STANDARD S-TYPE COOLING CABIN

PE-DC-CS S-Type

Data Center PCM Cooling Cabin Series

All 5-32 C phase points | Unified S-type calculation basis | Chilled-water peak buffering

PE-DC-CS-S SERIES

SERIES CAPACITY	ESTIMATED DISCHARGE	PHASE POINTS	S-TYPE ENVELOPE
347-680 kWh	2.34 MW max	18	S
PCM latent + water sensible	same basis as 7C reference	data-center cold storage line	2.8 x 2.3 x 2.3 m

APPLICATION CONTEXT

Chilled-water buffering, peak shaving, short resilience windows

CALCULATION BASIS

1285 plates | 75% fill | 38 C water basis

Designed for AI data-center chilled-water systems, short peak windows, and recovery-time extension.

Unified S-Type Calculation Boundary

Every phase point is derived from the same cabin envelope, plate count, water-sensible basis, and discharge ratio.

FIXED S-TYPE BOUNDARY

CABIN ENVELOPE	PCM PLATES	PCM FILL PER PLATE
2.8 x 2.3 x 2.3 m	1285	5.0 L

EFFECTIVE FILL RATE	WATER SENSIBLE BASIS	DISCHARGE BASIS
75%	4.678 m3	3.434 kW/kWh

AUTOMATIC CALCULATION

1. Plate latent energy = PCM mass x material latent heat / 3600
2. PCM latent energy = plate latent energy x 1285 plates
3. Water sensible = water-equivalent volume x 4.2 x (38 C - phase point) / 3.6
4. Total storage = PCM latent energy + water sensible energy
5. Estimated discharge power = total storage x 7C reference power ratio

SELECTION RULE

Composite PCM is used where a composite variant is available. For phase points without a released composite variant, the highest-latent published organic or inorganic variant is used. The material library remains separate from installable product and module categories.

PE-DC-CS Full Temperature Matrix

Series capacity estimates under the same S-type cooling cabin structure, for early sizing and manual access.

Phase	Material	Plate kWh	PCM kWh	Water kWh	Total kWh	Power MW
5 C	Composite	0.306	393.5	180.1	573.6	1.97
7 C	Composite	0.292	374.8	169.2	544.0	1.87
10 C	Composite	0.321	412.3	152.8	565.1	1.94
12 C	Composite	0.350	449.7	141.9	591.7	2.03
15 C	Composite	0.350	449.7	125.5	575.3	1.98
17 C	Organic	0.278	356.9	114.6	471.6	1.62
18 C	Composite	0.350	449.7	109.2	558.9	1.92
20 C	Inorganic	0.451	580.0	98.2	678.3	2.33
21 C	Organic	0.283	364.1	92.8	456.9	1.57
22 C	Inorganic	0.361	464.0	87.3	551.4	1.89
23 C	Organic	0.289	371.2	81.9	453.1	1.56
24 C	Composite	0.350	449.7	76.4	526.2	1.81
25 C	Organic	0.289	371.2	71.0	442.2	1.52
26 C	Inorganic	0.478	614.8	65.5	680.3	2.34
27 C	Organic	0.289	371.2	60.0	431.3	1.48
28 C	Inorganic	0.361	464.0	54.6	518.6	1.78
30 C	Inorganic	0.361	464.0	43.7	507.7	1.74
32 C	Organic	0.244	314.1	32.7	346.9	1.19

Note: The matrix is an S-type standard estimate. Final project values depend on engineering design, sample testing, and mutual approval.

Selection source: assets/data/pcm-product-lines.json | Calculation: S-type standard boundary

Material Architecture and Structure

Composite, inorganic, and organic PCM variants are mapped into the same plate-pack and water boundary.

Composite PCM

7 points

Preferred for high response and high conductivity chilled-water buffer windows.

Inorganic PCM

5 points

Provides higher capacity support at selected high-latent phase points.

Organic PCM

6 points

Covers mid-to-high phase points for moderate temperature-lift and cost-sensitive cases.

S-Type Plate Pack

18 points

1285 standard PCM plates, 5.0 L fill per plate, one hydraulic and maintenance boundary.

MATERIAL TO SYSTEM MAP

Composite: 7 Inorganic: 5 Organic: 6

Published phase points remain traceable to the plate manual layer; the S-type cabin manual aggregates them into one deployable envelope.

Engineering Integration and Validation

Manual values support pre-selection; project values must be checked against the actual water system, load curve, and controls.

1

Temperature Band

Confirm supply and return temperature, allowed rise, peak duration, and recovery time.

2

Capacity Window

Compare total storage and estimated discharge power across phase points on the same S-type basis.

3

Hydraulic Integration

Check interfaces, pressure drop, bypass, venting, drain, and maintenance clearance.

4

Control Logic

Define charge, discharge, bypass, and abnormal switching logic.

5

Site Validation

Record commissioning through temperature, flow, power, and recovery curves.

DOCUMENT CONTROL

PE-DC-CS-S SERIES | Rev B / 2026-07-09 | Passive Edge technical product manual