to “Mains Disconnect” below.

Rack and Safety Enclosure Dimensions and Weight

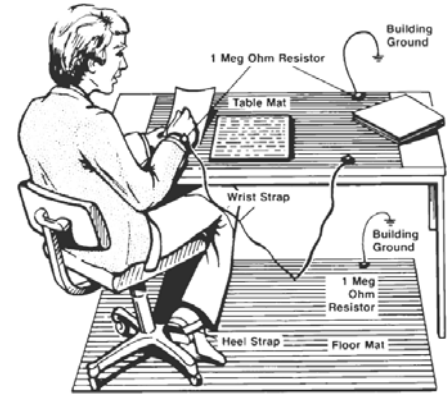
	Weight	Height	Depth	Width
Shipping Crate (with DPT Rack and Safety Enclosure)	300 kg (660 lbs)	167 cm (65.75 in)	92 cm (36.25 in)	120 cm (47.25 in)
Rack and Safety Enclosure alone (no test equipment installed)	150kg (330.7lbs)	160 cm (63 in.)	70 cm (27.6 in.)	100 cm (39.4 in.)
Rack and Safety Enclosure (all test equipment and fixtures installed)	162.5 kg (358 lbs)			

Static-safe Handling Procedures

Electrostatic discharge (ESD) can damage or destroy electronic components. Use a static-safe work station to perform at work on electronic assemblies. This figure shows a static-safe work station using two types of ESD protection:

- Conductive table-mat and wrist-strap
- Conductive floor-mat and heel-strap

Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone. To ensure user safety, the static-safe accessories must provide at least 1 M Ω of isolation from ground.



CAUTION

Some of the material in the safety enclosure can generate static electricity. Take care if you are using ESD sensitive devices in its vicinity.

Rack Ventilation

The Rack and Safety Enclosure has four air intake fans (two on each side) and two large exhaust fans on the rear of the Safety Enclosure hood. Additionally, there are two vents (no fans) on the rear of the rack for warm air exhaust.

CAUTION

For proper air flow through the Rack and Safety Enclosure, do not block air vents or rack cooling fans. Allow a minimum of 50 cm on each side and on the rear of the Rack and Safety Enclosure for ventilation.

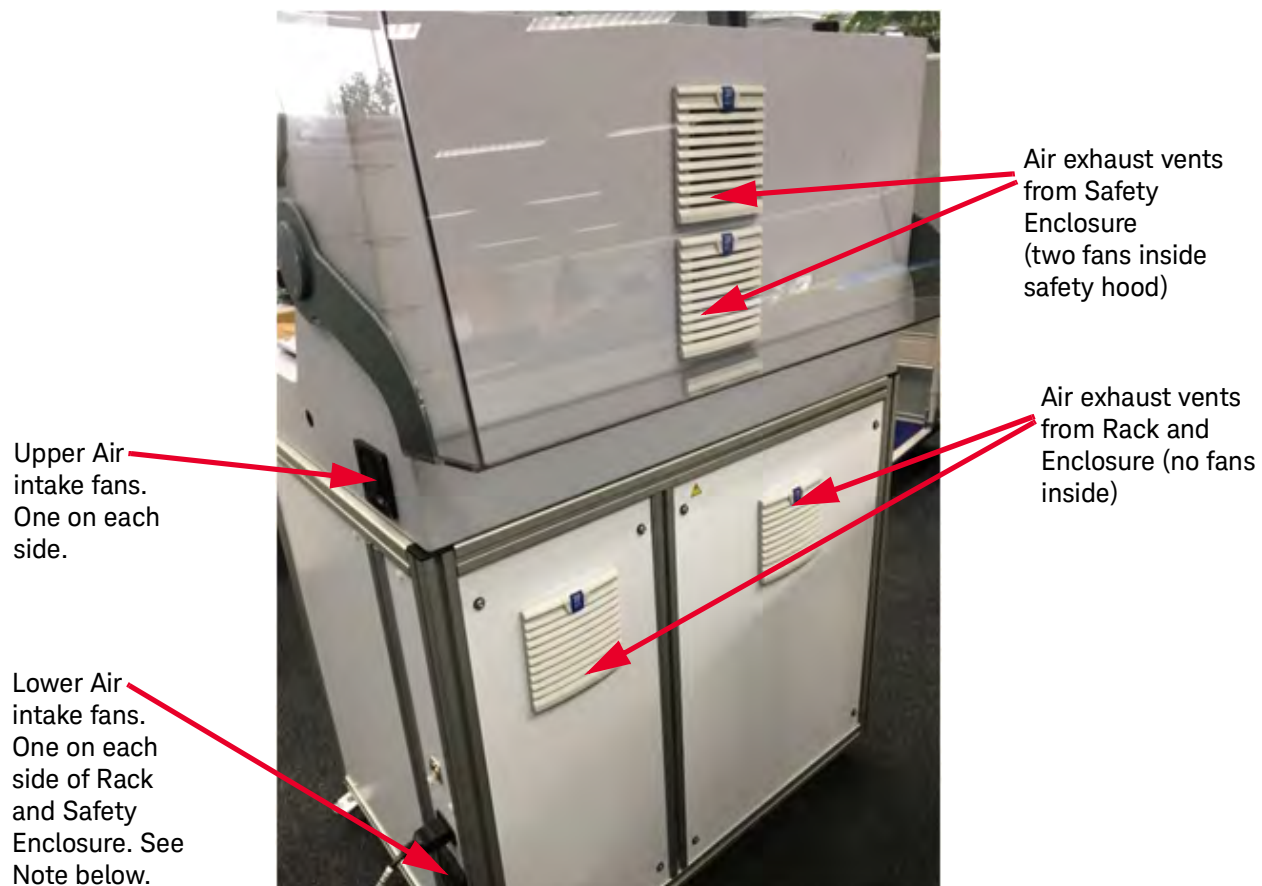


Figure 2 Air Flow through the DPT Rack and Safety Enclosure

NOTE

The Lower Air Intake fans on the chassis sides are temperature controlled. They turn on only when the temperature in the lower portion of the rack exceeds approximately 30 °C.

2 Operating the Rack and Safety Enclosure

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Safety Concepts in the DPT Rack and Safety Enclosure

- Safety Relays separate the HV power supply from the Test Fixture while the Safety Hood is open or not locked.
- The Safety Hood can be opened only when no high voltage is present.
- Safety is maintained during a power outage; the Safety Hood cannot be opened.
- It is possible to manually override the latch on the Safety Hood.

WARNING



Never attempt to bypass the safety functions and features of the PD1500A Double-Pulse Test Solution Rack and Safety Enclosure. To avoid contact with extremely high voltages, the rack cabinet must be operated with all side, front, and rear panels in place and the Safety Hood must remain closed. There are no user-serviceable parts inside.

Using the Rack and Safety Enclosure

Main On/Off Switch

The Rack and Safety Enclosure is supplied by one main AC voltage input. Turn it on or off with the main power switch at the front of the rack.

- 1 Turn the power switch to the **OFF** position.
- 2 Make sure **Emergency Stop** is pulled out.
- 3 Turn the power switch to the **ON** position. The internal fans start, the red and amber lights (in the light tower) turn on.
- 4 Press the **Reset** button. You should hear a few clicks as the safety relays energize. The amber light turns off followed by the red light. The green light turns on. The system is now operational.

To power off the complete system, turn the power switch to **OFF**.



Power Switch On



Power Switch Off

NOTE

In general, you should turn off the PD1500A solution when it will not be used for long periods of time. This is to prevent a problem with the Heinzinger HV power supply. If the solution has been left on and cannot communicate with the HV power supply, do the following:

1. Shut down the PD1500A DPT rack.
2. Disconnect the PD1500A from the ac power socket.
3. Wait a few minutes.
4. Reconnect the PD1500A rack to the ac power socket.
5. Turn on the PD1500A.

Light Tower Inside the Safety Hood

Green Light -- High voltage is off. It is safe to open the Safety Hood

Amber Light -- **Emergency Stop** button has been pushed. Pull the **Emergency Stop** button out and press the **RESET** button.

Red Light -- Safety Hood is locked and cannot be opened. High Voltage present.

Emergency Stop

The **Emergency Stop** button functionality works in two steps:

- In case of an emergency, press the **Emergency Stop**. This shuts off power to the test instruments. If the Safety Hood is closed, it remains locked.
- To reset, turn the main power switch to the **OFF** position. Pull out to release the **Emergency Stop** button. Turn the main power switch to the **ON** position. Reset the Emergency Stop circuit by pressing the **Reset** button.

Operation of the Safety Hood Interlock

Under normal conditions, the Safety Hood remains locked when the system is powered and functional *but not running a test*. To open the hood:

- 1 Make certain the green light in the light tower is on.
- 2 Press and hold the **Open** button while lifting the hood.

NOTE

IMPORTANT: The rack must be powered on AND the **Test Fixture** in place to open the safety hood. In the event of a power outage or the hood does not unlock when pressing the **Open** button; follow the *Manually Unlock the Safety Hood* instructions below.

Hood Status Indicator LED on Test Fixture

The Hood Status Indicator LED on the Test Fixture has the following indications:

Hood Status LED	Definition
Off	Safety Hood is unlocked but closed
Red	Safety Hood is unlocked and open
Green	Safety Hood is clocked and closed

In Case of a Power Outage

In case of a power outage, the PD1500A safely discharges the internal bank capacitors. However, it may take several minutes depending on the remaining charge. The Safety Hood remains locked in the event of a power outage.

Manually Unlock the Safety Hood

Under normal conditions, the Safety Hood remains locked when the system is powered and functional. If the Safety Hood is locked but the system is not powered on, you can manually unlock the Safety Hood for repair or maintenance. Before manually unlocking the Safety Hood, the system must be checked as follows:

- Unplug the ac power cord from the rack.
- The Safety Hood can then be unlocked manually using the key provided with the rack. To unlock, the emergency release safety switch should be rotated as follows:
 - **Unlock** - rotate counter-clockwise 1/4 turn
 - **Lock** - rotate clockwise 1/4 turn



WARNING



The safety hood must be closed and locked while running any Double-Pulse test. High voltage is present when running a Double-Pulse test. Do not attempt to operate the Double-Pulse Test Solution with the safety hood open or bypass the safety interlock feature.

Rack and Safety Enclosure Maintenance

There are no specific parts in the Rack and Safety Enclosure that require periodic replacement. Nevertheless, regularly check all parts in the system for changes like broken cables, defective fans, loose connections, etc.

Operate the DPT Rack and Safety Enclosure only in a clean environment with air that contains no dust or aggressive industrial gases. Clean the system rack and all fans and air exhaust vents periodically to guarantee appropriate air flow through the test system. After any maintenance work, the responsible safety engineer must approve the system before recommissioning.

Maintenance of the Safety Hood

Regularly check the Safety Hood as follows:

- Verify the functionality of the open and close mechanism.
- Ensure the pressurized cylinders are able to hold the cover open.
- Verify that the safety switch is functional and the cover remains locked when power is off.

CAUTION

Some of the material in the safety enclosure can generate static electricity. Take care if you are using ESD sensitive devices in its vicinity.

Recommended Maintenance Intervals

- **Weekly:** Check the safety equipment and the proper function of all safety features at the test system. Check all strain reliefs. Visual inspection for changes like bent pins or contacts, defective connectors, cracks on the enclosure or other signs of wear.
- **Monthly:** Check all mechanical parts in the system. For example loose screws on the rack, loose connectors. Visually inspect the system wiring and isolation.
- **Every 6 months:** Clean the system and the fans from dust. Check all connectors and contacts for abrasive wear. Clean if necessary. The two fans at the bottom of the rack (one fan on each side) have foam filters. No other fans or vents have filters. Clean dust from the filter with a vacuum or with a damp cloth.

CAUTION

Do not wash the air filters or install the filters in the chassis if they are wet.

- **12 months:** Perform the safety related tests according to DIN VDE 0701 / VDE 0702 or the corresponding standard valid in the country of operation of the test system. The tests should include the following measurements:
 - Isolation
 - Earth current
 - Ground bound
 - Correct installation

3 Additional Information

This chapter contains:

Rack and Safety Enclosure System Hardware
Components [page 27](#)

Rack and Safety Enclosure System Documentation [page 28](#)
Service Information [page 29](#)

When transporting the Rack and Safety Enclosure for long distances or outside a building always make sure that the environmental conditions like humidity, temperature and air pollution never exceed the related instrument specification. The ambient temperature should not exceed -20 °C to +60 °C.

Rack and Safety Enclosure System Hardware Components

The following test instruments must be installed in the Rack and Safety Enclosure:

- Either the:
 - DSOS104A, 4-Channel Oscilloscope -- mounted on top of the test rack, under the Safety Hood.

or

- MXR108A, 8-Channel Oscilloscope -- mounted on top of the test rack, under the Safety Hood.
- Double-Pulse Test Fixture for Si/SiC devices -- mounted on top of the test rack, under the Safety Hood.
- 33512B Waveform Generator -- mounted inside the test rack, facing the rear of the system.
- B2902B Precision Source/Measurement Unit -- mounted in the test rack (used for calibration only).
- Heinzinger EVO High Voltage Power Supply -- mounted in the test rack.

NOTE

These test instruments should be installed in the rack by a Keysight-trained Application Engineer. Refer to the *Keysight PD1500A System Installation Guide* for detailed information.

Rack and Safety Enclosure System Documentation

Each test instrument comes complete with its own documentation. The Country-specific power cord and other cables or accessories may be discarded. All necessary power cords and cables are included in the DPT system Rack and Safety Enclosure. For detailed information about any of the test instruments, refer to the documentation provided with the instrument.

- **PD1500A Control Software Guide:** Provides detailed information to install, configure, and use the PD1000A Control Software for the PD1500A DPT system. PN: PD1500-90001
- **PD1500A Rack and Safety Enclosure Operation Guide:** Provides detailed information to operate and maintain the PD1500 Test Rack and Safety Enclosure. PN: PD1500-90003
- **PD1500A Si/SiC Test Fixture User Guide:** Provides detailed information to install and use the Double-Pulse Test Modules for testing Si/SiC devices in the DPT Test Fixture. PN: PD1500-90004
- **PD1500A System Installation Guide:** Provides detailed information for Keysight personnel to install the Double-Pulse Rack and Safety Enclosure at a customer's site. PN: PD1500-90002

Documentation and software are available at: www.keysight.com/find/PD1500A

Instrument documentation, data sheets, firmware updates, software updates, specifications, and more can be found on the product web pages listed below.

www.keysight.com/find/PD1000A (for Control Software, and PD1000A general information)

www.keysight.com/find/DSOS104A 4-Channel Oscilloscope¹

www.keysight.com/find/MXR108A 8-Channel Oscilloscope¹

www.keysight.com/find/33512B Waveform Generator, 2-Ch with ARB

www.keysight.com/find/B2902B Precision Source/Measurement Unit

www.Heinzinger.com High Voltage Power Supply Model EVO

NOTE

Adobe Reader is required to view PDF files. It is available free at: <https://get.adobe.com/reader>.

¹ Depending on product availability, you will receive either the DSOS104 A 4-Channel oscilloscope or the MXR108A 8-Channel oscilloscope. Both oscilloscopes provide the same functionality. The MXR108A may be used when upgrading the PD1500A system.

Service Information

CAUTION

Do not remove the rear or side covers from the right side of the Rack and Safety Enclosure. There are no user-serviceable parts inside.

NOTE

Do not return the entire Double-Pulse Test Rack and Safety Enclosure to Keysight for repair. Contact your local Keysight Sales and Service office. They can identify and remove individual instruments from the rack and return that instrument to Keysight.

If you need to return a test instrument to Keysight for service or calibration, remove the individual instrument(s) from the rack. Attach a tag indicating the type of service required, your return address, and model number of the device to be repaired.

Repackaging the device requires original shipping containers and materials or their equivalents. Keysight Technologies can provide packaging materials for the individual test instruments. Contact Keysight as per **“Sales and Technical Support”** in the front matter of this manual.

Diagnostic and test information for the safety hood and interlock system is available for Keysight Application Engineers and Service personnel.



This information is subject to change without notice.

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