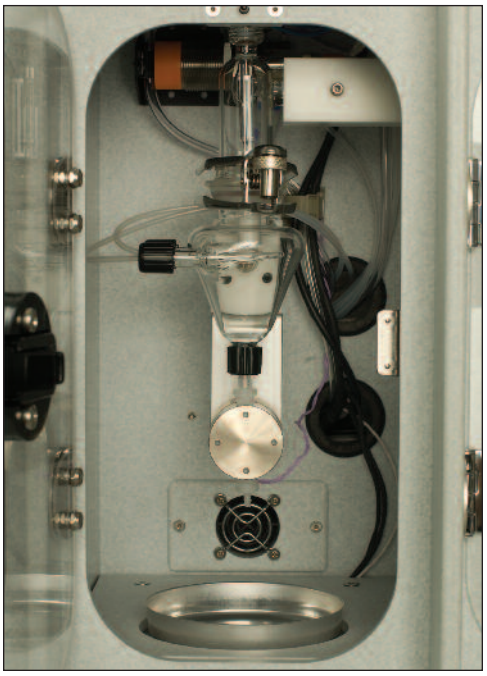
SPE-XPress

Automation of EPA Method 1664



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SPE-XPress Automation of EPA Method 1664

The SPE-XPress system is specifically designed for the extraction and evaporation required by EPA Method 1664 for Oil and Grease Analysis.

SPE-XPress is the ONLY system that:

- Both extracts your sample and evaporates the n-Hexane eliminating the transfer step
- Verifies that the sample vessel is empty utilizing a fluid sensor rather than a timeframe improving accuracy
- Runs multiple samples simultaneously on up to 6 stations

Simply load the 3-station SPE-XPress with standard one-liter sampling jars and walk away. The system flushes itself clean, preps the extraction disk, then filters and extracts the sample through sodium sulfate with n-Hexane. In the final stage the SPE-XPress automatically transfers the extract to a pre-weighed aluminum pan where it is evaporated to dryness. Remove the pan for final weighing and the process is complete. User-friendly PC software controls the functionality while recording data for downloading to LIMS.

SPE-Express is the only system that both extracts your sample and evaporates the n-Hexane. And the only one that utilizes a fluid sensor to verify that the sample vessel is empty. It will reduce time and labor in your lab, improve accuracy plus minimize analyst contact with hazardous chemicals.

Product Features and Benefits:

- Each system has three stations
- Two systems can be joined and connected to one PC for a total of 6 stations
- Each station can begin processing a new sample while a previous sample is being evaporated
- System is controlled with a PC using a single USB cable
- System comes with software containing one default method and offers the ability for the customer to create customized methods
- SPE-XPress software allows different users to have varying levels of access
- Fully enclosed unit does not require a fume hood
- System utilizes wide mouth amber jars designated by the EPA method
- System is available in 120 or 220 volts

SPE-XPress performs the entire process through evaporation to dryness in approximately 30-35 minutes depending on the content of your sample.

- Prep – 5 Minutes
- Filter – 5 minutes
- Transfer to evaporation – 10 minutes
- Evaporate to dryness – 10 minutes

SPE-XPress Automation of EPA Method 1664

The SPE-XPress automates each of the following steps:

1 Performs an n-Hexane rinse of the system components below the sample bottle.

2 Performs the addition of Methanol to prep the extraction disk.

3 Performs the addition of DI water to rinse away the methanol so that the sample does not come in contact with the methanol as mandated by the method.

4 Vacuums the aqueous sample through the filter. When the system senses the sample bottle is empty it sets the timer for 10 minutes, or whatever time the customer has selected, and continues to vacuum to remove moisture.

5 Elutes the sample. n-Hexane is forced to the top of the bottle to remove any residual from the glass container.

6 Vacuums the eluted sample through the filter.

7 Transfers eluted n-Hexane through the drying cartridge (G1065) into a glass chamber.

8 Turns on the heating device and maintains a known temperature before sample is added.

9 Transfers sample to pre-weighed aluminum pan for evaporation.

10 Allows you to start processing another sample on the same station while the first sample is being evaporated.

SPE-XPress Performance Data

Below is data derived from beta testing the SPE-XPress alongside the SPE-DEX®. SPE-XPress results were comparable and in some cases more accurate.

40mg/L Standard Data

10 Replicates of a 40mg/L Standard Horizon Extractor

Replicate	*Result (mg/L)*	*Recovery (%)*
1	39.70	99.25
2	33.80	84.50
3	32.10	80.25
4	36.10	90.25
5	42.80	107.00
6	32.30	80.75
7	34.50	86.25
8	35.80	89.50
9	39.60	99.00
10	41.20	103.00
Average	36.79	91.98

10 Replicates of a 40mg/L Standard SPE-XPress

Replicate	*Result (mg/L)*	*Recovery (%)*
1	38.30	95.75
2	36.40	91.00
3	36.70	91.75
4	38.80	97.00
5	38.00	95.00
6	37.80	94.50
7	38.60	96.50
8	38.20	95.50
9	36.60	91.50
10	36.90	92.25
Average	37.63	94.08

Matrix Spike and Matrix Spike Duplicate Data

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

Sample ID	*Volume (mL)*	*Dish Weight (g)*	*Final Dry Weight (g)*	*Difference*	*Result (mg/L)*	*Spike True Value*	*% Recovery*
I-1109080007	345	6.3964	6.4213	0.0249	72.17	N/A	N/A
I-1109080007-MS	170	6.3405	6.3831	0.0426	250.59	235.29 mg	75.8% Recovery
I-1109080007-MSD	160	6.3692	6.4192	0.0500	312.5	250.00 mg	96.1% Recovery

Comparison of "Real-World" Sample Results

Sample ID	*SPE-XPress Result (mg/L)*	*Horizon Result (mg/L)*	*RPD*
EE-1109090001	1.79	1.65	8.14
SE-1109090001	1.03	2.30	76.28
ER-1109090001	14.46	12.16	17.28
SR-1109090001	5.79	8.23	34.81
WR-1109090001	21.29	13.87	42.21
ENOT1108260001	1.16	0.85	30.85
I-1109010004	4.34	4.29	1.16
I-1109080005	278.53	35.24	155.08
I-1109080007	72.17	171.36	81.46

SPE-XPress Performance Data

MDL Data SPE-XPress

MDL Study with a 7 mg/L standard

Sample ID	*Volume (mL)*	*Dish Weight (g)*	*Final Dry Weight (g)*	*Difference*	*Result (mg/L)*
Blank	1000	6.2875	6.2895	0.0020	2.00
40mg/L Standard	1000	6.3597	6.3986	0.0389	38.90
MDL 1	1000	6.3704	6.3778	0.0074	7.40
MDL 2	1000	6.3522	6.3593	0.0071	7.10
MDL 3	1000	6.3302	6.3365	0.0063	6.30
MDL 4	1000	6.2914	6.2996	0.0082	8.20
MDL 5	1000	6.2173	6.2252	0.0079	7.90
MDL 6	1000	6.3199	6.3263	0.0064	6.40
MDL 7	1000	6.2400	6.2473	0.0073	7.30
					2.22 mg/L Calculated MDL

MDL Study with a 4 mg/L standard

Sample ID	*Volume (mL)*	*Dish Weight (g)*	*Final Dry Weight (g)*	*Difference*	*Result (mg/L)*
Blank	1000	6.2777	6.2797	0.0020	0.20
40 mg/L Standard	1000	6.3470	6.3829	0.0359	35.90
MDL 1	1000	6.3124	6.3158	0.0034	3.40
MDL 2	1000	6.3450	6.3475	0.0025	2.50
MDL 3	1000	6.2485	6.2510	0.0025	2.50
MDL 4	1000	6.4219	6.4243	0.0024	2.40
MDL 5	1000	6.2525	6.2556	0.0031	3.10
MDL6	1000	6.3088	6.3111	0.0023	2.30
MDL 7	1000	6.3401	6.3435	0.0034	3.40
					1.50 mg/L Calculated MDL

SPE-XPress Specifications

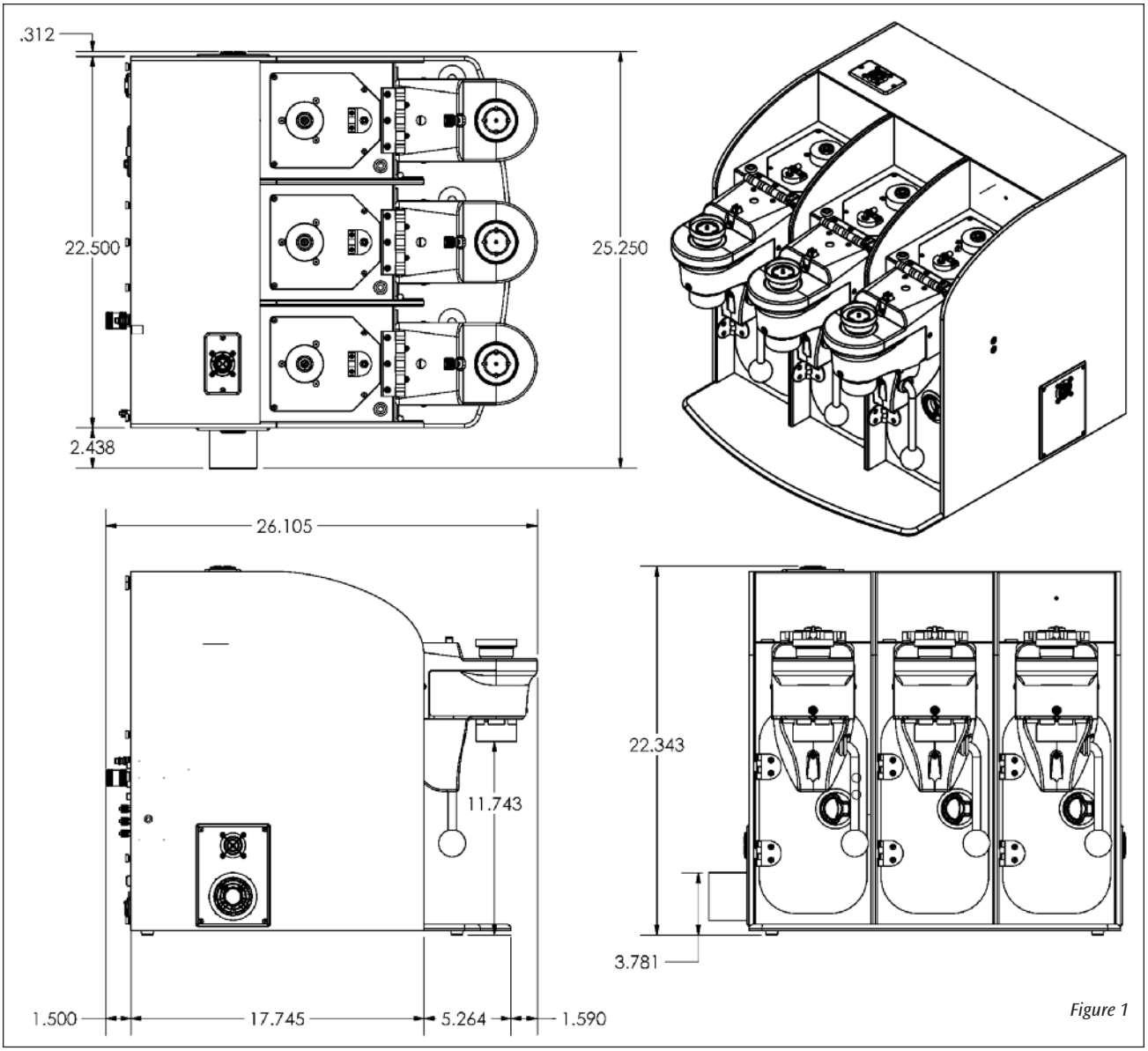

Figure 1

Unit Specifications

Unit Footprint: 22.25"w x 26.105"d x 22.343"h

Clearance: 2" all sides

Weight: Approximately 50 lbs

SPE-XPress Hardware Configuration

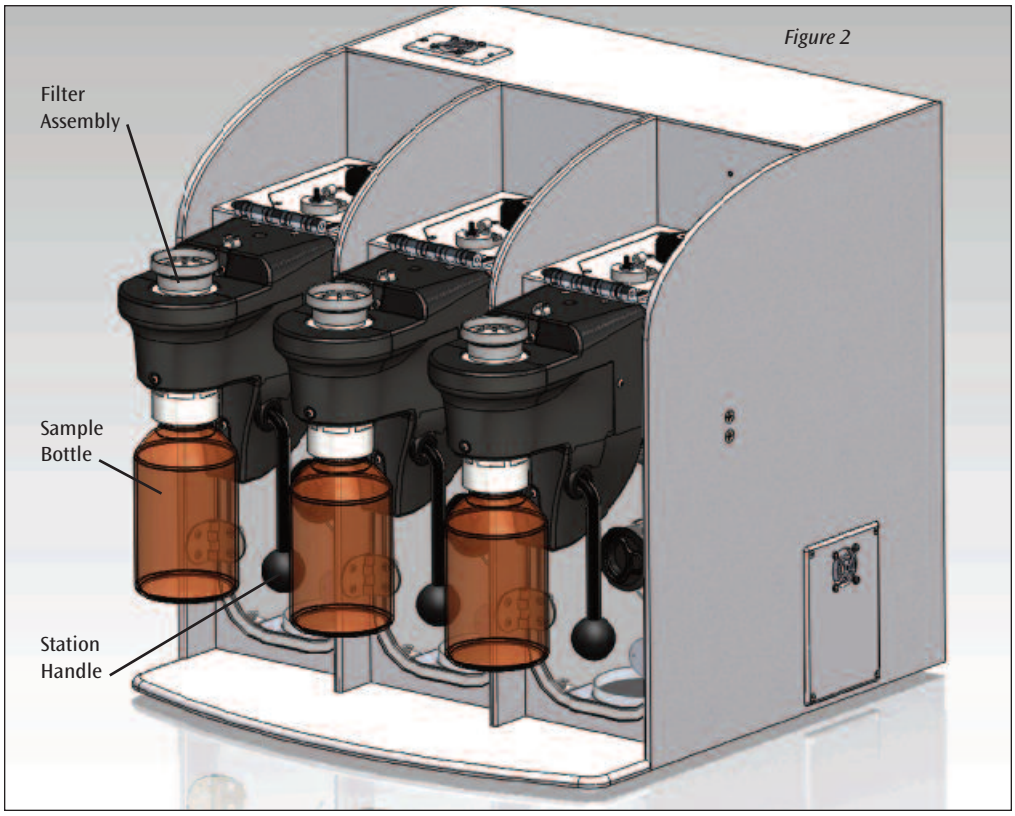

Figure 2

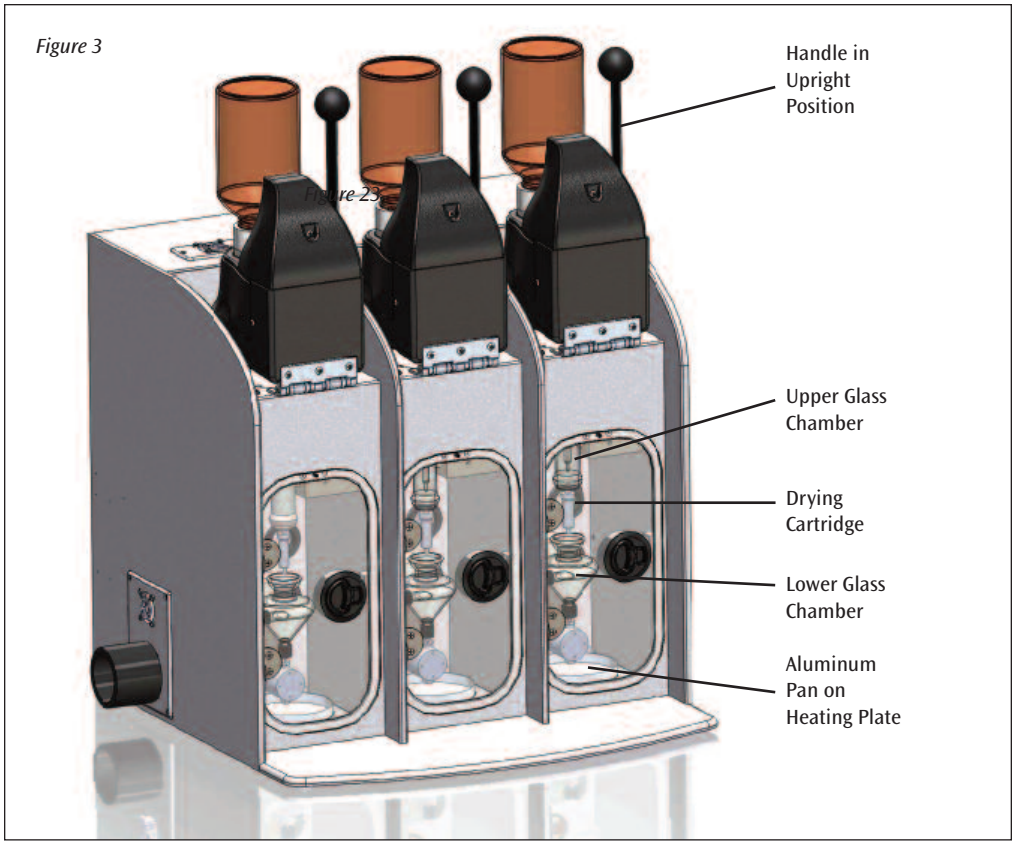

Figure 3

SPE-XPress Hardware Configuration

Figure 3

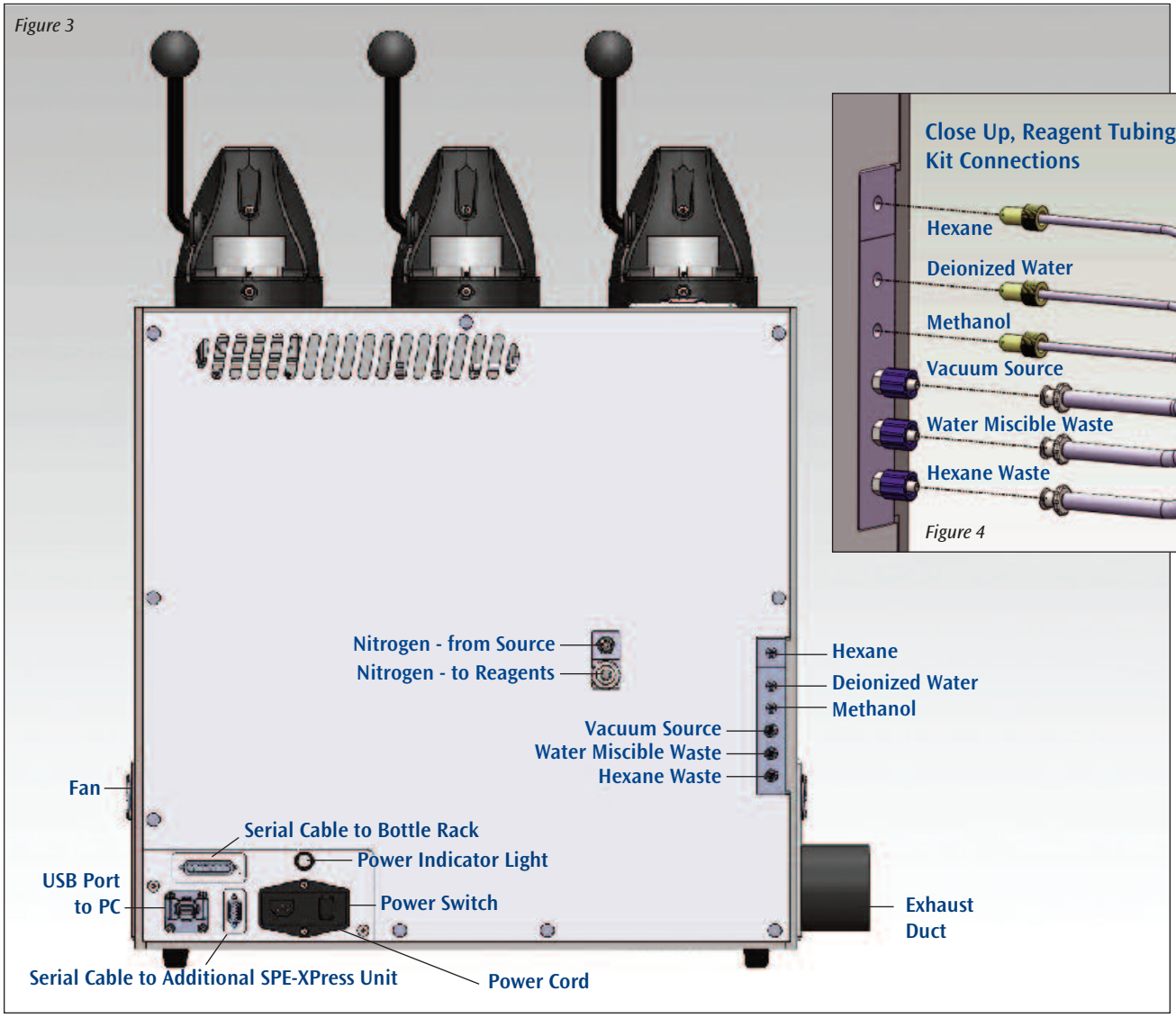

Figure 4