



Regulators, Suction

Scope of this Product Comparison

This Product Comparison covers low-volume, surgical, thoracic, and tracheal suction regulators that dynamically control the selected vacuum level, responding to changes in flow conditions that may be introduced during suctioning procedures. Adapters that convert continuous regulators to intermittent regulators are also covered. Other regulators, such as those controlled with a bleeder valve, that do not dynamically control vacuum levels are not included. In addition, any accessories associated with suction regulators are excluded; however, compatible inlet and outlet fittings are listed in the chart.

UMDNS information

This Product Comparison covers the following device terms and product codes as listed in ECRI's Universal Medical Device Nomenclature System™ (UMDNS™):

- Regulators, Suction, Low-Volume [13-329]
- Regulators, Suction, Surgical [15-051]
- Regulators, Suction, Thoracic [13-332]
- Regulators, Suction, Tracheal [13-333]

Purpose

Suction regulators control suction, typically from wall vacuum outlets, during the evacuation of various substances from the body that can impair breathing, impede healing, or obscure the surgical site. Types of suction regulators include surgical (general-purpose),

tracheal, oral, nasal, pharyngeal, gastrointestinal (GI), thoracic (chest), and pediatric. Some regulators are designed for multiple applications — for example, surgical/tracheal or oral/nasal/tracheal. Suction regulators



are used in the operating, emergency, and recovery rooms; in the intensive care and coronary care units; and at the patient's bedside (see Fig. 1).

Surgical suction regulators are used to control the removal of secretions such as vomitus, mucus, or blood during surgical procedures, as well as secretions in wound cavities after surgery. Tracheal suction regulators control suctioning that is performed directly or through an endotracheal or tracheostomy tube to clear excess secretions from the trachea or tracheobronchial tree; they are commonly used postoperatively for thoracic surgical patients, postanesthesia patients, and certain intensive care unit patients. Regulated oral, nasal, and pharyngeal suctioning may be needed to remove excessive secretions from unconscious and/or critically ill patients, as well as from patients recovering from anesthesia. In GI suctioning, semisolids, liquids, and gases are removed from the stomach and intestinal tract to prevent the buildup of gastric contents and swallowed air. Intermittent suctioning is often used with these regulators to minimize damage to the GI mucosal lining and blockage of the catheter tip if the tip entraps the stomach or intestinal wall. Thoracic suction regulators produce the vacuum levels and high airflows needed to remove blood, exudate, and air from the pleural cavity, thereby counteracting pneumothorax and allowing the lung to reexpand.

Principles of operation

The level of vacuum required for effective suctioning varies with the intended application, and excessive vacuum levels can cause tissue damage. A suction regulator provides a precise means of controlling these vacuum levels and adjusting the suction flow rate. For example, greater vacuum pressure is generally required to suction highly viscous material, such as mucus, than to suction blood; however, this need must be balanced against the need to minimize damage to underlying tissue.

The suction regulator is attached to the wall vacuum outlet or to a vacuum pump. In the regulator, a diaphragm continuously responds to changes in the vacuum pressure of the suction channel and maintains a preset vacuum level by means of a valve linked to the diaphragm.

The regulator limits the maximum amount of suction that can be administered to the patient by maintaining constant negative pressure. A mechanical bellows in the unit allows this control and ensures that the regulator will deliver enough airflow to maintain the desired pressure. The unit always contains a negative-pressure gauge.

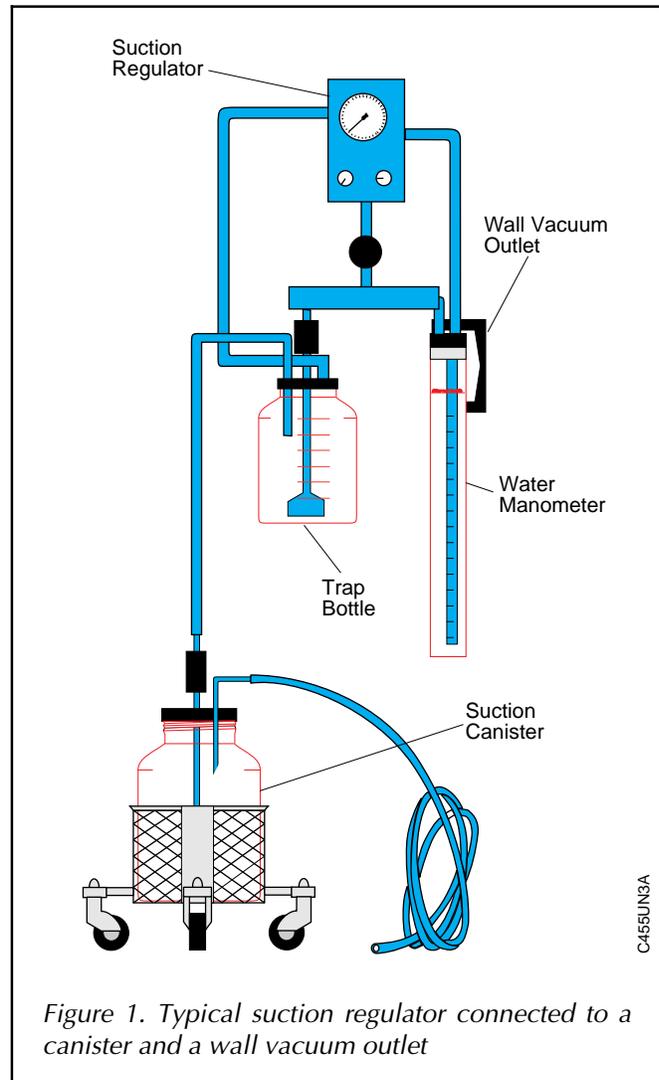


Figure 1. Typical suction regulator connected to a canister and a wall vacuum outlet

The vacuum control valve increases or decreases the suction channel vacuum automatically as the diaphragm senses changes in pressure. A spring with manually adjustable tension works against the diaphragm and controls the pressure at which the sensing diaphragm will open or close the vacuum control valve (see Fig. 2). A tiny bleed hole in the patient chamber of most regulators enables the device to better control the response to changing conditions by permitting a small flow of air into the chamber. For example, when the suction system is occluded, the bleed hole slowly leaks air into the patient chamber until the diaphragm/valve mechanism senses that the vacuum level is diminishing and increases the valve opening, allowing more air to be drawn out through the vacuum source. If occlusion persists, the regulator continually cycles, and equilibrium is established, beyond which the vacuum pressure will not increase.

Most regulators are equipped with a gauge calibrated in millimeters of mercury (mm Hg) that may

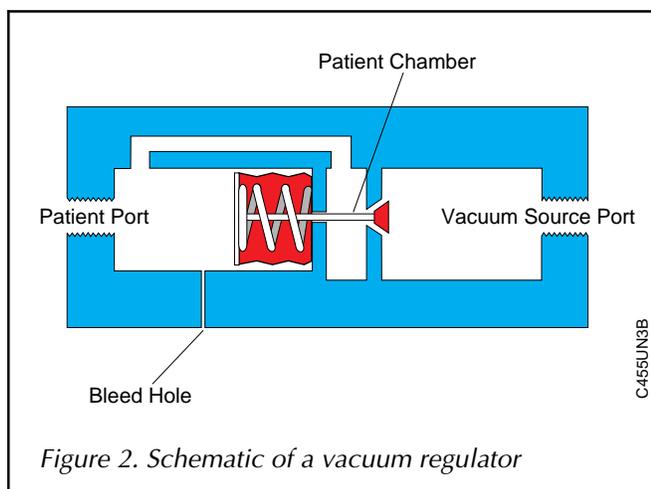


Figure 2. Schematic of a vacuum regulator

include a setting for full line vacuum (nonregulated vacuum, useful in emergencies such as massive hemorrhage). Some units, such as thoracic suction regulators, are calibrated in centimeters of water (cm H₂O); others have both mm Hg and cm H₂O calibrations. The vacuum scale range and graduations depend on the purpose of the particular regulator and on manufacturer preference.

Surgical/general regulators commonly have a vacuum scale range of 0 to 200 mm Hg and also are capable of providing full wall-line vacuum (usually greater than 500 mm Hg). Tracheal, oral, pharyngeal, and nasal suction regulators typically have a scale range of 0 to 200 mm Hg and sometimes provide full line vacuum. Some GI suction regulators can provide full line vacuum; others have a range of 0 to 120 mm Hg or 200 mm Hg. Thoracic suction regulators provide lower vacuum pressures than other types do, generally in the range of 0 to 45 mm Hg and 0 to 60 cm H₂O.

Suction regulators can function continuously (non-stop suctioning), intermittently (cyclically interrupting suction by purging the system to the atmosphere), or in both modes. Regulators with both functions have control valves that allow the user to switch between modes; intermittent timing (the interval of on and off cycles) can also be user adjustable. Intermittent suction minimizes the chance that tissue will clog the entry hole of the suction tube during drainage, allows efficient removal of nonhomogenous materials, and helps reduce the likelihood of tissue damage.

A collection container equipped with a trap bottle, overflow protection mechanism, or filter trap is placed between the patient and the suction regulator to reduce the risk of clogging the regulator and/or wall vacuum lines.

Reported problems

Operators should always make sure that the patient connection is occluded when setting the vacuum level; the gauge can then indicate the maximum pressure that will be delivered at the selected setting. If the connection is not occluded, the unit will be susceptible to the atmosphere and the gauge will indicate a pressure less than the maximum possible negative-pressure setting.

Hospitals have encountered clogged wall vacuum lines and aspirate-fouled regulators. Clogging can be minimized if overflow protection devices (traps or shut-off devices) are used. Aspirate can contaminate a regulator and expose personnel, and possibly patients, to a wide variety of infectious microorganisms. Because the bleed hole is typically only a fraction of a millimeter in diameter, it is susceptible to clogging by dirt, lint, or other fine particles suspended in the air. Therefore, the bleed hole should be examined during preventive maintenance to ensure that the vacuum regulator will function properly.

After every procedure, regulators should be treated as if they are contaminated and should be decontaminated and sterilized properly in accordance with manufacturer recommendations. ECRI recommends that users contact the manufacturer to obtain written confirmation that the decontamination and sterilization procedures they are using will not damage suction regulator components. Furthermore, ECRI recommends that sterilizable suction regulators be sterilized before they are taken apart for service; as an additional precaution, hospital staff should wear surgical gloves when working on suction regulators.

Improper vacuum levels can cause a variety of injuries, including compression of the inner walls of a wound cavity with subsequent ischemia (during wound drainage), exacerbation of hemorrhaging due to alveoli leaking air into the pleural cavity (during thoracic suctioning), and tissue damage due to trauma from the suction catheter tip (during tracheal suctioning). To help reduce these types of risks, the appropriate suctioning system should be used for each application.

Purchase considerations

A suction regulator should provide adequate protection against patient injury while providing adequate vacuum and flow capabilities. The regulator should also have a gauge that covers the range of vacuum levels the unit is designed to deliver or should permit the attachment of such a gauge.

Regulators should be designed to allow easy cleaning. The supplier should provide guidelines for cleaning, disassembly, and reassembly, as well as recommend appropriate cleansers and sterilization procedures. Purchasers should make sure that manufacturer recommendations are compatible with the hospital's equipment and procedures.

Stage of development

Suction regulators have been used in hospitals since the 1950s. Dedicated units (modern regulators designed for specific applications) were introduced in the 1960s; no significant technological changes are expected in the near future. A few manufacturers have made compact, lightweight regulators enclosed in a protective plastic housing; however, some of these manufacturers do not recommend their units for liquid-immersion sterilization. Some regulators have integral alarms to warn of high pressure. Several manufacturers offer adapters for intermittent regulation that attach to continuous regulators.

Bibliography

Carroll PL. *The principles of vacuum and its use in the hospital environment*. 2nd ed. Middletown (CT): Educational Medical Consultants.

Chulay M. Arterial blood gas changes with a hyperinflation and hyperoxygenation suctioning intervention in critically ill patients. *Heart Lung* 1988 Nov; 17(6 Pt 1):654-61.

Rudy EB, Baun M, Stone K, et al. The relationship between endotracheal suctioning and changes in intracranial pressure: a review of the literature. *Heart Lung* 1986 Sep;15(5):488-94.

Walsh JM, Vanderwarf C, Hoscheit D, et al. Unsuspected hemodynamic alterations during endotracheal suctioning. *Chest* 1989 Jan;95(1):162-5.

Standards and guidelines

Note: *Although every effort is made to ensure that the following list is comprehensive, please note that other applicable standards may exist.*

American Society for Testing and Materials. Specification for medical and surgical suction and drainage systems [standard]. ASTM Committee F29 on Anesthetic and Respiratory Equipment. F0960-86(1993). 1986 (reapproved 1993).

Canadian Standards Association. Vacuum devices used for suction and drainage [standard]. 1st ed. Z168.11-94. 1994.

International Electrotechnical Commission. Medical electrical equipment — part 1: general requirements for safety [standard]. IEC 60601-1 (1988-12). 1988.

Medical electrical equipment — part 1: general requirements for safety. Amendment 1 [standard]. IEC 60601-1-am1 (1991-11). 1991.

Medical electrical equipment — part 1: general requirements for safety. Amendment 2 [standard]. IEC 60601-1-am2 (1995-03). 1995.

Medical electrical equipment — part 1: general requirements for safety. Section 2. Collateral standard: electromagnetic compatibility — requirements and tests. IEC 60601-1-2 (1993-04). 1993.

International Organization for Standardization. Medical suction equipment — part 1: electrically powered suction equipment — safety requirements [standard]. BS EN ISO 10079-1:1997. 1991 (revised 1997).

Medical suction equipment — part 2: manually powered suction equipment [standard]. BS EN ISO 10079-2:1997. 1992 (revised 1997).

Medical suction equipment — part 3: suction equipment powered from vacuum or pressure source [standard]. BS EN ISO 10079-3:1997. 1992 (revised 1997).

Standards Association of Australia. Medical suction equipment — suction equipment powered from a vacuum or pressure source [standard]. AS 2120.3-1992. 1992.

Citations from other ECRI publications

Health Devices

Note: *Included are articles on suction catheters and tips, portable suction sources, and suction canisters, in addition to those on suction regulators.*

Suction catheters [evaluation]. 1977 Apr;6(6):132-41.

Suction tips [evaluation]. 1977 Apr;6(6):142-6.

Portable suction sources [evaluation]. 1978 Mar;7(5):119-41.

General purpose wall vacuum regulators [evaluation]. 1985 May;14(7):191-209.

Suction canisters [evaluation]. 1985 Dec;14(14):411-34.

Chemetron intermittent vacuum regulators [User Experience Network™]. 1987 May;16(5):179.

Vacuum regulators [User Experience Network™]. 1988 May;17(5):171.

Health Devices Inspection and Preventive Maintenance System

Suction regulators. 459.

Supplier information

Abbott

Abbott Laboratories
Hospital Products Div [152572]
Bldg AP52 Dept 241
200 Abbott Park Rd
Abbott Park IL 60064-3537
Phone: (847) 937-6100, (800) 222-6883
Fax: (847) 937-4100
Internet: <http://www.abbott.com>

Allied Healthcare

Allied Healthcare Products Inc [105171]
1720 Sublette Ave
St Louis MO 63110
Phone: (314) 771-2400, (800) 444-3954
Fax: (314) 771-1806
Internet: <http://www.alliedhpi.com>

Boehringer

Boehringer Laboratories Inc [102227]
500 E Washington St
Norristown PA 19401
Phone: (610) 278-0900, (800) 642-4945
Fax: (610) 278-0907
E-mail: pcb@boehringerlabs.com
Internet: <http://www.boehringerlabs.com>

Clements Medical

Clements Medical Equipment Pty Ltd [305625]
43 Mary Parade
PO Box 137
Rydalmere, NSW 2116
Australia
Phone: 61 (2) 96383285
Fax: 61 (2) 96383295
E-mail: info@clemequip.com.au
Internet: <http://www.clemequip.com.au>

Dameca

Dameca A/S [156977]
Islevdalvej 211
DK-2610 Roedovre Koebenhaven
Denmark
Phone: 45 (44) 913480
Fax: 45 (44) 916941
E-mail: info@dameca.com

J H Emerson

J H Emerson Co [101244]
22 Cottage Park Ave
Cambridge MA 02140-1691
Phone: (617) 864-1414, (800) 252-1414
Fax: (617) 868-0841
E-mail: rob@jhemerson.com
Internet: <http://www.jhemerson.com>

W T Farley

W T Farley Inc [105041]
4450 Shopping Ln
Simi Valley CA 93063-3451
Phone: (805) 526-4991, (800) 327-5397
Fax: (805) 581-2071
Internet: <http://www.wtfarley.com>

Greggersen

Greggersen Gasetechnik GmbH [171163]
Bodestrasse 27-29
Postfach 800403
D-21004 Hamburg
Germany
Phone: 49 (40) 7393570
Fax: 49 (40) 7384915

MG Electric

MG Electric (Colchester) Ltd [151092]
Wyncolls Rd
Colchester, Essex CO4 4HT
England
Phone: 44 (1206) 842244
Fax: 44 (1206) 845849
E-mail: sales@mgelectric.co.uk
Internet: <http://www.mgelectric.co.uk>

Ohmeda Medical

Datex-Ohmeda (India) Pvt Ltd
An Instrumentarium Co [354295]
Block EP & GP Sector V
Plot XI-16 Salt lake
Calcutta 700 091
India
Phone: 91 (33) 3574002
Fax: 91 (33) 3574001
Internet: <http://www.datex-ohmeda.com>

Datex-Ohmeda Ltd (UK)
An Instrumentarium Co [354403]
Ohmeda House
71 Great North Rd
Hatfield, Hertfordshire AL9 5EN
England
Phone: 44 (1707) 263570
Fax: 44 (1707) 260065
Internet: <http://www.datex-ohmeda.com>

Datex-Ohmeda Pte Ltd
Div Instrumentarium Corp [351978]
#12-05/07 Gateway E
152 Beach Rd
Singapore 189721
Republic of Singapore
Phone: 65 3918618
Fax: 65 2916618
E-mail: irene.bay@datex-ohmeda.com
Internet: <http://www.datex-ohmeda.com>

Ohmeda Medical
An Instrumentarium Co [347601]
8880 Gorman Rd
Laurel MD 20723
Phone: (410) 888-5200, (800) 527-9209
Fax: (410) 888-0544
Internet: <http://www.ohmedamedical.com>

Precision Medical

Precision Medical Inc [106490]
300 Held Dr
Northampton PA 18067-1150
Phone: (610) 262-6090, (800) 272-7285
Fax: (800) 352-1240
E-mail: tclarkpmi@earthlink.net
Internet: <http://www.precisionmedical.com>

Ro-Med

Ro-Med Medical Holdings [178133]
PO Box 7259
Bonaero Park 1622
South Africa
Phone: 27 (11) 9732993
E-mail: romed@iafrica.com

Technologie Medicale

Technologie Medicale SA [241959]
boite postale 88
20 avenue du Dr Vaillant
F-93230 Romainville
France
Phone: 33 (1) 48455895
E-mail: info@technologiemedicale.com

Western Medica

Western Medica [184244]
875 Bassett Rd
Westlake OH 44145-1106
Phone: (440) 871-2160, (800) 783-7890
Fax: (440) 871-2197
E-mail: medica@westernenterprises.com
Internet: <http://www.westernmedica.com>

About the chart specifications

The following terms are used in the chart:

Adjustable cycle: Applicable only to those regulators that have an intermittent or continuous/intermittent function.

Vacuum adjust lock: This feature enables the operator to lock the vacuum level adjustment knob at the desired position.

Pin stop: Most gauges on suction regulators have this feature, which prevents the gauge needle from making more than one revolution.

Inlets and outlets: Suppliers of compatible inlet and outlet fittings are listed; check with the manufacturer for other available fittings. The Diameter Index Safety System (DISS), developed by the Compressed Gas Association, is an international standard to ensure fitting compatibility with hospital receptacles.

Abbreviations:

ABS — Acrylonitrile-butadiene-styrene

BS — British Standard

CCU — Critical care unit

CE mark — Conformance European mark

CGA — Compressed Gas Association

CSA — Canadian Standards Association

dB — Decibels

EN — European Norm

ER — Emergency room

EtO — Ethylene oxide

FDA — U.S. Food and Drug Administration

GI — Gastrointestinal

GS — Geprüfte Sicherheit

ICU — Intensive care unit

IEC — International Electrotechnical Commission

ISO — International Organization for Standardization

MDD — Medical Devices Directive

OR — Operating room

TUV — Technischer Ueberwachungs Verein

Note: The data in the charts derive from suppliers' specifications and have not been verified through independent testing by ECRI or any other agency. Because test methods vary, different products' specifications are not always comparable. Moreover, products and specifications are subject to frequent changes. ECRI is not responsible for the quality or validity of the information presented or for any adverse consequences of acting on such information.

When reading the charts, keep in mind that, unless otherwise noted, the list price does not reflect supplier discounts. And although we try to indicate which features and characteristics are standard and which are not, some may be optional, at additional cost.

For those models whose prices were supplied to us in currencies other than U.S. dollars, we have also listed the conversion to U.S. dollars *to facilitate comparison among models*. However, keep in mind that exchange rates change often.

Need to know more?

For further information about the contents of this Product Comparison, contact the *HPCS* Hotline at +1 (610) 825-6000, ext. 5265; +1 (610) 834-1275 (fax); or hpcs@ecri.org (e-mail).

About ECRI . . .

ECRI is a nonprofit health services research agency and a Collaborating Center of the World Health Organization, providing information and technical assistance to the healthcare community to support safe and cost-effective patient care for more than 25 years. The results of ECRI's research and experience are available through its publications, information systems, databases, technical assistance program, laboratory services, seminars, and fellowships.

Our full-time staff includes a wide range of specialists in healthcare technology, hospital administration, financial analysis, risk management, and information and computer science, as well as hospital planners, attorneys, physicists; biomedical, electrical, electronic, chemical, mechanical, and registered engineers; physicians; basic medical scientists; epidemiologists and biostatisticians; and writers, editors, and communications specialists.

Underlying ECRI's knowledge base in healthcare technology are its integrity and objectivity. ECRI accepts no financial support from medical product manufacturers, and no employee may own stock in or consult for a medical equipment or pharmaceutical company.

The scope of ECRI's resources extends far beyond technology. ECRI keeps healthcare professionals, manufacturers, legal professionals, information specialists, and others aware of the changing trends in healthcare, healthcare standards and regulations, and the best ways to handle environmental and occupational health and safety issues. ECRI also advises on management issues related to healthcare cost containment, accreditation, risk management, human resources, quality of care, and other complex topics.

ECRI has more than 35 publications, databases, software, and services to fulfill the growing need for healthcare information and decision support. They focus on three primary areas: healthcare technology, healthcare risk and quality management, and healthcare environmental management.

Product Comparison Chart

MODEL	ABBOTT	ALLIED HEALTHCARE	ALLIED HEALTHCARE	ALLIED HEALTHCARE
	General Purpose 43304-01	Chemetron Vacutron (Cont/Interm)	Chemetron Vacutron Continuous	Chemetron Vacutron High Vac : Surgical
WHERE MARKETED	USA	Worldwide	Worldwide	Worldwide
FDA CLEARANCE	Not specified	Yes	Yes	Yes
CE MARK (MDD)	Not specified	Yes	Yes	Yes
TYPE(S) OF SUCTION	Surgical, all common procedures	All common procedures, GI	All common procedures	ER, ICU, CCU, OR
FUNCTION	Continuous	Continuous and intermittent	Continuous	Continuous
ADJUSTABLE CYCLE Increments	No NA	Yes 3-30 sec	No NA	No NA
VACUUM ADJUST LOCK	No	No	No	No
VACUUM GAUGE Pin stop Range, mm Hg	Yes 10-300, full line	Yes 0-300 (0-40 kPa)	Yes 0-300 (0-40 kPa)	Yes 0-760, full line : 0-300, full line
Graduations, mm Hg	10	5	5	20 : 5
INLETS AND OUTLETS	Chemetron, DISS, Ohmeda, Puritan	Handtight, Medstar, NCG, Ohmeda, Puritan, Schrader, Stem	Handtight, Medstar, NCG, Ohmeda, Puritan, Schrader, Stem	Handtight, Medstar, NCG, Ohmeda, Puritan, Schrader, Stem
DISINFECTION/ STERILIZATION	Gas	Flush with isopropyl alcohol	Flush with isopropyl alcohol	Flush with isopropyl alcohol
H x W x D, cm (in)	3.8 x 3.8 x 7.6 (1.5 x 1.5 x 3)	17.4 x 6.7 x 10.4 (6.9 x 2.6 x 4.1)	17.4 x 6.7 x 10.4 (6.9 x 2.6 x 4.1)	17.4 x 6.7 x 10.4 (6.9 x 2.6 x 4.1)
WEIGHT, g (lb)	454 (1)	750 (1.7)	600 (1.3)	600 (1.3)
LIST PRICE	\$532.33	\$615	\$285	\$285
WARRANTY	1 year	2 years, parts and labor	2 years, parts and labor	2 years, parts and labor
OTHER SPECIFICATIONS	Color-coded gauge scale, conductive from vacuum port to patient port; dual scale; graduated in mm Hg and in Hg; available with Vac- Gard Filter/Shutoff Valve, a 0.3-micron bacteria-eliminating filter effective against laser plume and bovi smoke.	Mini-style; clean by flushing with cold sterilant; color- coded glow-in-the- dark gauge; weight- bearing brass posts prevent case from cracking; Soft- Touch knobs available; various inlets and outlets available.	Mini-style; clean by flushing with cold sterilant; color- coded glow-in-the- dark gauge; weight- bearing brass posts prevent case from cracking; Soft- Touch knobs available; various inlets and outlets available.	Mini-style; clean by flushing with cold sterilant; color- coded glow-in-the- dark gauge; weight- bearing brass posts prevent case from cracking; Soft- Touch knobs available; various inlets and outlets available.

Colons separate data on similar models of a device.

Product Comparison Chart

MODEL	ALLIED HEALTHCARE	ALLIED HEALTHCARE	ALLIED HEALTHCARE	ALLIED HEALTHCARE
	Chemetron Vacutron Intermittent	Chemetron Vacutron Pediatric (Cont)	Chemetron Vacutron Pediatric (Cont/Int)	Oxequip Quadra-Vac Series *
WHERE MARKETED	Worldwide	Worldwide	Worldwide	Worldwide
FDA CLEARANCE	Yes	Yes	Yes	Yes
CE MARK (MDD)	Yes	Yes	Yes	No
TYPE(S) OF SUCTION	All common procedures, GI drain	Pediatric	Pediatric	All common procedures : Pediatric : ER, ICU, CCU, OR
FUNCTION	Intermittent	Continuous	Continuous and intermittent	Continuous
ADJUSTABLE CYCLE Increments	Yes 3-30 sec	No NA	Yes 3-30 sec	No NA
VACUUM ADJUST LOCK	No	No	No	No
VACUUM GAUGE Pin stop Range, mm Hg	Yes 0-300 (0-40 kPa)	Yes 0-300	Yes 0-300	Yes 0-200 : 0-200 : 0-200, full line
Graduations, mm Hg	5	5	5	2
INLETS AND OUTLETS	Handtight, Medstar, NCG, Ohmeda, Puritan, Schrader, Stem	Chemetron, DISS, Handtight, Medstar, NCG, Ohmeda, Puritan, Schrader, Stem	Chemetron, DISS, Handtight, Medstar, NCG, Ohmeda, Puritan, Schrader, Stem	Chemetron, DISS, Handtight, Medstar, NCG, Ohmeda, Puritan, Schrader, Stem
DISINFECTION/STERILIZATION	Flush with isopropyl alcohol	Flush with isopropyl alcohol	Flush with isopropyl alcohol	Clean with isopropyl alcohol
H x W x D, cm (in)	17.4 x 6.7 x 10.4 (6.9 x 2.6 x 4.1)	17.4 x 6.7 x 10.4 (6.9 x 2.6 x 4.1)	17.4 x 6.7 x 10.4 (6.9 x 2.6 x 4.1)	15.2 x 7.6 x 15.2 (6 x 3 x 6)
WEIGHT, g (lb)	750 (1.7)	750 (1.7)	750 (1.7)	680 (1.5)
LIST PRICE	\$525	\$285	\$615	\$260
WARRANTY	6 years, parts and labor	2 years, parts and labor	2 years, parts and labor	1 year, parts and labor
OTHER SPECIFICATIONS	Mini-style; clean by flushing with cold sterilant; color-coded glow-in-the-dark gauge; weight-bearing brass posts prevent case from cracking; Soft-Touch knobs available; various inlets and outlets available.	Mini-style; clean by flushing with cold sterilant; color-coded glow-in-the-dark gauge; weight-bearing brass posts prevent case from cracking; Soft-Touch knobs available; various inlets and outlets available.	Mini-style; clean by flushing with cold sterilant; color-coded glow-in-the-dark gauge; weight-bearing brass posts prevent case from cracking; Soft-Touch knobs available; various inlets and outlets available.	Vacuum off allows positive shutoff for the entire regulator; modular design allows key components to be maintained or replaced with minimal downtime.

Colons separate data on similar models of a device.

* Continuous : Pediatric : Surgical.

Product Comparison Chart

MODEL	ALLIED HEALTHCARE	BOEHRINGER	BOEHRINGER	BOEHRINGER
	Timeter VR1000 Series *	3700 : 3740	3701 : 3706	3704
WHERE MARKETED	Worldwide	Worldwide	Worldwide	Worldwide
FDA CLEARANCE	Yes	Yes	Yes	Yes
CE MARK (MDD)	No	Yes	Yes	Yes
TYPE(S) OF SUCTION	All common procedures	Recovery, OR, ICU, bedside, GI drainage	Recovery, OR, ICU, bedside, GI drainage	Recovery, OR, ICU, bedside, GI drainage
FUNCTION	Continuous	Continuous	Continuous	Continuous and intermittent
ADJUSTABLE CYCLE Increments	No NA	No NA	No NA	Yes NA
VACUUM ADJUST LOCK	Yes	Optional	Optional	Optional
VACUUM GAUGE				
Pin stop	Yes	NA	NA	NA
Range, mm Hg	0-200, full line	0-200, full line : 0-760	0-200 : 0-100	0-200
Graduations, mm Hg	2	10 : 30	10	10
INLETS AND OUTLETS	Handtight, Medstar, NCG, Ohmeda, Puritan, Schrader, Stem	All available	All available	All available
DISINFECTION/ STERILIZATION	Clean with isopropyl alcohol	Steam, Cidex, EtO, STERRAD	Steam, Cidex, EtO, STERRAD	Steam, Cidex, EtO, STERRAD
H x W x D, cm (in)	20.3 x 7.6 x 11.4 (8 x 3 x 4.5)	11.4 x 6.4 x 10.2 (4.5 x 2.5 x 4)	11.4 x 6.4 x 10.2 (4.5 x 2.5 x 4)	11.4 x 6.4 x 10.2 (4.5 x 2.5 x 4)
WEIGHT, g (lb)	700 (1.5)	607 (1.3)	607 (1.3)	726 (1.6)
LIST PRICE	\$260	\$332 : \$401	\$306 : \$369	\$640
WARRANTY	1 year, parts and labor	10 years, parts and labor	10 years, parts and labor	10 years, parts and labor
OTHER SPECIFICATIONS	Gauge can be swiveled and rotated; self-relieving regulating valve; on/off valve; line/regulate switch for full line vacuum; large, knurled adjusting knob; aluminum body; all-metal construction.	3-way control valve (off, regulate, line); safety lock-out for line vacuum; fully serviceable w/o special tools; straight-through high-flow ports; all-metal construction with synthetic sapphire coating on wear surfaces; linear gauge allows for 180° field of view; no gauge calibration required; free trial; same-day shipment.	Fully serviceable w/o special tools; straight-through high-flow ports; all-metal construction with synthetic sapphire coating on wear surfaces; linear gauge allows for 180° field of view; no gauge calibration required; free trial; same-day shipment.	3-way control valve (off, intermittent, continuous); line vacuum not available for patient safety; fully serviceable without special tools; fluid-tolerant intermitting mechanism with self-cleaning ports; filter-protected timing circuit; straight-through high-flow ports; all-metal construction w/synthetic sapphire coating on wear surfaces; free trial; same-day shipment.

Colons separate data on similar models of a device.

* Models in the VR1000 Series are classified as follows: VR1000 (as listed in chart), VR1002 (w/o line/reg switch), VR1004 (w/o on/off valve), VR1006 (w/o lock), VR1008 (w/o DISS-M, w/ 1/4" hose barb), and VR1400 (w/ 0-400 mm Hg gauge).

Product Comparison Chart

MODEL	BOEHRINGER	BOEHRINGER	BOEHRINGER	CLEMENTS MEDICAL
	7700 : 7740	7701 : 7970	7702-L	SUC89142 High Suction, High Flow
WHERE MARKETED	Worldwide	Worldwide	Worldwide	Worldwide
FDA CLEARANCE	Yes	Yes	Yes	No
CE MARK (MDD)	Yes	Yes	Yes	Submitted
TYPE(S) OF SUCTION	Recovery, OR, ICU, bedside, GI drainage	Recovery, OR, ICU, bedside, GI drainage	Recovery, OR, ICU, bedside, GI drainage	ER, surgery, critical care, adult pharyngeal
FUNCTION	Continuous	Continuous	Continuous and intermittent	Continuous
ADJUSTABLE CYCLE Increments	No NA	No NA	Yes NA	No NA
VACUUM ADJUST LOCK	Optional	Optional	Optional	No
VACUUM GAUGE				
Pin stop	Yes	Yes	Yes	Yes
Range, mm Hg	0-200, full line : 0-760	0-200 : 0-100	0-200	0-760
Graduations, mm Hg	2 : 10	2	2	20
INLETS AND OUTLETS	All available	All available	All available	Several available
DISINFECTION/ STERILIZATION	Steam, Cidex, EtO, STERRAD	Steam, Cidex, EtO, STERRAD	Steam, Cidex, EtO, STERRAD	Autoclave, various others
H x W x D, cm (in)	11.4 x 6.4 x 10.2 (4.5 x 2.5 x 4)	11.4 x 6.4 x 10.2 (4.5 x 2.5 x 4)	10.2 x 7.6 x 10.2 (4 x 3 x 4)	28 x 8 x 14 (11 x 3.1 x 5.5)
WEIGHT, g (lb)	634 (1.4)	634 (1.4)	1,103 (2.4)	1,000 (2.2)
LIST PRICE	\$280 : \$352	\$254 : \$309	\$500	Not specified
WARRANTY	5 years, parts and labor; 1 year, gauge	5 years, parts and labor; 1 year, gauge	5 years, parts and labor; 1 year, gauge	1 year
OTHER SPECIFICATIONS	3-way control valve (off, regulate, line); straight-through high-flow ports; safety lock-out for line vacuum; fully serviceable without special tools; all-metal construction with synthetic sapphire coating on wear surfaces; free trial; same-day shipment.	Straight-through high-flow ports; fully serviceable without special tools; all-metal construction with synthetic sapphire coating on wear surfaces; free trial; same-day shipment.	3-way control valve (off, intermittent, continuous); straight-through high-flow ports; line vacuum not available for patient safety; fluid-tolerant intermittent mechanism with self-cleaning ports; filter-protected timing circuit; fully serviceable w/o special tools; all-metal construction w/synthetic sapphire coating on wear surfaces; free trial.	Height and weight include polycarbonate safety jar; connectors include Ring Index, BS 5682, Drager, Puritan Bennett, and Ohmeda; other types can be manufactured on request. Meets AS 2120-3.

Colons separate data on similar models of a device.

Product Comparison Chart

MODEL	CLEMENTS MEDICAL	CLEMENTS MEDICAL	CLEMENTS MEDICAL	CLEMENTS MEDICAL
	SUC89152 Low Suction, Low Flow	SUC89162 Medium Suction, Low Flow	SUC89172 Medium Suction, High Flow	SUC89182 Very Low Suction, High Flow
WHERE MARKETED	Worldwide	Worldwide	Worldwide	Worldwide
FDA CLEARANCE	No	No	No	No
CE MARK (MDD)	Submitted	Submitted	Submitted	Submitted
TYPE(S) OF SUCTION	Drainage, decompression	Infant mucus extraction	ER, surgery, infant pharyngeal, critical care	Thoracic drainage
FUNCTION	Continuous	Continuous	Continuous	Continuous
ADJUSTABLE CYCLE Increments	No NA	No NA	No NA	No NA
VACUUM ADJUST LOCK	No	No	No	No
VACUUM GAUGE Pin stop Range, mm Hg	Yes 0-190	Yes 0-450	Yes 0-450	Yes 0-80 cm H ₂ O
Graduations, mm Hg	5	10	10	2 cm H ₂ O
INLETS AND OUTLETS	Several available	Several available	Several available	Several available
DISINFECTION/ STERILIZATION	Autoclave, various others	Autoclave, various others	Autoclave, various others	Autoclave, various others
H x W x D, cm (in)	28 x 8 x 14 (11 x 3.1 x 5.5)	28 x 8 x 14 (11 x 3.1 x 5.5)	28 x 8 x 14 (11 x 3.1 x 5.5)	28 x 8 x 14 (11 x 3.1 x 5.5)
WEIGHT, g (lb)	1,000 (2.2)	1,000 (2.2)	1,000 (2.2)	1,000 (2.2)
LIST PRICE	Not specified	Not specified	Not specified	Not specified
WARRANTY	1 year	1 year	1 year	1 year
OTHER SPECIFICATIONS	Height and weight include polycarbonate safety jar; connectors include Ring Index, BS 5682, Drager, Puritan Bennett, and Ohmeda; other types can be manufactured on request. Meets AS 2120-3.	Height and weight include polycarbonate safety jar; connectors include Ring Index, BS 5682, Drager, Puritan Bennett, and Ohmeda; other types can be manufactured on request. Meets AS 2120-3.	Height and weight include polycarbonate safety jar; connectors include Ring Index, BS 5682, Drager, Puritan Bennett, and Ohmeda; other types can be manufactured on request. Meets AS 2120-3.	Height and weight include polycarbonate safety jar; connectors include Ring Index, BS 5682, Drager, Puritan Bennett, and Ohmeda; other types can be manufactured on request. Meets AS 2120-3.

Colons separate data on similar models of a device.

Product Comparison Chart

MODEL	DAMECA	DAMECA	J H EMERSON	J H EMERSON
	32005 : 32006	32515 : 32550	55-JR	55-JV
WHERE MARKETED	Worldwide, except Canada and USA	Worldwide, except Canada and USA	Worldwide	Worldwide
FDA CLEARANCE	No	No	Yes	Yes
CE MARK (MDD)	Submitted	Submitted	No	No
TYPE(S) OF SUCTION	ER, surgical, tracheal	ER, surgical, tracheal	Thoracic drainage	Thoracic drainage
FUNCTION	Continuous	Continuous	Continuous	Continuous
ADJUSTABLE CYCLE Increments	No NA	No NA	No NA	No NA
VACUUM ADJUST LOCK	No	No	No	No
VACUUM GAUGE				
Pin stop	No	No	No	No
Range, mm Hg	0-100 kPa : 0-25 kPa	0-80 kPa : 0-90 kPa	0-60 cm H ₂ O	0-60 cm H ₂ O
Graduations, mm Hg	2	5	1 cm H ₂ O	1 cm H ₂ O
INLETS AND OUTLETS	Several available	Several available	Several available	Several available
DISINFECTION/STERILIZATION	Alcohol	Alcohol	Gas	Gas
H x W x D, cm (in)	Not specified	17 x 4 x 7 (6.7 x 1.6 x 2.8) : *	15.2 x 10.1 x 8.9 (6 x 4 x 3.5)	20.2 x 10.1 x 8.9 (8 x 4 x 3.5)
WEIGHT, g (lb)	Not specified	Not specified	907 (2)	907 (2)
LIST PRICE	Not specified	Not specified	\$675	\$625
WARRANTY	1 year	1 year	1 year	1 year
OTHER SPECIFICATIONS	Overflow safety device; adapter for sliding clamp; on/off valve.	Overflow safety device; adapter for sliding clamp; on/off valve; 60 dBA sound level for 32515.	High flow and low pressure; safety feature (pop-off) is user set to either 25-30 or 60-70 cm H ₂ O; built-in positive-pressure relief valve.	Designed for use during transport of patients in need of continuous thoracic suctioning; operated using compressed O ₂ from cylinder or wall outlet; provides high flows at low vacuum levels.

Colons separate data on similar models of a device.

* 15 x 5 x 8 cm (5.9 x 2 x 3.1 in).

Product Comparison Chart

MODEL	W T FARLEY	GREGGERSEN	MG ELECTRIC	MG ELECTRIC
	3-100 DU-O-VAC	Vacuum Regulator Standard -1 to 0	SAM 50 : SAM 51	SAM 52 : SAM 53
WHERE MARKETED	USA	Worldwide	Worldwide, except North America	Worldwide, except North America
FDA CLEARANCE	Yes	No	Not specified	Not specified
CE MARK (MDD)	Not specified	Yes	Yes	Yes
TYPE(S) OF SUCTION	Oral, tracheal	Surgical	ER	ER
FUNCTION	Continuous	Continuous	Continuous	Continuous
ADJUSTABLE CYCLE Increments	No NA	No NA	No NA	No NA
VACUUM ADJUST LOCK	No	Yes	No	No
VACUUM GAUGE Pin stop Range, mm Hg	Yes 0-200, 0-600	Yes -1 to 0 bar, full line	Yes 0-760	Yes 0-150
Graduations, mm Hg	2 and 10	0.05 bar	25; 5 kPa : 25	10
INLETS AND OUTLETS	All current manufacturers available	Several available	Several available	Several available
DISINFECTION/ STERILIZATION	EtO; decontaminate with cold liquid disinfection	Not specified	Autoclavable to 134°C; disinfect wash to 85°C	Autoclavable to 134°C; disinfect wash to 85°C
H x W x D, cm (in)	32.4 H x 10.2 W (12.75 H x 4 W)	12.4 x 6 x 10.5 (4.9 x 2.4 x 4.1)	18 x 9 x 14 (7 x 3.5 x 5.5)	18 x 9 x 14 (7 x 3.5 x 5.5)
WEIGHT, g (lb)	1,361 (3)	600 (1.3)	500 (1.1)	500 (1.1)
LIST PRICE	\$280	Not specified	£177 : £115 *	£216 : £155 **
WARRANTY	1 year, parts and labor	6 months	1 year	1 year
OTHER SPECIFICATIONS	Requires no electrical power; operated by compressed O ₂ from cylinder or wall outlet; gauge can be rotated 360°; pediatric and adult models available; DU-O-VAC has 2 O ₂ -check-valve outlets in addition to a separate suction outlet.	Meets German standard; international standards available.	Filter clip; remote or direct probe. Meets requirements of BS, EN, ISO 9001, TUV/GS, and Nordic Standard Accreditation.	Filter clip; remote or direct probe. Meets requirements of BS, EN, ISO 9001, TUV/GS, and Nordic Standard Accreditation.

Colons separate data on similar models of a device.

* US\$262 : US\$170.

** US\$320 : US\$230.

Product Comparison Chart

MODEL	MG ELECTRIC	OHMEDA MEDICAL	OHMEDA MEDICAL	OHMEDA MEDICAL
	SAM 54	Continuous	Continuous : Intermittent ISU	Surgical/ Free Flow
WHERE MARKETED	Worldwide, except North America	Worldwide	Worldwide	Worldwide
FDA CLEARANCE	Not specified	Yes	Yes	Yes
CE MARK (MDD)	Yes	Yes	Yes	Yes
TYPE(S) OF SUCTION	ER	All common procedures	GI drainage, all common procedures	OR, ICU, CCU, ER
FUNCTION	Continuous	Continuous	Continuous and intermittent	Continuous
ADJUSTABLE CYCLE Increments	No NA	No NA	Independent off/on 3-30 sec	No NA
VACUUM ADJUST LOCK	No	No	Yes	Yes
VACUUM GAUGE				
Pin stop	Yes	Except low & high	Yes	Except high
Range, mm Hg	0-760	0-200, full line (std 2- or 3-mode); 0-160 (low); 0-760 (high)	0-200, full line	0-200, full line (standard); 0-760 (high)
Graduations, mm Hg	25	5; 25 for high	5	5; 25 for high
INLETS AND OUTLETS	Several available	Diamond, DISS, Hand- I-Twist, Med-Star, 1/8" NPT, NCG, OES, Puritan, Schrader; tubing nipple, DISS, overflow trap	Diamond, DISS, Hand- I-Twist, Med-Star, 1/8" NPT, NCG, OES, Puritan, Schrader; tubing nipple, DISS, overflow trap	Diamond, DISS, Hand- I-Twist, Med-Star, 1/8" NPT, NCG, OES, Puritan, Schrader; tubing nipple, DISS, overflow trap
DISINFECTION/ STERILIZATION	Autoclavable to 134°C; disinfect wash to 85°C	Gas	Gas	Gas
H x W x D, cm (in)	18 x 8.9 x 14 (7 x 3.5 x 5.5)	14.7 x 7.6 x 9.7 (5.8 x 3 x 3.8)	16.8 x 8.9 x 12.2 (6.6 x 3.5 x 4.8)	14.5 x 8.9 x 11 (5.7 x 3.5 x 4.3)
WEIGHT, g (lb)	500 (1.1)	312 (0.69)	794 (1.75)	630 (1.38)
LIST PRICE	£489 (US\$725)	\$300	\$665	\$390
WARRANTY	1 year	3 years, parts and labor	3 years, parts and labor	3 years, parts and labor
OTHER SPECIFICATIONS	Filter clip; 2 jars and mobile trolley included. Meets requirements of BS, EN, ISO 9001, TUV/GS, and Nordic Standard Accreditation.	Color-coded gauge scale; glow-in-the- dark needle and increments; std low and high vac gauge; positive- action toggle selector switch; positive-pressure relief valve; low has 150 mm Hg vacuum relief valve; std 3- mode and high provide regulated, off, and full vacuum; standard 2- mode, low provide regulated vacuum, and off; standard and low gauge accu- racy ± 10 mm Hg. *	Color-coded gauge with glow-in-the- dark needle and increments; patented pneumatic logic device controls on/ off cycle; regulator module and gauge interchangeable w/continuous and Surgical Free Flow; standard gauge accu- racy ± 10 mm Hg. *	Color-coded gauge scale; glow-in-the- dark needle and increments; std and high gauge; on/off flip tab; suction flow bypasses regulator mechanism for high flows and minimal maintenance; modular design speeds main- tenance; modular components removable for cleaning or replacement; over- sized regulator bellows meet OR demands; standard gauge accuracy ± 10 mm Hg. *

Colons separate data on similar models of a device.

* Modular components are removable for cleaning or replacement (repair kits available at a discount). International versions meet ISO 10079-3, including counterclockwise gauge rotation.

Product Comparison Chart

MODEL	OHMEDA MEDICAL	PRECISION MEDICAL	PRECISION MEDICAL	PRECISION MEDICAL
	Thoracic	PM 3000 (2-mode) : PM 3100 (3-mode)	PM 3300	PM 3400
WHERE MARKETED	Worldwide	Worldwide	Worldwide	Worldwide
FDA CLEARANCE	Yes	Yes	Yes	Yes
CE MARK (MDD)	Yes	No	No	No
TYPE(S) OF SUCTION	Thoracic drainage, mediastinal drainage	Bedside, ICU, recovery, OR, ER	GI drainage, all common procedures, bedside	Pediatric
FUNCTION	Continuous	Continuous	Continuous and intermittent	Continuous and intermittent
ADJUSTABLE CYCLE Increments	No NA	No NA	Yes 3-30 sec	Yes 3-30 sec
VACUUM ADJUST LOCK	No	No	No	No
VACUUM GAUGE Pin stop Range, mm Hg	Yes 0-60 cm H ₂ O	Yes 0-200, full line	Yes 0-200, full line	Yes 0-150 (restricted to 150)
Graduations, mm Hg	1 cm H ₂ O	5	5	5
INLETS AND OUTLETS	Diamond, DISS, Hand- I-Twist, Med-Star, 1/8" NPT, NCG, OES, Puritan, Schrader, tubing nipple, overflow trap	Diamond, DISS, Hand- I-Twist, Med-Star, NCB, NPT, Ohmeda, Puritan, Schrader, Oxequip (old style)	Diamond, DISS, Hand- I-Twist, Med-Star, NCB, NPT, Ohmeda, Puritan, Schrader, Oxequip (old style)	Diamond, DISS, Hand- I-Twist, Med-Star, NCB, NPT, Ohmeda, Puritan, Schrader, Oxequip (old style)
DISINFECTION/ STERILIZATION	Gas	Decontaminate with cold liquid sterilant (Cidex)	Decontaminate with cold liquid sterilant (Cidex)	Decontaminate with cold liquid sterilant (Cidex)
H x W x D, cm (in)	18.3 x 9.1 x 8.6 (7.2 x 3.6 x 3.4)	13.2 x 7.1 x 5.1 (5.2 x 2.8 x 2)	13.5 x 7.4 x 8.1 (5.3 x 2.9 x 3.2)	13.5 x 7.4 x 8.1 (5.3 x 2.9 x 3.2)
WEIGHT, g (lb)	700 (1.54)	572 (1.26)	667 (1.5)	667 (1.5)
LIST PRICE	\$465	\$217	\$500	\$525
WARRANTY	3 years, parts and labor	2 years, parts and labor	2 years, parts and labor	2 years, parts and labor
OTHER SPECIFICATIONS	Color-coded, low- pressure gauge with glow-in-the-dark needle & increments; negative-pressure relief valve limits maximum vacuum; regulating diaphragm for pressure accuracy and high flow rates; low- positive-pressure relief valve re- lieves pressure with patient coughs or from tension pneumothorax; gauge accuracy ±3 cm H ₂ O; positive-action toggle selector switch. *	ABS housing; cast backplate for structural strength; color-coded gauge scale; gauge plugs into cast backplate; modular design; large mode and regulator knobs; large internal ports for maximum flow; standard 3-mode provides reg, off, full (PM 3100); standard 2-mode provides reg and off (PM 3000); hose tubing nipple and 90° tubing nipple available.	ABS housing; cast backplate for structural strength; color-coded gauge scale; gauge plugs into cast backplate; modular design; large mode and regulator knobs; large internal ports for maximum flow; modular design (including intermittent modular design); hose tubing nipple and 90° tubing nipple available.	ABS housing; cast backplate for structural strength; color-coded gauge scale; gauge plugs into cast backplate; modular design; large mode and regulator knobs; large internal ports for maximum flow; modular design (including intermittent modular design); hose tubing nipple and 90° tubing nipple available.

Colons separate data on similar models of a device.

* Modular components are removable for cleaning or replacement (repair kits available at a discount). International versions meet ISO 10079-3, including counterclockwise gauge rotation.

Product Comparison Chart

MODEL	RO-MED	TECHNOLOGIE MEDICALE	TECHNOLOGIE MEDICALE	WESTERN MEDICA
	PSU-1000	TM Vacuum Regulator	TM Vacuum Regulator	Suction Regulator
WHERE MARKETED	Southern Africa, others in Africa	Worldwide	Worldwide	Worldwide
FDA CLEARANCE	Not specified	No	No	Not specified
CE MARK (MDD)	Not specified	Yes	Yes	Not specified
TYPE(S) OF SUCTION	ER, surgical, ICU	Surgical, oral, nasal, tracheal	Pediatric, gastric, thoracic	Surgical, tracheal, pediatric, nursery, gastric, drainage
FUNCTION	Continuous	Continuous	Continuous	Continuous and interrupter
ADJUSTABLE CYCLE Increments	No NA	No NA	No NA	No NA
VACUUM ADJUST LOCK	No	Yes	Yes	No
VACUUM GAUGE				
Pin stop	Yes	Yes	Yes	Yes
Range, mm Hg	0-100 kPa	0-600 mbar, every 25 mbar graduations; 0-1,000 mbar, every 50 mbar graduations See range above	0-250 mbar	0-100, 0-120, 0-160, 0-200, 0-760; dual-scale gauge in mm Hg and cm H ₂ O
Graduations, mm Hg	5 kPa	See range above	Every 10 mbar	5
INLETS AND OUTLETS	Several available	Inlet: 1/4 G, 12/100, 1/8 BSP; outlet: tubing nipple or safety trap	Inlet: 1/4 G, 12/100, 1/8 BSP; outlet: tubing nipple or safety trap	To meet all applications
DISINFECTION/STERILIZATION	Autoclavable, other methods not specified	Autoclavable when disassembled	Autoclavable when disassembled	Alcohol
H x W x D, cm (in)	14 x 6 x 11 (5.5 x 2.4 x 4.3)	32 x 9 x 12.5 (12.6 x 3.5 x 4.9)	32 x 9 x 12.5 (12.6 x 3.5 x 4.9)	15.2 x 7.6 x 15.2 (6 x 3 x 6)
WEIGHT, g (lb)	600 (1.3)	570 (1.26)	570 (1.26)	907 (2)
LIST PRICE	\$115	\$146 maximum	\$167 maximum	\$180
WARRANTY	1 year	1 year	1 year	1 year
OTHER SPECIFICATIONS	Diaphragm control valve adjusts vacuum to accurate levels; overflow safety valve limits fluid intake into regulator and pipeline; available with graduated 1 or 2 L bottles. Regulator materials meet requirements of ISO 9000.	ABS body; polycarbonate cover; silicone membrane; ethylene/propylene gaskets; on/off vacuum switch; autoclavable; 150 cc safety trap; bacterial filter; overflow safety device.	ABS body; polycarbonate cover; silicone membrane; ethylene/propylene gaskets; on/off vacuum switch; autoclavable; 150 cc safety trap; bacterial filter; overflow safety device.	Meets standards of CGA and CSA.

Colons separate data on similar models of a device.