

VWR® ULTRAPURE WATER SYSTEMS

Great performance up
to 200 l a day

Purity models offer
flexibility for diverse
applications

Systems delivered with
free consumables and
accessories

Easy to install and
maintain



2 year
warranty

Puranitu TU

UT Puranitu

Water is the most basic and yet the most critical component of any experiment

While tap water may be good enough to drink, laboratory methods are more sensitive than human physiology! VWR water purification systems remove the impurities that threaten your results, from simple glass rinsing to solution production or instrument feeds. These are some of the challenges managed seamlessly by the VWR Purity range.

Table 1: Specific areas of concern by application.

Application	Particulates	Colloids	Ions	Dissolved gases	Organics	Nucleases	Pyrogens
General laboratory							
Autoclave	•	•	•				
Humidification	•	•	•				
Glassware washing/rinsing	•	•	•				
Media preparation	•	•	•				
Analytical laboratory							
Ion chromatography (IC)	•	•	•	•			
Atomic absorption (AA)	•	•	•	•			
High performance liquid chromatography (HPLC)	•	•	•	•	•		
Inductively coupled plasma spectroscopy (ICP)	•	•	•	•	•		
Mass spectroscopy (MS)	•	•	•	•	•		
Gas chromatography (GC)	•	•	•	•	•		
Total organic carbon (TOC)	•	•	•	•	•		
Life science laboratory							
Genomics							
(e.g. PCR, mutagenesis)	•	•	•	•	•	•	•
Proteomics							
(e.g. crystallography, electrophoresis)	•	•	•	•	•	•	•
Immunology							
(e.g. monoclonal antibody production, blots)	•	•	•	•	•	•	•
Pharmacology							
Cell and tissue culture	•	•	•	•	•	•	•
Drug discovery	•	•	•	•	•	•	•

Table 1 shows the impact of different contaminating parameters on experimental performance by application.

There are 2 major classes of impurities in water; dissolved and/or undissolved impurities. For both classes there exists a different and optimal method of purification.

Dissolved impurities are inorganic ions, small organic molecules as well as bigger, more complex molecules, (for instance, absence of nucleases, bacterial endotoxins and pyrogens are very important for experiments in life science labs) and gases.

Unsolved impurities are suspended particles (sand, rust and more), microorganism-like bacteria, fungi, algae and viruses and, last but not least, colloids which can cause indefinable results in some applications.

Suspended particles, colloids and inorganic ions

Suspended particles, typically 1 - 10 µm in size include sand, silt etc that can interfere with instrument operation, plug valves and other narrow flow paths as well as foul reverse osmosis membranes.

Slightly smaller (0,01 - 1,0 µm) colloidal particles typically have a slightly net negative charge and clog filters, interfere with instrument operation, foul reverse osmosis membranes and can bypass ion exchange resins, resulting in lower resistivity in deionised water systems.

Cations and anions adversely affect the results of inorganic analyses such as IC, AA, ICP/MS and may retard cell and tissue growth in biological research. They can also affect cartridge life in deionised water systems.

Dissolved gases and organics

Water naturally contains dissolved gases such as oxygen or carbon dioxide and others that can alter the pH of the water and oxygen, the most common non ionised gas, may cause corrosion of metal surfaces. While the exact source and composition may vary, organics foul ion exchange resins interfere with organic analyses including HPLC, gas chromatography and fluoroscopy. As well as hindering electrophoresis, tissue and cell culture. Typical organic impurities in tap water are proteins, residues of pesticides as well as more and more hormones due to the inability of wastewater plants to remove them.

Biologicals

Although chlorination eliminates harmful bacteria, tap water still contains live microorganisms along with pyrogens, viruses and nucleases that interfere with sterile applications, such as cell and tissue culture and can have a devastating impact on many life science research protocols.

Purification methods

To make pure and ultrapure water, impurities need to be efficiently and effectively removed. Water purification systems employ multiple technologies, some synergistically, to remove impurities and give you consistently PURE water. Water purification is a step-by-step process often requiring a combination of technologies.

Table 2: Efficiency of different methods at removing contamination from water.

	Distillation	Reverse osmosis	Deionisation	Electrodeionisation	Filtration	Ultrafiltration (UF)	Adsorption	Ultraviolet oxidation (UV)	Combination UV/UF
Inorganic ions	+++	++	+++	+++	+	+	+	+	+
Dissolved gases	++	+	+++	+++	+	+	++	+	+
Organics	++	++	+	+	+	+	+++	+++	+++
Particles	+++	+++	+	+	+++	+++	+	+	+++
Bacteria	+++	+++	+	+	+++	+++	+	+++	+++
Pyrogens	+++	+++	+	+	+	+++	++	+	+++
Nucleases	+	+	+	+	+	++	++	+	+++

Key: +++ Excellent, ++ Good, + Poor

The choice of methodology used depends on the application the water is being used for. In general, the higher the purity the more expensive it is to produce every litre.

Table 3: International Standards for water quality

Type of water	Electrical conductivity (µS/cm)	Salt content (ppm)	TOC content (µg/l)
Tap water*	600	300	Up to 5000
ASTM Type 3	0,25	0,05	200
ASTM Type 2	1	0,12	50
ASTM Type 1	0,055	0,028	50

* Tap water quality differs from place to place, this is an example only.

Typically, Type 2 or RO water is used for general laboratory equipment like water baths or incubators, buffer, media and reagent preparation or as a feed water supply for Type 1 water purification systems. Type 1 water is essential for analytical and life science techniques to ensure the best results.

Overview of VWR Purity water purification systems

Elegant simplicity, performance and value

The VWR Purity range offers 5 different models of purification systems to meet your needs without compromise. Each model uses an internal recirculation mode to ensure availability of high purity water at any time. Exchanging ultra-polisher cartridges (and pre-treatment cartridges in TU models) is easy without requiring any system depressurisation. Each system is available in 3 different models: Basic, with UV-lamp (UV) or UV-lamp and ultrafilter (UV/UF) to fulfil the specific demand of each application.

Systems requiring pre-treated feed

Purity PU 15 and 20 systems include a polisher cartridge pack, 0,2 µm final filter, pressure regulator; feed water monitoring and optional UV lamp and ultra-filter.



Purity PU 15

Designed for laboratories needing up to 50 l/day of ultrapure water such as HPLC or other instrumental analyses, sample preparation, glassware rinsing, or molecular biology work where endotoxins and/or nucleases would interfere.

Type 1 system pre-treated feed, <50 l/day



Purity PU 20

The Purity PU 20 system delivers ultrapure water to labs with a higher volume demand than the PU 15 systems.

Type 1 system pre-treated feed, <200 l/day



Purity TU

For <100 l/day Type 1 and Type 2 water from tap water as a feed water source.

From tap to Type 2 or Type 1 ultrapure water

All in one! The TU system is a compact system that purifies tap water into both ASTM Type I and II water. The Purity TU 3 and 6 feature a built-in 6 l reservoir to store the Type 2 water. The Purity TU 12 offers the choice of a 30 or 60 l external reservoir for customisable storage capacity.

Purity TU 3, 6 and 12 systems produce up to 100 l/day of Type 1 ultrapure water from tap water, as well as Type 2 water available from the tank.

Purity TU 3, 6 and 12 systems include an RO/pre-treatment cartridge, polisher cartridge pack, 0,2 µM final filter, UV lamp (for UV systems only) and ultra-filter (for UF systems only). The 3 and 6 l/h systems also include an internal 6 l tank with vent filter. The TU 12 requires an external tank.



Puranility PU 15

Type 1 system produces up to 50 l/day of 18,2 MΩxcm water at 25 °C

Smart features

- Backlit display tilts for easy viewing
- Variable speed dispensing
- Easy to change polisher cartridge
- Small footprint

Monitor feed water quality

- Good feed water quality leads to consistently ultrapure water and hence maximum cartridge life

Smart design

- Recirculation pump prevents bacterial growth during standstill and allows for constant monitoring of all system functions, allowing for the immediate display of fault messages if a problem is detected
- System delivered fully equipped with pressure regulator, ultrapure polisher cartridge and 0,2 µm sterile filter

Superior filters

- Ultra-filter is flushed automatically to ensure the highest retention of endotoxins and nucleases, which produces a long two year lifetime
- Validated 0,2 µm final filter with folded membrane can be sterilised up to 5 times

UV photo-oxidation 185/254 nm

- High performance UV assembly reliably reduces the content of microorganisms and their metabolites
- UV oxidation also reduces organic compounds in the water to ultra-low levels

Typical applications include:

Molecular biology and microbiology

- Cell and tissue culture
- PCR, DNA sequencing
- Electrophoresis

Analytical chemistry

- HPLC
- GC, GC-MS, ICP-MS, AA
- TOC measurements, IC

Feed water requirements

Source	Potable tap water pre-treated by reverse osmosis, ion exchange or distillation
Feed water conductivity (µS/cm)	<5
TOC (ppb)	Max. 50
Turbidity (NTU)	<1,0
Temperature (°C)	2 - 35
Pressure, psi (bar)	1,4 - 87 (0,1 - 6)

See user manual for more details.

Technical specifications

Operating pressure (bar)	2 to 6
Electrical requirements	90 - 240 V, 50/60 Hz
Power consumption (kW)	0,06
Feed water connector	3/4" NPT
WxDxH (cm)	30,5x30x54,5
Weight (kg)	Approx. 17
Temperature min./max. (°C)	2 - 35

Model	PU 15	PU 15 UV	PU 15 UV/UF
Applications	Instrumental analytical methods such as AAS, IC, ICP	High sensitivity instrumental analytical methods, such as HPLC, ICP-MS, TOC analyses	Microbiology, molecular biology, PCR, DNA, monoclonal antibodies, cell culture media
Resistance at 25 °C (MΩ, cm)	18,2	18,2	18,2
Conductivity (µS/cm)	0,055	0,055	0,055
TOC (ppb)	5 - 10	1 - 5	1 - 5
RNase (ng/ml)	n/a	n/a	<0,003
DNase (pg/µl)	n/a	n/a	<0,4
Bacteria (CFU/ml)	<1	<1	<1
Particles (0,22 µm/ml)	<1	<1	<1
Endotoxins (EU/ml)	n/a	n/a	<0,001
Flow rate (l/min)	1,5	1,5	1
Cat. No.	171-1100	171-1102	171-1101

Accessories and consumables

Description	Cat. No.
Disinfection cartridge	171-1182
Cleaning solution, 1 syringe (disinfection cartridge required)	171-1124
Disinfection granulate micro-chlor-VE12 (disinfection cartridge required)	171-1123
Polisher cartridge for Puranility PU 15	171-1104
Replacement UV lamp for Puranility TU, PU 15	171-1108
Sterile filter 0,2 µm	171-1105
Ultra-filter for Puranility PU 15, TU 3, 6, 12	171-1106
Wall holder for Puranility TU, PU 15	171-1125



Puranility PU 20

Type 1 system producing up to 200 l/day 18.2 MΩxcm water. Exceeds International Standard ASTM Type I, ISO 3696 Grade 1, ASTM D1193 and CLSI-CLRW.

Typical applications include:

- Molecular biology and microbiology
 - Cell and tissue culture
 - PCR, DNA sequencing
 - Electrophoresis analytical chemistry
 - HPLC
 - GC, GC-MS, ICP-MS, AA
 - TOC measurements, IC

Integrated feed water monitoring

- Built-in feed water cell monitors feed water conductivity - any exceeding of the limiting value is immediately displayed maximising cartridge life

UV photo-oxidation 185/254 nm

- High performance UV assembly reliably reduces the content of microorganisms and their metabolites
- UV oxidation also reduces organic compounds in the water to ultra-low levels
- Ready to use
- Feed water pressure regulator, wall bracket, UV lamp, ultrapure polisher cartridge, sterile filter, all included with one part number

Measurement of conductivity/resistivity

- Conductivity cells are carefully calibrated prior to each measurement via built-in reference resistance with cell constants at 0,01 cm-1
- Temperature measurements are made by a platinum chip sensor with ±0,1 °C accuracy

Quick connect cartridge replacement

- Aquastop quick connect capability enables cartridge replacement within seconds, even mid operation

GLP compliant documentation

- Real time clock and code protected operating system prevents unauthorised changes to system settings
- RS232 interface with adjustable send-interval for safe data transfer of all measured data, faults, date and time to a PC or log printer
- Digital microprocessor control automatically monitors and stores faults from the last four weeks
- USP compliant conductivity measurement with temperature compensation can be switched on or off

Tilting control panels for easy viewing

- Ergonomically designed controller tilts for optimal key pressing and easy readability
- Illuminated four-line alphanumeric display

Model	PU 20	PU 20 UV	PU 20 UV/UF
Applications	AAS, IC, ICP, standard buffer	Inorganic and organic trace analysis, HPLC, ICP-MS, IC, TOC analyses	Molecular biology, PCR, DNA, monoclonal antibodies, cell culture media
Resistance at 25 °C, (MΩ, cm)	18,2	18,2	18,2
Conductivity (µS/cm)	0,055	0,055	0,055
TOC (ppb)	5 - 10	1 - 5	1 - 5
RNase (ng/ml)	n/a	n/a	<0,003
DNase (pg/µl)	n/a	n/a	<0,4
Bacteria (CFU/ml)	<1	<1	<1
Particles (0,22 µm/ml)	<1	<1	<1
Endotoxins (EU/ml)	n/a	n/a	<0,001
Flow rate (l/min)	Up to 2	Up to 2	Up to 1,5
Cat. No.	171-1172	171-1174	171-1173

Feed water requirements

Source	Potable tap water, pre-treated by reverse osmosis, ion exchange or distillation
Feed water conductivity (µS/cm)	<2
TOC (ppb)	Max. 50
Bacteria count (CFU/ml)	<100
Turbidity (NTU)	<1,0
Temperature (°C)	2 - 35
Pressure, psi (bar)	1,4 - 87 (0,1 - 6)

Technical specifications

Operating pressure (bar)	0,1 to 6
Electrical requirements	90 - 240 V/50 - 60 Hz
Power consumption (kW)	0,1
Feed water connector	3/4" NPT
WxDxH (cm)	37x33x61,5
Weight (kg)	22 - 24
Temperature min./max. (°C)	2 - 35

Accessories and consumables

Description	Cat. No.
Disinfection cartridge for Puraniry PU 20	171-1182
Cleaning solution, 1 syringe (disinfection cartridge required)	171-1124
Disinfection granulate micro-chlor-VE12 (disinfection cartridge required)	171-1123
Polisher cartridge for Puraniry PU 20	171-1175
Replacement UV lamp for Puraniry PU 20 UV+UV/UF	171-1176
Ultra-filter for Puraniry PU 20	171-1184
Sterile filter 0,2 µm	171-1105



Puranity TU 3 / 6 / 12

For <100 l/day Type 1 and Type 2 water from tap water as a feed water source.

Typical applications include:

Molecular biology and microbiology

- Cell and tissue culture
- PCR, DNA sequencing
- Electrophoresis
- Analytical chemistry
- HPLC
- GC, GC-MS, ICP-MS, AA
- TOC measurements, IC
- Routine laboratory work
- Preparing and diluting buffers and reagents
- Rinsing lab glassware
- Supplying autoclaves and other small lab equipment

Powerful performance

- Based on your requirements, choose from capacities of 3, 6 or 12 l/h
- Conical bottom outlet allows for complete draining and efficient cleaning and disinfection
- Puranity TU 3 and 6 feature smart, integrated 6 l reservoir
- Puranity TU 12 offers external reservoir options, either 30 or 60 l; Polyethylene reservoir is opaque to light; CO₂ adsorber prevents TOC value increase from drawn-in CO₂
- Optional UV lamp and ultra-filter to customise ultrapure water quality
- Sterile venting filter/reservoir overflow protects against contamination by microorganisms
- Recirculation pump protects the high purity water from bacterial growth during standstills and maintains low conductivity value

Lasting economy

- Water purification progresses through independent cartridges with Aquastop and quick-connect for fast replacement
- Module 1 - Combination of pre-treatment and the reverse osmosis membrane
- Module 2 - Polishing cartridge contains high quality ultrapure resin for consistent purity and long cartridge life

Easy to operate

- Dispensing is easy and features variable speed to control flow
- The display can be tilted for optimal reading
- Place on bench or mount onto the wall



Feed water requirements

Source	Tap water
pH range	4 - 11
Temperature (°C)	2 - 35
Pressure, psi (bar)	1 - 6

Technical specifications

Operating pressure (bar)	1 to 6
Electrical requirements	100 - 240 V, 50/60 Hz
Power consumption (kW)	0,06
Feed water connector	¾" NPT
Temperature min./max. (°C)	2 - 35

Model	TU	TU UV	TU UV/UF
Applications	AAS, IC, ICP, standard buffer	Inorganic and organic trace analysis, HPLC, ICP-MS, IC, TOC analyses	Molecular biology, PCR, DNA, monoclonal antibodies, cell culture media
Type 1 water			
Resistance at 25 °C (MΩ, cm)	18,2	18,2	18,2
Conductivity (µS/cm)	0,055	0,055	0,055
TOC (ppb)	5 - 10	1 - 5	1 - 5
RNase (ng/ml)	n/a	n/a	<0,003
DNase (pg/µl)	n/a	n/a	<0,4
Bacteria (CFU/ml)	<1	<1	<1
Particles (0,22 µm/ml)	<1	<1	<1
Endotoxins, EU/ml	n/a	n/a	<0,001
Flow rate, l/min	Up to 1	Up to 1	Up to 1
Type 2 water			
Pure water production at 15 °C (l/h)	3, 6 or 12	3, 6 or 12	3, 6 or 12
Resistivity at 25 °C (MΩ, cm)	15 - 10	15 - 10	15 - 10
Conductivity (µS/cm)	0,067 - 0,1	0,067 - 0,1	0,067 - 0,1

Ordering information

Model	TU 3	TU 6	TU 12
Water production rate (RO, l/h)	3	6	12
Reservoir	6 l reservoir built-in for type 2 water		External tank required for type 2 water
WxDxH (cm)	40x30,5x54,5		33x37x61,5
Weight (kg)	Approx. 22	Approx. 22	Approx. 22
Cat. No.			
Basic	171-1134	171-1137	171-1162
UV	171-1135	171-1138	171-1163
UV/UF	171-1136	171-1139	171-1164

Accessories and consumables

Description	Cat. No.
Replacement UV lamp for Purity TU, PU 15	171-1108
Polisher cartridge for Purity TU	171-1141
Pre-treatment cartridge for Purity TU 3	171-1142
Pre-treatment cartridge for Purity TU 6	171-1143
Pre-treatment cartridge for Purity TU 12	171-1165
Sterile vent filter for 6 l internal tank	171-1144
Sterile end filter	171-1105

Accessories and consumables for TU 12 only

Choose 1 storage reservoir

Recommended accessories:

Sterile vent filter for storage tanks and sterile overflow

Options: UV lamp assembly for storage reservoir, wall holder

Description	Cat. No.
Storage reservoir 30 l	171-1170
Storage reservoir 60 l	171-1171
Sterile vent filter for storage reservoirs (sterile filter 0,2 µm + CO ₂ adsorber)	171-1166
Sterile overflow valve for tanks 30/60 l	171-1157
UV lamp assembly	171-1188
Replacement UV lamp for external storage tanks	171-1168
Wall holder	171-1125