



PSU and PCM Variants Technical Bulletin

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Introduction

This technical bulletin provides brief information about the new Power Supply Unit (PSU) and Power Cooling Module (PCM) variants that are being introduced for use in Seagate storage enclosures. The new power units (PSUs and/or PCMs) are compliant with Ecodesign requirements specified by the European Union, which demand increased power supply efficiency and fewer negative environmental impacts occurring throughout the product life cycle. For more information on the Ecodesign requirements, see the [European Union website](#).

Description

Seagate's new power units contain enhancements for improving performance of the enclosures by adhering to the new ECO standards. The new power units are designed by following Ecodesign principles, which have increased their efficiency.

The new Ecodesign power units have equivalent ratings with non-ECO power units. It is not mandatory to upgrade your power units to the ECO standard unless non-ECO power units are unavailable.

You must upgrade the system firmware to a supported version before installing a new power unit. You are allowed to mix non-ECO and Ecodesign power units in the same enclosure, but only for a limited time period while upgrading the power units to the ECO standard. During normal operation of an enclosure, both power units must be of the same version (either non-ECO or ECO standard). In a set of connected enclosures, both types of power unit can be used, provided the power units in a single enclosure are identical. The system will report a warning message—"Power supply is not supported"—if power units of different versions are installed in an enclosure.

The non-ECO power unit firmware is not compatible with the new Ecodesign power units, hence use of the new power unit requires the GEM (Generic Enclosure Management) code to be updated. However, the new power unit firmware supports the non-ECO power units.

New firmware files may have different firmware upgrade or downgrade procedures depending on the new inbuilt processor.

PSU sensor data during mixed-type operation

When a mix of non-ECO and Ecodesign (ECO) PSUs is installed in the same enclosure during the transitional replacement period, PSU sensor data will not be reported by the Ecodesign PSU. This is due to differences in communications timing between the older and newer PSU types; the firmware is unable to communicate with both PSU types simultaneously. During mixed-type operation, the following behavior is expected for the Ecodesign PSU:

Data type	Available during mixed-type operation?
VPD content (make, model, part number, serial number)	Yes, visible as normal
Voltage and current sensor data	No, not reported until mixed-type period ends
Temperature sensor data (inlet, hotspot, secondary hotspot)	No, not reported until mixed-type period ends

Once the non-ECO PSU is removed and replaced with an Ecodesign PSU, the firmware will correctly resume reporting both VPD content and full sensor data from the Ecodesign PSU. At that point, all voltage, current and temperature sensor values and enclosure status will return to normal. This behaviour applies equally to the reverse replacement sequence (Ecodesign to non-ECO).

IO continuity and system availability during the PSU swap

The non-ECO to Ecodesign PSU replacement procedure is non-disruptive to IO. Drive IO continues uninterrupted throughout all stages of the swap, and the enclosure remains fully powered and operational. The table below summarizes system status at each step:

Swap step	IO and system status
Non-ECO PSU removed, ECO PSU installed and powered (mixed-type period)	IO continues uninterrupted to all drives. The system remains fully operational. The ECO PSU is actively supplying power despite sensor data showing 0.00 V / 0.00 A.
Non-ECO PSU power disconnected before physical removal	IO continues uninterrupted. The ECO PSU assumes the full load. Fans increase to maximum speed. Redundancy alarm is raised but the system remains online.
Second ECO PSU installed and powered (both PSUs now ECO)	All alarms clear. Fans return to normal speed. Full sensor reporting resumes on both PSUs. System status returns to normal.

The system will raise alarms and run fans at maximum speed during intermediate steps (see below), but these are expected responses and do not indicate a risk to data or system availability.

⚠ IMPORTANT Ecodesign PSU is powered and operational during mixed-type operation voltage and current sensor values are reported as 0.00 V / 0.00 A while mixed PSU types are installed, the Ecodesign PSU is powered on and actively supplying power to the enclosure. The zero readings are a reporting artefact caused by the communications timing difference between PSU types, which do not indicate that the PSU is faulty or inactive. Do not remove the Ecodesign PSU on the basis of a 0.00 V sensor reading alone during the mixed-type transitional period. Doing so would leave the enclosure running on a single PSU with no redundancy. To confirm PSU status, use the GEM CLI `ddump_pwmgr` command, which will show the PSU state as `COMPATIBILITY_CHECK` (confirming it is present and powered, not REMOVED or OFF).

Additional system alerts during mixed-type operation

In addition to the sensor reporting behaviour described above, the following system responses will occur during the mixed-type transitional period. All are expected and will resolve automatically once the PSU replacement is complete.

System response	Detail
CRITICAL alarm - "Mixed PCM types"	A CRITICAL-level alarm is raised and the enclosure audible buzzer sounds continuously while mixed PSU types are both installed and powered. This is expected behaviour and will clear automatically once both PSUs are the same type.
Fans at maximum speed	The system reports "System airflow is compromised" and drives all fans to maximum speed for the duration of the mixed-type period. Normal fan control is restored automatically once both PSUs match.
Module Fault Rear LED - ON	The rear module fault LED illuminates while mixed PSU types are installed. It extinguishes automatically once both PSUs are the same type.

Automatic Ecodesign PSU secondary firmware upgrade

For an Exos Protect 4006 Series or Exos CORVAULT controller enclosure, if partner firmware update (PFU) is enabled and the non-ECO PSU is physically removed from the enclosure, the system automatically upgrades the secondary firmware on the installed Ecodesign PSU. This occurs without operator intervention and is part of the normal transition process:

Event	Detail
ECO PSU secondary firmware auto-upgrade	When the non-ECO PSU is physically removed, the system automatically upgrades the secondary firmware on the installed Ecodesign PSU (for example, from 1.07 0.00 to 1.07 1.02; exact versions may vary). This occurs without operator intervention and completes before full sensor reporting is restored.

The firmware upgrade completes before full sensor reporting is restored on the Ecodesign PSU. No operator action is required. The updated secondary firmware version will be visible in the `ddump_pwmgr` output once the upgrade is complete.

NOTE Best practice: after any FRU replacement, run the appropriate system-level bundle firmware update procedure as described in the product's documentation.

Seagate products and related Ecodesign PSUs and PCMs

The following table provides the list of Seagate products equipped with the new power units, along with their specifications.

Product	FRU type	Power rating	FRU part number (P/N)	Packaged FRU P/N	80+ certification
Exos E 5U84	PSU	2200W	1104546-XX	PFRUKE30-XX	Titanium
Exos E 4U106	PSU	2000W	1104654-XX	PFRUKE31-XX	Titanium
Exos CORVAULT	PSU	2000W	1104654-XX	PFRUKE33-XX	Titanium
Exos AP 4U100	PSU	3200W	1104655-XX	PFRUKE32-XX	Titanium
Exos E 2U12 Exos E 2U24	PCM	580W	1104029-XX	PFRUKE29-XX	Platinum
Exos AP 2U12 Exos AP 2U24	PCM	764W	1104335-XX	1106015-XX	Platinum
Exos AP 5U84	PSU	2200W	1104546-XX	PFRUKE30-XX	Titanium
Exos X 2U12 (4006) Exos X 2U24 (4006)	PCM	580W	1104029-XX	PFRUKE29-XX	Platinum
Exos X 5U84 (4006)	PSU	2200W	1104546-XX	PFRUKE30-XX	Titanium
Exos X 2U12 (3005, 4005) Exos X 2U24 (3005, 4005, 5005)	PCM	580W	1104029-XX	PFRUKE29-XX	Platinum
Exos X 5U84 (4005, 5005)	PSU	2200W	1104546-XX	PFRUKE30-XX	Titanium

Notes: Due to a branding update, Exos E has changed to Exos Scale, Exos AP to Exos Fuse, and Exos X to Exos Protect.

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Exos E 5U84	PSU	2200W	1104546-XX	PFRUKE30-XX	Titanium
Exos E 4U106	PSU	2000W	1104654-XX	PFRUKE31-XX	Titanium
Exos CORVAULT	PSU	2000W	1104654-XX	PFRUKE33-XX	Titanium

When a customer returns a PSU/PCM FRU, service personnel should order the same PSU/PCM PFRU as a replacement. However, if the same PFRU is not available *and* the customer has an older **non-ECO** FRU, service personnel must order a pair of **ECO** PSU/PCM PFRUs to upgrade both of the system's FRUs. Refer to the following table when ordering:

Product	PSU P/N shown in test log	PSU manufacturer shown in test log	Packaged FRU P/N (Replace 1:1 non-ECO to ECO)	Packaged FRU P/N (Replace 1:1 ECO)	Packaged FRU P/N (Replace 2:1 non-ECO to ECO)
Exos E 4U106 – non-ECO	700-014575-0800	ARTESYN	(1) PFRUKE27-01 (non-ECO)	N/A	(2) PFRUKE31-01 (ECO)
Exos E 4U106 – ECO	700-016288-0800	ARTESYN		(1) 1110567-01 (ECO)	
Exos E 4U106 – ECO	SPASGAT-02X	BPS		(1) PFRUKE31 (ECO)	

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