

What the report shows

Pages from a real CAS ASSIST assessment of a week of logged data. Every number, check and chart below was worked out by CAS ASSIST from the logs and the equipment register.

The plant is Sample Plant, a simulated three-compressor plant built from patterns seen in real assessments. No customer data.

The answer on page one

Scores for performance, efficiency, responsiveness and health, the key figures, and what to fix, ranked by what it saves. Savings that act on the same waste are counted once, never twice.

1 Executive Summary

Scope: The compressed air supply side at Sample Plant: 3 compressors, 2 dryers, 1 filter and 2 receivers, logged 2026-09-07 to 2026-09-14 (168 h of data).

Overall
50

Performance
58

Efficiency
33

Responsiveness
47

Health
65

AVERAGE DEMAND

737 scfm

Air made 977 scfm (purge and drains 240)
Air made is 65% of 1,495 scfm capacity
95th percentile 997 · peak minute 1,234

AVERAGE PRESSURE (FC1 FLOW CONTROLLER INLET PRESSURE)

99.9 psig

76 to 105 · in band 100% of the time
Lowest average 90 at SYS1

STATION POWER

185 kW

15,267 kWh in 168 h logged

ANNUAL ENERGY

777,330 kWh/yr

777,330 kWh/yr
\$93,280/yr · 4,160 h
Compressors 767,965 · other 9,365 kWh

SPECIFIC POWER

18.9 kW/100 scfm

1.0 × the units' rated 18.5

ISENTROPIC EFFICIENCY

73.8%

Ideal power + station power

LEAKS

327 scfm

33% of the air made
From decay tests

IDENTIFIED SAVINGS

\$30,590/yr

254,913 kWh/yr · 33% of the baseline
Overlaps counted once
(listed: \$32,795)

24 recommendations; estimated savings \$30,590/yr (recommendations that act on the same waste are counted once; listed one by one they add to \$32,795/yr).

What to fix, by savings

LOADING AND CONTROLS · OVERLAP COUNTED ONCE

C2 Trim VSD spends 13% of its energy on running part-loaded
C3 Backup spends 22% of its energy on running part-loaded
C3 Backup runs unloaded 63% of its running time



\$5,996/yr

\$3,754

\$2,243

\$515

DRYERS

Air is dried 78 °F further than the system needs
Add dew-point demand control to D2 Heatless



\$26,283/yr

\$17,021

\$9,261

All together (overlaps counted once)

Listed one by one they add to \$32,795/yr; the groups compound on the energy baseline.

\$30,590/yr

Every entry checked against the logs

Setpoints, nameplate data and ratings are checked against what the equipment actually did. Entries the data contradicts are flagged, and where the data settles it, the measured value is used. Here a setpoint and a nameplate rating didn't match the logs.

Entries Checked Against the Data

Each Register entry the logs can test. Where the data settles it, the analysis uses the data's value and says so; where the entry looks wrong but the data cannot settle it, it is flagged and kept. Correct the entry to clear a flag.

Item	Entry	Entered	From the Data	Result	Why
C1 Base	C1 Load pressure	98 psig	106.3 psig (5 rises, ± 0.7 psi)	Data used	The logs show where it really cuts back; that is used. Read the setpoints off the controller to correct the entry.
C1 Base	C1 FLA and service factor	182 A $\times$ 1.15	185 A at full load and 125 psig (1.02 $\times$ FLA)	Agrees	Into its service factor, within its rating.
C1 Base	C1 Rated power (full-load reference)	125.0 kW at 125 psig	121.9 kW at 125 psig from its own full-load power, confirmed from the logs	Data used	Vetted: its own full-load line, at each reading's discharge pressure, sets where it runs on its load curve.
C2 Trim VSD	C2 Target pressure	103 psig	103.2 psig (2 rises, ± 0.0 psi)	Agrees	Within 2 psi of the logs.
C3 Backup	C3 Load pressure	103 psig	106.0 psig (11 rises, ± 2.5 psi)	Check the entry	Too few or scattered rises to settle it: the entry is used.
C3 Backup	C3 FLA and service factor	160 A $\times$ 1.15	126 A at full load and 125 psig (0.79 $\times$ FLA)	Check the entry	Well under its FLA: the entry (another voltage, the drive's), the logger's scaling, or it never reaches full output.

The system mapped step by step

The system is worked out in order, each step building on what has already been confirmed, from the logged readings through to demand and leaks. Every result says whether it holds, is worth a look, or is flagged, and why.

3. Each Compressor

Item	Check	Found	Result	Why
C1 Base	Full-Load Power	109.8 kW (-1%)	✓ Holds	Against its rated 110.8 kW at the pressure it ran at.
C1 Base	Where It Eases Off	106.3 psig	! Worth a Look	The entered load is 98 psig; the logs show 106.3 and that is used. Read the setting off the controller.
C1 Base	Full-Load Amps	185 A (1.02 $\times$)	✓ Holds	Against its 182 A FLA $\times$ 1.15 service factor: it reaches full load.
C2 Trim VSD	Full-Load Power	87.5 kW (+8%)	! Worth a Look	Against its rated 80.9 kW at the pressure it ran at.
C2 Trim VSD	Where It Eases Off	102.3 psig	✓ Holds	Agrees with the entered 103 psig.
C3 Backup	Full-Load Power	62.8 kW (-18%)	✗ Flagged	Against its rated 76.1 kW at the pressure it ran at: less than it should draw (it may not reach full load, or the power reading is low)
C3 Backup	Where It Eases Off	106.0 psig	Not Checked	Too few or scattered times to settle it: the entered setting is used.
C3 Backup	Full-Load Amps	126 A (0.79 $\times$)	! Worth a Look	Against its 160 A FLA $\times$ 1.15 service factor: well under; check the entry and the logger's scaling, or it never reached full output.

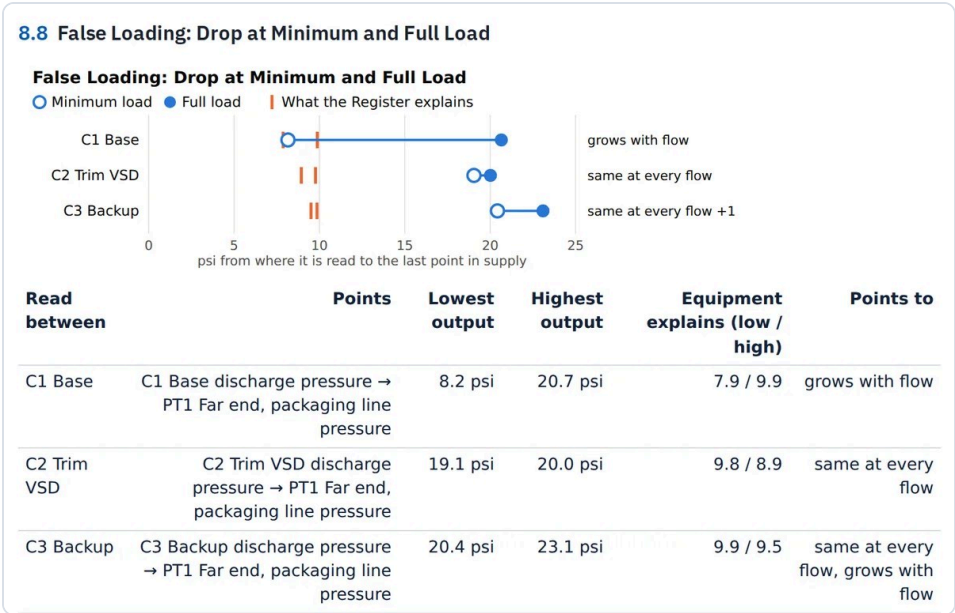
Problems no one entered

Problems that aren't in the equipment list still show up in the data. Here a dryer recorded as shutting down with the compressors kept running after they stopped, wasting stored air every shutdown.

5. Dryers, Purge and Drains				
Item	Check	Found	Result	Why
Dryers	Purge	about 240 scfm rated	Not Checked	The dryers purged through the decay tests, so the leak figure is leaks and purge together; the rated purge is an indication.
D2 Heatless	Flow Against Its Rating	—	Not Checked	No inlet pressure logged near it, so its flow against its rating could not be checked.
D2 Heatless	Tower Switch	every 5 min, about 146 scfm swing	× Flagged	Its tower switch shows in the demand every 5 min. Its rated purge is about 240 scfm. It kept switching with every compressor stopped, but it is entered as interlocked: check the interlock or the entry.

Pressure lost on the way

The pressure each compressor loses on the way to the far end of the system, against what the installed equipment should lose, and what the difference points to. Every psi made only to be lost is energy that delivers nothing.



The evidence behind each finding

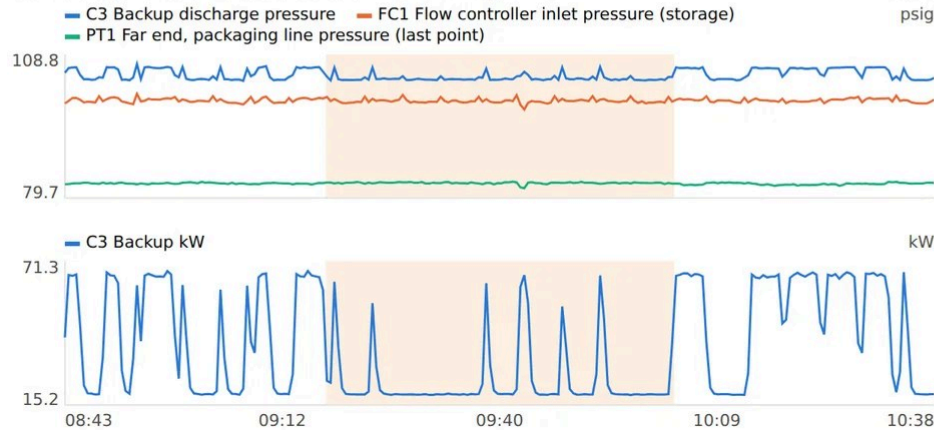
Every recommendation points back to the logged minutes that prove it, so you and your customer can see it for yourselves.

7 Evidence from the Logs

The logged data around when each top recommendation was seen; the shaded band is the time that triggered it. The others' evidence is in Appendix A.

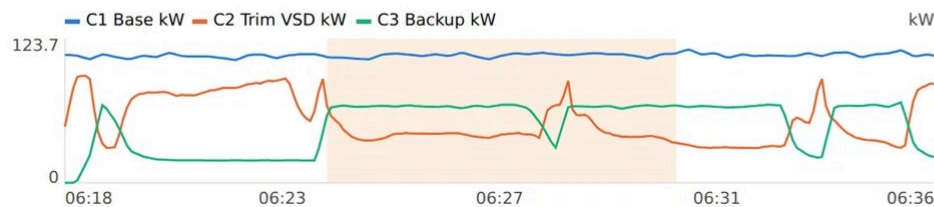
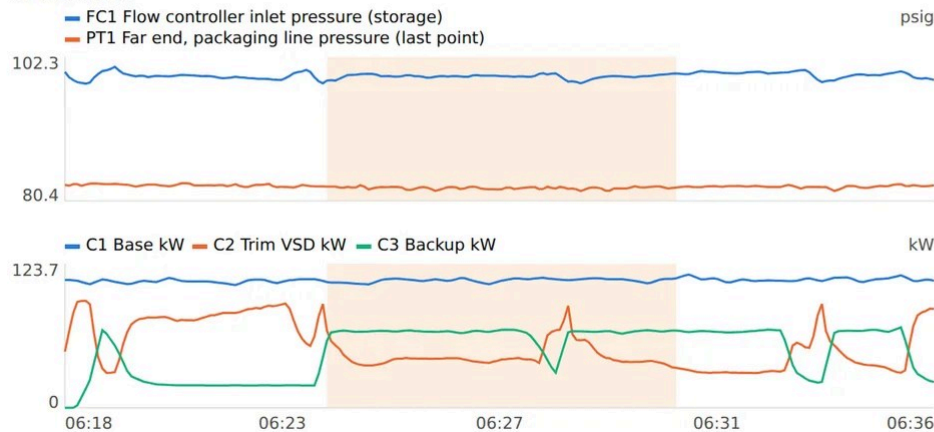
C3 Backup runs unloaded 63% of its running time

Sep 8
psig



Demand events: demand exceeds the compressors' maximum capacity 10% of the time

Sep 7
psig

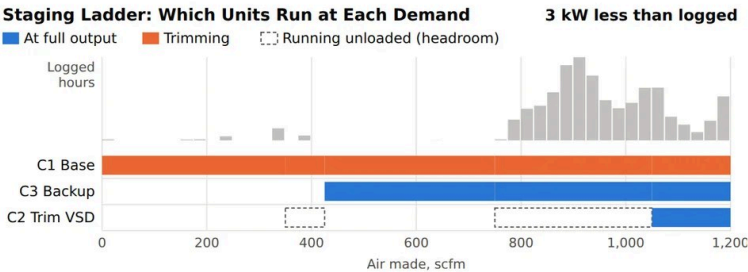


Which units should run at each demand

The arrangements of the compressors compared against the plant's real demand, with what each would save and what it asks of the machines.

8.6 Compressor Combinations: the Staging Ladder

Arrangement	Mean power	Units on	Less than logged		Starts per hour
As logged	185 kW	2.5	—		—
Ladder 1: C1 Base trims	182 kW	3.0	3 kW (12,471 kWh, \$1,497 a year)	0.1 (C3 Backup 1 in its busiest hour, limit 4)	
Ladder 2: C3 Backup trims	184 kW	3.0	1 kW (3,780 kWh, \$454 a year)	0.1 (C1 Base 1 in its busiest hour, limit 4)	
Ladder 3: C2 Trim VSD trims	187 kW	3.0	-3 kW (-11,780 kWh, \$-1,414 a year)	0.1 (C1 Base 1 in its busiest hour, limit 4)	



See it on your own data.

A guided demo on sample data, or on logs from one of your own sites.

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