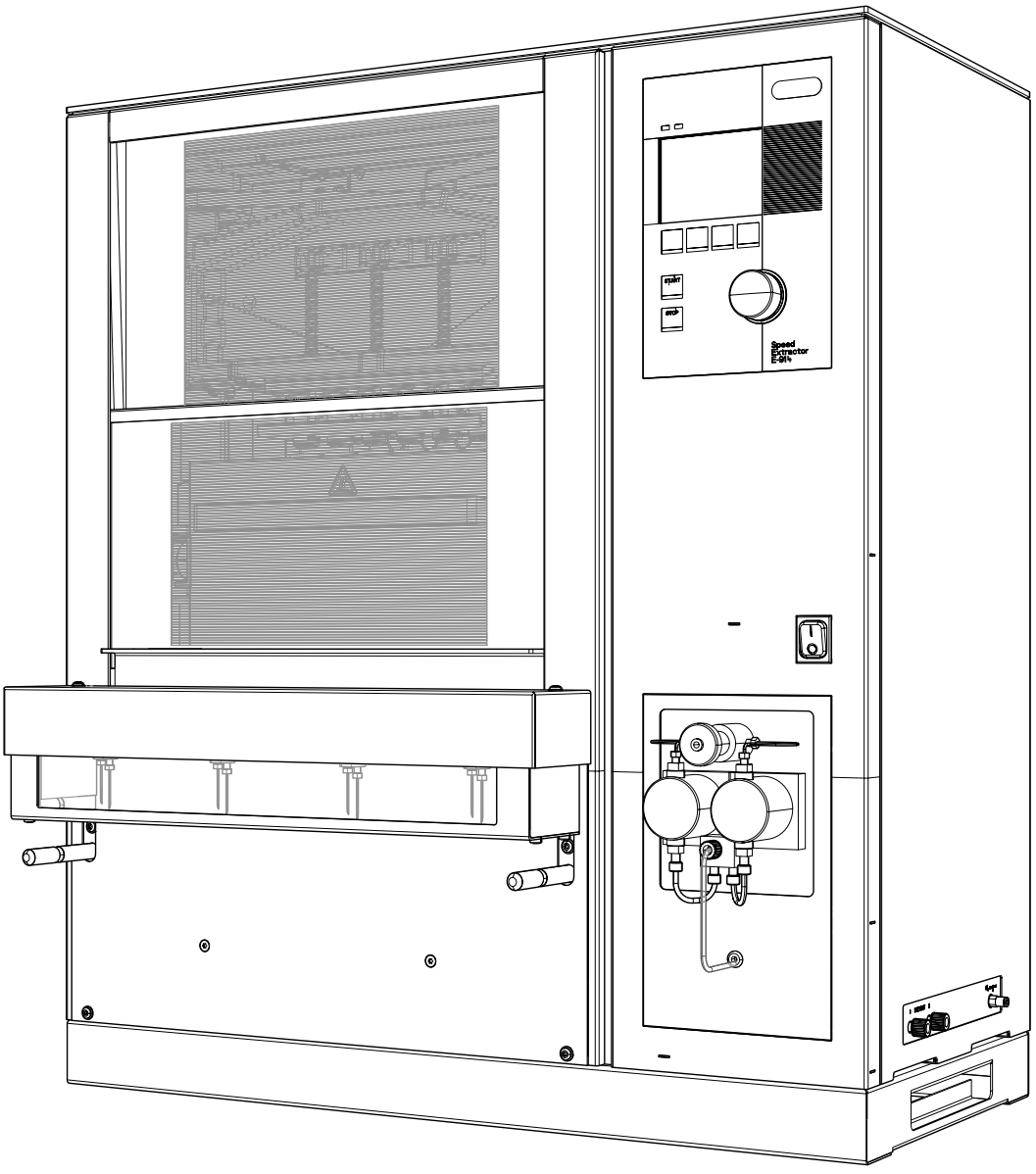
SpeedExtractor E-916 / E-914
Technical data sheet

The SpeedExtractor E-916 / E-914 is an automated instrument for parallel extraction of primarily organic compounds from a variety of solid or semi-solid matrices. Conventional methodologies (e.g. like Soxhlet extraction) are accelerated by using a solvent at elevated temperatures and pressures. The parallel concept of SpeedExtractor allows for simultaneous extraction of six samples in one run. A variety of different extract collection options with great synergy to the Multivapor™ and Syncore® Analyst for parallel evaporation and concentration maximizes productivity and streamlines the workflow.



Scope of delivery

The SpeedExtractor E-914/E-916 is delivered with a comprehensive starter kit consisting of tools, accessory and consumable items. Due to a variety of different collection options the collection vials need to be ordered separately. All SpeedExtractor models are delivered ready to use and are complete of:

Components	Qty
Collection unit* for E-916 or E-914	1
Cellulose filter, top	100
Glass fiber filter, bottom	100
FEP inlet/outlet tubes with ferrules and fittings	5 m / 6x or 4x 0.5 m
Solvent bottle, 1 L with filter	1
Quartz sand, 0.3 - 0.9 mm	2.5 kg
Extraction cell carrier, cell gripper and funnel	1 of each
Spares: cup seals (12), supporting ring (2), metal frit (25) and screws (2)	1 PU of each
Brushes, syringe, plunger, filter hook, extruder	1 of each
Tools: wrenches, screw driver, tube cutter	1 of each
SpeedExtractorRecord demo license with USB cable	1

* The collection tubes are NOT part of the scope of delivery as they need to beed ordered according to the customer's specific needs (see section "Accessories - Collection unit").

Order code

Choose the configuration according to your needs:

1 1 5 1 _ _ _ _

Number of positions

4 E-914: 4 positions
5 E-914: 4 positions mounted on pedestal*
6 E-914: 4 positions

Size of extraction cells

01 10 mL (E-916 only)
05 20 mL (E-916 only)
04 40 mL (E-916 or E-914)
08 80 mL (E-914 only)
12 120 mL (E-914 only)

Number of solvent ports

2 2-port
4 4-port

*Recommended for the use of round bottom flasks and Analyst R-6/Polyvap R-6 collection vessels; SpeedExtractor E-914 (Order number 11515xxx) is mounted on a pedestal which heightens the unit by 50 mm. The pedestal cannot be upgraded on existing instruments

Dimensions and weight

	E-916 / E-914	E-916 / E-914 on pedestal
Dimensions	670 x 725 x 500 mm	670 x 780 x 500 mm
Weight	90 kg	98 kg

Technical data

	E-812 HE
Connection voltage	100 - 240 VAC +/- 10%
Max. power consumption	max. 1750 W
Frequency	50/60 Hz
Interface	USB 2.0
Temperature control range	30 - 200 °C
Pressure range	50 - 150 bar
Primary pressure nitrogen connection	6 - 10 bar
Flow rate pump	1 - 50 mL/min
Extraction cell size	10, 20, 40, 80, 120 mL
Installation category	II
Degree of protection	2
Environmental conditions	For indor use only
Ambient temperature	5 - 40 °C
Altitude	Up to 2000 m
Humidity	Maxium relative humidity 80 % for temperatures up to 31 °C, and then linearly decreasing to 50 % at 40 °C
Noice level	< 70 dB

Accessories

Collection units and their collection vessels

To define the collection unit of your choice proceed as follow: 1. Define the type of vessel (flask, round bottom, appendix). 2. Define the size of the flask. 3. Get the order code of the corresponding unit fitting your tubes from the table below.

Type	Qty	Order no.	Cap*	Septa	Number of positions	Collection unit Rack**	Retaining plate
Flat bottom, narrow-necked vessels, SVL 22							
60 mL	72	49535	110565	49536	E-916	53698	11055205
60 mL	72	49535	110565	49536	E-914	11058332	11059365
240 mL	6	52672	11056535	11056535	E-916	53698	-
240 mL	6	52672	11056535	11056535	E-914	11058332	-
Round bottom, wide-necked vessels, GL 45							
220 mL	6	58208	11056528	53677	E-916	53698	-
220 mL	6	58208	11056528	53677	E-914	11058332	-
Round bottom, wide-necked vessels, without thread (Syncore Polyvap)							
150 mL	12	40907	110557	048690	E-916	53698	11057054
150 mL	12	40907	110557	048690	E-914	11058332	11058339
250 mL	6	38486	11058655	11058656	E-914	11055528	-
Residual volume, wide-necked vessels, GL 45 (Syncore Analyst R-12)							
150 mL, 1 mL	12	11056498	11056528	53677	E-916	53698	11057054
150 mL, 1 mL	12	11056498	11056528	53677	E-914	11058332	11058339
150 mL, 0.3 mL	12	11056499	11056528	53677	E-916	53698	11057054
150 mL, 0.3 mL	12	11056499	11056528	53677	E-914	11058332	11058339
Residual volume, wide-necked vessels, GL 45, amber (Syncore Analyst R-12)							
150 mL, 1 mL	12	11056910	11056528	53677	E-916	53698	11057054
150 mL, 1 mL	12	11056910	11056528	53677	E-914	11058332	11058339
150 mL, 0.3 mL	12	11056911	11056528	53677	E-916	53698	11057054
150 mL, 0.3 mL	12	11056911	11056528	53677	E-914	11058332	11058339
Residual volume, wide-necked vessels, without thread (Syncore Analyst R-6)							
250 mL, 1 mL	6	38569	11058655	11058656	E-914	11058344	-
250 mL, 0.3 mL	6	38485	11058655	11058656	E-914	11058344	-

Round bottom flasks with 29.2/32 flange

50 mL	1	431	E-914	11056043
100 mL	1	432		
250 mL	1	433		
500 mL	1	434		

* Cap with setpa included
** Collection unit is included in the standard scope of delivery

Accessories related to the extraction cell

Extraction cells: The extraction cells differ in size for the E-916 and E-914 and inner diameter for different sample volumes.The plug screw is included to close the cell at the bottom, but not the metal frit, nor the paper filter.

	Qty	Order no.
Extraction cell E-916, 10 ml	1	51238
Extraction cell E-916, 20 ml	1	51236
Extraction cell E-916, 40 ml	1	51235
Extraction cell E-914, 40 ml	1	51234
Extraction cell E-914, 40 ml	1	51233
Extraction cell E-914, 80 ml	1	51232

Expansion elements: The expansion element is a metal rod being used to reduce the amount of solvent consumption when empty cells are placed in the heating block (i.e. for a Leak Test). They are tailored to the volume of the corresponding extraction cells.

	Qty	Order no.
Expansion element, 2 ml	1	53708
Expansion element, 10 ml	1	53359
Expansion element, 20 ml	1	53358
Expansion element, 40 ml	1	53357
Expansion element, 80 ml	1	53356
Expansion element, 120 ml	1	53355

The funnel is tailored to the size of the extraction cell of the E-916 cells. One funnel fits to all E-914 cells.

	Qty	Order no.
Funnel E-916, 10 ml	1	53035
Funnel E-916, 20 ml	1	53396
Funnel E-916, 40 ml	1	53397
Funnel E-914, 40 - 120 ml	1	53036

The carrier is a rack accommodating 6/4 extraction cells. One rack is part of delivery.

	Qty	Order no.
Carrier for extraction cells E-914	1	53691
Carrier for extraction cells E-916	1	53690

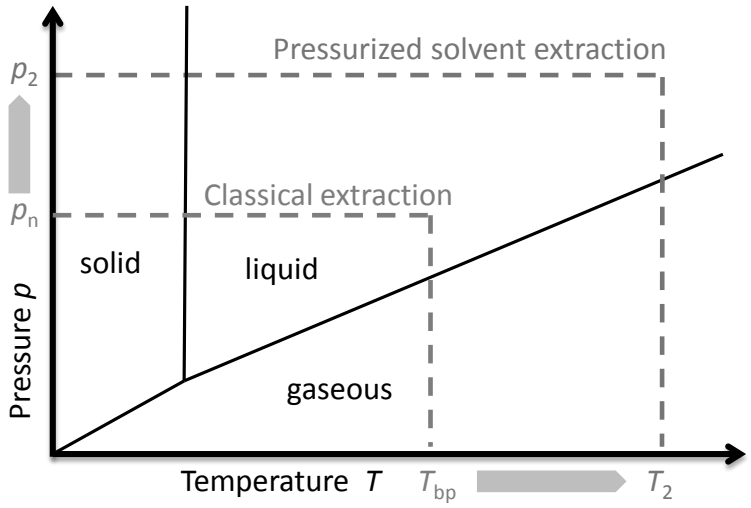
Optional Accessories

	Qty	Order no.
Safety cap for waste bottle, 7-port	1	11056948
Safety cap, 2-port	1	11056949
Solvent bottle with GL45 cap	1	53203
Top filter for E-916, cellulose	100	49572
Top filter for E-914, cellulose	100	51249
Top filter for E-916, glass fiber	100	11057189
Top filter for E-914, glass fiber	100	11057190
Bottom filter for E-916/914, cellulose	100	49569
Bottom filter for E-916/914, glass fiber	100	11055932
Extraction thimble for 40 ml cell, cellulose	25	11055334
Extraction thimble for 40 ml cell, glass fiber	25	11056633
Extraction thimble for 80 ml cell, cellulose	25	11059610
Extraction thimble for 80 ml cell, glass fiber	25	11059612
Extraction thimble for 120 ml cell, cellulose	25	11055358
Extraction thimble for 120 ml cell, glass fiber	25	11059611
Quartz sand	2.5 kg	37689
Diatomaceous earth	1.0 kg	53201
SpeedExtractorRecordTM software, licensed version	1	53073
SpeedExtractor IQ/OQ documenation for first installation and operation qualification	1	11056092
SpeedExtractor Repeating OQ	1	11056093

Functional principle

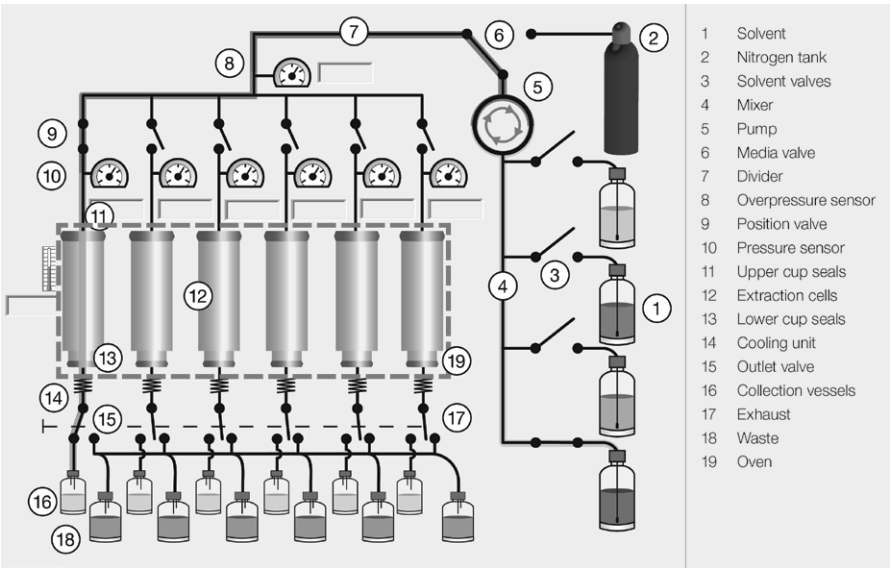
Theory of PSE

The combination of high temperature and pressure is used for PSE (Pressurized solvent extraction). Higher analyte solubility, enhanced penetration into the matrix and faster diffusion rates resulting in improved mass transfer are the most important arguments to switch to this modern extraction technique. An increase from normal pressure pn to p2 is thereby necessary to keep the solvent in the liquid state at T2.



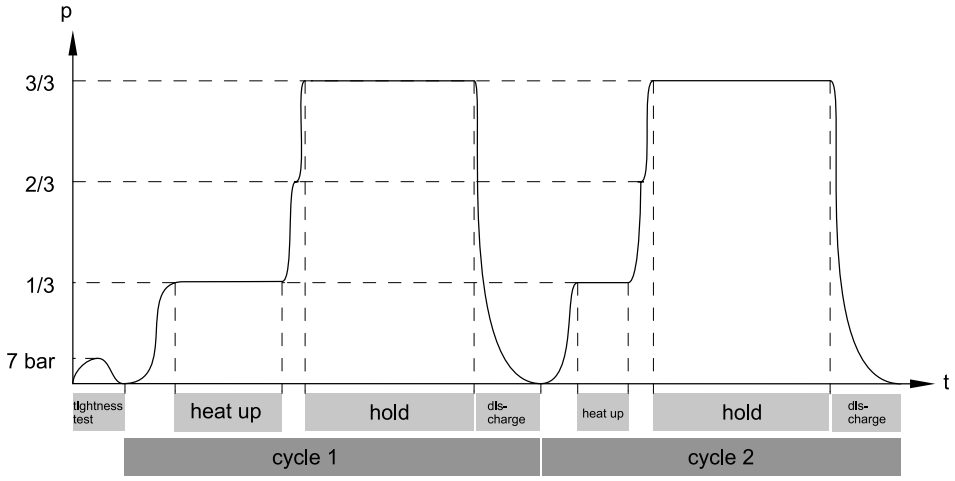
Schematic Diagram PSE

In contrast to classical extraction, in PSE the samples are exposed to elevated pressure and temperature. The sample is placed into the cells (12) which are accommodated in an oven (19). A solvent mixture is transferred into the cell by means of a HPLC pump (5). Each cell is separated and individually monitored (9+10), thus cross-contamination effects are fully eliminated. The extract is then discharged into various types of collection vials (16) which fit to BUCHI's parallel and rotary evaporators for subsequent evaporation and concentration. Manual sample transfer is obsolete.



PSE Process

Every extraction starts with a tightness test (1) as inherent element of the method ensuring the presence of nitrogen and all cells in place on acivated positions. After this quick initial check the extraction proceeds with multiple extraction cycles. Each extraction cycle consists of three steps - heat up (2), hold (3) and discharge (4). The speciality of the SpeedExtractor‘s heat up is a step by step increase to reach the pressure. Approaching the set pressure gradually guarantees a very consistent process avoiding overshooting the set pressure. After the final discharge of the last cycle the extraction cells are flushed with solvent and gas. Optionally, the extraction process can be monitored and documented using SpeedExtractorRecordTM.



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