

ÄKTA™ avant 150

Product Documentation



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1 Introduction

Purpose of this document

This document provides an overview of ÄKTA avant 150, general specifications and material conformity. For more information about ÄKTA avant 150, refer to the user documentation.

1.1 Instrument view

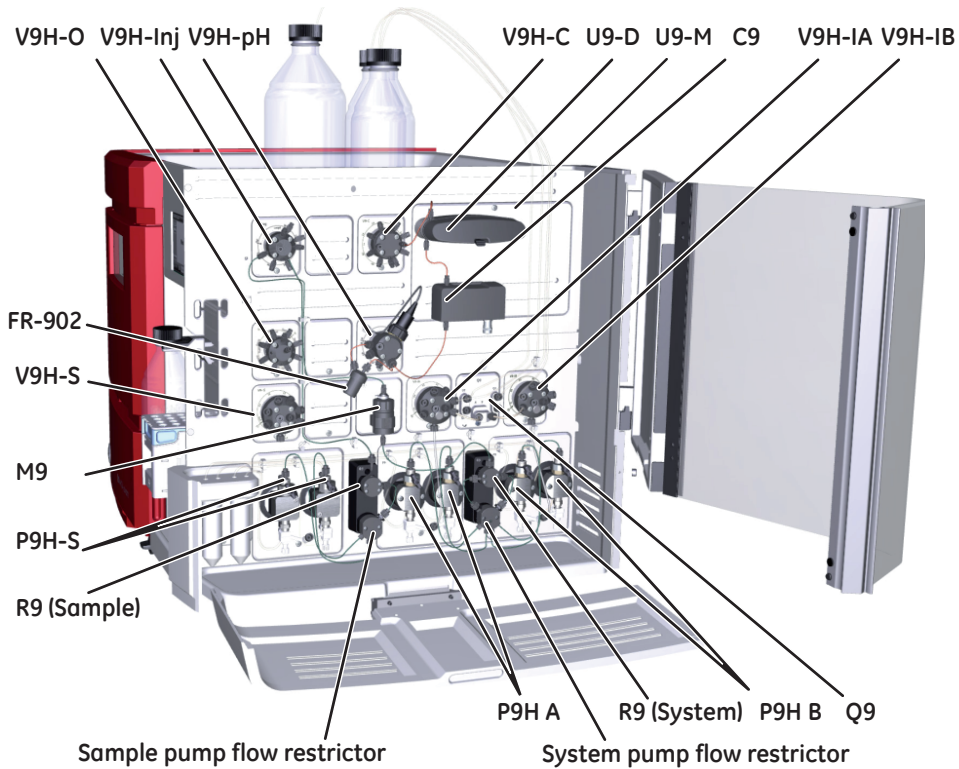
Front side

The front side of ÄKTA avant 150 is illustrated below.



Standard configuration of the wet side

The standard configuration of ÄKTA avant 150 is illustrated below. See [Standard modules, on page 5](#) for label descriptions.



Available modules

ÄKTA avant 150 is always delivered with the standard modules installed, but one or more optional modules may be added to the flow path. The following tables contains information on standard modules and optional modules.

Standard modules

Standard module	Description
System pump P9H A	A high precision pump, which delivers buffer in purification runs.
System pump P9H B	A high precision pump, which delivers buffer in purification runs.
Sample pump P9-H	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 150 and their volumes are: 0.6 ml, 1.4 ml (mounted at delivery) and 5 ml.
Injection valve V9H-Inj	Directs sample onto the column.
Inlet valve A V9H-IA	Inlet valve for System pump A with seven inlet ports and integrated air sensor.
Inlet valve B V9H-IB	Inlet valve for System pump B with seven inlet ports and integrated air sensor.
Sample inlet valve V9H-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 automatic mixing of four different solutions.
Column valve V9H-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 V9H-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 V9H-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 .

1 Introduction

1.1 Instrument view

Standard module	Description
Conductivity monitor C9	Continuously 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 V9H-A2	Second inlet valves for System pump A, to extend the number of inlets up to 14.
Second Inlet valve B V9H-B2	Second inlet valves for System pump B, to extend the number of inlets up to 14.
Extra Inlet valve V9H-IX	Inlet valve with eight inlet ports. No integrated air sensor.
Second Sample inlet valve V9H-S2	Second inlet valve for Sample pump to extend the number of sample inlets up to 14.
Versatile valve V9H-V	A 4-port, 4-position valve, which can be used to customize the flow path.
Loop valve V9H-L	Enables the use of up to five loops connected to the instrument.
Second Column valve V9H-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 V9H-O2	Valve which adds 12 outlet ports to the system, giving a total of 21 outlets.
Third Outlet valve V9H-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

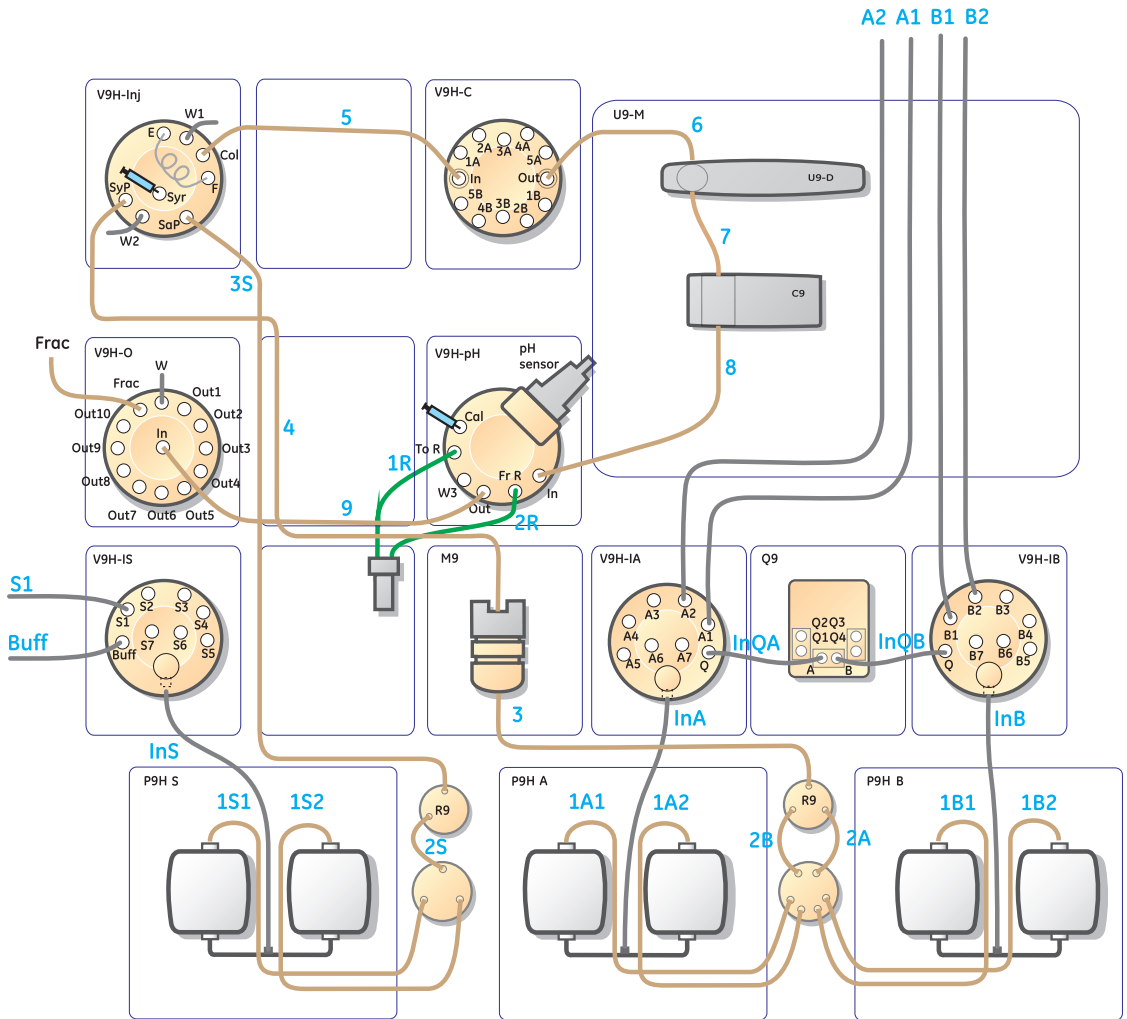
Illustration of tubing

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 150. The flow chart shows connected tubing between instrument components.

1 Introduction

1.2 Liquid flow path



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. 3/16", i.d. 2.9 mm	1500	A1 and A2 mounted

Label	Description	Tubing	Length (mm)	Mounted
B1-B7	Inlets to Inlet valve B	FEP, o.d. 3/16", i.d. 2.9 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. 3/16", i.d. 2.9 mm	1500	Yes
S1-S7	Inlets to Sample inlet valve	FEP, o.d. 3/16", i.d. 2.9 mm	1500	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. 3/16", i.d. 2.9 mm	220	Yes
InB	From Inlet valve B to System pump B	FEP, o.d. 3/16", i.d. 2.9 mm	220	Yes
InS	From Sample inlet valve to Sample pump	FEP, o.d. 3/16", i.d. 2.9 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. 1.0 mm	340	Yes
1A2	System pump A right to Restrictor A	PEEK, o.d. 1/16", i.d. 1.0 mm	340	Yes
2A	Restrictor A to Pressure monitor	PEEK, o.d. 1/16", i.d. 1.0 mm	100	Yes
1B1	System pump B left to Restrictor B	PEEK, o.d. 1/16", i.d. 1.0 mm	340	Yes

1 Introduction

1.2 Liquid flow path

Label	Description	Tubing	Length (mm)	Mounted
1B2	System pump B right to Restrictor B	PEEK, o.d. 1/16", i.d. 1.0 mm	340	Yes
2B	Restrictor B to Pressure monitor	PEEK, o.d. 1/16", i.d. 1.0 mm	100	Yes
1S1	Sample pump left to Restrictor S	PEEK, o.d. 1/16", i.d. 1.0 mm	340	Yes
1S2	Sample pump right to Restrictor S	PEEK, o.d. 1/16", i.d. 1.0 mm	340	Yes
2S	Restrictor S to Pressure monitor	PEEK, o.d. 1/16", i.d. 1.0 mm	100	Yes
3	Pressure monitor to Mixer	PEEK, o.d. 1/16", i.d. 1.0 mm	280	Yes
3S	Pressure monitor S to Injection valve	PEEK, o.d. 1/16", i.d. 1.0 mm	485	Yes
4	Mixer to Injection valve	PEEK, o.d. 1/16", i.d. 1.0 mm	400	Yes
5	Injection valve to Column valve	PEEK, o.d. 1/16", i.d. 1.0 mm	180	Yes
6	Column valve to UV monitor	PEEK, o.d. 1/16", i.d. 1.0 mm	160	Yes
7	UV monitor to Conductivity monitor	PEEK, o.d. 1/16", i.d. 1.0 mm	100	Yes
8	Conductivity monitor to pH valve	PEEK, o.d. 1/16", i.d. 1.0 mm	165	Yes
9	pH valve to Outlet valve	PEEK, o.d. 1/16", i.d. 1.0 mm	215	Yes
1R	To Flow restrictor	PEEK, o.d. 1/16", i.d. 1.0 mm	75	Yes
2R	From Flow restrictor	PEEK, o.d. 1/16", i.d. 1.0 mm	75	Yes
Frac	Outlet valve to Fraction collector	PEEK, o.d. 1/16", i.d. 1.0 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	FEP, o.d. 1/8", i.d. 1.6 mm	1000	No

2 General specifications

2.1 System specifications

Parameter	Data
System configuration	Benchtop system, external computer
Control system	UNICORN™ 6.1 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	<ul style="list-style-type: none"> Inlet: FEP tubing, i.d. 2.9 mm, Tubing connector 5/16" + Ferrule (blue), 3/16" After pumps: PEEK tubing, 1.0 mm i.d., Finger-tight connector, 1/16" Outlet and waste: FEP o.d. 1/8", i.d. 1.6 mm, Tubing connector 5/16" + Ferrule (yellow), 1/8"

2.2 Environmental 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 <i>ÅKTA avant Operating Instructions</i> .

2.3 Module specifications

System pumps

Parameter	Data
Pump type	Piston pump, metering type
Flow rate setting	0.01 to 150 ml/min (normal range) 0.01 to 300 ml/min (column packing flow)
Pressure range	0 to 5 MPa (0 to 50 bar)
Viscosity range	0.35 to 5 cP
Flow rate specifications	<ul style="list-style-type: none"> Accuracy: $\pm 1.5\%$ Precision: RSD < 0.5% (Conditions: 1.0 to 150 ml/min, < 3 MPa, 0.8 to 2 cP)

Sample pump

Parameter	Data
Pump type	Piston pump, metering type
Flow rate range	0.01 to 150 ml/min
Pressure range	0 to 5 MPa (0 to 50 bar)
Viscosity range	0.7 to 10 cP
Flow rate specifications	<ul style="list-style-type: none"> Accuracy: $\pm 2\%$ Precision: RSD < 0.5% (Conditions: 1.0 to 150 ml/min, < 3 MPa, 0.8 to 3 cP)

Mixer

Item	Description
Mixing principle	Chamber with a magnetic stirrer
Mixer volume	1.4 ml, 5 ml (default) or 15 ml

Gradient formation

Parameter	Data
Gradient flow rate range	<ul style="list-style-type: none"> Binary: 1 to 150 ml/min Quaternary: 2 to 40 ml/min
Gradient composition accuracy	<ul style="list-style-type: none"> Binary: $\pm 0.6\%$ Quaternary: $\pm 1\%$ (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 5 MPa (0 to 50 bar)
Accuracy	± 0.015 MPa or $\pm 1.5\%$ 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 $\pm 2\%$ at 0 to 2 AU U9-L: within $\pm 5\%$ at 0 to 2 AU

2 General specifications

2.3 Module specifications

Item	Description
Drift	U9-M (2 mm cell at 280 nm): $\leq 0.2 \text{ mAU} \text{ AU/h}$ U9-L (2 mm cell): $\leq 0.2 \text{ mAU} \text{ AU/h}$
Noise	U9-M : $< 0.08 \text{ mAU}$ U9-L : $< 0.1 \text{ mAU}$
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	$\pm 0.01 \text{ mS/cm}$ or $\pm 2\%$, 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	129 µl

Outlet valve fractionation

Item	Description
Number of outlets	10, expandable to 32
Fraction volumes	1 to 20000 ml
Delay volume (UV – Outlet valve)	535 µl

Built-in fraction collector

Item	Description
Number of fractions	Up to 576
Vessel types	<ul style="list-style-type: none"> • 3, 5, 8, 15, 50 ml tubes • 250 ml bottles • Deep well plates: 96 / 48 / 24

2 General specifications

2.3 Module specifications

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)	1807 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)	928 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 150 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	

3 Material conformity

3.1 Material definitions

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
P9H A P9H B P9H S	-	28963198 Pump P9H Cpl (primary flow path) 28955266 Piston 56117787 Y-Connector 28960825 Membrane 28963193 Pump Head P9H 28965233 Pump Head 28943626 Purge Valve 28962521 Seal Check valves in/out 28963058 Outlet Check valve 28963062 Inlet Check Valve 28962655 Valve housing Out 28962657 Ball retainer 28962659 Washer 28950137 Ball and Seat 28962653 Valve housing In 28962657 Ball Retainer 28950137 Ball and Seat	Alumina ECTFE EPDM Titanium PEEK UHMWPE/Elgiloy PEEK PEEK PEEK Sapphire/Ruby PEEK PEEK Sapphire/Ruby
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

3 Material conformity

3.2 Materials of construction

Part	Code No.	Component	Material
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
M9-5	28956246	28924700 Mixer chamber 5 ml 56302238 FILTER 10PP (1 µm) 56302237 Support net 28945536 Mixer top 56105749 Stirring magnet 12 mm 28924702 Mixer chamber 5 ml 28945544 O-ring 13.1 x 1.6	PP PP PEEK PTFE PEEK FPM/FKM
M9-15	28980309	28960890 Mixer chamber 15 ml 56302238 FILTER 10PP (1 µm) 56302237 Support net 28960895 Mixer top 28960900 Stirrer 28960891 Mixer chamber 15 ml 28976675 O-ring 22.1x 1.6 FPM/FKM 70 Green	PP PP PEEK PTFE PEEK FPM/FKM
	29011326	28948433 O-ring 13.1 x 1.6 mm High resistant	FFKM
V9H-Inj	28979283	28960722 Injection valve V9H-Inj 28958378 Valve stator injection 28958577 Valve rotor injection	PEEK PEEK
FR-902	18112135	56304545 Flow restrictor FR-902 56302557 Housing 56303929 Diaphragm	PEEK FFPM/FFKM
V9H-IS	28979279	Sample Inlet Valve V9H-IS (7 ports) 28967149 Sample Inlet Valve V9H-I 28967151 Valve stator inlet 2.5 asm. 28978688 Valve stator inlet 2.5-1.5 28967152 Valve rotor inlet 2.5 28934287 Valve inlet plug	PEEK PEEK PEEK
V9H-V	29090691	Versatile valve V9H-V 29087523 Stator versatile valve 29087518 Valve rotor versatile	PEEK PEEK/PTFE

Part	Code No.	Component	Material
V9H-L L1 L2	29090689	Loop valve kit V9H-L	
		29084943 Stator Loop Valve	PEEK
		28958809 Valve rotor column	PEEK/PTFE
		29092410 Tubing L1	PEEK
		29092454 Tubing L2	PEEK
V9H-O	28979281	Outlet Valve (V9H-O, 10 outlets)	
		28960723 Outlet valve V9H-O	PEEK
		28920867 Valve stator out	PEEK
		28958583 Valve rotor out	PEEK
		28968867 Outlet Valve stator asm.	PEEK
		28968865 Valve Plug Out	PEEK
V9H-IA	28979248	Inlet valve V9H-IA	
		28967151 Valve stator inlet 2.5 assembly	PEEK
		28934287 Valve inlet plug	PEEK
		28978688 Valve stator inlet 2.5-1.5	PEEK
		28967152 Valve rotor inlet 2.5	PEEK
V9H-IB	29050946	Inlet valve V9H-IB	
		28967151 Valve stator inlet 2.5 assembly	PEEK
		28934287 Valve inlet plug	PEEK
		28978688 Valve rotor inlet 2.5-1.5	PEEK
		28967152 Valve rotor inlet 2.5	PEEK
V9H-pH	28956508	pH valve V9H-pH	
		28958414 Valve stator pH	PEEK
		28958807 Valve rotor pH	PEEK/PTFE
		56322802 Dummy pH	
		56119556 pH Electrode dummy	PTFE
		56119557 O-ring 5.3 x 2.4	FFPM/FFKM
V9H-C	29050951	Column valve V9H-C	
		28958809 Valve rotor column	PEEK/PTFE
		28960728 Valve stator column assembly	
		28958403 Valve stator column	PEEK
		28959783 Valve column plug	PEEK

3 Material conformity

3.2 Materials of construction

Part	Code No.	Component	Material
Built-in fraction collector	-	28977840 Fraction collector F9H 56119887 Tubing i.d. 1.0 mm, o.d. 1/16" 28977838 SLED ARM cpl 28922162 Capillary connector 28926764 Fitting UNF 10-32 ferrule 28969112 CAPILLARY / Accumulator 28977836 Accumulator sled cpl 28921813 Glass tube Ø10 / 44 28921297 O-ring 10 x 1,5 EPDM 70 28902730 Piston Ø 10 28967516 Nozzle Cpl 28967518 Main nozzle part asm 28966995 Main nozzle part 28949866 Plug, nozzle	PEEK PP PEEK PEEK Borosilicate EPDM PE PPS 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 28902003 Electrode 28902005 Insulator	PEEK Titanium PCTFE
C9	29011363	Second Conductivity monitor 28921084 Thread housing 28902003 Electrode 28902005 Insulator	PEEK Titanium PCTFE
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

Part	Code No.	Component	Material
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

3 Material conformity

3.2 Materials of construction

Part	Code No.	Component	Material
	28975175	28975175 Capillary and Tubing kit	
A1	28975177	Tubing A1	FEP
A2	28975232	Tubing A2	FEP
B1	28975237	Tubing B1	FEP
B2	28975240	Tubing B2	FEP
Q1	28924000	Tubing Q1	FEP
Q2	28924001	Tubing Q2	FEP
Q3	28924002	Tubing Q3	FEP
Q4	28924003	Tubing Q4	FEP
S1	28979157	Tubing S1	FEP
S2	28979158	Tubing S2	FEP
Buff	28979159	Tubing Buff	FEP
InQA	28924012	Tubing InQA	FEP
InQB	28924013	Tubing InQB	FEP
InA	28975846	Tubing InA	FEP
InB	28975848	Tubing InB	FEP
InS	28977233	Tubing InS	FEP
9	28975696	Tubing 9	PEEK
8	28975695	Tubing 8	PEEK
2R	28975700	Tubing 2R	PEEK
1R	28975698	Tubing 1R	PEEK
7	28975694	Tubing 7	PEEK
6	28975693	Tubing 6	PEEK
5	28975690	Tubing 5	PEEK
1A1	28975368	Tubing 1A1	PEEK
1A2	28975611	Tubing 1A2	PEEK
1B1	28975619	Tubing 1B1	PEEK
1B2	28975620	Tubing 1B2	PEEK
1S1	28975621	Tubing 1S1	PEEK
1S2	28975682	Tubing 1S2	PEEK
2S	28975684	Tubing 2S	PEEK
3	28975685	Tubing 3	PEEK
W1	28924392	Tubing W1	ETFE
W2	28924394	Tubing W2	ETFE
W3	28924395	Tubing W3	ETFE
W	28975377	Tubing W	FEP
2A	28975682	Tubing 2A	PEEK
2B	28975683	Tubing 3S	PEEK
3S	28975688	Tubing 2B	PEEK
4	28975689	Tubing 4	PEEK
Frac	28975701	Tubing Frac	PEEK
Out1	28975394	Tubing Out1	FEP
Out2	28975730	Tubing Out2	FEP
InjEF	28975394	Tubing InjEF	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
P9H A P9H B P9H S	28979375	28963198 Pump P9H MDH cpl (rinse system) 29140541 Drainage Check Valve IN 29140537 Drainage Check Valve Housing 28959717 Pump Wash Housing 28959720 Pump Drainage Plate 28978573 Membrane 100 ml	PVDF/PEEK/Alumina PVDF PPS PPS EPDM

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.



Thomas Wallin Valid from 14 November 2012
QA Site Leader
GE Healthcare

For local office contact information, visit
www.gelifesciences.com/contact

GE Healthcare Bio-Sciences AB
Björkgatan 30
751 84 Uppsala
Sweden

www.gelifesciences.com/avant

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First published May 2013

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GE Healthcare Europe GmbH
Munzinger Strasse 5, D-79111 Freiburg, Germany

GE Healthcare UK Limited
Amersham Place, Little Chalfont, Buckinghamshire, HP7 9NA, UK

GE Healthcare Bio-Sciences Corp.
800 Centennial Avenue, P.O. Box 1327, Piscataway, NJ 08855-1327, USA

GE Healthcare Japan Corporation
Sanken Bldg. 3-25-1, Hyakunincho Shinjuku-ku, Tokyo 169-0073, Japan

