

AGGRESSIVE UPS LOADS

Real Field Behavior of Dynamic and Regenerative Industrial Loads

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Technical information booklet | V1.1

How should this booklet be read?

Real field measurement - Fluke 435-II / Power Log

Original analyzer screen capture. Channel, unit and time information are preserved from the source screen.

Redrawn from real field data

The chart shows numerical values from the field record; it does not add waveform or simultaneity information.

REPRESENTATIVE VISUAL - NOT A FIELD MEASUREMENT

Used to explain a concept or function. It is not a real measurement screen or a machine wiring diagram.

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1. The Field Problem We See

A machine is running and production continues. The visible average UPS load is not very high, yet at certain moments the UPS output becomes unstable or the UPS switches to bypass. In the field, the first suspicion is usually insufficient power. But average load percentage alone does not explain the whole behavior.

A dynamic machine does not ask for the same current at every instant. At one moment it draws little power, at another it creates a short current burst, and in some operating moments it can push active energy back toward the supply. These are different conditions for power electronics and they must not be treated as one generic overload.

2. What Is an Aggressive Load?

Aggressive Load is the practical term Gurer Elektronik uses for dynamic industrial loads whose current, active power and sometimes power direction can change sharply in short time windows. It is not an IEC or IEEE class and it is not a negative label for the machine. The machine may be doing its own work correctly; it simply does not appear to the UPS as a calm, steady load.

When we use this term, we look at rate of change, waveform shape, RMS-to-peak relationship, harmonic content, active power direction and repeatability in the working cycle.

3. Brand, Nameplate, Process and Real Energy Behavior

The brand identifies the manufacturer. The model describes the machine structure. The nameplate gives nominal design and supply data. The process determines what the machine is actually doing at that moment. The real electrical behavior at the site emerges from all of these together, and must be measured in time.

4. RMS, Peak, Active Power, Apparent Power and Energy

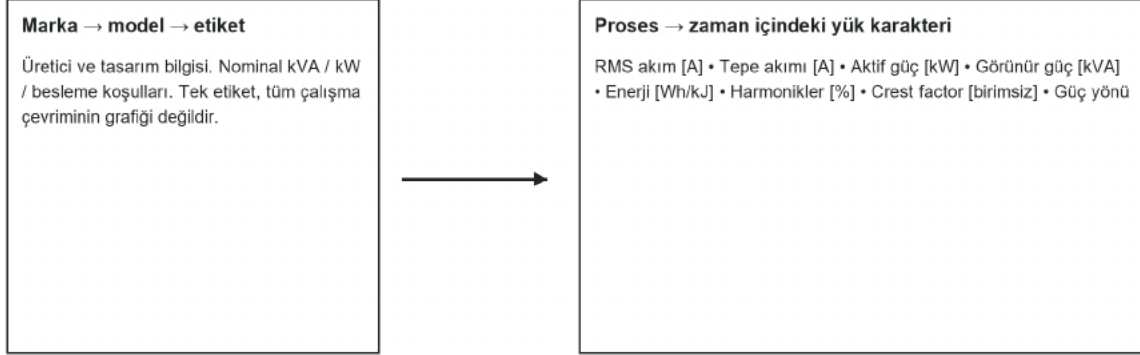
RMS current tells us heating effect. Peak current tells us the stress on semiconductors and magnetic components. Active power tells us the direction and amount of real energy transfer. Apparent power shows the electrical burden seen by the supply. Energy is power integrated over time.

For this reason, one high number on a screen is not enough. A load may have a moderate RMS value but high peaks. It may have high current without returning energy. Another load may look calmer in current but create a reverse active power interval during braking.

Etiket bilgisi ve gerçek enerji karakteri

Gurer Elektronik / kavramsal eğitim seması. Bu şekil sayısal saha kavdı içermez.

TEMSİLİ GÖRSEL – SAHA ÖLÇÜMÜ DEĞİLDİR



Etiketle tek bir nominal değer vardır; sahada ise zamanla değişen bir enerji karakteri vardır.

Tepe akımını etiket RMS değeriyle doğrudan karşılaştırarak üretici veya bütün ürün ailesi hakkında hüküm verilmez.

5. Different Operating Moments on the Same Load

The same machine can behave very differently during acceleration, steady cutting, braking, fast deceleration, direction change or tool movement. Looking only at the nameplate or a single average reading hides these differences.

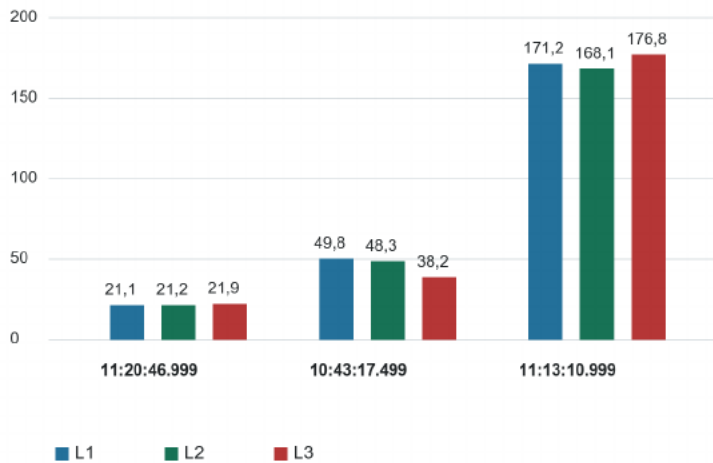
The field record must be read as a time story. Which event occurred at which motion? Did the UPS bypass during a peak current moment, during reverse active power, or during a combined transient? This distinction changes the diagnosis.

Yükün akım karakteri tek bir sayı değildir

Saha B / MEAS 159 / 28.08.2025. RMS çalışma örnekleri ve tepe akımı ayrı ölçeklerde gösterilmiştir.

Gerçek saha verisinden yeniden çizilmiştir.

RMS akım [A] / örnek çalışma anları



TEPE AKIMI / ayrı büyüklük

10:43:17.499 kayıt aralığında L1: 525,8 A; L2: 401,4 A; L3: 377,2 A. L1 aynı kayıt aralığında RMS Ort: 49,8 A; RMS Maks: 69,9 A. 525,8 A sürekli akım değildir.

Düşük, orta ve ağır örnekler aynı yükün farklı zamanlarıdır; üretim hareketi veya proses adı bu kayıttan çıkarılmadı. Min/Ort/Maks ve CF alt pencereleri karıştırılmaz. Kaynak: SAHA_B_MEAS159_SECILI_TUM_KANALLAR.csv.

Power Log 5.9 - [MEAS 159 -- SD Kart]

Dosya Düzen İzle Araçlar Pencerele Yardım

Kimden 28.08.2025 10:46 Kime 28.08.2025 10:48

Özet Elektronik tablo Voltaj ve Akım İstatistikler Eğim ve Sıgliklar Freqans / Dengele Güç Enerji Güç Harmoniği Harmonik Dağıtım Ölçü: SWL RMS Ölçü No: 2: SWL 28.08.2025 10:39:18 117 m.sn.

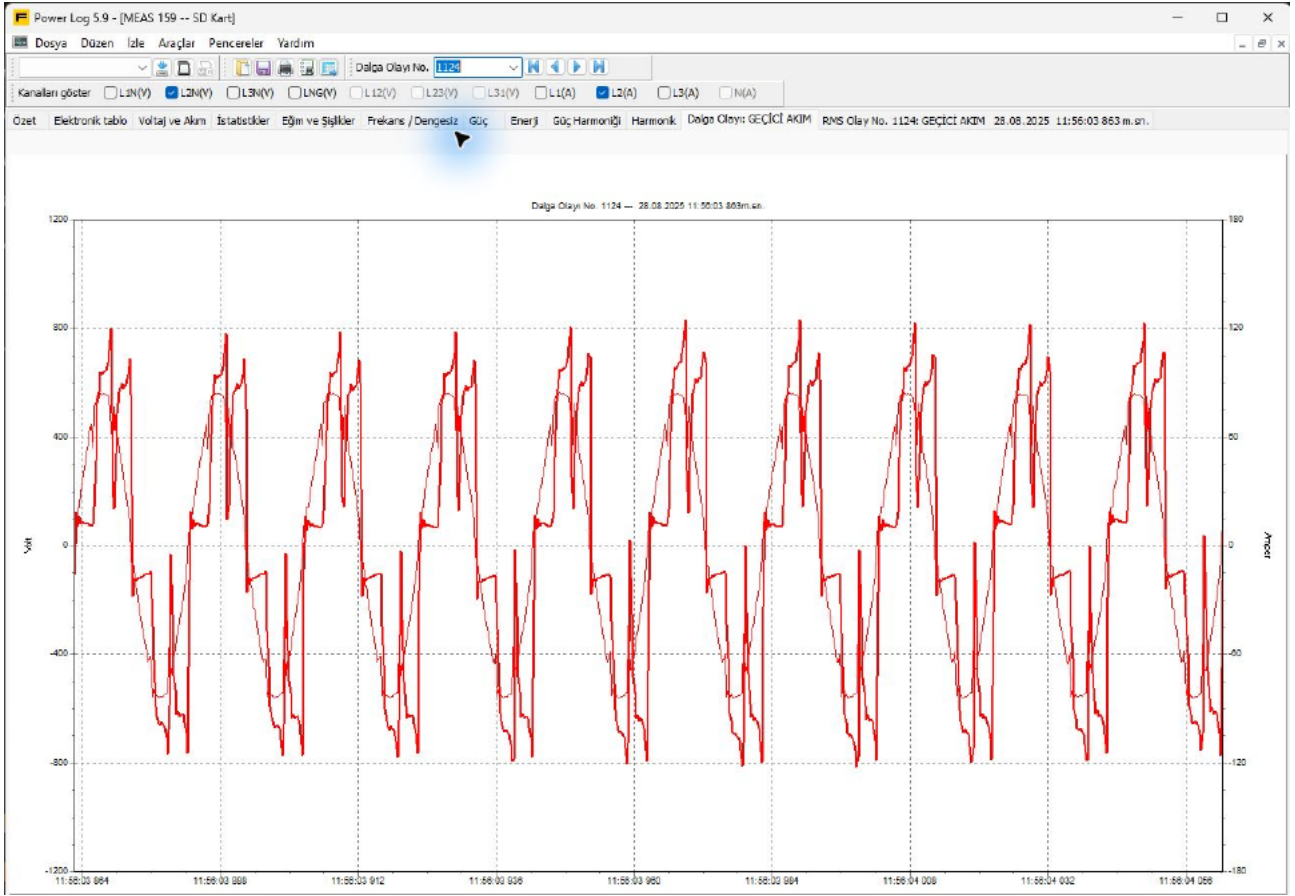
Filtre Sıra ☒ L1N(V) / L1(A) ☒ L2N(V) / L2(A) ☒ L3N(V) / L3(A) ☒ L1N(V) / L2(A) Maks ☒ L2N(V) / L3(A) Maks ☐ Min ☐ Ort ☒ Maks

Tarih	İşlev	Süre	L1N(V) / L1(A) Maks	L2N(V) / L2(A) Maks	L3N(V) / L3(A) Maks	L1N(V) / L2(A) Maks	L2N(V) / L3(A) Maks	L1N(V) / L3(A) Maks	LNG(V) / N(A) Maks	Toplam Maks
28.08.2025 10:43:14 499m.sn.	Tape Voltajı		360,4 V (f)	546,6 V (f)	264,3 V (f)					
28.08.2025 10:43:14 499m.sn.	Tape Akımı		0,000 kA (f)	0,001 kA (f)	0,001 kA					
28.08.2025 10:43:14 749m.sn.	Tape Voltajı		359,6 V (f)	545,2 V (f)	264,2 V (f)					
28.08.2025 10:43:14 749m.sn.	Tape Akımı		0,001 kA (f)	0,000 kA (f)	0,001 kA					
28.08.2025 10:43:14 999m.sn.	Tape Voltajı		359,7 V (f)	545,1 V (f)	264,3 V (f)					
28.08.2025 10:43:14 999m.sn.	Tape Akımı		0,001 kA (f)	0,001 kA (f)	0,001 kA					
28.08.2025 10:43:15 249m.sn.	Tape Voltajı		360,6 V (f)	546,2 V (f)	264,3 V (f)					
28.08.2025 10:43:15 249m.sn.	Tape Akımı		0,001 kA (f)	0,000 kA (f)	0,001 kA					
28.08.2025 10:43:15 499m.sn.	Tape Voltajı		359,7 V (f)	545,3 V (f)	264,4 V (f)					
28.08.2025 10:43:15 499m.sn.	Tape Akımı		0,001 kA (f)	0,000 kA (f)	0,001 kA					
28.08.2025 10:43:15 749m.sn.	Tape Voltajı		359,5 V (f)	544,9 V (f)	264 V (f)					
28.08.2025 10:43:15 749m.sn.	Tape Akımı		0,001 kA (f)	0,001 kA (f)	0,001 kA					
28.08.2025 10:43:15 999m.sn.	Tape Voltajı		360,3 V (f)	546,3 V (f)	264 V (f)					
28.08.2025 10:43:15 999m.sn.	Tape Akımı		0,001 kA (f)	0,001 kA (f)	0,001 kA					
28.08.2025 10:43:16 249m.sn.	Tape Voltajı		359,5 V (f)	545 V (f)	264,1 V (f)					
28.08.2025 10:43:16 249m.sn.	Tape Akımı		0,000 kA (f)	0,001 kA (f)	0,001 kA					
28.08.2025 10:43:16 499m.sn.	Tape Voltajı		360,3 V (f)	546,5 V (f)	264,1 V (f)					
28.08.2025 10:43:16 499m.sn.	Tape Akımı		0,001 kA (f)	0,000 kA (f)	0,001 kA					
28.08.2025 10:43:16 749m.sn.	Tape Voltajı		359,4 V (f)	545,1 V (f)	264,1 V (f)					
28.08.2025 10:43:16 749m.sn.	Tape Akımı		0,000 kA (f)	0,000 kA (f)	0,001 kA					
28.08.2025 10:43:16 999m.sn.	Tape Voltajı		359,5 V (f)	544,8 V (f)	264 V (f)					
28.08.2025 10:43:16 999m.sn.	Tape Akımı		0,000 kA (f)	0,000 kA (f)	0,001 kA					
28.08.2025 10:43:17 249m.sn.	Tape Voltajı		360,1 V (f)	546,2 V (f)	264,1 V (f)					
28.08.2025 10:43:17 249m.sn.	Tape Akımı		0,000 kA (f)	0,000 kA (f)	0,001 kA					
28.08.2025 10:43:17 499m.sn.	Tape Voltajı		326,9 V (f)	553,9 V (f)	335,6 V (f)					
28.08.2025 10:43:17 499m.sn.	Tape Akımı		0,526 kA (f)	0,401 kA (f)	0,377 kA					
28.08.2025 10:43:17 749m.sn.	Tape Voltajı		316,8 V (f)	546 V (f)	321,9 V (f)					
28.08.2025 10:43:17 749m.sn.	Tape Akımı		0,022 kA (f)	0,022 kA (f)	0,01 kA					
28.08.2025 10:43:17 999m.sn.	Tape Voltajı		316,8 V (f)	546 V (f)	321,6 V (f)					
28.08.2025 10:43:17 999m.sn.	Tape Akımı		0,018 kA (f)	0,015 kA (f)	0,008 kA					

6. Harmonics, Crest Factor and Nonlinear Current

Nonlinear current is common in modern industrial loads. A waveform may contain strong peaks, harmonic components and a crest factor that is much higher than a clean sine wave. This stresses cables, transformers and UPS output stages differently than a purely resistive load would.

A high crest factor does not automatically mean regenerative energy. It means that the current waveform is not smooth and the peak-to-RMS relationship is severe. Regeneration must be confirmed by active power direction and event timing.



7. Bidirectional Active Power and Regenerative Energy

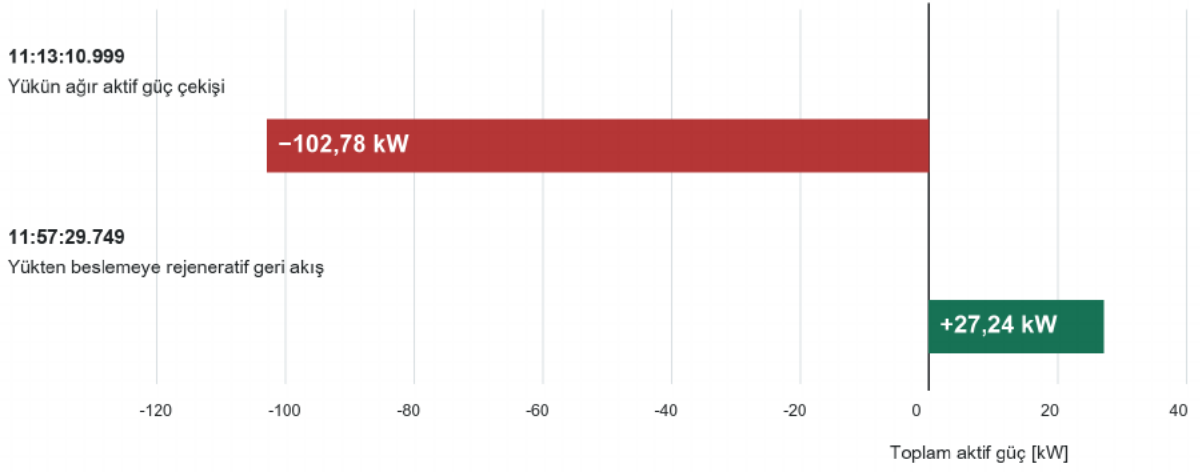
The critical sign of regeneration is not simply high current. It is active power flowing in the reverse direction during a braking, stopping, lowering or deceleration event. In this interval, mechanical energy is converted back into electrical energy.

If that energy reaches a UPS output stage that was not designed to absorb it, the UPS may alarm, switch to bypass, shut down the inverter output or stress internal power stages. The behavior is short, event-based and strongly tied to the machine cycle.

Aynı ölçüm noktasında iki ayrı aktif güç yönü

Saha B / MEAS 159 / 28.08.2025. Aynı zamanlardaki kayıt sonuçları karşılaştırılır; eşzamanlı olay değildir.

Gerçek saha verisinden yeniden çizilmiştir.



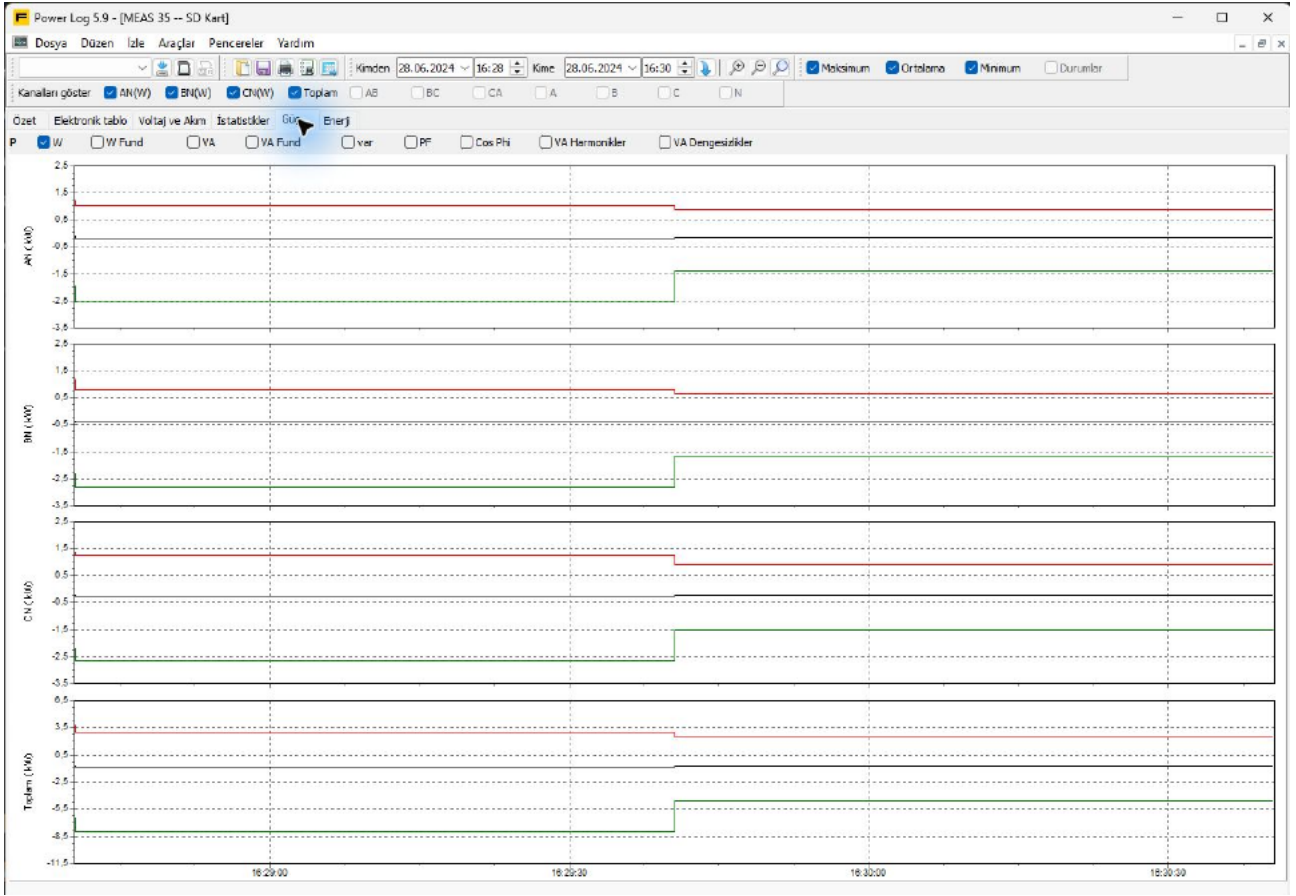
Bu kaydın saha yön referansı: negatif = tüketim, pozitif = geri akış. Kritik satırlar (f); OL yok.

Kaynak: SAHA_B_MEAS159_SECILI_TUM_KANALLAR.csv ve özgün Power Log B01/B03. Eğrilerin faz açısı gösterilmez.

8. Field Case A

In Field A, the machine moved quickly on a long horizontal axis. The installed UPS power was high compared with the nominal process power, yet bypass behavior still appeared. This is the typical situation where a simple 'larger UPS' interpretation can be misleading.

After applying the Gurer Elektronik regenerative suppression solution, the bypass problem was no longer observed in that application. The result is presented as a field observation, not as a universal claim for every UPS and every machine.



Field Case A: Data Reading

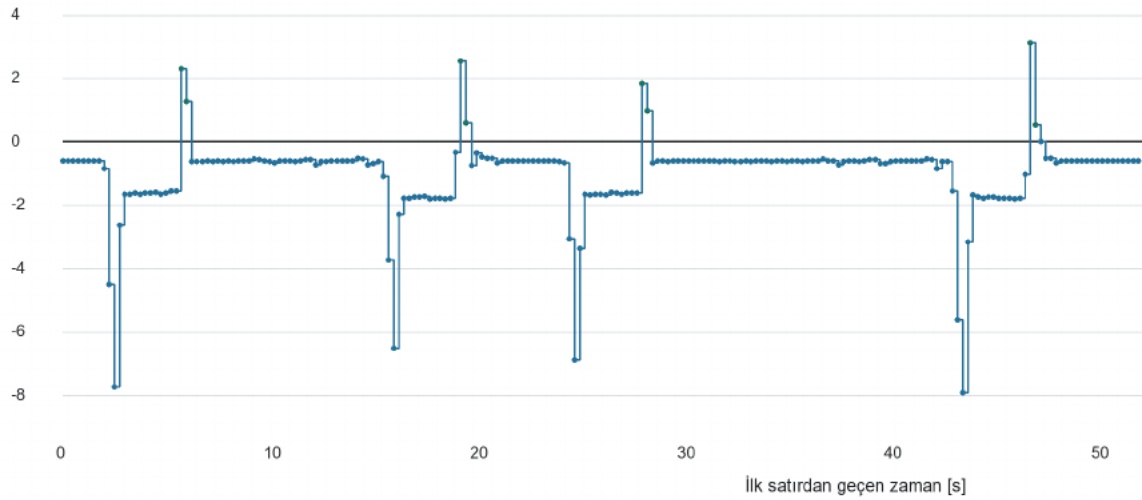
The field data is useful because it shows the event character over time. Short peaks, waveform distortion and motion-related electrical behavior must be considered together. A single current or power value cannot describe the whole machine.

Saha A: tekrarlayan aktif güç işaret değişimleri

MEAS 42 / 28.06.2024 / satır zamanları 16:35:48.998–16:36:41.248 / kayıt adımı 0,250 s.

Gerçek saha verisinden yeniden çizilmiştir.

Toplam aktif güç Ort [kW]



209 satır: 200 negatif, 8 pozitif, 1 sıfır. Pozitif satırlar dört kümeye ayrılır; en yüksek Ort +3,12 kW.

Bu çizgi kayıt sonuçlarını bağlar; periyot içi dalga biçimi değildir. Saha B işaret referansı Saha A'ya aktarılmadı.

9. Field Case B

Field B had a heavier industrial load profile and a wider data archive. The record includes moments of high power draw, reverse active power and measurement-limit behavior. The important point is to separate these categories instead of treating all of them as the same overload event.

This case also showed why event timing matters. A UPS can be stable during normal load, then become unstable during braking or fast deceleration. The load is not simply 'too large'; its energy behavior is changing direction.

Yeni Saha A kaydı: MEAS 48

28.06.2024 / iki adet 60 s toplulaştırılmış sonuç. Min/Ort/Maks birbirinin yerine kullanılmaz.

Gerçek saha verisinden yeniden çizilmiştir.

16:59:09.426 / toplam aktif güç

Min: -7,35 kW; Ort: -0,96 kW; Maks: +3,54 kW,

Enerji sayaçları / yazılım adları

Wh İleri: 1,0 Wh

Wh Ters: 17,0 Wh

Faz Ort değerleri negatiftir. Fazların pozitif uçlarının eşzamanı bu özetten çıkmaz.

17:00:09.426 / toplam aktif güç

Min: -6,21 kW; Ort: -0,75 kW; Maks: +3,36 kW,

Enerji sayaçları / yazılım adları

Wh İleri: 2,0 Wh

Wh Ters: 21,0 Wh

Faz Ort değerleri negatiftir. Fazların pozitif uçlarının eşzamanı bu özetten çıkmaz.

16:59:09.426→17:00:09.426 sayaç farkları: İleri +1 Wh; Ters +4 Wh. Yuvarlama ve pencere uyumu dikkate alınır.

Destekleyici iki işaretli zarf; tam olay süresi veya net fiziksel rejeneratif enerji hesaplanmadı. Kaynak: yeni Power Log dışı aktarımı.

Power Log 5.9 - [MEAS 159 -- SD Kart]

Dosya Düzen İzle Araçlar Pencereleir Yardım

Özet Elektronik Tablo Voltaj ve Akım İstatistikler Eğim ve Sıklıklar Frekans / Dengele Güç Enerji Güç Harmoniği Harmonik Dağıt Olayı: SWL RMS Olay No: 2: SWL 28.08.2025 10:39:18 117 m.sn.

Filtre Sıra ☒ L1N(V) / L1(A) ☒ L2N(V) / L2(A) ☒ L3N(V) / L3(A) ☐ L1N5(V) / N(A) ☒ Toplam ☐ Min ☒ Ort ☐ Maks

Tarih	İşlev	L1N(V) / L1(A) Ort	L2N(V) / L2(A) Ort	L3N(V) / L3(A) Ort	Toplam Ort
28.08.2025 11:13:06 499m.sn.	Etkin Güç	-1,73 kW (f)	-1,78 kW (f)	-1,72 kW (f)	-5,22 kW (f)
28.08.2025 11:13:06 749m.sn.	Etkin Güç	-1,73 kW (f)	-1,78 kW (f)	-1,72 kW (f)	-5,22 kW (f)
28.08.2025 11:13:06 999m.sn.	Etkin Güç	-1,72 kW (f)	-1,78 kW (f)	-1,71 kW (f)	-5,22 kW (f)
28.08.2025 11:13:07 249m.sn.	Etkin Güç	-1,72 kW (f)	-1,77 kW (f)	-1,72 kW (f)	-5,22 kW (f)
28.08.2025 11:13:07 499m.sn.	Etkin Güç	-1,73 kW (f)	-1,78 kW (f)	-1,72 kW (f)	-5,22 kW (f)
28.08.2025 11:13:07 749m.sn.	Etkin Güç	-1,72 kW (f)	-1,78 kW (f)	-1,72 kW (f)	-5,22 kW (f)
28.08.2025 11:13:07 999m.sn.	Etkin Güç	-1,72 kW (f)	-1,78 kW (f)	-1,72 kW (f)	-5,22 kW (f)
28.08.2025 11:13:08 249m.sn.	Etkin Güç	-1,72 kW (f)	-1,78 kW (f)	-1,71 kW (f)	-5,22 kW (f)
28.08.2025 11:13:08 499m.sn.	Etkin Güç	-1,72 kW (f)	-1,77 kW (f)	-1,71 kW (f)	-5,19 kW (f)
28.08.2025 11:13:08 749m.sn.	Etkin Güç	-1,72 kW (f)	-1,78 kW (f)	-1,71 kW (f)	-5,22 kW (f)
28.08.2025 11:13:08 999m.sn.	Etkin Güç	-1,72 kW (f)	-1,78 kW (f)	-1,71 kW (f)	-5,22 kW (f)
28.08.2025 11:13:09 249m.sn.	Etkin Güç	-1,72 kW (f)	-1,78 kW (f)	-1,71 kW (f)	-5,22 kW (f)
28.08.2025 11:13:09 499m.sn.	Etkin Güç	-1,72 kW (f)	-1,79 kW (f)	-1,72 kW (f)	-5,22 kW (f)
28.08.2025 11:13:09 749m.sn.	Etkin Güç	-1,71 kW (f)	-1,78 kW (f)	-1,72 kW (f)	-5,19 kW (f)
28.08.2025 11:13:09 999m.sn.	Etkin Güç	-1,72 kW (f)	-1,79 kW (f)	-1,72 kW (f)	-5,22 kW (f)
28.08.2025 11:13:10 249m.sn.	Etkin Güç	-1,71 kW (f)	-1,78 kW (f)	-1,71 kW (f)	-5,19 kW (f)
28.08.2025 11:13:10 499m.sn.	Etkin Güç	-1,72 kW (f)	-1,78 kW (f)	-1,72 kW (f)	-5,22 kW (f)
28.08.2025 11:13:10 749m.sn.	Etkin Güç	-12,95 kW (f)	-13,48 kW (f)	-14,14 kW (f)	-40,56 kW (f)
28.08.2025 11:13:10 999m.sn.	Etkin Güç	-33,76 kW (f)	-33,59 kW (f)	-35,43 kW (f)	-102,78 kW (f)
28.08.2025 11:13:11 249m.sn.	Etkin Güç	-31,18 kW (f)	-31,1 kW (f)	-32,94 kW (f)	-95,22 kW (f)
28.08.2025 11:13:11 499m.sn.	Etkin Güç	-30,42 kW (f)	-30,18 kW (f)	-31,81 kW (f)	-92,4 kW (f)
28.08.2025 11:13:11 749m.sn.	Etkin Güç	-30,38 kW (f)	-30,52 kW (f)	-31,45 kW (f)	-92,34 kW (f)

Field Case B: Event Archive

The screen captures in this section are kept as field evidence. Channel names, units and time information belong to the original measuring environment. The purpose is not to overstate the record, but to show how the load changes during real operation.

Power Log 5.9 - [MEAS 159 -- SD Kart]									
Dosya Düzen İzle Araçlar Pencereleler Yardım									
Özet Elektronik tablo Voltaj ve Akım İstatistikler Eğim ve Sıgliklar Frekans / Dengele Güç Enerji Güç Harmoniği Harmonik Dağıtıcı SWL RMS Dayı No: 2: SWL 28.08.2025 10:39:18 117 m.sn.									
Filtre	Süre	L1N(V) / L1(A)		L2N(V) / L2(A)		L3N(V) / L3(A)		Ünig(V) / N(A)	Toplam
Tarih	İşlev	L1N(V) / L1(A) Ort		L2N(V) / L2(A) Ort		L3N(V) / L3(A) Ort		Toplam Ort	
28.08.2025 11:57:26 499m.sn.	Etkin Güç	327,67 kW (f,OL)		327,67 kW (f,OL)		-32,2 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:26 749m.sn.	Etkin Güç	327,67 kW (f,OL)		327,67 kW (f,OL)		-31,05 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:26 999m.sn.	Etkin Güç	327,67 kW (f,OL)		327,67 kW (f,OL)		-29,8 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:27 249m.sn.	Etkin Güç	327,67 kW (f,OL)		-28,39 kW (f)		-28,57 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:27 499m.sn.	Etkin Güç	-24,4 kW (f)		-26,31 kW (f)		-27,13 kW (f)		-77,85 kW (f)	
28.08.2025 11:57:27 749m.sn.	Etkin Güç	-23,07 kW (f)		-25,17 kW (f)		-25,55 kW (f)		-73,8 kW (f)	
28.08.2025 11:57:27 999m.sn.	Etkin Güç	-22,37 kW (f)		-24,47 kW (f)		-24,86 kW (f)		-71,7 kW (f)	
28.08.2025 11:57:28 249m.sn.	Etkin Güç	-21,71 kW (f)		-23,86 kW (f)		-24,17 kW (f)		-69,75 kW (f)	
28.08.2025 11:57:28 499m.sn.	Etkin Güç	-20,86 kW (f)		-23,04 kW (f)		-23,19 kW (f)		-67,08 kW (f)	
28.08.2025 11:57:28 749m.sn.	Etkin Güç	-18,25 kW (f)		-20,2 kW (f)		-20,39 kW (f)		-58,86 kW (f)	
28.08.2025 11:57:28 999m.sn.	Etkin Güç	-2,6 kW (f)		-2,82 kW (f)		-2,64 kW (f)		-8,07 kW (f)	
28.08.2025 11:57:29 249m.sn.	Etkin Güç	-3,02 kW (f)		-3,24 kW (f)		-2,98 kW (f)		-9,24 kW (f)	
28.08.2025 11:57:29 499m.sn.	Etkin Güç	-1,21 kW (f)		-1,53 kW (f)		-1,25 kW (f)		-3,99 kW (f)	
28.08.2025 11:57:29 749m.sn.	Etkin Güç	9,51 kW (f)		8,71 kW (f)		9,03 kW (f)		27,24 kW (f)	
28.08.2025 11:57:29 999m.sn.	Etkin Güç	327,67 kW (f,OL)		8,98 kW (f)		9,39 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:30 249m.sn.	Etkin Güç	327,67 kW (f,OL)		9,23 kW (f)		9,64 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:30 499m.sn.	Etkin Güç	327,67 kW (f,OL)		327,67 kW (f,OL)		10 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:30 749m.sn.	Etkin Güç	327,67 kW (f,OL)		327,67 kW (f,OL)		10,6 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:30 999m.sn.	Etkin Güç	327,67 kW (f,OL)		327,67 kW (f,OL)		11,13 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:31 249m.sn.	Etkin Güç	327,67 kW (f,OL)		327,67 kW (f,OL)		11,63 kW (f)		983,01 kW (f,OL)	
28.08.2025 11:57:31 499m.sn.	Etkin Güç	327,67 kW (f,OL)		327,67 kW (f,OL)		327,67 kW (f,OL)		983,01 kW (f,OL)	
28.08.2025 11:57:31 749m.sn.	Etkin Güç	327,67 kW (f,OL)		327,67 kW (f,OL)		327,67 kW (f,OL)		983,01 kW (f,OL)	

10. Physical Explanation of Regenerative Energy

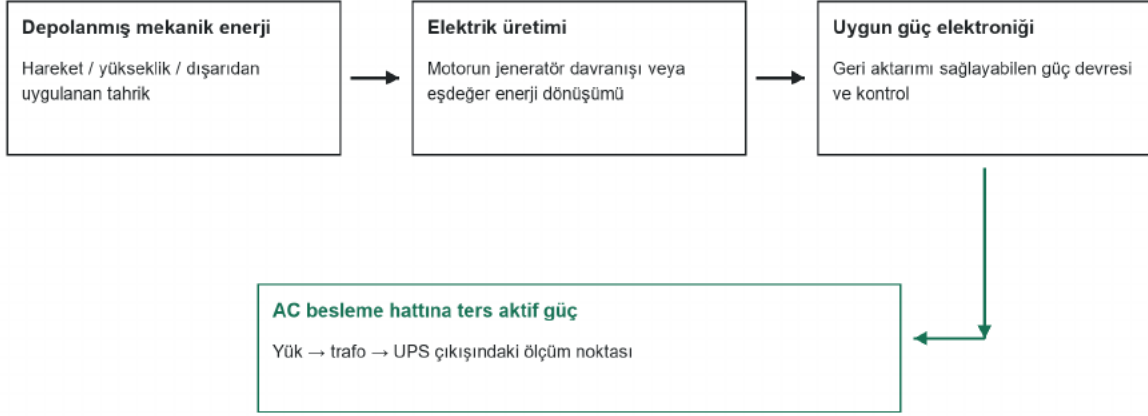
During braking or rapid deceleration, a motor-driven mechanical system can behave like a generator. Stored mechanical energy returns electrically through the drive system. Depending on the drive and supply arrangement, this energy can appear on the supply side and reach the UPS output.

If the UPS has no suitable path to absorb or process this reverse energy, internal voltage stress, synchronization disturbance or protection behavior can occur. The correct solution is to identify the event early and manage it at the proper point.

Rejeneratif enerjinin genel mekanizması

Öğretici işlev şemasıdır. İncelenen makinenin iç devresi veya doğrulanmış bağlantı planı değildir.

TEMSİLİ GÖRSEL – SAHA ÖLÇÜMÜ DEĞİLDİR



Sürücü DC bus'ı genel dönüşüm güzergâhında bulunabilir. Her sürücü AC hatta enerji geri veremez.
Saha B'de kesin izlenen bölüm dış besleme yolu ve aktif güç yönüdür; makinenin özel iç topolojisi bu şemadan çıkarılmaz.

11. Possible Effects on the UPS

A regenerative load can force the UPS into bypass, trigger alarms, interrupt inverter operation or increase stress on internal power stages. The exact reaction depends on the UPS topology, firmware, protection thresholds, output impedance and the severity of the event.

This is why the diagnosis must include UPS logs, event timing, load type, motion cycle and field measurement. The problem should not be reduced to a simple power-rating question.

12. UPS Regenerative Energy Suppression Unit

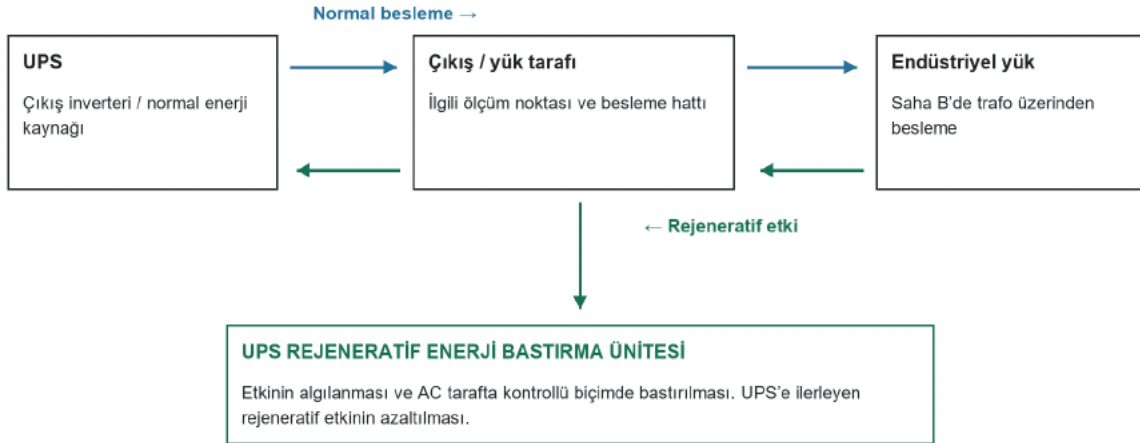
Gurur Elektronik's UPS Regenerative Energy Suppression Unit is developed for applications where dynamic and regenerative loads create UPS bypass, alarm or power-stage stress problems. The unit is connected in parallel to the UPS output and the regenerative load. It does not require intervention in the UPS DC bus connections.

When a regenerative event is detected on the load side, the unit suppresses the effect before it is carried deeper into the UPS internal structure. The aim is to reduce unnecessary electrical and thermal stress and keep the system under better control.

UPS REJENERATİF ENERJİ BASTIRMA ÜNİTESİ

Gürer Elektronik / ticari ayrıntı içermeyen işlevsel prensip şeması. Elektrik bağlantı planı değildir.

TEMSİLİ GÖRSEL – SAHA ÖLÇÜMÜ DEĞİLDİR



Yerleşim ve çizgiler yalnız işlev ilişkisini anlatır; seri/paralel bağlantı, anahtarlama düzeni veya kontrol eşiği tarif edilmez.
Saha sonucu: uygulamadan sonra ilgili UPS bypass problemi gözlenmedi; yeniden bypass şikâyeti alınmadı.

13. Measurement Limits and OL

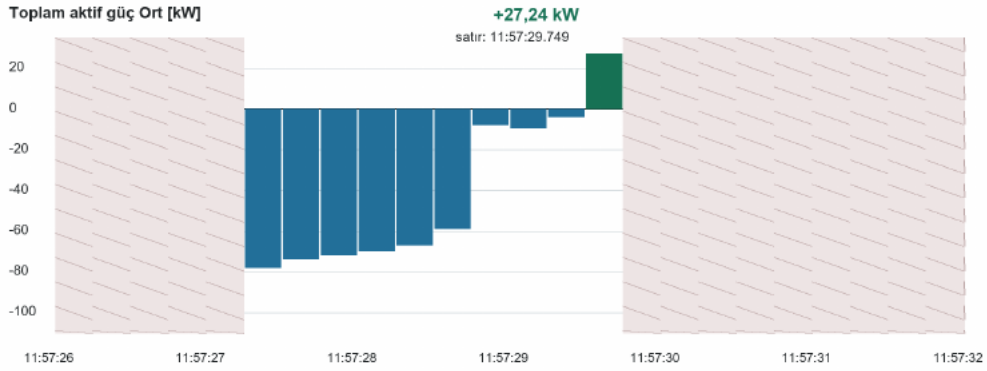
Field measurement records have their own limits. When the analyzer displays OL or the measurement range is exceeded, the extreme number around that interval must not be accepted blindly as a real current or power value. It should be treated as a range-limit condition and interpreted together with the surrounding clean samples.

This distinction protects the report from both exaggeration and under-reading. The useful conclusion is the event character: when it occurs, how long it lasts, what direction active power takes and how the UPS reacts.

Geri akış kaydı ve çevresindeki ölçüm boşlukları

Saha B / MEAS 159 / 28.08.2025 / nominal kayıt kutuları: 11:57:26–11:57:32. OL alanları doldurulmamıştır.

Gerçek saha verisinden yeniden çizilmiştir.



Taralı alan: OL / bilinmeyen güç

Nominal katkı: $27,24 \times 0,250 = 6,81 \text{ kJ}$

250 ms kutu düzeni kayıt zamanına dayalıdır; fiziksel geçiş anlarını veya güç alt penceresini kesinleştirmez.
6,81 kJ ≈ 1,89 Wh yaklaşık katkıdır; toplam olay enerjisi veya garantili edilmiş fiziksel minimum değildir.

14. Technical Appendices

The appendices collect reference values, field archive boundaries and source traceability. They are included so that the reader can understand what the field records do and do not prove.

14.1 Field B numerical reference table: Key measured intervals and clean samples are used as references, while range-limit intervals are treated carefully.

14.2 Field A reference data: The application is presented as a field case with observed UPS behavior before and after suppression.

14.3 Event, heavy-load and OL indexes: High draw, regenerative direction and measurement overflow are kept as separate categories.

14.4 Topology and Record-Reading Limits

The booklet explains the field behavior and public application principle. It does not publish circuit thresholds, detection algorithms, component-level design details or values that would make the unit easy to copy.

14.5 Visual and Source Traceability: Original field measurement screens are kept visually traceable. Redrawn charts represent numerical values from the record and do not add waveform timing that was not present.

14.6 General Technical Sources: The interpretation follows standard power electronics concepts: RMS, peak value, crest factor, active power, apparent power, harmonics, regenerative braking and UPS protection behavior.

Final word: A UPS problem seen in the field is not always a UPS power-size problem. When the connected machine is dynamic and regenerative, the real question is what the load is doing at the moment the UPS reacts.