Ex Print

User Manual
Zone 1, 2, 21, 22
Class I/II Division 1/2

Hazardous Area Label Printer System Suitable for All Gas and Dust Applications

Simplifying Complexity. Delivering Safety.

expo Technologies

ML668 v1 I 27 June 2025

Thank you for purchasing the Ex Print. Scan the QR code to register your unit. By registering your product it will help Expo keep you up to date with the latest news and information about your printer system.

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SECTION 1: SAFETY

This manual contains important information required for the safe installation and operation of the Ex Print. Keep this manual in an easily accessible and safe location close to the system for future reference.

Only trained and authorized personnel should install, commission, and maintain the system. Before proceeding with any work related to the system the installer/operator should:

- Be knowledgeable about safe working practices within the hazardous area where the system is to be installed and operated.
- Be familiar with and competent in interpreting any relevant national laws and local legislation, applying them correctly to specific situations.
- Carefully read and understand the contents of this manual, adhering to all instructions and warnings.

WARNING! Installation, commissioning, maintenance, and troubleshooting must only be performed by qualified and authorized personnel in accordance with local and site regulations.

Note: The system can be operated by personnel who has read and understood the relevant sections of this manual and the Zebra printer manual.

1.1: GENERAL SAFETY

These safety instructions are intended to prevent equipment damage and/or personal injury:

- The system is to be used only in areas defined in this manual.
- The system must only be operated under the conditions specified in this manual.
- The system must only be used for the purpose described in this manual.
- Before commencing any installation or maintenance work, always ensure the complete system, supply air and electrical supplies are switched OFF, following safe isolation procedures.
- The system must be installed as specified in this manual, adhering to all safety warnings and recommendations.
- The system must be inspected, maintained, and cleaned regularly as described in this manual.
- No unauthorised modifications to the equipment should be made.
- It is the responsibility of the installer/operator to ensure settings are configured correctly.
- Purging and pressurization must be carried out in accordance with the relevant standards for the specific installation hazardous area.

This document contains specific safety information for all stages of the product's use, including installation, commissioning, operation, maintenance and troubleshooting.

WARNING! Failure to follow these instructions may compromise the functionality and operation of the equipment, cause personal injury and/or result in an explosion.

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1.2: TRANSPORTATION, STORAGE AND HANDLING SAFETY

The system must be protected against impacts and adverse environmental conditions. It should only be transported and stored under the conditions specified in this manual.

The system is suitable for manual handling by two people. Safe manual handling procedures should be applied and Expo recommends personnel wear appropriate PPE when handling the system.

Storage Temperature Range	-40 to +60°C (-40 to +140°F)
Relative Humidity	5 to 85%, non condensing
Weight	Packed: 50 kg (110 lb) Unpacked: ~33 kg (73 lb)

WARNING! Incorrect handling of the system may cause severe personal injury and/or damage to the system.

- Never stand under suspended loads.
- Secure the load before transporting.
- Use lifting equipment suitable for the system's weight or the correct number of personnel for manual handling.

1.3: DISPOSAL

Do not dispose of the system in general waste. The battery (if fitted), electrical and electronic components and other parts must be recycled in accordance with local regulations and directives.

1.4: MARKINGS IN THE MANUAL

CAUTION! This symbol indicates a hazard that may cause injury or damage to the system if not avoided.

WARNING! This symbol indicates a hazard that may cause serious injury or damage to the system if not avoided.

Note: This indicates important notes, information, or advice.

1.5: SPECIFIC CONDITIONS OF USE

For models PR-1xE-D, PR-1xE-E, PR-1xE-L and PR-1xE-K, the power to the pressurized enclosure is not automatically controlled by the purging control system. Where required by local code of practice, it is user's responsibility to provide an appropriately certified means of isolation adjacent to the enclosure, marked with suitable operating instructions. Alternatively, another equally effective means of isolation and associated operating procedure shall be provided.

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SECTION 2: APPLICATION SUITABILITY

This hazardous area printer from Expo has the Ex marking, meaning that it has been designed and tested to operate safely in explosive environments when used strictly in accordance with the operating instructions.

The hazardous area printers are designed for use where the hazardous area is non-mining (above ground). Each model is certified for different hazardous medium and locations.

- PR-1xE-A = ATEX & IECEx Zone 1; flammable gases, or vapours
- PR-1xE-B = ATEX & IECEx Zone 21; flammable powder or dust
- PR-1xE-D = ATEX & IECEx Zone 2; flammable gases, or vapours
- PR-1xE-E = ATEX & IECEx Zone 22; flammable powder or dust
- PR-1xE-G = NEC 500 Class I Div 1; flammable gases, or vapours
- PR-1xE-H = NEC 500 Class II Div 1; flammable powder or dust
- PR-1xE-K = NEC 500 Class I Div 2; flammable gases, or vapours
- PR-1xE-L = NEC 500 Class II Div 2; flammable powder or dust

The system has been constructed from materials suitable for the most common hazardous installation locations and is designed for use under normal industrial conditions of ambient temperature, humidity, and vibration.

Construction Materials

- Stainless Steel
- Laminated Glass
- Nylon
- Neoprene
- Nickle-plated Brass Fixing
- Aluminium

Note: For further guidance on installations in conditions that may cause abnormal stresses or adversely affect the system, please consult Expo.

SECTION 3: INTRODUCTION

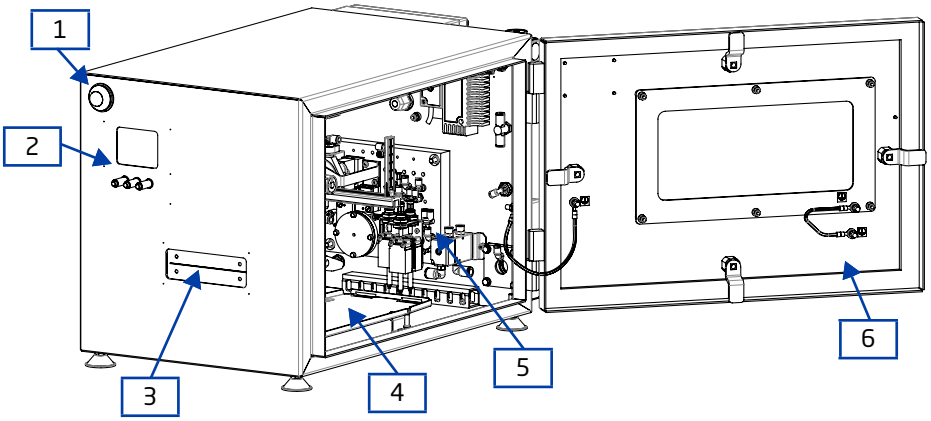
3.1: DESCRIPTION

The Ex Print is a hazardous area printer system which provides an Ex p protection solution (pressurized enclosure) ensuring safety, integrity, and compliance for installing and operating the Zebra thermal label printer within hazardous areas.

The system incorporates Expo's world-renowned MiniPurge purge and pressurization system with Zebra's popular ZT111 4" thermal transfer label printer, offering a reliable and robust printing solution, no matter the location.

Pre-configured with quick and easy installation, the Ex Print is ready for use straight from the box for most applications. Where necessary, the system can be configured for specific applications, making the Ex Print suitable for a wide range of industrial applications.

3.2: EX PRINT COMPONENTS

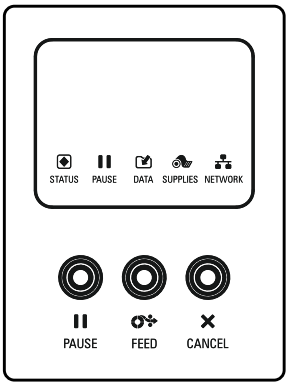


1	Enclosure Pressure Indicator
2	Printer Control Interface • Viewing Window for Printer Status Lights • Extended Push Buttons
3	Label Outlet Slot
4	Zebra ZT111 Printer
5	Integrated MiniPurge System
6	Side Access Door with 4x Locks

Note: The covers to the Zebra ZT111 printer has been removed to facilitate complete purging of the system before startup and must not be re-installed.

3.2.1: Printer Control Panel Interface

View the printer status lights for printer through the wide-angle viewing window and control the printer using the three extended push buttons.



1	Light STATUS	These indicator lights show the current status of the printer. For more information, refer to section 9.2 Zebra Printer Status Indicators
2	Light PAUSE	
3	Light DATA	
4	Light SUPPLIES	
5	Light NETWORK	
6	Button PAUSE	Starts or stops printer operation when pressed.
7	Button FEED	Forces the printer to feed one blank label each time the button is pressed.
8	Button CANCEL	Cancels label formats when the printer is paused. • Press once to cancel the next label format. • Press and hold for 2 seconds to cancel all label formats.

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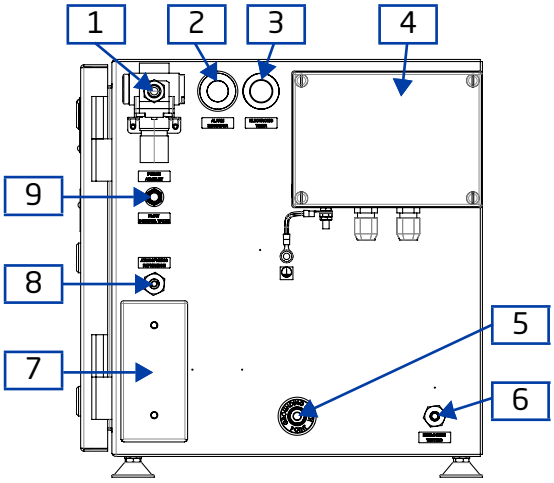
3.2.2: Rear panel

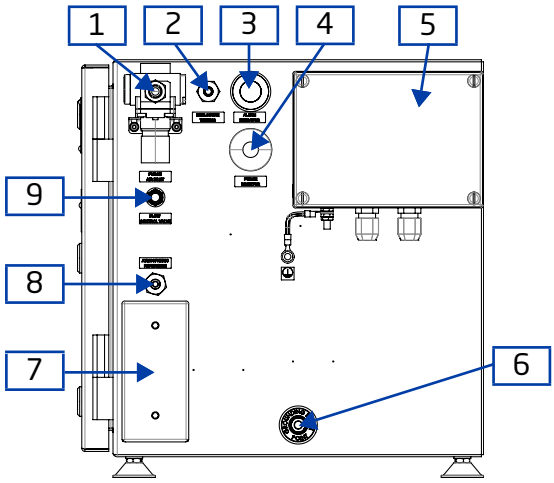
The rear panel configuration depends on the model:

PR-1xE-A



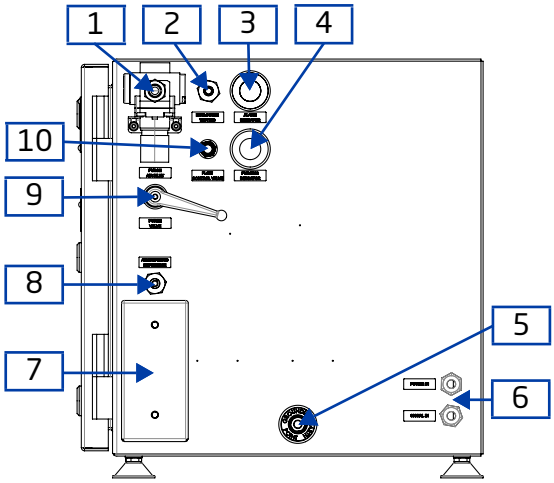
1	Air Inlet - Regulator Valve
2	Enclosure Pressure Indicator
3	Purge Time Indicator
4	MIU/e Terminal Box
5	External Earth Stud
6	Atmospheric Pressure Reference Port
7	Relief Valve
8	Enclosure Pressure Testing Port
9	Flow Control Valve

PR-1xE-B



1	Air Inlet - Regulator Valve
2	Atmospheric Pressure Reference Port
3	Enclosure Pressure Indicator
4	Power Inhibit Button
5	MIU/e Terminal Box
6	External Earth Stud
7	Relief Valve
8	Enclosure Pressure Testing Port
9	Flow Control Valve

PR-1xE-D / PR-1xE-K



1	Air Inlet - Regulator Valve
2	Atmospheric Pressure Reference Port
3	Enclosure Pressure Indicator
4	Purge Indicator
5	External Earth Stud
6	Power and Ethernet Ex e Cable Glands
7	Relief Valve
8	Enclosure Pressure Testing Port
9	Purge Valve
10	Flow Control Valve

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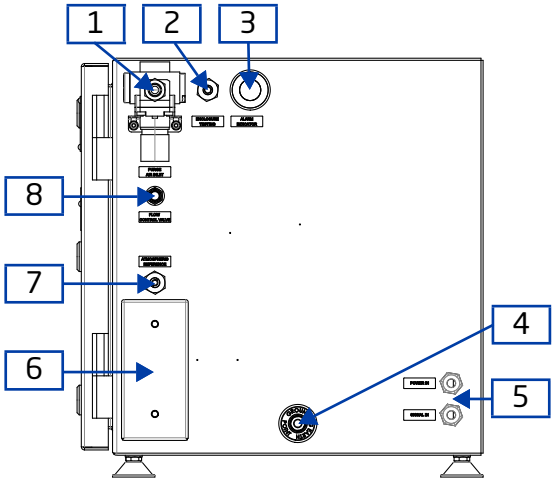
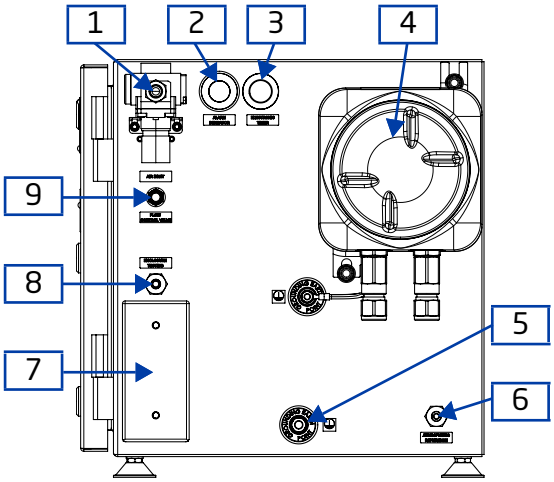
PR-1xE-E / PR-1xE-L



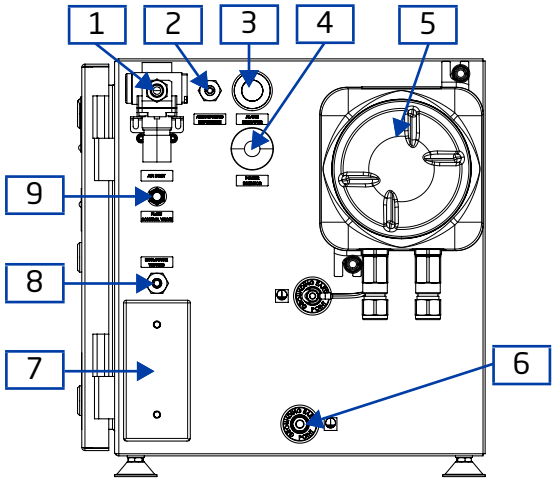
1	Air Inlet - Regulator Valve
2	Atmospheric Pressure Reference Port
3	Enclosure Pressure Indicator
4	External Earth Stud
5	Power and Ethernet Ex e Cable Glands
6	Relief Valve
7	Enclosure Pressure Testing Port
8	Flow Control Valve

PR-1xE-G



1	Air Inlet - Regulator Valve
2	Enclosure Pressure Indicator
3	Purge Time Indicator
4	MIU/d Terminal Box
5	External Earth Stud
6	Atmospheric Pressure Reference Port
7	Relief Valve
8	Enclosure Pressure Testing Port
9	Flow Control Valve

PR-1xE-H



1	Air Inlet - Regulator Valve
2	Atmospheric Pressure Reference Port
3	Enclosure Pressure Indicator
4	Power Inhibit Button
5	MIU/d Terminal Box
6	External Earth Stud
7	Relief Valve
8	Enclosure Pressure Testing Port
9	Flow Control Valve

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3.2.3: System Indicators

Enclosure Pressure Indicator

The Ex Print has two high contrast, two-colour visiwinks, one fitted to the front, and one to the rear, to indicate the enclosure's pressurization status.

Pattern		Description
	Green	Normal Operation, Enclosure Pressurized.
	Red	Pressure Alarm. Low or No Enclosure Pressure.

Purge Time Indicator (PR-1xE-A / PR-1xE-G)

The four yellow LEDs flash sequentially to indicate purge progress:

 0 to 25% of Time	 26 to 50% of Time	 51 to 75% of Time	 76 to 100% of Time

Purge Indicator (PR-1xE-D / PR-1xE-K)

A high contrast, two-colour visiwink is fitted to the rear of the printer to indicate purge status:

Pattern		Description
	Black	Purge Flow Too Low or Not in Purge Mode.
	Yellow	System Purging.

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SECTION 4: OPERATION

4.1: GAS HAZARDOUS AREA - ZONE 1 & 2, CLASS I DIV 1 & 2 OPERATION

Systems located in areas of hazardous gas require protection through purge and pressurization. This two-step process must be completed before electrical equipment inside the enclosure can be safely energised.

During the purge cycle, the purge system flushes the enclosure with clean compressed air, displacing any hazardous gas that may have accumulated when the system was not pressurized.

To ensure all areas of the enclosure are purged and only clean purge air remains inside, the purge cycle must allow for multiple volume changes. This should align with local regulations for the hazardous area rating and region.

WARNING! It is the user's responsibility to ensure the system purges for an adequate time to "clean" the internal enclosure atmosphere.

Required Purge Time

- 10 minutes: Zone 1 (PR-1xE-A):
- 4 minutes: Zone 2 (PR-1xE-D) Class I Div 1 & 2 (PR-1xE-G & PR-1xE-K)

Note: Refer to the nameplate for the system's minimum purge time.

The purge cycle is indicated by the purge time indicator turning yellow. At the end of the purge cycle:

4.1.1: Zone 1 (PR-1xE-A) / Class 1 Div 1 (PR-1xE-G)

The system will automatically switch to leakage compensation mode, adjusting the flow rate (approximately 20 Nl/min / 0.7 SCFM) to compensate for leakage through the label outlet slot. This maintains overpressure in the enclosure and prevents hazardous gas from re-entering.

- Enclosure Overpressure: Indicated by the enclosure pressure indicators turning green.
- Power and Network: Automatically turned ON for the Zebra printer.

If enclosure pressure is lost, the system will:

- Low Pressure: Indicate by the enclosure pressure indicators turning red.
- Power and Network: Automatically disconnected from the Zebra printer.

Once enclosure pressure is re-established, a purge cycle will commence before power and the Ethernet network are automatically reconnected to the Zebra printer.

4.1.2: Zone 2 (PR-1xE-D) / Class I Div 2 (PR-1xE-K)

The user manually starts and stops the purge cycle. Once stopped, the system will enter leakage compensation mode, adjusting the flow rate (approximately 20 Nl/min / 0.7 SCFM) to compensate for leakage through the label outlet slot. This maintains overpressure in the enclosure and prevents hazardous gas from re-entering.

- Enclosure Overpressure: Indicated by the enclosure pressure indicators turning green.
- Power and Network: Manually turned ON to the printer by the user.

If enclosure pressure is lost, the system will:

- Low Pressure: Indicate by the enclosure pressure indicators turning red.
- Power and Network: Must be manually disconnected from the printer by the user as soon as possible, or as required by the local code of practice.

Once enclosure pressure is re-established, the user must start a new purge cycle before reconnecting power and the Ethernet network to the printer.

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4.2: DUST HAZARDOUS AREA - ZONE 2 & 22, CLASS II DIV 1 & 2 OPERATION

Systems located in areas with hazardous dust or powder require protection through pressurization only. The overpressure in the enclosure and prevents hazardous dust and powder from re-entering.

WARNING! It is the user's responsibility to ensure the system is free from dust before sealing and powering the system.

4.2.1: Zone 21 (PR-1xE-B) / Class II Div 1(PR-1xE-H)

The system supplies air at a sufficient flow rate (approximately 20Nl/min) to pressurize the enclosure and compensate for losses through the label outlet slot.

- Enclosure Overpressure: Indicated by the enclosure pressure indicators turning green.
- Power and Network: Connected automatically once the user confirms the enclosure is clean and pressurized by pressing the power inhibit button on the back of the system.

If enclosure pressure is lost, the system will:

- Low Pressure: Indicate by the enclosure pressure indicators turning red.
- Power and Network: Automatically disconnected from the Zebra printer.

Once enclosure pressure is re-established, the user must confirm the enclosure is free from dust by pressing the power inhibit button again to reconnect the power and the Ethernet network to the Zebra printer.

4.2.2: Zone 22 (PR-1xE-E) / Class II Div 2 (PR-1xE-L)

The system supplies air at a sufficient flow rate (approximately 20Nl/min) to pressurize the enclosure and compensate for losses through the label outlet slot.

- Enclosure Overpressure: Indicated by the enclosure pressure indicators turning green.
- Power and Network: Manually turned ON to the printer by the user.

If enclosure pressure is lost, the system will:

- Low Pressure: Indicate by the enclosure pressure indicators turning red.
- Power and Network: Must be manually disconnected from the printer by the user as soon as possible, or as required by the local code of practice.

Once enclosure pressure is re-established, the user can reconnect power and the Ethernet network to the printer after ensuring the enclosure is free from dust and properly overpressurized.

4.3: THERMOSTATIC SWITCH

The Ex Print is fitted with a thermostatic switch. If the temperature inside the enclosure rises above 50°C (122°F) the system will automatically disconnect power to the Zebra printer. The System will then automatically reconnect power to the Zebra printer once the temperature has fallen below 35°C (95°F).

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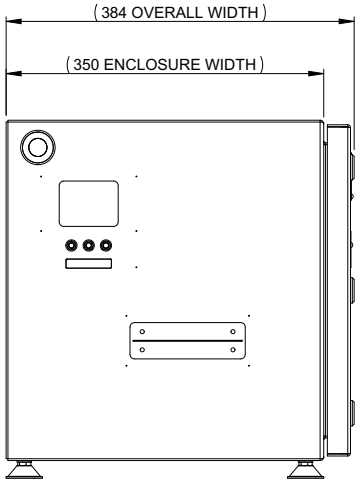
SECTION 5: PRINTER SETUP

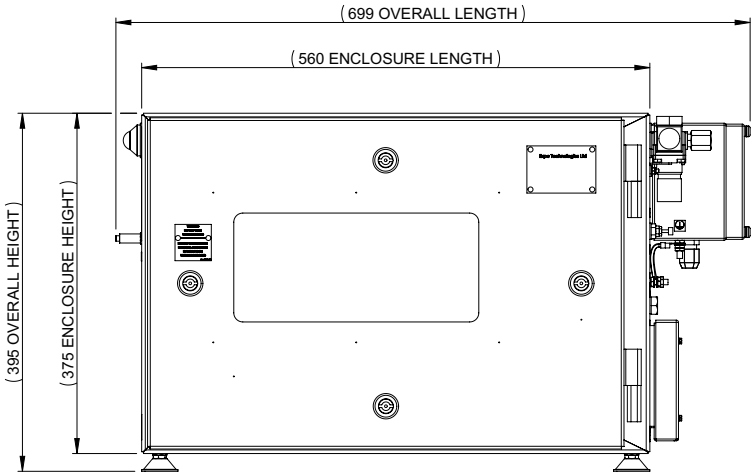
5.1: DIMENSIONS

All Dimensions are in mm

5.1.1: PR-1xE-A / PR-1xE-B Dimensional Drawing

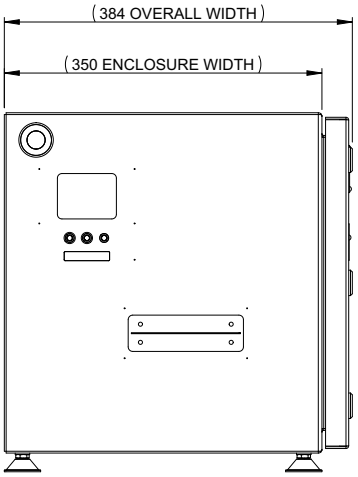


FRONT VIEW

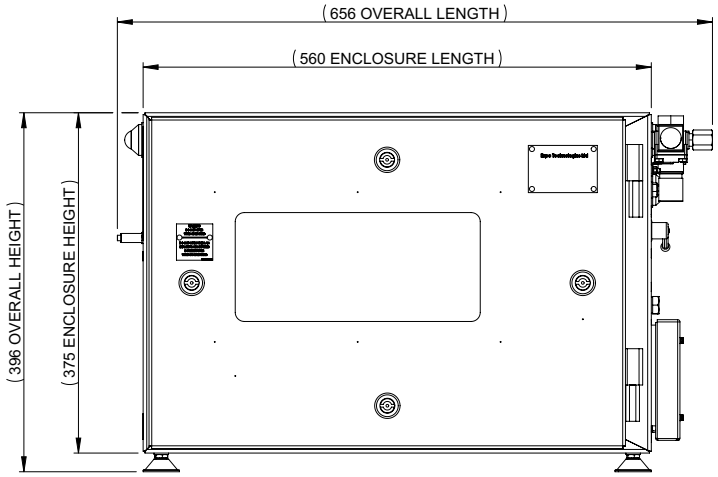


SIDE VIEW

5.1.2: PR-1xE-D / PR-1xE-E / PR-1xE-K / PR-1xE-L Dimensional Drawing

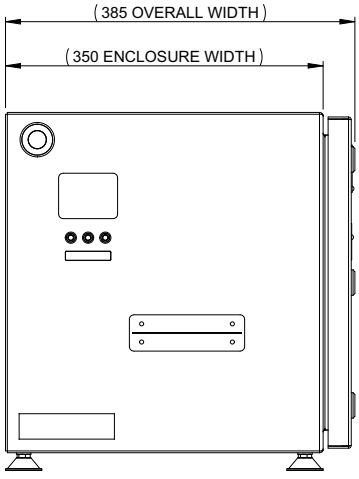


FRONT VIEW

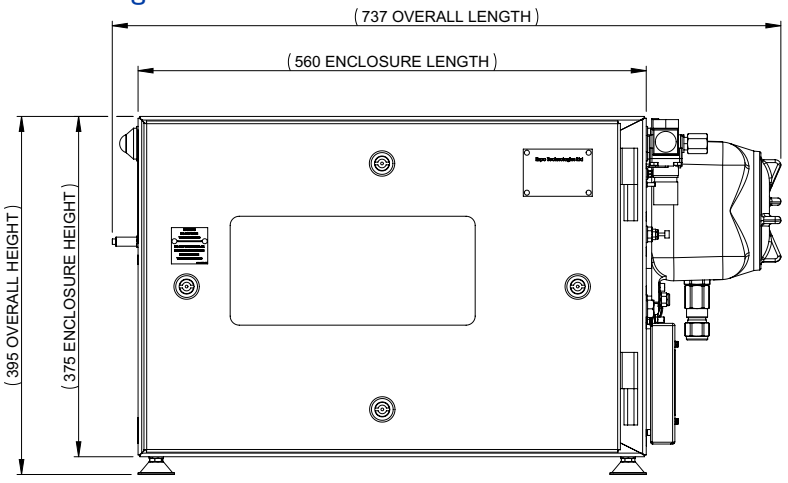


SIDE VIEW

5.1.3: PR-1xE-G / PR-1xE-H Dimensional Drawing



FRONT VIEW



SIDE VIEW

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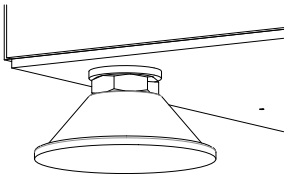
5.2: SELECT A LOCATION

- Must be solid, level and of sufficient size and load-bearing capacity.
- The area where the printer will be located must include adequate space to remove printouts, refill printer media and ribbon, and carry out any connection work.

WARNING! When moving the printer, safe handling practices should be observed.

5.2.1: Feet adjustment to stabilise the printer (if required)

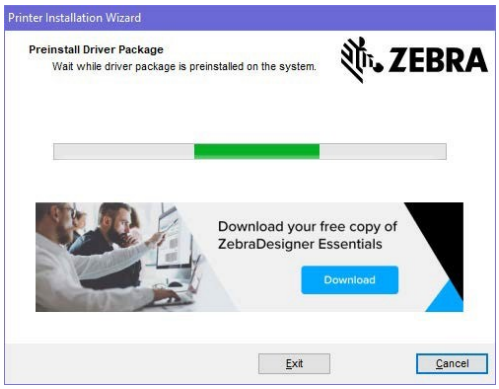
1. Loosen the lock nut with a spanner (13 mm)
2. Adjust the height of the foot as required.
3. Tighten the lock nut to secure the foot.
4. Repeat steps 1-3 as needed for each foot.

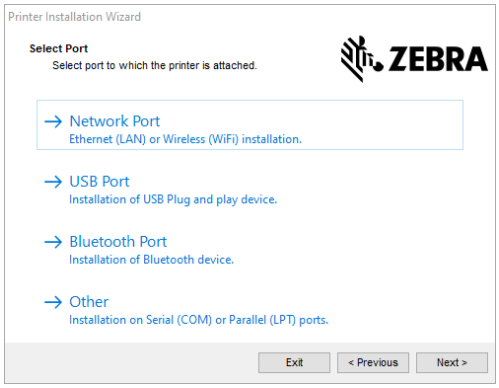


Note: The Ex Print must be level to maintain print quality of the Zebra printer.

5.3: PRINTER DRIVERS

Install all the correct drivers on the Windows-based computer before connecting the printer.





1. Install the printer drivers from zebra.com/drivers.
2. Run the printer installation wizard and follow the instructions.
3. Select “Network Port” when prompted, and follow all other prompts.

Note: Refer to the Zebra printer manual for more detailed instructions.

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5.4: ELECTRICAL CONNECTION

- Installations shall comply with instructions in this manual, relevant regulations, and local codes of practices for electrical installations.
- The power to the printer system shall have a means of isolation. The isolating switch must be approved for the location or located in a non-classified area.
- Separate power and data cables as much as possible. Use short cables where feasible to avoid coupling capacitances and inductances. Cables shall not exceed 3 m (9.8 ft) in length.

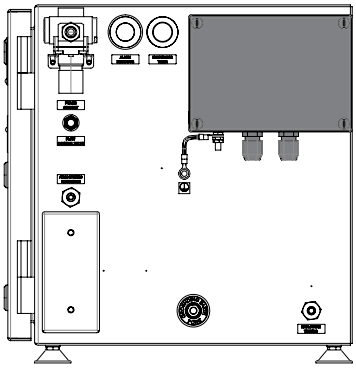
WARNING! Always observe safe working practices for electrical systems.
- Disconnect power and secure from re-connection.
- Ensure the absence of voltage before commencing work.

WARNING! Ensure cables are suitably rated for the installation area and all connections are correct, fully secure, with no bare wires protruding and LAN wires remain twisted as close to the connection point as possible.

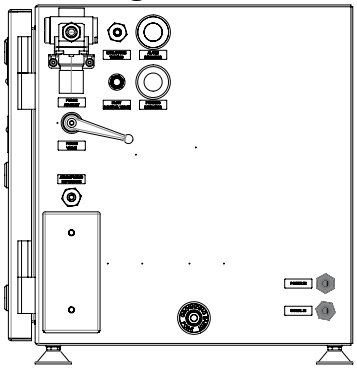
WARNING! The power supply must not exceed the system's specification.

Three methods of wiring connections are available depending on the model:

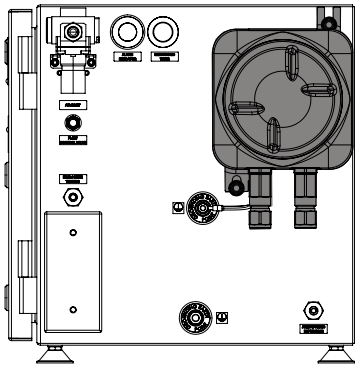
MIU/e Terminal Box



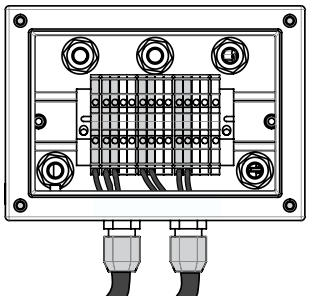
Direct wiring



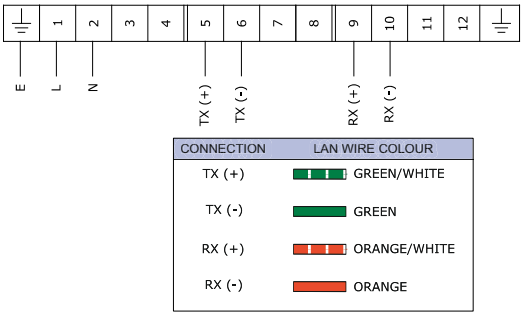
MIU/d Terminal Box



5.4.1: MIU/e Terminal Box



1. Remove the MIU/e lid by loosening the four retaining screws.
2. Insert the power cable through the power supply cable gland on the left.
3. Loosen the required terminal screw, insert the wire, and tighten to a torque between 0.4 Nm and 0.8 Nm:
   - Live to terminal 1, Neutral to terminal 2
   - Earth to the Earth terminal
4. Tighten the cable gland to secure the cable.
5. Insert the Ethernet cable through the Ethernet connection cable gland on the right.
6. Loosen the required terminal screw, insert the wire, and tighten to a torque between 0.4 Nm and 0.8 Nm:
   - Tx (+) to terminal 5, Tx (-) to terminal 6
   - Rx (+) to terminal 9, Rx (-) to terminal 10
7. Tighten the cable gland to secure the cable.
8. Replace the terminal box lid and tighten the four retaining screws.



CONNECTION	LAN WIRE COLOUR
TX (+)	GREEN/WHITE
TX (-)	GREEN
RX (+)	ORANGE/WHITE
RX (-)	ORANGE

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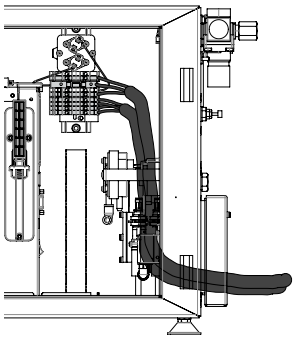
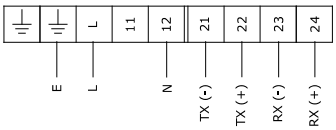
5.4.2: Direct Connection



1. Insert the power cable through the power supply cable gland at the rear of the system and route it through the enclosure to the terminal block.
2. Loosen the required terminal screw, insert the wire, and tighten to a torque between 0.4 Nm and 0.8 Nm:
   - Live to terminal L, Neutral to terminal 12
   - Earth to the Earth terminal
3. Tighten the cable gland to secure the cable.

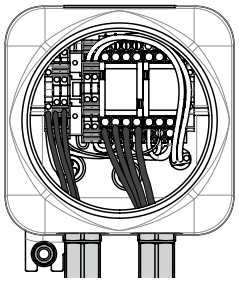


CONNECTION	LAN WIRE COLOUR
TX (-)	GREEN
TX (+)	GREEN/WHITE
RX (-)	ORANGE
RX (+)	ORANGE/WHITE

4. Insert the Ethernet cable through the Ethernet connection cable gland at the rear of the system and route it through the enclosure to the terminal block.
5. Loosen the required terminal screw, insert the wire, and tighten to a torque between 0.4 Nm and 0.8 Nm:
   - Tx (-) to terminal 21, Tx (+) to terminal 22
   - Rx (-) to terminal 23, Rx (+) to terminal 24
6. Tighten the cable gland to secure the cable.

5.4.3: MIU/d Terminal Box

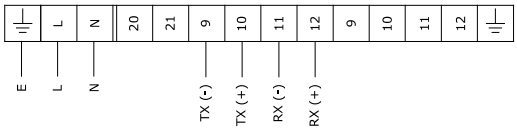
1. Loosen the lid locking screw, unscrew the lid and remove from the terminal box.
2. Insert the cables through the cable entries in the bottom of the MIU/d.



CAUTION! Cable glands, conduit or other cable entry devices must be used for cable entries into the MIU/d. They shall be appropriately certified and installed in accordance with the manufacturer's instructions.

Note: Glands are not supplied with the system. Cable entries are supplied with NPT threads.

3. Loosen the required terminal screw, insert the wire, and tighten to a torque between 0.4 Nm and 0.8 Nm:
   - Live to terminal L, Neutral to terminal N
   - Earth to the Earth terminal
   - Tx (-) to terminal 9, Tx (+) to terminal 10
   - Rx (-) to terminal 11, Rx (+) to terminal 12
4. Replace and fully screw down the terminal box lid. Secure in place by tightening the lid locking screw.

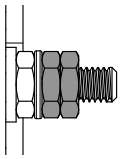


CONNECTION	LAN WIRE COLOUR
TX (-)	GREEN
TX (+)	GREEN/WHITE
RX (-)	ORANGE
RX (+)	ORANGE/WHITE

5.5: EARTH CONNECTION

WARNING! The printer system must be earthed to the ground accordingly. The protective earth wire must be the same size as the largest wire used to bring power into the enclosure.

The Ex Print can be earthed using the M8 Earth stud on the back of the printer enclosure. The connection shall be a ring lug, properly crimped and fully secured (2.5 Nm torque) with anti-shake washers to prevent accidental loosening.



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5.6: AIR SUPPLY CONNECTION

5.6.1: Air Supply Quality and Safety

The air supply must be: clean, non-flammable and from a non-hazardous location. The air should be of Instrument Air Quality, free from water and oil in accordance to BS ISO 8573-1: 2010.

Particles	≤20.000 particles/m^3 in 0.1 µm to 0.5 µm ≤400 particles/m^3 in 0.5 µm to 1 µm ≤10 particles/m^3 in 1 µm to 5 µm
Humidity	-10°Cdp to +3°Cdp
Oil Content	≤0.1 mg/m^3

Note: The system can operate with lower air quality, however this may reduce its operational life.

Precautions when handling compressed air:

- Wear appropriate PPE.
- Take precautions when connecting or disconnecting supplies.
- Ensure all pipework and systems are secured and in good condition.
- Never block pipes with any part of the body.

5.6.2: Pipework

- All pipework/tubing and fittings must conform to local regulations, including flammability ratings.
- Protect pipework and connections from mechanical damage.

5.6.3: Connecting the Air Supply

1. The Ex Print is fitted with a regulator. The inlet port has a 1/4" NPTF fitting; connect it to the air supply using:
    - Metal pipe: Recommended diameter is ½".
    - Pneumatic plastic tubing: Recommended outer is diameter 12 mm outer diameter is recommended

Note: Using smaller pipes may result in reduced/insufficient airflow to operate the system.

2. Flush the pipework through with instrument-quality air for at least 10 seconds per meter of pipe to remove debris.
3. Connect the pipe to the regulator, ensuring it is fully secure.

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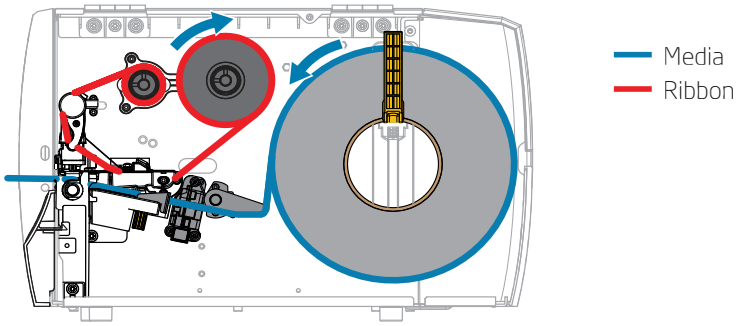
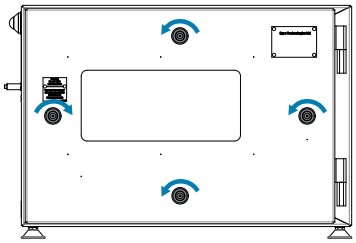
5.7: INSERTING THE MEDIA AND RIBBON

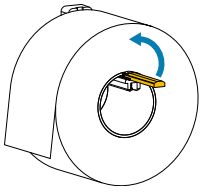


5.7.1: Loading the Media

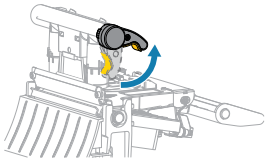


1. Unlock and open the side access door.

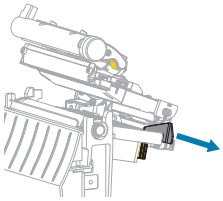
2. Slide out and flip down the media supply guide.



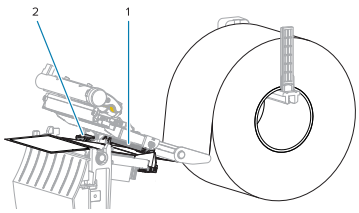
3. Insert the media roll into the printer. Ensure the roll pushed back completely.
4. Flip up the media supply guide and adjust it to touch the edge of the roll.



5. Release the printhead assembly, as the printhead lever rotates upward, the printhead assembly pivots upward.



6. Slide the outer media guide all the way out.



7. Load the media through the slot in the transmissive media sensor (1) and under the inner media guide (2). The media should touch the back of the media slot.

WARNING! HOT SURFACE! The printhead may be hot and could cause serve burns. Allow the printhead to cool.

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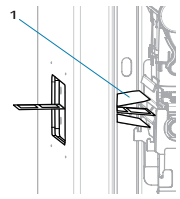
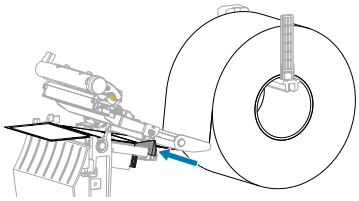
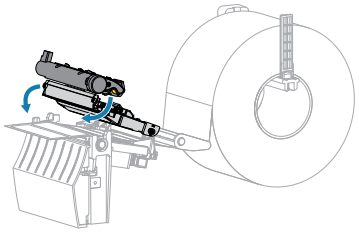


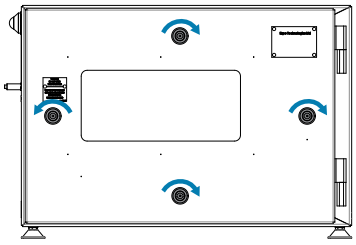
8. Pass the media through the shims (1) and out of the enclosure slot.



9. Adjust the outer media guide to touch the edge of the media lightly.



10. Close the printhead assembly.

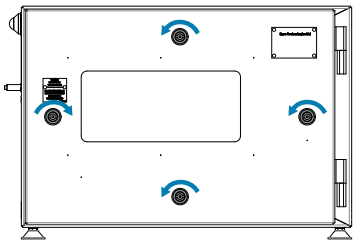


11. Close and lock the side access door.

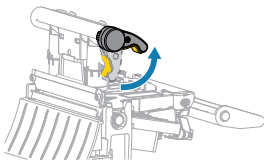
5.7.2: Loading the Ribbon

Note: Ribbon is used only with thermal transfer labels. Do not load ribbon with direct thermal labels.

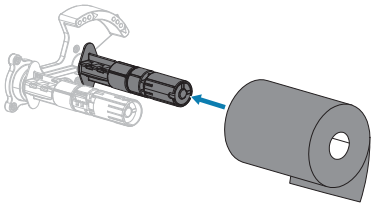
CAUTION! Use a ribbon that is wider than the media to protect the printhead. The ribbon must be coated on the outside.



1. Unlock and open the side access door.



2. Release the printhead assembly, as the printhead lever rotates upward, the printhead assembly pivots upward.



3. Place the ribbon roll on the ribbon supply spindle, ensuring the loose end of the ribbon unrolling as shown. Push the roll back completely.

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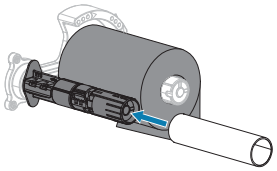
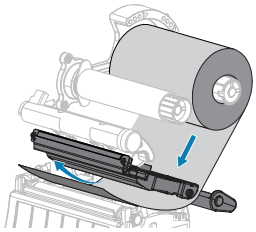
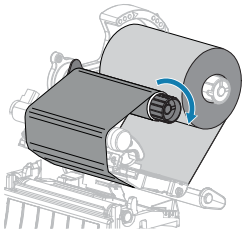


4. Ensure the empty ribbon core is on the ribbon take-up spindle. Push the core back as far as it will go.

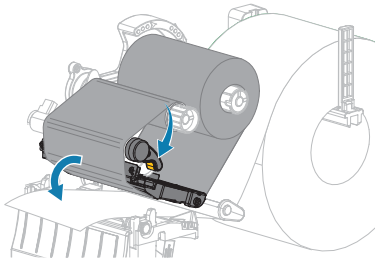


5. Bring the ribbon under the printhead assembly.

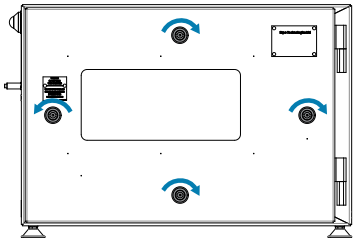
WARNING! HOT SURFACE! The printhead may be hot and could cause serve burns. Allow the printhead to cool.



6. With the ribbon tracking as far back as it can under the printhead assembly:
   - Wrap the ribbon around the core on the ribbon take-up spindle.
   - Rotate the spindle several turns to tighten and align the ribbon.



7. Rotate the printhead lever downward to lock it in place.



8. Close and lock the side access door.

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SECTION 6: SYSTEM START-UP

WARNING! Never turn the power ON to the system while the side access door and/or terminal box lids are open/removed (when fitted) unless the atmosphere is confirmed to be free of hazardous medium.

6.1: PRE-START UP CHECKS

- Check all connections and ensure the system is installed as per this manual.
- Check the exit of the relief valve is free from obstructions.

Note: If turning on the Zebra printer for the first time, refer to the Zebra printer manual for setup instructions.

6.2: PR-1xE-A (ZONE 1) / PR-1xE-G (CLASS I DIV 1)

1. Ensure the power button on the Zebra printer is turned ON.
2. Close the side access door and secure it by all four locks.
3. Turn ON the main power supply and Ethernet network.
4. Turn ON the air supply.
5. The purge timer will start automatically when the enclosure pressure reaches 0.5 mbar (0.2"wc), the enclosure pressure indicators will turn green, and the purge flow rate (225 Nl/min / 8.5 SCFM) is satisfied.
6. The purge time indicator yellow LEDs will flash during the purge process. Once the purge is complete, the yellow LEDs will turn OFF, and the system will power ON the Zebra printer and connect it to the Ethernet network.

Note: The printer is supplied with the purge timer set to the minimum required purge time for the area:

- Zone 1: 10 minutes
- Class I Div 1: 4 minutes

7. The printer is ready for use.

6.3: PR-1xE-B (ZONE 21) / PR-1xE-H (CLASS II DIV 1)

1. Ensure the power button on the Zebra printer is turned ON.
2. Clean the system interior to ensure it is free from dust or powder.
3. Close the side access door and lock all four locks.
4. Turn ON the main power supply and Ethernet network.
5. Turn ON the air supply.
6. Once the enclosure pressure reaches over 2.5 mbar (1"wc), the enclosure pressure indicators will turn green. Press the power inhibit button.
7. The system will then power ON the Zebra printer and connect it to the Ethernet network.
8. The printer is ready for use.

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6.4: PR-1xE-D (ZONE 2) / PR-1xE-K (CLASS I DIV 2)

1. Ensure the power button on the Zebra printer is turned ON.
2. Close the side access door and lock all four locks.
3. Turn ON the air supply.
4. Once the enclosure pressure reaches 0.5 mbar (0.2"wc), the enclosure pressure indicators will turn green. Slowly rotate the handle of the purge valve to the ON position to start purging.
5. When the purge indicator turns yellow, keep the valve handle in that position and start a timer.

Note: It is the user's responsibility to ensure the system is purged for a minimum of 4 minutes.

6. After the required time elapses, rotate the purge valve handle to the OFF position.
7. Turn ON the power to the system and connect the Ethernet network.
8. The printer is ready for use.

6.5: PR-1xE-E (ZONE 22) / PR-1xE-L (CLASS II DIV 2)

1. Ensure the power button on the Zebra printer is turned ON.
2. Clean the system interior to ensure it is free from dust or powder.
3. Close the side access door and lock all four locks.
4. Turn On the air supply. Once the enclosure pressure reaches over 2.5mbar, the enclosure pressure indicators will turn green.
5. Turn ON the power to the system and connect the Ethernet network.
6. The printer is ready for use.

SECTION 7: MAINTENANCE

Routine preventive maintenance is crucial for reliable printer operation. The following schedule serves as a guideline and should be supplemented by any national or local regulations.

Every 6 Months

- Check that all system labels are legible and undamaged; replace if necessary.
- Inspect door and window seals for leaks; replace if necessary.
- Check all locks are functioning properly.
- Clean and inspect relief valve, removing debris or corrosion.

Every 2 Years

- Perform all checks listed in the 6-month maintenance.
- Confirm the system's suitability for the hazardous area and system functions properly.
- Ensure no unauthorised modifications have been made.
- Confirm the air supply quality (refer to section 5.6.1 – Air Supply Quality).
- Inspect all system component and pipework for security and damage; repair or replace if necessary.

Every 3 Years

- Perform all checks listed in the 6-month and 2-year maintenance.
- Replace the electronic timer battery. Refer to Section 10.2 – E-Timer Battery Replacement.

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SECTION 8: CLEANING

WARNING! Disconnect the power and shut off the airflow before accessing the enclosure.

8.1: GENERAL SYSTEM - INTERIOR & EXTERIOR

WARNING! Use cleaning substances compatible with the printer's construction materials. Avoid solvents or abrasives that could compromise the enclosure's performance.

- For general cleaning, use a damp cloth or cotton pad.
- For stubborn spots, use water or a diluted household cleaning solution.
- Clean all non-metallic surfaces, including plastic parts and viewing windows, with a damp cloth only.

8.2: ZEBRA PRINTER CLEANING SCHEDULE

Over time, the movement of media or ribbon across the printhead wears through the protective ceramic coating, exposing and eventually damaging the print elements (dots). To avoid abrasion:

- Clean the printhead frequently.
- Minimize printhead pressure and burn temperature (darkness) settings by optimizing the balance between the two.
- When using Thermal Transfer mode, ensure that the ribbon is as wide or wider than the media to prevent exposing the printhead elements to the more abrasive label material.

This table shows the recommended cleaning schedule. These intervals are intended as guidelines only. You may have to clean more often, depending upon your application and media.

Area	Method	Interval
Print Head	Solvent	**Direct Thermal Mode:** After each roll of media. **Thermal Transfer Mode:** After each roll of ribbon.
Platen Roller	Solvent	
Media Sensors	Air Blow	
Ribbon Sensor	Air Blow	
Media Path	Solvent	
Ribbon Path	Solvent	
Tear-Off/Peel-Off Bar	Solvent	Every month
Take-Label Sensor	Air Blow	Every six months

Note: Use the Zebra Preventive Maintenance Kit (part number 47362) or a lint-free cloth dipped with 99.7% isopropyl alcohol.

Note: Refer to the Zebra printer manual for detailed cleaning procedures.

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SECTION 9: TROUBLESHOOTING

9.1: PURGE AND PRESSURIZATION TROUBLESHOOTING

9.1.1: Pressure Alarm is ON Continuously

Fault Location	Cause	Solution
Air Supply	No/Inadequate air supply pressure or low flow rate.	Turn the air supply ON. Check the air supply pressure at the inlet is stable between 3.5Barg to 7.5Barg / 50psi to 101psi.
Pipework	Air Inlet Pipe is incorrect, damaged or leaking.	Ensure the supply pipe bore is suitable for the flow rate/sized at least the size of the Control Unit inlet fitting. Check for damage/air leaks – replace or repair damage, tighten any loose connectors.
Enclosure	Excessive leakage from the pressurized enclosure.	Check the side access door is closed, locked and sealed. Check cable glands have been used or blanked as required (direct wiring).
MiniPurge Control Unit	The Pressure/flow sensor fault.	Consult Expo.

9.1.2: Relief Valve opens continuously or intermittently

Fault Location	Cause	Solution
Enclosure	Enclosure pressure is too high.	Adjust the flow control valve to reduce the flow.
Relief Valve Unit	Debris on the relief valve disk allows air to leak from the valve. Relief valve malfunction.	Clean the valve disk from the inside of the enclosure. Consult Expo.

9.1.3: System Fails to Switch power ON

Power Supply	Mains Power not connected/ connected correctly. Mains Power isolator/fuse in the OFF position/Faulty. Thermostatic switch has tripped / faulty.	Check electrical connections are connected correctly and fully secure. Turn the isolator ON. Replace/repair faulty components. Allow the internal temperature to cool. Consult Expo.

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PR-1xE-A & PR-1xE-G Only

9.1.4: System Fails to Switch power on after Purge is complete

Fault Location	Cause	Solution
MiniPurge Control Unit	Purge Timer not switching.	Purge Timer is not complete – wait till the time has elapsed. Consult Expo.
	Purge Time not correct .	Set the timer to the minimum available purging time and check the system operates as accepted. Note: Ensure the purge time is returned to its original setting and checked before returning the system into service.

9.1.5: System begins purging but the cycle fails to complete

Fault Location	Cause	Solution
Electronic Timer	The timer is set to 00.	Reset the timer to the correct purge time.
	The battery pack is discharged.	Replace the battery module.

9.1.6: System Alarms after purging and purge cycle is repeated

Fault Location	Cause	Solution
Enclosure	Enclosure pressure is too low.	Check the enclosure pressure with a manometer or gauge. Adjust the Flow Control Valve to increase the flow/pressure.

Note: If the system does not purge and pressurize as it should, or the issue is not listed, contact Expo.

9.2: ZEBRA PRINTER STATUS INDICATORS

Indicator Lights	What they Indicate
	STATUS light steady green (other lights steady yellow for 2 seconds during printer power-up). The printer is ready.
	PAUSE light steady yellow. The printer is paused.
	STATUS light steady red. SUPPLIES light steady red. The media supply is out. The printer needs attention and cannot continue without user intervention.

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	STATUS light steady red. SUPPLIES light flashing red. The ribbon supply is out. The printer needs attention and cannot continue without user intervention
	STATUS light steady yellow. SUPPLIES light flashing yellow. The printer is in Direct Thermal mode, which does not require ribbon; however, ribbon is installed in the printer.
	STATUS light steady red. PAUSE light steady yellow. The printhead is open. The printer needs attention and cannot continue without user intervention.
	STATUS light steady yellow. The printhead is over temperature.
	STATUS light flashing yellow. Indicates one of the following: • The printhead is under temperature. • The power supply is over temperature. • The main logic board (MLB) is over temperature.
	STATUS light steady red. PAUSE light steady red. DATA light steady red. The printhead was replaced with one that is not a genuine Zebra printhead. Install a genuine Zebra printhead to continue.
	STATUS light flashing red. The printer is unable to read the dpi setting of the printhead.
	NETWORK light off. No Ethernet link is available.
	NETWORK light steady green. A 100 Base-T link was found.
	NETWORK light steady yellow. A 10 Base-T link was found.
	NETWORK light steady red. An Ethernet error condition exists. The printer is not connected to your network.

Note: Refer to the Zebra ZT111 printer manual for all other diagnostic and troubleshooting tests and issues.

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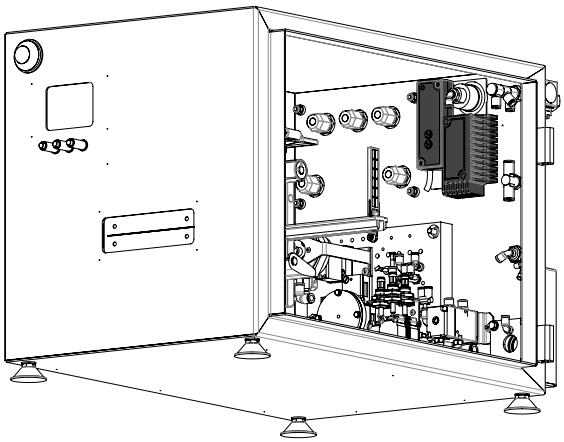
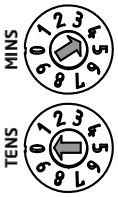
SECTION 10: REPAIRS & CONFIGURATION



10.1: SET THE PURGE TIMER



1. Unlock and open the side access door. The Timer module is located on the inside of the rear panel as shown above.
2. Adjust the timer settings. Using a small flat-head screwdriver, rotate the dials on the timer module according to the time required.
   - The bottom dial sets the tens.
   - The top dial sets the units.
     For example: To set the timer to ten minutes, adjust the bottom dial to "1" and the top dial to "0".

Note: Setting the timer to 00 minutes will result in infinite purging; the cycle will never complete. The printer is supplied with purge timer set for the required application

3. Close and lock the side access door.

10.2: E-TIMER BATTERY REPLACEMENT

The battery module for the e-timer should be replaced every three years.

Dispose of the battery module according to the battery's Material Safety Data Sheet and relevant local or national regulations.

1. Unlock and open the side access door. Locate the timer and battery module inside the rear panel.
2. Remove the old battery.
   - Use a flat-head screwdriver to loosen and remove the two retaining screws from the battery pack.
   - Carefully pull the battery module away from the e-timer to unplug it.

CAUTION! Pulling at an angle may damage the e-timer connector.

3. Install the new battery module.
   - Insert the screws and washers into the new battery module.
   - Fully plug the new battery module into the e-timer.
   - Tighten the screws to secure the battery in place.
4. Close and lock the side access door. The system will automatically complete a purge cycle before reconnecting power to the Zebra printer.

SECTION 11: RECOMMENDED SPARES

Part Number	Description	Quantity
ETM-IS31-001	Intrinsically Safe Battery Pack (PR-1xE-A & PR-1xE-G only)	1

WARNING! Access inside the printer system shall only be for the purposes described in this manual. Repairs to the purge system shall only be performed by an Expo trained service and authorised engineers. Contact Expo.

SECTION 12: TECHNICAL SPECIFICATION

12.1: GENERAL SPECIFICATION

Label Printer		Zebra ZT111 Thermal Transfer Label Printer
User Interface		Push Buttons for Printer Control 2x Viewing Windows. Printer LEDs ; Media and Ribbon Low-leakage Label Slot Side Access Door for Media and Ribbon Change 2x Enclosure Pressure Indicator - Front & Back Flow Control Valve Enclosure Pressure Test Port
Purge Gas		Clean Compressed Air
Air Supply Pressure		Regulated Supply 3.5 barg to 7.5 barg (50 psig to 101 psig)
Pressurization Flow Rate		Approximately 20 Nl/min (0.7 SCFM)
Enclosure Pressure		1.5 mbarg to 4.5 mbarg (0.6”wc to 1.8”wc)
Enclosure OverPressure Relief Valve		10 mbarg (4”wc)
Process Connections		Purge Air Inlet: 1/4” NPT
Power Supply		100 VAC to 240 VAC, 50 Hz to 60 Hz, Sleep Power: 3.43 W, Print Power: 57 W @ 120 VAC, 60 Hz Sleep Power: 3.39 W, Print Power: 59 W @ 230 VAC, 50 Hz
Electrical Connection	Power	Screw Terminal
	Ethernet Network	Screw Terminal
	Earth Connection	M8 Stud
Thermostatic Switch		Opens at 50°C (122°F) - Disconnects Power Closes at 35°C (95°F) - Connects Power Automatic Reset
Enclosure Material		316L Stainless Steel (2 mm Thick) Laminated Glass (6.4 mm Thick)
Ingress Protection		IP42
Operating Temperature		5°C to 40°C (41°F to +104°F)
Operating Humidity		20% to 85%, Non-condensing
Storage & Transport Temperature		-40°C to +60°C (-40°F to +140°F)
Storage & Transport Humidity		5% to 85%, Non-condensing

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12.2: SYSTEM SPECIFICATION

12.2.1: PR-1xE-A

Protection Method	Purge and Pressurization
User Interface	Purge Time Indicator (4 Yellow LEDs) Purge Timer Switch - 2x Dials for Setting Purge tTme
Purge Flow Rate	225 Nl/min (8.5 SCFM)
Minimum Enclosure Pressure	0.5 mbar (0.2"wc)
Action on Loss of Pressure	Local Alarm and Trip Power
Electrical Connection	MIU/e Ex e Stainless Steel Terminal Box M16 Cable Glands suitable for cable Ø5mm to 10mm Screw Terminals - 24 to 14 AWG (0.2mm^2 to 2.5mm^2) wire
Unit Dimensions (LxWxD)	699 mm x 384 mm x 395 mm (27.5" x 15.1" x 15.6")
Unit Weight	33 kg (73 lb)

12.2.2: PR-1xE-B

Protection Method	Pressurization
User Interface	Power Inhibit Button
Minimum Enclosure Pressure	2.5 mbar (1"wc)
Action on Loss of Pressure	Local Alarm and Trip Power
Electrical Connection	MIU/e Ex e Stainless Steel Terminal Box M16 Cable Glands suitable for cable Ø5mm to 10mm Screw Terminals - 24 to 14 AWG (0.2mm^2 to 2.5mm^2) wire
Unit Dimensions (LxWxD)	699 mm x 384 mm x 395 mm (27.5" x 15.1" x 15.6")
Unit Weight	32 kg (71 lb)

12.2.3: PR-1xE-D / PR-1xE-K

Protection Method	Purge and Pressurization
User Interface	Purge Inhibit Handle Purge Status Indicator
Purge Flow Rate	225 Nl/min (8.5 SCFM)
Minimum Enclosure Pressure	0.5 mbar (0.2"wc)
Action on Loss of Pressure	Local Alarm Only
Electrical Connection	Direct Internal Wiring M16 Cable Glands suitable for cable Ø5mm to 10mm Screw Terminals - 24 to 14 AWG (0.2mm^2 to 2.5mm^2) wire
Unit Dimensions (LxWxD)	656 mm x 384 mm x 396 mm (25.8" x 15.1" x 15.6")
Unit Weight	30 kg (66 lb)

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12.2.4: PR-1xE-E / PR-1xE-L

Protection Method	Pressurization
Action on Loss of Pressure	Local Alarm Only
Minimum Enclosure Pressure	2.5 mbar (1"wc)
Electrical Connection	Direct Internal Wiring M16 Cable Glands suitable for cable Ø5mm to 10mm Screw Terminals - 24 to 14 AWG (0.2mm^2 to 2.5mm^2) wire
Unit Dimensions (LxWxD)	656 mm x 384 mm x 396 mm (25.8" x 15.1" x 15.6")
Unit Weight	29 kg (64 lb)

12.2.5: PR-1xE-G

Protection Method	Purge and Pressurization
User Interface	Purge Time Indicator (4 Yellow LEDs) Purge Timer Switch - 2x Dials for Setting Purge tTme
Purge Flow Rate	225 Nl/min (8.5 SCFM)
Minimum Enclosure Pressure	0.5 mbar (0.2"wc)
Action on Loss of Pressure	Local Alarm and Trip Power
Electrical Connection	MIU/d Ex d Flameproof Terminal Box M20 NPF Threaded holes for Cable Glands (not supplied) Screw Terminals - 24 to 14 AWG (0.2mm^2 to 2.5mm^2) wire
Unit Dimensions (LxWxD)	737 mm x 385 mm x 395 mm (29.0" x 15.1" x 15.6")
Unit Weight	35 kg (77 lb)

12.2.6: PR-1xE-H

Protection Method	Pressurization
User Interface	Power Inhibit Button
Minimum Enclosure Pressure	2.5 mbar (1"wc)
Action on Loss of Pressure	Local Alarm and Trip Power
Electrical Connection	MIU/d Ex d Flameproof Terminal Box M20 NPF Threaded holes for Cable Glands (not supplied) Screw Terminals - 24 to 14 AWG (0.2mm^2 to 2.5mm^2) wire
Unit Dimensions (LxWxD)	737 mm x 385 mm x 395 mm (29.0" x 15.1" x 15.6")
Unit Weight	34 kg (75 lb)

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12.3: CERTIFICATION

	PR-1xE-A	PR-1xE-B
Area of Use	Zone 1	Zone 21
ATEX (Euope) ExVeritas 19ATEX0469X	Ex db ia pxb IIC T4 Gb	Ex pxb tb IIIC T135°C Db
IECEx (International) IECEx EXV 19.0024X	Ex db ia pxb IIC T4 Gb	Ex pxb tb IIIC T135°C Db
EMC Compliance	EN 61000-6-2:2019 EN 61000-6-4:2019	EN 61000-6-2:2019 EN 61000-6-4:2019

	PR-1xE-D	PR-1xE-E
Area of Use	Zone 2	Zone 22
ATEX (Euope) ExVeritas 19ATEX0470X	Ex pzc IIC T4 Gc	Ex pzc IIIC T135°C Dc
IECEx (International) IECEx EXV 19.0025X	Ex pzc IIC T4 Gc	Ex pzc IIIC T135°C Dc
EMC Compliance	EN 61000-6-2:2019 EN 61000-6-4:2019	EN 61000-6-2:2019 EN 61000-6-4:2019

	PR-1xE-G	PR-1xE-H
Area of Use	Class I Div 1	Class II Div 1
Declaration of Conformity (USA) EXPO 25MDOC1448	Compliance with NFPA 496 Class I Div 1 Groups B, C, D	Compliance with NFPA 496 Class II Div 1 Groups E & F
FCC Compliance	FCC CFR47 Part 15 Subpart B 107 & 109	FCC CFR47 Part 15 Subpart B 107 & 109

	PR-1xE-K	PR-1xE-L
Area of Use	Class I Div 2	Class II Div 2
Declaration of Conformity (USA) EXPO 25MDOC1476	Compliance with NFPA 496 Class I Div 2 Groups B, C, D	Compliance with NFPA 496 Class II Div 2 Groups E & F
FCC Compliance	FCC CFR47 Part 15 Subpart B 107 & 109	FCC CFR47 Part 15 Subpart B 107 & 109

12.4: MODEL NUMBERS

PR-1xE-y

x = Zebra Printer Model (Resolution)

2 = ZT11142 Thermal Transfer printer (4", 203 dpi)

3 = ZT11143 Thermal Transfer printer(4", 300 dpi)

y = Hazardous Area

A = ATEX/IECEx Zone 1

B = ATEX/IECEx Zone 21

D = ATEX/IECEx Zone 2

E = ATEX/IECEx Zone 22

G = NFPA Class I Div 1

H = NFPA Class II Div 1

K = NFPA Class I Div 2

L = NFPA Class II Div 2

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EU Declaration of Conformity CE

This declaration of conformity is issued under the sole responsibility of the manufacturer and EU representative named above.

Object of the declaration:

Product Name:	Ex Print
Product Options:	This declaration covers all variants associated with the above product

The object of the declaration described above is in conformity with the relevant union harmonisation legislation:

Type of Legislation:
Electromagnetic Compatibility Directive 2014/30/EU
ATEX Directive 2014/34/EU

The following harmonised standards and technical specifications have been applied:

Type of Legislation:	**General Standard:**	**Reference Standard:**
EMC Directive:	Electromagnetic compatibility (EMC) - Generic standards. Immunity standard for industrial environments	EN 61000-6-2:2019
	Electromagnetic compatibility (EMC) - Generic standards. Emission standard for industrial environments	EN 61000-6-4:2019
ATEX Directive:	Equipment general requirements	EN IEC 60079-0:2018/AC:2020
	Equipment protection by pressurized enclosure "p"	EN 60079-2:2014
	Equipment protection by increased safety "e"	EN 60079-7:2015+A11:2024
	Equipment protection by intrinsic safety "i"	EN 60079-11:2012
Ingress Protection:	Degrees of protection provided by enclosures (IP Code)	EN 60529 1992+A2:2013 (IP42)

Notified body:

NB Name:	ExVeritas
NB Number:	2804

Technical documentation and assessments are in the Expo Technologies Ltd confidential technical file SC051.
For and on behalf of Expo Technologies Ltd.

John Paul De Beer
Managing Director

Date: 7th January 2025

SC051-EU DoC Ex Print Issue 01

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