US VALVE

# IRX-B

SPACE SAVING COMBINATION BALL AND CHECK VALVE WITH A PATENTED FLOW ADVANTAGE

## ENGINEERED FOR DATA CENTERS

## BUILT TO PERFORM

# High Cv Performance. Space-Saving Design. Built to Simplify Your System.

## Higher Efficiency Requires More Flow in Less Space.

The AI revolution runs on power, and power creates heat. As rack densities increase and next-generation chips run hotter, CDU footprints continue to expand while space inside modern data centers becomes increasingly constrained. These systems must be sized to remove heat from high-power, tightly packed compute, placing greater pressure on both performance and physical footprint. Air cooling has reached its limit, and liquid cooling is now essential. Today's data centers rely on closed-loop systems, including chilled water, direct liquid cooling, and coolant distribution units, to maintain server inlet temperatures within extremely narrow tolerances.

The CDU is the control center of the cooling loop, where flow must be precisely managed and consistently protected. As system densities grow, standard ball valves and check valves take up valuable space while falling short on the high Cv required to support modern cooling architectures. This adds unnecessary complexity and reduces system efficiency at a time when performance and reliability leave little margin for error.

**$540,000** PER HOUR

A single cooling outage costs enterprises an average of $540,000 per hour in lost revenue, SLA penalties, and remediation, not including hardware replacement.

Source: Oxford Economics/ServiceNow, 2024

## The Hidden Threat Inside Your CDU Cooling Loop

Traditional valve designs introduce risks your cooling architecture cannot afford.

### SYSTEM OVERLOAD RISK

As chip power and density increase, CDUs must remove more heat without growing in size. Traditional valve designs limit flow, reducing the system's ability to keep up with rising thermal demands in space-constrained environments.

### SYSTEM PRESSURE DROP

High pressure drop across traditional check valves reduces usable flow and forces pumps to work harder, limiting efficiency and cooling performance as thermal loads increase.

### SYSTEM DESIGN INEFFICIENCY

Bulky, off-the-shelf valves require extra piping and connections, increasing CDU footprint and system complexity in environments where space must be prioritized for compute resources.

## When Failure Is Not an Option

US Valve's patented IRX-B combination Ball and Check Valve is engineered and custom-built for your high-flow direct-to-chip liquid and two-phase cooling applications. Our solutions don't just meet standards; they set them.

**Max Flow & Lowest Pressure Drop**
High Cv elastomer hinge check valve design improves pump and CDU cooling efficiency, pulling heat from the chip.

**Zero Leak Paths**
Internally retained valve seat eliminates external leak paths and provides a fortress of protection for servers.

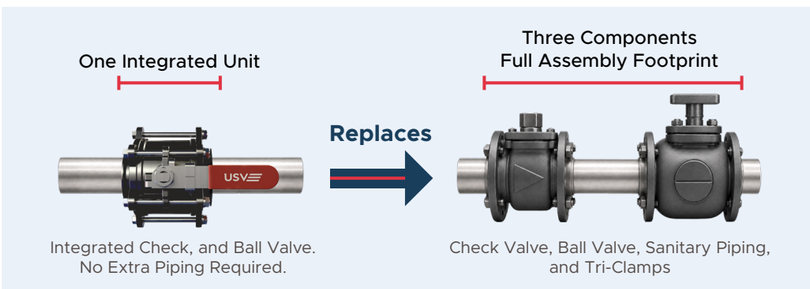
**Engineered to Order**
Valves are designed for your system, not the other way around. USV engineers utilize CFD and create designs that meet your system's flow, space, and material requirements.

## More Flow in Less Space

**50% Smaller Footprint***
Integrated isolation and check functionality in one compact unit, eliminating excess piping and freeing up critical space.
(Based on 4" Tri-Clamp)

**Higher Flow. Lower System Loss.**
High usable Cv with reduced pressure drop allows the system to move more fluid with less energy and greater efficiency.

**Designed Around Your Architecture**
Custom connection options and configurations simplify integration and reduce overall system size.




**Half the Space. All the Performance.**

## Compare For Yourself

| Nominal Size | USV IRX-B Flow Coefficient | Poppet Style Flow Coefficient | USV IRX-B Flow Advantage* |
|---|---|---|---|
| 1" | 37 | 18 | 2x |
| 1.25" | 65 | 29 | 2x |
| 1.5" | 83 | 44 | 2x |
| 2" | 145 | 55 | 3x |
| 2.5" | 350 | 80 | 4x |
| 3" | 590 | 145 | 4x |
| 4" | 920 | 164 | 6x |
| 5" | 1400 | 360 | 4x |
| 6" | 2800 | 458 | 6x |

The **USV IRX-B** Series delivers 2x to 6x higher usable Cv across valve sizes compared to conventional designs. This performance comes from a fundamental reduction in internal restriction.
**USV IRX-B has lower pressure drop under all conditions.*

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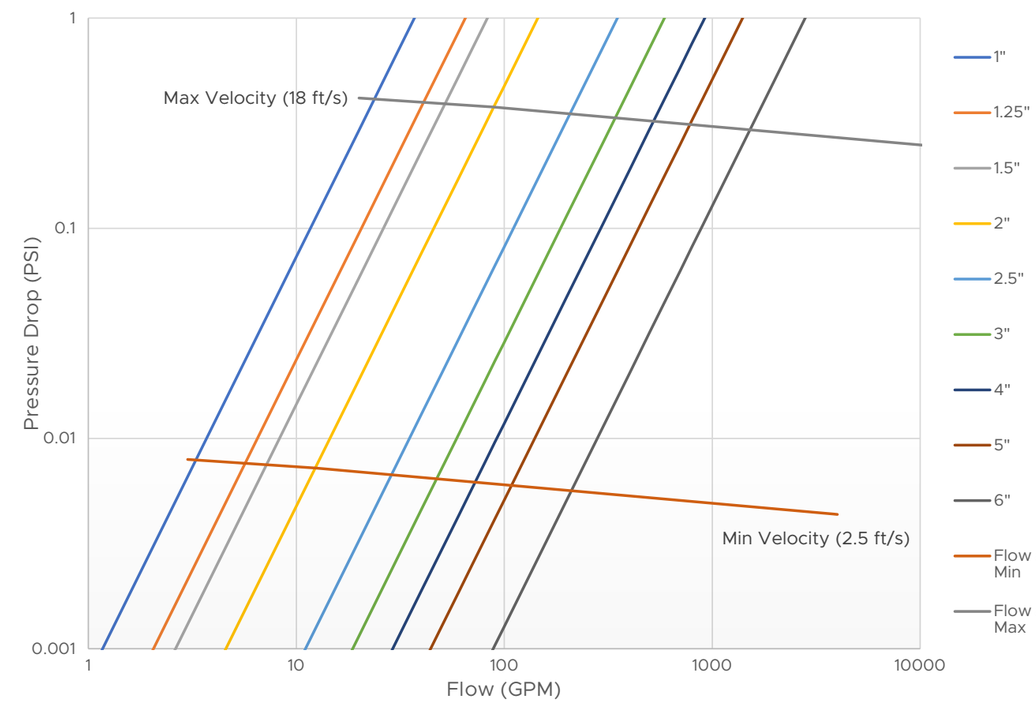
## Operate More Efficiently

The USV IRX-B Series maintains a larger effective flow area when open, reducing internal restriction and pressure loss.

## The USV IRX-B Advantage

1. **Lower pressure loss at higher flow**
2. **Full port design with lower turbulence**
3. **Predictable performance that meets your system's demands.**




## What This Means in Practice

Lower pressure drop delivers system-level gains. Pumps can be sized more accurately, energy demand is reduced, and performance remains stable as flow varies. In continuous-duty systems, including data center cooling, these advantages compound over time, improving efficiency and reducing operational risk.

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## Your System Sets the Requirements. We Build to Match.

The USV IRX-B Series is designed to be configured around your system, not the other way around.

Select from common sizes, materials, and connections below, or quickly align on exactly what your application requires. This platform is built to adapt, making it easy to integrate the valve into your layout.

## USV IRX-B Series Common Configurations

| Nominal Size | 1” | 1.25” | 1.5” | 2” | 2.5” | 3” | 4” | 5” | 6” |
|---|---|---|---|---|---|---|---|---|---|
| DIN | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 |
| Max Pressure | 250 PSI | | | | | | | | |
| Body Materials | 316 SS, Carbon Steel, Brass, Aluminum | | | | | | | | |
| Seal Materials | EPDM, Viton, NBR, Neoprene, Silicone | | | | | | | | |
| Connections | Tri-Clamp/Sanitary, Flanged, Groove End, MNPT/FNPT, Wafer, ORB, Custom | | | | | | | | |
| Custom Length | Specify exact end-to-end dimension | | | | | | | | |
| Custom Width | Specify exact end-to-end dimension | | | | | | | | |
| Profiles | Optimized profiles for high-density CDU installations | | | | | | | | |
| Certifications | ISO 9001:2015 | | | | | | | | |
| Patent | Protected by US Patent No. 12,422,051 and international patent WO2025/128473. | | | | | | | | |

**Consult USV for additional materials, sizes, and end connections*

## Where Standard Ends, Flexibility Begins

The configuration options shown above represent the most common ways the IRX-B Series is specified and applied. They are provided to illustrate typical starting points, not to restrict what can be built.

The IRX-B Series is a fully configurable check valve platform. Materials, seals, connections, end-to-end length, overall width, and internal geometry can all be tailored to match your system requirements. The valve is designed to integrate cleanly into virtually any layout, allowing you to specify exactly what your application demands without forcing adapters, workarounds, or layout concessions.

### Ready to configure an IRX-B Check Valve for your system?

Share your flow rate, connections, media, and pressure requirements, and our team will quickly engineer an IRX-B High-Flow, Low-Pressure-Drop check valve tailored to your application. With rapid prototyping and on-demand production capacity, U.S. Valve is built to support your CDU fluidics program from concept to scale.



## A Platform You Can Build On

Engineered scale, proven execution, and long-term partnership.

*Trusted Solutions, Improving Lives™*

U.S. Valve is part of IDEX Corporation, a global engineered products company traded on the New York Stock Exchange (IEX) and a member of the S&P 500. That scale and accountability provide the foundation behind how we commit to programs, support customers, and deliver reliably over the long term.

IDEX is a $3.5 billion organization with approximately 9,000 employees and operations in more than 20 countries, serving industries where performance, reliability, and continuity are non-negotiable. Across fluid systems, life sciences, fire and rescue, precision optics, and data center infrastructure, IDEX builds mission-critical products designed to perform consistently in demanding environments.

As demand accelerates for AI infrastructure and data center power and cooling systems, IDEX continues to invest alongside its customers. That investment translates into real capacity, disciplined execution, and the ability to support programs not just at launch, but through expansion, replication, and sustained operation.

## Partnered for Engineered Performance at Scale

**Fast Delivery**
Valves are typically assembled, tested, and released within one to two days of order receipt, helping programs stay on schedule without sacrificing quality or consistency.

**Tested Performance**
Every valve is one hundred percent tested prior to shipment to verify zero-leak integrity and ensure reliable performance in real operating conditions.

**Capacity to Scale**
Backed by IDEX’s global manufacturing footprint, US Valve programs are supported by expandable capacity across multiple facilities, providing continuity and the ability to scale production as demand grows.

**Engineering & Execution**
US Valve combines application-level engineering support with fast, autonomous execution, allowing decisions, quoting, and delivery to move quickly as programs evolve.

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