

INNOVATIVE
TECHNOLOGY
WORLDWIDE



NEUBERGER, INC.

New!
PowerDry[®]
Continuous-Cleaning Vacuum Systems

Laboratory Diaphragm Pumps for Air • Gases • Liquids

oil-free, dry running
corrosion-resistant materials
contamination-free operation

VACUUM SYSTEM SELECTION GUIDE

for
blotting
filtration
gel dryers
rotary evaporators
vacuum concentrators
solid phase extraction



The LABOPORT[®] Family

Automatic Vacuum Pumping Systems

Maintain precise control of the distillation process

KNF's vacuum pump controller uses advanced microprocessor features and offers you complete control over the evaporative process. It maintains system vacuum precisely to within $\pm 0.2\%$ for the duration of your process. It prevents foaming and boiling, by venting instantly with the touch of a button. With five memory registers, it stores separate vacuum level and hysteresis settings for multiple processes, solvents or even individual users. Bright red LED digits are easy to read. Only premium, corrosion-resistant Kalrez[®] resin, ceramic, and polypropylene materials are in contact with the gas stream. There are no stainless steel components to fail from pitting or corrosion.

This controller may be purchased as a complete vacuum system featuring a LABOPORT[®] vacuum pump and convenient, sturdy alloy stand to facilitate transportation within the lab.

User friendly features - Because we listened to valuable feedback from users like yourself, the PU842 controller is very simple to use. Choose among any of five programmable vacuum and hysteresis memory settings, and adjust them even while the pump is running. The instant purge and vent functions prevent foaming and boiling with the touch of a button. Push-on hose barbs connect quickly; no special wrenches are needed. It's designed to be virtually maintenance-free. Cleaning of wetted parts, if it becomes necessary, can be accomplished in minutes using simple tools, as all is accessible from outside the cabinet.

A versatile vacuum system - A complete system includes a dry, oil-free LABOPORT[®] vacuum pump and the programmable controller, mounted on the alloy stand.

These systems feature quality KNF LABOPORT[®] pumps, built tough, with heads made of solid Teflon[®] resin, and patented structured diaphragm plus exclusive multi-port Kalrez[®] valves. They will provide you with years of trouble-free performance. Models are available to 1.5 Torr end vacuum and flow capacities to 60 L/min.

Vacuum controller technical specifications

Weight	1.4 kg (3 lbs.)	Hose Connectors	$\frac{3}{8}$ in. ID hose barbs
Display Units	mm Hg (Torr) or mbar	Setpoint Range	Atm. - 1 Torr (1 mbar)
Hysteresis Range	Atm. - 1 Torr (1 mbar)	Accuracy	$\pm 0.2\%$ of scale
Overall Size: L x W x H	19 x 14 x 7 cm. 7.5 x 5.5 x 2.75 in.	Power Requirements	115 VAC 60 Hz only

System selection chart

Cap. L/min.	System Number	Pump Head Configuration	Wetted Materials Head/Valves/Diaphragm	Vacuum Torr ("Hg)	Pressure psig	Dimensions L X W X H cm	Shipping Wt. kg
Vacuum pump controller (less pump and alloy stand)							
	PU842	Controller Only	Polypropylene/Kalrez [®]			19 x 14 x 7	1.4
Complete vacuum system (includes controller, LABOPORT [®] pump and alloy stand)							
20	PU843-N820.3FTP	Two Stage	Teflon [®] /Kalrez [®] Teflon [®]	6 (29.7)	15	33 x 20 x 41	15
34	PU844-N840.3FTP	Two Stage	Teflon [®] /Kalrez [®] Teflon [®]	6 (29.7)	15	33 x 20 x 41	18
34	PU845-N842.3FTP	Two Stage	Teflon [®] /Kalrez [®] Teflon [®]	1.5 (29.86)	15	33 x 20 x 41	18



LABOXACT[®] Manual Vacuum Pumping Systems

Economical control of vacuum levels for evaporators

The LABOXACT[®] manual vacuum control system is ideally suited for less critical applications. It includes a continuously-adjustable vacuum valve, a safety-vent purge valve with purge gas inlet port, accurate digital vacuum gauge and a premium LABOPORT[®] pump featuring heads of solid Teflon[®] resin. The system is factory-mounted directly on a standard pump, is simple to adjust, and provides reliable manual control of your vacuum process.

System selection chart

Pump L/min.	System Number/Pump	Pump Head Configuration	Wetted Pump Materials Head/Valves/Diaphragm	Vacuum Torr ("Hg)	Pressure psig	Dimensions L X W X H cm	Shipping Wt. kg
Complete vacuum system (includes vacuum valves, digital gauge and specified LABOPORT [®] pump. Not available separately.)							
20	PU1334-N820FTP	Single Stage	Teflon [®] /Kalrez [®] Teflon [®]	75 (27)	15	40 x 22 x 28	10
20	PU1335-N820.3FTP	Two Stage	Teflon [®] /Kalrez [®] Teflon [®]	6 (29.7)	15	40 x 22 x 28	10
34	PU1336-N840FTP	Single Stage	Teflon [®] /Kalrez [®] Teflon [®]	75 (27)	15	41 x 22 x 30	13
34	PU1337-N840.3FTP	Two Stage	Teflon [®] /Kalrez [®] Teflon [®]	6 (29.7)	15	41 x 22 x 30	13



Available in 230V/50Hz. Specifications are subject to change without notice. You should always check corrosion-resistance charts for compatibility with the chemicals used in your laboratory.

LABOPORT® Vacuum Pumps

For rotary evaporation, vacuum ovens and distillation

Consider a KNF LABOPORT® pump for quiet, reliable operation without the messy handling of pump oil, or the expense of water aspirators. They are the perfect replacement for rotary vane pumps in applications where a variety of corrosive vapors are encountered.

Equipped with patented, sturdy Kalrez® multi-port valves, these pumps tolerate ingestion of occasional liquids without damaging or degrading performance. The thick, solid Teflon® resin heads will not peel or corrode when exposed to most solvents.

As these portable pumps are not explosion-proof, applicable codes pertaining to proper laboratory ventilation and solvent disposal should be adhered to, especially when processing potentially toxic and/or combustible liquids and vapors. Placing a cold trap prior to the pump will help to optimize the rate of evaporation, and reduce the amount of condensable vapors that enter the pump, extending diaphragm life.



Selection chart for rotary evaporation and distillation

For sample vessels <10 Liters

Cap. L/min.	Model Number	Head Configuration	Wetted Materials Head/Valves/Diaphragm	Vacuum Torr ("Hg)	Pressure psig	Dimensions L X W X H cm	Shipping Wt. kg
Distillation of high BP solvents (>110°C) <i>Chlorobenzene, DMF, DMSO, isoamyl alcohol, xylene</i>							
34	N842.3FTP	Two Stage	Teflon®/Kalrez®/Teflon®	1.5 (29.86)	15	33 x 17 x 22	12.2
Reflux reactions/distillation of high BP solvents (80-110°C) <i>Water, heptane, isobutyl alcohol, toluene</i>							
34	N842.3FTP	Two Stage	Teflon®/Kalrez®/Teflon®	1.5 (29.86)	15	33 x 17 x 22	12.2
34	N840.3FTP	Two Stage	Teflon®/Kalrez®/Teflon®	6 (29.7)	15	33 x 17 x 22	12.2
Distillation of medium BP solvents (60-80°C) <i>Acetonitrile, benzene, chloroform, ethanol, ethyl acetate, hexane, methanol</i>							
20	N820.3FTP	Two Stage	Teflon®/Kalrez®/Teflon®	6 (29.7)	15	32 x 16 x 20	9.5
34	N840.3FTP	Two Stage	Teflon®/Kalrez®/Teflon®	6 (29.7)	15	33 x 17 x 22	12.2
Distillation of low BP solvents (35-60°C) <i>Acetone, methylene chloride, pentane</i> KNF recommends the PU842 vacuum pump controller for use with these pumps to avoid solvent bumping.							
10	N810.3FTP	Two Stage	Teflon®/Kalrez®/Teflon®	6 (29.7)	15	28 x 14 x 19	7.2
20	N820FTP	Single Stage	Teflon®/Kalrez®/Teflon®	75 (27)	15	32 x 16 x 20	9.5
20	N820.3FTP	Two Stage	Teflon®/Kalrez®/Teflon®	6 (29.7)	15	32 x 16 x 20	9.5
34	N840FTP	Single Stage	Teflon®/Kalrez®/Teflon®	75 (27)	15	33 x 17 x 22	12.2
34	N840.3FTP	Two Stage	Teflon®/Kalrez®/Teflon®	6 (29.7)	15	33 x 17 x 22	12.2

For sample vessels >10 Liters

60	N860.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®	3 (29.8)	15	33 x 29 x 28	14.3
65	N840.1.2FTP	Parallel Head	Teflon®/Kalrez®	68 (27.3)	15	33 x 17 x 22	12.2

For applications involving a high volume of condensable vapors, consider pumps equipped with the PowerDry® - Self Cleaning pump option.

Selection chart for gel drying, vacuum concentration, vacuum ovens

Cap. L/min.	Model Number	Head Configuration	Wetted Materials Head/Valves/Diaphragm	Vacuum Torr ("Hg)	Pressure psig	Dimensions L X W X H cm	Shipping Wt. kg
Gel drying - use with a KNF dry ice trap							
20	N820.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	7.5 (29.6)	15	32 x 16 x 20	9.6
Vacuum concentration - use with a KNF dry ice trap							
34	N840.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	7.5 (29.6)	15	33 x 17 x 22	12.9
Large scale vacuum concentration							
60	N860.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	3 (29.8)	15	33 x 29 x 28	14.8
Small vacuum ovens - chamber capacity <15 liters; use with a KNF dry ice trap							
20	N820.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	7.5 (29.6)	15	32 x 16 x 20	9.6
Medium vacuum ovens - chamber capacity 15-30 liters; use with a KNF dry ice trap							
34	N840.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	7.5 (29.6)	15	33 x 17 x 22	12.9
34	N842.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	3 (29.8)	15	33 x 17 x 22	13.7
Large vacuum ovens - chamber capacity >30 liters; use with a KNF dry ice trap							
60	N860.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	3 (29.8)	15	33 x 29 x 28	14.8

Available in 230V/50Hz. Specifications are subject to change without notice. You should always check corrosion-resistance charts for compatibility with the chemicals used in your laboratory.

PowerDry® Continuous-Cleaning Vacuum Systems

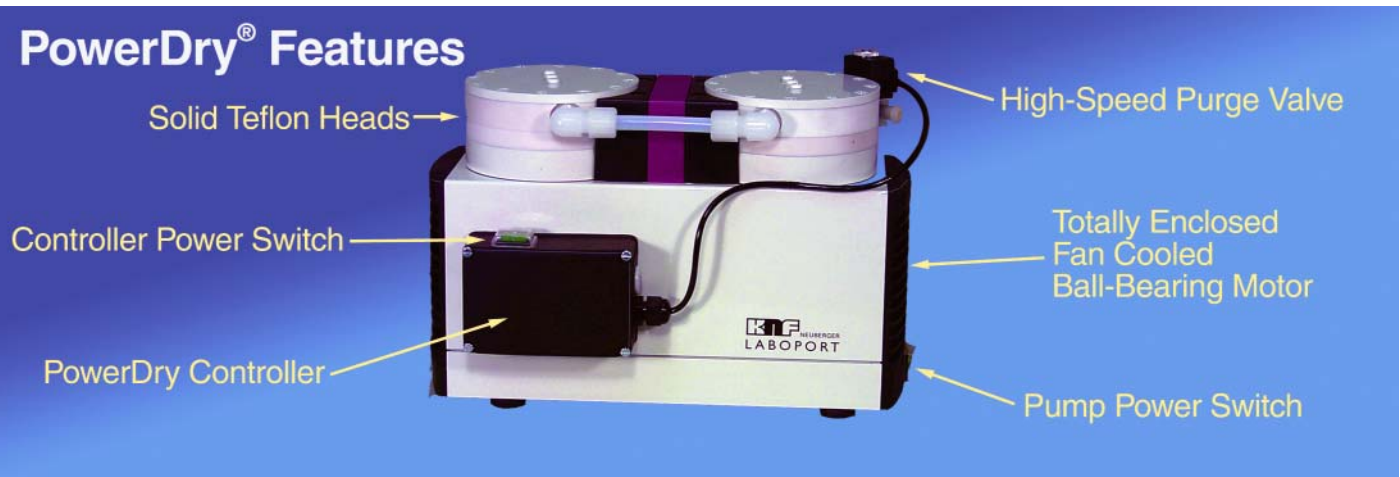
LABOPORT® pumps just got better with KNF's innovative solution to the problem of liquids accumulating inside the pump. These liquids usually collect when pumping saturated vapors, as encountered with vacuum ovens or rotary evaporators. Unless occasionally removed from the pump, they increase processing time, reducing pump efficiency and life. KNF's new, patent-pending PowerDry® system cycles automatically every few minutes, removing accumulated moisture instantly without disturbing your vacuum process.

How it Works - See diagram below. The PowerDry® system instantly removes accumulated condensate from the pump and restores efficiency while the pump is operating. During the PowerDry® cycle, an internal valve energizes and admits a burst of ambient air directly into the first stage. The resulting high pressure ratio instantly closes the pump's inlet valve, preserving the vacuum level within the evacuated chamber. The purge air moves through the pump at a high speed, forcing accumulated condensate out through the exhaust port. The drying operation is precisely controlled by an adjustable electronic timer. Three individual timing cycles are used while the pump is running; initial pump down time, drying cycle duration, and the interval between drying cycles.

Corrosion-resistant - KNF LABOPORT® pumps feature premium Teflon® and Kalrez® resins in contact with the gas stream. There are no coated-metal parts to pit or corrode. KNF's innovative molded structural diaphragm and multi-port valve system ensure reliable vacuum performance.

Technical specifications

Dryer Controller	Adjustable, 3 cycle electronic timer	Wetted Materials	Teflon® and Kalrez®
Pumpdown Cycle	13 to 360 seconds	Pump Type	Oil-Free diaphragm
Drying Cycle	1 to 10 seconds	No. of Stages	Two-stages
Repeat Cycle	10 to 900 seconds	Port Fittings	3/8" hose barbs



PowerDry® pump selection chart

Cap. L/min.	Model Number	Head Configuration	Wetted Materials Head/Valves/Diaphragm	Vacuum Torr ("Hg)	Pressure psig	Dimensions L x W X H cm	Shipping Wt. kg
20	N820.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	7.5 (29.6)	15	32 x 16 x 20	9.6
34	N840.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	7.5 (29.6)	15	33 x 17 x 22	12.9
34	N842.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	3 (29.8)	15	33 x 17 x 22	13.7
60	N860.3FT.40P	Two Stage PowerDry®	Teflon®/Kalrez®/Teflon®	3 (29.8)	15	33 x 29 x 28	14.8

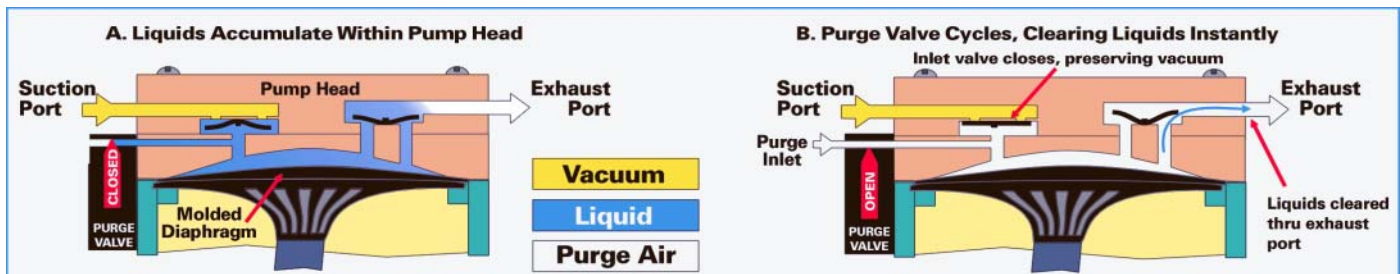


Fig. A. Liquids tend to accumulate within a pump head while handling saturated vapors. During the pump's PowerDry cycle, as shown in Fig. B, a high-speed purge valve energizes, admitting a burst of air into the pump's first stage. Because of the high pressure ratio, the pump's inlet check valve instantly closes, preserving your vessel's vacuum level. The purge air moves through the pump's heads at a high speed, propelling the accumulated liquids out the exhaust port, leaving your pump clean and dry. KNF recommends that a container be connected to the exhaust port of the pump to collect expelled liquids.

LABOPORT® Mini Pumps and Compressors

For vacuum filtration, blotting, degassing, dessication

These convenient KNF pumps are lightweight and easy to use for your flask filtration, vacuum manifold and vacuum blotting applications. They feature premium, corrosion-resistant Ryton®, Teflon® and Kalrez® resins. There are no metal wetted parts within the pump heads. They are fitted with KNF's patented, multi-port valve design for increased performance and tolerance of occasional liquids drawn into the system. An optional high-quality, smoothly-dampened brass vacuum or pressure gauge exhibits minimal needle bounce, and a convenient bleeder valve provides fine adjustment.



Selection chart for filtration, blotting, solid phase extraction

Cap. L/min.	Model Number	Head Configuration	Wetted Materials Head/Valves/Diaphragm	Vacuum Torr ("Hg)	Pressure psig	Dimensions L x W X H cm	Shipping Wt. kg
Flask filtration - pump only							
5.5	N86KTP	Single Stage	Ryton®/Kalrez®/Teflon®	120 (25.2)	35	18 x 9 x 15	1.9
11.5	N811KTP	Single Stage	Ryton®/Kalrez®/Teflon®	218 (21.3)	35	20 x 9 x 17	2.5
13	MPU953	Single Stage	Ryton®/Viton®/Teflon®	75 (27)	15	20 x 9 x 17	2.5
16	N816.3KTP	Two Stage	Ryton®/Kalrez®/Teflon®	15 (29.3)	7.4	36 x 14 x 9	4.0
30	N816.1.2KTP	Parallel Head	Ryton®/Kalrez®/Teflon®	120 (25.2)	7.4	36 x 14 x 9	4.0
Vacuum filtration, blotting, degassing, dessication, aspiration, solid-phase extraction - with vacuum gauge and bleeder valve							
5.5	PU837	Single Stage	Ryton®/Kalrez®/Teflon®	120 (25.2)	35	18 x 9 x 15	2.0
13	PU839	Single Stage	Ryton®/Viton®/Teflon®	75 (27)	15	20 x 9 x 17	2.6
Pressure filtration - with pressure gauge and bleeder valve							
5.5	PU838	Single Stage	Ryton®/Kalrez®/Teflon®	120 (25.2)	35	18 x 9 x 15	2.0
11.5	PU840	Single Stage	Ryton®/Kalrez®/Teflon®	218 (21.3)	35	20 x 9 x 17	2.6

Vacuum Pumps and Compressors

Economical solid Teflon® resin or 316 stainless steel heads

The FT pumps listed below are an excellent companion for most laboratory appliances requiring a dry, oil-free vacuum source. Use them with your gel dryer, rotary evaporator, distillation processor and vacuum filtration device. Built from premium corrosion-resistant Teflon® and Kalrez® resins, these pumps handle the harshest gases and vapors* found in the laboratory. The ST models are excellent for higher pressure or flow applications such as gas transfer or circulation. They feature machined 316 stainless steel heads, a diaphragm coated with Teflon® resin, and valves of Teflon® resin for handling tough corrosive vapors.*



Vacuum pumps with solid Teflon® resin heads

Cap. L/min.	Model Number	Head Configuration	Wetted Materials Head/Valves/Diaphragm	Vacuum Torr ("Hg)	Pressure psig	Dimensions L X W X H cm	Shipping Wt. kg
17	N726FTP	Single Stage	Teflon®/Kalrez®/Teflon®	50 (28)	20	20 x 11 x 18	4.8
17	N726.3FTP	Two Stage	Teflon®/Kalrez®/Teflon®	10 (29.5)	-	25 x 20 x 18	6.8
30	N726.1.2FTP	Parallel Head	Teflon®/Kalrez®/Teflon®	50 (28)	20	25 x 20 x 18	6.8

Vacuum pumps & compressors with 316 stainless steel heads

Cap. L/min.	Model Number	Head Configuration	Wetted Materials Head/Valves/Diaphragm	Vacuum Torr ("Hg)	Pressure psig	Dimensions L X W X H cm	Shipping Wt. kg
29.3	N035STP	Single Stage	316SS/Teflon®/Teflon®	70 (27)	60	26 x 15 x 20	12.5
29.3	N035.3STP	Two Stage	316SS/Teflon®/Teflon®	10 (29.5)	-	31 x 25 x 20	17
56	N035.1.2STP	Parallel Head	316SS/Teflon®/Teflon®	70 (27)	60	31 x 25 x 20	17

*You should always check corrosion-resistance charts for compatibility with the chemicals used in your laboratory. Teflon® is a registered trademark of DuPont. Kalrez® is a registered trademark of DuPont Dow. LABOPORT® is a registered trademark of KNF Neuberger GmbH. Specifications are subject to change without notice. Above pumps available in 115V/60Hz and 230V/50Hz.

About KNF Neuberger

KNF Neuberger, Inc., based in the Trenton, NJ area since 1977, designs and manufactures standard and custom-tailored air, gas and liquid diaphragm pumps. The company's broad range of products support a wide variety of applications, both as a vital part of a larger OEM (Original Equipment Manufacturer) system or as a stand-alone laboratory unit. KNF is a pioneer in the use of Teflon® for pumps that handle aggressive gases/liquids, holds over 200 patents and is clearly the world leader in dia-

phragm pump innovation. For the research laboratory, KNF introduced the innovative and popular LABOPORT® line of solid Teflon® pumps.

KNF Neuberger is part of a multinational corporation, established shortly after World War II and headquartered in Germany's Black Forest region. With a worldwide group of 12 wholly-owned subsidiaries in Europe, America and Asia and two R&D centers, KNF offers the true depth of capability needed to solve today's and tomorrow's design challenges.

FLODOS Liquid Diaphragm Pumps

For dosing or transfer of corrosive liquids

KNF's liquid diaphragm pumps are a convenient way to dose or transfer liquids in the laboratory. The pumps are self-priming and maintenance-free and will operate dry indefinitely without damage. Models are available featuring premium, corrosion-resistant PVDF and PTFE resins. There are no metal wetted parts to corrode nor any troublesome peristaltic tubing to break or fatigue. The flow rate is adjustable within the range specified in the selection chart. Hard-walled tubing is suggested for maximum adjustment effectiveness.



Selection chart

Cap. L/min.	Model Number	Maximum Pressure Head	Dimensions L X W X H cm	Barbed Connections	Shipping Wt. kg
Standard pressure pumps					
0.5 - 1.0	ND100	15 psig / 33 ft. H ₂ O / 3 mWg	18 x 18 x 8.5	8 mm ID	2.4
1.0 - 3.0	ND300	15 psig / 33 ft. H ₂ O / 3 mWg	22 x 21 x 10.5	12 mm ID	2.8
High pressure pumps					
0.9 - 1.4	ND1.100	60 psig / 130 ft. H ₂ O / 40 mWg	18 x 18 x 8.5	8 mm ID	2.4
1.0 - 3.0	ND1.300	60 psig / 130 ft. H ₂ O / 40 mWg	22 x 21 x 10.5	12 mm ID	2.8

Technical specifications (all models)

Maximum Suction Head 9 in. Hg / 10 ft. H₂O / 6 mWg

Motor Type Shaded pole AC, Thermal reset

Materials of Construction KT model - PP/PTFE/Viton®/PA, TT model - PTFE/PVDF

Standard continuous performance ratings listed above are per head and are based on technical data and test results of nominal units at sea level with water at 70° F (21° C) and nominal electrical supply. Dimensions and performance characteristics given are for reference only. Specifications and prices are subject to change without notice. Viton is a registered trademark of DuPont Dow.

Ambient Temperature Range +5 to +40°C

Medium Temperature Range +5 to +80°C

STEPDOS Programmable Liquid Metering Pumps

Consider a KNF STEPDOS liquid metering pump for quiet, precision metering without the inconvenience of tubing maintenance or failure. They are the perfect replacement for peristaltic tubing pumps in the lab, and can be used where a variety of neutral or corrosive liquids are encountered. These pumps use premium, corrosion-resistant wetted parts that are designed to last. They are virtually maintenance-free. Even the drip proof case will withstand the harshest lab environments. The microprocessor-controls feature exceptional operating flexibility and are described below for each model. The RC models are supplied with cables and Windows™ software for remote access to all functions of the pump from a personal computer. The S models are controlled by the on-board touch pad.



Technical specifications

STEPDOS 03

Flowrate 0.03 to 30 ml/min. (0.0005 to 0.48 GPH)

Max Pressure 90 psig, 195 ft H₂O, 60 mWg

Suction 13 ft H₂O, 12 in. Hg, 4 mWg

Accuracy ±2% accuracy

Keypad Start/Enter, Stop/Esc, Prime Drain, Program, Up, Down

Dispense Modes

Metering by volume: 30µl to 180 l

Metering by time: 0.34 seconds to 100 hours

Repeatable metering: 1 to 65,000 times with adjustable pause time up to 24 hours

Wetted Materials

Model	Head	Diaphragm	Valves
STEPDOS03KT, 08KT	PP	PTFE	FFPM
STEPDOS03TT, 08TT	PVDF	PTFE	FFPM
STEPDOS03ST (only)	316 Stainless	PTFE	FFPM

Control Input/Output Ports (All RC models)

Analog input: 0 - 20 mA, 4 - 20 mA, 0 - 10 VDC · Sensor input: open contacts (2), 5 VDC · Alarm output: NO or NC relay contacts

STEPDOS 08

Flowrate 0.08 to 80 ml/min. (0.013 to 1.28 GPH)

Max Pressure 30 psig, 66 ft H₂O, 20 mWg

Suction 13 ft H₂O, 12 in. Hg, 4 mWg

Accuracy ±2% accuracy

Keypad Start, Enter/Stop, Prime Drain, Program, Up, Down

Dispense Modes

Number of Strokes: 7 - 30,000

Time/Stroke: 0.36 sec to 5 min, 27 sec. Pause: 0 - 100 hours

Environmental/Mechanical (All models)

Ambient Temp: +5 to +40°C (+47 to +104°F)

Medium Temp: +5 to +80°C (+47 to +176°F)

Cabinet: IP65 Drip proof construction

Physical: 18 cm L x 11.5 cm W x 8 cm H, 1.5 kg (3 lbs.)

CE Mark: EN 61010/EN 55011

Connectors: 1/4" 28 UNF(F), Hose OD: 1/8" - 1/32" (1.5 - 3 mm)

Power: 100-230 VAC, 50-60 Hz, 14 Watts

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