



LARGE GAUGE

Vacuum Regulator

CONTINUOUS & CONTINUOUS INTERMITTENT

Model Series:

PMX3000, PMX3100, PMX3300, PMX3400, PMX3500, PMX3600

CAUTION

Federal (USA) law restricts this device to sale by or on the order of a physician.



CONTENTS

Receiving/Inspection3

Intended Use.....3

Read All Instructions Before Using.....3

Explanation of Abbreviations3

Safety Information - Warnings and Cautions.....3

Specifications4-5

Operating Instructions6

Continuous Series (PMX3000, PMX3100, PMX3500, & PMX3600)

 Parts Description8

 Parts List.....8

 Repair Kits.....9

 Disassembly Instructions.....9

 Assembly Instructions9

Continuous Intermittent Series (PMX3300 & PMX3400)

 Parts Description10

 Parts List.....10

 Disassembly Instructions.....11

 Assembly Instructions11

Large Gauge Vacuum Regulator Cleaning Illustration12

Cleaning/Decontamination.....12

Exterior Cleaning.....13

Maintenance13

Returns13

Disposal Instructions14

Troubleshooting.....14

Limited Warranty.....15

RECEIVING / INSPECTION

Remove the Precision Medical, Inc. *Large Gauge Vacuum Regulator* from the packaging and inspect for damage. If there is any damage, DO NOT USE and contact your Provider.

INTENDED USE

The devices are intended to control and show the amount of vacuum from a central vacuum system used in various medical suctioning procedures.

READ ALL INSTRUCTIONS BEFORE USING

This manual instructs a Professional to install and operate the *Large Gauge Vacuum Regulator*. This is provided for your safety and to prevent damage to the Large Gauge Vacuum Regulator. If you do not understand this manual, DO NOT USE the Large Gauge Vacuum Regulator and contact your Provider.

EXPLANATION OF ABBREVIATIONS

l/min	Liters Per Minute
mmHg	Millimeters of Mercury
inHg	Inches of Mercury
kPa	Kilopascal

SAFETY INFORMATION - WARNINGS AND CAUTIONS

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

Used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



CONSULT ACCOMPANYING DOCUMENTS



There are no components in this product made with natural rubber latex.

WARNING

DO NOT use this Large Gauge Vacuum Regulator for anything other than its Intended Use. Personal injury and/or damage to Regulator may result from misuse.

Only personnel instructed and trained in its use should operate this Large Gauge Vacuum Regulator.

SPECIFICATIONS

GAUGE RANGE:			
PMX3000:	0-200 mmHg - Full Vacuum	*PMX3300EHV:	0-300 mmHg (0-40kPa)
*PMX3000E:	0-200 mmHg (0-26 kPa)	PMX3300HV:	0-300 mmHg - Full Vacuum
PMX3000HV:	0-300 mmHg - Full Vacuum	PMX3400:	0-150 mmHg
PMX3100:	0-200 mmHg - Full Vacuum	*PMX3400E:	0-150 mmHg (0-20kPa)
*PMX3100E:	0-200 mmHg (0-26 kPa)	PMX3500:	0-150 mmHg
*PMX3100EHV:	0-300 mmHg (0-40kPa)	*PMX3500E:	0-200 mmHg (0-26 kPa)
PMX3300:	0-200 mmHg - Full Vacuum	PMX3600:	0-760 mmHg
*PMX3300E:	0-200 mmHg (0-26 kPa)	*PMX3600E:	0-760 mmHg (0-100 kPa)

**Counterclockwise direction*

GAUGE ACCURACY:	
Analog Gauge:	± 5% of MAX
Digital/Analog, Dual Gauge:	
Digital Display:	± 1% of Full Scale
Analog Gauge:	± 5% of MAX within ref. Indicator

VACUUM PORTS:
1/8 NPT Female

MODES OF OPERATION:	
PMX3000, PMX3500 Series:	OFF - No Vacuum REG. - (Regulated) provides an adjustable, continuous vacuum level
PMX3100, PMX3600 Series:	LINE - Provides maximum, continuous vacuum from the vacuum source OFF - No Vacuum REG. - (Regulated) provides an adjustable, continuous vacuum level
PMX3300, PMX3400 Series:	REG. - (Regulated) provides an adjustable, continuous vacuum level OFF - No Vacuum INT. - (Intermittent) provide an adjustable vacuum level that cycles between ON and OFF

Specifications are subject to change without prior notice.

FLOW RATES:

*PMX3000, PMX3100, & PMX3500:	REG	50 l/min
	LINE	55 l/min
**PMX3600 SERIES:	REG	71 l/min
	LINE	82 l/min
*PMX3300:	REG	50 l/min
	INT	10 l/min
*PMX3400:	REG	50 l/min
	INT	3 l/min

* MAXIMUM FLOW IS OBTAINED WITH A VACUUM SOURCE OF 21" Hg (71.1 kPa)

** MAXIMUM FLOW IS OBTAINED WITH A VACUUM SOURCE OF 25" Hg (84.6 kPa)

MAXIMUM VACUUM:

PMX3000 & PMX3100: REG. Mode @ Max - min. 100 mmHg above calibrated range

PMX3300 & PMX3300HV: REG. Mode @ Max - min. 100 mmHg above calibrated range

PMX3400 & PMX3500D: Restricted to 170 mmHg (23 kPa) ± 10 mmHg (1.3 kPa)

PMX3500E: Restricted to 160 mmHg (21 kPa) ± 10 mmHg (1.3 kPa)

PMX3600: REG. Mode @ Full Vac - 760 mmHg (101 kPa)

INTERMITTENT CYCLE TIME:

Factory set at approximately sixteen (16) seconds ON and eight (8) seconds OFF (reference only)

OPERATING ENVIRONMENTAL LIMITS:

0°F to 122°F (-18°C to 50°C)

RECOMMENDED ENVIRONMENTAL OPERATING LIMITS:

55°F to 85°F (13°C to 29°C)

STORAGE ENVIRONMENTAL LIMITS:

Temperature Range: -4°F to 140°F (-20°C to 60°C)

Humidity: Max 95% Non-condensing

Battery (Digital Vacuum Gauge Models ONLY):

3 Volt Lithium, ½ AA

OPERATING INSTRUCTIONS

CAUTION

Inspect the Large Gauge Vacuum Regulator for visual damage before use, DO NOT USE if damaged.

Failure to implement recommended protective devices may cause product contamination, malfunction and/or failure.

Contamination of the product voids all warranty claims.

NOTE: The Large Gauge Vacuum Regulator does not contain any protection from the ingress or passing of fluids. It is the user's responsibility to provide a collection container with overflow protection or a fluid trap and either a hydrophobic or micro-bacterial filter. Precision Medical provides these accessories separately.

The Digital / Analog Dual Gauges operate independently; if the digital gauge fails, the analog gauge will still function and vice versa.

1. Turn the Selector Knob to the "OFF" position.
2. Connect the Large Gauge Vacuum Regulator to a vacuum source.

A. REG. MODE (Regulated Mode) *ALL MODELS*

- a. Turn the Selector Knob to the "REG." position.
- b. Block the bottom port of the Large Gauge Vacuum Regulator.
- c. Using the regulator Knob, set the desired vacuum.

To *INCREASE* vacuum - Turn Knob *CLOCKWISE*

To *DECREASE* vacuum - Turn Knob *COUNTERCLOCKWISE*

Note: Stop turning when you feel resistance.

B. LINE MODE (Full, unregulated vacuum) *PMX3100 & PMX3600 Series ONLY*

- a. Turn the Selector Knob to the "LINE" position.

C. INT. MODE (Vacuum cycles ON and OFF.) *PMX3300 & PMX3400 Series ONLY*

- a. Turn the Selector Knob to the "REG." position, to select desired vacuum level.
- b. Turn the Selector Knob to the "INT." position.

NOTE: The intermittent cycle starts in the "OFF" phase, therefore a delay occurs before the intermittent cycle begins.

3. Turn the Selector Knob to the "OFF" position to turn the Large Gauge Vacuum Regulator off.

WARNING

When turning the Large Gauge Vacuum Regulator to “REG.” from “LINE” or “OFF”, the vacuum level will return to its previously regulated setting. Vacuum may be set at improper level fro procedure.

PMX3300 & PMX3400 ONLY: When turning the Large Gauge Vacuum Regulator to “REG.” or “INT.” from any position, The vacuum level will return to its previously regulated setting.

ALWAYS confirm vacuum setting prior to performing procedure.

The vacuum CAN NOT be regulated when the Selector Knob is set to the “LINE” position.

Full Line Vacuum is present between settings.

REGULATE MODE

Turn Selector Knob fully clockwise to the regulator mode and confirm vacuum setting before use.

LINE MODE

Turn Selector Knob fully counterclockwise for line vacuum and confirm vacuum setting before use.

CAUTION

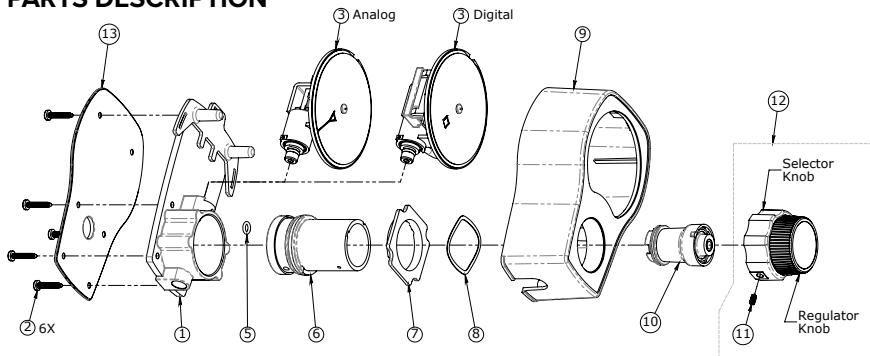
DO NOT operate the Large Gauge Vacuum Regulator when the collection canister is “full”. This may cause loss of vacuum and damage to the Large Gauge Vacuum Regulator. This will **void the warranty**.

CONTINUOUS SERIES (PMX3000, PMX3100, PMX3500 & PMX3600)

CAUTION

Missing or illegible labels must be replaced, contact Precision Medical, Inc.

PARTS DESCRIPTION



PARTS LIST

No.	Description	PMX3000	PMX3100	PMX3500	PMX3600
1	Housing Assembly	1561XL			
2	Screw	503956 (*505152)			
3	Analog Gauge Assembly)	503694XL (*505163XL)	503826XL (*505162XL)	505937XL	
	Analog Gauge Assembly (Export E)	503923XL	504225XL		
	Analog Gauge Assembly (HV)	504309XL			
	Analog Gauge Assembly (Export E)(HV)		506384XL		506555XL
	Digital Assembly	505244XL (0-200 mmHg)	505391XL (0-150 mmHg)	505938XL	
	Digital Assembly (HV)	505392XL (0-300 mmHg)			
	Digital Assembly (Export E)	506036XL	506034XL	506040XL	
	Digital Assembly (Export E) (HV)	506038XL (0-300 mmHg)			
4	Snubber	1396			
5	O-ring	1016			
6	Selector Assembly	1563	1564	1563	505935
7	Selector Ring	502685			
8	Wave Spring Washer	1614 (*505154)			
9	Case Assembly	1565XL	1566XL	1565XL	1566XL
10	Regulator Module Assembly	1567 (*505164) (**505962)	1567 (*505164)	505962	
--	Washer (metal)	NA	NA	502818	NA
--	Washer (plastic)	NA	NA	503879	NA
11	Set Screw	1391 (*505158)			
	Control Knob Assembly	1568 (*505165)			
13	Rear Cover	508957			
--	Battery for Digital Assembly	8066			

* MR Models ONLY (PMX3000MR, PMX3100MR & PMX3500MR) ** HV Models ONLY (PMX3000HV & PMX3100HV)

DISASSEMBLY INSTRUCTIONS

PMX3000, PMX3100, PMX3500 & PMX3600 Series

(Reference "PARTS DESCRIPTION")

1. Loosen the Set Screw (Item# 11) in Selector Knob.
2. Pull the Control Knob Assembly (Item# 12) away from case. (The Regulator Module (Item# 10) is threaded onto the Control Knob Assembly.)
3. Remove the screws (Item# 2) from the back of the Regulator.
4. Separate the Case Assembly (Item# 9) by pulling it away from the Housing Assembly (Item# 1).
5. Remove the Selector Assembly (Item# 6) by pulling it away from the Housing Assembly (Item# 1).
6. Remove the Gauge Assembly (Item# 3).

ASSEMBLY INSTRUCTIONS

1. To assemble, perform the "DISASSEMBLY INSTRUCTIONS" in reverse order.

NOTE: Ensure the Selector Assembly is inserted into the control knob assembly with the groove in the 12 o'clock position.

Ensure tabs and slots on various components are properly aligned and engaged when reassembling.

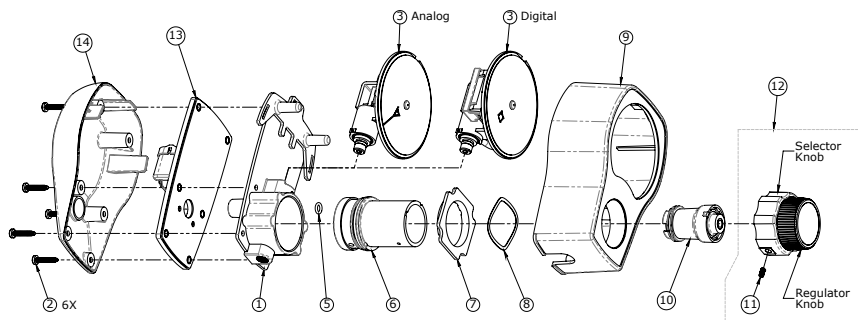
2. Lubricate all O-rings and cavities with Vacuum grease (part# 1775) supplied in the Large Gauge Vacuum Regulator Repair Kit.
3. Repeat steps 1 through 3 of "OPERATING INSTRUCTIONS".
4. Prior to returning Large Gauge Vacuum Regulator to service verify accuracy of gauge.

CONTINUOUS INTERMITTENT SERIES (PMX3300 & PMX3400)

CAUTION

Missing or illegible labels must be replaced, contact Precision Medical, Inc.

PARTS DESCRIPTION



PARTS LIST

No.	Description	PMX3300	PMX3400
1	Housing Assembly	502102XL	
2	Screw	503956	
3	Analog Gauge Assembly Analog Gauge Assembly (Export E) Analog Gauge Assembly (HV) Digital Assembly Digital Assembly (HV) Digital Assembly (Export E) Digital Assembly Export E (HV)	503694XL 503923XL 504309XL 505244XL (0-200 mmHg) 505392XL (0-300 mmHg) 506036XL 506038XL	503826XL 504225XL 505391XL (0-150 mmHg) 506034XL
4	Snubber	1396	
5	O-ring	502231	
6	Selector Assembly	1805	
7	Index Ring	502685	
8	Wave Spring Washer	1614	
9	Case Assembly	1827XL	
10	Regulator Module Assembly	1567 (*505962)	1567
11	Set Screw	1391	
12	Control Knob Assembly	502100	
13	Timing Module	502103	
14	Rear Case	508958	

* HV MODELS ONLY (PMX3300HV)

DISASSEMBLY INSTRUCTIONS

PMX3300 & PMX3400 Series

(Reference "PARTS DESCRIPTION")

1. Loosen the Set Screw (Item # 11) in Selector Knob.
2. Pull the Control Knob Assembly (Item # 12) away from case. (The Regulator Module (Item # 10) is threaded onto the Control Knob Assembly.)
3. Remove the screws (Item # 2) from the back of the product.
4. Remove the Rear Case (Item # 14) by pulling away from product.
5. Remove screws (Item# 2) from the top of the Timing Module.
6. Remove the Timing Module (Item# 13) by pulling away from the Housing Assembly (Item# 1).
7. Separate the Case Assembly (Item# 9) by pulling it away from the Housing Assembly (Item# 1).
8. Remove the Selector Assembly (Item# 6) by pulling it away from the Housing Assembly (Item# 1).
9. Remove the Gauge Assembly (Item# 3).

ASSEMBLY INSTRUCTIONS

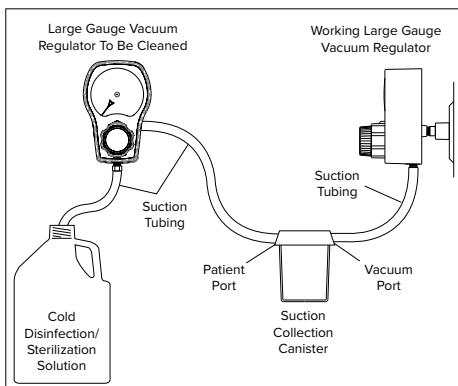
1. To assemble, perform the "DISASSEMBLY INSTRUCTIONS" in reverse order.
NOTE: Ensure the Selector Assembly is inserted with the groove in the 12 o'clock position.

Ensure tabs and slots on various components are properly aligned and engaged when reassembling.

2. Lubricate all O-rings and cavities with Vacuum grease (part# 1775) supplied in the Large Gauge Vacuum Regulator Repair Kit.
3. Repeat steps 1 through 3 of "OPERATING INSTRUCTIONS".
4. Prior to returning Large Gauge Vacuum Regulator to service verify accuracy of gauge.

LARGE GAUGE VACUUM REGULATOR CLEANING ILLUSTRATION

(See Cleaning/Decontamination Instructions)



CAUTION

DO NOT autoclave or immerse in liquid. This will cause damage to the Large Gauge Vacuum Regulator and will **void the warranty**.

DO NOT set the Large Gauge Vacuum Regulator to the "INT"(Intermittent) mode when cleaning. Pulling cleaning fluids thru the Intermittent mode will damage the timing module and void the warranty.

If Large Gauge Vacuum Regulator becomes internally contaminated, warranty is voided, DO NOT send back to Precision Medical, Inc. for repair. Follow your facilities contaminated equipment protocol.

This Large Gauge Vacuum Regulator contains magnetic, ferrous material that may affect the results of an MR.

Be sure all connections are tight and leak free.

Note: MR Conditional models have a MR Conditional label.



CLEANING / DECONTAMINATION (As Needed)

1. Attach a working Large Gauge Vacuum Regulator with a continuous regulated mode to a minimum vacuum source of 15 inHg.
2. Mix cold disinfection/sterilization solution Cidex OPA or the like according to its manufacturer's directions.
3. Connect tubing as shown in Cleaning Illustration on previous page.
4. Turn the working Large Gauge Vacuum Regulator on to a continuous regulated mode.
5. Adjust the vacuum to a minimum of 120 mmHg.

6. Set the Large Gauge Vacuum Regulator to be cleaned to the “REG.” mode, and set at 100 mmHg.
7. Allow cold disinfection/sterilization solution to pass through and collect in Suction Canister. Procedure should continue for time recommended by the manufacturer of the cold disinfection/sterilization solution for the desired level of disinfection or sterilization.
8. Turn the Large Gauge Vacuum Regulator to be cleaned to the “LINE” mode (if applicable).
9. Allow remaining cold disinfection/sterilization solution to pass through and collect in Suction Canister.
10. Set working Large Gauge Vacuum Regulator to its maximum vacuum setting.
11. Thoroughly dry the internal components by drawing maximum vacuum through the Regulator to be cleaned for at least 30 seconds in both “REG.” and “LINE” modes (if applicable).

NOTE: If it is not possible to pass cold disinfection/sterilization solution through the Regulator, then the passageways are totally blocked and **DISASSEMBLY** of the Regulator is required. Be sure to follow your facilities' Bio-hazard protocol.

EXTERIOR CLEANING

1. Disconnect all gas connections and equipment before cleaning.
2. Clean exterior surfaces using Super Sani-Cloth germicidal disposable wipes. Remove all visible contamination from the external surfaces of the device and its accessories. Be sure to closely inspect and remove contamination from seams and recesses on the device that may trap contaminants. Wipe with clean paper towel to remove debris.
3. After all visible contamination is removed; use a second germicidal wipe to thoroughly wet the surfaces of the device and accessories. Allow to remain wet for 4 minutes. Use additional wipes if needed to assure surfaces are wetted continuously for 4 minutes.
4. Allow device to air dry completely.
5. Visually inspect the device for visible contamination. Repeat cleaning/disinfection process if necessary.

MAINTENANCE

Before each use, visually inspect Large Gauge Vacuum Regulator for any sign of damage, **DO NOT USE** if damaged.

RETURNS

Returned products require a Returned Goods Authorization (RGA) number, contact Precision Medical, Inc. All returns must be packaged in sealed containers to prevent damage. Precision Medical, Inc. will not be responsible for goods damaged in transit. Refer to Precision Medical, Inc. Return Policy available on the internet: www.precisionmedical.com.

Note: Federal Law prohibits shipping of bio-hazard materials via U.S. mail.

DISPOSAL INSTRUCTIONS

Dispose of the *Large Gauge Vacuum Regulators* in accordance with local regulations.



⚠️WARNING

Bio-hazardous devices should be disposed of properly.

TROUBLESHOOTING

If the *Preset Large Gauge Vacuum Regulator* fails to function, consult the Troubleshooting Table below. If problem cannot be solved, consult your Provider.

Problem	Probable Cause	Remedy
No vacuum at bottom port (gauge at zero)	<ol style="list-style-type: none"> 1. Regulator turned "OFF" 2. Loose connection 3. No vacuum to Regulator 4. Clogged vacuum Port 	<ol style="list-style-type: none"> 1. Turn white Selector Knob to "REG." mode. Adjust gray Preset Knob 2. Tighten connection 3. Connect to a known working vacuum source 4. Disassemble and clean
No vacuum at bottom port (gauge showing vacuum)	Clogged Regulator	Disassemble and clean
Vacuum at bottom port (No reading on gauge when port is blocked)	Defective Gauge	Replace Gauge
Gauge will not return to zero	<ol style="list-style-type: none"> 1. Clogged Snubber 2. Damaged Regulator Module 3. Defective Gauge 	<ol style="list-style-type: none"> 1. Replace Snubber 2. Replace Regulator Module 3. Replace Gauge
Vacuum Regulation erratic	<ol style="list-style-type: none"> 1. Dirty Regulator Module 2. Defective Regulator Module 	<ol style="list-style-type: none"> 1. Disassemble, clean and lubricate O-ring 2. Replace Module
Stiff movement of white Selector Knob	Dirty Selector Module cavity or O-rings	Disassemble, clean casting cavity and lubricate cavity and O-rings
No digital display	Dead battery	Replace battery
<u>Intermittent Models ONLY:</u> No Intermittent (INT.) cycle	<ol style="list-style-type: none"> 1. Improper mode selected 2. Defective Timing Module 	<ol style="list-style-type: none"> 1. Turn Selector Knob to "INT." mode 2. Replace Timing Module

Applies to MRI labeled Large Gauge Vacuum Regulators only!



Indicates the device is MR Conditional and can be used in an MR Environment

WARNING! This product may be used near a MR Environment (e.g. in the MR System room near the scanner). It should not be utilized directly inside of the MR System (e.g. inside of the bore of the scanner). The device must be securely attached to a wall Gas Outlet.

- This information must be kept with the device.
- MR Conditional with 1.5T MR systems.
- Service must be performed by qualified personnel.
- Large Gauge Vacuum Regulators must be kept to manufacturing specifications.
- Fittings must be kept MR conditional if serviced or replaced.
- MRI manufactures guidelines supersedes this information
- Consult MRI Manufacture if used with an Open MRI.

LIMITED WARRANTY AND LIMITATION OF LIABILITY

Precision Medical, Inc. warrants that the Large Gauge Medical Vacuum Regulator (the Product) will be free of defects in workmanship and/or material for the following period:

Ten (10) years from date of shipment.

Should any failure to conform to this warranty appear within the applicable period, Precision Medical, Inc. shall, upon written notification thereof and substantiation that the goods have been stored, installed, maintained and operated in accordance with Precision Medical, Inc.'s instructions and standard industry practice, and that no modifications, substitutions, or alterations have been made to the goods, correct such defect by suitable repair or replacement at its own expense.

ORAL STATEMENTS DO NOT CONSTITUTE WARRANTIES.

The representative of Precision Medical, Inc. or any retailers are not authorized to make oral warranties about the merchandise described in this contract, and any such statements shall not be relied upon and are not part of the contract for sale. Thus, this writing is a final, complete and exclusive statement of the terms of that contract.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHER WARRANTY OF QUALITY, WHETHER EXPRESS OR IMPLIED.

Precision Medical, Inc. shall not under any circumstances be liable for special, incidental or consequential damages including but not limited to lost profits, lost sales, or injury to person or property. Correction of nonconformities as provided above shall constitute fulfillment of all liabilities of Precision Medical, Inc. whether based on contract, negligence, strict tort or otherwise. Precision Medical, Inc. reserves the right to discontinue manufacture of any product or change product materials, designs, or specifications without notice.

Precision Medical, Inc. reserves the right to correct clerical or typographical errors without penalty.



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