EnSmart™

Building Management System
+ AI Analytics Platform

On-Premises Intelligence. Real Savings. Zero Compromise.

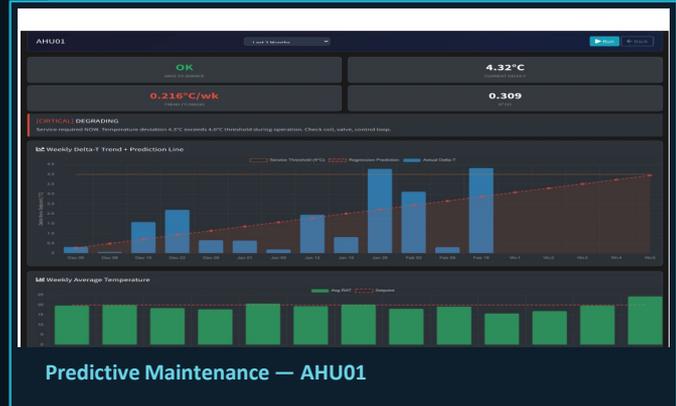| ₹35.2L/yr	268.84T	24–72 hrs	56.6%
Energy Savings (Single Site)	CO₂ Avoided per Year	Fault Prediction Window	VFD Energy Reduction

Predictive Maintenance — AHU01

HVAC Efficiency Scoring

What's Happening in Your Building Right Now

Without AI analytics and smart BMS, buildings lose money silently — every hour, every day.

Equipment Fails Without Warning

HVAC breakdowns discovered only after temperature complaints — not before failure.

Average downtime when reactive

Energy Waste You Can't See

VFDs running at full speed when 60% is enough. Valves overcooling. Sensors stuck.

Energy wasted on average

No Actionable Data

1,440 stuck sensors, 5,433 anomalies — engineers see alerts but can't prioritise.

Stuck sensors at Bafna Ph2 alone

Compliance Risk

Pharma cleanrooms, OT suites — temperature deviations go undetected for hours.

Detected deviation in live pharma site

EnSmart BMS + AI Analytics solves all four — from a single on-premises platform.

One Platform. Every Building System.

EnSmart SmartNova Platform integrates BMS hardware, software and AI analytics — all running on-premises within your infrastructure.

AI Analytics Engine
Predictive Maintenance · Efficiency Scoring · Load Forecasting · Sensor Anomaly Detection
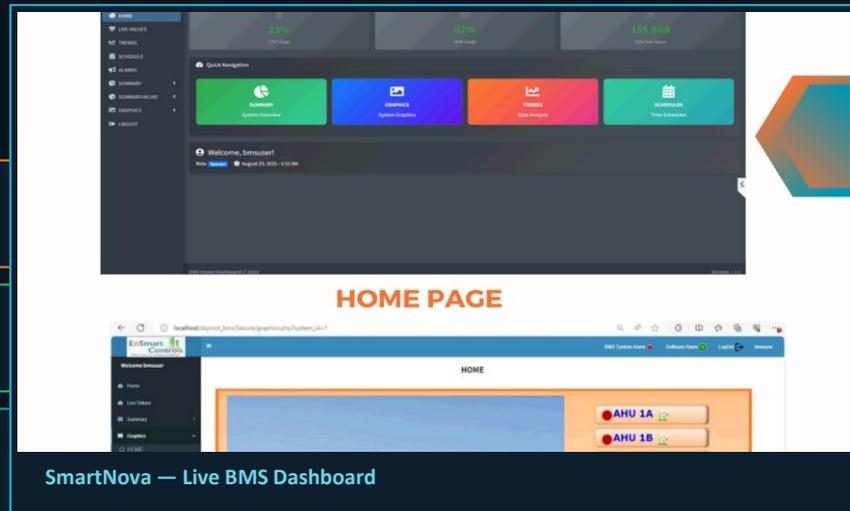
Nova Energy Management
VFD Optimisation · Valve Control · Carbon Reporting · BEE/ECBC 2017 Compliance

EnSoft BMS / IBMS
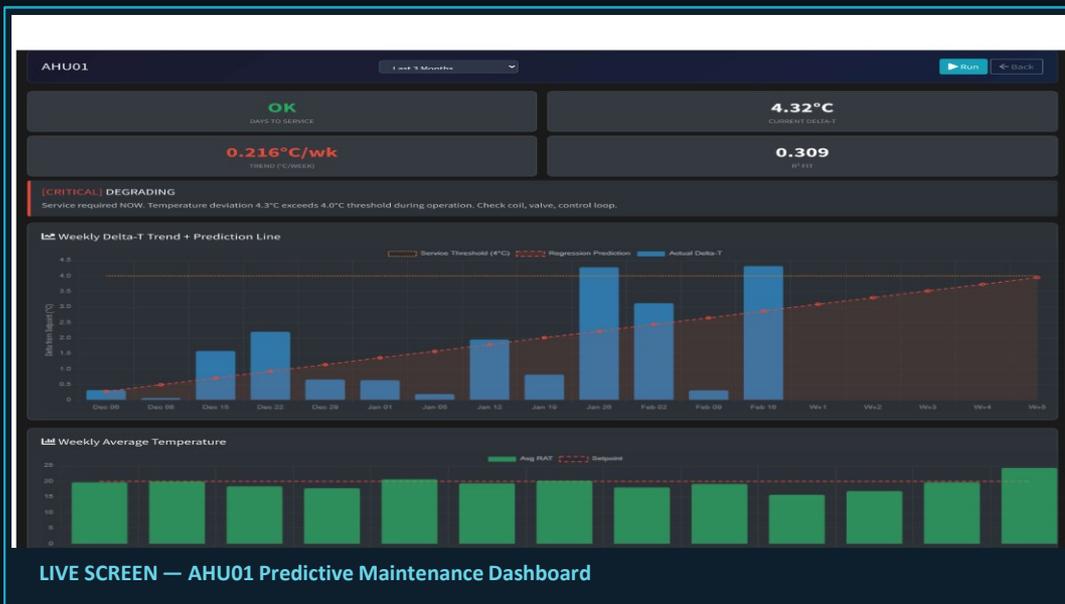HVAC · Fire · Access Control · Lighting · AHU 3D Graphics · Multi-Site Dashboard

DDC Controller Hardware
BACnet/IP Native · ARM A53 1.5GHz · -40°C to 60°C · CE/RoHS · ISO 16484 · Made in India

SmartNova — Live BMS Dashboard

| BACnet/IP | Modbus RTU/TCP | MQTT | 21 CFR Part 11 | ISO 16484-1:2024 | CE/RoHS | FDA | INBAC |

AI MODULE 1 OF 4 — PREDICTIVE MAINTENANCE

Know Equipment Will Fail — 24 to 72 Hours Before It Does.

LIVE SCREEN — AHU01 Predictive Maintenance Dashboard

What This Screen Shows

[CRITICAL] Degrading

AHU01 temperature deviation 4.3°C exceeds 4.0°C threshold — service required NOW

Trend Rate: 0.216°C/week

AI regression predicts continued degradation — 5 weeks to critical failure

Weekly Delta-T Chart

Actual vs predicted deviation shown week-by-week with regression prediction line

Proactive Action

Facility team can schedule maintenance THIS week — before occupants are affected

**Customer Value: Prevent unplanned downtime.
Save ₹1,00,000+ per avoided emergency call-out.**

AI MODULE 2 OF 4 — HVAC EFFICIENCY SCORING

Every AHU Gets a Score. Poor Scores Get Fixed.

LIVE SCREEN — AHU01 Efficiency Dashboard · Score 57/100

Score Breakdown Explained

Setpoint Adherence   **23.3/40**

Avg 19.34°C vs 20.1°C setpoint

Temperature Stability   **3.7/25**

σ=3.4°C — high hunting, PID retuning needed

Comfort Band Time   **14.9/20**

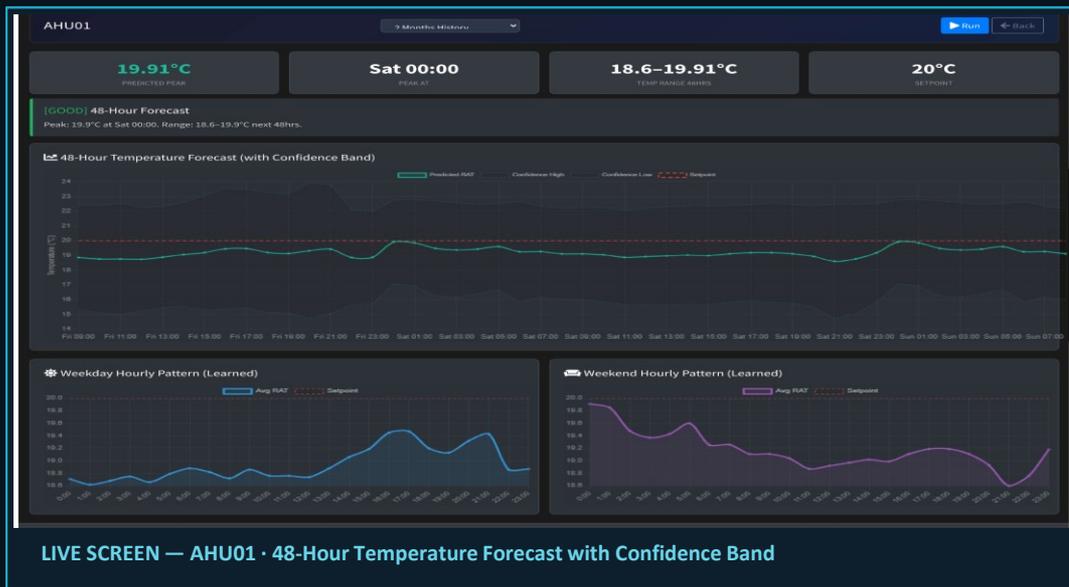73% of time within comfort band

Sensor Health   **15/15**

All sensors operational

Customer Value: Find underperforming AHUs fast. Prioritise maintenance with data, not guesswork.

AI MODULE 3 OF 4 — LOAD FORECASTING & PATTERN LEARNING

The AI Learns Your Building's Patterns.
Then Predicts the Future.

LIVE SCREEN — AHU01 · 48-Hour Temperature Forecast with Confidence Band

What the AI Has Learned

48-Hour Forecast
Peak predicted: 19.9°C at Sat 00:00. Confidence band shows min/max range for planning.

Weekday Pattern Learned
AI has learned hourly demand curves — higher loads 10:00–17:00, drop at night.

Weekend Pattern Learned
Different occupancy profile on weekends — AI schedules HVAC differently automatically.
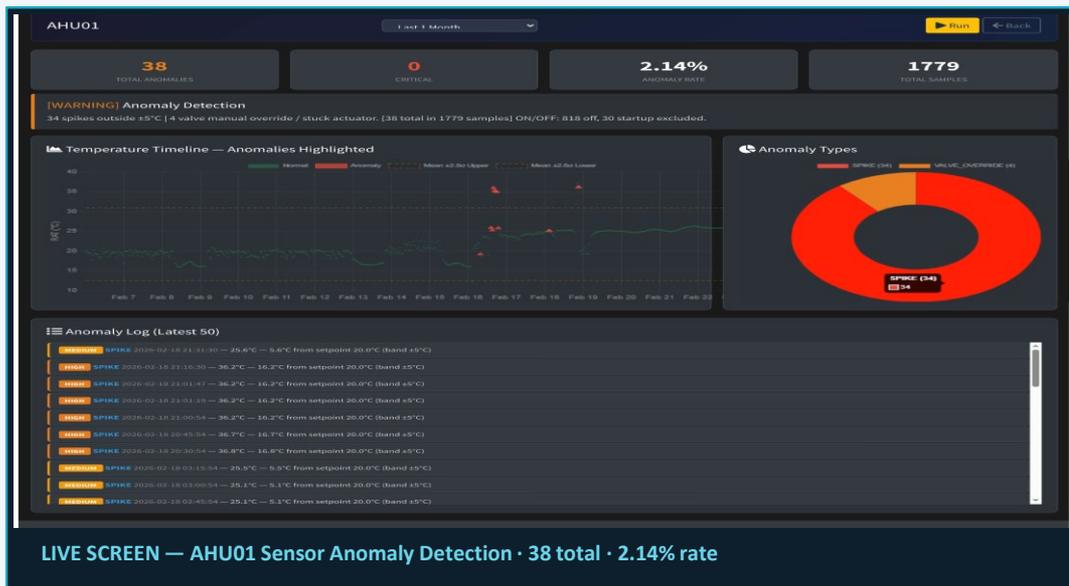
Pre-Cooling Optimisation
AI pre-cools spaces before peak occupancy — reducing peak energy demand by 15–20%.

Customer Value: Proactive HVAC scheduling.
15–20% reduction in peak demand charges.

AI MODULE 4 OF 4 — SENSOR ANOMALY DETECTION

5,433 Anomalies. 1,440 Stuck Sensors. Detected. Classified. Prioritised.

LIVE SCREEN — AHU01 Sensor Anomaly Detection · 38 total · 2.14% rate

Anomaly Types Detected

Temperature Spikes — **1,662**
Sudden readings outside ±2.5σ — identify sensor faults vs real events

Flatline Sensors — **427**
Stuck readings — sensor failure, wiring fault or communication loss

Valve Override Events — **38**
Manual overrides during automation — flag for control loop review

Total Stuck Sensors — **1,440**
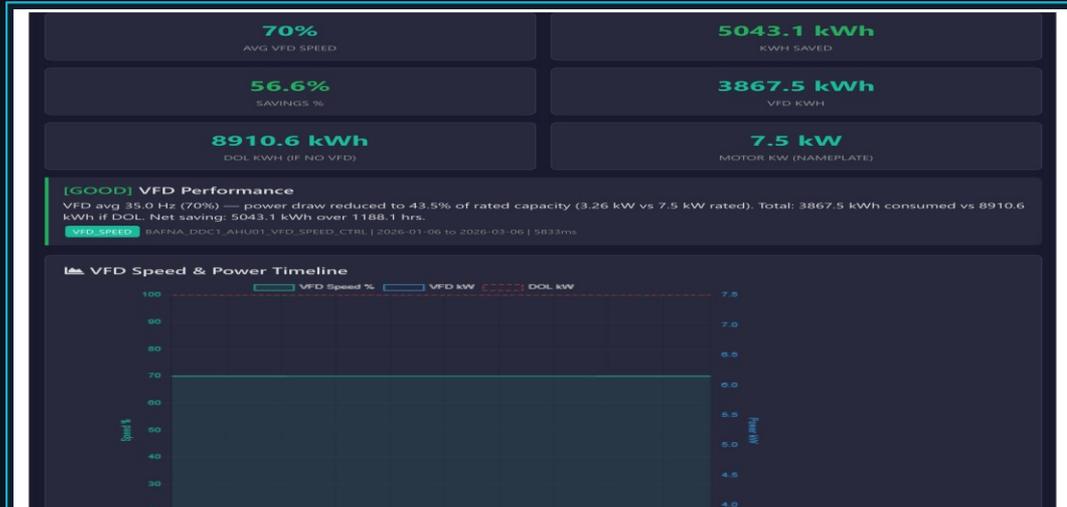Across 37 systems at Bafna Ph2 — prioritised by anomaly rate %

**Customer Value: 10–20 pt efficiency gain.
Calibrate sensors before faults cause failures.**

LIVE RESULTS — VFD PERFORMANCE · BAFNA PH2 · AHU01

56.6% Energy Saved on AHU01 Alone.
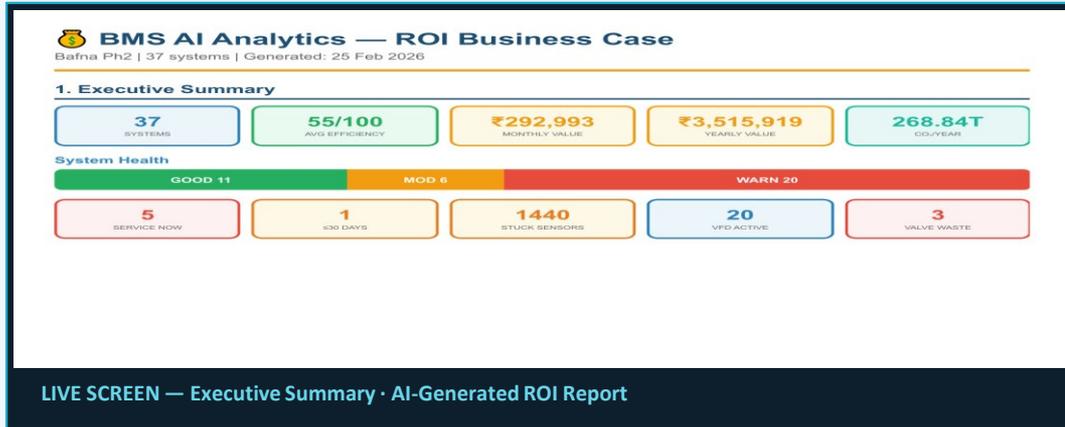# 20 Systems. ₹28.5 Lakhs Saved per Year.

70%	5043.1 kWh
AVG VFD SPEED	KWH SAVED
56.6%	3867.5 kWh
SAVINGS %	VFD KWH
8910.6 kWh	7.5 kW
DOL KWH (IF NO VFD)	MOTOR KW (NAMEPLATE)

[GOOD] VFD Performance
VFD avg 35.0 Hz (70%) — power draw reduced to 43.5% of rated capacity (3.26 kW vs 7.5 kW rated). Total: 3867.5 kWh consumed vs 8910.6 kWh if DOL. Net saving: 5043.1 kWh over 1188.1 hrs.
VFD_SPEED BAFNA_DDC1_AHU01_VFD_SPEED_CTRL | 2026-01-06 to 2026-03-06 | 5833ms

📈 VFD Speed & Power Timeline
VFD Speed %   VFD kW   DOL kW

AHU01 Metrics

| 70% |
| Avg VFD Speed |

| 5,043 |
| kWh Saved |

| 56.6% |
| Savings % |

| ₹2.85L |
| Yearly Saving/AHU |

| 20 | 27,321 kWh | ₹2.37L | ₹28.5L | 268.84T |
| VFD Systems Active | Saved per Month | Monthly EB Savings | Yearly EB Savings | CO_2 Avoided/Year |

LIVE ROI REPORT — BAFNA PH2 · 37 SYSTEMS · GENERATED 25 FEB 2026

₹35.2 Lakhs Per Year.
Verified. Quantified. Real.

LIVE SCREEN — Executive Summary · AI-Generated ROI Report

Carbon & Sustainability — 268.84T CO₂ Avoided

ROI Breakdown

VFD Energy Savings (EB)
Monthly: ₹2,37,695   **Yearly: ₹28,52,344**

20 VFDs · Affinity Law $P \propto S^3$ · ₹8.7/kWh

Valve Waste Recovery
Monthly: ₹5,298   **Yearly: ₹63,575**

3 systems overcooling · PID retuning

Maintenance Avoidance
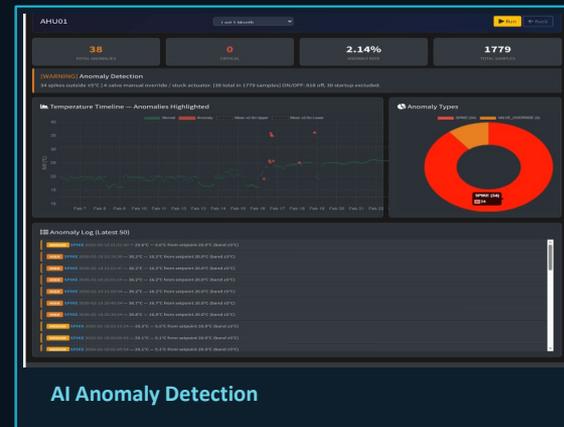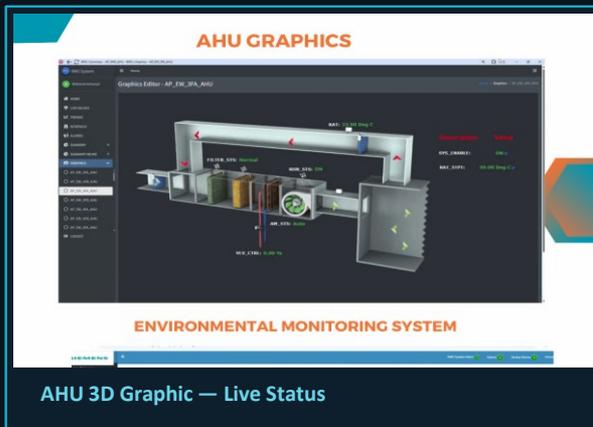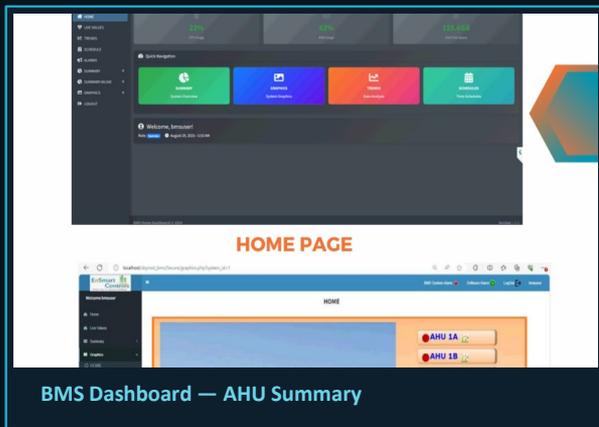Monthly: ₹50,000   **Yearly: ₹6,00,000**

6 systems service NOW or ≤30 days

TOTAL ANNUAL VALUE

₹35,15,919 / yr

What Your Operators See Every Day

Real screens from live deployments — SmartNova BMS on-premises, web-based, no client software needed.

BMS Dashboard — AHU Summary

AHU 3D Graphic — Live Status

AI Anomaly Detection

Web-Based Access

Any browser, any device, LAN or VPN — no software install

3D AHU Graphics

Live status overlaid on 3D AHU model — RUN, FILTER, VALVE, RAT

Real-Time Alarms

Multi-level alarm routing — email + SMS escalation, zero missed events

AI Alert Layer

BMS alarms + AI anomalies on one dashboard — zero context switching

PHARMA / 21 CFR — ON-PREMISES AI ANALYTICS DEPLOYED

The Only BMS AI That Stays Inside Your Facility.

Our AI analytics engine runs entirely on your servers — no cloud, no data leaving your premises. Critical for pharma, defence and sensitive facilities.

Data Never Leaves Premises
All AI computation runs on your on-site server. No cloud dependency. No third-party data exposure.

21 CFR Part 11 Compliant
Tamper-proof, timestamped electronic records. Full audit trail for every AI decision and alarm.

Cleanroom HVAC Validation
AI monitors temperature, humidity and differential pressure — alerts before deviation from spec.

Predictive Alert Before Failure
AI detected 4.3°C delta-T degradation — trending up 0.216°C/week — scheduled before audit.

DEPLOYED — Pharma Site · AHU01 Critical Alert

21 CFR Part 11	FDA Registered	On-Premises	GxP Validated
Compliant	EnSmart	AI Engine	Process

Clients: Aurobindo Pharma · Natco Pharma · OneSource · J&J · Laurus Labs

The Value EnSmart Delivers

₹35.2L/yr

Verified Energy ROI

Actual ROI report from live Bafna Ph2 — 37 AHUs, 20 VFDs, 3 valve systems

56.6%

VFD Energy Reduction

Affinity law $P \propto S^3$ — VFDs running at 70% speed save 56.6% of energy

24–72 hrs

Fault Prediction Window

AI detects HVAC degradation before occupants feel it — avoid emergency calls

5,433

Anomalies Auto-Detected

1,440 stuck sensors, 1,662 spikes, 427 flatlines — all classified by AI

268.84T

CO_2 Avoided Per Year

Equivalent to 12,802 trees planted or 116.9 cars off road annually

On-Premises

AI — No Cloud Required

All AI runs inside your facility. No internet dependency. Pharma-safe.

200+

Projects Delivered

Across pharma, IT parks, commercial, hospitals, retail — since 2013

Open

BACnet/IP — No Lock-in

ISO 16484 / ASHRAE 135 — works with any certified device globally

Your Building Has a ₹35 Lakh Problem.

We can show you exactly where it is — in your building, with your data, in 48 hours.

📊 Request a Live Demo

See BMS AI Analytics running on real data from your sector

📋 Free Site Assessment

Submit your IO list — we map ROI potential within 48 hours

🏭 Pharma Validation Pack

21 CFR Part 11 documentation, test protocols and IQ/OQ/PQ support

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