

## **Technical Specifications and Operational Features of the DRINKSTATION® Da Vinci Advanced Water Purification System**

The DRINKSTATION® Da Vinci represents a significant advancement in point-of-use (POU) water purification and dispensing technology. This comprehensive overview employs industry-standard terminology to describe the system's proprietary technologies, operational parameters, and purification methodology.

### **Multi-Barrier Purification Architecture**

The DRINKSTATION® Da Vinci implements a sequential multi-barrier purification approach that significantly exceeds conventional single-stage filtration systems. The integrated purification protocol incorporates progressively stringent filtration stages to achieve comprehensive contaminant reduction.

#### Primary Filtration Matrix

The initial stage employs a tripartite filtration mechanism consisting of:

- **Sediment Filtration:** Mechanical removal of suspended particulate matter and turbidity-causing agents
- **Activated Carbon Adsorption (ACF):** Utilization of microporous carbon media for reduction of volatile organic compounds (VOCs), disinfection byproducts, and organoleptic improvement
- **Kinetic Degradation Fluxion (KDF):** Redox-based heavy metal reduction via electrochemical oxidation-reduction reactions

#### Secondary Membrane Filtration

Following primary filtration, water traverses a semi-permeable Reverse Osmosis (RO) membrane, facilitating molecular separation of microcontaminants including:

- Pesticide and herbicide residuals
- Micro and nano-plastics
- Per- and polyfluoroalkyl substances (PFAS/ "forever chemicals")
- Pharmaceutical compounds and endocrine disruptors

#### Tertiary Disinfection and Polishing

The system incorporates advanced post-membrane treatment:

- **Ultraviolet (UV) Sanitization:** Non-chemical microbial inactivation of bacteria, viruses, and protozoan cysts through germicidal irradiation

- Optional Deionization (DI): Ion exchange process for removal of residual monovalent ions that may bypass RO filtration, achieving ultrapure water specifications when it is required by the user
- Coconut-Based Carbon Polishing: Final organoleptic enhancement utilizing renewable coconut-derived carbon media for superior palatability

## **Advanced Thermal Management System**

### **Flash Chilling Technology**

The DRINKSTATION® Da Vinci incorporates proprietary heat exchange technology that enables rapid thermal transfer for on-demand cold water dispensing. The system achieves immediate cooling to 35°F (1.7°C) through an optimized refrigeration cycle with enhanced thermal conductivity at the water-refrigerant interface.

### **Carbonation Technology**

The system features an instantaneous carbonation module that supersaturates water with carbon dioxide through a proprietary pressure-regulated dissolution process. This results in consistent, restaurant-quality carbonation with adjustable saturation levels.

### **Thermal Dispensing Capabilities**

Integrated heating elements provide immediate access to hot water at programmable temperature settings suitable for various culinary and beverage applications. The system maintains thermal energy efficiency through advanced insulation and on-demand activation.

### **pH Optimization Technology**

The DRINKSTATION® Da Vinci incorporates controlled remineralization to produce alkaline water with a pH value of approximately 9.5. This is achieved through precise addition of alkalizing mineral compounds, creating a buffered solution with stable alkaline properties.

## **Physical Specifications and Integration**

The system integrates these advanced technologies within a compact form factor measuring 16.75” (H) × 12.50” (W) × 19.25” (D), facilitating residential countertop installation. The comprehensive design incorporates nearly 100 patented technologies related to:

- Advanced water filtration methodologies
- Controlled remineralization processes
- Thermal management systems (heating and cooling)
- Carbonation dissolution physics
- Refrigeration thermodynamics

This integrated approach provides multifunctional water treatment capabilities within a single POU appliance, delivering superior water quality for residential applications.