Dryer Controller Manual

Refrigerated Air Dryer Digital Controller · Installation · Operation · Service

Document	Dryer Controller Manual
Applies to	ADV-DRY series refrigerated dryers · Elitech ECS-180pro controller (DS8011 platform)
Part 1	Everyday Operation, for operators
Part 2	Service & Configuration, for technicians
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PART 1: EVERYDAY OPERATION (for operators)

1. What This Controller Does

Your air dryer removes water from the compressed air before it reaches your tools and equipment. The controller on the front runs the refrigeration system automatically. In normal use you never need to touch it.

The number on the screen is the dew point, a measure of how dry your air is. Lower is drier. With air flowing through the dryer, a healthy unit reads roughly 30–45 °F. With no air flowing, or right after start-up, the reading sits near room temperature. That is normal, not a fault.

> **IMPORTANT** New units ship switched OFF and the screen shows “oFF”. This is not a fault. One time only, at first start-up, hold the ▲ and ▼ buttons together for 3 seconds to switch the controller on. From then on it remembers this state, and the on/off switch on the dryer is all you use.

2. Daily Use: Quick Reference

To do this…	…do this
Start or stop the dryer	Use the on/off switch on the dryer. The controller remembers it is on, so it comes straight back each time. The air compressor is separate: start and stop it at its own controller (MAM6080).
First start-up of a new unit (one time)	Hold ▲ + ▼ together for 3 seconds to switch the controller on. After this one step, the on/off switch is all you use.
Read air dryness (dew point)	It is the normal display. Roughly 30–45 °F with air flowing = good.
See how hot the refrigeration is running	Press ▼ once (condenser temperature). Returns by itself after 30 s.
See the dryer’s compressor hours	Press ▲ once. This counts the dryer’s internal refrigeration compressor, not the air compressor. CtL means hours, up to 999. Above 999 the display splits the number: CtH shows the thousands, CtL shows the rest. Example: CtH 2 then CtL 450 = 2,450 hours.
Snowflake icon flashing	The refrigeration compressor is in a protective wait (up to 3 minutes between starts). Not a fault. Just wait.
After a power outage	Nothing to do. The unit restores its previous state on its own.
Remote start (option)	AERO can add a wall station that starts and stops the air compressor and dryer together from one switch. Ask your AERO technician.

3. If the Unit Beeps: Alarm Codes

When something is wrong, the screen alternates a code (A…) with the temperature and the buzzer sounds. Most alarms clear themselves once the cause is fixed. Here is what each code means in plain terms and what to do first:

Code	In plain terms	What to do
A31	Air is not dry enough (dew point too high). The dryer keeps running. Air keeps flowing, but wetter than it should be.	Usually the dryer is being asked for more air than it is sized for, or the incoming air is very hot. If it does not clear when demand drops, call service. Wet air can damage paint work and tools.
A32	The refrigeration is running too hot. The dryer stops itself for protection.	Check three things: the fan is spinning, the cooling fins on the back are clean and unblocked, and the unit has open space and fresh air around it. Clean or clear, then let it cool. It restarts on its own. If it repeats, call service.
A11	Refrigerant pressure problem (the safety switch tripped). The dryer stops itself.	This usually needs a service visit because it can mean a refrigerant leak. It can also trip in a very cold room (below ≈36 °F) or after long running with no air flowing. Note what was happening and call service.
A21	The air-dryness sensor has failed or a wire is off.	Call service.

Code	In plain terms	What to do
A22	The refrigeration temperature sensor has failed or a wire is off.	Call service.

If an alarm stays on after the cause is clearly fixed: press CLR + ▲ together and release within 3 seconds to reset.

4. Do and Don’t

- DO keep at least 3 feet of clear space around the dryer and keep the cooling fins clean. Heat is the number one killer of these units.
- DO start and stop the dryer with its on/off switch. The air compressor has its own controls; never stop the air compressor by cutting its power.
- DON’T switch the dryer off and straight back on repeatedly. After a stop, the refrigeration compressor can wait up to 3 minutes before restarting. That is the protection timer, not a fault.
- DON’T spray water at the unit or block the fan outlet.
- DON’T change settings in the parameter menu. Everything is factory-set for your machine. Changes belong to service technicians using Part 2 of this manual.

PART 2: SERVICE & CONFIGURATION (for technicians)

5. Keys and Indicators

5.1 Status Indicators

Indicator	Meaning
Setting (wrench)	On = parameter setting mode · Off = normal running display
Refrigeration (snowflake)	On = refrigeration compressor running · Off = stopped · Flashing = start delay in progress
Fan	On = condenser fan running · Off = fan stopped
Antifreeze	On = antifreeze valve open · Off = closed (applies only when relay K2 is configured as antifreeze valve, F40 = 2)

5.2 Keys

Key	Function
SET	Hold 3 s: enter parameter menu (“PAS” prompt). Short press: confirm password / open a parameter for editing / save value and return to the menu list.
CLR	Short press: exit parameter setting (values save automatically). Also used in the fault-reset and factory-restore key combinations.
▲ (up)	Normal display: short press shows refrigeration compressor accumulated hours (CtH = thousands, CtL = remainder). In menus: move up / increase value.
▼ (down)	Normal display: short press shows condensation (condenser) temperature. In menus: move down / decrease value.
▲ + ▼ together	Hold 3 s: switch the controller ON or OFF. Used once at first start-up of a new unit; daily start and stop is the dryer’s on/off switch. The ON state is retained through power cycles.
CLR + ▲ together	Press and release within 3 s: manual fault reset.

When editing a value, holding ▲ or ▼ steps in single digits for the first 5 seconds, then steps in tens.

6. How the Controller Runs the Dryer

Refrigeration compressor: after power-up it waits out the power-on delay (F20, 60 s) and always respects the anti-short-cycle time (F21, 180 s) between starts. In the default mode (F22 = 1) it cycles on dew point: running when the dew point is above F23 (36 °F) and stopping once it has held at or below F23 − F24 (29 °F) for the F25 delay. This keeps the dew point in the mid-30s °F without freezing the evaporator.

Fan: mode F41 = 3 cycles the condenser fan on dew point together with the antifreeze logic (F31/F32). Consequence worth knowing: with zero air load (bench running, no compressed air flowing) the dew point drops fast, the logic holds the fan off, and the condenser can climb until an occasional A32 trips. Under real air load the fan runs normally and the condenser stays cool. Occasional no-load A32 on the bench is expected behavior, not a defect.

7. Parameter Settings

7.1 Entering the Parameter Menu

Hold SET for 3 seconds until “PAS” shows, press SET (“0” appears), enter 55 with ▲ / ▼, then press SET. Select a parameter with ▲ / ▼, press SET to edit, adjust with ▲ / ▼, and press SET to save and return to the list. CLR or 30 seconds without a key exits and saves. The password is valid for a single entry.

7.2 Parameter Table

Temperatures are shown in °F as configured on AERO units (F92 = 1), with the component-factory °C value in parentheses. Displayed values round to the nearest whole degree after unit conversion. Every parameter in this table was verified against production AERO units (July 2026); all values match DS8011 factory defaults. AERO units ship with no OEM parameter changes.

Code	Description	Range	Default	Remarks
Temperature alarms				
F11	Dew point high-temperature alarm setpoint (A31)	50–113 °F	95 °F (35 °C)	Alarm when dew point exceeds this value
F12	Condensation high-temperature alarm setpoint (A32)	108–158 °F	149 °F (65 °C)	Alarm when condensation temperature exceeds this value
F13	Dew point alarm detection delay	0–500 s	120 s	A31 reports only after the condition persists this long
F14	Condensation alarm detection delay	0–500 s	0 s	Same, for A32
F15	Dew point alarm start-up suppression	0–600 s	300 s	A31 detection begins this long after compressor start
F18	Dew point sensor correction	±18 °F	0	Offset applied to P1 reading
F19	Condensation sensor correction	±18 °F	0	Offset applied to P2 reading
Refrigeration compressor				
F20	Compressor power-on start delay	10–300 s	60 s	Minimum wait after power-up before compressor may start
F21	Compressor anti-short-cycle time	30–300 s	180 s	Minimum time between compressor starts
F22	Compressor working mode	0 / 1	1	0 = runs continuously while unit is on · 1 = cycles on dew point (F23–F25)
F23	Compressor start temperature	14–194 °F	36 °F (2 °C)	Dew-point cycling mode
F24	Compressor stop return difference	0.9–45 °F	7 °F (4 °C)	Stops when dew point ≤ F23 − F24 for the F25 delay
F25	Dew-point-control stop delay	0–600 s	300 s	
Fan and antifreeze				
F31	Antifreeze start temperature	23–50 °F	36 °F (2 °C)	Antifreeze action starts below this dew point
F32	Antifreeze return difference	0.2–18 °F	1 °F (0.5 °C)	Stops above F31 + F32
F40	Relay K2 function	0–2	1	0 = not used · 1 = condenser fan · 2 = antifreeze valve
F41	Fan control mode	0–3	3 (AERO)	0 = fan off · 1 = by condensation temp (F42/F43) · 2 = runs with compressor · 3 = by dew point temperature. Do not change.
F42	Fan start temperature	90–131 °F	122 °F (50 °C)	Active only when F41 = 1
F43	Fan stop return difference	0.2–18 °F	2 °F (1 °C)	
Faults and alarms				
F50	Fault input (S2) switch type	0–2	0	0 = normally open · 1 = normally closed · 2 = input disabled. S2 is the refrigerant pressure switch on ADV-DRY units (A11).
F51	A31 (dew point high) response	0 / 1	0	0 = alarm only · 1 = alarm + shutdown
F52	A32 (condensation high) response	0 / 1	1	0 = alarm only · 1 = alarm + shutdown
F53	A31 reset method	0 / 1	0	0 = automatic recovery · 1 = manual reset (CLR + ▲)
F54	A32 reset method	0 / 1	0	Same options
F55	Fault-signal (A11) reset method	0 / 1	0	Same options
F56	Fault-signal detection delay	0–300 s	1 s	0 = report immediately

Code	Description	Range	Default	Remarks
F57	Fault-signal (A11) response	0–2	1	0 = alarm only · 1 = alarm + shutdown · 2 = alarm, stop refrigeration compressor only
Remote control and system				
F58	Remote switch (S1) type	0 / 1	1	0 = normally open · 1 = normally closed. Ignored when F60 = 0.
F60	System control mode	0 / 1	0	0 = local (keypad) · 1 = remote via S1 contact. See Section 9.
F63	Compressor run-time reset	0 / 1	0	Set to 1 to zero the hour counter; parameter returns to 0
F64	Not documented (firmware V1.5)	n/a	80	Observed on AERO units. Do not change.
F88	Dew point temperature compensation	0 / 1	1	0 = off · 1 = enabled
F89	K1 / K2 output swap	0 / 1	0	0 = K1 refrigeration compressor, K2 fan · 1 = swapped. Do not change.
F90	Administrator password	0–999	55	0 = no password. Do not change.
F91	RS485 slave address	0–999	1	
F92	Temperature unit (firmware V1.5)	0 / 1	1 (AERO)	0 = °C · 1 = °F. All temperature setpoints auto-convert when switched.
F95	Not documented (firmware V1.5)	0 / 1	1	Observed on AERO units. Do not change.

ENGINEERING NOTE Firmware V1.5 (AERO units) adds parameters F64, F92 and F95 beyond the published DS8011 V2.0 table and skips some intermediate codes. For any parameter marked “Do not change” or not documented: record the value before touching it, change one item at a time, and revert if the effect is unknown.

7.3 One-Touch Factory Restore

Within 1 minute of applying power, with the controller switched OFF: hold ▲ + CLR for more than 5 seconds until “FAC” shows, then press SET within 8 seconds. “End” confirms the restore. Any other key cancels.

CAUTION Factory restore returns the controller to Celsius and component-factory defaults. After a restore, set F92 = 1 (°F) and verify the values marked “AERO” in the table above.

7.4 Forgotten Password

At the “PAS” prompt press SET so “0” is shown, then hold SET for 30 seconds to force entry into the parameter menu. The standard password is stored in F90 (factory 55). Do not change it.

8. Fault Codes: Technical Troubleshooting

Code	Meaning	Controller response	Cause / field action
A11	External fault input (S2) active. On ADV-DRY units S2 is the refrigerant pressure switch.	Per F57 (default 1 = alarm + shutdown). Reset per F55.	Causes: low refrigerant pressure / leak; ambient below ≈36 °F; long no-load running; high refrigerant pressure (as A32); poor pressure-switch contact. Test: set F50 = 0 (input disabled) and run about 3 minutes. If the dew point falls to 32–41 °F the refrigeration circuit is good, so inspect the switch and wiring. If it does not fall, suspect a refrigerant leak. Restore F50 afterward.
A21	Dew point sensor (P1) fault: open or short circuit	Alarm	Check P1 (white) sensor wiring; replace the dew point sensor.
A22	Condensation sensor (P2) fault: open or short circuit	Alarm; fan then runs together with the compressor	Check P2 (blue) sensor wiring; replace the condensation sensor.

Code	Meaning	Controller response	Cause / field action
A31	Dew point above F11 (after F13 delay; suppressed for F15 seconds after compressor start)	Per F51 (default 0 = alarm only). Reset per F53.	Feel the drain: cool → sensor problem. Not cool → open the side panel: refrigeration compressor running but not cooling = refrigerant leak; not running but hot = replace its run capacitor first; if it still will not run, refrigeration compressor failure.
A32	Condensation temperature above F12 (after F14 delay)	Per F52 (default 1 = alarm + shutdown). Reset per F54.	Cycle the fan off/on and confirm it runs; clean dirty or blocked condenser fins; improve ventilation / reduce ambient. See also the no-load note in Section 6.

8.1 Other Symptoms

Symptom	Likely cause	Action
Display flashes and restarts repeatedly	Unstable or inadequate power supply	Check dryer power wiring; try a dedicated supply circuit.
Refrigeration compressor hums/vibrates a few seconds, stops, repeats every few minutes	Run capacitor failed; compressor cylinder seized	Replace the run capacitor first; if the behavior persists, replace the refrigeration compressor.
No temperature change 5 minutes after start (or very small)	Refrigeration compressor not starting; refrigerant leak; sensor fault	Use the drain-temperature test in A31 above to separate sensor / leak / capacitor / compressor.

9. Remote Start (S1 Input)

As standard, the dryer and the air compressor start separately: the dryer at its own switch, the air compressor at the MAM6080 controller. A combined remote start (wall station) is available as an option.

Where it connects: the dryer's remote start input is the S1 terminal pair on the controller (red leads). Enable it with F60 = 1; contact polarity follows F58 (factory 1). Contact closed = run, open = stop. Confirm this at commissioning.

CAUTION S1 is a dry-contact input. Never apply voltage to the S1 terminals. Connect only an isolated relay contact or switch.

For the wall-station design, wiring, relay details, and the commissioning procedure, refer to the AERO Remote Start Manual.

- Until a remote station is installed: run F60 = 0 (keypad control), or F60 = 1 with a jumper across S1.
- RS485 alternative: Modbus register 16 (0x0010) switches the controller on/off remotely (1 = on, 0 = off). See Section 11.

10. Terminals and Wiring

Terminal	Function
1	Alarm relay output, 10 A
2	Fan relay output (K2), 10 A
3	Refrigeration compressor relay output (K1), 1.5 HP (25 A), max 17 A
4 / 5	L / N, 220 VAC 50/60 Hz supply
S1	Remote run switch, dry contact (red leads). Active when F60 = 1.
S2	External fault input, dry contact (black leads). Refrigerant pressure switch on ADV-DRY units; mode per F50.
P1	Dew point sensor, NTC (white leads)
P2	Condensation sensor, NTC (blue leads)
RS485	V · G · A · B, Modbus RTU

NOTICE Refrigeration compressors above 1.5 HP must be driven through an AC contactor. Do not switch them directly on the K1 relay. Fan loads on K2: 1 kW resistive maximum.

11. RS485 Communication

Modbus RTU slave. 9600 baud, 8 data bits, no parity, 1 stop bit. Supported commands: 03 (read registers) and 06 (write single register). Slave address per F91 (factory 1). Poll no faster than every 500 ms, and write with command 06 only when a value actually changes (flash memory wear).

Register (dec)	Content	Notes
0	Dew point temperature	Read-only
1	Condensation temperature	Read-only
4	Digital input status	Bit 1 remote switch · bit 2 fault signal
5	Digital output status	Bit 0 refrigeration compressor · bit 1 fan · bit 2 alarm · bit 8 compressor waiting
6	Controller status	Bit 0 power on · bit 1 shutdown · bit 2 working · bit 3 alarm
7 / 8	Alarm status 1 / 2	A21, A22, A31, A32, A11, memory fault bits
10	Run time	Read-only, hours
16	On / Off setting	Read/write: 1 = on, 0 = off (remote on/off)
17–51	System parameters	Per the parameter table, read/write

12. Glossary

Term	Plain meaning
Dew point	The temperature at which water starts condensing out of the air. This is the number on the main display. Lower = drier air.
Condensation temperature	How hot the refrigeration condenser is running (press ▼ to view). High = poor cooling.
Return difference (hysteresis)	The gap between a switch-on point and its switch-off point, so equipment does not chatter on and off.
Anti-short-cycle	A forced minimum wait between refrigeration compressor starts (F21), protecting it from damage.
Antifreeze protection	Logic that keeps the evaporator from icing up when the dew point gets too low (F31/F32).
Dry contact	A switch or relay contact with no voltage on it. The controller supplies its own sensing signal. Never feed power into S1 or S2.
CtH / CtL	How the 3-digit display shows refrigeration compressor hours. CtL is the count up to 999 hours. Above that, CtH shows the thousands and CtL the remainder: CtH 2 then CtL 450 means 2,450 hours.
NTC sensor	The temperature probe type used for P1 and P2 (resistance drops as temperature rises).