



Demeter™
Food Microbiology Media
Preparation System



Enhance lab:

- Throughput
- Flexibility
- Traceability
- Profitability

Demeter™ Sterilized & Precise DI Water Dispensing

DEMETER™ SPECS:

- Dispense capability range: 90mL - 4L
- Heating module up to 94° C
- 2 internal sterilization cycles: routine and intensive
- 3 filters, final filtration to 0.2 µm
- 16 recipes/dispenses for volume and heat (Ambient-50° C)
- UV lamp 254 nm
- Barcode scanner
- Scale ± 0.1% accuracy
- LIMS interface
- Non-volatile data storage for the 100 most recent dispenses
- Dispense ± 2% volume accuracy & ± 2° C temp accuracy
- Printer for data label records
- NIST traceable thermocouple and scale
- PP enclosure
- 10 gal PVDF tank
- 9.6 kW, 208VAC, 3 phase, 27 amp

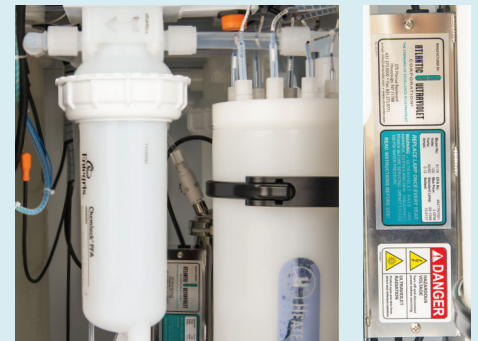
BENEFITS:

- Automatically dispense sterile water with high precision, accuracy, and traceability for temperature & volume
- Increase lab throughput with quick, high capacity performance
- Skip media preparation autoclave step due to 0.2 µm filtration (ISO11133)
- Procedural time savings entering incubator at incubation temperature
- Sterilization of components prevents bacteria growth through 3 methods: heat, UV, & filtration
- Documented traceability through system by streamlining audit procedure for yearly ISO/IEC 17025:2005 lab inspection
- Lab specific customization through programmable recipes
- Volumetric dispense accurately with secondary weight confirmation

STERILIZATION:

Demeter™ sterilizes water through 3 components to prevent bacteria accumulation:

- Heater cycles hot water through plumbing at 94° C
- 254 nm UV light unravels DNA of bacteria
- Final filtration at 0.2 µm trap impurities in filters



Internal filtration to 0.2 µm and UV light for sterilization and purity.

APPLICATIONS:

Ideal applications include environmental, food microbiology, and food manufacturing QA/QC labs conducting pathogen testing for the following:

- E. coli O157:H7
- Listeria
- Salmonella

Demeter™ assists in automating media preparation with many media reagents including the following:

- BPW-Buffered Peptone Water
- BPBW-Butterfield's Phosphate-Buffered Dilution Water
- TSB-Trypticase Soy Broth
- LB- Lactose Broth
- Fraser Broth

DEMETER™ UTILITY:

The Demeter™ instrument from Heateflex was engineered for accuracy, traceability, and sterility for the media preparation processes in food microbiology testing labs, and in biological buffer/media preparation.

Automation begins with a sample container being filled with sterile water, delivering increased accuracy with a precision pour and accurate heat dispensing.

The system delivers 0.2 µm filtration sterilized water. When using Demeter™ with sterile media reagents, test sample procedures skip the autoclave, thereby reducing autoclave requirements and delivering long-term benefits in cost reduction.

Lab chosen programmable recipes for dispensed sterile water are at incubation temperature, saving labs time bringing samples up to temperature. Users often

experience an increase in throughputs of bulk media batches and less spoilage/waste from batch testing failures, as well as seeing benefits from an emphasis on traceability.

Additionally, Demeter™ logs media preparation test procedural data providing quicker and higher accuracy record keeping compared to handwritten laboratory notebooks.

Printer for data label records



DEMETER™ ROI & COST SAVINGS:

Heateflex built Demeter™ to provide labs the ability to perform microbiology testing quicker and efficiently, resulting in numerous ways to increase throughput.

Demeter™ has the benefits of using a quality certified premade media with the cost savings of a dehydrated media powder. According to Bioprocess International, these powders are one-half the price compared to premade media.

Time and cost savings come by freeing up the autoclave to process bio-waste. FDA BAM guidelines requires 15 minutes at 121° C to sterilize media. By not having to do this step in each batch, time is saved, and more samples may be processed in the existing facilities. This saves customers in not having to purchase more autoclaves.

Significant time savings arise from the incubator not having to bring samples up to incubation temperature or being used to store pre-warmed media. Depending on volume, this amount of time savings changes. For example, a 60L incubator ½ full would have a savings of ~2 hours while a 400L incubator ½ full would have a savings of ~3 hours.

1000mL Calibration

Dispense Counter	1000mL	dev	% dev
1	1000.3	.3	.03
2	1000.4	.4	.04
3	1001.2	1.2	0.12
4	1001.0	1.0	0.10
5	997.6	2.4	0.24
6	999.5	.5	0.05
7	998.0	2.0	0.20
8	997.0	3.0	0.30
9	998.4	1.6	0.16
10	998.8	1.2	0.12
Average	999.22	1.4	0.14

TRACEABILITY THROUGHOUT SYSTEM:

Demeter™ meets increasing regulatory requirements in traceability and documentation. Beginning with the barcode scanner, documentation for user, sample, and media reagent are logged. Dispense temperature is recorded with a NIST traceable thermocouple and scale. The scale provides documentation for net weight of user added media and dispensed water added to the sample, recording the media preparation ratio. Lastly, the PLC tracks the machine ID and a time stamp of the media creation.

After the media is created, two locations contain documented data. First, data can be pushed out to a LIMS system through connecting to an RS232 port. Second, a data label prints out a label as shown below, which can be added to a lab notebook.

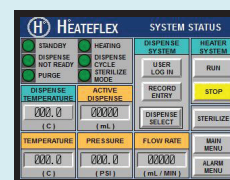
EXCELLENT PRECISION & ACCURACY:

The table demonstrates the consistency in dispensing accurate recipes when users select parameters from the PLC. In this example, 1000mL dispensing 10 times had an average dispense volume of 999.22mL with a percentage deviation average of 0.14%.

BARCODE SCANNING CAPABILITIES:

For documenting lab user, media reagent, and sample tracking, Demeter™ has a wand barcode scanner able to read the following symbologies in the laboratory:

- 2D Symbologies: Data Matrix, QR Code, Micro QR Code, Aztec Code
- Stacked Symbologies: PDF417, MicroPDF417, Composite
- Linear Symbologies: UPC, Code 39, Code 128, Interleaved 2 of 5, Codabar, GSI Databar, Code 93
- Postal Symbologies: ISPS OneCode (4CB), POSTNET, PLANET, Japanese Post, Australian Post, Royal Mail, KIX Code



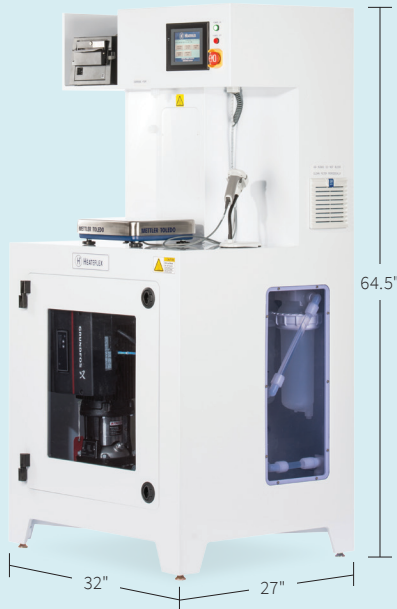
PLC Dispense Controller with Touch Screen



Barcode scanner tracks sample ID through system



Demeter™ Small Footprint, High Performance



BUILT ACCORDING TO INDUSTRY STANDARDS

- Dispense volume accuracy: $\pm 2\%$ (ISO 6887)
- Weight accuracy: $\pm 0.1\%$ within limits of detection of scale (ISO: 11133: 2014)
- Temperature accuracy: $\leq \pm 2^\circ\text{C}$ (Media manufacturers' commonly recommended incubator temperature range)
- $0.2\mu\text{m}$ final filtration allows elimination of autoclave step when used with sterile dehydrated media reagents (ISO: 11133: 2014)

DEMETER™ PERFORMANCE

Pathogen	Incubation Temp	ΔT	GPM	LPM
E. Coli O157:H7	42° C	22° C	1.65	6.25
Salmonella	37° C	15° C	2.43	9.19
Listeria	27° C	7° C	5.20	19.66

PERFORMANCE CAPACITY

Pathogen	90mL dispense	225mL dispense	1L dispense	2L dispense	3L dispense	3.375L dispense
E. Coli O157:H7	1 sec	4 sec	12 sec	16 sec	24 sec	30 sec
Salmonella	1 sec	4 sec	12 sec	16 sec	24 sec	30 sec
Listeria	1 sec	4 sec	12 sec	16 sec	24 sec	30 sec

Dispense rates are adjustable



Call today for prices and lead times,
or visit us online at www.heateflex.com

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