TRP Total-Rapid-Prep™

Integrated Extraction, Sample Clean-up and Concentration System

Imagine performing the total sample preparation process automatically in a fraction of the time it takes today

Total Rapid Prep does just that. It combines and automates the three steps of the sample preparation process into one integrated unit.

FMS introduces the first and only "Total Solution" Sample Prep system available that combines three sample prep processes into one economical package. The TRP Total-Rapid-Prep performs the extraction, sample clean-up and concentration for six samples simultaneously in less than a few hours, producing the highest recoveries and best results for all target analytes. A Windows based system that is easy to use, controls the system and is fully programmable. With the TRP system you have the option to run a single sample prep process such as extraction, sample clean-up or concentration. You may also run a variety of processes including extraction, clean-up and evaporation in a single step. The TRP system increases sample throughput while reducing errors and poor recoveries. It also provides a cleaner background and eliminates cross contamination due to its advanced closed loop system design. TRP uses FMS's high quality and inexpensive Teflon based pre-packed disposable columns which guarantee high recoveries and eliminate glassware clean-up. Applications include Dioxins, PCBs, PAHs, PBDEs and Pesticides.

Three systems in one economical package

The TRP Total-Rapid-Prep combines three systems in one economical package and performs the entire extraction, clean-up and concentration for six samples in less than a few hours producing high recoveries and excellent precision for all analytes.

PLE™ - Pressurized Liquid Extraction Module
Power-Prep™ – Multi- column Sample Clean-up module
PowerVap™ Evaporation & Solvent Exchange module

Performs six simultaneous Extractions and Clean-ups and Concentrations in a few hours

The TRP Total-Rapid-Prep combines extraction, clean-up, and evaporation into one integrated and economical system. The Total-prep's parallel processing of 6 simultaneous extraction, clean-up and concentration makes the same day turnaround of samples possible.

Automated unattended operation

With the TRP Total-Rapid-Prep all one needs to do is to load the sample in the extraction cells, install the extraction cells and clean-up columns on the TRP and click on the "RUN" button and the TRP will perform the entire sample preparation in virtually one step automatically and unattended and have the final fraction ready for GC, LC, or GC/LC/MS analysis.

Same day sample turnaround for multiple samples

The Total-Rapid-Prep combines extraction, clean-up, and evaporation into one integrated and economical system. The Total-Prep's parallel processing on 6 samples and simultaneous extraction, clean-up and concentration makes the same day turnaround of up to 30 samples possible.

Sample preparation for POP analysis made easy

The TRP Total-Rapid-Prep™ performs complete sample preparation for six samples automatically and unattended producing the final extract for GC, LC, and GC/LC/MS analysis. The TRP uses pre-packed disposable clean-up columns as well as ready to use disposable extraction cell end caps. Because of the integrated design of the TRP, there is no need for transferring the sample from one system to another for further processing. These features allow for "Raw sample in, GC, LC, and GC/LC/MS ready fraction out", with minimal need for glassware washing.

Automates EPA SW846 and 40 CFR 136 methods

The Total-Rapid-Prep extraction, Clean-up and concentration system has been approved by the US EPA as an automated alternative to SW- 846 and 40 CFR 136 methods for POPs analysis.

Electronic documentation and reporting

The DMS-6000 real time software plots in real time all the extraction data including 6 channels of pressure and 6 channels of temperature and the sample concentration data such as temperature, and nitrogen. This allows automatic documentation of the entire sample preparation data. All sample preparation data can be superimposed reviewed and printed in graphic or tabular format. The DMS-6000 software allows the creation of an automatic data report based on the sample sequence set up. Printed data contains the graph and parameters of the sample preparation.

Great reductions in solvents and glassware usage

The TRP Total Prep utilizes inexpensive pre-packed disposable clean-up columns, filtration cartridges, and inexpensive disposable concentration tubes. It can also use disposable extraction cell end caps, greatly reducing the amount of contaminated parts needing to be washed. The great efficiency with which the TRP performs extraction and clean-up reduces the amount of solvent used.

Dramatic savings in time and resources

The TRP Total-Rapid-Prep™ performs complete sample preparation in just a few hours per six samples, basically 30-45 minutes per sample, instead of several days. This translates into great savings in time and labor.

Low Background automated sample prep

TRP Total-Rapid-Prep provides a cleaner background and eliminates cross contamination due to use of pre-packed disposable columns as well as its advanced closed loop system design.

Wide range of inexpensive extraction cell sizes

A wide range of inexpensive stainless steel extraction cell sizes are available for the Total-Prep™. Currently available sizes include 5ml, 10ml, 20ml, 40ml, 70ml, and 100ml.
They are made of either stainless steel 316, or the special acid and alkali resistant alloy stainless steel. With its flexible design and construction the Total-Prep™ can accommodate the whole range of extraction cell sizes; from the 5ml cell all the way to the 100ml, in the same system.

Wide range of pre-packed disposable clean up columns

A wide variety of pre-packed disposable clean up columns are available for use with the Total-Rapid-Prep™. These clean up columns vary in size and packing material types from standard multi-layered A-B-N silica to the special and custom made.

Disposable Columns used for Dioxins & PCBs, PBDEs analysis:

1. Multi-layered A-B-N silica
2. Alumina
3. Carbon
4. High capacity acid silica (optional used for fatty samples, this column removes 3-5 grams fat

Disposable or reusable extraction filtration end caps

The Total-Rapid-Prep™ extraction cells can be used with either disposable Teflon end caps or stainless steel reusable end caps. In high throughput laboratories where fast sample turn around time is the goal, the Disposable Teflon end caps may be used to save end cap washing and assembly time. The reusable stainless steel end caps may be used when saving time and labor is not the overriding issue.

Modular and expandable

The TRP Total-Rapid-Prep™ is modular and expandable from one to six sample configurations. The modular and flexible design of the TRP™ allows laboratories to acquire a one sample configuration system inexpensively and expand it to 2, 3, 4, 5, or a 6 sample configuration as demand for higher sample throughput grows. The TRP™ modular and flexible design and construction makes expansions extremely easy and fast. The laboratory personnel can easily add the expansion modules on sight by connecting them to the existing system in less than an hour. This type of design and construction make the TRP ™ not only easily expandable but also easily maintainable.

Great method development tool

The Total-Rapid-Prep™ is the best method development tool in today's laboratories. The Total-Prep™ is capable of utilizing a wide range of extraction cell sizes, clean up columns, and multiple solvent selection valves. Along with the very flexible DMS6000 software the Total-Prep™ is an extremely capable tool for experimenting with different sample sizes, solvents, flow rates, clean up packing materials, extraction pressures and temperatures.

Robust and maintainable

The TRP Total-Rapid-Prep™ modular and flexible design and construction makes it the most easily maintainable system in today's laboratories. The modularity of the TRP translates into virtually no down time. The TRP is made up of various modules, and channels. Each channel operates independently of other channels, If one channel malfunctions the rest will still work. Any malfunctioning modules can be replaced by the laboratory personnel on sight. The large bore plumbing of the extraction module makes it virtually clog free. The exposed construction makes parts replacement extremely easy.

Principles of Operation:

The Total-Rapid-Prep™ performs complete sample preparation for six samples for GC or GC/MS analysis in a few hours. This is achieved by the simultaneous processing of six samples.

- Solid or semi solid sample is mixed with drying agent and placed in the extraction cells. The extraction cells are then filled with the solvent(s) of choice. They are pressurized & heated.

- While the samples are being extracted the clean up columns are conditioned.

- As soon as the extraction cycle is terminated, the extraction columns are depressurized, and flushed with solvent, and then purged with nitrogen.

- At the moment of extraction columns depressurization the concentration cycle is started.

- Solvent exchange (if necessary) is performed for the concentrated sample, and the sample is then transferred to the clean up columns for purification.

- As soon as the first fractions start to come off the clean up columns, the concentration cycle starts.

- The final concentrated fractions are then transferred for GC/MS analysis.

Software

Electronic documentation and reporting:

FMS's powerful, easy to use, windows-based monitoring and control software is extremely flexible. It includes functions to develop and optimize methods. Input parameter includes flow rates, volumes, column selection, sample size, solvent selection and fraction collection. The DMS-6000 real time software plots all the extraction data including 6 channels of pressure and 6 channels of temperature and the sample concentration data such as temperature, and nitrogen. This powerful feature allows automatic documentation of the entire sample preparation data. All sample preparation data can be superimposed and printed in graphic or tabular format. The software allows the creation of an automatic data report based on the sample sequence set up. Printed data contains the graph and parameters of the sample preparation.

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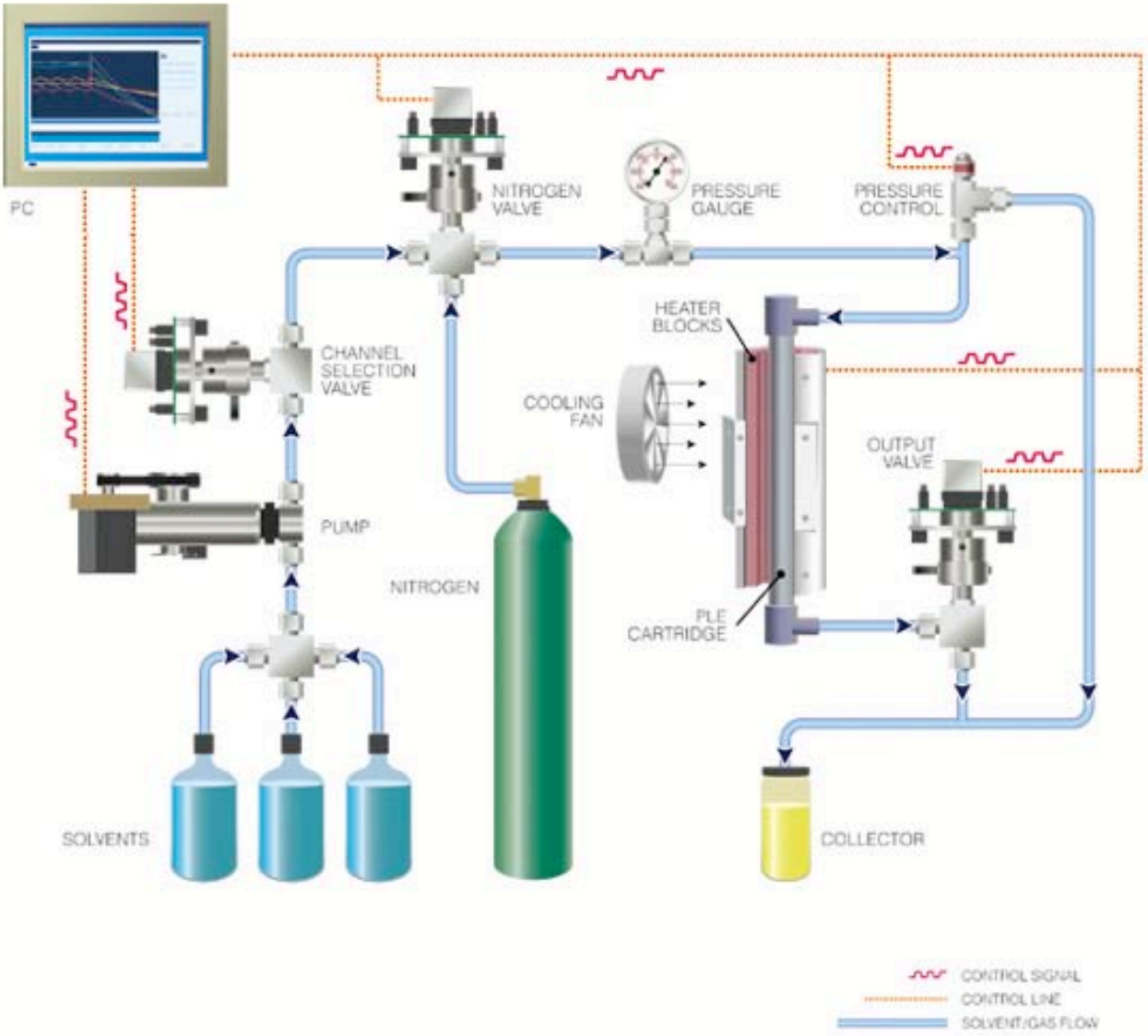
PLE ™ Schematic



PLE + Clean-up Schematic