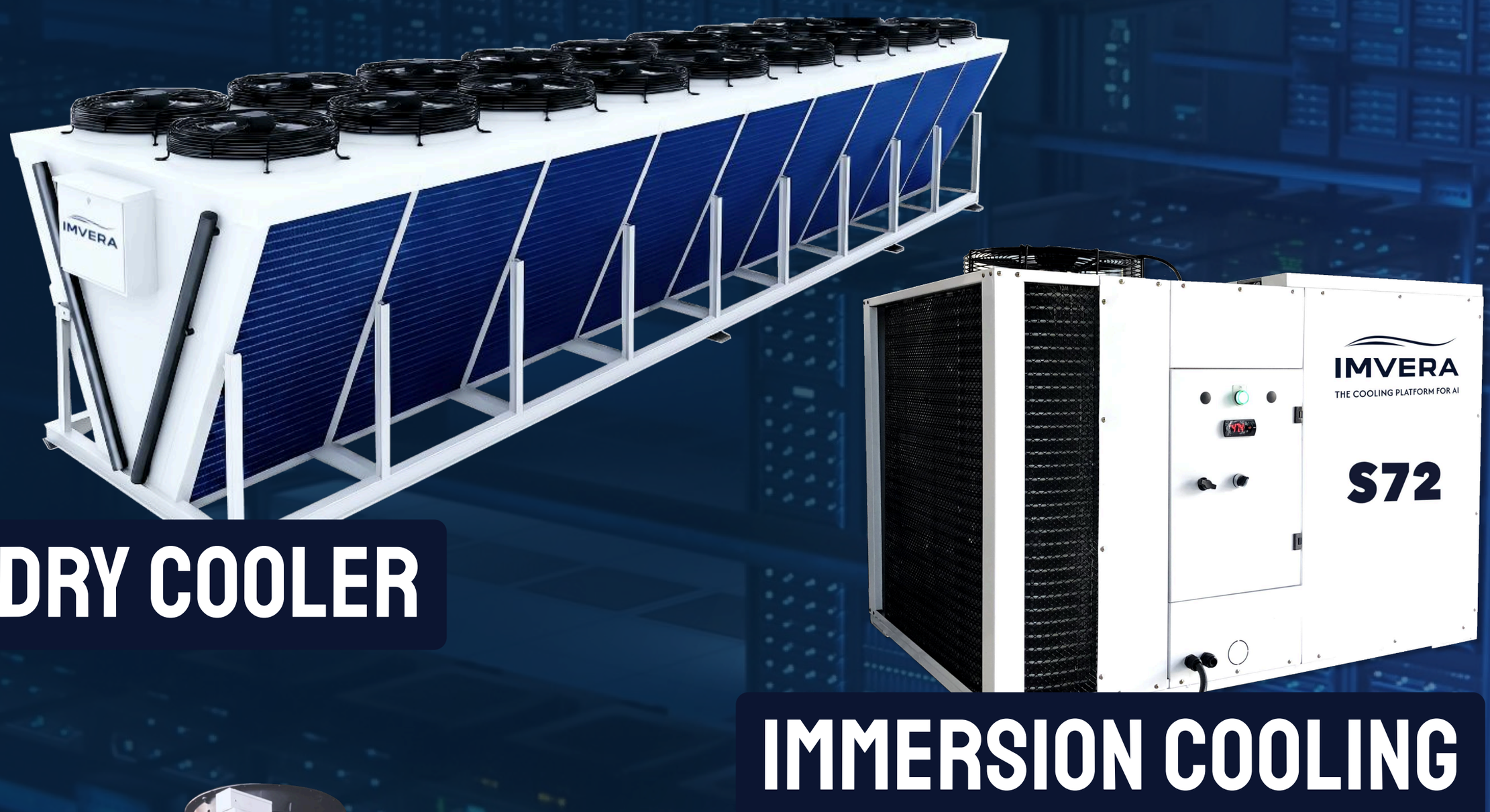
IMVERA

THE COOLING PLATFORM FOR AI

ENGINEERED FOR PERFORMANCE · DATA CENTER COOLING

DATA CENTER COOLING SOLUTIONS

Reliable Thermal Management for High-Density Server Environments



DRY COOLER

IMMERSION COOLING

NEW

D-COAT+ TECHNOLOGY

FOR MAXIMUM PROTECTION

ADIABATIC

COMPANY OVERVIEW

About CIG BluSolutions

Engineering Excellence in HVAC/R Solutions

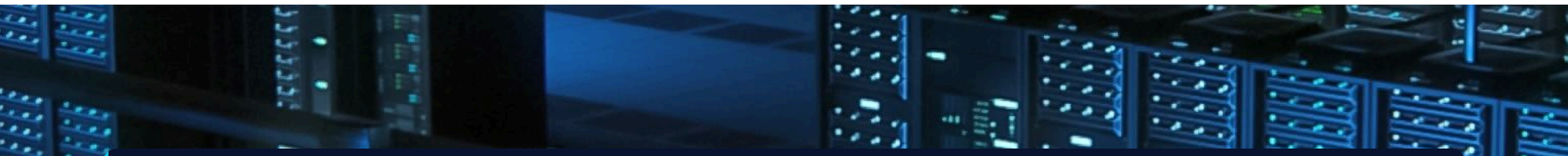
CIG BluSolutions is a trusted manufacturer of advanced HVAC/R technologies, delivering high-performance thermal management solutions for commercial, industrial, and specialized applications worldwide. With over 40 years of engineering expertise, we design systems that excel in demanding operational environments — including data centers, industrial process cooling, marine-grade applications, and cold chain logistics.

Our manufacturing facility in Pathumthani, Thailand produces world-class heat exchangers and dry coolers supplied to major global OEMs. Every unit exits our facility with rigorous quality validation under ISO 9001:2015 standards.

Under our strategic vision — ***Advancing Sustainability*** — we continuously invest in energy-efficient designs and eco-conscious materials that reduce environmental impact without compromising operational performance.

Global Certifications

- ISO 9001:2015 Quality Management
- UL Certified — Maximum Capacity & Safety
- Carrier Q+ Level 3 Approved Supplier
- AHRI — Verified Performance
  *Available for selected models or upon request
- EcoVadis Sustainability Bronze Rating
- Carbon Footprint Organization (CFO)
- REACH Compliant
- RoHS Certified



IMVERA by CIG BluSolutions

The IMVERA product line represents CIG BluSolutions' dedicated engineering series for data center thermal management. Combining four decades of heat exchanger manufacturing expertise with purpose-built designs for IT infrastructure environments, IMVERA products are engineered to meet the precision demands of modern high-density server facilities — delivering reliable, energy-efficient heat rejection at scale.

IMVERA
THE COOLING PLATFORM FOR AI

ENGINEERED FOR PERFORMANCE · DATA CENTER COOLING

TOTAL IMMERSION

Dielectric Fluid Cooling for Data Centers

Reliable Thermal Management for High-Density Server Environments

1.08 PUE
ACHIEVABLE PUE

60 kW
S-20 · S-40 · S-80

~80 kW
LESS ENERGY VS. AIR COOLING

Custom
CONFIGURED PER PROJECT

NEW

D-COAT+ TECHNOLOGY

FOR MAXIMUM PROTECTION

PRODUCT OVERVIEW

IMVERA S-Series Immersion Cooling

The IMVERA S-Series is a family of self-contained dielectric fluid immersion cooling systems engineered for data center deployments. Servers are fully submerged in electrically non-conductive dielectric fluid that absorbs heat directly from all IT hardware surfaces. The warmed fluid is then circulated by pump through a CIG BluSolutions fin-tube coil heat exchanger — cooled by an integrated fan unit — before returning to the tank. No external chiller, no facility water loop, no complex infrastructure. Each unit is a complete, standalone cooling system designed for rapid deployment and scalable configuration.

ACHIEVABLE PUE

1.08

LESS ENERGY VS. AIR COOLING

~80 %

PER RACK — NO HOT SPOTS

60 kW

CONVENTIONAL

Air-Cooled Server Room

- ✗ PUE typically 1.8–1.89 industry average
- ✗ Server fans consume 10–15% of IT power
- ✗ Hot spot risk above 20–25 kW per rack
- ✗ Dust and humidity degrade hardware over time
- ✗ High construction cost for cooling infrastructure

VS

IMVERA S-SERIES

Dielectric Immersion Cooling

- ✓ PUE 1.08 achievable — ~80% less energy use
- ✓ Server fans removed — fluid does the cooling
- ✓ Up to 60 kW per rack with no hot spot risk
- ✓ Fluid shields hardware from dust, humidity, corrosion
- ✓ Lower construction cost — no CRAC or raised floor

Model Range

S-72

7.2 kW

Unit: 900 × 1,400 × 890 mm
Bath: 580 × 830 × 573 mm
Supply: 220V / 1-Ph / 50Hz
Fan: Ø450 mm / 250W

S-156 STANDARD CONFIG

15.69 kW

Unit: 1,000 × 1,700 × 900 mm
Bath: 703 × 1,010 × 568 mm
Supply: 380V / 3-Ph / 50Hz
Fan: Ø500 mm / 450W

S-Custom

Project Specific

Capacity, tank size, coil rows, fan count & electrical supply all configured per project. Contact IMVERA Engineering.

S-72 and **S-156** are standard stocking configurations. All parameters — tank dimensions, coil specification, fan sizing, electrical supply, and fluid type — can be configured per project requirements.

Contact IMVERA Engineering with your IT load profile and site conditions.

OPERATING PRINCIPLE

How the S-Series Works

The IMVERA S-Series operates as a fully self-contained, air-cooled immersion cooling system. Dielectric fluid circulates in a closed loop entirely within the unit — from the immersion tank, through the pump, through CIG BluSolutions' proprietary fin-tube coil heat exchanger, and back. No external water connection is required.

How Immersion Works

01

Servers Submerged in Dielectric Fluid

IT equipment is fully immersed. Server fans are removed. Fluid contacts all heat-generating surfaces directly — CPU, GPU, memory, and PSU.

Fluid in tank: ≤ 65°C

02

Heat Absorbed by Fluid

Dielectric fluid absorbs heat at the point of generation. Thermal conductivity is far superior to air — no hot spots, no thermal gradient across the rack.

Direct contact cooling

03

Pump Circulates to Fin-Tube Coil HEX

Warm fluid is pumped to the CIG BluSolutions copper tube / aluminium fin heat exchanger — the same proven coil technology built for global OEM supply.

Flow: Continuous

04

Fan Rejects Heat to Air

The fan draws ambient air across the coil surface, rejecting heat to atmosphere. Cooled fluid returns to the tank. The loop is fully self-contained.

Ambient: ≤ 40°C

The Immersion Advantage

PUE 1.08 — ~80% Less Energy

Eliminates CRAC units, raised floor distribution, and hot/cold aisle infrastructure. PUE drops from the industry average of 1.85 to as low as 1.08 — directly reducing electricity costs at scale.

Zero Fan Noise — Silent Operation

Server fans are removed before deployment. The immersion environment is near-silent, eliminating vibration-induced hardware failures and enabling edge or office-adjacent deployments.

Up to 60 kW Per Rack — No Hot Spots

Fluid cooling removes the density ceiling imposed by air. Support GPU clusters, AI/HPC, and high-frequency trading workloads that exceed air-cooling thermal limits — with no hot spot risk.

Hardware Life Extension

Dielectric fluid shields hardware from dust, humidity, and corrosion. Reduced thermal cycling stress and vibration improve MTBF — lowering hardware refresh costs over the facility lifecycle.

Lower Construction Cost

No raised floor, no precision CRAC units, no hot aisle containment. The S-Series is self-contained — reducing upfront civil and M&E infrastructure cost significantly versus conventional DC builds.

Rapid Deployment & Easy Scale

Self-contained units deploy independently. Scale capacity by adding units — no central plant expansion required. Ideal for edge data centers, modular deployments, and fast-growth capacity planning.

Specifications

MODEL SPECIFICATIONS

PARAMETER	S-72	S-156
Heat Rejection Capacity	7.20 kW	15.69 kW
Overall Dimension (W × L × H)	900 × 1,400 × 890 mm	1,000 × 1,700 × 900 mm
Bath (Tank) Dimension (W × L × H)	580 × 830 × 573 mm	703 × 1,010 × 568 mm
Electric Power Supply	220V / Single-phase / 50Hz Max 32A	380V / Three-phase / 50Hz Max 21A
Fluid Pump	0.5 HP | 370W avg. (max 570W) | 230V 50Hz	
Fan Diameter / Power	Ø450 mm / 250W 1,380 r/min · 230V 50Hz	Ø500 mm / 450W 1,320 r/min · 380V 50Hz
Fan Quantity	1 fan standard | redundancy fan available on request	
Control System	Temperature monitoring · Fan & pump cut-off protection	
Heat Exchanger Type	Air-cooled fin-tube | U-Shape | Copper tube · Aluminium fins	
Fluid Inlet Temperature	65°C	
Fluid Outlet Temperature	45°C	
Ambient Air Temperature	40°C	
Dielectric Fluid Type	Air-cooled fin-tube | U-Shape | Copper tube · Aluminium fins	
Electrical Breakdown Voltage	12.5 kV Factory-tested at commissioning · Annual retest recommended	

S-72 and **S-156** are standard configurations based on verified factory specifications. For higher IT load requirements, multi-unit deployments, or custom tank dimensions, contact IMVERA Engineering for S-Custom configuration. All electrical and thermal specifications are configurable per project.

Core Features

Dielectric Fluid Tank

Stainless steel bath engineered for long-term dielectric fluid containment — fluid-tight, corrosion-resistant, and sized for the target server configuration.

Fluid Circulation Pump

Reliable fluid pump maintains continuous dielectric circulation from tank to heat exchanger — ensuring stable server temperatures and consistent heat rejection performance.

CIG Fin-Tube Coil Heat Exchanger

Copper tube / aluminium fin coil, U-shape — CIG BluSolutions' core manufacturing expertise. Proven in OEM supply to Carrier, Trane, and Daikin. The same engineering rigour, purpose-built for dielectric fluid cooling.

Integrated Fan Unit

Draws ambient air across the coil surface to reject heat to atmosphere — making the system fully self-contained with no external water connection required.

Temperature Controller

Automated temperature monitoring with configurable cut-off protection for pump and fan — maintaining safe fluid temperatures and protecting IT equipment at all times.

Factory-Tested & Fluid-Ready

Every unit is pressure-tested, pump-verified, and dielectric breakdown voltage tested (≥ 12.5 kV) at our ISO 9001:2015 facility — delivered commission-ready for immediate server loading.

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MAXFLOW DRY COOLER

V-Type Heat Rejection System

Reliable Thermal Management for High-Density Server Environments

132.6–1164.7 kW
CAPACITY RANGE

EC 800 mm
FAN TYPE / DIAMETER

77 dB(A)
SOUND PRESSURE

V-Type
COIL CONFIGURATION

Fin-Tube | Micro-Channel
HEAT-EXCHANGER

Water
FLUID MEDIUM

NEW

D-COAT+ TECHNOLOGY

FOR MAXIMUM PROTECTION

PRODUCT OVERVIEW

MaxFlow Dry Cooler

The IMVERA MaxFlow Dry Cooler is a V-type fin-and-tube heat rejection unit designed specifically for water-cooled data center infrastructure. Featuring EC axial fans, inner-grooved copper tube coils, and a symmetrical V-frame structure, it delivers high thermal capacity in a compact installation footprint — optimized for 24/7 mission-critical operation.

132.6–1164.7 kW	800 mm	2.9 kW/fan	77 dB(A)	4.4 A
CAPACITY RANGE	EC FAN DIAMETER	MOTOR POWER INPUT	SOUND PRESSURE LEVEL	FAN CURRENT (PER MOTOR)

Application Scope

01

Data Center Cooling Loops

Primary or secondary heat rejection for water-cooled server infrastructure. Operates in closed-loop circuits with treated process water or glycol solutions.

02

CDU / Chiller Heat Rejection

Paired with Coolant Distribution Units or process chillers as the outdoor heat rejection stage. Suitable for rear-door, direct-liquid, or immersion cooling topologies.

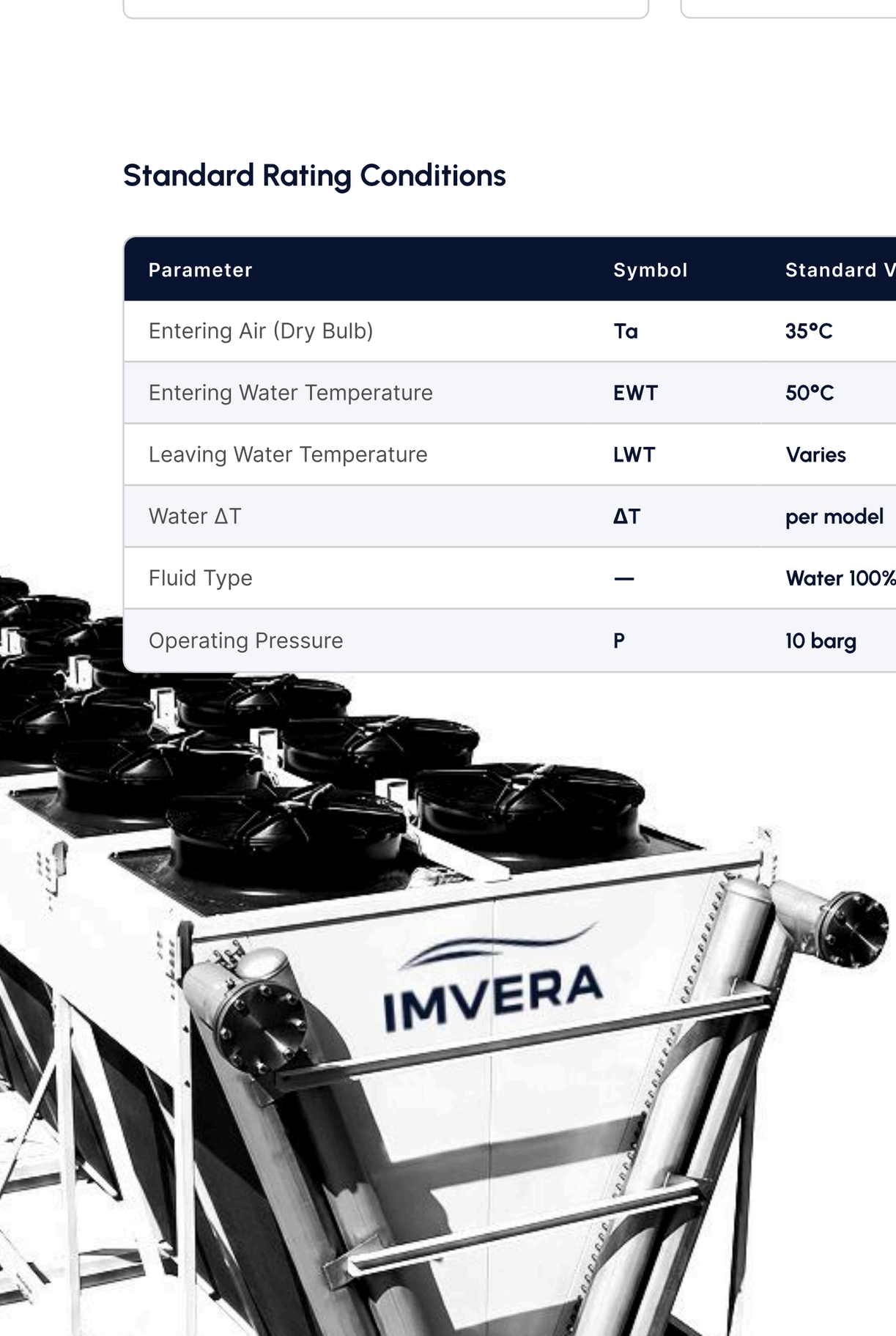
03

Free Cooling & Economizer Mode

When ambient temperatures permit, the MaxFlow can operate in free-cooling mode, significantly reducing mechanical cooling energy consumption during cooler seasons.

Standard Rating Conditions

Parameter	Symbol	Standard Value	Unit	Notes
Entering Air (Dry Bulb)	**Ta**	**35°C**	°C DB	Ambient dry-bulb temperature
Entering Water Temperature	**EWT**	**50°C**	°C	Hot water inlet to coil
Leaving Water Temperature	**LWT**	**Varies**	°C	See selection data table
Water ΔT	**ΔT**	**per model**	K	EWT − LWT, model-dependent
Fluid Type	**—**	**Water 100%**	—	Ethylene glycol correction available
Operating Pressure	**P**	**10 barg**	barg	16 barg available on request



ENGINEERING HIGHLIGHTS

Core Features

IMVERA

V-Type Coil Configuration

The symmetrical V-frame design maximises coil face area relative to unit footprint, improving air-side heat transfer effectiveness and enabling high rejection capacity in a compact envelope.

AL Fin / CU Tube | 2, 3, or 4 Rows

EC Axial Fan Technology

Electronically commutated (EC) motors provide precise speed control, high efficiency across the operating range, and IP54-rated protection. Fan speed modulation enables energy savings at part-load.

Ø800 mm | 2.9 kW/fan | IP54

Inner-Grooved Copper Tube Coils

Copper tubes with inner-groove enhancement increase turbulence and wetted surface area, improving fluid-side heat transfer coefficients by up to 30% versus smooth bore tubes.

Inner-grooved CU | AL fins | 10 barg std.

Galvanized Steel Frame Construction

Heavy-gauge galvanized steel chassis provides structural rigidity for large multi-fan configurations. The V-frame base integrates forklift access points and anchor provisions.

Hot-dip galvanized | Powder-coated finish

Scalable Series Configuration

Multiple fan-row configurations (2 to 10 fans per row × 2 rows) allow capacity scaling from 38 kW to over 582 kW in a single unit. Standard width is consistent at 2,250 mm.

2–20 fans | H: 2,451 mm | W: 2,250 mm

Mission-Critical Reliability

Each unit undergoes hydraulic pressure testing, fan balance verification, and electrical safety checks at CIG BluSolutions' ISO 9001:2015-certified facility in Pathumthani, Thailand.

Leak-tested coils | ISO 9001:2015

Nomenclature

CLVC — 2 1 2 — 080 — E 0 — 33

CL	V	C	2	2	2	080	E	0	33
Product Series Liquid Dry Cooler	Unit Type V-Shape	Coil Type Fin & Tube	Fan Rows (per side)	Fans per Row (2–10)	Coil Rows 2, 3, or 4	Fan Ø 800 mm	Motor Type EC Motor	Fluid Type Water	Dimension Code

PRODUCT SERIES

CL Liquid Dry Cooler

UNIT TYPE

V V-Shape frame

COIL TYPE

C Fin & Tube (Al fin / Cu tube)

M MCHE Micro-Channel

FAN DIAMETER

080 Ø800 mm

091 Ø910 mm

MOTOR TYPE

A AC Motor

E EC Motor (standard)

FLUID / REFRIGERANT

0 Water

1 R404a

Option: Propylene Glycol. Vol. 0-59% / water (ml)

Specific Heats for Aqueous Ethylene Glycol Solutions (cv)

% Ethylene Glycol:	0%	10%	20%	30%	40%	50%
Btu/h·gpm·°F:	500	490	480	470	450	433
kW/lpm·°C:	251	245	241	236	226	217

Altitude Correction

Altitude - Feet (M)	0 0	1000 (305)	2000 (610)	5000 (1525)	8000 (2440)	12000 (3660)	15000 (4575)
Correction Factor	1.000	0.979	0.960	0.900	0.841	0.762	0.703

SELECTION DATA — EC FAN Ø800 MM

Performance Table | Fin-Tube

IMVERA

Model	Heat Rejection (kW)	Airflow (CMH)	Power (kW)	Current (A)	Sound dB(A)	Water Flow (CMH)	Water ΔP (kPa)	Dimensions (mm) H	Dimensions (mm) W	Dimensions (mm) L	Connection In	Connection Out	Coil Surface Area (m²)	Weight (kg)
4-Fan Models (CLVC 222 – CLVC 224)														
CLVC-222-E0	132.26	180,000	11.6	17.6	77	11.6	95.66	2,451	2,250	2,400	2-1/8"	2-1/8"	267.82	398
CLVC-223-E0	172.1	168,000	11.6	17.6	77	15.0	74.04	2,451	2,250	2,400	2-1/8"	2-1/8"	401.74	591
CLVC-224-E0	172.1	168,000	11.6	17.6	77	18.2	64.82	2,451	2,250	2,400	2-5/8"	2-5/8"	535.66	656
6-Fan Models (CLVC 232 – CLVC 234)														
CLVC-232-E0	172.1	378,000	17.4	26.4	77	16.6	84.68	2,451	2,250	3,600	2-1/8"	2-1/8"	401.74	823
CLVC-233-E0	257.9	378,000	17.4	26.4	77	22.4	68.22	2,451	2,250	3,600	3-1/8"	3-1/8"	602.62	921
CLVC-234-E0	303.0	360,000	17.4	26.4	77	26.4	55.82	2,451	2,250	3,600	3-1/8"	3-1/8"	803.48	1019
8-Fan Models (CLVC 242 – CLVC 244)														
CLVC-242-E0	309.3	720,000	23.2	35.2	77	27.0	88.14	2,451	2,250	4,800	3-1/8"	3-1/8"	658.76	1072
CLVC-243-E0	398.4	680,000	23.2	35.2	77	34.6	69.60	2,451	2,250	4,800	3-1/8"	3-1/8"	988.12	1178
CLVC-244-E0	456.7	640,000	23.2	35.2	77	39.8	53.26	2,451	2,250	4,800	3-5/8"	3-5/8"	1317.5	1284
10-Fan Models (CLVC 252 – CLVC 254)														
CLVC-252-E0	356.3	1,100,000	29.0	44.0	77	31.0	23.52	2,451	2,250	6,000	3-1/8"	3-1/8"	823.44	1358
CLVC-253-E0	505.7	1,100,000	29.0	44.0	77	44.0	57.54	2,451	2,250	6,000	4-1/8"	4-1/8"	1235.16	1490
CLVC-254-E0	582.7	1,000,000	29.0	44.0	77	50.6	97.88	2,451	2,250	6,000	4-1/8"	4-1/8"	1646.88	1623
12-Fan Models (CLVC 262 – CLVC 264) — Dual Connections														
CLVC-262-E0	415.6	1,440,000	34.8	52.8	77	36.2	31.96	2,451	2,250	7,200	3-1/8"×2	3-1/8"×2	988.12	1527
CLVC-263-E0	580.6	1,440,000	34.8	52.8	77	50.6	86.06	2,451	2,250	7,200	3-1/8"×2	3-1/8"×2	1482.2	1686
CLVC-264-E0	659.0	1,320,000	34.8	52.8	77	57.4	97.14	2,451	2,250	7,200	3-1/8"×2	3-1/8"×2	1976.26	1844
14-Fan Models (CLVC 272 – CLVC 274)														
CLVC-272-E0	506.0	2,030,000	40.6	61.6	77	44.0	55.10	2,451	2,250	8,400	3-1/8"×2	3-1/8"×2	1152.82	1695
CLVC-273-E0	699.8	2,016,000	40.6	61.6	77	61.0	138.46	2,451	2,250	8,400	3-1/8"×2	3-1/8"×2	1729.22	1881
CLVC-274-E0	794.6	1,988,000	40.6	61.6	77	69.0	37.26	2,451	2,250	8,400	3-1/8"×2	3-1/8"×2	2305.64	2066
16-Fan Models (CLVC 282 – CLVC 284)														
CLVC-282-E0	592.5	2,688,000	46.4	70.4	77	51.6	56.88	2,451	2,250	9600	3-1/8"×2	3-1/8"×2	1317.5	1864
CLVC-283-E0	819.5	2,688,000	46.4	70.4	77	71.4	118.34	2,451	2,250	9600	3-1/8"×2	3-1/8"×2	1976.26	2076
CLVC-284-E0	962.2	2,560,000	46.4	70.4	77	83.8	177.06	2,451	2,250	9600	4-1/8"×2	4-1/8"×2	2635.02	2288
18-Fan Models (CLVC 292 – CLVC 294)														
CLVC-292-E0	757.6	4,200,000	58.0	88.0	77	66.0	90.18	2,451	2,250	12,000	4-1/8"×2	4-1/8"×2	1482.2	2033
CLVC-293-E0	1,039.7	4,200,000	58.0	88.0	77	90.4	186.02	2,451	2,250	12,000	4-1/8"×2	4-1/8"×2	2223.3	2271
CLVC-294-E0	1,164.7	4,000,000	58.0	88.0	77	101.4	65.72	2,451	2,250	12,000	4-1/8"×2	4-1/8"×2	2964.38	2509
20-Fan Models (CLVC 2102 – CLVC 2104)														
CLVC-2102-E0	757.6	4,200,000	58.0	88.0	77	66.0	90.18	2,451	2,250	12,000	4-1/8"×2	4-1/8"×2	1646.88	2201
CLVC-2103-E0	1,039.7	4,200,000	58.0	88.0	77	90.4	186.02	2,451	2,250	12,000	4-1/8"×2	4-1/8"×2	2470.32	2466
CLVC-2104-E0	1,164.7	4,000,000	58.0	88.0	77	101.4	65.72	2,451	2,250	12,000	4-1/8"×2	4-1/8"×2	3293.76	2731

Rating Conditions: All performance data rated at 100% water, entering air temperature (Ta) = 35°C, entering water temperature (EWT) = 50°C. Single unit values shown; dual configuration doubles heat rejection and flow rate. Contact IMVERA Engineering for glycol correction factors or alternate rating conditions.

TECHNICAL DRAWINGS & OPTIONS

Dimensions & Configuration | Fin-Tube

All IMVERA MaxFlow Dry Cooler models share a fixed height (H = 2,451 mm) and width (W = 2,250 mm). Unit length (L) scales with fan count. The V-frame accepts standard open-top container transport for units up to 12,000 mm length.

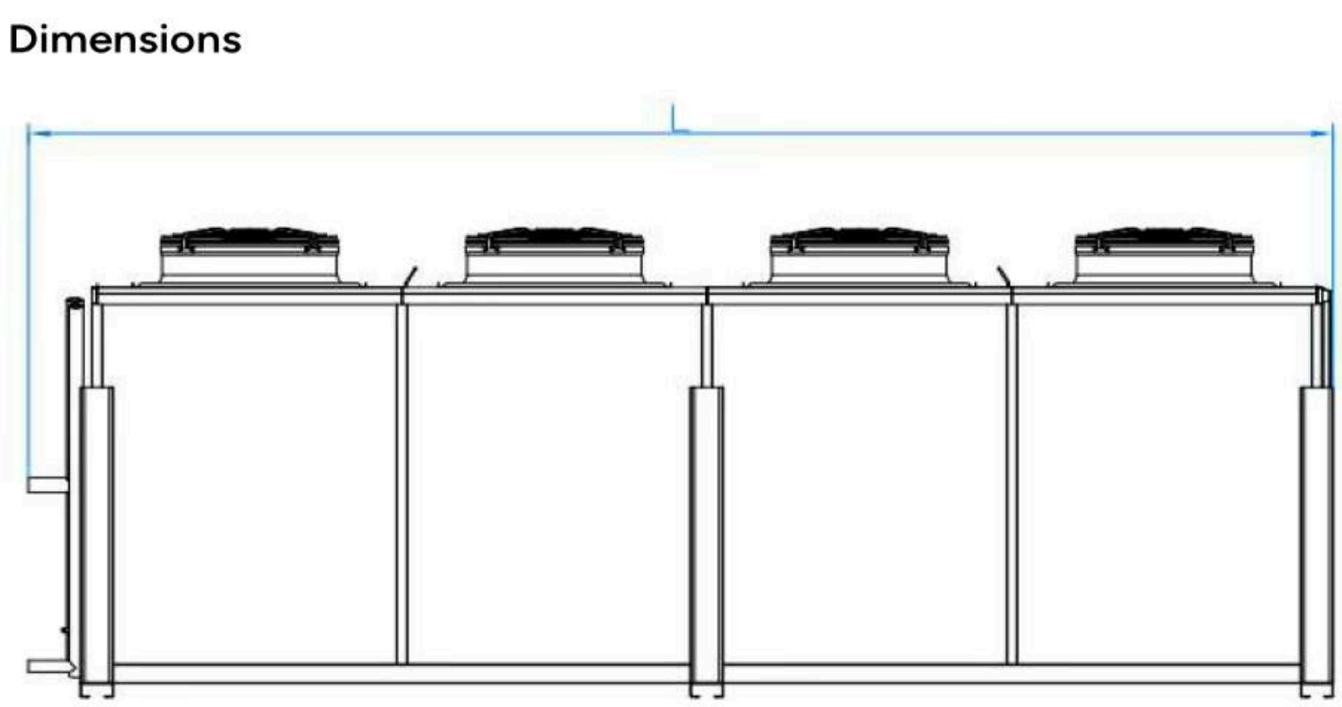
Unit Length by Fan Count

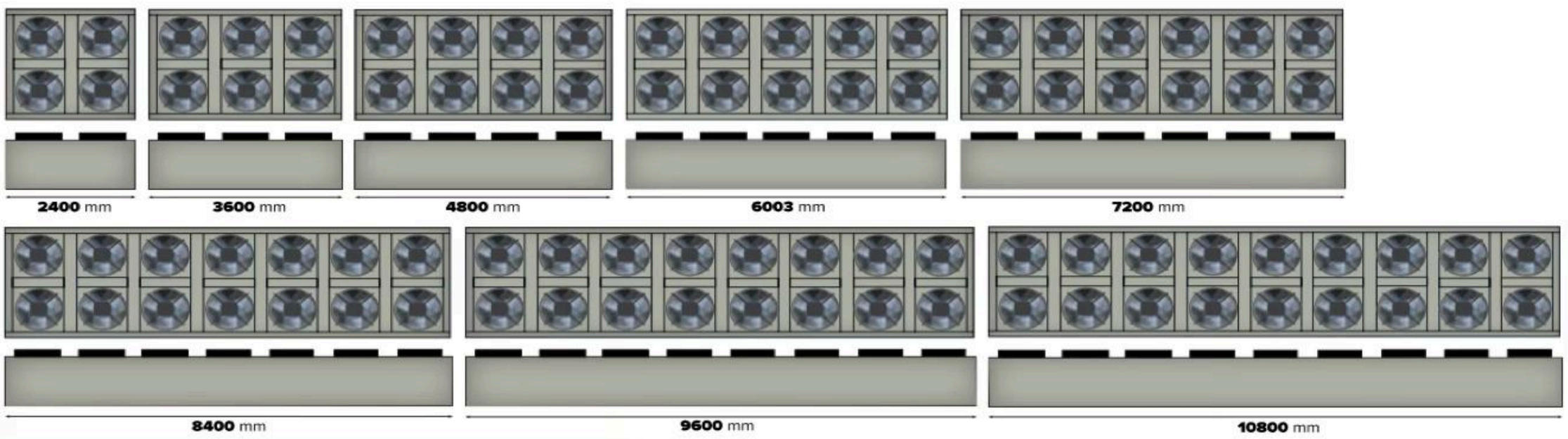
Fans (per unit)	Length L (mm)	H (mm)	W (mm)
4 fans (2×2)	**2,400**	2,451	2,250
6 fans (2×3)	**3,600**	2,451	2,250
8 fans (2×4)	**4,800**	2,451	2,250
10 fans (2×5)	**6,000**	2,451	2,250
12 fans (2×6)	**7,200**	2,451	2,250
14 fans (2×7)	**8,400**	2,451	2,250
16 fans (2×8)	**9,600**	2,451	2,250
20 fans (2×10)	**12,000**	2,451	2,250

General Specifications

Parameter	Specification
Fan Type	**EC Axial — IP54**
Fan Diameter	**Ø800 mm (std.)**
Motor Power	**2.9 kW per motor**
Fan Current	**4.4 A per motor**
Coil Type	**Al Fin / Cu Tube (inner-grooved)**
Coil Rows	**2, 3, or 4 rows**
Design Pressure	**10 barg standard**
Sound Pressure	**77 dB(A) @ 1 m**
Frame Material	**Hot-dip galvanized steel**
Power Supply	**400V / 3Ph / 50Hz**

Dimensions





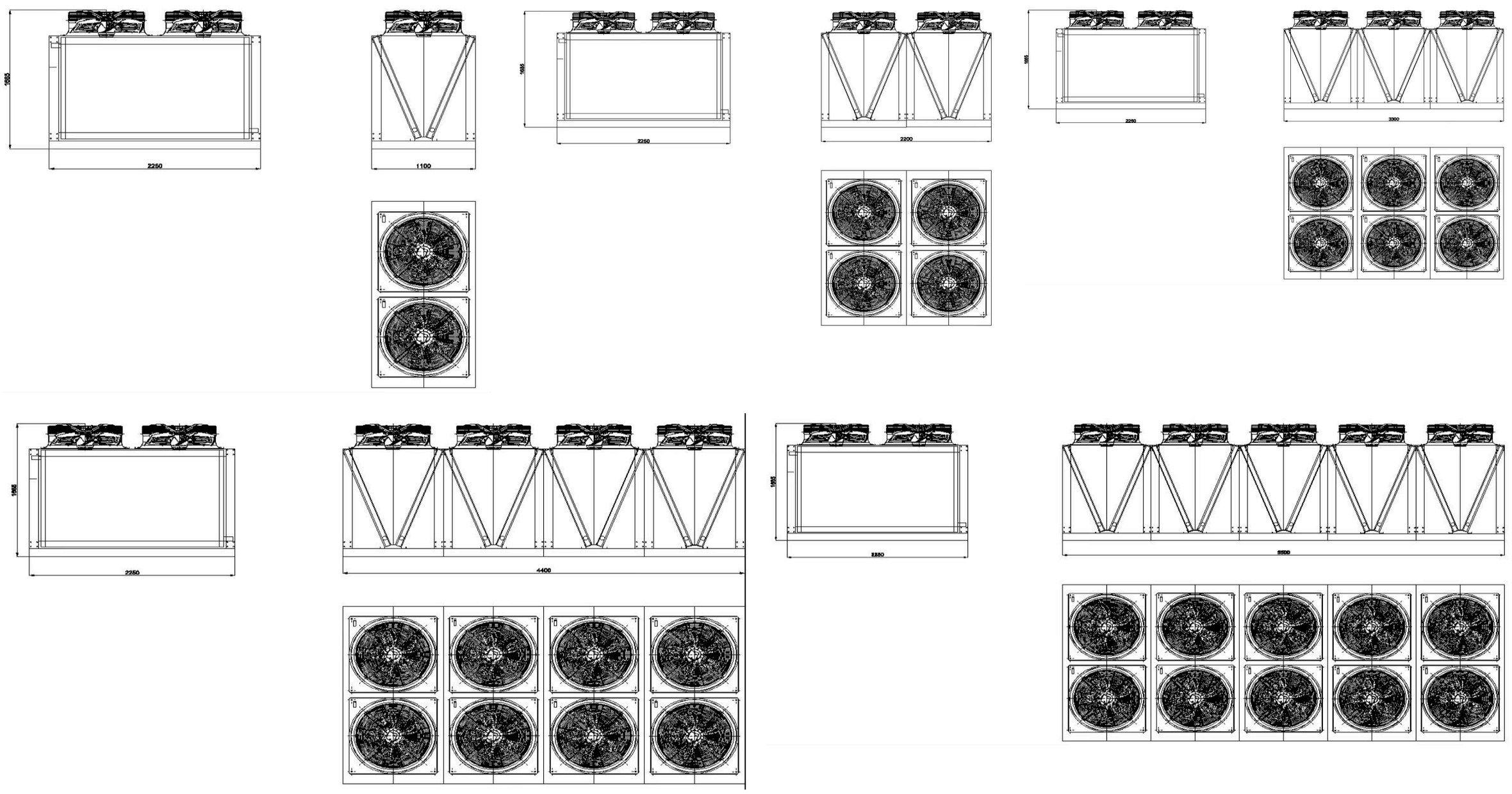
SELECTION DATA — EC FAN Ø800 MM

Performance Table | Micro-Channel

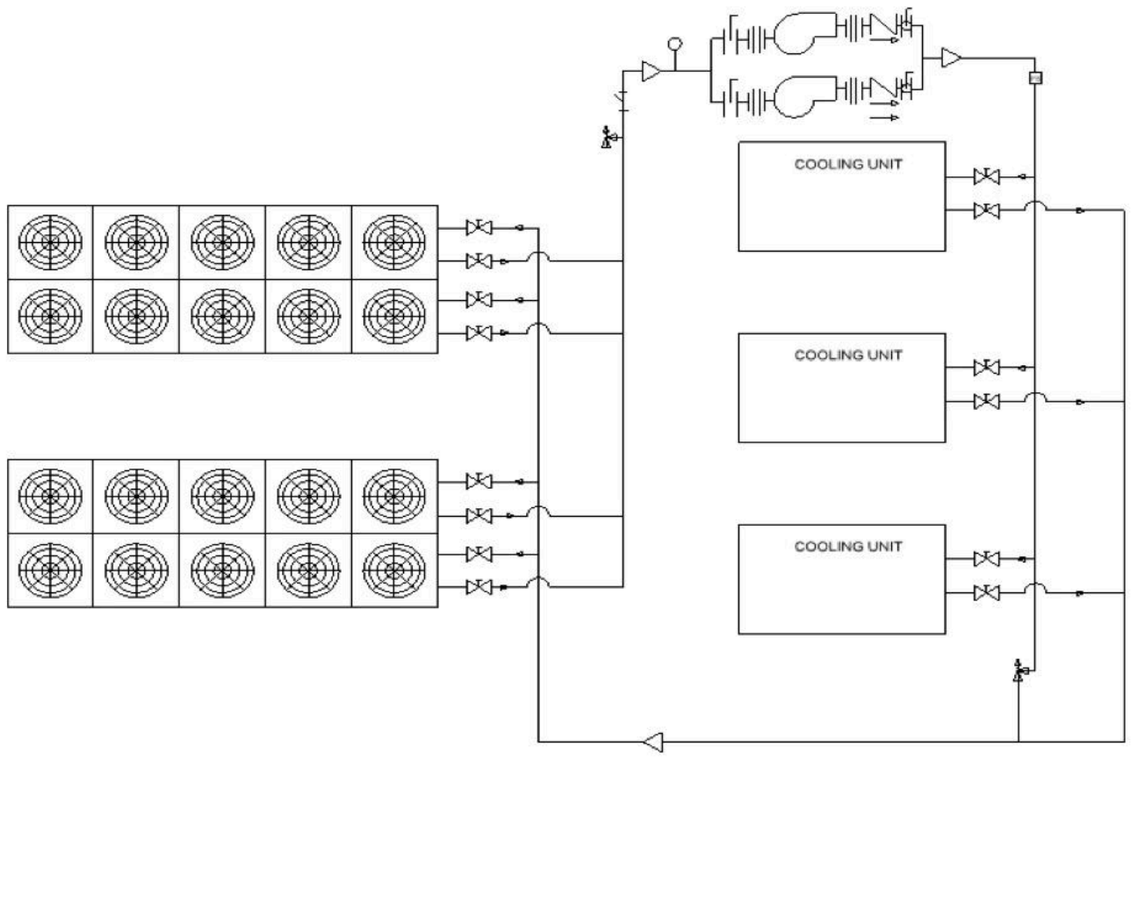
Model	Heat Rejection (kW)	Airflow (CMH)	Power (kW)	Current (A)	Sound dB(A)	Water Flow (CMH)	Water ΔP (kPa)	Dimensions (mm) H	W	L	Connection In	Out	Coil Surface Area (m²)	Weight (kg)
Micro-Channel Coil 2-4 fan model														
CLVM-211-E0	84.00	48000	5.80	8.80	77	6.582	4.6	1685	2250	1100	2-1/8"	2-1/8"	4.94	368
CLVM-221-E0	172.1	168,000	11.6	17.6	77	15.0	74.04	2,451	2,250	2,400	2-1/8"	2-1/8"	9.88	575
CLVM-231-E0	172.1	168,000	11.6	17.6	77	18.2	64.82	2,451	2,250	2,400	2-1/8"	2-1/8"	14.82	898
CLVM-241-E0	172.1	168,000	11.6	17.6	77	18.2	64.82	2,451	2,250	2,400	2-1/8"	2-1/8"	19.76	1221
CLVM-251-E0	172.1	168,000	11.6	17.6	77	18.2	64.82	2,451	2,250	2,400	2-1/8"	2-1/8"	24.7	1543

Rating Conditions: All performance data rated at 100% water, entering air temperature (Ta) = 35°C, entering water temperature (EWT) = 50°C. Single unit values shown; dual configuration doubles heat rejection and flow rate. Contact IMVERA Engineering for glycol correction factors or alternate rating conditions.

Micro-Channel Model Dimensions



Typical application



IMVERA

THE COOLING PLATFORM FOR AI

ENGINEERED FOR PERFORMANCE · DATA CENTER COOLING

SAVE - COOL ADIABATIC

Closed-Loop Adiabatic Cooling System

Reliable Thermal Management for High-Density Server Environments

527.5 kW
HEAT REJECTON CAPACITY

EC 800 mm
FAN TYPE / DIAMETER

Water
FLUID MEDIUM

Dual mode
DRY + ADIABATIC

NEW

D-COAT+ TECHNOLOGY

FOR MAXIMUM PROTECTION

PRODUCT OVERVIEW

How Adiabatic Cooling Works

The IMVERA Save-Cool is a closed-loop adiabatic liquid cooling system engineered for water-cooled data center infrastructure. Operating in dual mode — dry cooling when ambient conditions allow, automatically switching to adiabatic (evaporative pre-cooling) when outdoor temperatures rise — it delivers year-round free-cooling opportunities with measurable PUE improvements. Unlike open cooling towers, the Save-Cool uses a closed water circuit, eliminating contamination risk to process fluid and significantly reducing water consumption compared to conventional evaporative systems.

CCUSC-150 SAVE - COOL MODEL	527.5 kW HEAT REJECTION CAPACITY	19 kW MOTOR POWER INPUT	600 LPM WATER FLOW	10 FANS (EC AXIAL)

Application Scope

01

Data Center Cooling Loops

Primary or secondary heat rejection for water-cooled server infrastructure. Operates in closed-loop circuits with treated process water or glycol solutions, protecting IT equipment from contamination.

02

CDU / Chiller Heat Rejection

Paired with Coolant Distribution Units or process chillers as the outdoor heat rejection stage. Suitable for rear-door, direct-liquid, or immersion cooling topologies across hyperscale and edge deployments.

03

Free Cooling & Economizer Mode

When ambient temperatures permit, the Save-Cool operates in full dry mode — zero water consumption — extending free-cooling hours annually and reducing mechanical cooling energy cost significantly.

Core Features

V-Type Coil Configuration

The symmetrical V-frame design maximises coil face area relative to unit footprint, improving air-side heat transfer effectiveness and enabling high rejection capacity within a compact installation envelope — critical for data center rooftop and yard installations.

AL Fin / CU Tube · 4 Rows · Inner-grooved

EC Axial Fan Technology

Ten electronically commutated (EC) axial fans (Ø800 mm, 2.9 kW each) provide precise speed modulation across the full operating range. IP54-rated for outdoor exposure. Variable speed operation enables significant energy savings at part-load — essential for 24/7 data center operation.

Ø800 mm · 2.9 kW/fan · IP54 · 10 fans

High-Pressure Fine-Mist Adiabatic System

High-pressure nozzles atomise water into a fine mist in the inlet air chamber, maximising evaporative surface area and cooling efficiency. This approach avoids the scale accumulation and high maintenance burden associated with traditional cellulose pad systems.

Fine-mist nozzles · Demand-only activation · Low scale risk

Galvanized Steel Frame Construction

Heavy-gauge hot-dip galvanized steel chassis provides structural rigidity and long-term corrosion resistance for outdoor installations. The enclosed base structure supports forklift access points, crane lifting provisions, and vibration isolation mounts.

Hot-dip galvanized · Powder-coated finish

Intelligent ARII Control System (Option)

Optional integration with the ARII NB-IoT platform enables real-time monitoring, automated mode switching, performance data logging to Google BigQuery, and alert/alarm management — accessible via web dashboard. Reduces remote site operational burden for multi-facility DC operators.

NB-IoT · Web cloud · W: 2,250 mm

Mission-Critical Reliability

Each unit undergoes hydraulic pressure testing, fan balance verification, electrical safety checks, and adiabatic system commissioning at CIG BluSolutions' ISO 9001:2015-certified facility in Pathumthani, Thailand. Coils are leak-tested to 10 barg working pressure.

Leak-tested coils · ISO 9001:2015

OPERATING PRINCIPLE

How Adiabatic Cooling Works

The Save-Cool system operates as an intelligent two-mode heat rejection unit. It monitors ambient dry-bulb temperature continuously and selects the most energy-efficient cooling mode automatically — eliminating unnecessary water use while maintaining precise fluid outlet temperatures for downstream IT equipment.

Application Scope

Dry Cooling Mode

MODE 01

When ambient air temperature is sufficiently low, the unit operates as a standard liquid dry cooler — EC fans draw air across the coil surface, rejecting heat from the process fluid to atmosphere with zero water consumption. This is the preferred operating state for maximum efficiency.

Dry Mode: Ta < Switchover Point

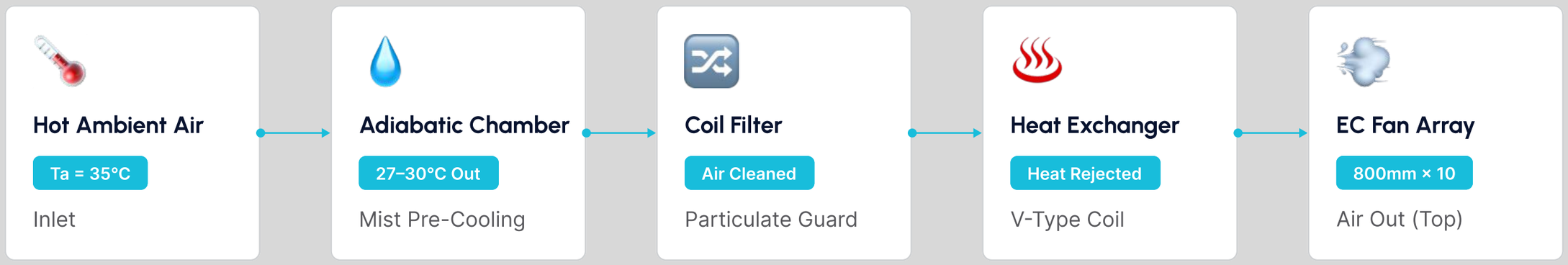
Adiabatic Pre-Cooling Mode

MODE 02

As ambient temperature rises above the dry-mode threshold, high-pressure nozzles create a fine water mist in the inlet air chamber. Evaporation lowers air temperature by 5–8°C before it reaches the coil — allowing the unit to maintain rated heat rejection capacity even in tropical or peak-summer conditions.

Adiabatic Mode: Ta ≥ Switchover Point

SYSTEM AIRFLOW PATH — ADIABATIC MODE ACTIVE



Performance Advantages

Extended Free-Cooling Hours

Extended Free-Cooling Hours
By pre-cooling inlet air, the Save-Cool allows dry free-cooling to operate at higher ambient temperatures, significantly extending economizer hours annually. In tropical climates (e.g., Southeast Asia), this can reduce mechanical cooling runtime by 30–50% versus a conventional dry cooler alone.

Dramatically Lower Water Use

Compared to open cooling towers, the Save-Cool uses water only when ambient conditions demand it — and only for pre-cooling, not as the primary heat rejection medium. Water consumption is reduced by up to 70–80% versus equivalent cooling tower capacity, lowering water treatment, disposal, and operating costs.

Closed-Loop Process Fluid Protection

The data center process fluid (water or glycol) never contacts the atmosphere or the adiabatic water circuit. This closed-loop separation eliminates biological contamination risk (Legionella, algae) and removes the need for chemical water treatment of the process side — critical for IT cooling loops.

Reduced Maintenance Burden

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PUE Impact at Scale

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Intelligent Control Integration

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TECHNICAL DATA — MODEL CCUSC-150

Specifications & Dimensions

IMVERA

UNIT PERFORMANCE DATA

PARAMETER	VALUE	UNIT
Heat Rejection Capacity	527.5	UNIT
EC Fan Diameter	Ø800	kW
Number of Fans	10	pcs
Total Motor Power Input	19	kW
Water Flow Rate	600	LPM
Power Supply	380 / 50	V / Hz
Unit Weight	4,800	kg

UNIT DIMENSIONS (MM)

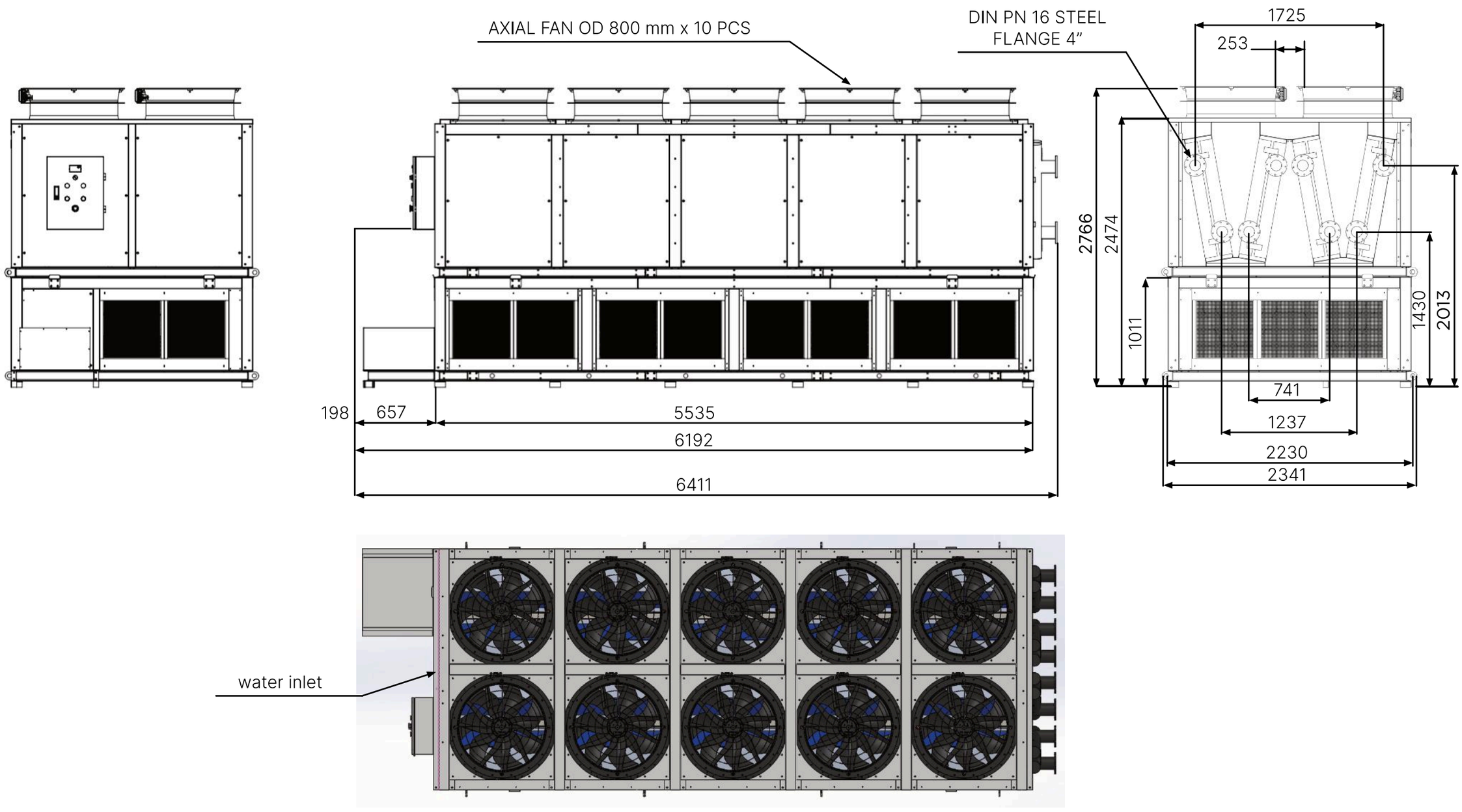
DIMENSION	VALUE
Width (W)	2,230
Length (L)	6,441
Height (H)	2,766
Coil Length	5,534
No. of Tube Rows	4
No. of Circuits	28
Fin Pitch	2.11 mm

Standard Rating Conditions

AIR SIDE	
Inlet Air Temperature (dry mode)	30°C Dry-bulb
Inlet Relative Humidity	98%
Outlet Air Temperature	37.2°C
Volumetric Air Flow	58,382 m³/h
Face Velocity on Coil	2.85 m/s
Air-Side Pressure Drop	110 Pa

FLUID SIDE	
Fluid Type	Water 100% Glycol correction available
Inlet Fluid Temperature (EWT)	46°C
Outlet Fluid Temperature (LWT)	32.4°C
Fluid ΔT	13.6 K
Volumetric Fluid Flow	2.5 l/s (150 LPM per coil)
Design Pressure	10 barg std. / up on request

Rating Conditions: Performance data rated at ambient Ta = 30°C dry-bulb with adiabatic pre-cooling active. Capacity based on 4 coils in parallel (total 40 tons × 4 = 160 tons ref. equivalent). Water flow: 150 LPM × 4 coils = 600 LPM total. Contact IMVERA Engineering for glycol correction factors, alternate rating conditions, or glycol-mixture capacity tables.



TECHNICAL DRAWINGS & OPTIONS

Optional Accessories & Customization

All IMVERA MaxFlow Dry Cooler models share a fixed height (H = 2,451 mm) and width (W = 2,250 mm). Unit length (L) scales with fan count. The V-frame accepts standard open-top container transport for units up to 12,000 mm length.

CORROSION

D-Coat+ / HERESITE Fin Coating

Sole certified HERESITE applicator in SEA. Two coating options for IMVERA fins:

HERESITE P-413
Salt spray 30,000 hrs
Offshore ISO 12944-9

D-Coat+ / UV
Salt spray 20,000 hrs
Superhydrophobic

STRUCTURAL UPGRADE

Stainless Steel Fan & Guard Upgrade

Optional 304 stainless steel fan blades and protective guards for enhanced durability. Suitable for applications with chemical wash-down requirements or aggressive ambient conditions.

THERMAL PERFORMANCE

Extended Coil Row Option (4 rows)

Additional copper tube coil rows increase effective heat transfer surface area, boosting rejection capacity for the same unit footprint. Ideal for high EWT-to-ambient differential applications.

PRESSURE

16 barg High-Pressure Option

Standard units rated at 10 barg. For district cooling or elevated-head systems requiring higher pressure — 16 barg-rated coils and manifolds available on request.

CONTROL

Integrated Electrical Panel

Factory-assembled control panel with EC fan controller, power distribution, fusing, and terminal connections. Reduces on-site installation time significantly.

FLUID

Glycol / Anti-Freeze Fluid Support

Units rated for ethylene glycol-water mixtures. Capacity correction factors available for 10–50% glycol concentrations. Contact engineering for adjusted selection data.

IMVERA

THE COOLING PLATFORM FOR AI

CIG BLUSOLUTIONS CO., LTD.

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