

CASE STUDY · INDUSTRIAL / GOVERNMENT

From Manual Switch-Flipping to Intelligent Automation — ISRO APEP Aluva's Voltas Chiller Plant Goes Smart in One Week

How EnSmart automated 4 Voltas chillers and pumps at a critical ISRO facility — integrating with existing hardware, delivering full BMS control in 7 days.

Client: ISRO — APEP · Aluva, Kochi, India · Chiller Plant Automation & BMS Integration · 2025

At a Glance

4 Voltas Chillers Automated	1 Week Full Deployment	0 Manual Trips After Go-Live	2 Days Trial to Full Implementation
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The Challenge — The Night Shift Problem

Four Voltas chillers. Condenser pumps. Chilled water pumps. A Voltas controller already installed — hardware in place, wiring done. But the Voltas controller had no BMS automation logic. It could not talk to a central BMS, act on schedules, or send alerts. Every start command, every stop command, every sequence — Satish Kumar, the BMS operator at ISRO APEP Aluva, had to physically walk to the panel and operate it by hand. The building was not managed by a system. It was managed by a man's feet.

- 4 Voltas chillers installed but operating fully manually — no BMS automation in place
- Chiller ON/OFF entirely manual — operator physically present at the Voltas panel every time
- Pump sequencing required human judgment and physical intervention for every operation
- The Voltas controller was an island — capable hardware with no connection to a central BMS
- No remote visibility — operator could not see Voltas chiller status from his workstation
- No automated scheduling — cooling ran on human memory, not time or load logic
- Risk of missed operations during shift changes, leaves, or late arrivals
- No fault logging — if a Voltas chiller tripped at 2AM, nobody knew until someone walked in

Why This Project Stood Out — Not a Replacement. A Translation.

The Translator Problem	The Voltas controller already existed — capable hardware doing its job at the chiller level. EnSmart did not rip it out. EnSmart's DDC controller read the Voltas system's signals and translated them into BMS commands. The Voltas chillers kept running. EnSmart added the brain on top.
Speed Under Pressure	Week 1: EnSmart prepared the controller and software at their facility — studying the Voltas IO, writing the logic, building the graphics. Week 2: Trial on-site. Days 3–4: Full implementation across all 4 Voltas chillers. What others might stretch into months, EnSmart executed in days.
Government-Grade Reliability	ISRO APEP is not a commercial office. It is a critical government facility. Cooling is not comfort — it is infrastructure. The integration had to work the first time and keep working. Downtime was not an option.
Complete Ownership — One Vendor	Controller. Software. Graphics. Panel. EnSmart supplied and commissioned all four — on top of the existing Voltas installation. One throat to hold for the BMS layer.
The Operator's Life Changed	Before: Satish Kumar's job was walking to the Voltas panel. After: Satish Kumar's job is monitoring a screen. The EnSmart software commands the Voltas chillers and pumps.

Deployment Timeline — Two Weeks. Four Chillers. One Operator Who Can Now Sit Down.

PERIOD	MILESTONE
Aug 2025 Week 1	EnSmart studies the Voltas controller IO and signal architecture. DDC controller programmed, BMS logic written, and operator graphics built at EnSmart's facility. Panel fabricated and tested. No site visit yet.
Aug 2025 Week 2, Days 1–2	EnSmart controller and panel installed at ISRO APEP Aluva. Data integration from the Voltas controller begins — signals mapped, wiring connected, communication verified. Trial run on all 4 chillers with engineer on-site.
Aug 2025 Week 2, Days 3–4	All 4 Voltas chillers fully automated under EnSmart BMS. Pump sequencing live. Graphics commissioned — chiller status, pump status, fault alarms all visible on screen. Satish Kumar trained on the new interface.
Aug 2025 End of Week 2	Full implementation complete. ISRO APEP Aluva Voltas chiller plant live under EnSmart BMS control. Manual panel operation retired.

Business Impact — What Changed the Morning After Go-Live

IMPACT AREA	WHAT CHANGED
Zero Manual Panel Trips	All 4 Voltas chillers and pumps start and stop on schedule or on software command. Satish Kumar's daily walk to the plant room became a glance at a screen.
Full Remote Visibility	Status, fault, run-hours, on/off state — all visible in real time from the EnSmart BMS workstation. What was invisible is now logged, timestamped, and accessible.
Fault Detection Without Inspection	If a Voltas chiller trips, the EnSmart BMS knows in seconds. An alert goes out. The operator does not discover a problem two hours later by walking past the plant room.
Reduced Single-Operator Dependency	When Satish Kumar is on leave, the system still runs. Automation does not take leave. Shift handover is now a software check, not a physical walkthrough of the panel room.
Foundation for Energy Optimisation	You cannot optimise what you cannot control. Now that Voltas chillers are under EnSmart BMS command, scheduling, load-based sequencing, and run-hour balancing are all possible — next phase ready.
One-Week Deployment Proves Repeatability	ISRO APEP Aluva is now a reference site for Voltas chiller BMS integration. Commissioned at a critical government facility in one week — the methodology is proven for any site across India.

How EnSmart Did It — Technical Approach

STEP 01 Site Study	<p>Voltas Controller IO Mapping</p> <p>EnSmart studied the Voltas controller's signal architecture remotely — identifying pump run status, chiller fault signals, on/off feedback, and all relevant IO points before touching site.</p>
STEP 02 Controller Programming	<p>DDC Logic & Sequence Writing</p> <p>EnSmart's DDC controller was programmed off-site with full automation logic: start/stop sequences, pump-chiller interlocks, time schedules, and fault handling for the 4-chiller layout.</p>
STEP 03 Panel Fabrication	<p>Panel Built & Bench-Tested Off-Site</p> <p>The integration panel was fabricated and tested at EnSmart's facility before any site installation — eliminating on-site debugging and compressing the deployment timeline.</p>
STEP 04 Site Integration	<p>Wiring, Signal Mapping & Communication</p> <p>On-site, EnSmart engineers connected the DDC to the Voltas system — mapping signal wires, verifying communication, and confirming every data point transferred correctly.</p>
STEP 05 Commissioning	<p>Graphics Live, Operator Trained</p> <p>BMS graphics showing all 4 Voltas chillers, pump status, fault alarms, and run hours on one screen. Satish Kumar trained on the new interface before EnSmart left site.</p>

FAQs — Common Questions About This Project

The Voltas controller and chillers were already installed. Did EnSmart replace them?

No. EnSmart's approach is integration first. The Voltas chillers kept running. EnSmart's DDC controller was connected on top — reading signals from the Voltas system and adding the automation logic that was missing. The Voltas hardware was fully retained. EnSmart added the intelligence.

What does "transferring data from the Voltas controller to EnSmart controller" actually mean?

The Voltas controller was speaking — but nobody was listening and acting at the BMS level. EnSmart's controller understood the Voltas signals (pump run status, chiller fault, on/off feedback), and added the missing logic: "if it is 9AM and cooling load is active, start Pump 1, wait 30 seconds, start Voltas Chiller 1." That is the automation that was missing.

How were 4 Voltas chillers and pumps automated in just one week?

Because EnSmart prepared everything before reaching site. The controller was programmed, the logic written, and the graphics built at EnSmart's facility during Week 1. Week 2 on-site was installation, connection, and commissioning — not starting from scratch. Preparation is the real project. Site work is the final act.

What does the BMS operator see now that he could not see before?

On one screen: which Voltas chillers are running, which pumps are on, run hours for each unit, fault status, on/off command history, and scheduling. Before: Satish Kumar walked to the panel to check. After: one EnSmart screen tells him everything. He issues commands from his chair.

Is this relevant to other facilities with Voltas or other OEM chiller plants?

Yes — exactly. Many facilities across India have Voltas, Blue Star, Carrier, or other brand chillers installed with no BMS automation on top. ISRO APEP Aluva is a direct reference for how to bridge that gap quickly, without replacing existing equipment, using EnSmart's integration methodology.

Who This Case Study Is For

AUDIENCE	WHY THIS APPLIES
Facility Managers	Inheriting an existing chiller plant with no BMS layer — and an operator walking to panels all day.
BMS Operators	Who spend more time at panels than at workstations. Satish Kumar's story is your story.
MEP Consultants	Specifying BMS integration on top of existing chiller brands for government or industrial clients.
Project Managers	Evaluating BMS vendors for government sites where downtime is not acceptable.
Energy Managers	Who cannot optimise what they cannot automate first. Control comes before optimisation.
Govt & Defence	Facilities with Voltas, Blue Star, Carrier or any OEM chiller plant running without BMS automation.

"The data existed at the Voltas controller level. The gap was automation logic and BMS integration. EnSmart closed that gap without touching the existing chiller hardware — in one week."

ISRO APEP trusted EnSmart to automate their Voltas chiller plant at Aluva. We delivered in one week.

If your facility has Voltas chillers — or any OEM chiller brand — running without BMS automation, a BMS operator doing manual panel work, or a chiller plant that depends on one person showing up every shift — the ISRO APEP Aluva project is your reference. EnSmart brings the controller, the software, the graphics, and the panel. We integrate with what you already have. We make the operator's walk unnecessary. And we do it on a timeline that respects your operations. ensmart.ai · bmssales@ensmart.ai · SmartNova Platform