

Multitype ICP Emission Spectrometer

ICPE-9000 Series

Supplies and Maintenance Parts



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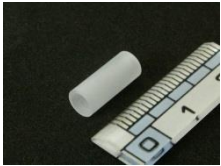
Sample Introduction

See [System Configurations](#) chart on page 21.

Torches

P/N	Part Name	Remarks	External Appearance
211-81448-00	Mini Torch	Mini torch (comes standard)	
204-74323-00	High Salts Torch	Used when introducing an undiluted solution of a sample where the base element is on the percent order of concentration	
204-70272-00	Standard Torch	Used with non-volatile organics	
204-77296-00	Volatile Organics Torch	Used when analyzing organic solvent samples that are difficult to inject into the plasma	
220-95356-20	Semi-Demountable Torch	Used for samples in HF (see replacement parts – page 4)	
205-09627-01	Demountable Torch	Used for samples in HF (see replacement parts – page 5)	

Semi-Demountable Type			
220-95356-20	Semi-Demountable Torch	Used for samples in HF	
220-95356-30	Semi-Demountable Torch Body		
220-95356-31	Semi-Demountable Torch Adaptor		
220-95356-32	Tapered Alumina Injector 1.5mm		
220-95356-33	Joint Clip B14-Nickel		
220-95356-34	GazFit Connectors for 4mm OD side arm (PKT4)		

Demountable Type			
205-09627-01	Demountable Torch	Used for samples in HF	
205-09631-00	Plasma Torch Sheathing		
205-09630-00	Sapphire Chip 1.8 mm		
205-09632-01	Injector Tube		
036-11213-00	O-Ring, 4DP12		

Nebulizers

Part Name	P/N	Remarks	External Appearance
Nebulizer, 10UES	046-00092-20	Standard Nebulizer	
	Includes:		
	046-00092-09	Connector, QSM	
	046-00092-10	Tube adaptor, 0735	
	037-61113-01	Clamp, SNP-1	
	046-00092-18	Take-up tube ASSY, NFTS-075	
Nebulizer, 07UES	046-00092-21	For small sample amounts	
	Includes:		
	046-00092-09	Connector, QSM	
	046-00092-10	Tube adaptor, 0735	
	037-61113-01	Clamp, SNP-1	
	046-00092-18	Take-up tube ASSY, NFTS-075	
Nebulizer, DuraMist	220-95356-25	For samples containing >5% HF	
	Includes:		
	220-95356-13	Sample Tubing ASSY, NFT-050	
	046-00092-09	Connector, QSM	
	046-00092-10	Tube Adaptor, 0735	
	037-61113-01	Clamp, SNP-1	
	046-00092-19	Ratchet UniFit Kit	
Nebulizer, OpalMist	220-95356-26	For samples containing ≤5% HF	
	Includes:		
	220-95356-14	Sample Tubing ASSY, NFT-075	
	046-00092-09	Connector, QSM	
	046-00092-10	Tube Adaptor, 0735	
	037-61113-01	Clamp, SNP-1	
	046-00092-19	Ratchet UniFit Kit	
Nebulizer, SeaSpray, ARG-1-USS2S	046-00092-12	For samples with up to 20% TDS	
	Includes:		
	046-00092-09	Connector, QSM	
	046-00092-10	Tube adaptor, 0735	
	037-61113-01	Clamp, SNP-1	
	046-00092-18	Take-up tube ASSY, NFTS-075	

Nebulizer, Noordermeer, 01-801-0749	220-95356-01	For samples with up to 40% TDS	
	<i>Includes:</i>		
	037-61113-01	Clamp, SNP-1	
	--	Take-up tube ASSY	

Eluo™ Cleaning Tool	220-95356-02	Used to flush nebulizer with cleaning solution to dislodge particle build-up	
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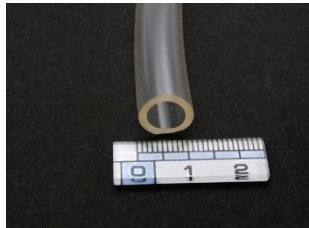
Spray Chambers

P/N	Part Name	Remarks	External Appearance
046-00093-02	Cyclone Chamber, HE	For use with Mini Torch and High Salts Torch	
	<i>Includes:</i>		
	046-00093-92	Locking Screw	
	046-00093-93	Seal	
220-95356-11	Twister Spray Chamber	For use with non-volatile organics	
220-95356-10	IsoMist Kit	Temperature-controlled sample introduction system. Programmable from -10°C to +60°C. Ideal for volatile organics. Also aids in stability for long durations of continuous analysis.	
	<i>Includes:</i>		
	220-95356-12	PuraFlex Transfer Tube	
	046-00093-01	Drain	
	--	Bench-top Jack	
	210-15508-01	Ball Joint Clip	

220-95356-22	Tracey TFE Spray Chamber	For use with HF system	
Old Style			
211-80437-01	Straight Chamber Drain	For use with non-volatile organics*	
211-43472-00	Water-Cooled Chamber Kit	For use with VOC torch	
205-07778-02	HF Chamber ASSY	For use with HF system	

*Requires [Nebulizer Holder Kit, Type 2](#) (see page 10)

Drains

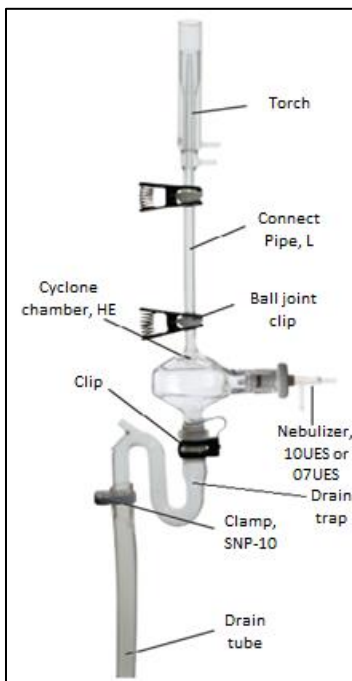
P/N	Part Name	Remarks	External Appearance
046-00093-01	Drain Trap (Leveler)	Drain for cyclone spray chamber	
016-31429-10	Drain Tube	For use with Drain Trap	
220-95356-23	HF Drain	Drain device used with Tracey HF System	
Old Style			
211-86140-91	Drain Kit	Used for straight chamber, water-cooled chamber, organics, and HF system	
	Includes:		
	035-65014-13	Half Union, HZ-01-0-PP	
	035-65102-01	Union, FZ28-00-PP	

Orifices

P/N	Part Name	Remarks	External Appearance
211-84352-91	Orifice ASSY, L	For use with Standard configuration and Small Sample Amounts configuration	
211-43740-00	Orifice ASSY	For use with High Salts or Standard Size torch	

Miscellaneous

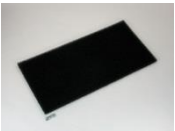
P/N	Part Name	Remarks	External Appearance
204-19281-00	Water Bubbler	Used to prevent blockages in the nebulizer when analyzing high salt samples	
211-48062-00	Nebulizer Holder Kit, Type 2	Includes organic-solvent resistant O-rings	



211-86533-00	Connect Pipe L	Connects torch to sample introduction accessories
210-15508-01	Ball Joint Clip	Used with Connect Pipe L
046-00993-01	Clip	Attaches Drain Trap to Cyclone Chamber
037-61113-04	Clamp, SNP-10	Attaches drain tubing to Drain Trap
220-95356-21	PFA Adapter	Connect Pipe used with HF System
Old Style		
211-84175-00	Connect Pipe HFS	Connect Pipe used with HF System

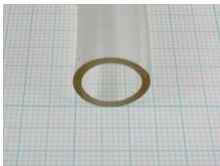
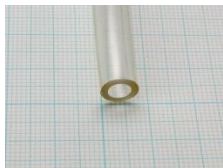
ICPE-9000

Main Unit

P/N	Part Name	Remarks	Replacement	External Appearance
211-86308-00	Filter, Bottom	RF Cooling Intake	1 Year	
211-86287-00	Filter, Left	Electronics Cooling	1 Year	

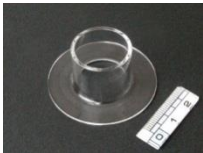
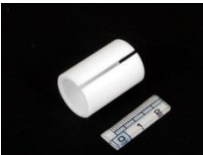
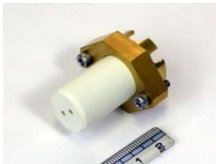
Plasma Stand

For sample introduction accessories, see pages 3-9

P/N	Part Name	Remarks	Replacement*	External Appearance
016-31404-00	Tygon Tubing	Auxiliary gas and carrier gas 1/8" x 1/16" Specify length (meters)	1 Month	
211-85118-91	Plasma Gas Tube ASSY	Tube for plasma gas	1 Month	
016-31429-10	Drain Tube	Tygon tubing 7/16" x 1/16" Specify length (meters)	3 Months	
016-31428-00	Leveler Exhaust Tube	Tygon tubing 3/16" x 5/16" x 7/16" Specify length (meters)	3 Months	

211-86114-95	Partition Window Holder	Axial view window	
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***Varies by sample type**

P/N	Part Name	Remarks	External Appearance
211-80620-00	Bonnet	Protects RF Induction Coil <i>Only used with radial view kit</i>	
211-81444-00	Torch Adapter	Used with Mini Torch	
211-86093-91	Torch Positioning Jig	Used to set torch height	
211-88275-91	Axial Mirror	Located in cooling jacket	
211-85422-91	Ceramic Purge Pipe	Argon purge pipe for radial view	

Argon Supply

P/N	Part Name	Remarks	Replacement	External Appearance
210-14037-00	Inline Filter	For argon supply	1 Year	
035-69703-01	Insert, B-405-170	Two used when replacing filter	1 Year	
035-62974-01	Sleeve Set, B400SET	Two used when replacing filter	1 Year	
016-43505-00	Tube, 44PP, White	Argon supply Specify length (meters)	--	
035-65503-00	Half Union, 1/4"	Connect argon supply hose to regulator. Comes with nut and ferrule.	--	

Vacuum System

P/N	Part Name	Remarks	Replacement	External Appearance
017-30166-01	Pump Oil, R-2	1 L	6 Months	
210-07003-04	Molecular Sieve	1 kg	6 Months	
017-30813-01	Silicone Grease	HVAG-G, 50 g	6 Months	
042-00125-25	Oil Mist Trap	OMT-050A	6 Months	

ASC-6100F

*Check [Chemical Compatibility](#)

Maintenance Parts

P/N	Part Name	Remarks	External Appearance
206-50290-91	Nozzle ASSY, F	Sample introduction nozzle for auto-sampler	
211-83697-00	Connection Tube	Used to connect nozzle tubing to nebulizer tubing	

Sample Cups / Accessories

P/N	Part Name	Remarks	External Appearance
046-00147-04	Vial, 16 mL	Polypropylene vial, 16 mL	
220-95369-00	Vials, 16 mL	Polypropylene vials, 16 mL 1000/pk	
200-93113-05	Reagent Tube	Glass tube, 53 mL	
046-00150-27	Vial, 12 mL	Glass vial, 12 mL	

220-95306-01	Vials, 12 mL	Glass Vials, 12 mL 1000 /pk	
206-50295-01	Turntable Cover	Protects samples in auto-sampler from contamination	

Peripheral Equipment

Software

P/N	Part Name	Remarks
211-44263-92	ICPEsolutions, v1.31	Win7 compatible (32-bit)
211-44280-91	QAQC Software	Accuracy management software package
211-44482-93	ICPEsolution v2.00	21 CRF Part 11 compliant. Compatible with Win7 32-bit. For compliance, requires: • QAQC Package (211-44280-91) • CLASS-Public Agent (223-18236-92)

Auto-samplers

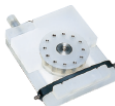
Part Name	P/N	Remarks	External Appearance
ASC-6100F	206-50100-30	Sample Capacity: 60 x 15-mL sample tubes 8 x 20-/50-mL reagent cups	
CETAC ASX-520	220-95336-01	Sample Capacity: 240 x 14-mL sample tubes 8 x 50-mL reagent vials	
	Requires:		
	211-83697-00	Connecting Tube	
	088-52848-42	CETAC/ICPE-9000 Comm. Cable	

High-Sensitivity Analysis

P/N	Part Name	Remarks	External Appearance
220-95337-01	CETAC U5000 AT+	Ultrasonic Nebulizer; Sample injection system developed for high-sensitivity ICP analysis. Uses ultrasonic energy to nebulize a solution consisting of extremely fine particles. This enables the ICPE-9000 to perform analyses at a sensitivity 10 times higher than conventional nebulizers	
220-95370-01	ESI hydrideICP	Hydride Vapor Generator; Provides high-sensitivity measurement for Ge, As, Se, Sn, Sb, Te, Pb, Bi, Hg	

Peristaltic Pumps

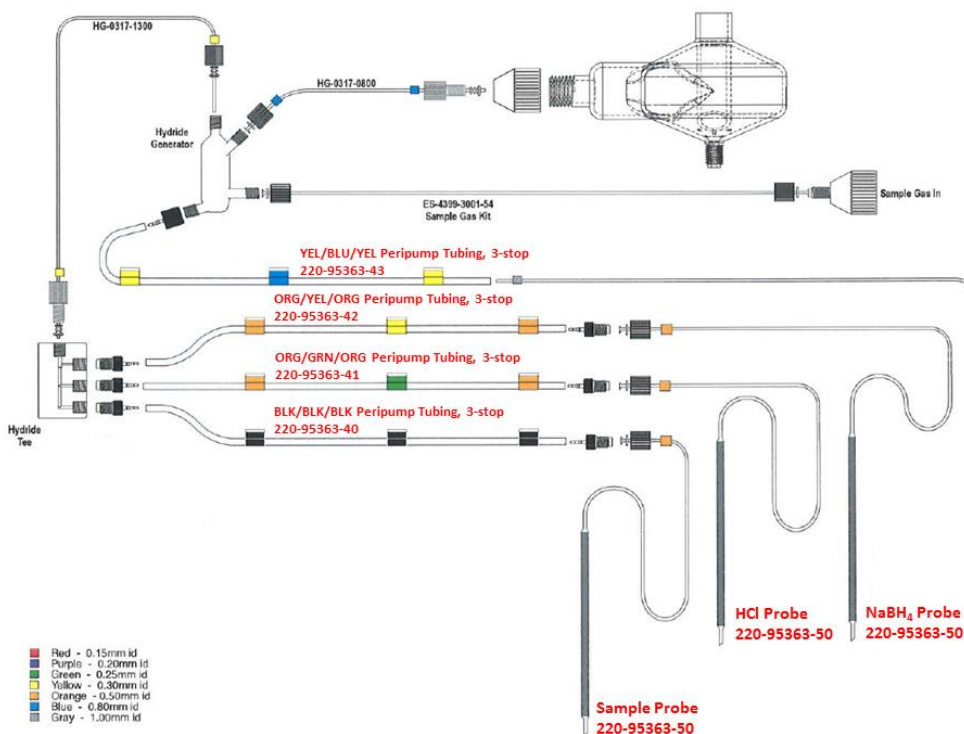
Pumps

P/N	Part Name	Remarks	External Appearance
220-95370-02	ESI MP²	Four-channel peristaltic pump	
211-88177-91	Shimadzu Peristaltic Pump	One-channel peristaltic pump	
	<i>Includes:</i>		
	016-31424-00	Tygon® tubing	
	205-09340-00	Retainer Strap	

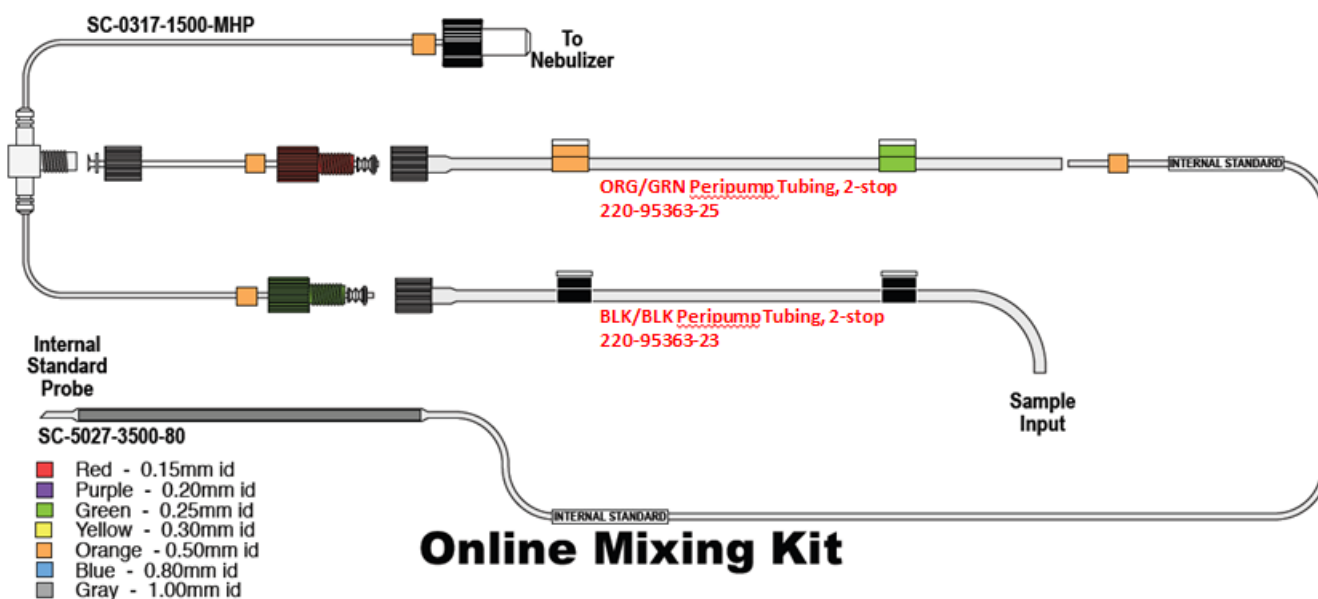
Accessories

Part Name	P/N	Remarks
HVG Upgrade Kit	220-95363-03	Converts ESI MP2 pump to hydride vapor generator unit
Internal Standard Addition Kit	220-95363-30	Allows for in-line addition of internal standards
ICP Connection Kit	220-95370-03	Includes nebulizer adapter, 1/4-28 male/female barbed fittings (4 each), and ASC nozzle

HVG Diagram:



Internal Standard Mixing Kit:



Online Mixing Kit

Tubing

Part Name	P/N	Remarks
BLK/BLK, Santoprene	220-95363-20	2-stop, MPP-076-PHR, 12/pk
BLK/BLK, PVC	220-95363-23	2-stop, flared, MPP-076-F-PVC, 12/pk
BLK/BLK, Solva	220-95363-24	2-stop, flared, MPP-076-F-S, 12/pk
ORG/GRN, PVC	220-95363-25	2-stop, flared, MPP-038-F-PVC, 12/pk
RED/RED, PVC	220-95363-26	2-stop, MPP-114-PVC, 12/pk
GRY/GRY, Santoprene	220-95363-27	2-stop, MPP-130-PHR, 12/pk
BLK/BLK/BLK, Tygon	220-95363-40	3-stop, flared, ES-4397-3076, 12/pk
ORG/GRN/ORG Tygon	220-95363-41	3-stop, flared, ES-4397-3058, 12/pk
ORG/YEL/ORG PVC	220-95363-42	3-stop, flared, ES-4397-3051, 12/pk
YEL/BLU/YEL PVC	220-95363-43	3-stop, flared, ES-4397-3152, 12/pk
Probe ASSY	220-95363-50	For HVG; sample/reagents

Chillers/Cooling Kits

Part Name	P/N	Remarks	External Appearance
Cooling Water Circulator, CA-1115A-1	044-01813-01	Cooling water circulator for ICPE-9000	
	Requires:		
	211-86152-91	Valve Kit	
Low-temperature Thermostatic Chamber, NCB-1200(SP)	044-01910-01	Chiller for CCD	
Tap Water Connection Kit	211-86153-91	Required when tap water is used to cool ICPE-9000	--

Chemical Compatibility: ASC-6100F

Chemical	Sample	Rinse Liquid
Water (<0.5% acid)	✓	✓
Ethanol	✓	✓
Hydrochloric acid	✓	✓
Nitric acid	✓	✓
Sulfuric acid	✓	X
Xylene	X	X
Perchloric acid	✓ **	X
Methanol	✓	✓
Sodium hydroxide	✓	X
Gasoline	X	X
Petroleum	X	X
Acetic acid	X	X
MIBK	X	X
Butyl acetate	X	X
Acetone	X	X
IPA	X	X
THF	X	X

✓ Can be used

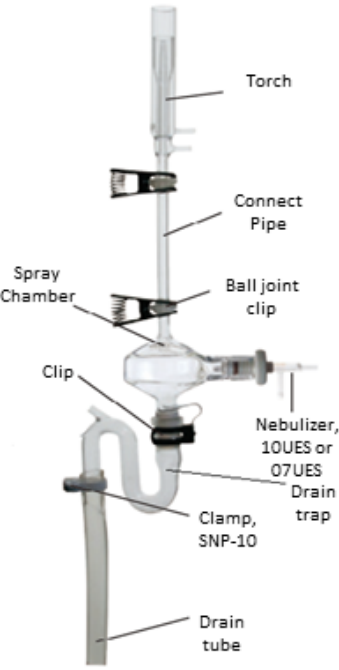
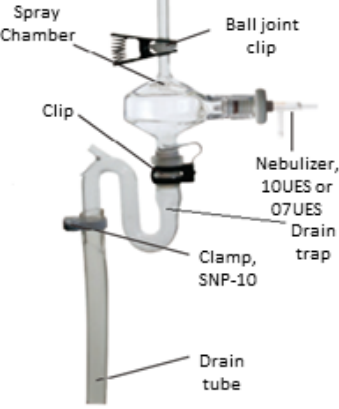
X CANNOT be used

** Glass sample cups required

Organic Solvents Compatibility

Compound	Boiling Point (°C)	Vapor Pressure (mmHg)	Torch	Chamber
Methanol	64.7	99	VOC	Twister Spray Chamber
Ethanol	78.3	120	Standard	Twister Spray Chamber
n-Propyl alcohol	97.5	15	Standard	Twister Spray Chamber
Isopropyl alcohol	82.4	33	Standard	Twister Spray Chamber
n-Butyl alcohol	117.5	4	Standard	Twister Spray Chamber
n-Hexyl alcohol	157	3	Standard	Twister Spray Chamber
Ethyl acetate	77.1	74	VOC	Twister Spray Chamber
n-Butyl alcohol	126.3	10	Standard	Twister Spray Chamber
Isobutyl acetate	118	13	Standard	Twister Spray Chamber
Amyl acetate	148.8		Standard	Twister Spray Chamber
Isoamyl acetate	142	4	Standard	Twister Spray Chamber
Acetone	56.3	175	VOC	IsoMist Spray Chamber
Dichloromethane	40	349	VOC	Twister Spray Chamber
1,2-dichloroethane	83	64	VOC	Twister Spray Chamber
Methyl isobutyl ketone (MIBK)	117	5	Standard	Twister Spray Chamber
Di-isopropyl ketone	125	3	Standard	Twister Spray Chamber
Di-isobutyl ketone (DIBK)	168	2	Standard	Twister Spray Chamber
Acetylacetone	140.5		Standard	Twister Spray Chamber
Acetic acid	117.8	12	Standard	Twister Spray Chamber
Propionic acid	141	2.8	Standard	Twister Spray Chamber
n-Butyl Cellosolve	171.2		Standard	Twister Spray Chamber
Chloroform	61.2	160	Standard	Twister Spray Chamber
Carbon tetrachloride	76.7	90	Standard	Twister Spray Chamber
o-Dichlorobenzene	180	1	Standard	Twister Spray Chamber
Toluene	110.6	21	VOC	Twister Spray Chamber
Xylene	138-144	47	Standard	Twister Spray Chamber
Nitrobenzene	210.9	<1	Standard	Twister Spray Chamber
Aniline	184.6	<1	Standard	Twister Spray Chamber
Pyridine	115.5	15	Standard	Twister Spray Chamber
Acetonitrile	81.6	70	Standard	Twister Spray Chamber
Benzyl alcohol	205.4	<1	Standard	Twister Spray Chamber
Tributyl phosphate	289		Standard	Twister Spray Chamber
Dimethyl sulfoxide (DMSO)	189	0.4	Standard	Twister Spray Chamber
n-Methyl-2-pyrindone (NMP)	202		Standard	Twister Spray Chamber
N,N-dimethylacetamide (DMA)	165.5		Standard	Twister Spray Chamber
Gasoline	35-200		VOC	IsoMist Spray Chamber
Kerosene	150-300		Standard	Twister Spray Chamber
Light oil	220-350		Standard	Twister Spray Chamber
Naphtha	30-200		VOC	IsoMist Spray Chamber

System Configurations

Sample Type \ Item	Nebulizer	Sample Tubing	Spray Chamber	Torch	Drain	Other
Standard	Nebulizer, 10UES Connector → Tube adapter →	Take-up tube ASSY, NFTS-075	Cyclone Chamber, HE Seal Locking Screw	Mini Torch		Orifice ASSY, L
Small Sample Amounts	Nebulizer, 07UES Connector → Tube adapter →	Take-up tube ASSY, NFTS-075	Cyclone Chamber, HE Seal Locking Screw	Mini Torch		
High Salt Samples ≤5% TDS	Nebulizer, 10UES Connector → Tube adapter →	Take-up tube ASSY, NFTS-075	Cyclone Chamber, HE Seal Locking Screw	High TDS torch		- Orifice ASSY - Water Bubbler 
High Salt Samples ≤20% TDS	SeaSpray Nebulizer, ARG-1-US\$2S Connector → Tube adapter →	Take-up tube ASSY, NFTS-075	Cyclone Chamber, HE Seal Locking Screw	High TDS torch		
High Salt Samples ≤30% TDS	Noordermeer Nebulizer, 01-801-0749	--	Cyclone Chamber, HE Seal Locking Screw	High TDS torch		
Organic Solvent Samples	Nebulizer, 10UES Connector → Tube adapter →	Take-up tube ASSY, NFTS-075	Twister Chamber, HE Locking Screw	Standard size torch		Radial view only; remove axial jacket
Volatile Samples IsoMist Kit	--	--	IsoMist	VOC torch		- Radial view only; remove axial jacket - PuraFlex Adapter - Benchtop Jack
HF Acid Samples	Nebulizer, DuraMist/OpalMist	Take-up tube ASSY, NFT-050/075	Tracey TFE Chamber	De-mountable torch	HF Drain	- Radial view only; remove axial jacket - PFA Adapter - Mounting Bracket



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