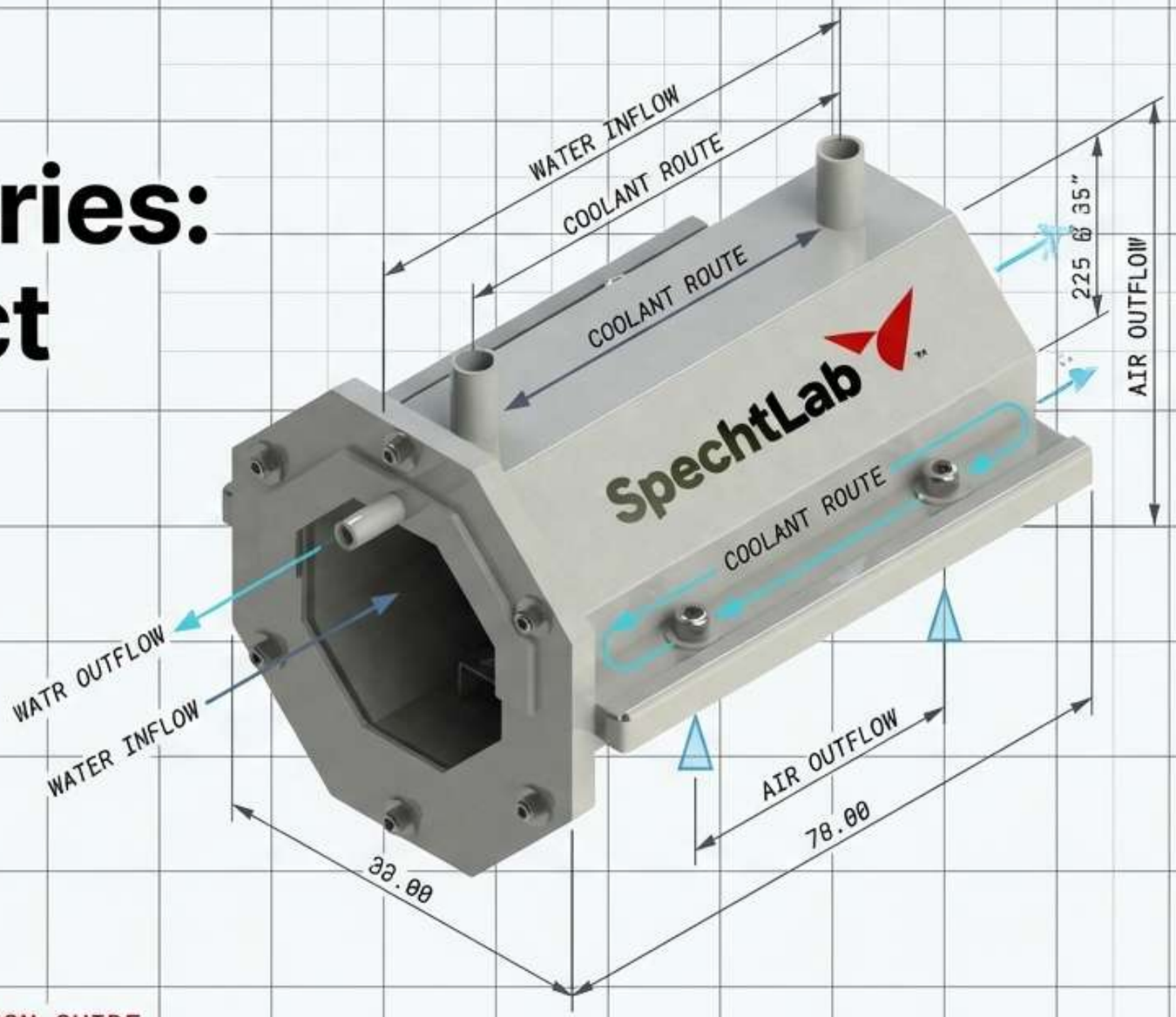
spechtLab.

# SpechtLab LC Series: Technical Product Reference

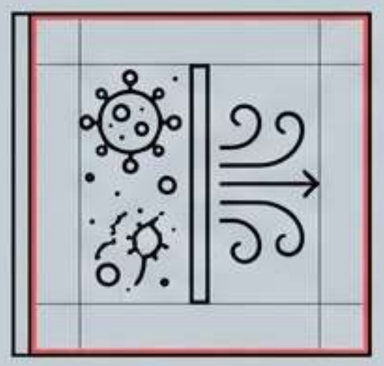
## Water & Air Cooled Camera Enclosures for Extreme Industrial Environments.




COMPREHENSIVE TECHNICAL SPECIFICATION & INTEGRATION GUIDE

# THE THREAT VECTOR

Extreme
Ambient Heat



Airborne
Particulate Matter
(Dust/Soot)

Severe Mechanical
& Corrosive Stress

# THE ENGINEERED SOLUTION

## Core Purpose

Engineered to protect sensitive AI-driven optical sensors and stereoscopic cameras in hostile heavy-industry conditions.

## Design Philosophy

Enables rapid repair, maintenance, and installation in high-risk OHS (Occupational Health and Safety) zones without requiring production line shutdowns.

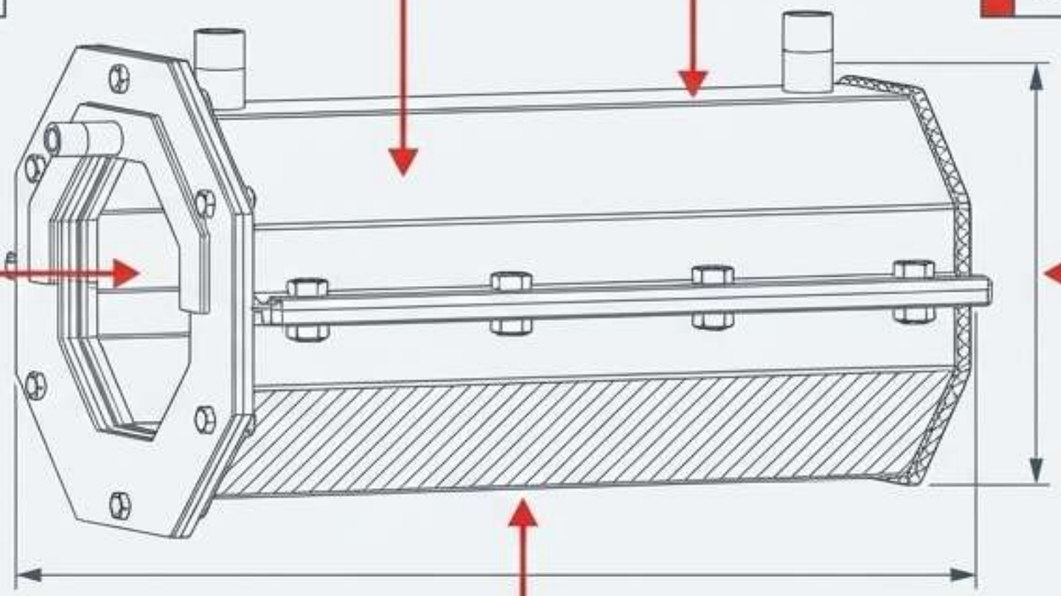
## Key Capability

Maintains internal thermal equilibrium, allowing delicate optical equipment to survive where standard hardware categorically fails.

# MECHANICAL ANATOMY & MATERIAL INTEGRITY

1 **Housing Material:**
**AISI 310 Stainless Steel**
Selected for extreme thermal and oxidation resistance.

2 **Ingress Protection:**
**IP65**
Total dust ingress protection & resistance to low-pressure water jets.

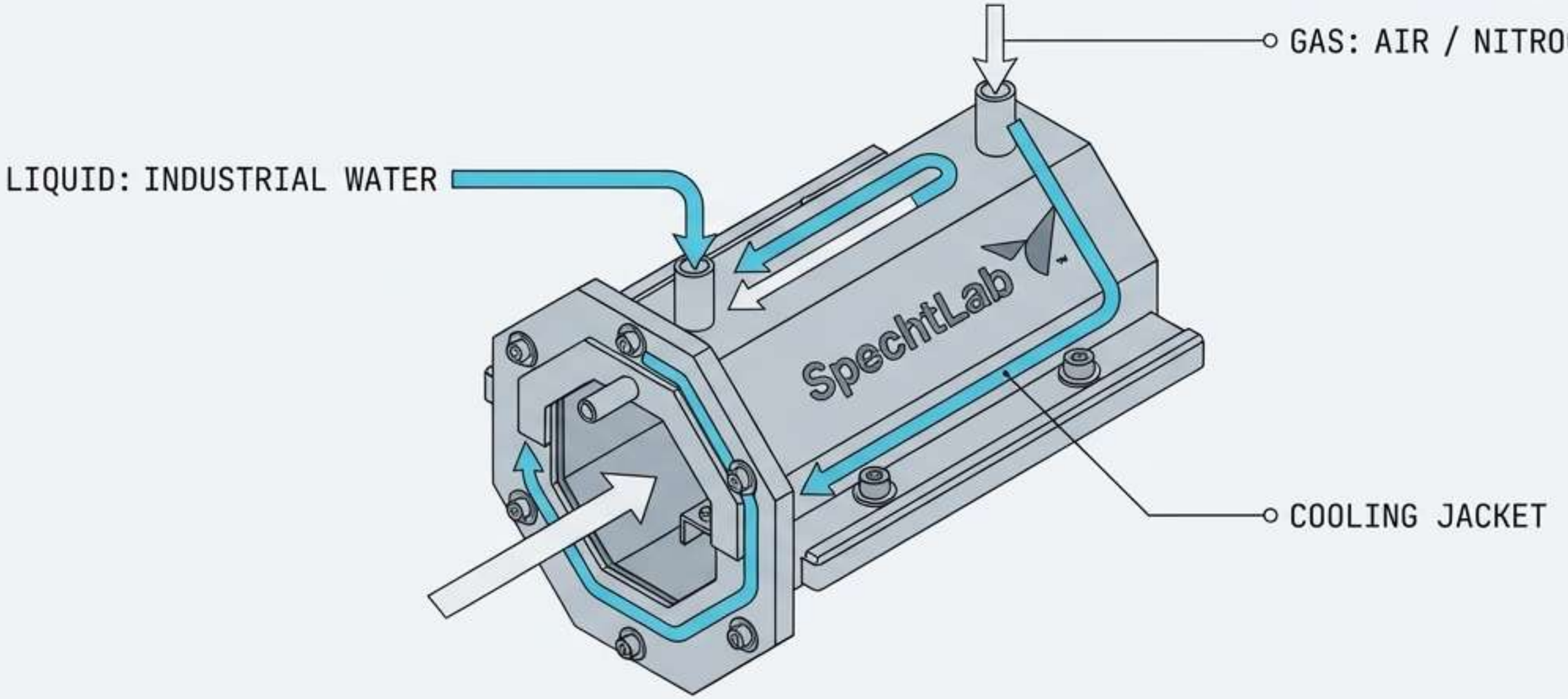


3 **Optical Interface:**
Custom Glass
Equipped with IR/Bandpass Filter options.

5 **Total Weight:**
4.620 kg

4 **Physical Footprint:**
950 x 400 x 470 mm

# THERMAL MANAGEMENT ARCHITECTURE




## Thermal Equilibrium in Hostile Zones

The LC Series relies on dual-modality thermal management. Industrial water provides the primary thermal shield against radiant furnace heat, while continuous air/nitrogen flow provides secondary cooling and environmental clearing.

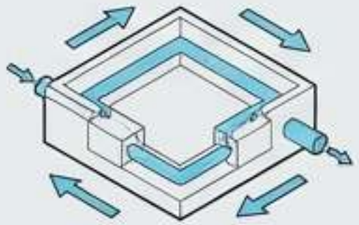
# COOLING DYNAMICS: LIQUID VS. GAS

## LIQUID (WATER) COOLING

**Role:**
Primary thermal shield.

**Mechanism:**
Continuous flow of industrial water inside the chamber walls.

**Strict Requirement:** ⚠
Water MUST flow continuously when placed in hot environments.

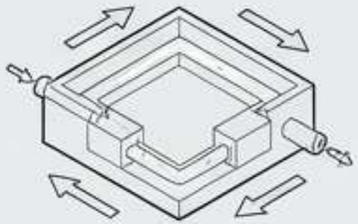


## GAS (AIR) COOLING

**Role:**
Secondary thermal management and internal pressure equilibrium. `Inter`

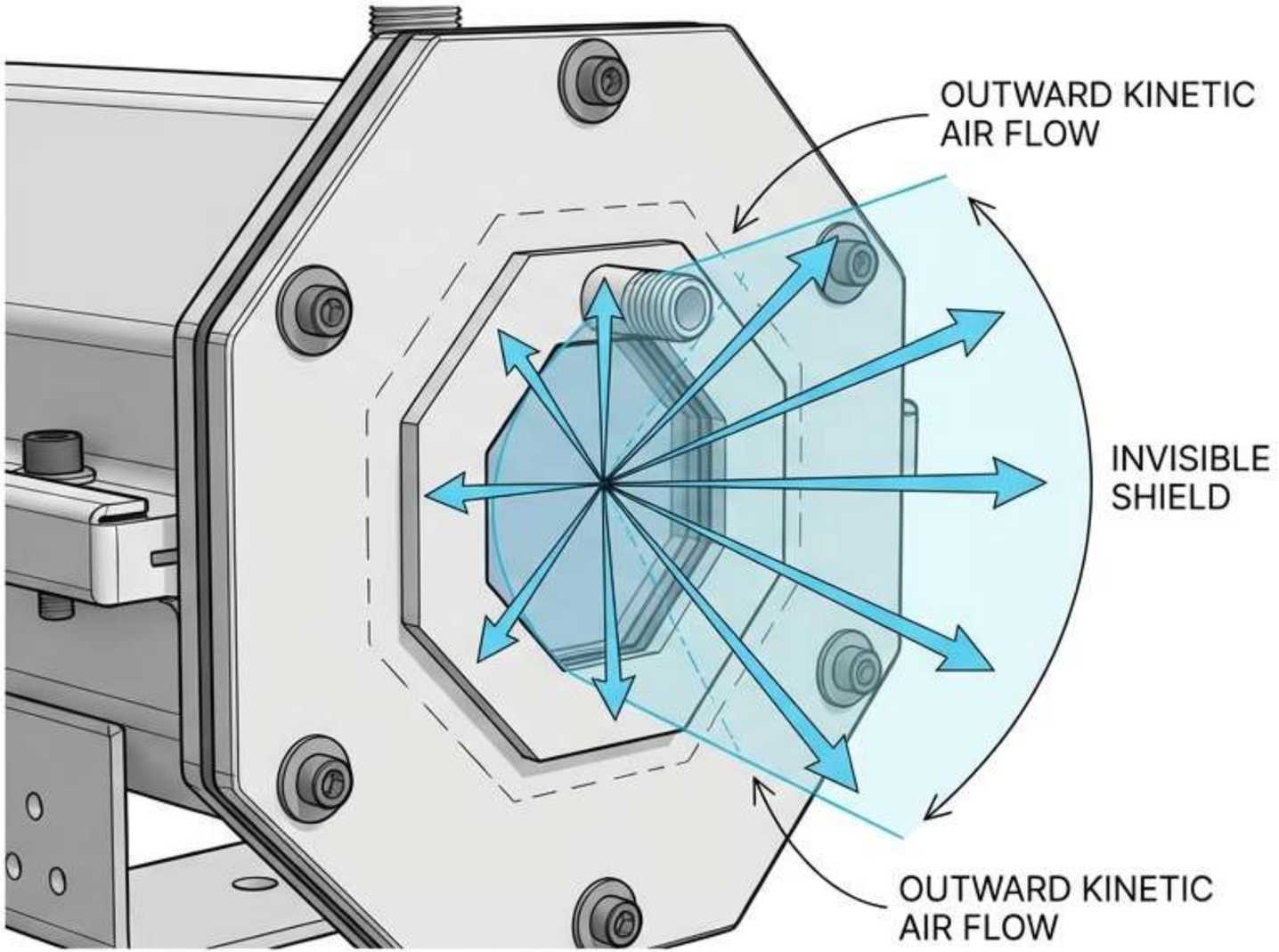
**Mechanism:**
Utilizes industrial Nitrogen gas or purified air.
`JetBrains Mono`

**Strict Requirement:** ⚠
Requires sustained pneumatic feed for optimal operation.



⚠ **OPERATIONAL LIMIT WARNING:** While deployed in extreme heavy-industry environments, the documented maximum operating temperature for this unit under full cooling load is **strictly 400°C.**

# AIR CURTAIN TECHNOLOGY & OPTICAL INTEGRITY




[ > **The Air Curtain Effect:** The continuous outward air flow acts as an invisible kinetic shield, deflecting particulate matter.

[ > **Lens Integrity:** Ensures the specialized IR/Bandpass glass remains perfectly dry, clean, and free of occluding debris, metal dust, or soot.

[ > **Supplementary Role:** Aids in dissipating localized thermal buildup around the optical aperture, contributing to temperature regulation.

**Data Note:** Exact required air pressure for the air curtain is not specified in the source (Kaynakta belirtilmemiştir).

# EMPIRICAL SPECIFICATIONS THRESHOLDS

## MAX OPERATING TEMP


## MAX LIQUID PRESSURE

4 bar

## IND. WATER TEMP LIMITS

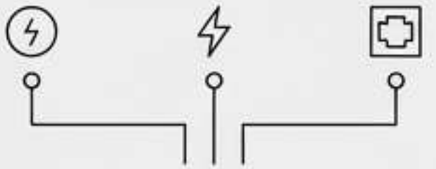

## FLOW RATE REQ (25°C WATER)

10 Liters/min

## FLOW RATE REQ (35°C WATER)

20 Liters/min

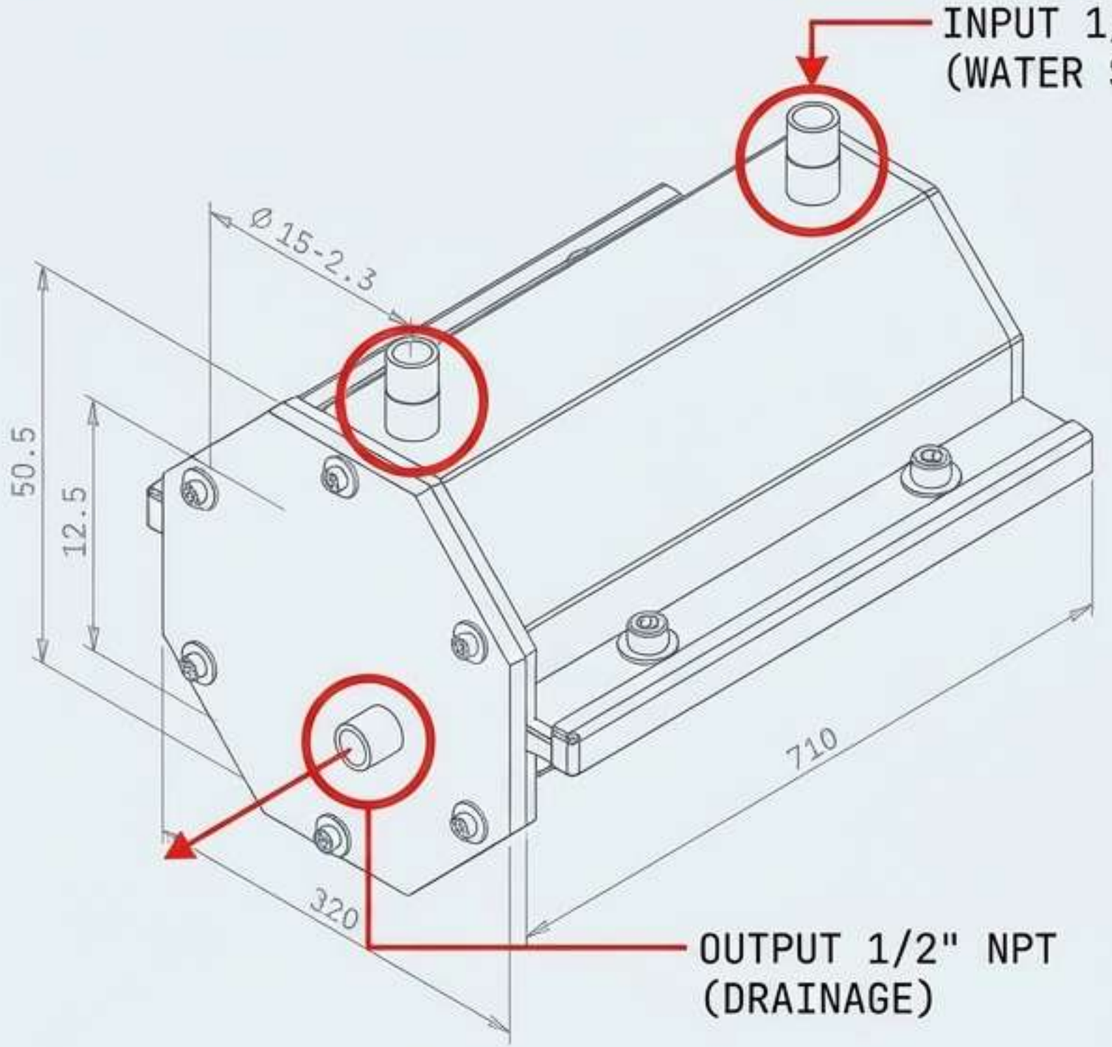
## ELECTRICAL INPUTS



220V AC / 24V DC / PoE

Data: M12 x 1 (12-pin/8-pin X code), RJ45

# ASSEMBLY PROTOCOLS: PLUMBING



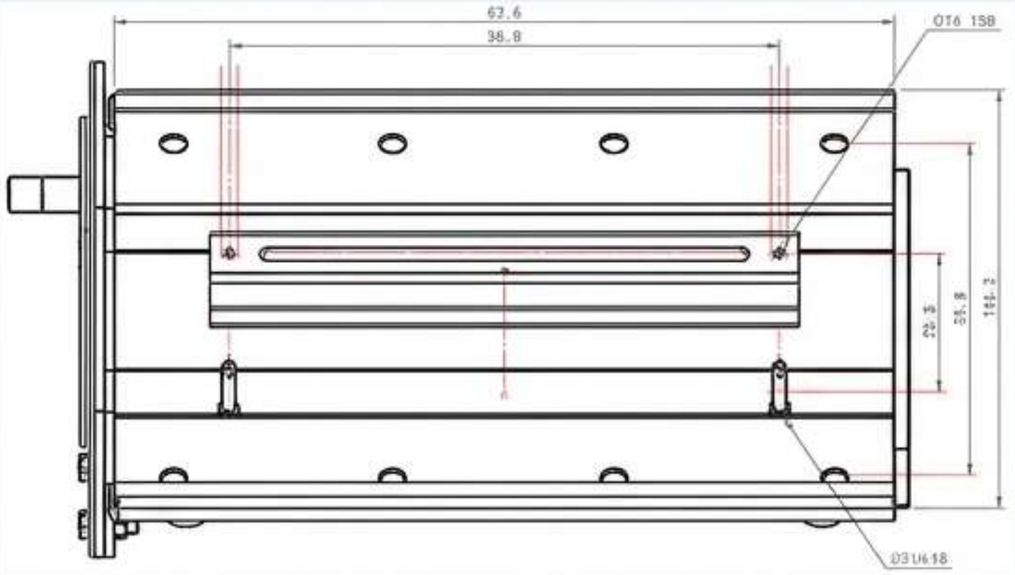

1. Connect industrial water supply to the designated 1/2 inch input.

2. Route the output line to a safe drainage or recirculation loop.

## CRITICAL PLUMBING RULE

Never close or obstruct the water exit 1/2 inch connectors.
In high-heat environments, water MUST flow continuously.
Failing to maintain an open exit will result in pressure build-up and catastrophic unit damage.

# ASSEMBLY PROTOCOLS: CAMERA MOUNTING




Step 1:

Remove the securing nuts located on the internal mounting rail.

Step 2:

Carefully extract the rail from the main LC housing.

Step 3:

Mount the stereoscopic or AI camera securely to the removed rail.

Step 4:
Insert the rail back into the housing and reverse the nut assembly to lock the camera in place.

# ELECTRICAL & INTEGRATION GUIDELINES

## COMPLIANT INTEGRATION

**EMC Compliance:** Adequately shielded cables must be used wherever Electromagnetic Compatibility (EMC) is an issue in the plant.

**Environmental Resistance:** The unit is IP65 rated and can be safely deployed in damp or high-humidity operational zones.

## RESTRICTED ACTIONS

**Cable Routing:** Video and data cables must NEVER share the same conduit with supply voltage cables.

**Liquid Hazards:** For security reasons, do not install near open water containers and never pour liquids directly into the unit.

# APPLICATION: IRON, STEEL & METAL PROCESSING

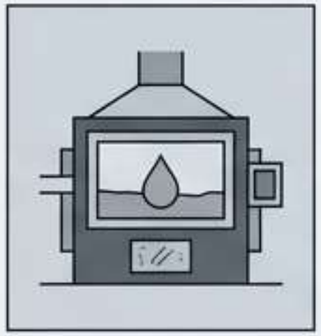

**Sector:** Iron, Steel & Non-Ferrous Metal Processing

Deployed over continuous casting lines, rolling mills, plasma heating, and induction heating zones.

**VALUE:**
Protects advanced stereoscopic width-measurement and OCR AI cameras from **intense radiant furnace heat** and **corrosive metal dust**, enabling **real-time dimension and defect tracking** without hardware failure.

`CRITICAL CALLOUT: ENSURE PROPER THERMAL SEALING`
`DATA: 24/7 OPERATION ENABLED`

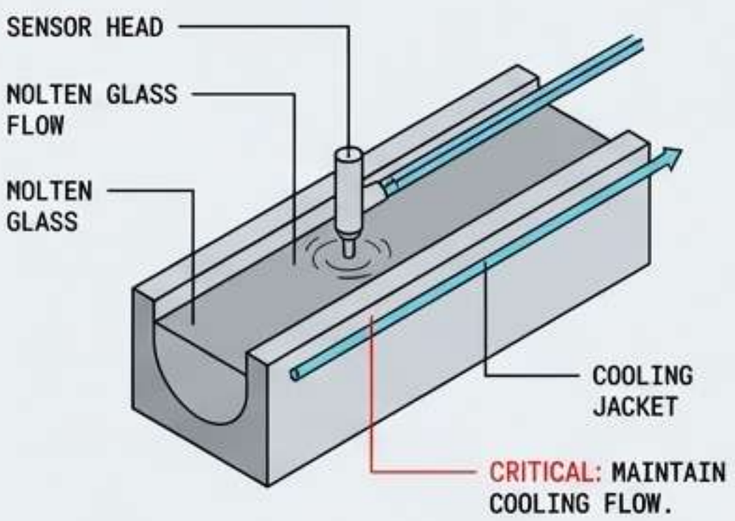
# CROSS-SECTOR DEPLOYMENT PROFILES

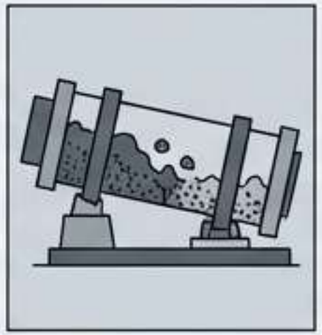


## GLASS PRODUCTION

In-furnace and hot-end monitoring. Ensures defect detection AI survives ambient furnace heat for total quality control.

**ENVIRONMENT:** HIGH-TEMP, MOLTEN GLASS ZONES.
**DATA:** DEFECT DETECTION AI ENABLED.

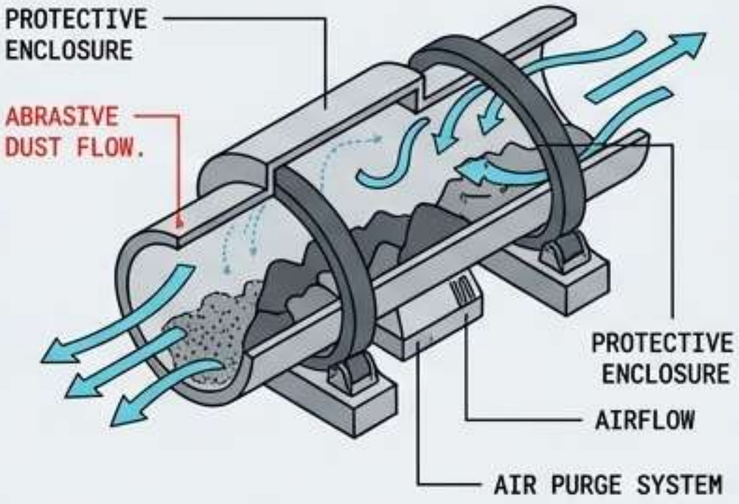


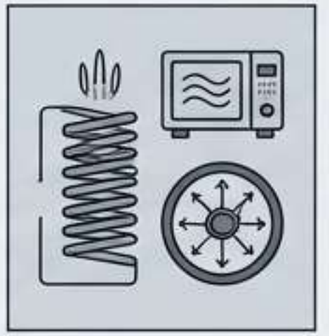



## CEMENT & REFRACTORY

Rotary kiln monitoring. Built to withstand extreme, abrasive, particulate-heavy environments without lens occlusion.

**ENVIRONMENT:** ABRASIVE, DUSTY, HIGH-TEMP KILN.
**PROTECTION:** PARTICULATE SHIELDING.

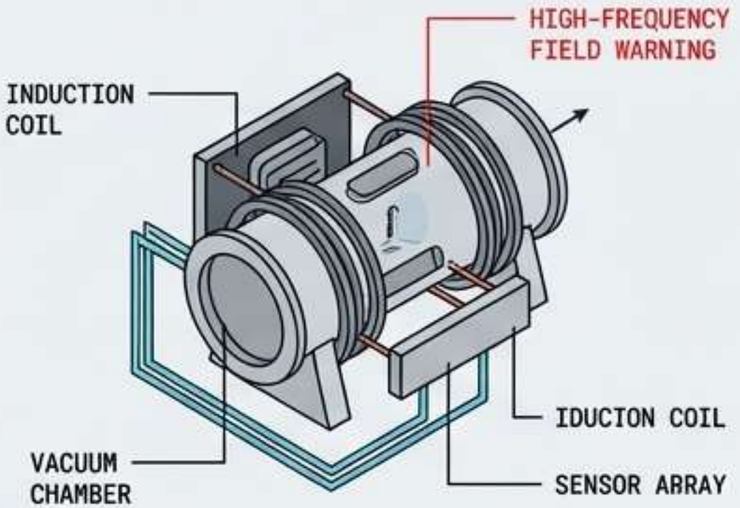


## ENERGY & SCIENTIFIC

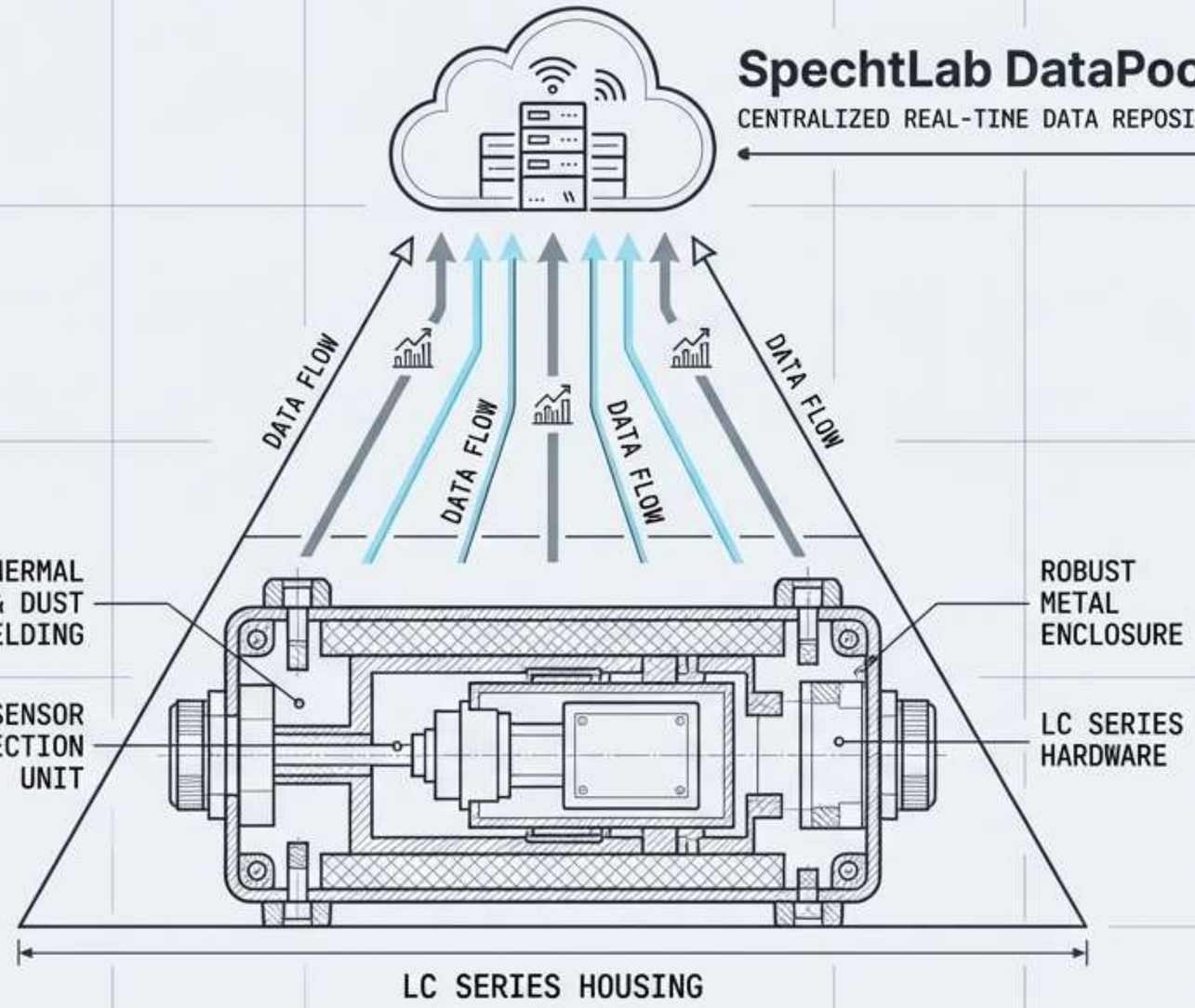
Used in medium/high-frequency induction, microwave heating, and advanced vacuum equipment operations.

**ENVIRONMENT:** VACUUM, ELECTROMAGNETIC FIELDS, RF HEATING.
**APPLICATIONS:** INDUCTION, MICROWAVE.




**Data Note:** Specific energy sector deployment metrics are not specified in the source (Kaynakta belirtilmemiştir).

# ECOSYSTEM SYNTHESIS: HARDWARE ARMOR FOR INDUSTRY 4.0




The LC Series is not just a protective box; it is the physical enabler of Industry 4.0 in extreme environments. By ensuring the survival of optical sensors, the LC Series guarantees a continuous, real-time data flow into SpechtLab's DataPool™.

- POWERS ADVANCED AI ANALYTICS
- REAL-TIME DEFECT DETECTION
- PREDICTIVE MAINTENANCE ALGORITHMS

[Data Note: Specific data transmission rates are not specified in the source]

SpechtLab.

For detailed integration planning, custom cooling configurations, and DataPool ecosystem deployment:

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Phone: +90 506 884 01 56

Manufacturing: Domestic Production (Yerli Üretim) - Engineered for Global Deployment.