

USER MANUAL

Rack Mount 1-3KVA

On-Line UPS

Uninterruptible Power Supply

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1.INTRODUCTION

This rack-mounting On-Line-Series is an uninterruptible power supply . It protects your data by supplying battery backup when power fails. With Winpower or Commander Pro software the uninterruptible power supply (UPS) will safely store data and shut down your network operating system before the battery is fully discharged, whether you're there or not. It provides perfect protection specifically for file servers, minicomputers, Internet hubs, telecommunication systems and other mission-critical applications.

The rack-mounting On-Line-Series includes: 1K(S)/1KE, 1.5K(S), 2K(S),3K(S). The models with "S" or "E" extension allow for expanding runtime by simply plugging in additional battery packs.

2.IMPORTANT SAFETY INSTRUCTIONS

- **SAVE THESE INSTRUCTIONS** - This Manual Contains Important Instructions that should be Followed during Installation and Maintenance of the UPS and Batteries.
- Intended for Installation in a Controlled Environment.
- Servicing of Batteries Should be Performed or Supervised by Personnel Knowledgeable of Batteries and the Required Precautions. Keep Unauthorized Personnel Away from Batteries.
- **CAUTION** - A disconnect switch shall be provided by others for ac output circuit. To reduce the risk of fire, connect only to a circuit provided with branch circuit overcurrent protection for 30 amperes rating in accordance with the National Electric Code, ANSI/NFPA 70".(For Models TR2K,TR3K,TR2KS,TR3KS)
- When Replacing Batteries, Replace With the Same Number and Type.
- **CAUTION** - Do Not Dispose of Battery or Batteries in a Fire. The Battery May Explode.
- **CAUTION** - Do Not Open or Mutilate the Battery or Batteries. Released Electrolyte is Harmful to the Skin and Eyes. It May be Toxic.
- **CAUTION** - A Battery can present a Risk of Electrical Shock and High Short Circuit Current. The Following Precautions Should be Observed When Working on Batteries:
 - A. Remove watches, rings, or other metal objects.
 - B. Use tools with insulated handles.
 - C. Wear rubber gloves and boots.
 - D. Do not lay tools or metal parts on top of batteries.
 - E. Disconnect charging source prior to connecting or disconnecting battery terminals.
- Use No.12 AWG, 90°C copper wire and 22 lb-in Torque force when connecting to terminal block.(For Models TR2K,TR3K,TR2KS,TR3KS)

TRANSPORT

- Please transport the UPS system only in the original packaging (to protect against shock and impact).

SET-UP

- Condensation may occur if the UPS system is moved directly from a cold to a warm environment. The UPS system must be absolutely dry before being installed. Please allow an acclimatization time of at least two hours.
- Do not install the UPS system near water or in damp environment.
- Do not install the UPS system where it would be exposed to direct sunlight or near heat.
- Do not block off ventilation openings in the UPS system's housing.

INSTALLATION

- Do not connect appliances or items of equipment which would overload the UPS system (e.g. laser printers) to the UPS outlet socket.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.

2. IMPORTANT SAFETY INSTRUCTIONS

- The UPS can be operated by any individuals with no previous technical experience.
- Connect the UPS system only to an earthed shockproof socket outlet.
- The building wiring socket outlet (shockproof socket outlet) must be easily accessible and close to the UPS system.
- With the installation of the equipment it should be prevented, that the sum of the leakage current of the UPS and the connected consumer does not exceed 5.0mA.
- The standard model is accompanied by a standard battery pack. The long backup time model is only accompanied by batteries of 24Ah or higher capacity due to its heavy charging current to avoid damaging the battery and causing hazards.

OPERATION

- The UPS system features its own, internal current source (batteries). The UPS output sockets may be electrically live even if the UPS system is not connected to the building wiring socket outlet.
- In order to fully disconnect the UPS system, first press the Standby switch then disconnect the mains lead
- Ensure that no fluids or other foreign objects can enter the UPS system.

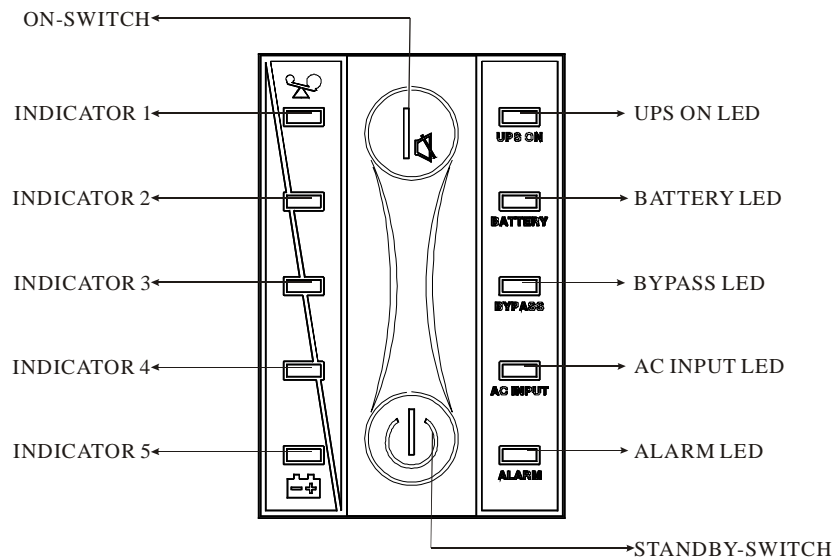
MAINTENANCE, SERVICING AND FAULTS

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- **Caution** - risk of electric shock. Even after the unit is disconnected from the mains power supply (building wiring socket outlet), components inside the UPS system are still connected to the battery and are still electrically live and dangerous.
- Before carrying out any kind of servicing and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exist in the terminals of high capability capacitor such as BUS-capacitors.
- Only persons adequately familiar with batteries and with the required precautionary measures may exchange batteries and supervise operations. Unauthorized persons must be kept away from the batteries.
- **Caution** - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!
- Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
 - remove wristwatches, rings and other metal objects
 - use only tools with insulated grips and handles.
- When changing batteries, install the same number and type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only with a fuse of the same type and amperage in order to avoid fire hazards.

3. SYSTEM DESCRIPTION

3.1 DISPLAY PANEL

The UPS power control and operating indicators are located on the front display panel.



ON-SWITCH

- The UPS can be turned on by pressing ON-SWITCH button for 1 second.
- An acoustic alarm can be deactivated by pressing ON-SWITCH button.

STANDBY-SWITCH

- The inverter can be turned off by pressing STANDBY-SWITCH. The output can be provided by the mains power via the BYPASS.

AC INPUT LED

- Lights up when the mains power is available.
- Blinks and the BATTERY-LED lights up at the same time when the mains power is out of tolerance.
- Blinks when the live conductor and the neutral conductor reversed at the input.

UPS ON LED

- Lights up when output power provided by the mains power via the inverter.

BATTERY LED

- Lights up when the mains power is failed and the inverter is powered by the batteries.

BYPASS LED

- Lights up when output power provided by the mains power via the bypass.

ALARM LED

- Lights up when the UPS system is in fault condition, at the same time, an acoustic warning signal is issued every second.

INDICATOR

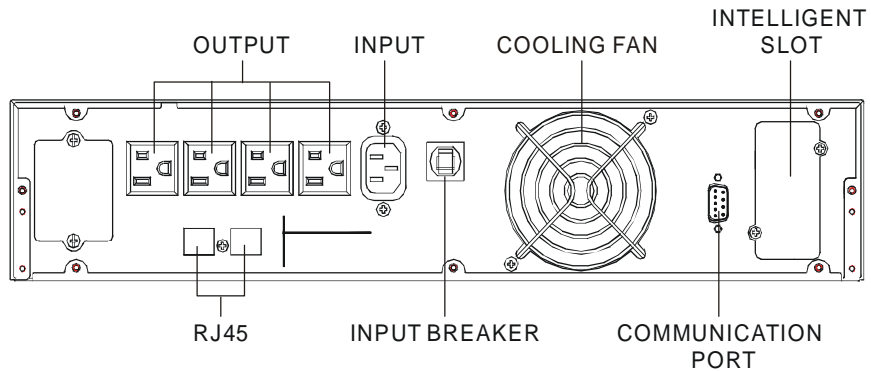
- Load level signaled when the AC INPUT LED lighting up
- Battery level signaled when the BATTERY LED lighting up

	Load Level	Battery Level
INDICATOR 1	96%-105%	1%-35%
INDICATOR 2	76%-95%	36%-55%
INDICATOR 3	56%-75%	56%-75%
INDICATOR 4	36%-55%	76%-95%
INDICATOR 5	1%-35%	96%-100%

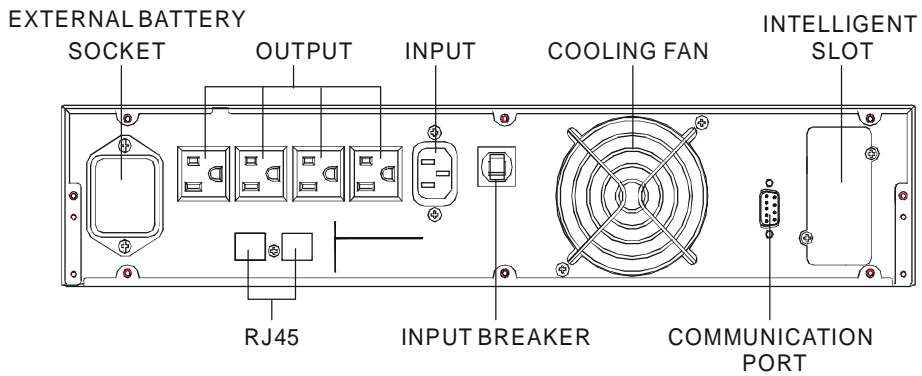
3. SYSTEM DESCRIPTION

3.2 REAR PANEL

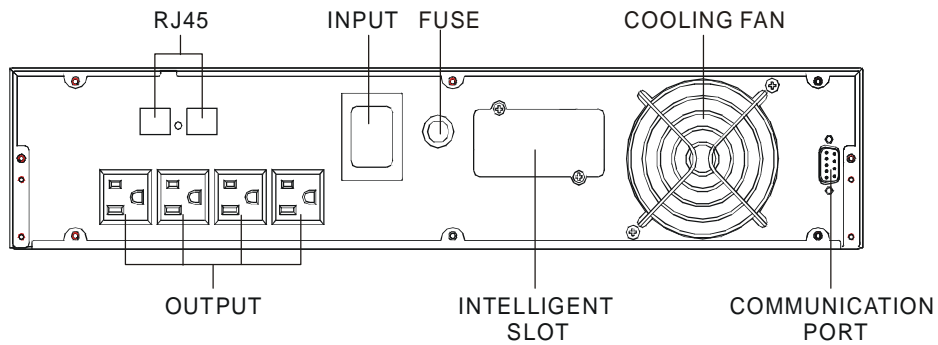
The rear panels of your UPS and battery pack can be found among below drawings. The input and output connectors and some other useful connectors are on the rear panel.



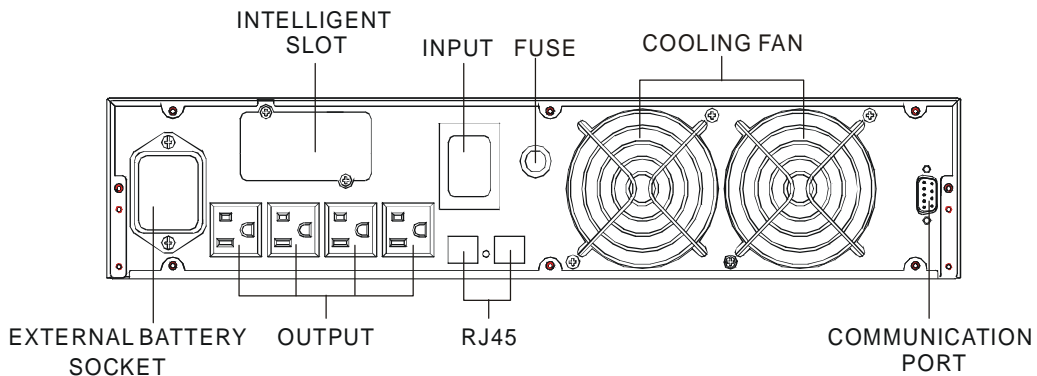
TR1K



TR1KS/TR1KE

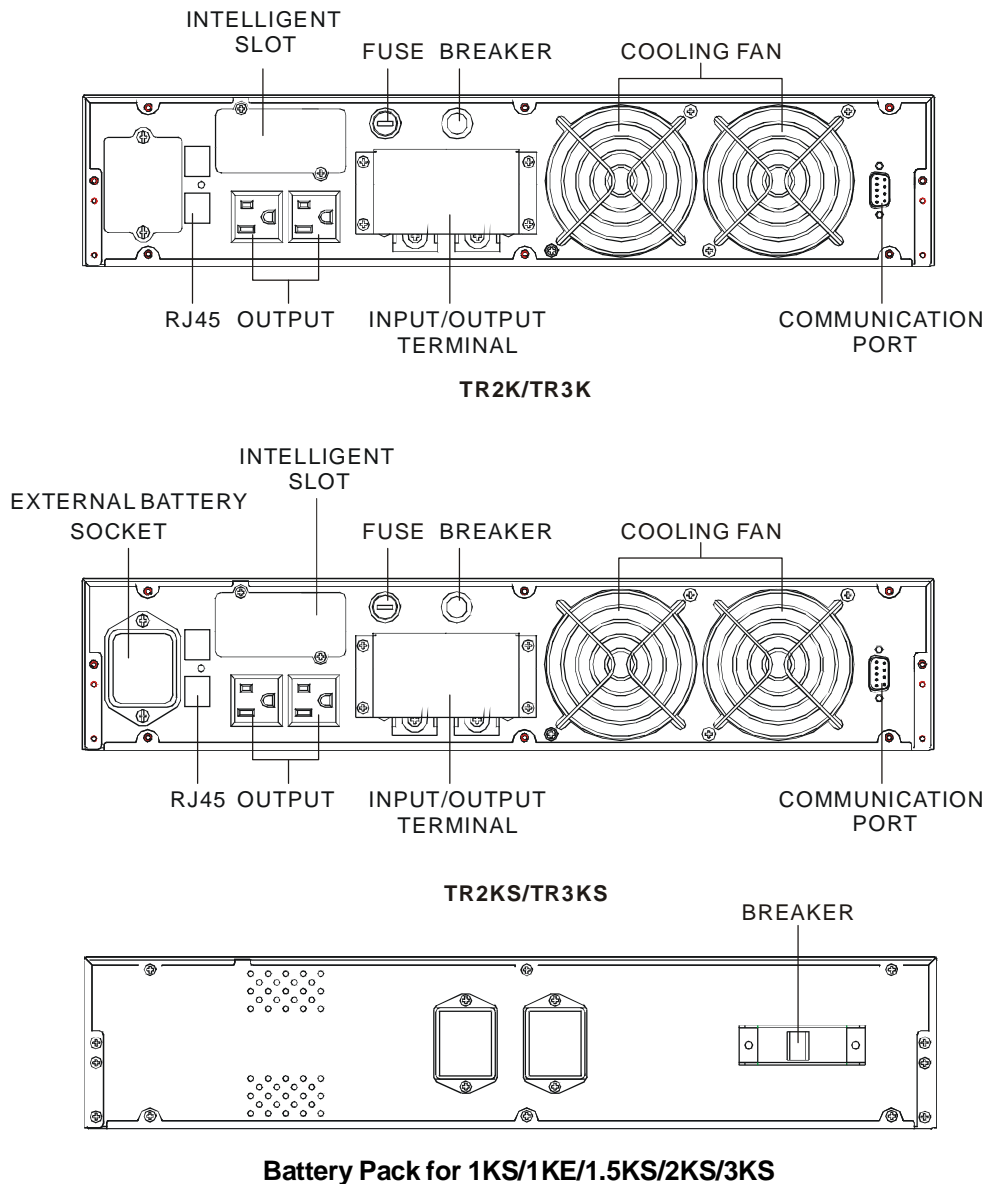


TR1.5K



TR1.5KS

3. SYSTEM DESCRIPTION



SURGE PROTECTION: This transient voltage surge-suppression slot applies surge protection for surge suppression devices such as telephone, fax and network line protectors.

COMMUNICATION PORT: Winpower or Commander Pro software can be used with the UPS for power management. Standard serial interface cable is compatible with 1K(S)/1KE/1.5K(S)/2K(S)/3K(S) UPS.

INPUT/OUTPUT: If socket is available, just insert compatible cable plug. If terminal is available, qualified electrician should be asked for wiring.

Note: Terminal cover should be put back for safety reason after wiring completed.

INPUT BREAKER: If the breaker pops out/off, reduce the load on the UPS by unplugging equipment and reset the breaker.

EXTERNAL BATTERY SOCKET: Special battery power cable is applied with the battery pack. Insert the cable into the battery connector on UPS and battery pack separately to connect battery pack to UPS. The same battery packs can be daisy chained together to achieve desired run time in the same way.

Notes: One chain of battery packs can be connected to one UPS only.

Only the battery connectors marked with the equal voltage can be connected.

4.1 OPERATION ENVIRONMENT

Ambient Temperature: 0°C to 40°C

Installation height < 1500m

Relative humidity: 20% to 90 %, no condensation

4.2 BATTERY APPLICATION

Fully charge the batteries by leaving the UPS system connected to the mains for 1-2 hours. You may also use the UPS directly without charging the batteries but the stored energy time may then be shorter than the nominal value specified.

If the battery service life (3 – 5) years at 25 °C ambient temperature has been exceeded, the batteries must be exchanged. In this case please contact your dealer.

If the batteries are to be stored in temperate climatic zones, they should be charged every three months for 1-2 hours. You should shorten the charging intervals to two months at locations subject to high temperatures.

4.3 TROUBLESHOOTING

Using the table below, some common problems can be solved. If the problem persists or some problems undetected in table below occurred, please call the After-Sales service department. Be sure you have the following informations:

1. Model number, serial number
2. Date on which the problem occurred
3. Description in detail of the problem

Problem	Possible cause	Remedy
No indication, no warning tone even though system is connected to mains power supply	No input voltage	Check building wiring socket outlet, check input cable
AC INPUT LED blinks	Phase and neutral conductor at input of UPS system are reversed	Turn mains power socket by 180°
AC INPUT LED blinks and BATTERY LED lights up	Input power and/or frequency are out of tolerance	Check input power source and inform dealer if necessary
AC INPUT and BYPASS LED light up even though the power supply is available	Inverter not switched on	Press On button “I”
UPS ON LED lights up, warning tone at intervals (every 1 or 4 seconds)	Mains power supply has failed	battery operation; warning tone at intervals of 1 second means battery is almost empty
ALARM LED lights up, warning tone once a second	Overload	Reduce number of users at UPS output
ALARM-LED lights up, permanent warning tone	UPS-mistake	Notify dealer!!
Emergency supply period shorter than nominal value	Batteries not fully charged / batteries defective	Charge the batteries for at least 1 - 2 hours. Check capacity. If the problem still persists, consult your dealer.

5. TECHNICAL DATA

5.1 ELECTRICAL SPECIFICATIONS

Model	1K(S)/1KE	1.5K(S)	2K(S)	3K(S)
INPUT				
Voltage	60VAC~138 VAC			
Frequency	46Hz ~ 54Hz / 56Hz ~ 64Hz			
Amperage(maximum)	10A	15A	20A	30 A
OUTPUT				
Power rating	1kVA 0.7k W	1.5kVA 1.05kW	2kVA 1.4kW	3kVA 2.1kW
Voltage	110/115/120VAC			
Frequency	(50Hz/60Hz)±0.2Hz (Battery Mode)			
Wave form	Sinusoidal			
BATTERIES(STANDARD)				
Number and type	3x12V7.2Ah	4x12V7.2Ah	8x12V7.2Ah	8x12V7.2Ah

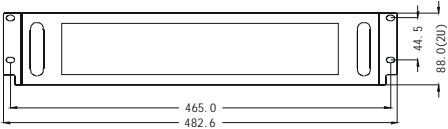
5.2 TYPICAL STORED ENERGY TIME (BATTERY MODE)

Typical values at 25°C in minutes:

Model	100 % Load	50 % Load
1K/1KE	5	14
1.5K	5	14
2K	9	21
3K	5	17.5

Notes: 1KE UPS model do not connect external battery pack.

5.3 MECHANICAL DATA

Model	Net Weight(kg)	Dimension (mm)
1K/1KE	16.3	 <p>Depth: 450</p>
1KS	9.1	
Battery Pack 36V	22.5	
1.5K	21	
1.5KS	11.5	
Battery Pack 48V	27.8	
2K/3K	11.2	
2KS/3KS	12.3	
Battery Pack 96V	27.8	

5.4 EMC

1K(S)/1KE/1.5K(S) /2K(S)/3K(S)	-EFT	IEC61000-4-4	Level 4
	-Surge	IEC61000-4-5	Level 4
	-ESD	IEC61000-4-2	Level 4
	-RS	IEC61000-4-3	Level 3
	-Conducted Emission	FCC PART 15	Class B
	-Radiated Emission	FCC PART 15	Class B

5.5 COMMUNICATION PORT

The type of signals, serial command(RS232), is provided by the UPS to communicate with a host computer. The RS232 communication port transmits both utility power and UPS status to the host computer, providing the host computer with proprietary command sequence to monitor the utility power and UPS status and to control the UPS output.

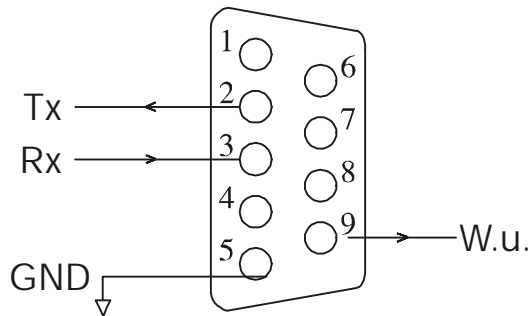
The data format of RS232 is listed as followed:

- Baud Rate : 2400 bps
- Data Length : 8 bits
- Ending Bit : 1 bit
- Parity Bit : none

5.5.1 RS232 INTERFACE

The following is the pin assignment and description of DB-9 connector.

Pin#	Description	I/O
3	RS232 Rx	Input
2	RS232 Tx	Output
5	Ground	Input
9	Wake up	Output



RS232 Interface

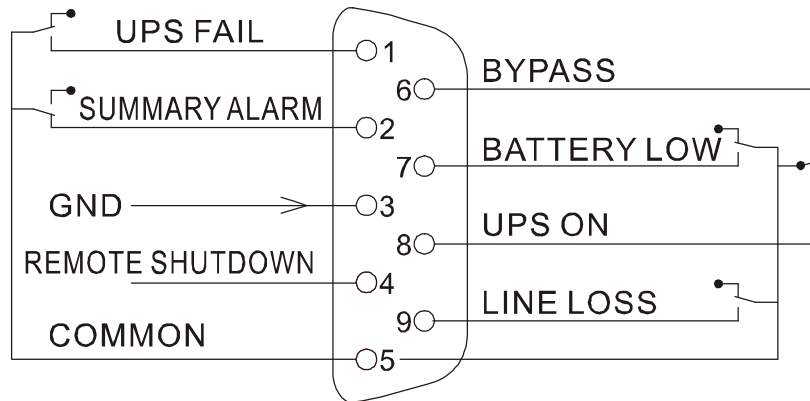
5.5.2 AS400 INTERFACE

Except for the communication protocol as mentioned above, this series UPS has AS400 card (an optional accessory) for AS400 communication protocol. Please contact your local distributor for details.

The following is the pin assignment and description of DB-9 connector in AS400 card.

Pin#	Description	I/O
1	UPS Fail	Output
2	Summary Alarm	Output
3	GND	Input
4	Remote Shutdown	Input
5	Common	Input
6	Bypass	Output
7	Battery Low	Output
8	UPS ON	Output

5. TECHNICAL DATA



DB9 Interface of AS400 communication protocol

5.6 OPERATING ENVIRONMENT

Temperature: 0 °C to 40 °C

Installation height: < 1500 m

Relative humidity: 0 to 95%, non-condensing

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