ÄKTA™ avant 25

Product Documentation

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1 Introduction

Purpose of this document

This document provides an overview of ÄKTA avant 25, general specifications and material conformity. For more information about ÄKTA avant 25, refer to the user documentation.

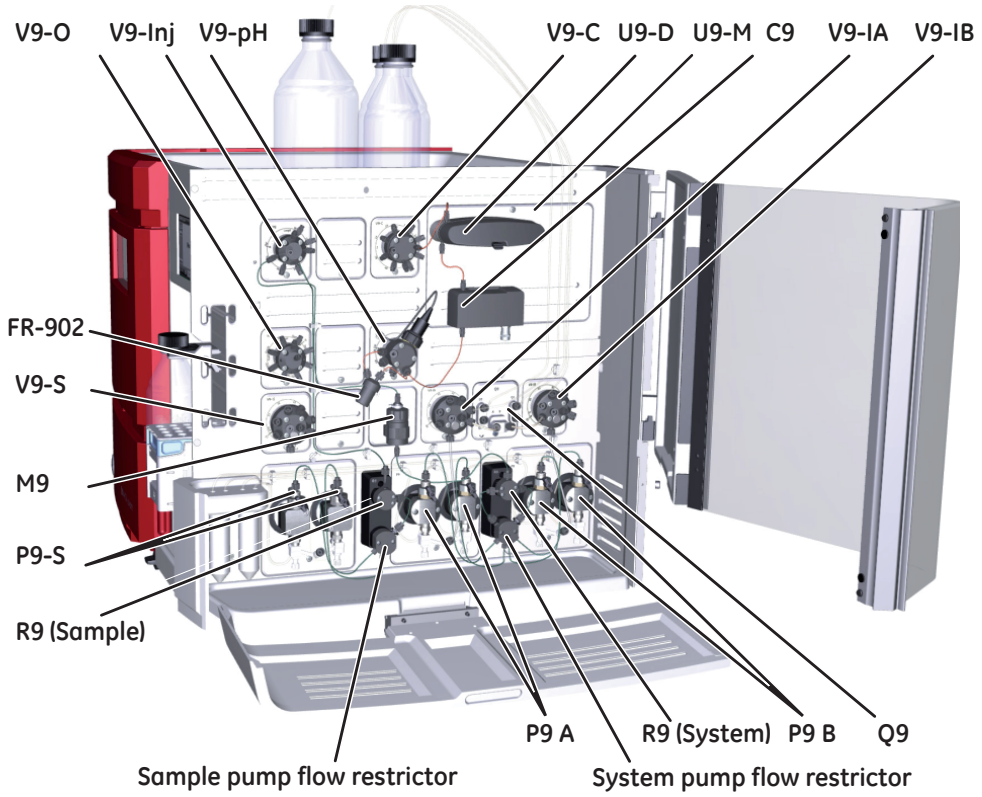
1.1 Instrument view

Front side

The front side of ÄKTA avant 25 is illustrated below.

Standard configuration of the wet side

The standard configuration of ÄKTA avant 25 is illustrated below. See *Standard modules, on page 5* for label descriptions.



Available modules

ÄKTA avant 25 is always delivered with the standard modules installed, but one or more optional modules may be added to the flow path. The following tables contain information on standard modules and optional modules.

Standard modules

Standard module	Description
System pump **P9 A**	A high precision pump, which delivers buffer in purification runs.
System pump **P9 B**	A high precision pump, which delivers buffer in purification runs.
Sample pump **P9-S**	A high precision pump which delivers sample or buffer in purification runs.
Pressure monitors **R9**	Reads the system pressure after System pump A, System pump B and Sample pump.
Pump flow restrictor	Prevents the system from siphoning if the flow path after the System pumps or Sample pump is open.
Mixer **M9**	Mixes the buffers delivered from the system pumps to a homogeneous buffer composition. Three mixer chambers are available for ÄKTA avant 25 and their volumes are: 0.6 ml, 1.4 ml (mounted at delivery) and 5 ml.
Injection valve **V9-Inj**	Directs sample onto the column.
Inlet valve A **V9-IA**	Inlet valve for System pump A with seven inlet ports and integrated air sensor.
Inlet valve B **V9-IB**	Inlet valve for System pump B with seven inlet ports and integrated air sensor.
Sample inlet valve **V9-IS**	Inlet valve for Sample pump with eight inlet ports (seven sample inlets and one buffer inlet) and integrated air sensor.
Quaternary valve **Q9**	Allows automatical mixing of four different solutions.
Column valve **V9-C**	Connects up to five columns to the instrument, and directs the flow to one column at a time. The Column valve features two integrated pressure sensors. The valve allows the user to choose flow direction through the column, or to bypass the column.
pH valve **V9-pH**	Enables the pH electrode and flow restrictor **FR-902** to be included in the flow path or bypassed during a run. The pH electrode may be calibrated when installed in the pH valve.
Outlet valve **V9-O**	Directs the flow to the Fraction collector, Fraction collector 2 or any of the ten outlet ports or waste.
UV monitor **U9-M**	Measures the UV/Vis absorbance at up to three wavelengths simultaneously in the range 190-700 nm.
UV detector **U9-D**	Detects the UV/Vis absorbance and is connected to **U9-M**.

Standard module	Description
Conductivity monitor **C9**	Continuosly measures the conductivity of buffers and sample solutions.
Built-in fraction collector	Built-in flexible fraction collector that can collect up to 576 fractions. A cooling function protects the fractions from heat degradation.

Optional modules

Module	Description
Second Inlet valve A **V9-A2**	Second inlet valves for System pump A, to extend the number of inlets up to 14.
Second Inlet valve B **V9-B2**	Second inlet valves for System pump B, to extend the number of inlets up to 14.
Extra Inlet valve **V9-IX**	Inlet valve with eight inlet ports. No integrated air sensor.
Second Sample inlet valve **V9-S2**	Second inlet valve for Sample pump to extend the number of sample inlets up to 14.
Versatile valve **V9-V**	A 4-port, 4-position valve, which can be used to customize the flow path.
Loop valve **V9-L**	Enables the use of up to five loops connected to the instrument.
Second Column valve **V9-C2**	Valve which connects five additional columns to the instrument, extending the number of columns up to 10. The valve allows the user to choose flow direction through the column, or to bypass the column.
Second Outlet valve **V9-O2**	Valve which adds 12 outlet ports to the system, giving a total of 21 outlets.
Third Outlet valve **V9-O3**	Valve which adds 12 outlet ports to the system, giving a total of 32 outlets.
External air sensor **L9-1.5** or **L9-1.2**	Sensor which prevents air from being introduced into the flow path.
I/O-box **E9**	Module which receives analog or digital signals from, or transfers analog or digital signals to, external equipment that has been connected to the system.
Second UV monitor **U9-L**	Monitor which measures the UV absorbance at a fixed wavelength of 280 nm.

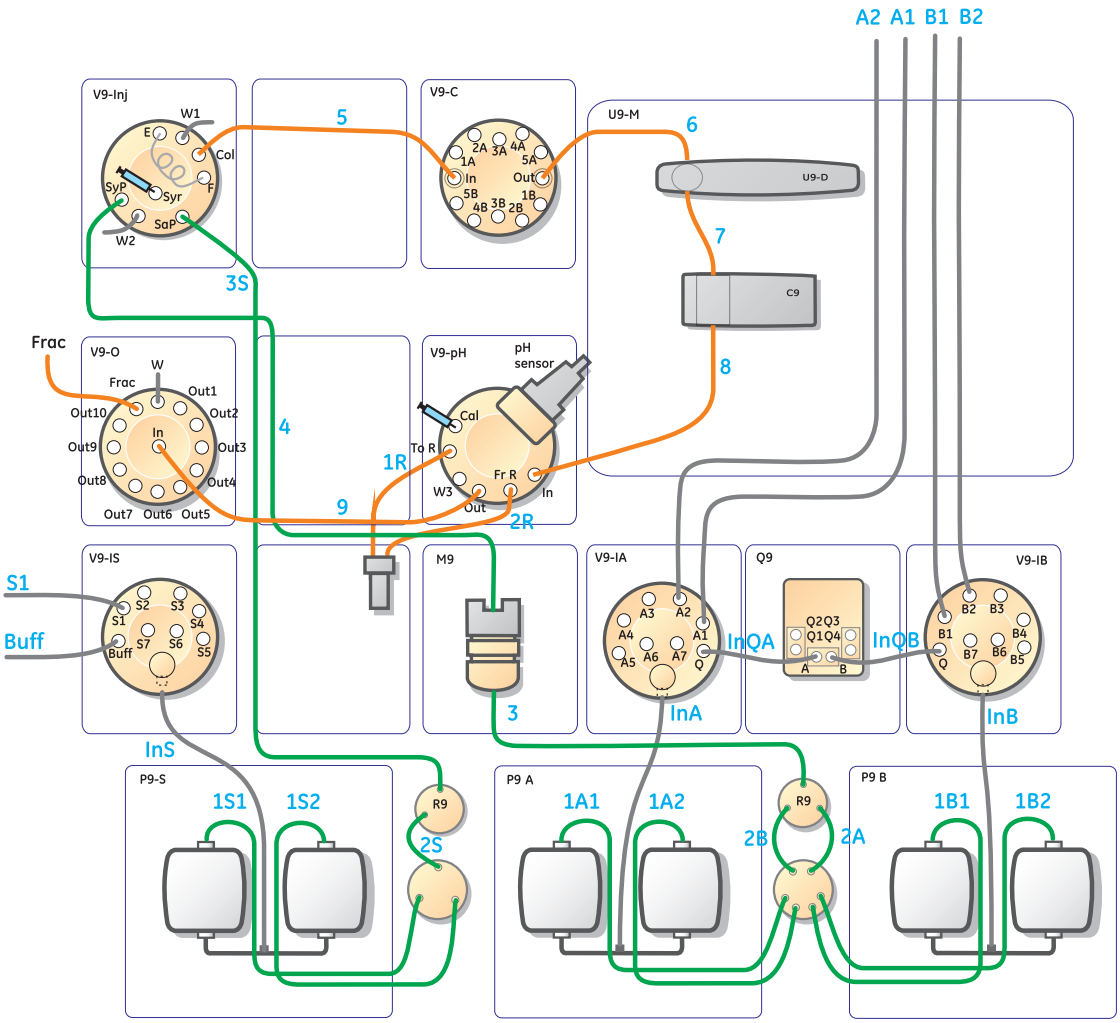
Module	Description
Second Conductivity monitor **C9**	Monitor which measures the conductivity of buffers and sample solutions.
Second Fraction collector **F9-R**	Round fraction collector that can collect up to 175 fractions.

1.2 Liquid flow path

Illustration of tubing

The liquid flow path and system functionality can be extended in multiple ways to fit the user's needs. One or more optional components can be added to the flow path. External equipment can also be connected to the instrument via the I/O-box E9.

The illustration shows a detailed flow chart for ÄKTA avant 25. The flow chart shows connected tubing between instrument components.



Inlet tubing

The table below shows the labels, diameters, and standard lengths of the inlet tubing. The table also shows which tubing is mounted on delivery.

Label	Description	Tubing	Length (mm)	Mounted
A1-**A7**	Inlets to Inlet valve A	FEP, o.d. 1/8", i.d. 1.6 mm	1500	**A1** and **A2** mounted

Label	Description	Tubing	Length (mm)	Mounted
B1-B7	Inlets to Inlet valve B	FEP, o.d. 1/8", i.d. 1.6 mm	1500	**B1** and **B2** mounted
Q1-Q4	Inlets to Quaternary valve	FEP, o.d. 1/8", i.d. 1.6 mm	1500	Yes
Buff	Buffer inlet to Sample inlet valve	FEP, o.d. 1/8", i.d. 1.6 mm	1000	Yes
S1-S7	Inlets to Sample inlet valve	FEP, o.d. 1/8", i.d. 1.6 mm	700	**S1** and **S2** mounted
InQA	From Quaternary valve to Inlet valve A	FEP, o.d. 1/8", i.d. 1.6 mm	110	Yes
InQB	From Quaternary valve to Inlet valve B	FEP, o.d. 1/8", i.d. 1.6 mm	110	Yes
InA	From Inlet valve A to System pump A	FEP, o.d. 1/8", i.d. 1.6 mm	220	Yes
InB	From Inlet valve B to System pump B	FEP, o.d. 1/8", i.d. 1.6 mm	220	Yes
InS	From Sample inlet valve B to Sample pump	FEP, o.d. 1/8", i.d. 1.6 mm	220	Yes

High pressure tubing

The table below shows the labels, diameters, and standard lengths of the high pressure tubing. The high pressure tubing is mounted on delivery.

Label	Description	Tubing	Length (mm)	Mounted
1A1	System pump A left to Restrictor A	PEEK, o.d. 1/16", i.d. 0.75 mm	340	Yes
1A2	System pump A right to Restrictor A	PEEK, o.d. 1/16", i.d. 0.75 mm	340	Yes
2A	Restrictor A to Pressure monitor	PEEK, o.d. 1/16", i.d. 0.75 mm	100	Yes
1B1	System pump B left to Restrictor B	PEEK, o.d. 1/16", i.d. 0.75 mm	340	Yes

Label	Description	Tubing	Length (mm)	Mounted
1B2	System pump B right to Restrictor B	PEEK, o.d. 1/16", i.d. 0.75 mm	340	Yes
2B	Restrictor B to Pressure monitor	PEEK, o.d. 1/16", i.d. 0.75 mm	100	Yes
1S1	Sample pump left to Restrictor S	PEEK, o.d. 1/16", i.d. 0.75 mm	340	Yes
1S2	Sample pump right to Restrictor S	PEEK, o.d. 1/16", i.d. 0.75 mm	340	Yes
2S	Restrictor S to Pressure monitor	PEEK, o.d. 1/16", i.d. 0.75 mm	100	Yes
3	Pressure monitor to Mixer	PEEK, o.d. 1/16", i.d. 0.75 mm	280	Yes
3S	Pressure monitor S to Injection valve	PEEK, o.d. 1/16", i.d. 0.75 mm	485	Yes
4	Mixer to Injection valve	PEEK, o.d. 1/16", i.d. 0.75 mm	400	Yes
5	Injection valve to Column valve	PEEK, o.d. 1/16", i.d. 0.50 mm	180	Yes
6	Column valve to UV monitor	PEEK, o.d. 1/16", i.d. 0.50 mm	160	Yes
7	UV monitor to Conductivity monitor	PEEK, o.d. 1/16", i.d. 0.50 mm	100	Yes
8	Conductivity monitor to pH valve	PEEK, o.d. 1/16", i.d. 0.50 mm	165	Yes
9	pH valve to Outlet valve	PEEK, o.d. 1/16", i.d. 0.50 mm	215	Yes
1R	To Flow restrictor	PEEK, o.d. 1/16", i.d. 0.50 mm	75	Yes
2R	From Flow restrictor	PEEK, o.d. 1/16", i.d. 0.50 mm	75	Yes
Frac	Outlet valve to Fraction collector	PEEK, o.d. 1/16", i.d. 0.50 mm	1280	Yes

Outlet tubing

The table below shows the labels, diameters, and standard lengths of the outlet tubing.

Label	Description	Tubing	Length (mm)	Mounted
Out1 - **Out32**	Outlets from Outlet valve	ETFE o.d. 1/16", i.d. 1.0 mm	1000	No

2 General specifications

2.1 System specifications

Parameter	Data
System configuration	Benchtop system, external computer
Control system	UNICORN™ 6.0 or later version
Connection between PC and instrument	Ethernet
Dimensions (Length x Depth x Height)	860 x 710 x 660 mm
Weight (excluding computer)	116 kg
Power supply	100-240 VAC, 50-60 Hz
Power consumption	800 VA
Enclosure protective class	IP 21, wet side IP 22
Tubing and connectors	• Inlet: FEP tubing, inner diameter (i.d.) 1.6 mm, Tubing connector 5/16″ + Ferrule (yellow), 1/8″ • Pump to Injection valve: PEEK tubing, i.d. 0.75 mm, Fingertight connector, 1/16″ • After Injection valve: PEEK tubing, i.d. 0.50 mm, Fingertight connector, 1/16″ • Outlet and waste: ETFE tubing, i.d. 1.0 mm, Fingertight connector, 1/16″

2.2 Enviromental requirements

Parameter	Data
Storage and transport temperature range	-25°C to 60°C
Operating temperature range	4°C to 35°C
Relative humidity	20% to 95%, non-condensing
Chemical environment	See *ÄKTA avant Operating Instructions*.

2.3 Module specifications

System pumps

Parameter	Data
Pump type	Piston pump, metering type
Flow rate range	0.001 to 25 ml/min (normal range) 0.01 to 50 ml/min (column packing flow)
Pressure range	0 to 20 MPa (0 to 200 bar)
Viscosity range	0.35 to 10 cP
Flow rate specifications	• Accuracy: ±1.2% • Precision: RSD < 0.5% (Conditions: 0.25 to 25 ml/min, < 3 MPa, 0.8 to 2 cP)

Sample pump

Parameter	Data
Pump type	Piston pump, metering type
Flow rate range	0.001 to 50 ml/min
Pressure range	0 to 10 MPa (0 to 100 bar)
Viscosity range	0.7 to 10 cP
Flow rate specifications	• Accuracy: ±2% • Precision: RSD < 0.5% (Conditions: 0.25 to 50 ml/min, < 3 MPa, 0.8 to 3 cP)

Mixer

Parameter	Data
Mixing principle	Chamber with a magnetic stirrer
Mixer volume	0.6 ml, 1.4 ml (default) or 5 ml

Gradient formation

Parameter	Data
Gradient flow rate range	Binary: 0.25 to 25 ml/min Quaternary: 1 to 25 ml/min
Gradient composition accuracy	• Binary: ±0.6% • Quaternary: ±1% (Conditions: 5 to 95 B. 0.5 to 25 ml/min, 0.2 to 2 MPa, 0.8 to 2 cP)

Valves

Parameter	Data
Type	Rotary valves
Number of valves	6 standard valves, up to 6 optional valves
Functions	Inlet valve, Sample inlet valve , Injection valve, Column valve, pH valve, Outlet valve
Options	Second Inlet valve, Loop selection valve, Versatile valve, Second Column valve, Extra Outlet valve, Extra Inlet valve

Quaternary valve

Parameter	Data
Type	4-port solenoid actuated membrane valve
Functions	Quaternary gradients or BufferPro

Number of inlets

Parameter	Data
Inlet A	7, expandable to 14
Inlet B	7, expandable to 14

Parameter	Data
Sample inlet	7, expandable to 14
Quaternary inlet	4

Pressure monitors

Item	Description
Number of sensors	4
Placement of sensors	After System pump, after Sample pump, integrated in column valve (pre-column and post-column)
Range	0 to 20 MPa (0 to 200 bar)
Accuracy	±0.02 MPa or ±2% whichever is greater

Air sensors

Item	Description
Placement of sensors	Integrated in Inlet A, Inlet B and Sample inlet
Optional external placement	Before sample inlet valve, after injection valve
Sensing principle	Ultrasonic

UV monitors

Item	Description
Number of monitors	Up to 2
Wavelength range	**U9-M**: 190 to 700 nm in steps of 1 nm, up to 3 wavelengths **U9-L**: 280 nm
Absorbance range	-6 to 6 AU
Linearity	**U9-M**: within ± 2% at 0 to 2 AU **U9-L**: within ± 5% at 0 to 2 AU

Item	Description
Drift	**U9-M** (2 mm cell at 280 nm): ≤ | 0.2 mAU | AU/h **U9-L** (2 mm cell): ≤ | 0.2 mAU | AU/h
Noise	**U9-M**: < 0.08 mAU **U9-L**: < 0.1 mAU
Operating pressure	0 to 2 MPa
Flow cells: **U9-M**	Standard: Optical path length 2 mm Cell volume 2 µl Total volume: 11 µl Option: Optical path length 10 mm Cell volume 8 µl Total volume 12 µl Optical path length 0.5 mm Cell volume 1 µl Total volume 10 µl
Flow cells: **U9-L**	Standard: Optical path length 2 mm Cell volume 2 µl Total volume: 30 µl Option: Optical path length 5 mm Cell volume 6 µl Total volume 20 µl

Conductivity monitor

Item	Description
Number of monitors	Up to 2
Conductivity reading range	0.01 to 999.99 mS/cm
Accuracy	±0.01 mS/cm or ±2%, whichever is greater, (within 0.3 to 300 mS/cm)
Operating pressure	0 to 5 MPa (0 to 50 bar)
Flow cell volume	22 µl

Temperature monitor integrated in Conductivity monitor

Item	Description
Reading range	0°C to 99°C
Accuracy	±1.5°C within 4°C to 45°C

pH monitor

Item	Description
pH reading range	0 to 14
Accuracy	±0.1 pH unit (within pH 2 to 12, temp. within 3°C from calibration temp.)
Operating pressure	0 to 0.5 MPa (0 to 5 bar)
Flow cell volume	76 µl

Outlet valve fractionation

Item	Description
Number of outlets	10, expandable to 32
Fraction volumes	0.1 to 20000 ml
Delay volume (UV – Outlet valve)	142 µl (with pH electrode and flow restrictor off-line)

Built-in fraction collector

Item	Description
Number of fractions	Up to 576
Vessel types	• 3, 5, 8, 15, 50 ml tubes • 250 ml bottles • Deep well plates: 96 / 48 / 24

Item	Description
Vessel type selection	Automatic recognition
Fraction volumes	0.1 to 250 ml
Spillage-free modes	Automatic, DropSync or accumulator
Protection of fractions	Covered vessels and climate control (settable 6°C to 20°C)
Organic solvents	No
Delay volume (UV – dispenser head)	518 µl (with pH electrode and flow restrictor off-line)

Fraction collector F9-R, 2nd

Parameter	Data
Number of fractions	Up to 175
Vessel types	3 ml, 8 ml, 15 ml or 50 ml tubes
Fraction volumes	0.1 to 50 ml
Spillage-free mode	DropSync
Fractionate flammable liquids	Yes
Delay volume (UV – dispenser head)	240 µl (with pH electrode and flow restrictor off-line)
Dimensions (W x D x H)	320 x 400 x 250 mm
Weight	5 kg

I/O box

Parameter	Data
Number of ports	2 analog in, 2 analog out 4 digital in, 4 digital out
Analog range	In +/- 2 V Out +/- 1 V

3 Material conformity

3.1 Material definitions

Introduction

The tables below list the primary wetted materials in the flow path and the pump rinsing system of the ÄKTA avant 25 system.

Primary flow path

Material	Abbreviation
Ethylene ChloroTriFluoroEthylene	ECTFE
Ethylene TetraFluoroEthylene	ETFE
Fluorinated Ethylene Propylene	FEP
Fluorinated Propylene Monomer	FPM/FKM
Fully Fluorinated Propylene Monomer	FFPM/FFKM
PolyChloroTriFluoroEthylene	PCTFE
PolyEtherEtherKetone	PEEK
PolyPropylene	PP
PolyTetraFluoroEthylene	PTFE
UltraHighMolecularWeightPolyEthylene	UHMWPE
Aluminum oxide	Alumina
Elgiloy	
Hastelloy™ C-276	
Quartz glass	
Ruby	
Sapphire	
Titanium grade 2	

Material	Abbreviation
Titanium grade 5 [1]	

1 Used in pressure sensors only.

Pump rinse system

Material	Abbreviation
EthylenePropyleneDiene M-class rubber	EPDM
PolyEtherEtherKetone	PEEK
PolyPropylene	PP
PolyPhenylene Sulfide	PPS
PolyVinylidene DiFluoride	PVDF
Silicone	

3.2 Materials of construction

Introduction

The following tables list the materials used in flow path and pump rinse system components.

Primary flow path

Part	Code No.	Component	Material
Q9	**28950503**	**28924653 Q9 Quaternary valve**	
		28944270 Buffer Prep Mixing Housing	PEEK
		28929467 Q9 P2-1 Mixing Plug	PEEK
		28924596 Solenoid valve 2/2 type 6606, Marking Q4	PEEK/EPDM
		28924595 Solenoid valve 2/2 type 6606, Marking Q3	PEEK/EPDM
		28924592 Solenoid valve 2/2 type 6606, Marking Q2	PEEK/EPDM
		28924589 Solenoid valve 2/2 type 6606, Marking Q1	PEEK/EPDM

Part	Code No.	Component	Material
P9 A **P9 B**	-	**28942298 Pump P9 Cpl (primary flow path)** 56116124 Piston 28945400 Y-Connector 56119415 Membrane 28939480 Pump Head P9 20939097 Pump Head 28943626 Purge Valve 56118261 Seal **Check valves in/out** 28963058 Outlet Check valve 28962655 Valve housing Out 28962657 Ball retainer 28962659 Washer 28950137 Ball and Seat 28963062 Inlet Check Valve 28962653 Valve housing In 28962657 Ball Retainer 28950137 Ball and Seat 56305879 Purge Valve	 Sapphire ECTFE EPDM Titanium PEEK UHMWPE/Elgiloy PEEK PEEK PEEK Sapphire/Ruby PEEK PEEK Sapphire/Ruby PEEK
P9-S	-	**28945183 Pump P9 Cpl (primary flow path)** 28945183 Piston 56117787 Y-Connector 28978573 Membrane 28952471 Pump Head P9-S 56305641 Pump Head 28943626 Purge Valve 28962521 Seal **Check valves in/out** 28963058 Outlet Check valve 28962655 Valve housing Out 28962657 Ball retainer 28962659 Washer 28950137 Ball and Seat 28963062 Inlet Check Valve 28962653 Valve housing In 28962657 Ball Retainer 28950137 Ball and Seat 56305879 Purge Valve	 Alumina ECTFE EPDM Titanium PEEK UHMWPE/Elgiloy PEEK PEEK PEEK Sapphire/Ruby PEEK PEEK Sapphire/Ruby PEEK

Part	Code No.	Component	Material
R9 (System pumps)	-	**28944995 Pressure monitor R9 (System) with pump flow restrictor** 28951451 Pressure monitor R9 (System) 28947686 Pressure connector 28933525 Pressure sensor 28945164 Restrictor Housing R9 (System) Assembly 28977560 Compression Spring 28966920 Membrane 28989942 Plunger 28946870 Restrictor Stopper 28946577 Pump Restriction Housing	 PEEK Titanium Hastelloy C-276 FFPM/FFKM PEEK PEEK PEEK
R9 (Sample pump)	-	**28944998 Pressure monitor R9 (Sample) with pump flow restrictor** 28951453 Pressure monitor R9 (Sample) 28947688 Pressure connector 28933525 Pressure sensor 28945174 Restrictor Housing R9 (Sample) Assembly 28977560 Compression Spring 28966920 Membrane 28989942 Plunger 28946870 Restrictor Stopper 28947779 Pump Restriction Housing	 PEEK Titanium Hastelloy C-276 FFPM/FFKM PEEK PEEK PEEK
M9-0.6	**28956186**	**28922334 Mixer chamber 0.6 ml** 56302238 Filter 10PP (1 µm) 56302237 Support net 28945536 Mixer top 28963112 Stirring magnet 9.1 mm 28916429 Mixer chamber 0.6 ml 28945544 O-ring 13.1 x 1.6	 PP PP PEEK PTFE PEEK FPM/FKM
M9-1.4	**28956225**	**28924642 Mixer chamber 1.4 ml** 56302238 Filter 10PP (1 µm) 56302237 Support net 28945536 Mixer top 28924648 Stirring magnet 12 mm 28924646 Mixer chamber 1.4 ml 28945544 O-ring 13.1 x 1.6	 PP PP PEEK PTFE PEEK FPM/FKM

Part	Code No.	Component	Material
M9-5	**28956246**	**28924700 Mixer chamber 5 ml**	
		56302238 FILTER 10PP (1 µm)	PP
		56302237 Support net	PP
		28945536 Mixer top	PEEK
		56105749 Stirring magnet 12 mm	PTFE
		28924702 Mixer chamber 5 ml	PEEK
		28945544 O-ring 13.1 x 1.6	FPM/FKM
	29011326	**28948433 O-ring 13.1 x 1.6 mm High resistant**	FFKM
V9-Inj	-	**28920910 Injection valve V9-Inj**	
		28943034 Valve stator injection	PEEK
		28943040 Valve rotor injection	PEEK/PTFE
FR-902	**18112135**	**56304545 Flow restrictor FR-902**	
		56302557 Housing	PEEK
		56303929 Diaphragm	FFPM/FFKM
V9-IS	**28962007**	**Sample Inlet Valve (V9-IS, 7 ports)**	
		28920915 Sample Inlet Valve V9-IS	
		28934791 Valve stator inlet 1.5 assembly	
		28934276 Valve stator inlet 1.5	PEEK
		28934290 Valve rotor inlet	PEEK
		28934287 Valve inlet plug	PEEK
V9-V	**29011353**	**28992313 Versatile valve V9-V**	
		28987417 Stator versatile valve	PEEK
		28987420 Valve rotor versatile	PEEK/PTFE
V9-L	**29011358**	**Loop valve kit (V9-L)**	
		28987182 Stator Loop Valve	PEEK
		28924597 Valve rotor column	PEEK/PTFE
L1		29011637 Tubing L1	PEEK
L2		29011638 Tubing L2	PEEK
V9-O	**28956512**	**Outlet Valve (V9-O, 10 outlets)**	
		28920867 Valve stator out	PEEK
		28933172 Valve rotor out	PEEK/PTFE
V9-IA	**28956510**	**Inlet valve V9-IA**	
		28934791 Valve stator inlet 1.5 assembly	
		28934287 Valve inlet plug	PEEK
		28934276 Valve stator inlet 1.5	PEEK
		28934290 Valve rotor inlet 1.5	PEEK

Part	Code No.	Component	Material
V9-IB	**28962006**	**Inlet valve V9-IB**	
	28934791	Valve stator inlet 1.5 assembly	
	28934287	Valve inlet plug	PEEK
	28934276	Valve stator inlet 1.5	PEEK
	28934290	Valve rotor inlet 1.5	PEEK
V9-pH	**28956508**	**pH valve V9-pH**	
	28939643	Valve stator pH	PEEK
	28939641	Valve rotor pH	PEEK/PTFE
	56322802	Dummy pH	
	56119556	pH Electrode dummy	PTFE
	56119557	O-ring 5.3 x 2.4	FFPM/FFKM
V9-C	**28956506**	**Column valve V9-C**	
	28924597	Valve rotor column	PEEK/PTFE
	28920925	Valve stator column assembly	
	28931925	Valve stator column 2.0	PEEK
	28920897	Valve column plug	PEEK
Built-in fraction collector	-	**28915000 Fraction collector F9**	
	56119406	Tubing i.d. 0.5 mm, o.d. 1/16"	PEEK
	28915100	SLED ARM cpl	
	28922162	Capillary connector	PP
	28926764	Fitting UNF 10-32 ferrule	PEEK
	28947864	CAPILLARY / Accumulator	PEEK
	28915400	Accumulator sled cpl	
	28921813	Glass tube Ø10 / 44	Borosilicate
	28921297	O-ring 10 x 1,5 EPDM 70	EPDM
	28902730	Piston Ø 10	
	28930043	Drop sync	
	28949863	Main nozzle part asm	PE
	28946078	Main nozzle part	PPS
	28949866	Plug, nozzle	PEEK
F9-R	**29011362**	**Fraction collector F9-R**	
	56119406	Tubing i.d. 0.5 mm, o.d. 1/16"	PEEK
C9	**28956495**	**Conductivity monitor C9**	
	28921084	Thread housing	PEEK
	28902003	Electrode	Titanium
	28902005	Insulator	PCTFE
C9	**29011363**	**Second Conductivity monitor**	
	28921084	Thread housing	PEEK
	28902003	Electrode	Titanium
	28902005	Insulator	PCTFE

Part	Code No.	Component	Material
U9-2 (All sizes of flow cells for **U9-M** contains these wetted materials)	**28979380**	**28975936 UV flow cell 2 mm for U9-M** 28975932 Cell In 1000 assembly 28975442 Cell In 1000 28975447 Cone 1000 28977556 UV Fiber 1000 28975445 Cell Shims 2.0 1000 28975934 Cell Out 2.0 assembly 56001792 Cone 400 28975444 Cell Out 2.0	 PEEK PEEK Quartz glass PEEK PEEK PEEK
U9-L (All sizes of flow cells for **U9-L** contains these wetted materials)	**29011325**	**56305582 UV Cell 2 mm for U9-L** 56305584 Cuvette 56305586 Fix bushing 56068200 Cuvette ANS. 2 U 56068800 Seal assembly 56068900 Seal	 Titanium Titanium Quartz glass PTFE
	-	**56118577 Fingertight HPLC**	PEEK

Part	Code No.	Component	Material
	28956606	**28930248 Capillary and Tubing kit**	
		56303131 Sample loop 500 µl	
		56118577 Fingertight HPLC	PEEK
		56303343 Loop 500 µL Bearb.	PEEK
A1		28923732 Tubing A1	FEP
A2		28923987 Tubing A2	FEP
B1		28923993 Tubing B1	FEP
B2		28923994 Tubing B2	FEP
Q1		28924000 Tubing Q1	FEP
Q2		28924001 Tubing Q2	FEP
Q3		28924002 Tubing Q3	FEP
Q4		28924003 Tubing Q4	FEP
S1		28924004 Tubing S1	FEP
S2		28924005 Tubing S2	FEP
Buff		28924011 Tubing Buff	FEP
lnQA		28924012 Tubing lnQA	FEP
lnQB		28924013 Tubing lnQB	FEP
lnA		28924014 Tubing lnA	FEP
lnB		28924015 Tubing lnB	FEP
lnS		28924016 Tubing lnS	FEP
9		28924353 Tubing 9	PEEK
8		28924354 Tubing 8	PEEK
2R		28924355 Tubing 2R	PEEK
1R		28924356 Tubing 1R	PEEK
7		28924357 Tubing 7	PEEK
6		28924358 Tubing 6	PEEK
5		28924359 Tubing 5	PEEK
1A1		28924371 Tubing 1A1	PEEK
1A2		28924374 Tubing 1A2	PEEK
1B1		28924375 Tubing 1B1	PEEK
1B2		28924376 Tubing 1B2	PEEK
1S1		28924377 Tubing 1S1	PEEK
1S2		28924378 Tubing 1S2	PEEK
2S		28924380 Tubing 2S	PEEK

Part	Code No.	Component	Material
3		28924381 Tubing 3	PEEK
W1		28924392 Tubing W1	ETFE
W2		28924394 Tubing W2	ETFE
W3		28924395 Tubing W3	ETFE
W		28924396 Tubing W	ETFE
2A		28955484 Tubing 2A	PEEK
2B		28955485 Tubing 2B	PEEK
3S		28955488 Tubing 3S	PEEK
4		28955489 Tubing 4	PEEK
Frac		28955627 Tubing Frac	PEEK

Pump rinse system

Part	Code No.	Component	Material
	80100651	Tubing	Silicone
	-	59129200 Tube i.d. 2.1 mm, o.d. 4.1 mm	Silicone
	-	28959057 BD Falcon™ 50 ml tube	PP
P9 A P9 B	**28953655**	**28942298 Pump P9 Cpl (rinse system)** 29140541 Drainage Check Valve IN 29140537 Drainage Check Valve Housing 28959717 Pump Wash Housing 28959720 Pump Drainage Plate 28950435 Membrane 25 ml	 PVDF/PEEK/Alumina PVDF PPS PPS EPDM
P9-S	**18111203**	**28945183 Pump P9-S Cpl (rinse system)** 29140541 Drainage Check Valve IN 29140537 Drainage Check Valve Housing 28977775 Pump Wash House 56116470 Pump Drainage Plate 28978573 Membrane 100 ml Union, Luer to M6	 PVDF/PEEK/Alumina PVDF PPS PPS EPDM PEEK

Material conformity: Signature

The Quality System of GE Healthcare is certified according to ISO9001, and is thereby in control of the product realization process. GE Healthcare has a controlled process for quality assurance in selection, assessment and evaluation of supplier where strict adherence to specifications for all material is the basis.

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GE Healthcare

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